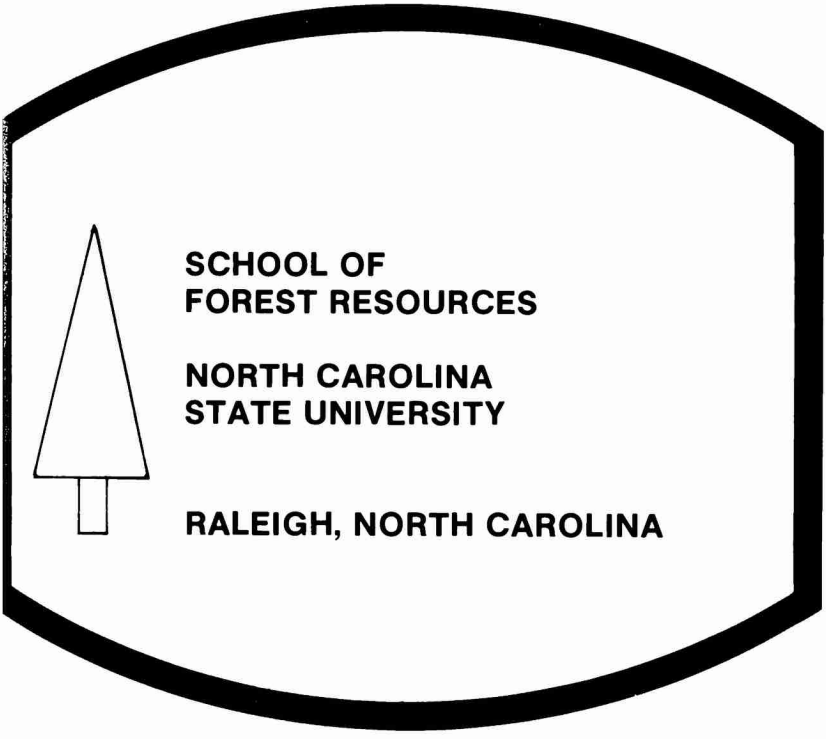
PINETUM 1976

PINETUM



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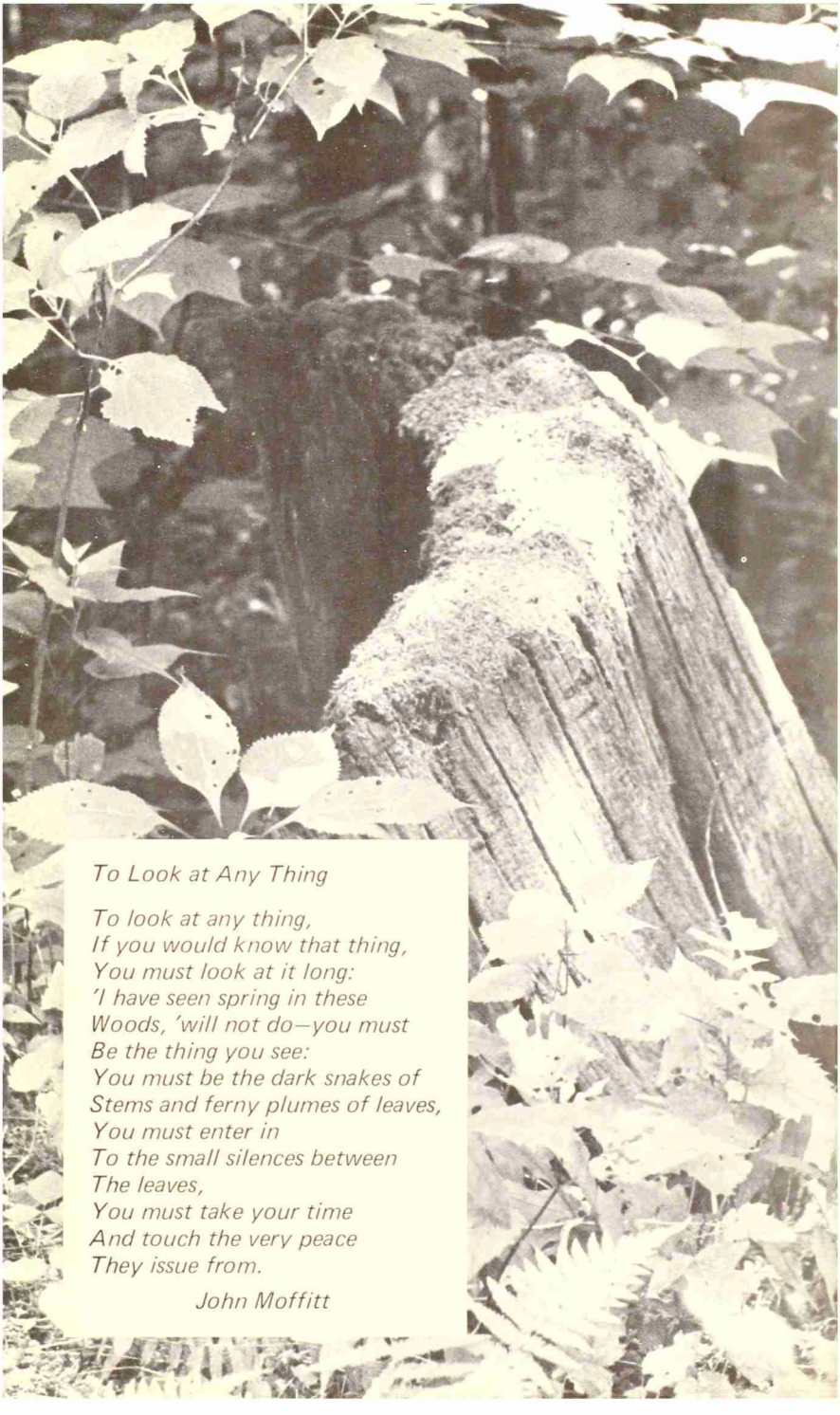

To Look at Any Thing

To look at any thing,
If you would know that thing,
You must look at it long:
'I have seen spring in these
Woods, 'will not do—you must
Be the thing you see:
You must be the dark snakes of
Stems and ferny plumes of leaves,
You must enter in
To the small silences between
The leaves,
You must take your time
And touch the very peace
They issue from.

John Moffitt

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Bess Simons
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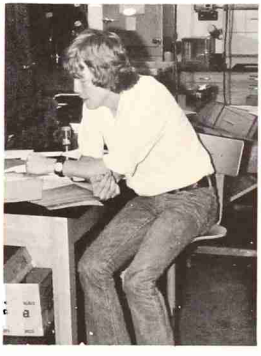
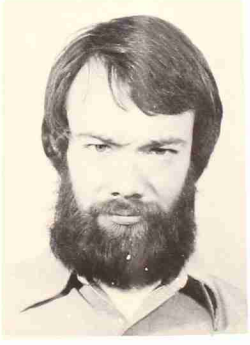


Scott Sillars
Business Manager



Charlie Williams
Photographer

ACKNOWLEDGMENT

The PINETUM staff would like to thank the secretaries, the faculty, Dr. Kao for his patience, the students for their inspiration, and the advertisers for the means of bringing together another school year.

DEDICATION

The 1976 PINETUM is dedicated to Thomas V. Gemmer in appreciation of the great service he has been to students in Forest Resources as a teacher, an advisor, a friend.

After receiving his Masters in Forestry at Purdue University in Indiana in 1970, Tom Gemmer came to State to work on his Ph.D. in the field of computer utilization in forestry. He immediately began extending his knowledge of computers and their relation to the forestry industry to the students through his course entitled "Quantitative Methods in Forest Resources". The use of computers in forestry is a new and expanding field, and, finding few sources to guide him, Mr. Gemmer tailored the course into one of the most popular and relevant courses in the school. He eventually wrote his own text to suit the needs of the students.

Mr. Gemmer was justly rewarded for his dedication to his students and his field by being named the Outstanding Professor at N. C. State in the spring of 1974. Proof of his ability as a teacher can be found by looking at the student's evaluation of his course: straight A's across the board.

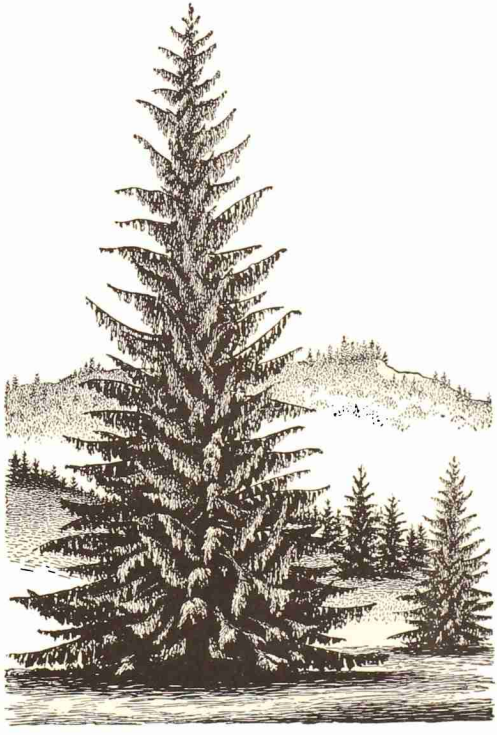
Mr. Gemmer is also of value to the School and its students through his involvement with Forestry Summer Camp (he heads the fire school and the mountain

trips), as advisor to the Forestry Club, and most recently through his course in fire control.

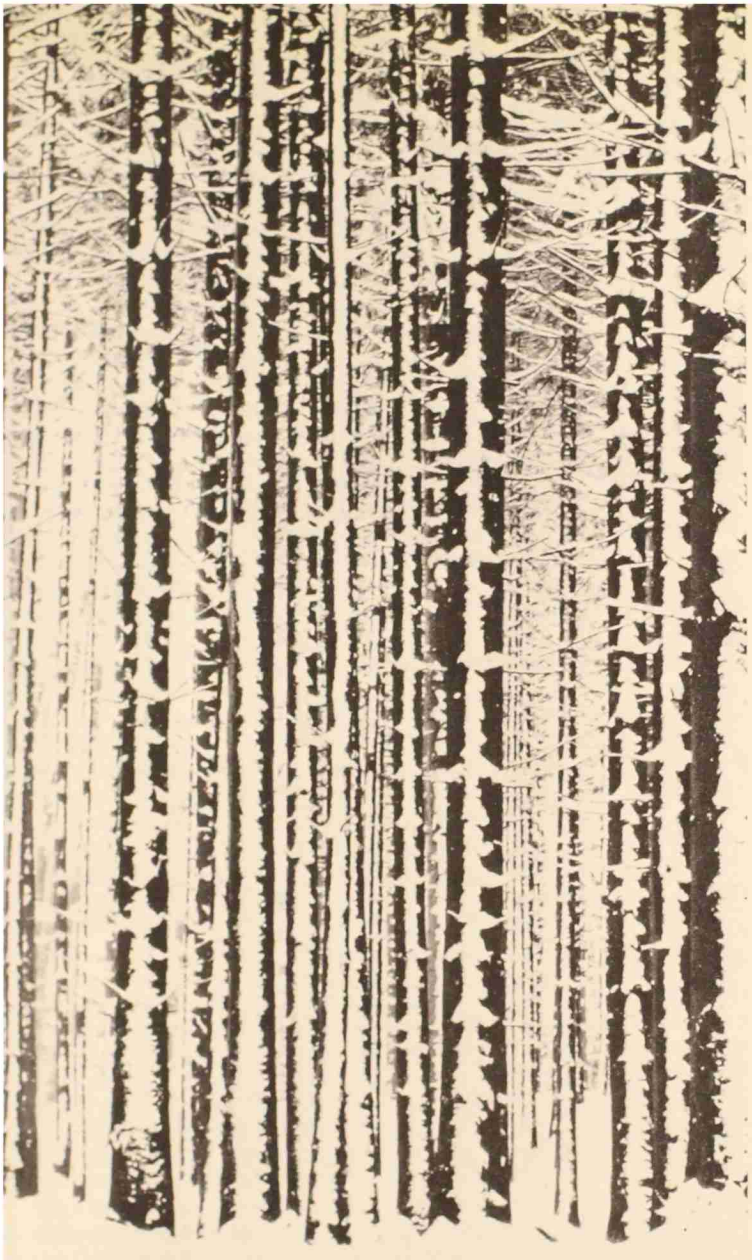
Mr. Gemmer's interest in the use of computers in forestry is a product of past professions. After obtaining a B.S. in Forestry from Purdue in 1955 and a two and a half year stint in the Army, he went to work for Brunswick Pulp & Paper in pulpwood procurement. He then became employed by IBM in computer sales to the paper industry for four years. Returning to Purdue for his Masters, Mr. Gemmer became night supervisor for the Purdue Computing Center.

Coinciding with Mr. Gemmer's interest in computers and forestry was an increase of interest in computer applications by the U. S. Forest Service. The U. S. Forest Service encouraged Gemmer's interest and suggested that he apply to the N. C. State Statistics Department for his Ph.D. To the benefit of the School of Forest Resources, the Statistics Department referred his application to Forestry where there happened to be an opening for someone of Gemmer's talents. He applied to and was accepted by the school, where he continues his research work and doctorate: wildfire management through computer simulation.

While Tom Gemmer's accomplishments in both teaching and further education deserve praise, the students, faculty, and staff in Forest Resources are even more indebted to him for his selfless helping hand, true concern, and sincere friendship.



ARTICLES

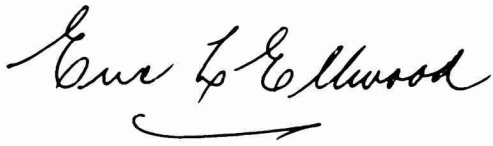


'The final conclusion is that we know very little, and yet it is astounding that we know so much, and still more astounding that so little knowledge can give us so much power.'

Bertrand Russell

HIGHLIGHTS OF THE 1975-76 SCHOOL YEAR

by



Our school policy on freshman enrollment in recent years has been to limit growth substantially by raising admission requirements above the general admission qualifications level required for the campus. One consequence of this policy has been that over the past few years the general trend of SAT scores of freshpersons entering our school has been upward in contrast to the down trend in the other schools and also nationally. However, the fall of 1975 saw our biggest enrollment ever (see enrollment table) with the major increase being in the Forestry curriculum. The principal reasons for our limiting enrollments are that space and facilities are becoming limited, and faculty teaching loads must be controlled to avoid dilution of the quality of the programs offered. As examples of the enrollment pressures, recent statistics showed the forestry faculty to have the fifth heaviest student contact hour teaching load out of some 50 teaching units on this campus.

Our School Space Allocation Committee (SSAC) is seeking out every nook and cranny in the Biltmore Complex to accommodate the increased demand for space——to say nothing of the summer camp tight fit at Hill Forest. One unfortunate aspect of the space crunch was our need to convert the student lounge into offices for faculty and staff.

Some welcome relief was afforded during the year in the form of three new faculty positions allocated to the school. The search is on to fill these positions. In addition, arrangements were made for Dr. Arthur Cooper, who is with the N. C. Department of Natural and Economic Resources on extended leave from the University, to join our Forestry faculty on a full-time basis next July 1. We are looking forward to his return to the campus.

We have been having our usual fun and games with the school forests. Currently we are contesting the claim of Jones and Onslow Counties to impose ad valorem county taxes on the Hofmann Forest which is located in those counties. This is a long and complex issue and it necessitated retaining a legal firm and taxation consultant. Added to this was the incidence of a 2,000 acre fire on the forest during February which, fortunately, did not destroy any plantations.

On the plus side, we learned in February that the Army Corps of Engineers, which purchased the School's Hope Valley Forest for reservoir construction, had deposited their check for the land. This money is earmarked for replacement of the Hope Valley Forest in another location and we now plan to immediately move ahead on land acquisition plans elsewhere.

In the area of teaching program development, we have been working with the School of Design's Landscape Architecture program to develop a thrust in land use planning as applied to forestry and recreation. One aspect of this relationship

is that we appointed Dr. Arthur Sullivan, the Landscape Architecture program leader, as a joint member of our forest resources faculty.

Work also commenced in earnest on the development of a curriculum in forest engineering in response to suggestions from segments of the forest products industries. This program is being developed in cooperation with the Schools of Engineering and of Agriculture and Life Sciences (Biological and Agricultural Engineering). Dr. Awatif Hassan, the second female faculty member to be hired by the school, has been assigned the responsibility of spearheading this program.

The trial run of the evening course on "The Making of a Manager" taught by Professor Robert Vokes, with the assistance of Professor Dahle, proved to be a success and it demonstrated a need. As a result, arrangements were consummated with the Department of Economics and Business for that department to assume responsibility for teaching such a course with the support of the N. C. Pulp and Paper Foundation. The interest of the industrial sector in stimulating the development of this course is an expression of their concern about the need for students to develop an awareness of the nature of management. Also, during the year arrangements were made with the School of Agriculture and Life Sciences for our school to play a more active role in the operation of the Wildlife program. This curriculum is administratively located in the Department of Zoology.

