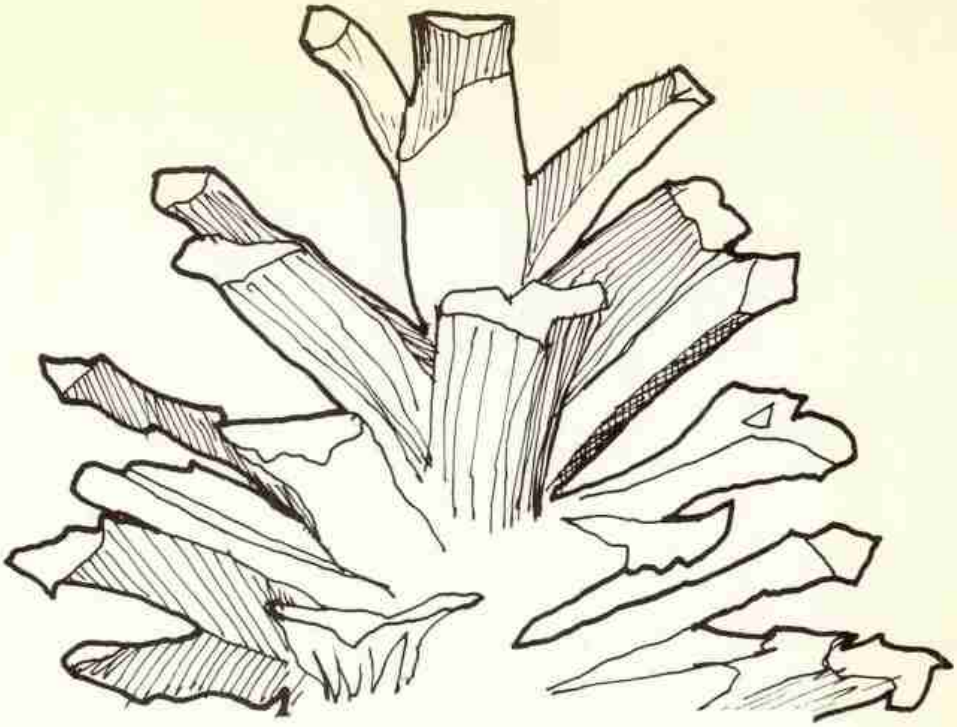
PINETUM 1975



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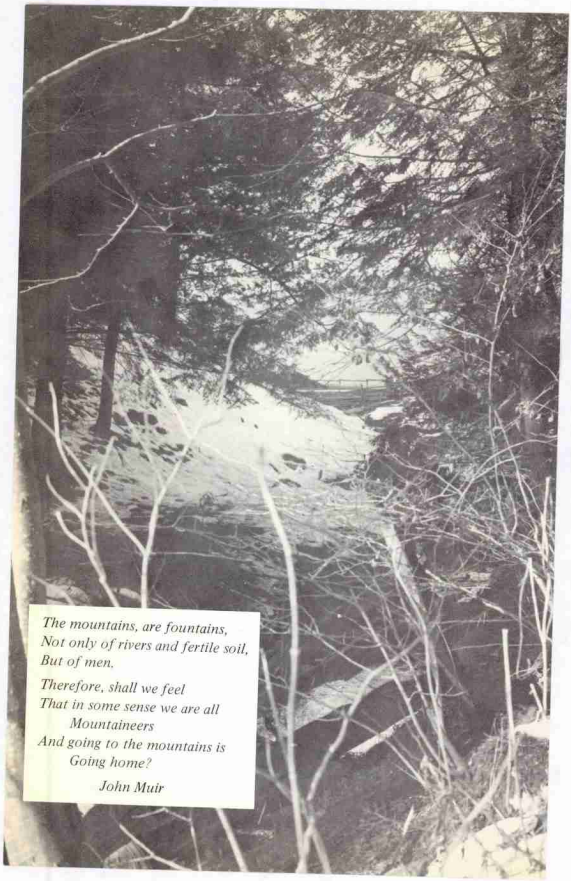
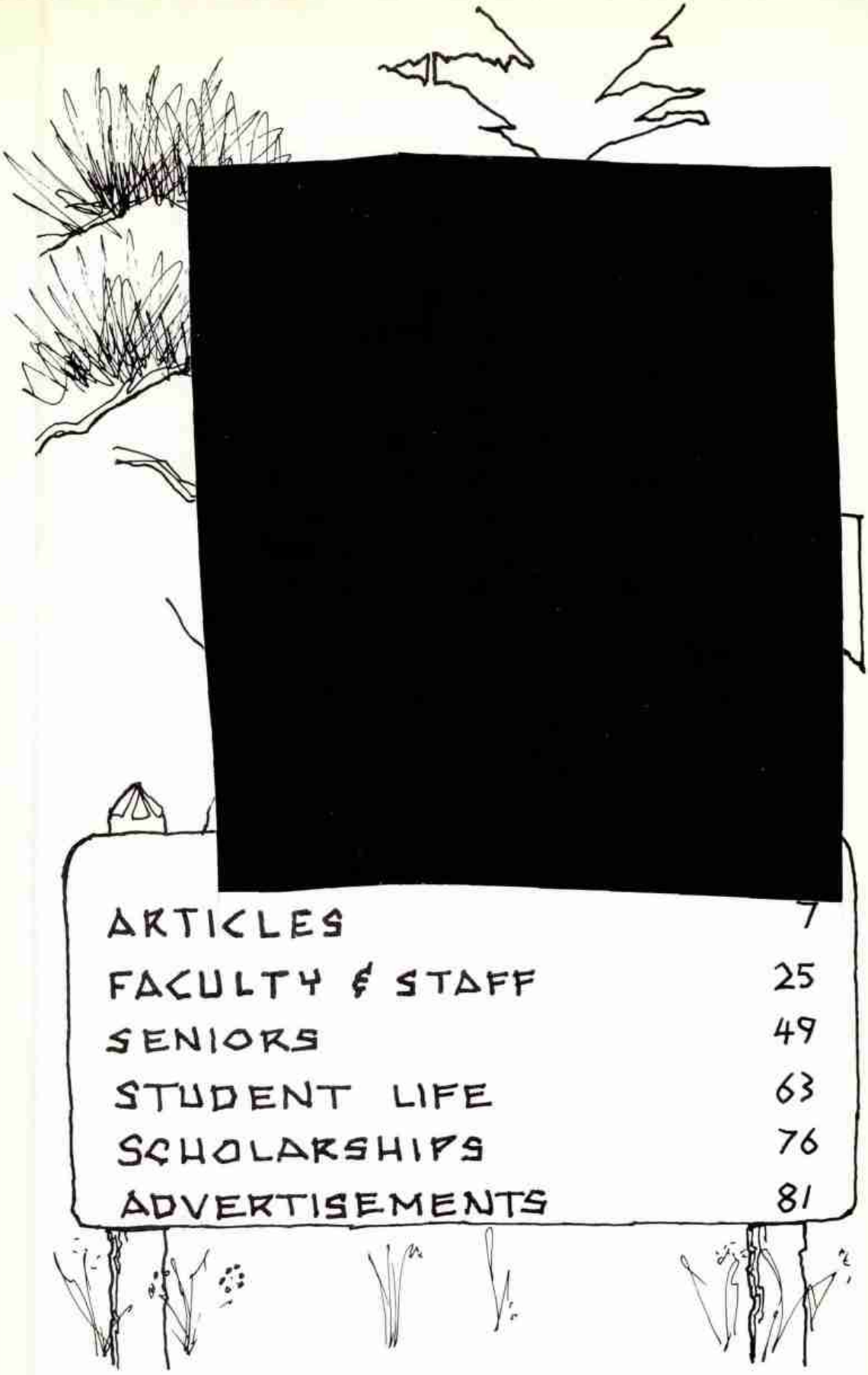


The mountains, are fountains,
Not only of rivers and fertile soil,
But of men.

Therefore, shall we feel
That in some sense we are all
Mountaineers
And going to the mountains is
Going home?