New program development in research has included the initiation of another industry-university cooperative research program in forest engineering and systems and related equipment to increase efficiency and minimize costs in forest plantation establishment and management. In its first year of operation nine industries are supporting the program which will be developed jointly with the Schools of Engineering and of Agriculture and Life Sciences.

Another new enterprise under development during the year was an interinstitutional and agency program to carry out research on how best to manage the renewable resources of the Southern Appalachians. Under this concept the U. S. Forest Service, National Park Service, Western Carolina University and our School of Forest Resources will combine forces to work on these problems and opportunities. This program should eventually facilitate graduate student program opportunities related to the Southern Appalachians. Two other new research projects of interest commenced during the year. A study of the mysterious cause of death of a large number of pine trees in the Wake County area is under the direction of Dr. Perry. Industrially generated air pollution is suspected. Dr. Lester Holley and Extension Specialist William Huxster obtained a research grant from the federal extension service to undertake a study of means to generate increased forest productivity on small privately owned woodlands.

School faculty and administrators continued to play a role at the state and national level in a variety of task forces and study committees dealing with forest resources and recreation. These contributions, while not immediately apparent in their affect at our home base, do contribute to the shaping of state and federal policies (which means legislation and funding) on management and research relating to renewable natural resources and recreation.

In continuing education and extension new activities included the operation of three new annual schools for administrators by the Department of Recreation Resources Administration in park security and safety, management of zoological parks and aquariums, and arts management.

A new venture by the forest resources extension specialists was the establishment of a highly successful mini-summit program located on the coast of Manteo,

N. C. This program was jointly sponsored with the Wildlife Federation and combines recreation with ecology and conservation. The course attracted a considerable spectrum of people from several states. Another similar program is planned for the late spring but with emphasis upon recreation and renewable resources in a mountain location—Cashiers, N. C. One of the not so happy aspects of the extension program was that Walt Keller, Specialist in Charge, Forest Resources Extension, announced his intention to retire later during the year. Walt, who heads the largest forest resources extension program in the USA, is nationally recognized for the quality of his program and he will be missed as will Extension Specialist Fred Whitfield who also retired and whose name became a household word amongst those interested in the protection of forest trees. With Dr. Barefoot's move to his new assignment in University Studies, Dr. Mike Levi was appointed to head up Forest Products Extension. Another veteran to announce his retirement at the end of this academic year is Professor "Bing" Miller of the Recreation Resources Department. Bing has devoted a career of dedicated service and his place will be hard to fill.

ENROLLMENT FALL 1975

Curriculum	Undergraduate	M.S.	Ph.D.
Conservation	50		
Forestry	414	34	17
Natural Resource Recreation Mgt.	31		
Recreation and Park Administration	285	20	
Pulp and Paper Science and Technology	110		
Wood Science and Technology	51	15	17
Special and Unclassified	5		
TOTAL	946	69	34

Degrees awarded in 1974-75 were:

Bachelor	194
Masters	12
Doctorate	8
TOTAL	214

FACULTY AND STAFF

Changes in faculty personnel included the following appointments and resignations:

Dr. James McGraw was appointed an Extension Assistant Professor succeeding Fred Whitfield who decided to take an early retirement.

Dr. M. P. Levi was named Specialist In-charge of the Extension Wood Products Section replacing Dr. A. C. Barefoot who was named Head of University Studies.

Mr. Elvin Clapp was appointed to a temporary teaching position in Recreation Resources Administration.

Dr. John Cheeseman was appointed a Research Associate to work on the Wake County Pine Kill problem.

Dr. Awatif Hassan was appointed Associate Professor in the Department of Forestry.

Mr. Edward C. Sossaman was appointed Liaison Geneticist to work with the Tree Improvement program.

Dr. A. L. Sullivan was appointed Associate Professor for Forestry and Design.

Mr. Robert F. Vokes was named a Visiting Professor this year with teaching responsibilities in the Department of Wood and Paper Science.

Mr. W. Keith Watts was appointed a Research Assistant in the Department of Wood and Paper Science to work on a project sponsored by the Furniture R&D Applications Institute.

Several awards and recognitions were made during the year to the faculty as follows.

Dr. Bruce Zobel was elected as a member of the Swedish Forestry and Agriculture Academy.

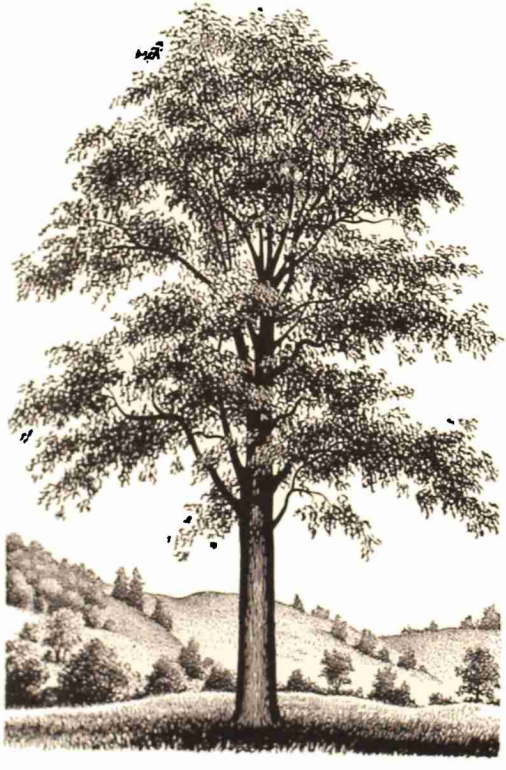
Dr. C. B. Davey is serving as President of the Soil Science Society of America.

Dr. I. S. Goldstein was named Chairman of 1976 Gordon Research Conference on Chemistry and Physics of Paper and to the Editorial Board of Wood and Fiber. He also was an SWST Visiting Scientist.

Dr. Robert G. Hitchings was awarded the NCSU Distinguished Alumni Professorship (3 year term).

Dr. Myron Kelly was named Director of the Visiting Scientist Program for the Society of Wood Science and Technology.

Dr. Robert E. Sternloff was the recipient of the N. C. Recreation and Park Society "Fellow" Award.



THE CHANGING PATTERNS OF WOOD UTILIZATION

by

Irving S Goldstein

The complexion and practices of the forest industry are strongly influenced if not completely determined by the products being produced. For those forest areas where wood in one form or another is the principal product the forestry practices of harvesting, regeneration and management will vary depending on the kind and form of wood desired. Even in forest areas where water, wildlife or recreation are most important, forest management practices may be influenced by the variable economic return from different forms of the by-product wood.

The earliest use of wood was as fuel. Primitive man probably used what was available in the form of windfalls, branches or small trees. Later, hardwoods were preferred because of their higher density and good conversion to charcoal for metallurgical uses. Much fuel wood became available from the clearing of land for agriculture. Although in 1875 three-fourths of the energy consumed in the United States was derived from wood, the shift since then to fossil fuels such as coal, petroleum and natural gas has relegated wood to a very minor and mostly sentimental role in charcoal grills and fireplaces.

As a structural material wood was first used in its round natural state. Although well designed by nature for lifting the tree's photosynthetic apparatus above its competition a cylinder is not the best shape for general use. However, roundwood served well in masts and spars, log cabins, corduroy roads and transportation rollers. Similar uses still persist in the form of utility poles, marine and construction piling and fence posts.

With the replacement of laborious hand hewing techniques for squaring lumber by powered machinery the use of squared framing lumber as we know it today became possible, along with boards for sheathing, decking, panelling and siding. The cutting of these rectangular shapes from round trees demanded sawlogs of large diameter.

As long large logs from the first-growth forest became increasingly scarce it was necessary to resort to laminating techniques to provide the heavy structural timbers and arches for buildings such as churches, gymnasiums, factories and warehouses with large open spaces requiring long spans. At the same time the high labor costs associated with the installation of boards for sheathing and decking led to rapid development of the plywood industry whose large panel products can be rapidly put into place. The introduction of insulating board panels of wood fiber for sheathing not only reduced the time and labor for installation, but made more solid wood available for framing lumber.

Attempts to utilize the wood residues from both primary and secondary manufacturing processes led to the development of new panel products such as particleboard and medium density fiberboard. These have found application in such non-structural uses as underlayment and hidden or veneered furniture parts. The rapid acceptance and growth of these reconstituted panel products soon outstripped the original raw material supply in the form of residues and required the use of roundwood deliberately harvested and reduced to particles or fibers to meet the increased demand.

Concurrent with these changes in the utilization of solid wood the pulp and

paper industry outgrew rags and straw as its raw material and turned completely to wood for its fiber. At first the technology allowed only the use of certain northern softwoods, but the development of the versatile kraft process and its application to southern pines and hardwoods led to the concentration of most of the pulping capacity of the U. S. in the southern states. Management and harvesting for pulpwood bear little resemblance to the procurement of masts for the Royal Navy.

Total tree chipping can provide raw material for pulp mills or particleboard and fiberboard plants from wooded areas once considered of little commercial value because they contained few large straight trees. Chip'n'saw operations can yield framing lumber as well as pulp chips from stands in which trees of less than sawlog diameter predominate.

As we are faced with increasing demands for structural wood products and paper products for our growing population from a shrinking forest base, the trend outlined above of increasing reliance on reconstituted products will doubtless continue. Eventually we may no longer use solid wood in any size, but depend completely on wood fiber-polymer composites.

At the same time we are possibly at the threshold of yet another step in this progression of using smaller aggregates of wood substance, the utilization of wood at the molecular level for chemicals and energy. These uses for wood in response to increased costs for fossil fuels are certainly not novel in basic concept insofar as they represent a return to practices of the 19th century before fossil fuels completely displaced wood. While the energy needs of the country have grown twentyfold in the past century and we do not have enough wood to meet all our current energy needs, it is entirely possible in regions which are densely forested and lightly populated to meet both home heating and electric power needs from wood A recent study has examined this prospect for the State of Vermont. The cost and availability of fossil fuels will determine the viability of such uses for wood.

Similarly, chemicals from wood is not a new concept. The destructive distillation of wood to charcoal and the controlled thermal degradation of wood by pyrolysis and distillation was in the past used as a source of such chemicals as methanol (wood alcohol), acetone and acetic acid. Turpentine and rosin were traditionally obtained by tapping pine trees, although they are now more readily available as a by-product of the kraft pulping process.

At present most of the synthetic organic chemicals produced for use as solvents, polymers, plastics and chemical intermediates are obtained from petroleum or natural gas. However, the conversion of wood into chemicals for the production of most of our synthetic plastics, fibers and rubbers is technically feasible and will become economically feasible if oil prices continue to climb at a faster rate than wood costs.

The fulfillment of all our polymer needs from wood as a renewable raw material should not place an impossible burden on our wood supply, but might actually improve the availability of wood for lumber, plywood and pulp by providing a use for less valuable wood which would allow reforestation and improved forest management.

For processes involving the conversion of wood to chemicals or to energy the form or nature of the wood harvested is of no importance. Species or size do not matter. This broad freedom from the usual procurement restrictions could have a great effect on the future total pattern of wood utilization and forest management.

CHANNELIZATION? UGH!

by

Tavalt Jmaki

"Man marks the earth with ruin, his control
Stops with the shore . . . . . ."

—Byron in Childe Harold's Pilgrimmage.

Channelization is an activity that alters moisture regimes in stream basins, and modifies the character and the rate of flow in stream channels. Many, possibly the majority, in the "now generation" have come to regard channelization as an evil operation, rupturing the delicate balance of allegedly fragile swamp ecosystems and imperiling the natural environment; they may not concede that man's control extends as far as the shore, but they fear that his influence may extend into the estuaries and even to the ocean itself.

Public awareness of the consequences of channelization has heightened within the past decade as more work has been initiated or planned under authorization of the Small Watershed Act. In North Carolina alone, this act, frequently referred to as Public Law 566, has resulted in the alteration of 675 miles of stream channels prior to 1972, and some eleven hundred additional miles are planned for treatment. Opposition to further channelization has been rapidly intensifying, exemplified by the well-publicized Chicod Creek project in Pitt and Beaufort counties of North Carolina, a project blocked before any digging started, and now enmeshed in litigation. The known or imagined danger that channelization poses for the entire swamp ecosystem underlies the current controversy and opposition which have grown so virulent as to have virtually halted further work under PL-566.

It is generally true that where solid information is lacking, opinions are likely to be numerous, and often at least partly without substance. We face this situation with respect to channelization; all the truth about it has not yet been discovered, nor the data base fully developed. Note, for example, what the prestigious report of Arthur D. Little, Inc. and the Philadelphia Academy of Science contained in part in their conclusions to the Council on Environmental Quality:

. . . . . "The drainage of wetlands shifts the species composition of bottom lands; reduces or eliminates the hardwoods, which in turn reduces habitats and food resources for wildlife. This may have far reaching effects as these areas are often part of major flyways.[1]

. . . . ."Erosion and sedimentation are among the most severe effects of channelization and were most commonly encountered. Erosion is produced by many activities among which are clear cutting (sic!) the forest; snagging or removing vegetation from stream banks which often renders them unstable; straightening the stream channel; and changing the slope of the stream. The effect of the sediment load is to increase stream turbidity and reduce light penetration which in turn reduces algal productivity which is necessary for the formation of a diverse and productive food web . . . . . ."[2]

The School of Forest Resources with support from the Water Resources Research Institute and the Office of Water Resources Research is now engaged in

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[1]Page 22a and [2] page 22b, of the **Report on Channel Modifications Vol. I** submitted to The Council on Environmental Quality, March 1973.

heroic investigation attempting to find out whether this State or any state with its streams subjected to channelization can long endure. More specifically, our investigations involve eleven streams and associated swamp forests stretching from Craven County northward a hundred miles to Gates County. One phase of our study is directed toward the behavior of the water table and soil moisture regime between channelized and non-channelized stream basins. Another major phase involves inventorying and characterization of the vegetation communities and how their primary productivity, as well as the floristic composition, may be undergoing modification due to altered moisture regimes. Another major phase is directed toward measurement of the altered ecosystem in relation to the quality of habitat for wildlife, such as wood duck, wood cock, raccoon, deer, songbirds, and the like.

In this heroic enterprise, the real heroes are the students and scholars who have undertaken to delve into specific aspects of the problem area hoping to emerge from the morass with something more solid than the conventional folklore about swamp ecosystems in North Carolina. They deserve to be named here, if not to be decorated with a swamp sumac leaf-cluster, or equal. Judy Baldwin has undertaken the measurement of circumferential expansion of several valuable swamp timber species in relation to fluctuations in water levels. Mitch Flinchum is characterizing the flora of the swamps, including the diversity and phenological manifestations as influenced by soil moisture regimes. Skip Hyberg is undertaking an inventory of the growing stock in the vicinity of the 18 ground water well lines to quantify the stand density, the volume of usable wood, the nature and extent of cull trees, the character and quality of ingrowth from the channel to the upper reaches of the flood plains. John Lollis is attempting to apply a matrix approach to assessing the amount and quality of food species for wildlife by different seasons within areas that have been clearcut and areas which have not been "selectively" high-graded for several decades. Allen Pinkelton is analyzing the land use prior to channelization and after the alteration by means of aerial photos; he is also employing multispectral photography to identify the extent of ponding after major storms. Finally, Dennis Hazel serves as the coordinator for the entire operation, and pinch hits in data collection if others should falter. With his marvelous mechanic skills he manages to keep the equipment and instruments operating without debilitating hiatuses. With nominal assistance from the principal investigator, he will explore the shallow stratigraphy of the several stream basins to determine whether there are notable differences in depth and position of strata that might account for possible differences in water table fluctuations.

The project is now roughly halfway through its scheduled life. Have we learned anything? At this sitting, it seems prudent to withdraw behind a few annoyingly cautious generalizations, until all the data have been collected and properly massaged.

The swamp forests of most of our sample streams have been drastically high-graded and mutilated over the past century and a half. In no sense are they pristine, nor worth preserving without first improving them.

The most attractive stands of swamp timber existing today are likely to be in areas clearcut more than a half century ago, thus allowing a new forest to spring up in the wake of the logging, unfettered by hulking culls that dominate and deform the young growth.

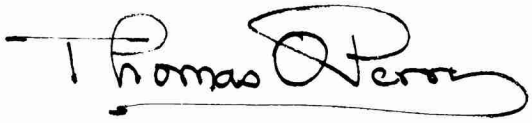
The notion that clearcutting of swamp forests causes excessive erosion is a persistent myth that needs to be destroyed.

Non-channelized streams are not free of sedimentation so long as soil from roads and fields is transported into the floodplain of swamp forests.