John Muir



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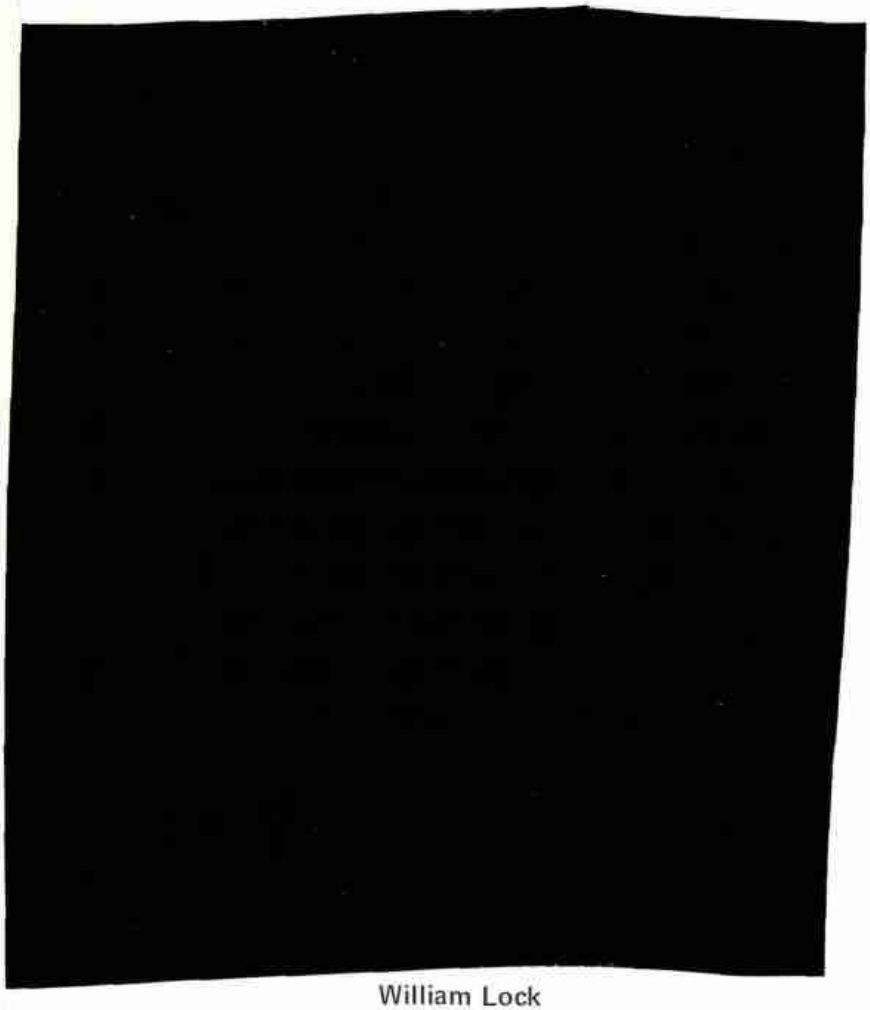

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DEDICATED TO

Dr. Donald Henry John Steensen

WE ARE PROUD TO DEDICATE THE 1975 PINETUM TO DR. DONALD HENRY JOHN STEENSEN, Associate Professor of Forestry and of Wood and Paper Science. Born in the Iowa town of Clinton, known once for its lumber milling, Dr. Steensen lived his boyhood on the west banks of the Mississippi River, in the heart of what had become one of the richest agricultural and industrial regions of this planet, significant also in being the junction of four major railroads.

His higher education began at the Western Illinois State Teachers College in 1950, but after completing two years of study, he was called into the Armed Services with communications assignments in the Army both within the States and in Germany. After being mustered out of the Army in 1955, he enrolled in electrical engineering at Iowa State University, but fortunately transferred into Forestry at the beginning of his senior year. He received the baccalaureate degree in science in March 1958, graduating as the top student in the Wood Utilization curriculum of that school.

He was awarded a fellowship at Duke University where he received the Master of Forestry degree in 1960 and had also completed his residency requirements for the Ph.D. degree by that year. In September 1960 he was appointed Assistant Professor at Auburn University where he quickly demonstrated his versatility and broad capabilities by serving as co-teacher of multiple section courses in mensuration, photogrammetry, and statistics, as well as teaching courses in forest economics and linear programming. In August 1965 he joined

the faculty of the School of Forest Resources at N. C. State where he undertook a vigorous program of teaching mensuration and forest economics. Duke University awarded him the Ph.D. degree in 1966.

Dr. Steensen personifies the completely dedicated teacher whose whole motivation is directed towards being a superior teacher in the broadest context. Over the past decade he has amply demonstrated how well he has excelled in this role. In 1971 he was selected as one of the outstanding teachers on the campus and appointed to the University Academy of Outstanding Teachers. Continually he has been a source of inspiration to other members of the faculty in developing and up-dating complete and explicit syllabi for the courses in mensuration and forest economy and its operation which he continues to teach with undiminished vigor and dedication. In addition, he serves as the director of the 10-week summer camp program.