We could speculate further, but it is not possible to say everything at once about so complex and varied an environmental entity as the swamp ecosystem. It may be worth remembering that channelization is really an old activity, even though nobody is bothering to say that "that's the way it was 200 years ago." Nevertheless, since that time, at least 200,000 miles of the Nation's waterways have "suffered" some sort of stream development, improvement, or modification. The main purpose of all the past tinkering with natural water courses has been to drain land for agricultural use, to reduce flooding, and to facilitate water transportation. Often lacking proper planning, engineering, or financing, the earlier efforts proceeded in climates of relative calm, without public outcries, **sans** injunctions. Until now, the prevailing philosophy has seemed to be that which is echoed in the words of engineer and later 31st President Hoover in his assessment of the mighty Mississippi: "What has the river lost?", he queried. "What it has lost in romance, it has gained in tonnage!" When the final truth about channelization emerges, those of us who still cling to some romantic notions about pristine swamp ecosystems may wake up to find that there are indeed some tradeoffs tending to life channelization above the level of an unmitigated evil.

URBAN FORESTRY

by



"If trees could vote then every good forester could be president. But what about people? . . . When will the foresters come out of the forest and work near the city, where the people are, to take the trees to the city? . . . Foresters, it seems, must broaden their outlook and concern themselves with total environmental quality. It is the same problem we have in the transportation business. In 1910, the railroaders made the mistake of confining themselves to the railroad business. Had they conceived they were in the transportation business at that time we might have far better coordinated transportation today . . . . If we get the foresters out of the forest so that they can see the trees in the cities, and bring to other cities William Penn's vision of 'Greene Countrie Townes', then foresters would not have to worry if trees could vote and would win the confidence of fellow humans, not as in the slogan, a chicken in every pot, but with a **tree in every plot.**"

Athelstan Spilhaus 1969
"If Trees Could Vote"
J. of Forestry, Vol. 67:8-10

Foresters have long recognized their role in managing natural resources, particularly the renewable resources of water, timber, wildlife, and recreation, on large blocks of private and public lands which are removed from centers of population by distance or river swamps or abrupt changes in topography. The population explosion and the development of high-speed expressways has fostered an urban sprawl which is overcoming the barriers of distance and topography so that cities now spread out into the territories that were once the private domain of the forester. This article examines the opportunities for foresters to respond to these changes in population distribution.

Modern cities like Chicago contain a surprisingly large amount of open space. Five to ten percent of cities like New York and Chicago and 16-20 percent of cities like Raleigh, Winston-Salem, and Charlotte are not suitable for use as sites for either residential or industrial use. City rights-of-way for water, sewer, power transmission and streets constitute some 40 percent of the acreage in most cities. These rights-of-way are often lined or covered with trees and other vegetation. Thus, in the city of Raleigh, which includes some 31,000 acres in the city limits, there are over 4,000 acres of open space. An additional 2,000 acres of open space exists along city streets, in parks, and on school grounds, etc. that support vegetation. Inclusion of the tree covered areas in residential yards will add another nearly 1,000 acres to the previous figures to bring the total to between 6,000 and 7,000 acres of the city which supports trees or some other form of perennial vegetation.

The zoning jurisdiction of most cities extends beyond the city limits into the suburbs. Raleigh is no exception. Its zoning jurisdiction extends two miles beyond the city limits to include a total area of approximately 84,000 acres. Much of this area is undeveloped and is held by real estate speculators. For ex-

ample, there are over 7,000 acres of land which are zoned for industrial development which are not used. Only about 50 acres of this industrial land is consumed in a given year. Thus, there is more than 140 years' supply of land which is now largely unmanaged in this one category alone. Accurate determination of the total acreage within the corporate limits of Raleigh or in its zoning jurisdiction that is now or will continue to be occupied by trees during the coming hundred years will require considerable efforts. However, the point should be clear—in and around most American cities are thousands of acres of land upon which foresters can apply their professional skills for personal profit and for the benefit of society. What are some of these applications?

A major justification for the establishment of national forests in the eastern United States was to provide a reliable supply of potable water to cities and to protect navigable streams. Only in the second paragraph of the Secretary of Agriculture James Wilson's letter to Gilford Pinchot has the topic of timber production come up. Perhaps this was all political eyewash but the fact remains that much of the research and management by the United States Forest Service has centered on erosion control, flood control, and production of water for cities. In the Piedmont of the United States and in other regions of the world, cities have extended their boundaries into their water supplies, hence foresters find opportunity and employment with city water works, with soil conservation services and with the city planning offices that are concerned with matters of pollution and water management. In recent years there has been much investigation of the use of forests as areas of waste disposal particularly sewage and other liquid wastes.

The value of trees leaps several hundredfold when they become part of the urban landscape rather than a mere forest commodity. Data show that a typical residential home is worth 2 to 5 thousand dollars more when it is surrounded by a proper stand of trees. Not all of this increase in value can be accounted for by the mysterious factor of aesthetic appeal. Indeed, figures show that the heating and air conditioning costs of houses surrounded by trees can be reduced by some $200 per year which is equivalent to the income generated by an investment of $4,000 at 5% interest.

Establishment and maintenance of healthy trees in and about the city on both private and public property can involve foresters working with tree maintenance companies, landscape contractors, and city park and public utilities and planning departments. People are often surprised to learn that foresters and tree managers in cities like Denver, Colorado and Edinborough, Scotland, are either employed by or receive most of their operating funds from public utilities and street rights-of-way departments rather than from parks departments. This is a reflection of the fact that most of the tree problems are generated on the largest portion of publicly-owned lands—the city streets—where damage and stresses to trees are greatest.

The constant digging of sewers and power lines, the bumps of automobiles and the compaction of soil by pedestrians and the general lack of proper root space makes the life of a city tree short and harsh. The average city tree lives less than 18-25 years before some man-made disaster strikes. A regular program of growing and replacing trees before they become too large and become a nuisance or before their rotting limbs become a safety hazard is an integral part of any urban forest management program. Care must be taken to have a proper age class distribution in a park or along a city street; otherwise the citizens will scream loudly when one of these scenic spots is denuded by the dutch elm disease or some other disaster.

Weyerhaeuser and other companies are establishing permanent paper and waste salvage operations in or near city landfills. A full tree chipper and stump shredder and a small saw mill could be combined with these facilities to serve the double function of reducing the consumption rate of precious landfill space and provide a supplement to our supply of forest products.

Real estate developers would welcome such a facility since a typical real estate development requires the clearing of some 20 to 40 percent of the acreage for the establishment of house sites, closed yards, streets and other open spaces. Frequently the real estate developer has to pay some $1,200 per acre for such land clearing and then pay another $800 or so to dispose of the stumps therefrom. Currently, in the city of Raleigh, real estate developers must pay $12 per truck load to dump old stumps into Gresham's Lake.

There are abundant opportunities for foresters to be employed in and about cities both by the public and private sectors of our economy. The major innovation demanded of the city forester will be that 90 percent of his energy will be devoted to dealing with people as individuals and in the political processes of decision making. Managing of the renewable resources of water and timber and recreation range and wildlife is much more of a people-oriented enterprise when 35,000 property owners are involved than when a single property owner is involved.

The forester who supplements his technical knowledge with public speaking, political science, personnel management, landscape planning, horticulture, recreation, wildlife, and other special skills will find multiple career opportunities in and about the cities of the world. There is a high probability that between 15 and 30 percent of our forestry graduates may ultimately find employment that involves urban situations.

FOREST ENGINEERING

by

Awatif Hassan

Engineering by definition is the branch of science that puts power and materials to work for man and his environment. Formal engineering education was not recognized in ancient times. Structures were built by trial and error. Those who built the pyramids of ancient Egypt and the Great Wall of China were not called civil engineers because the engineering specialization we know today were not developed until the 1700's and 1800's.

Forest Engineering involves some aspects of civil and mechanical engineering and forestry. Forest engineering is being practiced by engineers of other disciplines who have developed interest in biological sciences and adopted forestry for their system approaches, or by foresters who are working for or associated with the forest industry in the fields of mechanized forest operations or forest road systems.

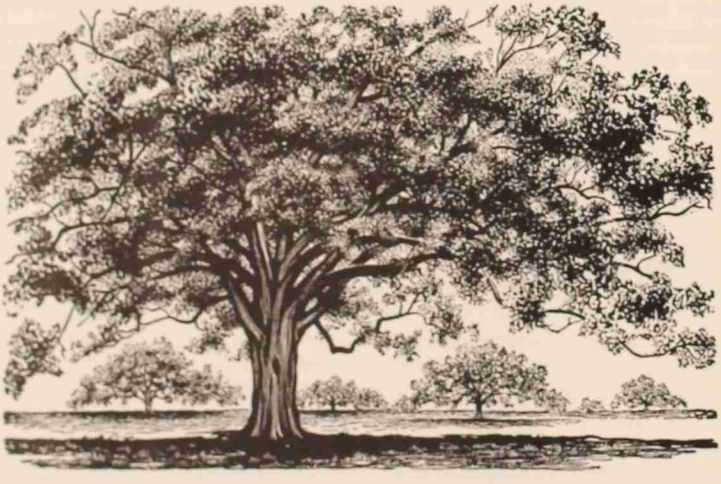
The increased demand for forest products has resulted in the advancement and progress of forest mechanization. Therefore, the need for formal forest engineering education to meet the forest industry demands has been recognized. A forest engineer conference on education was held in 1969, for discussing curricula and requirements of different employment agencies. Following this conference, several undergraduate programs (fewer than ten) were initiated in the northeastern, southern and western regions of the United States. Most of these programs are option curricula in Agriculture or Civil Engineering. Some of these programs offer a very special curriculum in logging and harvesting systems ignoring all other aspects of engineering and reforestation. The Department of Biological and Agricultural Engineering, NCSU, offers an emphasis sequence in Forest Engineering in the science curriculum (SBE). The selection of this emphasis sequence is entirely at the discretion of the student and does not detract from the core curriculum in Biological and Agricultural Engineering.

The forest engineering curriculum that I am proposing may require 135-145 credit hours for graduation, so that accreditation by the Engineering Council for Professional Development (ECPD) and/or the Society of American Foresters would be sought. Thus the graduate will be able to practice forestry and/or engineering. The students going into this program will be encouraged to take the same general program of courses as freshmen in engineering. The proposed program will provide basic training in systems and equipment for forest production and harvesting, reforestation, soil and water control and conservation, developing forest road systems, material handling in the forest and at the wood processing plants, and other phases of forestry. Students may complete the proposed program in four years with the provision of completing a 10-week summer camp program immediately following the sophomore year and three months of field training after the junior year. This program will have to be administered jointly with the School of Engineering in order to meet the ECPD graduation requirements.

The industry and public agencies involved with forest production or forest products are in great need of forest engineers with the proper training. Graduates

of this program may find employment with pulp and paper or lumber companies, with federal and state agencies, with private and engineering consulting firms, or with machinery and equipment companies. The proposed curriculum provides adequate depth in certain fields to prepare the graduate to pursue further research training for advanced degrees. Forestry is the fifth largest manufacturing industry in the United States, thus opportunities for employment are great nationwide in this new field.

Graduate study in forest mechanization leading to the degrees of Master of Science and Doctor of Philosophy has been initiated. Students majoring in Forestry or Engineering may join. Several assistantships and summer employment are available. These assistantships are supported by the Industry—NCSU Cooperative Research Program on Forest Equipment/Systems Development recently initiated. Research problems will be mainly in machine design evaluation and development for forestry application, operations research and systems analysis, and weather-soil-machine interaction as related to plantation establishment. The students involved will have the opportunities to familiarize themselves with the forest mechanization practices and problems and establish good relations with participating forest products companies and machinery manufacturers.



RESEARCH IN RECREATION

by

The Department of Recreation Resources Administration conducts research studies as one of its major functions. Involved in the research are faculty and graduate students working together as a team of specialized scientists. Funding for the research comes from Federal and State sources and is used for personnel, travel, equipment, computer processing of data, data collection and report publication.

Described below are the major projects recently completed or currently underway. These range from studies dealing with the carrying capacity of water resources for recreation to those dealing with problems of disseminating information resulting from the research.

Recently Completed Research

Capacity of Water Resources for Recreational Use

The emergence of recreation as a full blown and popular use of water resource developments has compounded the conceptual and practical difficulties associated with allocation and management of water resources. Measures are being adopted and decisions are being made that relate to the management and development of water resources for recreation, yet the information necessary to guide such decisions is totally inadequate. In 1969, the Department of Recreation Resources Administration initiated a pioneering study of recreation on lakes and reservoirs to provide the kind of information essential to correct allocative management decisions. The study emphasized boater behavior and the capacity of water bodies to provide recreation opportunity.

The objectives of the study were to:

1) Identify the relationships between the behavioral patterns of lake users and conditions of lake use

2) Identify the relationship between satisfaction of lake users and intensity of use

3) Infer the likely effects of selected use intensity and condition control measures on behavioral patterns and use satisfaction

4) Describe the managerial implications of the study conclusions.

Lake Burlington, North Carolina, was selected as the study site and data were collected during the summer of 1969 to describe the behavior of boaters, patterns of use and the condition and intensity of boating activity. All data were processed by special computer programs written to rectify and interpret aerial-photographic data and to integrate aerial, observation, and interview data into a single data file consisting of such variables as velocity, density, number, and distribution of boats.

Three reports have been published as a result of this research:

Capacity of Water-Based Recreation Systems: The State of the Art,
WRRI Report No. 90, Part I

Capacity of Water-Based Recreation Systems: A Systems Approach to Capacity Analysis, WRRI Report No. 90, Part II

Capacity of Water-Based Recreation Systems: Methodology and Findings, WRRI Report No. 90, Part III.

Relationship Between Privately and Publicly Supplied Urban Recreational Open Space

Traditional recreation planning has relied heavily on standards for deciding how much and which public recreational services to supply. This is particularly true of urban recreational planning which has ignored existing private recreational space in planning for public supply of recreational open space. Not accounting for the relationship between these two important sources of open space supply can lead to serious misallocations of capital, human, and land resources.

A key finding of this research is that public and private recreational space are substitutes. This means that a change in the supply or price of one directly affects the demand for the other. As a result, reliance on traditional space standards as a stand-in for reliable demand data must be strongly challenged. Public open space planning should consider existing neighborhood private space if maximum social welfare per tax dollar spent is to be realized.

Another important finding is that privately supplied space seemed to be preferred to publicly supplied space. Middle-income and upper-income neighborhoods expressed less demand for public space because they could afford to substitute the more preferred private space. Demand for public space in densely populated, lower-income neighborhoods was greater because they could not afford the private space alternative.

Income level and existing supply of private recreational space emerged as essential considerations in urban open space planning. These are also important considerations for many other public policy decisions such as land-use zoning, transportation planning, urban renewal, and taxing policies. An article on this research will be appearing in the fall edition of the **Journal of Leisure Research.**

Current Research

Substitutability of Urban and Rural Recreational Open Space

The objective of this project is to devise a means for measuring the relationship between urban and rural recreation opportunities. It represents an attempt to recognize that the people who live and recreate in the city are, for the most part, the same people who patronize recreation sites outside the city.

One of the topics uppermost in public attitude is that of land use and the policies and decisions which determine the use to which lands are allocated. This is particularly true for lands at the rural-urban interface where competition among alternative uses is most evident. Rapid and unplanned expansion of urban boundaries and intense bidding for use of land within cities points to an urgent need for information upon which collective land use planning should be based.

The core of the concern over the way land is used lies in the issues relevant to the quality of the environment in which people live. Most (about 70 percent) of the U. S. population lives in an urban environment, and a major determinant of the quality of that environment is the amounts of various types of open space available. Another determinant is the abundance and type of recreational opportunities available near the urban center but outside its boundaries.

Unfortunately, much of the urban open space planning takes place as if the urban area existed in a vacuum. Urban open space conditions are the only basis

upon which this major category of collective land-use decisions are based. It is reasonable to assume, however, that the demand for urban open space will vary according to the available supply of forest and rural recreation lands within a reasonable driving-time radius. This is because urban and rural open space are hypothesized substitutes for one another.

Practically no research effort has been devoted to determining (1) whether substitutability exists and is important and (2) the degree to which urban and rural open space are substitutes.

If the ultimate goal of achieving efficient allocation of land among its many possible uses is to be reached, studies of the type proposed here are required. The results of this research should indicate the relevance, or lack of relevance, of considering the availability of recreation opportunities in areas surrounding the city when internal plans for open space are being formulated. If significant substitution exists, the implication is that some of the existing city plans will have to be re-evaluated and probably altered since many of these planning efforts have not previously considered the availability of external open space. Similarly, current efforts aimed at making forest and rural recreation areas equally available to all urban centers may have to be reconsidered to the extent that internal open space supply varies among these cities. This research is to be completed by mid-1976.

Design of a Recreation Employment Information System

Currently there is no system available to provide up-to-date information on the demand and supply of personnel for recreation and park employment in North Carolina. Such a system would provide major benefits through development of a uniform position classification scheme, indication of trends in supply and demand of qualified personnel, projection of future imbalances in employment opportunities, and through gauging the effectiveness of technical training and professional educational programs for the recreation field. Furthermore, an efficient computerized system would answer the recurrent demands for information relating to recreation employment.