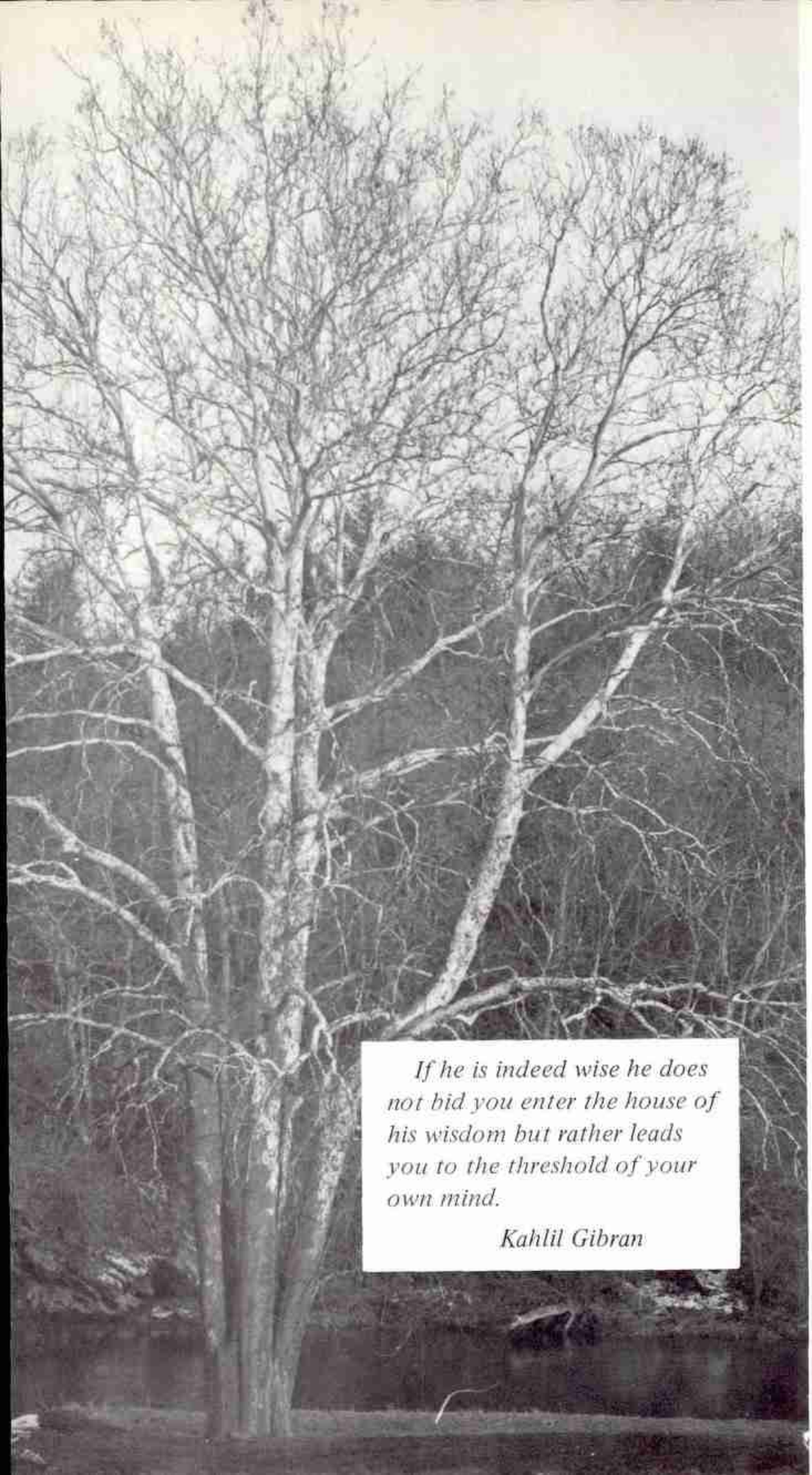
In his firm belief that education is a process, not a fixture, he has striven to revise and improve the forestry curriculum and to broaden the offerings through development of meaningful options and a dual degree program with the Department of Economics. His leadership in this area has been enhanced by his service as chairman of the curriculum committee in the Department of Forestry.

His concern for, and knowledge of, students, and the rapport he has established with them have contributed to the reputation he has attained as the preeminent adviser of undergraduate students, ——a task he has performed so well that an admiring and envious colleague from Auburn University was prompted to declare "Professor Steensen has such a way with students that they flock to him for advice, not only in his own field but also in others!"

It is not alone in teaching and in advising that Dr. Steensen has excelled. His scholarly and professional achievements are reflected by his membership in Sigma Xi, Xi Sigma Pi, Gamma Sigma Delta, Society of American Foresters, American Forestry Association, and Association of Consulting Foresters. Despite his dedicated involvement in the academe, he has found time to devote to civic and athletic affairs. In Auburn he held all the offices in the Civitan Club from Board of Directors to President, was voted Civitan of the Year in 1962, and received the Civitan International Award for the Outstanding Club Treasurer in 1962-63. His enthusiasm for young people and athletics is reflected in his service to Little League sports and his coaching of amateur athletics on several occasions.

Congenial, open, dedicated teacher, and adviser without peer,——the students, staff, and faculty take this opportunity to salute you, Dr. Steensen, and to wish you well in your continued efforts to better the traditions of students, and, through them, of mankind.

ARTICLES



If he is indeed wise he does not bid you enter the house of his wisdom but rather leads you to the threshold of your own mind.

Kahlil Gibran

HIGHLIGHTS OF THE 1974-75 ACADEMIC YEAR

by Dean Eric L. Ellwood

The biggest news of the year was the announcement by Chancellor John T. Caldwell that he planned to take early retirement and effective July 1, 1975. The unprecedented growth of North Carolina State University in both quantity and quality during the 16 years under Chancellor Caldwell reflects his dynamic leadership and energetic contribution to the institution. He will be greatly missed.