This project is proceeding through the six steps which follow:

1) Develop a descriptive position classification scheme for recreation and park personnel

2) Identify all existing North Carolina agencies (and identify probable future agencies) with a responsibility for providing recreation and park services, both public and private, and that employ personnel who are functioning within the position framework devised in step 1

3) Identify the suppliers of trained recreation and park personnel

4) Identify the clientele (legislators, government offices, educational institutions, recreation agencies, etc.) of an information system on recreation employment and determine the frequency and type of their information needs

5) Identify all factors that are expected to act as determinants of both the demand (employment opportunities) and the supply (available manpower) of recreation employment

6) Identify existing sources of information on current and past recreation employment situations, on the factors identified in step 5, and on available computer and information system technology.

One Master's thesis has already been completed through this project and two others are expected.

Identification of Barriers to Acceptance and Application of Recreation Research

The objectives of this project are to:

1) Ascertain the level of awareness among Southeastern forest recreation managers of existing output of research results relevant to problems associated with the planning, development, operation, and maintenance of developed forest recreation sites

2) Evaluate awareness of existing research results relevant to this problem area as a barrier to research application and prescribe means for increasing awareness based on the results of this study.

To date some results are already available and indicate that managers, planners, and administrators of forest lands in the South who have recreation supply responsibilities have been surveyed to determine their attitudes toward recreation research and knowledge of research accomplishments and sources of research assistance. Results indicate this group is generally supportive of recreation research, but they feel they do not have enough input in determining which problems are addressed by researchers. They also feel that research results are not very clearly presented. However, most of this group is not well acquainted with existing research publications, sources of research publications, or the recreation scientists involved. They generally are not knowledgeable of which institutions are doing recreation research either. The median amount of time spent reading research results is 1 hour per week. Only one third feels that recreation research output has a positive influence on the management decisions they make. These results will be used to better define the research communication problem and to formulate recommended actions for improving communication.

The results of this study are scheduled to be published in the first edition of the new journal entitled **Southern Journal of Applied Forestry.**

Development of Models for Forecasting Future Recreation Participation

This project is aimed at identifying the determinants of recreation participation in the Piedmont Crescent Urban Region of North Carolina. Through this identification, measurement of relationships can be undertaken to develop models that will enable prediction of recreation participation in outdoor recreation activities.

Results thus far have indicated that the amount and accessibility of water resources are major determinants of the amounts and kinds of recreation participated in by Piedmont residents. Other important factors include occupation and income of households, types and amounts of recreation sites available, and amount of forest land available for recreation. The models developed through this project are expected to provide important tools for use by recreation planners and policy makers.

Public Involvement in Resource Decision Making

In recent years, natural resource agencies have been subjected to court challenges, protests, and other activities by organized groups demanding different decisions or inclusion in the decision-making process. We are currently assessing the attitudes of public land managers (forestry, recreation, wildlife) toward public involvement and the factors affecting these attitudes in a 4-state area. Simultaneously we are contacting State and Federal agency administrative offices to learn whether public involvement is a part of the formal decision-making process and on what issues citizens are involved.

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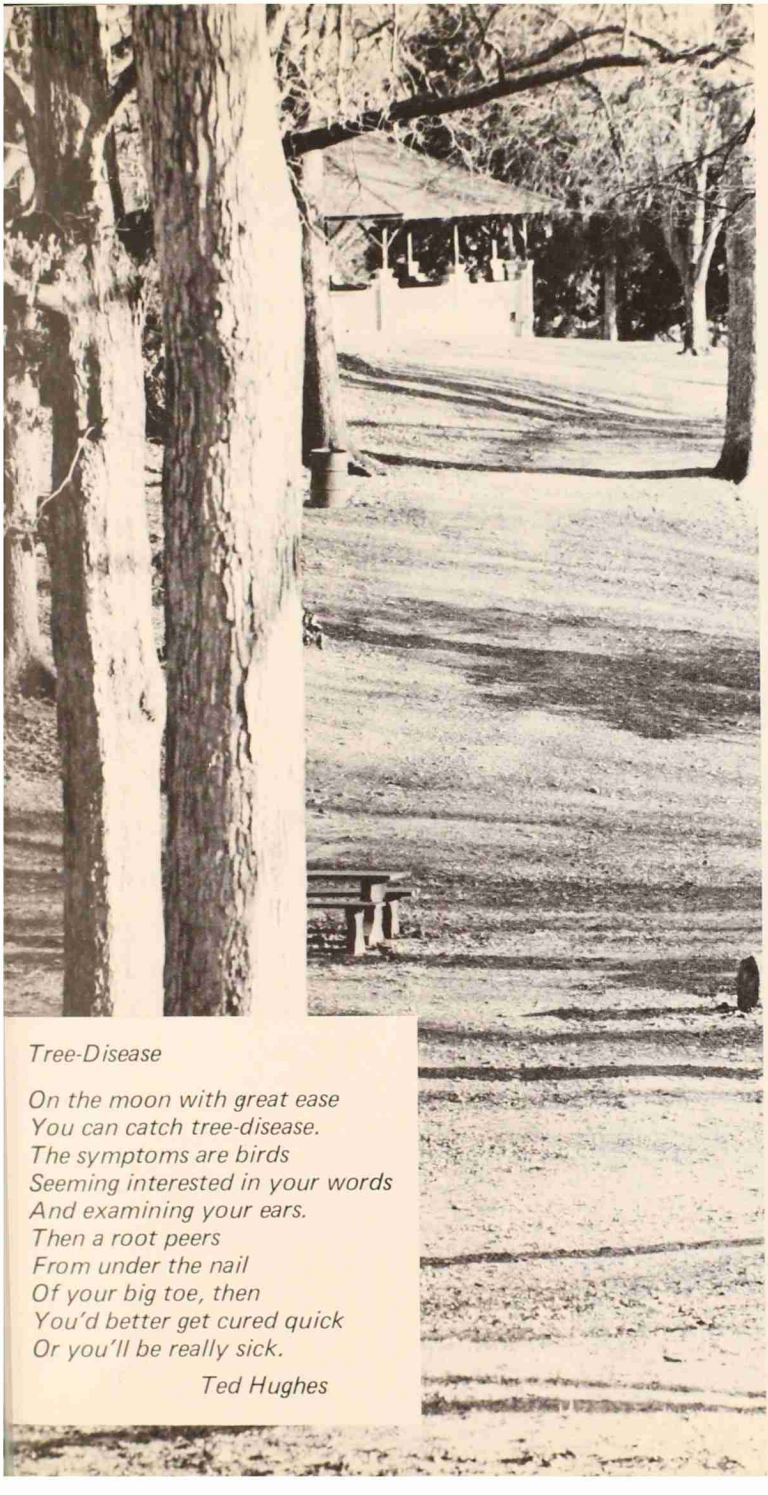
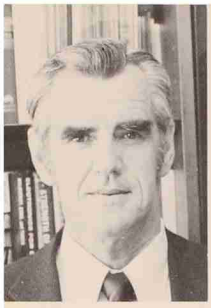


Tree-Disease

On the moon with great ease
You can catch tree-disease.
The symptoms are birds
Seeming interested in your words
And examining your ears.
Then a root peers
From under the nail
Of your big toe, then
You'd better get cured quick
Or you'll be really sick.

Ted Hughes



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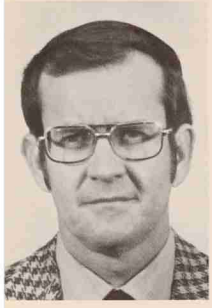

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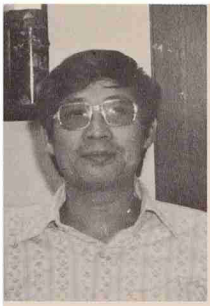

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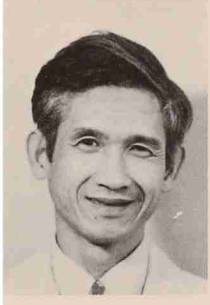

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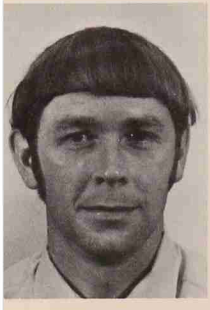

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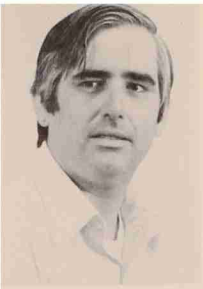

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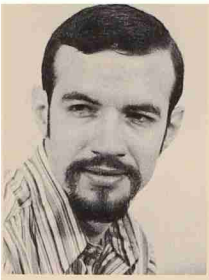

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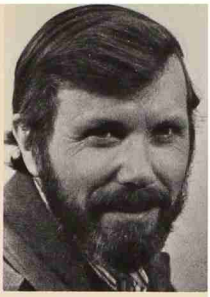

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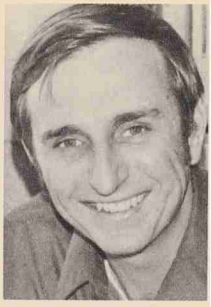

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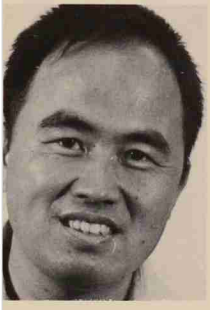

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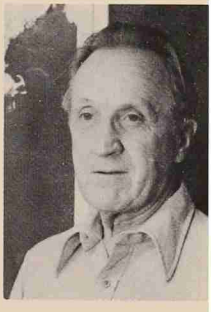

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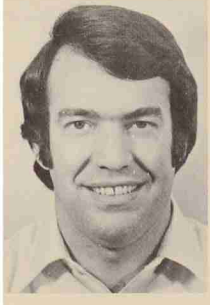
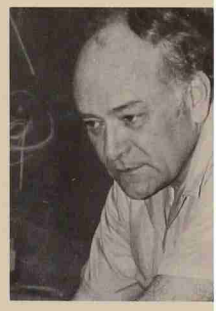


PHILIP K. McKNELLY
Assistant Professor of Recreation
B.S., M.E., University of Arkansas; Ph.D., Texas A&

W. R. (Mac) McLAURIN
Research Assistant, Wood and Paper Science

L. L. MILLER
Associate Professor of Recreation Administration
B.S., Wake Forest University; M.A., University
of North Carolina at Chapel Hill

DONALD E. MORELAND
Professor of Botany, Crop Science, and Forestry
B.S.F., M.S., Ph.D., N. C. State University



GENE NAMKOONG
Professor of Genetics and Forestry
B.S., M.S., State University of New York;
Ph.D., N. C. State University

RONALD G. PEARSON
Professor of Wood Engineering
B.C.E., B.A., M. Eng., University of Melbourne, Austr

THOMAS O. PERRY
Professor of Forest Genetics
B.S., M.A., Ph.D., Harvard University

ANCO PRAK
Associate Professor of Industrial Engineering; In-Charge Furniture Manufacturing and Management Curriculum
Ph.D., N. C. State University

RICHARD J. PRESTON, JR.
Dean Emeritus and Professor of Forest Resources
A.B., M.S.F., Ph.D., University of Michigan

R. HEATH REEVES
Associate Professor of Wood and
Paper Science
B.S., University of California, Berkeley;
M.S., Ph.D., Institute of Paper Chemistry

CHARLES N. ROGERS
Associate Professor of Pulp and
Paper Engineering
B.S., N. C. State University

RAY SMITH
Executive Secretary of the Pulp and
Paper Foundation
B.S., N. C. State University

WILLIAM E. SMITH
Professor of Recreation Resources Administration
B.S., Western Carolina University; M.A.,
University of North Carolina at Chapel Hill; Ed.D.,
George Peabody College

EDWARD C. SOSSAMAN, JR.
Liaison Geneticist-Cooperative Programs
B.S., M.S., N. C. State University

JERRY R. SPRAGUE
Research Assistant, Cooperative Programs
B.S., N. C. State University

VIVIAN T. STANNETT
Camille Dreyfus Professor of Chemical Engineering,
Professor of Wood and Paper Science, and Dean
of the Graduate School
B.S., London Polytechnic Institute; Ph.D., Polytech
Institute of Brooklyn

W. M. STANTON
Extension Forest Resources Specialist
(Urban Forestry)
B.S., M.S., N. C. State University

DONALD H. J. STEENSEN
Assistant Professor of Forestry and Wood and Paper Science
B.S., Iowa State University; M.F., Ph.D., Duke University

ROBERT E. STERNLOFF
Professor of Recreation Resources Administration
B.S., M.S., University of Illinois; Ph.D., University of Wisconsin

ARTHUR SULLIVAN
Associate Professor and Program Director of Landscape Architecture; Associate Professor of Forestry
B.A., M.S., University of New Hampshire; Ph.D., Cornell University

RICHARD J. THOMAS
Professor of Wood and Paper Science and Botany
.S., Pennsylvania State University; M.W.T., N. C. State University, Ph.D., Duke University

ROBERT F. VOKES
Adjunct Professor of Wood and Paper Science
B.S., Syracuse

M. ROGER WARREN, JR.
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WILLIAM KEITH WATTS
Research Assistant, Wood and Paper Science

A. J. WEBER
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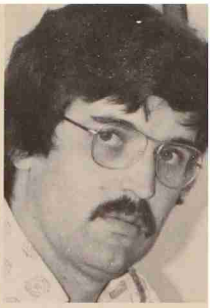
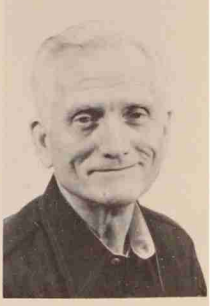
B.S., M.S., N. C. State University

R. J. WEIR
Liaison Geneticist, Cooperative Program
University of Maine; M.S., N. C. State University

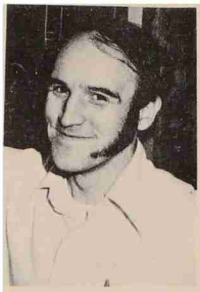


F. E. WHITFIELD
Extension Forest Resources Specialist, Retired
B.S., N. C. State University, M.S., Syracuse



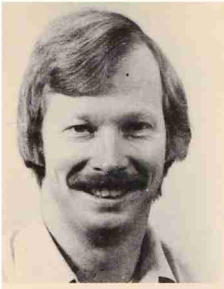
RICHARD R. WILKINSON
Professor of Landscape Architecture;
Associate Department of Forestry
B.S., LA, Pennsylvania State University;
MLA, University of Michigan

BETH WILSON
Teaching Technician—Recreation
Resources Administration
B.S., M.S., N. C. State University



A. G. WOLLUM, II
Associate Professor of Soil Science and Forestry
B.S., Minnesota; M.S., Ph.D., Oregon State University

BRUCE J. ZOBEL
Director, Cooperative Programs, and Edwin F. Conger
Distinguished Professor of Forestry and Genetics
B.S., M.S., Ph.D., University of California



Virgil Allen
Computer Programmer
Fertilization Cooperative

Norma Bergeron
Secretary
Cooperative Programs

Angeline Brantly
Head Secretary
Extension Forest Resources (W

Grayce Broili
Head Secretary
Recreation Resources
Administration

Jackie Burrell
Clerk-Typist
Forestry

Addie M. Byrd
Research Technician
Cooperative Programs

Sam Clark
Librarian

Sue Cross
Secretary
Forestry

Dan Dyke
Research Technician
Wood and Paper Science

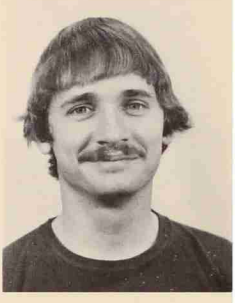
Sarah Eure
Student Affairs
Dean's Office

Margaret Grier
Librarian

John Hall
Research Technician
Forestry

Cynthia Hammond
Research Technician
Wood and Paper Science

Alice Hatcher
Computer Programmer
Cooperative Programs



Dennis Hazel
Research Technician
Forestry

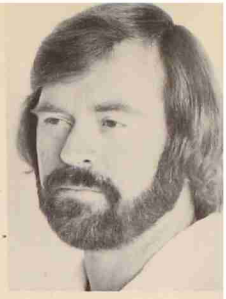
Carol Holland
Secretary
Cooperative Programs