This academic year has seen a general worsening of the nation's economic health which combines continuing inflation with an industrial recession. The housing industry, upon which much of the forest products industries are directly or indirectly dependent, was particularly hard hit. In the immediate future this does pose difficulties in job placement for those graduating students (and summer employees) seeking employment in the forestry profession. However, this is strictly a cyclical condition which is building a backlog for housing demand and which will eventually rebound back into a strong production phase. The question is, when! Most economic analysts are of the opinion that a turnaround will begin in the latter half of 1975. In the interim, a high level of entrepreneurship will need to be shown by many graduates in seeking employment opportunities. We suggest acceptance of temporary employment or seeking jobs in other than direct forestry work until stability in employment is restored. The employment situation for recreation graduates appears to be best in the field of county recreation positions and also an increasing number of opportunities with apartment complexes. Employment of graduates from the pulp and paper curriculum seems to be very little affected by the current economic downturn.

The Southern pine beetle seems to have chosen 1974 and 1975 as banner years to build up its population with consequent heavy losses in pine in the South and at a time when the market for wood is limited. Our school forests, particularly the Hill and the Schenck, have not been immune from its attacks which have been incurring losses to us. The United States Department of Agriculture initiated a major crash research program on the beetle during the year and four research projects have been submitted by faculty from North Carolina State University, along with those of faculty from other universities and from the U. S. Forest Service. Over the five year life of the research program it is hoped to find ways to control the depredations of this very damaging insect.

This year we have expended considerable effort in working towards program development at both the state and federal level, which will hopefully result in increased financial support for forest resources activities on a national basis and specifically for our School. On the state level we have participated in developing a long range forestry plan for North Carolina under the auspices of the N. C. Forestry Association. Also one of our faculty (Dr. Bryant) chared a state committee, established by the N. C. Legislature, with the objective of recommending preferred forest practices for North Carolina. At the national level faculty have been active (particularly Walt Keller) in developing a program and support for expanding forest resources extension throughout the nation. If funded, several additional forest resource extension specialists could be added to our program in North Carolina during 1976. Another national activity with which we are involved is a study, under the auspices of the National Academy of Sciences, to review ways in which the nation's wood resources might be used to reduce total energy demand on the nation and to substitute for products derived

from non renewal resources such as fossil fuels and metals. This study will result in recommendations on needed research and on suggested national policies for the management of renewable resources.

In the field of continuing education the outstanding record of our Department of Recreation Resources Administration in conducting annual schools for practicing professionals in revenue sources and in maintenance management have resulted in requests for them to establish two new programs—one in park security and safety and one in management of zoological parks and aquariums. Arrangements for initiating these programs are underway.

On the academic side, this spring we introduced a trial run of a new course entitled "The Making of a Manager." This course, being taught by Adjunct Professor Robert Vokes of Black Clawson Company with the assistance of Professor Dahl of the Economics Department, is in response to suggestions that students in technological programs should be more aware of the nature of management in business and industry. Student response to the course, so far, is good.

In conformity with our School enrollment policy over the last two years the admissions to the School are again being controlled to limit the total enrollment because of large class sizes and shortages of certain facilities.

Enrollment rose significantly in the 1974 fall only in the forestry curriculum compared to the previous year.

ENROLLMENT FALL 1974

Curriculum	Undergraduate	M.S.	Ph.D.
Conservation	51		
Forestry	372	16	16
Natural Resource Recreation Mgt.	33		
Recreation and Park Administration	296	18	
Pulp and Paper Science and Technology	97		
Wood Science and Technology	37	11	11
Special and Unclassified	6		
TOTAL	892	45	27

Degrees awarded in 1973-74 were:

Bachelor	192
Masters	17
Doctorate	4
TOTAL	213

FACULTY/STAFF

Changes in faculty personnel included the following appointments and resignations:

Richard C. Allison joined the extension wood products section succeeding Dr. Fred Hill.

John Berry has been appointed as Research Assistant in the Department of Wood and Paper Science to work as project leader on lumber yield improvement and wood utilization project sponsored by the Furniture R&D Applications Institute.

Beth Wilson was appointed as a Teaching Technician in the Department of Recreation Resources Administration for this academic year.

A. G. (Sandy) Mullin resigned from our teaching staff to go into business for himself.

Dr. A. C. Barefoot returned from sabbatical leave on Senior Fulbright-Hays Research Fellowship and Visiting Fellow of Wolfson College, University of Oxford, England for purposes of developing a dendrochronology for Winchester, England.

Dr. Robert C. Kellison returned July 1 from a year of study at the New Zealand Forest Research Institute in Rotorua, New Zealand, on tree improvement research with emphasis on American species planted in New Zealand.