Martha Holland
Administrative Secretary
Cooperative Programs

Marilyn Horne
Secretary
Wood and Paper Science

Frances Jamerson
Secretary
Forestry

Joan Johnson
Head Secretary
Wood and Paper Science



Vernon W. Johnson
Research Technician
Cooperative Programs

Edith M. Jones
Research Technician
Cooperative Programs

Thelma King
Duplicating Machine Operator
School

Adrianna Kirkman
Research Technician
Wood and Paper Science

Frances Liles
Assistant Director of
Student Affairs

Frank Liles, Jr.
Research Technician
Fertilization Cooperative

Martha F. Matthias
Research Technician
Cooperative Programs

Susan A. Mills
Secretary
xtension Forest Resources

Everett Morgan
Maintenance Superintendent
Wood Products Lab

Marjorie Paulsen
Head Secretary
Forestry

Jackie Rawls
Secretary
Recreation Resources
Administration

Nancy Roberts
Administrative Secretary
School of Forest Resources

Valda Schmitt
Research Technician
Forestry

Robert C. Seli
Research Technician
Wood and Paper Science

Roman Sopko
Research Technician
Wood and Paper Science

William Swint
Research Technician
Wood and Paper Science

Rebecca Wagner
Data Typist
Cooperative Programs

Mary Walker
Budget Clerk
School

Delores Watkins
Secretary
Pulp and Paper Science

Judy Williams
Secretary
Extension Forest Resources

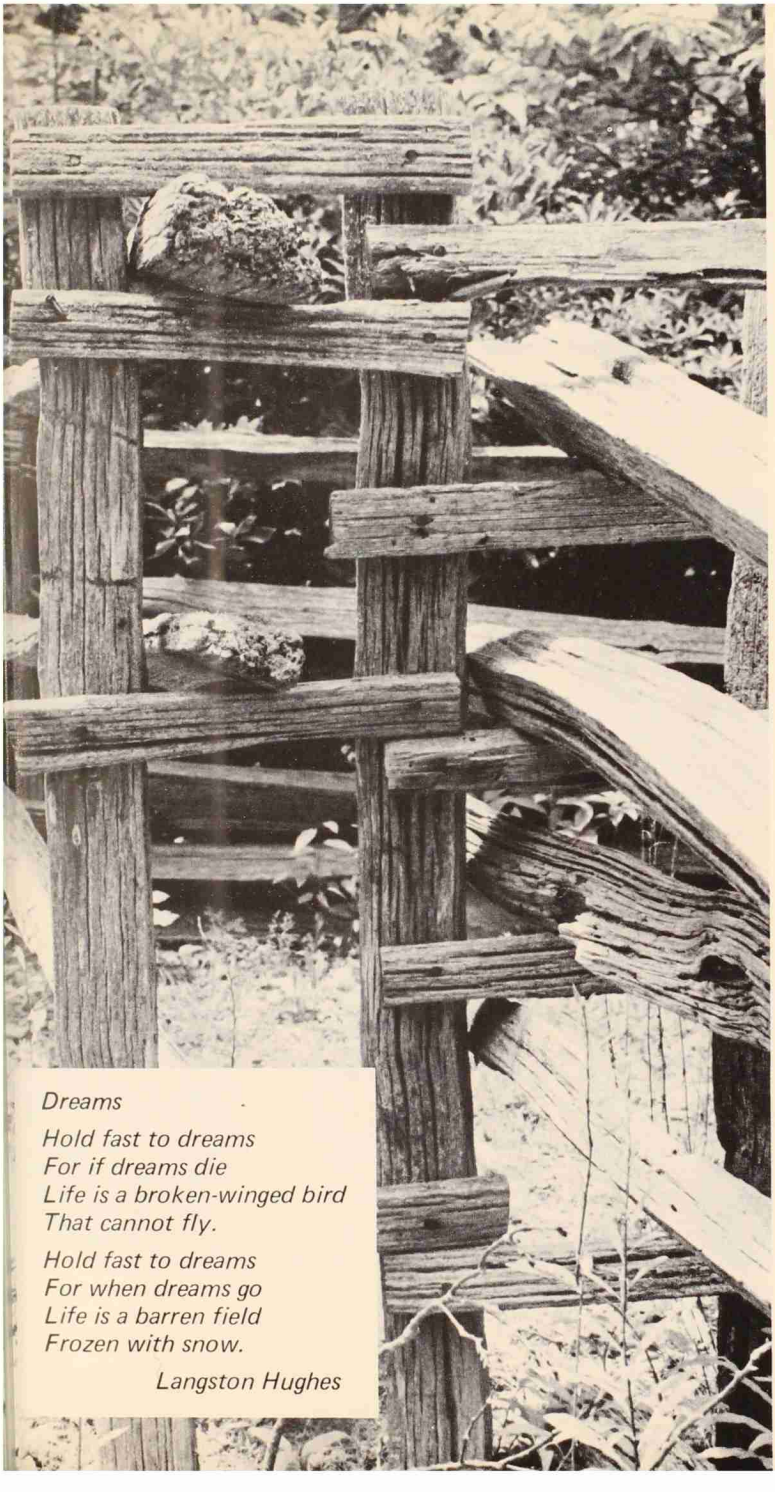
Mike Williford
Field Technician
Cooperative Programs

Elizabeth Wilson
Research Technician
Wood and Paper Science

Sue Wooten
Secretary
Fertilization Cooperative

Valerie Wright
Botanical Illustrator
Forestry

SENIORS

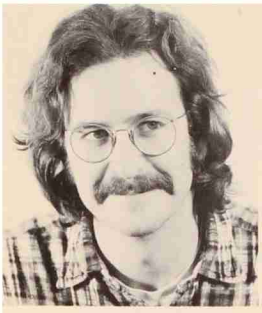


Dreams

Hold fast to dreams
For if dreams die
Life is a broken-winged bird
That cannot fly.

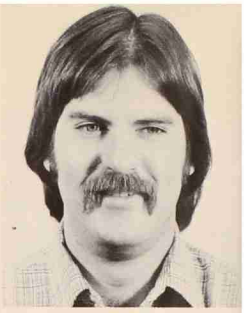
Hold fast to dreams
For when dreams go
Life is a barren field
Frozen with snow.

Langston Hughes

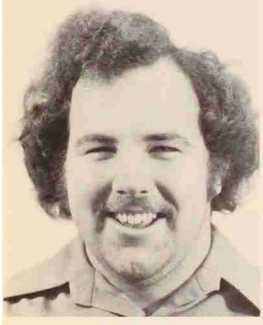


Rob Addelson
FOR

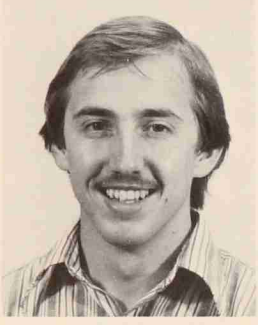
Susan Andrews
FOR
Xi Sigma Pi, SAF, Forestry Club



Mike Aull
FOR



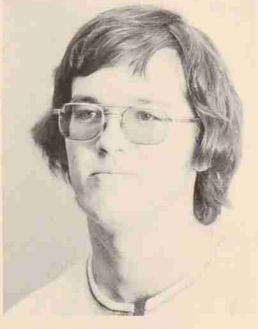
James Bailey
FOR



Dail Bass
WPS
FPRS

Kendall Curfman Beavers, III
FOR

Karla Bellinger
FOR
Xi Sigma Pi (Mich. Tech)
Alpha Eta

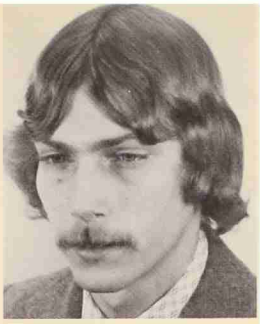


William W. Bindeman
FOR
Xi Sigma Pi

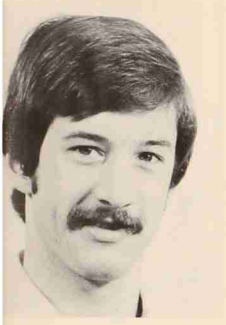
David E. Brande
FOR
Xi Sigma Pi

Ronnie Brande
CON
Xi Sigma Pi

Robert M. Browder
WST
FPRS

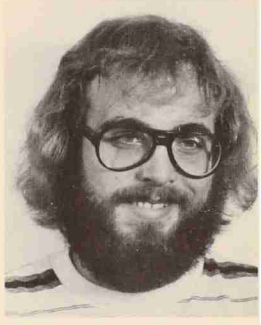


Steve Brown
PPT



Jim Buzzard
PTT
Phi Kappa Phi

John F. Calloway, Jr.
PPT
Lambda Chi Alpha



Carson Carmichael
PPT/CHE
AICHE (Pres.), TAPPI,
Xi Sigma Pi, Golden Chain

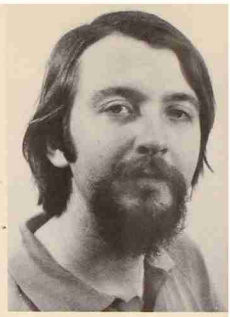
Neil Carroll
FOR
Xi Sigma Pi

Mike Clubb
FOR
ROTC

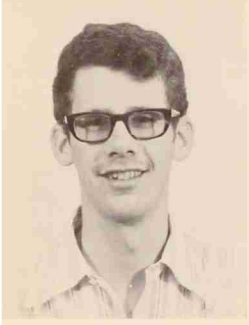
Alan R. Colwell
FOR
Forestry Club

David Combs
FOR
Xi Sigma Pi
Varsity Baseball

Locke Conrad
FOR
Sigma Pi



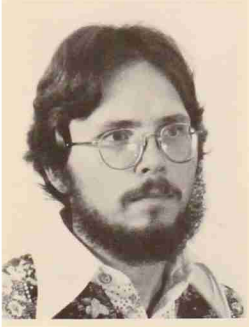
William M. Crassons
FOR



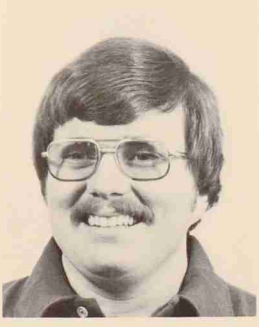
William R. Cross
FOR
Xi Sigma Pi

John M. Crump
FOR

William M. Daugherty
FOR
Xi Sigma Pi

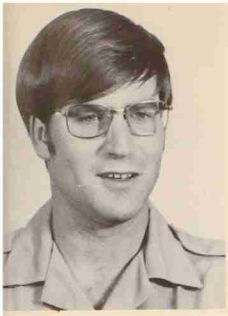


Malcom S. Dickerson
RPA
Rho Phi Alpha



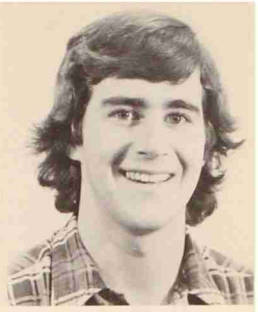
Gene Dillon
PPS

Leo J. Edge
RPA/NRR
TAPPI

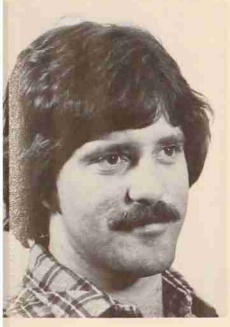


Steve Emery
RPA/NRR

Carl E. Falco
FOR
Xi Sigma Pi (Forester)



Duke Grimes
FOR



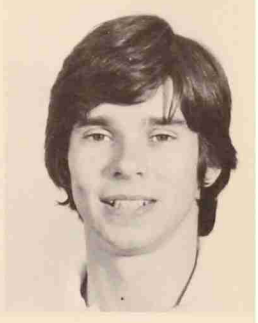
Craig H. Guernsey
FOR
Xi Sigma Pi

Desi Gulley
PTT
TAPPI

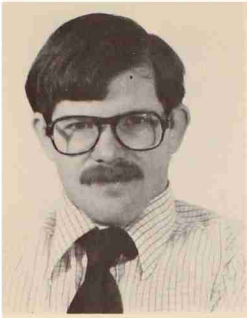
Philip J. Hall
FOR/CON
Forestry Club (Vice-Pres.)
Xi Sigma Pi, Homelite Award
Xi Sigma Pi Scholarship

Robert Hall
PTT
TAPPI

Billy G. Hamilton
WST
FPRS (Pres.)
Forestry Council



Fred Hardin
FOR
Forestry Club (Pres.)
SAF, NRA

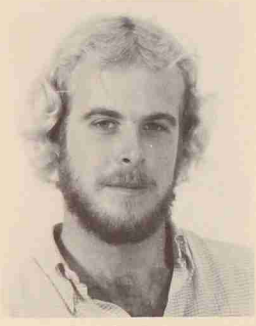


Bruce Ford Harvey
FOR/CON
Forestry Council, Forestry Club, Student Senate, SAF, Xi Sigma Pi

Kathy Hendricks
FOR

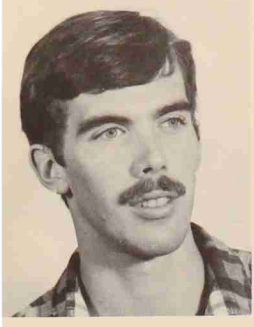
Marsha Hinkie
PPT
Forestry Council, TAPPI
Xi Sigma Pi

William D. Holleman
FOR
Rugby Club



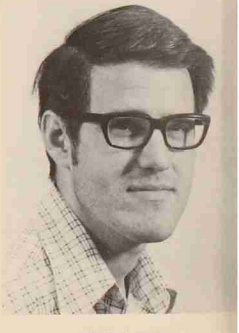
John E. Hutson
FOR
Marching Band, Stage Band, XA, Xi Sigma Pi

Robert S. Jordan
FOR



Terry Jordan
FOR
Forestry Club, SAF

Joseph B. Kelleher
FOR

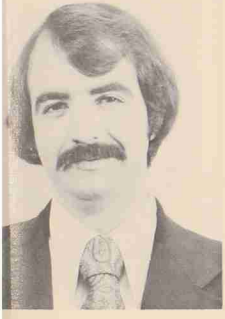


Chris Lent
FOR

Pam Lojko
RPA
Rho Phi Alpha
Xi Sigma Pi

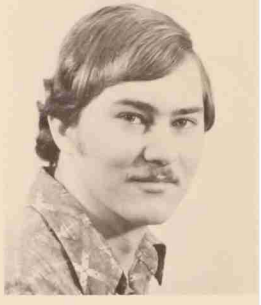
Mark Lynch
FOR
Forestry Club, Rugby Club,
SAF

Lee Matthews
RPA
Rho Phi Alpha

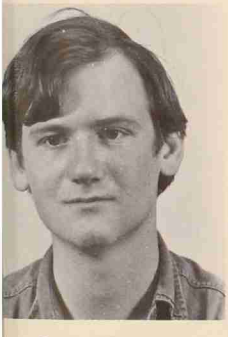


Jerry McAbee
FOR
Xi Sigma Pi, Forestry
Council, Forestry Club,
F, Am. Geophysical Union

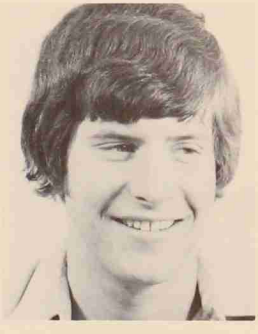
Cobie McKinney
RPA
Forestry Council (Pres.),
Rho Phi Alpha (Secy.),
Xi Sigma Pi, Golden Chain



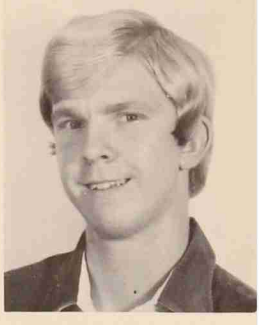
Donald H. McNeil
FOR



George Melton
FOR



Chip Metheney
PPC



Harold Midyette
PPT
TAPPI (Secy.),
Student Senate

Bill Miller
FOR
Forestry Club (Vice-Pres.)

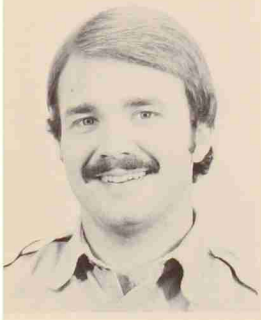
Thomas B. Monroe
FOR

Joel Monteith
PPT

Sue Moore
RRA

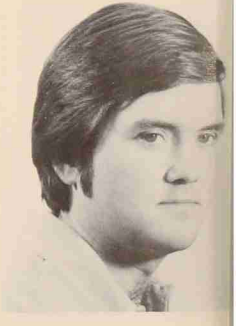
Dennis G. Morgan
FOR

Len Nelson
PPT
TAPPI



Bill Overbey
FOR

Bill Overby
RPA



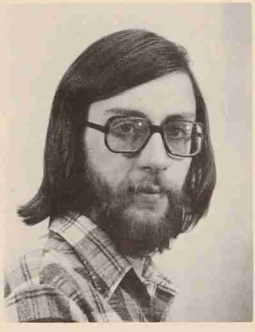
Philip W. Owenby
RPA

Robert Panella
FOR

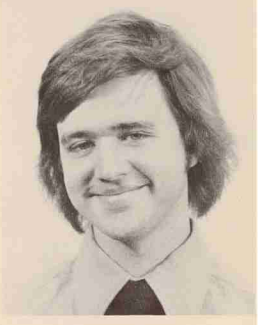
Rodney Pryor
RPA
Rho Phi Alpha

Kent Reid
FOR
Marching Band, Concert Band,
Xi Sigma Pi

Michael H. Renfroe
FOR
Sigma Pi, Phi Kappa Phi,
Alpha Zeta, SAF



Brad M. Riggs
FOR



Richard Roach
FOR
Xi Sigma Pi

Terri Robbins
RPA
Rho Phi Alpha

Lillian Ruedrich
CON

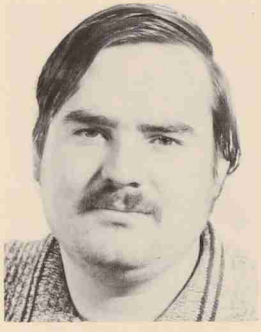
Debra Schaar
FOR/CON
Xi Sigma Pi, Ecos.