Dr. William T. McKean returned January 1 from spending six months with the Weyerhaeuser Company pulping research group in Everett, Washington, and also devoting part of his time during the fall 1974 semester to teaching at the University of Washington in Seattle.

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

Dr. Ralph Bryant chaired a state committee mandated by the State Legislature to recommend forest practices needed for North Carolina. He was also subsequently appointed to the new instituted N. C. Forestry Council.

Dr. Hou-min Chang was given the Sigma Xi Research Award.

Dr. C. B. Davey was chosen President-elect of the Soil Science Society of America and served as President of the N. C. State Chapter of Gamma Sigma Delta.

During the summer of 1974, Dr. J. W. Duffield served for eight weeks on the staff of Apache-Sitgreaves National Forest, working on compartment prescriptions in New Mexico and Arizona.

Dr. I. S. Goldstein was selected as Vice-chairman of the 1974 Gordon Research Conference on Chemistry and Physics of Paper, Chairman 1976 Conference.

Dr. Myron W. Kelly was selected as Director of the Society of Wood Science and Technology Visiting Scientist program.

Dr. J. O. Lammi served as faculty exchange research fellow with the U. S. Forest Service, Washington, D. C. in November and December 1974.

Dr. Bruce Zobel was named the TAPPI Gold Medalist for 1975. The associated citation described Dr. Zobel's work as follows: "The work by Dr. Bruce Zobel will have greater impact on the forestry industry throughout the world... in the next several decades than that of any other single living individual."

Dr. Eric Ellwood was selected a TAPPI Fellow and elected a Director of TAPPI. He is also chairing a national committee to make recommendations on research policies on the chemical utilization of ligno-cellulosic materials.

Professor (and Extension Specialist) Walt Keller chaired the national committee on the expanded extension forest resources proposal and also chaired the ECOP Special Task Force Committee on Forestry to write a long term forestry extension program.

Promotions for the year included:

Dr. Robert C. Kellison to Associate Professor of Forestry.

Mr. Andrew J. Weber to Assistant Professor of Forestry Extension.

Mr. Ronald G. Pearson to Professor of Wood and Paper Science.

Dr. Josef S. Gratzl to Professor of Wood and Paper Science.

Dr. William L. Hafley to Professor of Forestry.

Mr. William T. Huxster to Professor of Forestry Extension.

MAKING FOREST LAND MORE PRODUCTIVE

by Bruce Zobel

There is currently a very heavy demand for wood products from southern timberlands. But meeting that demand is becoming increasingly difficult because increased agricultural usage and changes caused by increased population result in the removal of large acreages from timberland production. As an alternative, there is great interest in obtaining needed cellulosic raw material from tropical and subtropical forest areas such as Central or South America. And despite exceptionally favorable conditions for growing wood resources, numerous difficulties prevent this option from being the panacea once visualized. Currently, emphasis is on growing more timber on southern forest land, and the instruction from the 28 members of the pine and hardwood cooperatives[1] is "Make each acre more productive."

The heavy demand for cellulose and other wood products is caused by the general recognition that wood is a uniquely adaptable, easily renewable resource. In addition to the demands for wood products **per se**, there is a steadily increasing demand for wood as a source of energy and perhaps as a source of sugars. If petroleum prices continue to rise, a number of products formerly obtained exclusively from petorleum, such as certain plastics, can be more economically obtained from wood. The determination whether wood will be used as a source of organic chemicals depends upon the ultimate price and availability of petroleum and coal. Another heavy demand on the forest resource, often not considered since it does not directly include wood production as such, is the need for forest acreage used primarily for recreation or amelioration purposes. In localized areas this use supercede all other demands for forest land.

Viewed in total, the **age of the forester** has arrived. No longer can he be looked upon as a necessary evil or an inconvenient expense. The forester is beginning to be accepted as the very necessary, professionally-trained husbandman of America's most widespread, most adaptable, renewable natural resource.

Under the guidance of the professionally-trained forester, the productivity of forest land can be improved by using one or all of the following: (1) increased utilization to capture the current very heavy wastage associated with current harvesting practices; (2) the best site preparation and silvicultural methods to improve stocking and tree growth where warranted; (3) fertilizers where warranted; (4) the best genetic stock available for regeneration.

Utilization standards in the forest industry are rapidly changing, almost to the point of constituting a "revolution." New techniques for pulping, board manufacture, gluing and finishing, have enabled the development of diverse, very useful products from wood considered as waste a few years ago. Changes in harvesting methods are great, and systems such as "whole tree" chipping are greatly extending the wood resource. The low quality, dirty chips now being produced were considered unusuable a few years ago; but, new mill technology allows use of these for many papers and cellulose products, as well as for energy.

Intensive forest management is becoming standard in the Southeast. It is now a recognized fact that maximum gains or optimal economic returns will never be achieved until all tools available to the silviculturist are used together as each supplements the others. For example, site preparation without use of the best genetic stock will never produce the optimum yields and good planting stock plus the best silvicultural practices will be ineffective on soils that have not

been improved by correcting a nutrient deficiency through fertilization. No matter what care is given the trees in the field, sick or poorly developed planting stock resulting from undesirable nursery practices or genetically inferior seed can negate all the potential gain for that rotation. Put into its proper perspective, forest trees must have a degree of care and attention similar to crop plants so that growing cellulose truly becomes a forest farming operation. Methods such as site preparation, special nursery practices, containerized seedlings, and release from competition are all being used on an operational scale. Despite limitations imposed by certain environmental considerations, silvicultural practices are becoming increasingly more intensive. Techniques and machinery now available allow establishment of plantations in such a way that the planted trees have a maximum chance for growth with minimal interference from competing vegetation; in many hardwood plantations this includes cultivation from one to several times. Truly, forest farming is here.

As information is obtained on the best kinds and rates, fertilizers are being applied to an operational scale. The scarcity and current high cost of fertilizer has acted as a deterrent to its wider usage, even when it is known to be beneficial. Data in hand on the need for certain nutrients on specific pine sites and for hardwoods make it evident that fertilization must be employed if maximum cellulose production is to be obtained.

The third tool of the silviculturist is to use genetically improved planting stock. This practice is now widespread for the southern pines, and within 10 years essentially all trees planted in the Southeast will be from seed orchard stock. In the N. C. State Industry Cooperative, the goal of planting 300,000,000 genetically improved trees will have been achieved by member organizations within the next several years; in 1973, for example, about 200,000 acres (150 million trees) were planted by members of the Cooperative. The current 10 to 20 percent volume gains achieved, and the expected future 30 to 40 percent gains, will considerably improve the productive capacity of forest land. One of the most exciting developments is the breeding of strains of trees adaptable to produce a crop on lands formerly considered as marginal, or even submarginal, for economic timber production. Forests are consistently being relegated to the less productive lands and it is necessary to develop strains of trees that are more resistant to droughty or excessively wet soils as well as for conditions in which trees cannot develop satisfactorily because of attacks by pests. Breeding efforts in this direction have been very productive, with good gains made.

In summary, it is evident that there are increasing pressures on the forest resource and we as foresters must rise to the challenge. The attitude of public, government and industry regarding the value, use and management of forest lands is radically changing. The hope of vast supplies of inexpensive cellulose from other regions such as from South America, has not materialized. This fading hope has created the need to produce more cellulose from a diminishing land base. Our instructions from members of the Cooperative are "Produce more on each acre." By relaxing utilization standards and by intensifying silvicultural and forest management techniques, we are attaining that goal.

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[1]Two cooperatives involved operate in 13 southeastern states. The Pine Cooperative has 23 industrial and three state forest service members; the Hardwood Cooperative contains 19 industries, one state forest service, and the Hardwood Research Council as members. These organizations control approximately 25 million acres of land and plant over 400,000 acres (300,000,000 trees) each year.

SOIL MANAGEMENT IN A PRODUCTIVE FOREST

by C. B. Davey

The soil is a basic resource which is essential to the production of the goods and services which come from the forest and are used for the needs and enjoyment of mankind. On the geological time scale, soil is renewable. On time scales with which man is familiar, soil is not easily renewed. It can easily be lost or altered, however.

As populations increase, much forested land is being used for food production, urban development, and highways. Also as public concern mounts for the preservation of wilderness and other wild lands, additional areas of forest land are being removed from management. The demands placed on the remaining forested land increases while the overall quality of the land decreases. Thus good soil management in productive forests becomes imperative.

Soil is subject to various hazards during forest management. The most potentially damaging occur during preparation for, and execution of, harvesting. The construction of roads must be done carefully, especially on steep terrain, to avoid siltaton of streams, accelerated erosion, or in certain areas actual land slides. Felling and skiding equipment may also damage forest soil if the soil is too wet or the topography too steep during logging. New systems such as skyline, balloon, and helicopter logging have been developed in order to protect easily damaged soils.

Soil damage is not restricted to steep lands. Some of the most serious site quality destruction I have witnessed has occurred in the Coastal Plain on very flat land. This damage occurs as the result of the use of heavy equipment on fine textured soils when the soils were wet. The result has been excessive compaction and destruction of soil structure. This can, and has, resulted in serious loss of site quality without actual loss of soil from the site.

In the Piedmont, most of the soils have previously been used for agriculture and have suffered varying amounts of topsoil loss due to sheet and gulley erosion. Logging on such lands must be done in ways which do minimum damage to the forest humus. In this way additional erosion can be prevented.