J. Mark Schreier
PPT
TAPPI

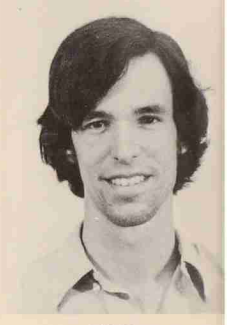
J. Michael Shareck
WPS
NFPRS

Sid Shearin
RPA/NRR
Xi Sigma Pi, Rho Phi Alph

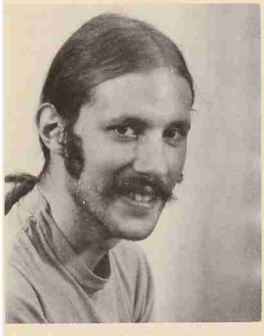
Mike Sherrill
PPT
TAPPI



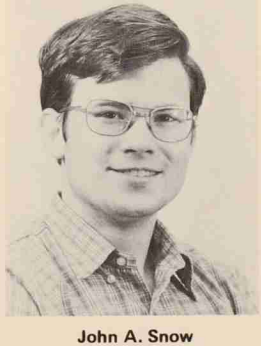
John F. Skelley, Jr.
FOR



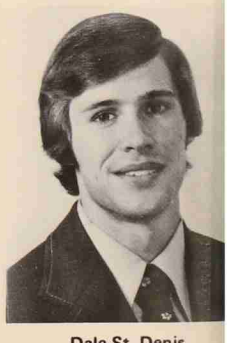
Ed Sloan
FOR
Forestry Club



Sam W. Smith
FOR

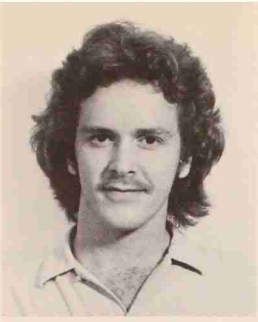


John A. Snow
FOR



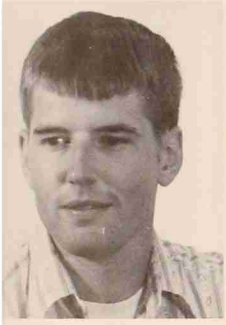
Dale St. Denis
PPT/CHE
TAPPI (Pres.), Xi Sigma P
Varsity Swim Team

Richard Standiford
FOR



Richard P. Thornton
FOR

James Walsh
FOR
Forestry Club



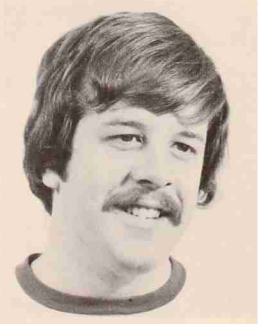
Michael J. Weisenberger
FOR
Forestry Club, AFROTC

Bob Westmoreland
FOR

Michael A. Willard
FOR/Ag. Econ.
Xi Sigma Pi

Charles A. Williams
FOR
orestry Club, Outing Club,
netum (photographer), SAF

Harold Williams
FOR

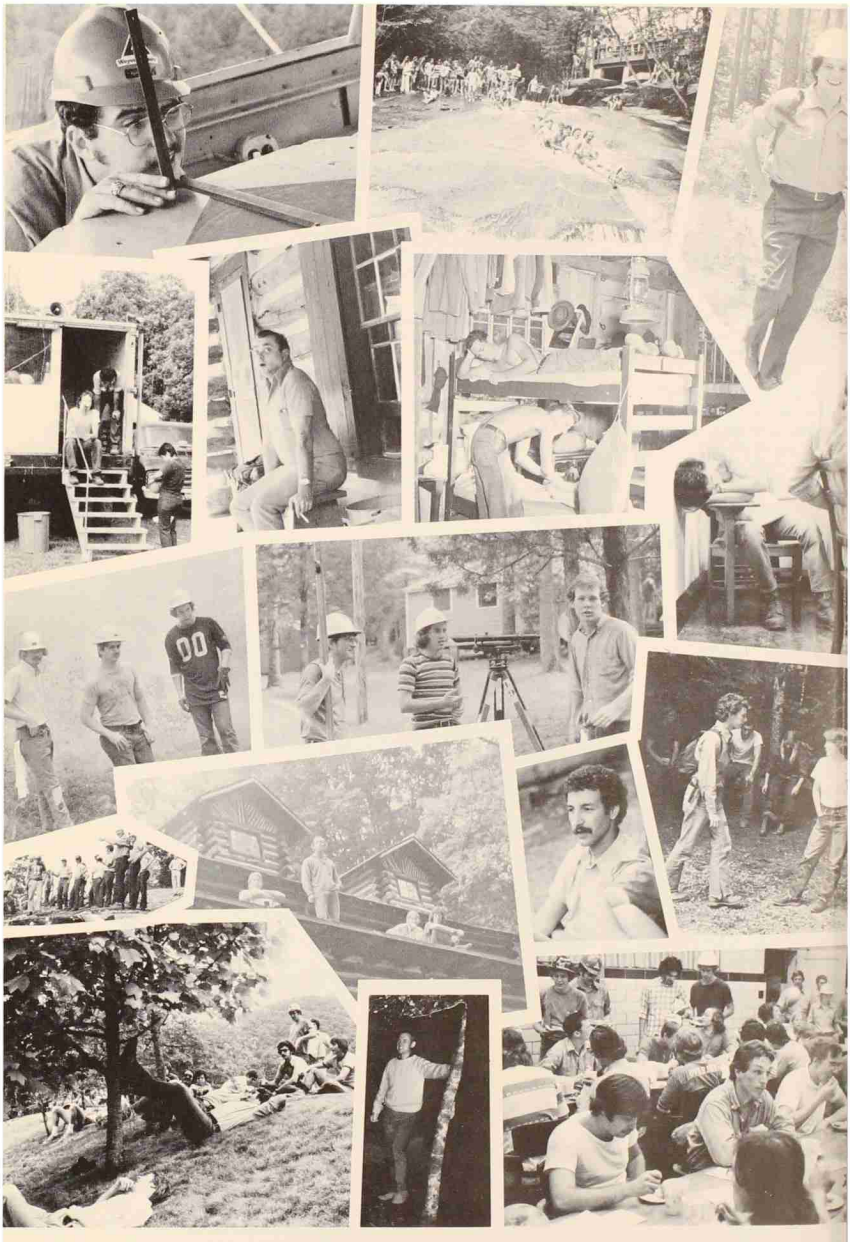


Rodney Williams
FOR
TAPPI

Glenn Woolard
RPA/NRR
Xi Sigma Pi, Rho Phi Alpha,
Phi Kappa Phi

SENIORS NOT PICTURED

Abee, Robert McDonald	CON
Aldridge, Donald Milton	FOR
Allison, Richard Samuel	FOR
Angel, Richard Lee	RPA
Armstrong, Ralph Martin	FOR
Baker, John Reid	FOR
Baker, Steven Howard	FOR
Banks, William J.	RPA
Barefoot, James Eric	WST
Barnes, William Alan	PPT
Billings, Roy M.	RPA
Bishop, Samuel David	RPA
Blakeney, Jack Cole	WST
Boone, David Harper	RPA
Bounds, Kathy Ann	RPA
Braun, Raymond Joseph	RPA
Breslford, Ann Irene	RPA
Brown, Richard Alan	FOR
Bundy, Janice Theresa	RPA
Bunn, Graham Norwood	RPA
Burns, William Judson	RPA
Burnworth, Franki White	RPA
Cartwright, Mary Annett	RPA
Childers, James David	RPA
Clark, Jon William	FOR
Connette, Sarah Kirtlan	RPA
Cooper, Donna Jean	RPA
Cossart, Ray Nelson	FOR
Cramer, Gary Carl	FOR
Crawford, James Bradley	RPA
Cross, Calvin L.	RPA
Crosson, Dudley Joseph	RPA
Day, Thomas Clyde	RPA
Dennis, Harrison Richard	WST
Denton, Frank Edwin	RPA
Dilday, Mary Woods	RPA
Divens, Robert Arnold	RPA
Doub, Deana Fleming	RPA
Eddy, David Myers	RPA
Elkins, George Michael	NRR
Ellen, John Rodney	RPA
Fonner, James	WST
Freeman, William Charles	CON
Fulenwider, Elizabeth M.	CON
Fusco, Richard Joseph	RPA
Gerrity, Jane Elizabeth	RPA
Gooding, John Stephen	RPA
Gordon, James Max	WST
Gregory, Charles Blaine	RPA
Grubbs, Gary Kawathen	FOR
Gwyn, Wright Hamilton	RPA
Hailey, Robert Harwell	FOR
Haskins, David	WST
Hedgecock, Kenneth Clay	RPA
High, Walter Bankston	CON
Hinson, Richard Dwane	FOR
Holt, Thomas Eugene	WST
Houston, Allan Edward	FOR
Howell, Edward Nelson	RPA
Johnson, Carl Thomas	RPA
Johnson, Timothy Virgil	RPA
Jones, Eugene Hardy	RPA
Krakowski, Alan Joseph	NRR
Laws, Kenneth Patrick	RPA
Leonard, Michael Shelby	RPA
Lingerfelt, Roy Bruce	RPA
Luton, Kent Austin	FOR
Lyday, Russell Wilson	CON
Mann, Raymond Thomas	FOR
Martin, Wilbur Charles	RPA
Maxwell, Guy Ray	CON
Mayes, Dorothy Bynum	RPA
McGrath, Margaret Wyatt	RPA
McLeod, Dona Marie	RPA
Melton, Andrew Calvin	FOR
Morton, Russell Wayne	CON
Mroczek, Rita Nancy	FOR
Mull, Steve Monroe	RPA
Neal, John Hines	FOR
Nettnin, Jeffrey Lee	CON
Newsome, George H., Jr.	RPA
Oakley, Truby Donald	RPA
Pennington, Michael Pat	FOR
Pillsbury, Edward James	WST
Pledger, Lloyd W., Jr.	RPA
Pope, John Malcom	RPA
Postlethwatt, William E.	FOR
Preddy, Steve Watson	RPA
Pyatt, Daniel Everett	FOR
Ray, Haywood	RPA
Reddick, Mark Hodgin	RPA
Reilly, Ann	RPA
Rice, Douglas James	FOR
Richardson, Patrick Lee	CON
Riley, Lynne Joyce	CON
Rogers, Stanley Vann	RPA
Russell, Carl Lynn	RPA
Salmon, Tory V.	PPT
Sawyer, Kenneth Michael	RPA
Scarborough, Carol Lane	RPA
Senter, David Lee	FOR
Shoe, Craig Shoffner	NRR
Shouse, David McDaniel	RPA
Sigmon, Barry Luthur	FOR
Sox, Joseph Maynard	CON
Stafford, Philip George	FOR
Stainback, Claude Wayne	FOR
Stauffer, Herbert Chris	CON
Strauss, Robert	WST
Sugg, Phoebe Jane	NRR
Sullivan, Brent Gilman	RPA
Thayer, Richard Thomas	FOR
Thomas, Albe Virgil, Jr.	FOR
Thomson, Douglas Arthur	RPA
Thornburg, William C.	RPA
Thornton, Timothy Bruce	CON
Trageser, Michael David	RPA
Traynham, Garry Maurice	RPA
Turner, Donald David	WST
Ulatowski, Betsey Fern	RPA
Vanvalkenburgh, William	FOR
Vaughan, Steve Craig	FOR
Walters, Clayton Russel	PPT
Walton, Gerald Kevin	RPA
Ware, Timothe Gene	RPA
Weaver, Steve Leonard	RPA
Webster, Michael Thomas	RPA
West, Curtis Alan	NRR
Wetherington, Robert	WST
Wicker, Vaughn Pittman	RPA
Wilkinson, William Cary	CON
Williams, Willard E.	RPA
Wilson, Steve Allen	CON
Wray, Edmund Jones	RPA
Yates, Rodney Dale	RPA
Young, James William	FOR



STUDENT LIFE

FOREST RESOURCES COUNCIL

The Forest Resources Council serves as the representative and governing body of the undergraduates in the School of Forest Resources. The members consist of four student senators, an elected representative from each of the three departments, and a representative from each of the seven clubs and honorary societies.

The main responsibility of the council is to dispense the student fee budget which totaled approximately $3,500.00 for 1975-76. The PINETUM is funded with the majority of this money and the remainder is used to support the various school organizations, to provide newspaper and magazines subscriptions in the library, and to pay for the lobby phone.

During the year the council was active in choosing the Outstanding Professor and Alumni Distinguished Professor for the School, designing and implementing a school faculty and course evaluation, attempting to stop the faculty from taking the student lounge by presenting a petition protesting the move, as well as allocating student funds to the various student organizations. Also through the efforts of the council improvements are being made on access to Biltmore and a further study is in progress by a Landscape Architect for the Physical Plant.

Council meetings are held bi-monthly and students are always welcome. This year's council was a very willing and responsible group and served the school well.

President	Cobie McKinney
Vice President	George Melton
Secretary	Marsha Hinkie
Treasurer	Betsey Ulatowski

Other Members: Jim Duncan, Bobby Greene, Bill Hamilton, Jerry McAbee, John May, Harold Midyette, Peter Sweenson, Ron Terry, Bill Miller.

Xi Sigma Pi

The Mu Chapter of Xi Sigma Pi had its thirty-sixth year during the 1975-76 school year and its second as being known as the honor society for students of forest resources management curricula.

This past year, as never before, Xi Sigma Pi became a service organization. The tutoring program for students of Biltmore Hall continued its function from last year. The coffee pot became a daily fixture in the basement of Biltmore in the spring semester. The Schenck Forest will see a permanent shelter in the picnic area, thanks to the volunteer labor of the Chapter and, as always, seniors of the School will be invited to the Xi Sigma Pi sponsored picnic at the end of the year.

On the scholastic side of life, Xi Sigma Pi meetings featured presentations by Dr. Lammi about remote sensing, by Dr. Barkalow on South African wildlife, and by Dr. Duncan Heron on experiencing the Eno River State Park. For the first time, the Mu Chapter was privileged to nominate Phil Hall for the Southern Regional Scholarship of the National Office of Xi Sigma Pi.

The 1975-76 school year saw the induction of forty new members and the terms of Carl Falco as Forester, Kent Reid as Assistant Forester, George Melton as Ranger and Debbie Schaar as Secretary/Fiscal Agent. Faculty sponsors were Don "Doc" Steensen and "Papa Bear" Bryant.

RHO PHI ALPHA

Rho Phi Alpha is the honorary fraternity for Parks and Recreation Administration. The fraternity was organized in 1958 by Professor Thomas I. Hines. With the help of the top eleven seniors in the class of 1958 the organization came into being. These twelve people are the charter members of the Alpha chapter of Rho Phi Alpha.

The purposes of the fraternity are: to recognize scholastic achievements, to encourage students of high moral character and unselfish devotion to the study, research and application of knowledge to Parks and Recreation, and to recognize those who have made outstanding contributions to the field.

The fraternity participates in various activities each year. In the fall, Rho Phi Alpha operates a booth during the University Open House. The fraternity also sponsors a spring picnic for all students and faculty in the department. At this picnic, any professor who may be retiring is honored for his service by Rho Phi Alpha. The fraternity also honors an outstanding senior each year. Outstanding Senior for 1974-75 was last year's president, Joe Kaylor.

Pledges are initiated during both the fall and spring semesters. Activities associated with pledging include a smoker, a banquet and a formal initiation.

FORESTRY CLUB

by Phil Hall

The North Carolina State University Forestry Club is composed of students who share an interest in the profession of forestry. Since its founding in 1929, the Forestry Club has provided students with an opportunity for fellowship, fun, and learning.

The activities of the Forestry Club include social events such as the annual fall pig-picking at which prospective new members get acquainted with the club while enjoying a lot of good food and drink. The highlight of the spring social calendar is the Logger's Brawl. At this event, the accent is on music, dancing, and, of course, elbow bending.

Friendly competition in both old and new forestry skills is the objective of the club sponsored Rolleo in the fall and the annual trip to the Southeastern Forestry Club Conclave in the spring. This year, the Rolleo was held in conjunction with the North Carolina State Fair. Among the events held at the Rolleo are log birling, log rolling, cross-cut sawing, bow sawing, speed chopping, pole climbing, pole felling, chain throwing, axe throwing, knife throwing, fire fighting, tobacco spitting, and beer chugging. The fellowship and fun of the Rolleo more than compensates for the hard work of preparation and practice. A benefit of the Rolleo is the sharpening of skills needed when the Forestry Club participates in the Conclave.

The Conclave is an annual meeting of Forestry Clubs of the Southeastern United States to compete in events similar to those held at the Rolleo with the addition of technical events. Technical events include pole classification, compass and pacing, timber estimation, wood identification, dendrology, wildlife, and aerial photo interpretation. Last year's Conclave was held at Mississippi State University. N. C. State University Forestry Club proudly claimed first place in the skilled events, but the technical events were the club's Waterloo. Everyone in the Forestry Club is practicing hard for the upcoming Conclave which will be held at the University of Georgia. Hopes are high that the club can improve its fifth place finish of last year.

The Forestry Club finances its activities through tree jobs and pulpwood jobs. Since there hasn't been a market for pulpwood lately, tree jobs have been the

main source of income. The club maintains a tool locker containing chain saws, climbing gear, and miscellaneous equipment. In addition to the money banked for the club, members gain valuable experience in tree climbing, equipment operation, and occasional bandaid application. Although the members don't get paid for their work, making money for the club, learning, and fellowship is ample payment.

Tree jobs, social events, the Rolleo, and the Conclave all contribute to a busy year for the Forestry Club, but the one event that ties everything together occurs on the first and third Tuesdays of each month during the school year. This, of course, is the regular meetings at which things seem to get organized and accomplished despite a severe abuse of Robert's Rules of Order. Almost all of these meetings are attended by Mac McLaurin and Tom Gemmer, the club's faculty advisors. They provide guidance, make helpful suggestions, and serve as a steadying influence over the rowdy timber beasts in the club. As often as not, the Forestry Club's meetings are adjourned to Jake's or Charlie Fallon's for some refreshment after heated debates concerning old and new business. These unofficial meetings are often as constructive and informative as the official meetings. At one such meeting, George Melton, the club's president for the spring, declared the problem of a sustained yield of forestry professors at N. C. State to be open for discussion. Although the present crop of professors is very valuable to the students, everyone agreed that it's a shame that they are all reaching rotation age at the same time. After a few more rounds were served, the members decided to clear-cut and start over, but that finding superior stock for regeneration would be difficult.

During the course of an unofficial meeting at the end of each semester, the tradition is that seniors toast the end of the ordeal of classes, tests, and papers. However, for Forestry Club members, the end of school is made bittersweet by the leaving of friends and memories of good times made possible by the club. The good times, the fellowship, and the work of the Forestry Club are enjoyable memories carried by all members when they leave North Carolina State University.

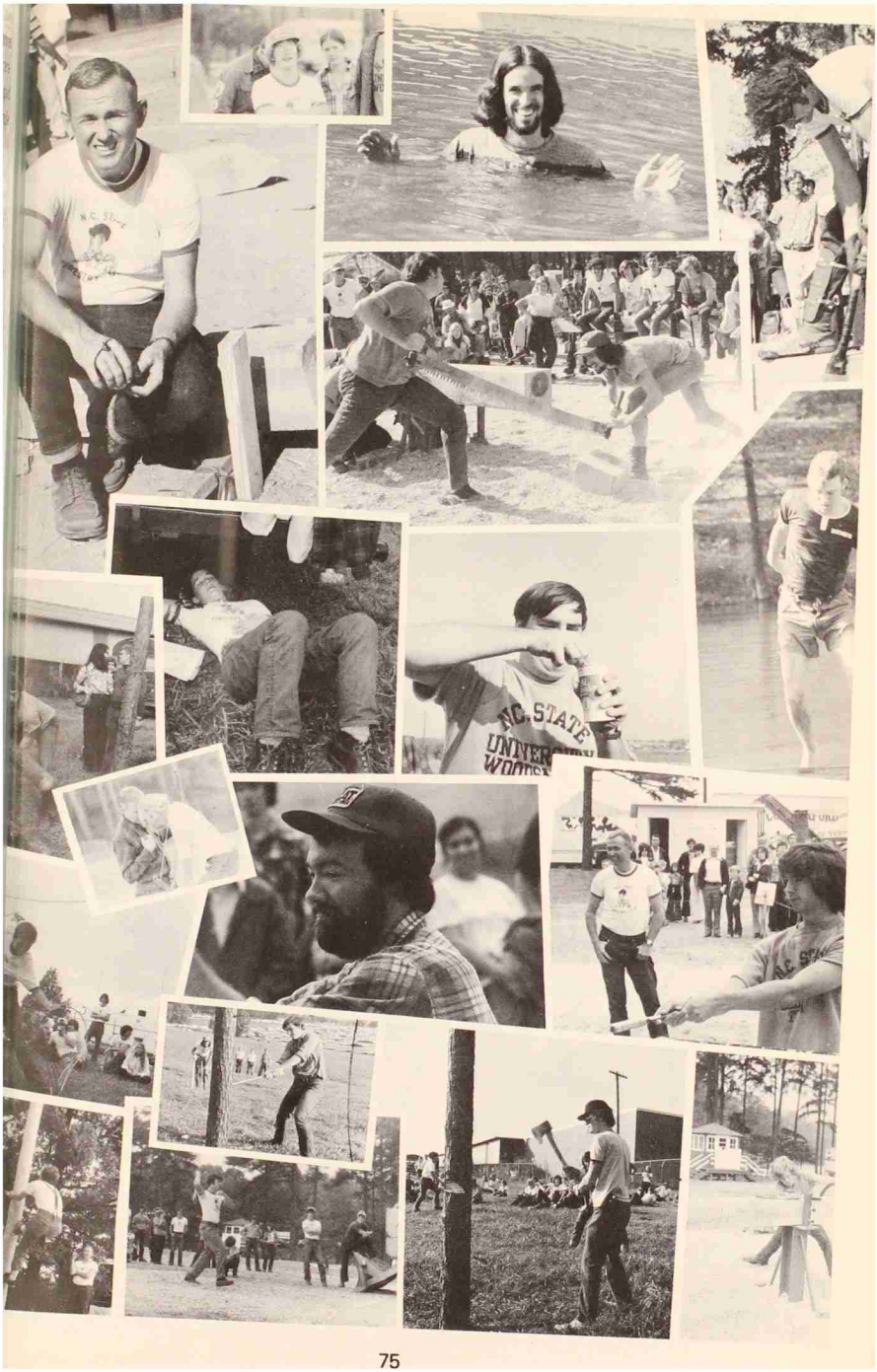
ROLLEO '75

The 1975 Rolleo was not what one would call your run-of-the-mill Rolleo. Gone was the sweet security of Research Farm No. 3, where you knew that all those people laughing at you when you butchered your event were just your buddies. Gone also was the relaxed atmosphere and forever flowing beer.

For the 1975 Rolleo wasn't held in the middle of a cow pasture; it was held in the middle of the State Fair. A pat on the back and some fast talk from the North Carolina Forest Service prompted the Forestry Club to give up its beer, relaxed atmosphere, free admission, and week's classes for the spotlight of the State Fair.

The Forestry Club staged two demonstrations a day of old-time loggers' events for the pleasure of the crowd for the week prior to the Rolleo. On Rolleo Saturday crowds of people watched in amazement and amusement as the juniors walked off with the axe throwing, pole climbing, and chain throwing. The seniors took second, winning cross-cut sawing, birling, and speed chopping; the sophomores placed third with wins in log rolling, pulp toss, and felling and twitching; and the freshmen came in fourth with five second places.

Despite many setbacks, the State Fair Presentation came off quite well (it was one of the most popular events at the fair), the participants enjoyed themselves, everyone "State Faired" themselves to death, and did we drink a lot of milk!


NC STATE

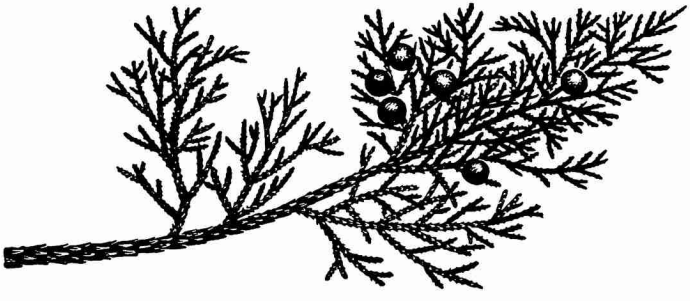
N. C. State Student Chapter of the FOREST PRODUCTS RESEARCH SOCIETY

The NCSU Student Chapter of the FPRS was formed in 1952 as the first student chapter ever organized within the society. The society is formed of anyone interested in forestry products. Most of the Student Chapter's members have been Wood Science and Technology students, but other active members have been in the Forestry and Furniture Manufacturing and Management curricula. The objective of the society is to keep interested students informed of current industrial practices in the forest products field. The result of this endeavor has been to sharpen the students awareness during his undergraduate study of current events relative to wood utilization.

The chapter is advised by Pofressor Roy M. Carter. The 1975 fall semester and the 1976 spring semester involved two picnics to renew acquaintances between interested students, FPRS chapter members, and faculty. Other events included a sectional meeting in Pipestem, West Virginia, Lloyd Cramer of Cramer Veneer Company presenting a very interesting lecture and the chapter's help in making N. C. State's Open House a success.

The Society has provided many useful services for the student chapter. In addition the chapter has functioned in a manner that has contributed a lot of interest in Wood Science and Technology as a career. Many lasting friendships are formed in our chapter that will be cherished forever.

President	Bill Hamilton
Vice President	Robert Browder
Secretary	Jerry Carpenter
Treasurer	David Haskins



NCSU STUDENT CHAPTER OF TAPPI

The NCSU Student Chapter of TAPPI is affiliated with the national organization of TAPPI (Technical Association of the Pulp and Paper Industry). The chapter was established at N. C. State in 1957.

The organization promotes friendship and communication among the students in the curriculum. Two picnics are sponsored by TAPPI during the year.

Several meeting-technical sessions are held during the year. Chapter business is discussed during the first part of the meetings after which a visiting lecturer from the industry speaks on contemporary subjects or innovations concerning the pulp and paper industry.

Each year the chapter plans to attend the nearest Virginia-Carolina section TAPPI meeting. This year approximately 20 students traveled to New Bern, N. C., and toured the Weyerhaueser mill there. The mill trip was followed by two technical sessions and a banquet.

For the second consecutive year, the NCSU Chapter has won the national membership drive competition among student chapters. The chapter was awarded $75 for the treasury.

President	Dale St. Denis
Vice President	Brad Schultz
Program Chairman	Ron Terry
Treasurer	Alan Barnes
Secretary	Harold Midyette
Forestry Council Rep.	Marsha Hinkie
Activities Coordinator	Bobby Damsky
TAPPI Advisors	Prof. R. G. Hitchings
	C. N. Rogers

SUMMER CAMP

by John Shannon

A New York City boy, I remember trying to convince myself that living in Rougemont, North Carolina for ten weeks would not be that terrible. But all those cows made the self-persuasion difficult. "Could this be where the cows punch in in the morning?", I had wondered. The Slocum Summer Camp program soon had me too busy to ponder such things.

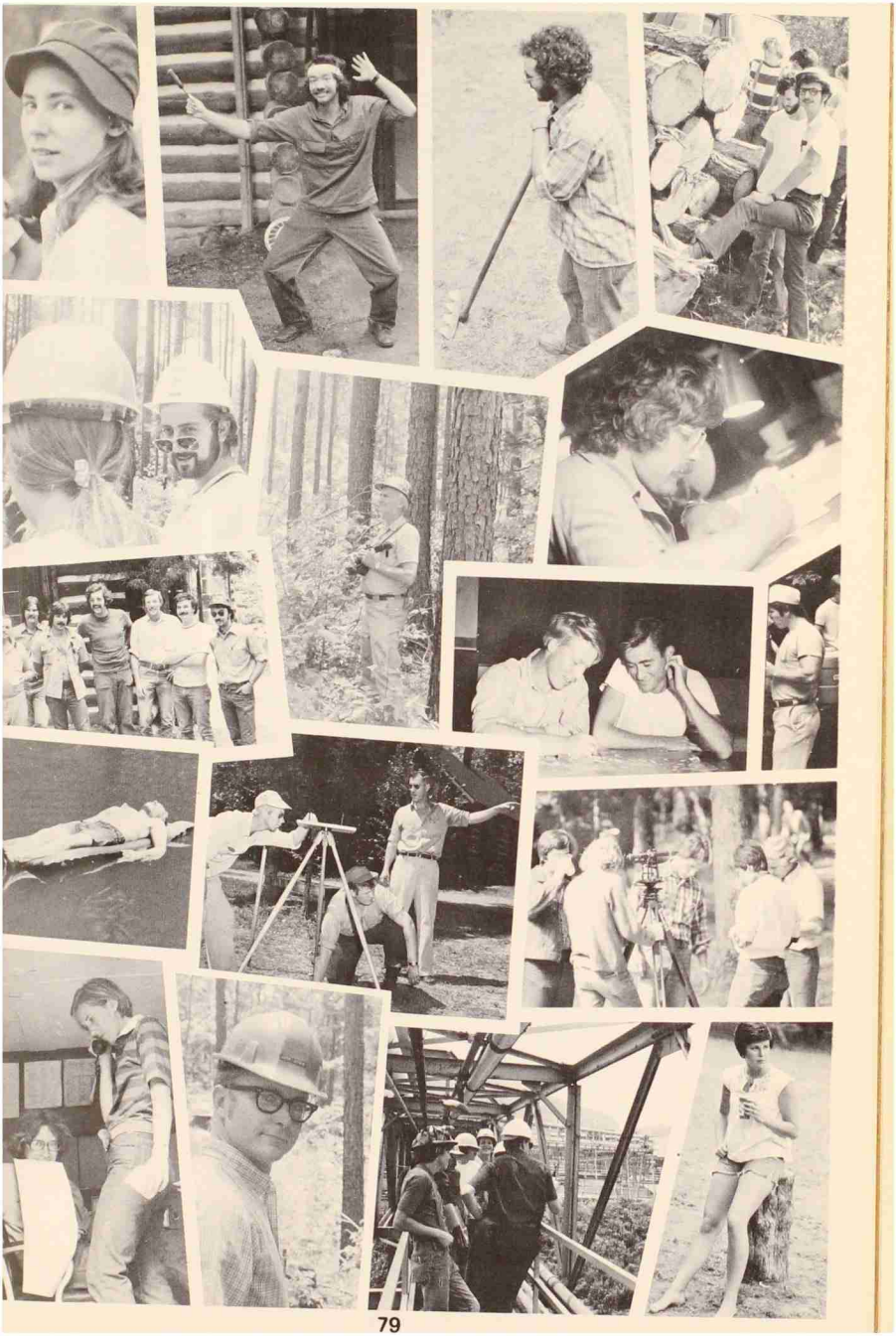
Dr. Maurice Farrier made early appearances at camp and set us chasing ostomids. "Big Green" was evasive but Farrier impressive. For a text of our impressions see the bathroom walls in Harrelson. Larry Jervis sat me on his knee and defined the art of "waggling in", something my father should have explained years ago. Larry seemed to have a mastery of the subject. Big Chief Dr. Tom Perry led an all day tour of "The Hill", the objectives of which were to trap wild arrowheads and to broil. Most succeeded in the latter. In silviculture, Dr. Jack Duffield drilled us mercilessly till we had achieved professional levels in form and accuracy of lime-socking trees. He neglected to inform me that limesock fights are perilous undertakings for short-armed individuals. I learned that on my own, first hand. "Happy Jack" was also camp's resident tree man. His Morrocan protege Driss displayed a good arm during dendro quizzes, hurling rocks farther than Mount Vesuvius.

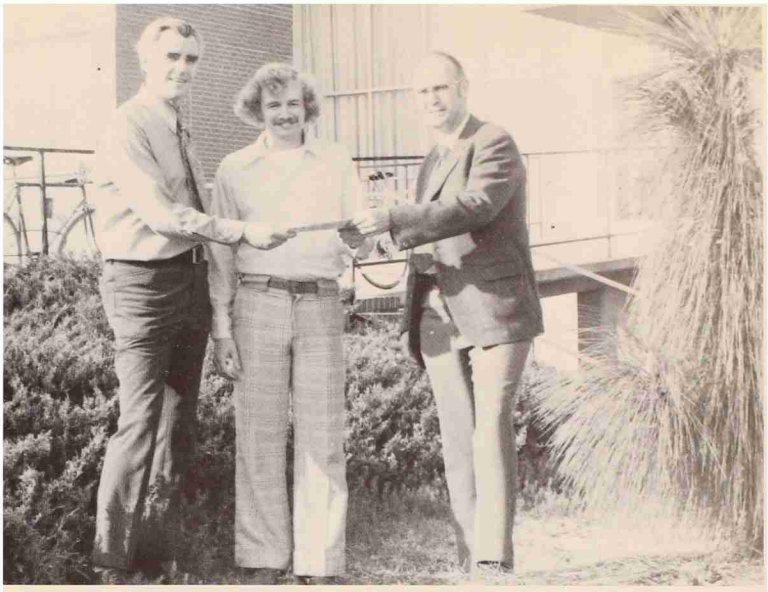
The great bulk of our time at Hill Forest was devoted to mapping and cruising. It was during this segment the students shared so much time together. Commonly bumping shoulders for eighteen hours of the day, a stratified class grew integrated. It was this solidarity that kept summer camp's mortality rate low. Nicknames evolved: wildman, crazyman, hot lips. Playful badgering persisted. Bess Simons and Herman Speece were the most attainable targets due to the immensity of their hearts. Bess should be cannonized, and Herman allowed to keep the bus he handled so majestically. Joe Kelleher's banjo merits perpetual display in the Lodge.

Camp Director "Doc" Steensen is a story in himself. He was heavenly when aid was sought for mapping, but in the mornings he looked like hell. He once joked that he and his wife had not passed a summer together in two decades. That may be the only reason Mrs. Steensen has not fled to Canada.

Tom Gemmer was ringleader when the troops hit the road. In Kinston, simulated water from simulated sources doused simulated flames. Only the beer was real. In Cullowee, we learned to appreciate the food back at camp. Anyone with something nasty to say about cook Vivian should have his biltmore stick snapped.

Slocum Summer Camp was a tremendous experience as well as a lot of fun. These ends were met because the members of the forestry faculty are super professionals as well as caring individuals. Their obvious dedication has earned our school high honors. Through patience and expertise these gentlemen conduct their work and train America's foresters. And isn't this training the stuff of Summer Camp?





Phil Hall receives the Homelite Award

SCHOLARSHIPS AND AWARDS

BILTMORE WORK SCHOLARSHIP

Susan Claire Andrews
Gary K. Grubbs
Vernon R. Phillips

CONGER WORK SCHOLARSHIP

James Howard Boyd
Michael P. Pennington
Michael Weisenberger

GARDEN CLUB OF N. C. SCHOLARSHIP

Gregory H. Cheek
Keith H. Edwards
Terry Gene Edwards
Michael D. Fernandez
Douglas M. Hancock
Kenneth A. Pollock
David F. Ruff
John D. Shoffner
Elizabeth B. Simons
Richard S. Toppe
Carlene H. Warren
Glenn Edward Woolard

WILLIAM HOLT AND ELLA (RAE) TURRENTINE MEMORIAL EDUCATIONAL FOUNDATION SCHOLARSHIP

Russell B. Haynes
Wendy G. McBane

NCSU ALUMNI ASSOCIATION SCHOLARSHIP

James L. Mostrom
James L. Norris

PULP AND PAPER TECHNOLOGY SCHOLARSHIPS

5th Year Chem-E Students
Robert E. Durland
Kent O. Hudson
Joseph D. Rector

Seniors
Stephen Edward Brown
James Alan Buzzard
Carson Carmichael
Robert Eugene Dillon
Desi Ward Gulley
Robert Stephen Hall
Marsha Jane Hinkie
Frank Walker Metheney
Leonard Dorsey Nelson
Dale St. Denis
Ronald Lynn Terry
Rodney Clay Williams

Juniors
John Victor Aberton
Robert Edward Barlow
Scott Michael Bradshaw
Carl Russell Brothers
Calvin Wayne Bucher
Robert S. Damsky
James Rodney Edwards
James Stephen Gaines
John Harry Gurganious
Frank David Harper
Robert Richard Kaminskas
Thomas Julian Lawson
John Milton May
Edward Madison Melson
William Mark Ray

Sophomores
Patricia Ann Adams
Joseph L. Auglin
Alan F. Armstrong
Blas P. Arroyo
James H. Bunch
Ronnie W. Campbell
Robert Louis Cate
Michael R. Clowers
Bradford C. Garnett
Jimmy Carroll Gregg
Steven Herman Hamrick
Edward B. Hickman
Ted S. James
Michael J. Kerkhof
Andrea J. McAfee
Jeffrey Merck
David M. Osborne
Thomas R. Putnam
John E. Richardson, Jr.
Robert T. Slockett
Robert A. Vinson
William H. Watson, Jr.
Michele L. Webb
Larry L. Williams

Freshmen
Michael F. Baxter
Mitchell R. Baxter
Robert T. Canup
John Eric Chrise
Jimmy L. Duncan
Cynthia A. Franklin
John C. Gill
Michael H. Holden
Gary L. Martin
Gregory B. Mixson
Jeannette E. Moore
Ronnie W. Newman
Mary S. Parker
Robbie Lee Robertson
Keith L. Stevens
Charles L. White
Mark S. Williams


P
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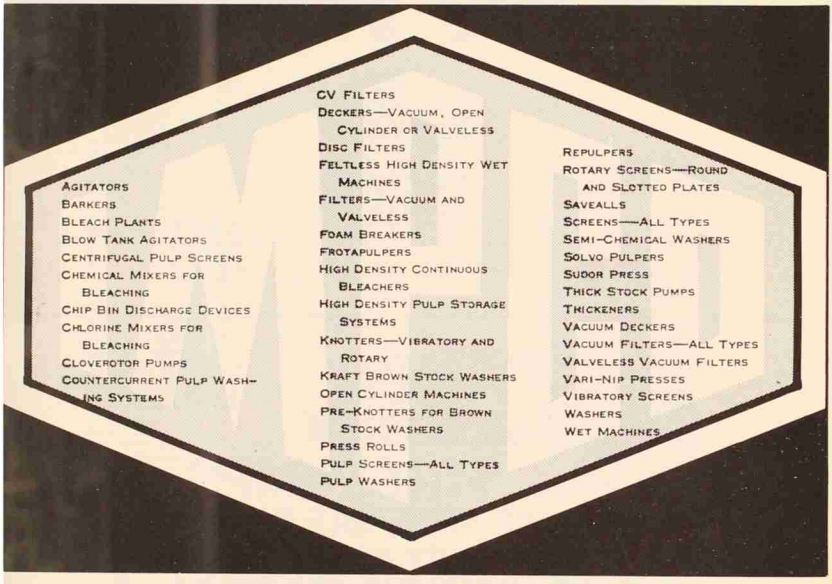

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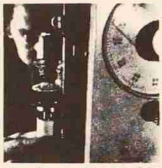

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You will also become a guardian of our great natural resources. For while we work, we replenish the forest, conserve the environment. We are concerned about the air we breathe, the water we drink and the origins of our raw material. We are concerned with pulp and paper work and your career with Eastex.

Make an appointment at your placement office now to see the Eastex representative on campus. In the meantime, write for our brochures.

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High Yield Forestry includes research!

Controlled pollination to help us develop superior trees is one part of our forestry research.

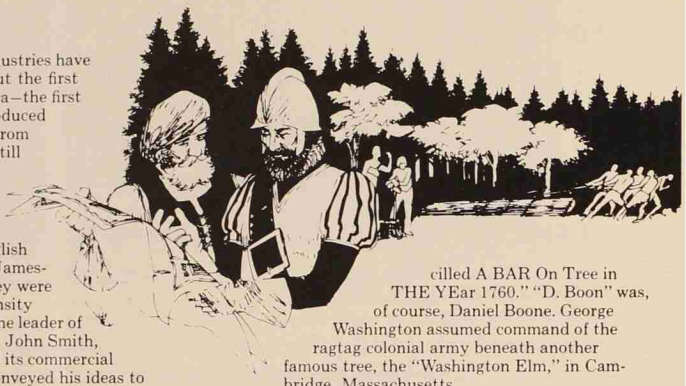
And research is just one part of our High Yield Forestry. Also involved are planting millions of seedlings, fertilizing, thinning, harvesting, and complete utilization of the fiber from the forest.

Besides products, our forests provide recreational opportunity, serve as a habitat for wildlife, protect watersheds, and return oxygen to the atmosphere.

Weyerhaeuser

The Tree Growing Company

America's first industry: now more important than ever.



Over the years, industries have come and gone. But the first industry in America—the first enterprise that produced finished products from raw materials—is still vital and dynamic. In fact, it's more important today than ever before.

When early English settlers landed at Jamestown, Virginia, they were awed by the immensity of the forest. But the leader of the group, Captain John Smith, quickly recognized its commercial possibilities. He conveyed his ideas to London, and several months later Dutch and Polish millwrights arrived in the New World. Under the direction of Captain Smith, they constructed a sawmill near Jamestown, and America's first industry was born. The year was 1607.

The Value of Lumber

Soon, America's vast virgin forest was supplying products for many industries. The forest also provided building materials for homes, shops, and churches.

Because of the heavy demands on the forests and inaccessibility of the enormous wood supply in the interior, the early colonists actually worried about a wood shortage. As early as 1798, newspapers and magazines were urging conservation measures to preserve and improve the forest. It's interesting that the methods advocated at that time are common in modern silviculture (forest management). Editorials urged the thinning of diseased and stunted trees. The harvesting of old trees to promote growth of younger, faster-growing trees. And the thoughtful regulation of fires which settlers often used to clear land for crops.

But conservation was difficult because wood was vital for the colonists. They used it to build buggies, buildings, ships, butter churns, walkways, furniture—almost everything.

The colonists and early Americans found other interesting uses for trees. A famous colonial charter was hidden in the base of a tree to keep it from the British. On a tree in northeastern Tennessee, these words were carved: "D. Boon cilled A BAR On Tree in THE YEar 1760." "D. Boon" was, of course, Daniel Boone. George Washington assumed command of the ragtag colonial army beneath another famous tree, the "Washington Elm," in Cambridge, Massachusetts.

The Future of the Forest

These are just a few examples of the role played by the forest in early America. It was important then. It's important now. And it will be even more important in years to come. Because wood is a renewable resource. And, while other natural resources are dwindling, the forest can go on forever.

Georgia-Pacific is helping protect this natural resource by managing its forests scientifically. In addition, the Company is planting millions of trees each year. And, each year, more of the newly planted trees are "supertrees" which are bred from superior stock. The "supertrees" grow faster, are healthier, and have more usable wood fiber than ordinary trees.

However, a wood shortage in the U.S. is possible in the near future because vast tracts of forestland, most of it government-owned, are *not* being managed to best advantage. That is why it is so important that G-P, as a private timberland owner, *is* heeding the words of the conservationists of 1798. Because, as much as Americans relied on the forest products industry in the past, they'll rely on it even more in the years to come.

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There's tall timber capacity in a Clark cable skidder. Its powerful winch brings home even the trees you can't get close to. And adjusts itself automatically for wear. A full-length belly pan protects the power train against all the abuse that tall timber country can dish out. Sizes from 81 hp to 276 hp.

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Over 100 million seedlings back up this commitment to regenerate our forests.

Ever since the 1930's The Chesapeake Corporation has been practicing intensive forest regeneration. Reforesting over 150,000 acres throughout our woodlands in Delaware, Maryland, Virginia, and North Carolina. In fact, during the 1972 season, we planted our *100 millionth pine seedling!*

Encouraging cooperative forestry programs throughout our region has also been an important part of Chesapeake's reforestation program. When equipment scheduling permits we will reforest private land at cost or will give the landowner, at no charge, up to 10,000 seedlings on a matching basis to reforest his land.

At Chesapeake we believe in the forests. They have to be protected and wisely used to supply man with his growing needs.

Forest regeneration. Just another way Chesapeake is working with nature to serve man.

Our professionally trained foresters will be glad to advise you on any questions you may have concerning forest management. Contact: Director of Forest Information and Education, The Chesapeake Corporation, (804) 843-5375, or The State Division of Forestry in Charlottesville.

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You can see what we are up to in Taft, Louisiana where we've added 815 tons a day to our chlor-alkali capacity. You can see it in the new H Series diaphragm cells, installed not only at Taft, Louisiana and Niagara Falls, New York but in licensee plants at home and abroad.

You can see it in the increased use of our SVP® process for the effluent free production of chlorine dioxide. And, in the not too distant future, you will be seeing more of what we can do as our new MX™ membrane cells begin commercial production of caustic and chlorine.

Hooker is proud of its close working relationship to the pulp and paper industry. We like to talk about it, but more important we like to do something about it.

Actions, after all, speak louder than words.

Hooker Chemicals & Plastics Corp.
Niagara Falls, New York 14302
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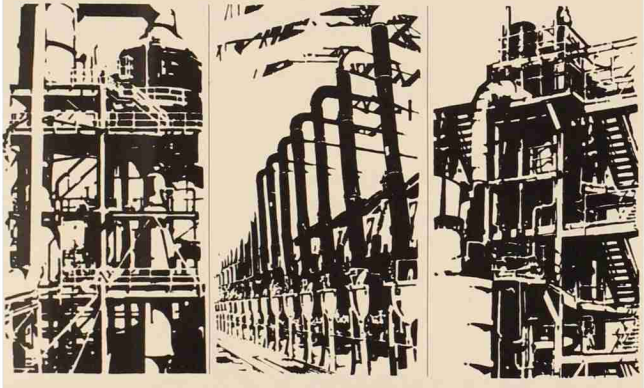

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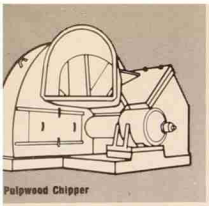
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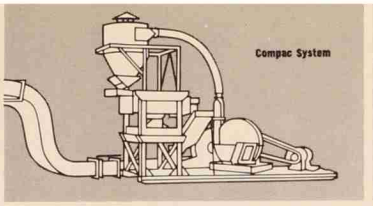
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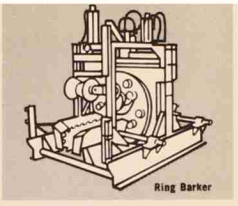
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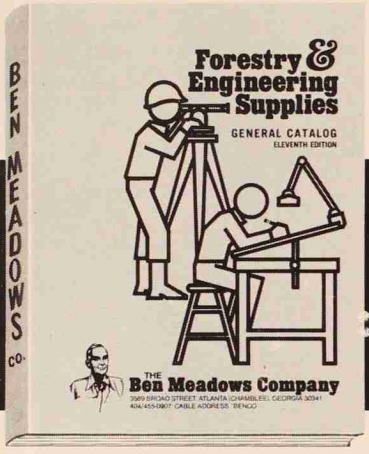

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Why International Paper is helping to develop a 1,000,000-acre fores on land it doesn't own

We want to make sure there'll still be enough wood products around when your children grow up.

Industry sources estimate Americans will use about twice as much paper and wood in the year 2000 as they use today. And the U.S. Forest Service predicts that our nation's commercial timberlands won't be able to keep up with the demand.

One of our solutions is to help private landowners increase their yield. They own about 60 percent of America's forest lands – yet produce only 30 percent of the wood fiber. (Forest products companies own only 13 percent of the forest lands – and produce 34 percent of America's fiber.)

We're looking especially to people who own land close to our operations in the South – America's woodbasket. In 1976 we'll expand our program to the Northeast and West Coast.

How we help landowners

We do it through the Landowner Assistance Program.

We'll show a private landowner how to prepare a site, plant, protect, thin, and harvest – at no charge. This way, he can get the most from his forest land – in some cases, *double* his yield.

We'll even find a contractor to do the actual work. Or do the job ourselves at cost.

For this help, IP gets the right to purchase the timber at competitive prices.

We've got more than 300,000 acres in the Landowner Assistance Program now. We're aiming for 1,000,000 before 1980.

A big help. But it's only one thing we're doing to increase the world's wood-fiber supply.

Higher yield from our own lands

We've developed a Supertree – a southern pine that grows taller, straighter, healthier and faster than ordinary pines.

We're experimenting with a new machine that can harvest an entire tree – taproots and all. The roots used to be left in the ground.

We're moving ahead on fertilization techniques. Tree Farm programs. Research.

Will all this be enough to keep the world's fiber supp going strong?

It'll help. But more mu be done.

At International Paper, we believe forest products companies, private landowners and government should work together to develop more constructive policies for managing America's forests. The wror policies can make tree farmi impossible and force the sal of forest land for other purposes. The right policies can assure continuation of America's forests – a renewable natural resource.

If you'd like more infor mation about LAP — our Landowner Assistance Program, write Woodlan Dept., International Pape Company, P. O. Box 232 Mobile, Ala., 36601.

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