In intensively managed forests, soil (and thus site) improvement is possible. Operations such as bedding, subsoiling, and fertilizing are some of the silvicultural operations which if done properly have the potential to not only maintain but actually improve site quality.

Regardless of our management objectives, whether they be for the production of wood, water, wildlife, or recreation opportunities, the careful husbanding of our soil resource is paramount to success.

WHAT THE SOUTHERN FOREST MANAGER SHOULD PRODUCE—FROM THE PULP AND PAPER MAKER'S POINT-OF-VIEW

by R. G. Hitchings

The demand for paper and paperboard products has changed during the past year from "unprecedented shortages" to the recession problems of today—lay-offs, full warehouses, shut-downs. It is time to look toward the years ahead and plan for the type of raw material that will be required for the pulp and paper products of the future.

First, one might look at a few of the pressures being applied to the raw material base of the paper industry and the physical processes currently in use by the paper industry. Southern pine species have been the major raw material of the southern paper industry and hardwoods have become increasingly important as more white paper mills have moved to this region.

The southern pine raw material base is shifting from relatively mature trees to young trees with high juvenile wood content brought about by shorter rotations. From a pulp making point-of-view this means lower yields and from the paper making point, this means papers of lower tearing strengths with the possibility of finer fibers. Recent logging practices, including whole tree logging, in-the-woods chipping, and greater utilization of residuals, have tended to increase the amount of dirt and bark particles, decreased the yield and lower the overall physical strength of papers and paper boards made from these blends of raw materials. The modern wood pulp mill today may be accepting wood from 5-6 different types of sources instead of only one-round, unbarked pulpwood bolts.

Blends of pine fibers and hardwood fibers are necessary for many bleached grades of papers in order to develop uniformity, opacity and printability characteristics necessary for the market place. For the coarse, unbleached papers and boards, the inclusion of hardwood fibers is usually considered as adulterants in these grades and in amounts greater than 10-15% of the total furnish tend to decrease the physical strengths of the final papers below acceptable trade standards. One grade of paper, corrugating medium,—the rippled sheet in the center of the paper carton, is 80-85% hardwood fibers with the balance pine fiber. The hardwood fibers, usually made by the semi-chemical process, have given this grade of paper its desirable stiffness characteristics. Thus, hardwood pulps are normally blended with pine pulps in order to meet normal physical strength standards, with the hardwood content varying for 5-90% depending on the other characteristics desired in the finished paper and paperboard.

Recycled papers or waste papers have formed approximately 20% of the new paper supply for the past 25 years. Governmental agencies have encouraged increased use of recycled fibers by changing paper purchasing standards. This has changed the amounts of recycled fibers used by some southern mills from 0 to as much as 300 tons/day and these recycled fibers are found in coarse grades such as, linerboard, and in finer papers, such as, facial and toilet papers. An overall goal of 30% recycled fibers in papers and paperboards, has been discussed as desirable and attainable by the paper industry. Recycled fibers commonly decrease the strength of papers made from them. After 3-5 times of recycling, this strength loss is 10-15 percent of the original sheet strength properties. In many grades of papers, virgin pulps and recycled fibers are blended in order to attain the minimum physical strength properties required.

Agricultural residues in the form of cereal straws, bagasse (waste sugar

canes), cornstalks, as well as fiber crops such as kenaf, have been suggested as sources for papermaking fibers. Some of these have furnished fibers for this industry in years past, but have largely been replaced by woodpulp fibers. Problems of storage for 9-12 months periods, possibility of fires, higher costs of collecting and baling, generally lower pulps yields compared to wood, and high pith and dirt contents have made it difficult for these materials to compete with wood fibers. These fibers are shorter, and contain more short-length molecular components which are difficult to drain on conventional paper making equipment. Again, the fibers may rarely be used alone but are blended with long-fibered softwood pulps in order to make satisfactory papers.

Over the past fifteen years, synthetic fibers, including rayon, nylon, dacron kodel, fortran, and glass have been used in the manufacture of specialized papers, particularly filter papers, vacuum cleaner bags, and washable dusting cloths. These fibers may be made extremely long and with a wide range of diameters, however, usually require special resins and/or adhesives to hold the fibers together. Wood fibers, as well as other forms of cellulosic fibers, have a natural bonding tendency that does not require these additional adhesives for high strengths. The dollar value of high polymer synthetic fibers has been from 3 to 100 times greater than that wood pulp fibers. In recent months, with the increasing costs of petroleum by-products, the value ratio has in some cases been greater, thus making wood fibers more attractive than synthetic fibers for competitive purposes. For specialized end-uses, these fibers will continue to be used, but unless the prices of coal, oil, and gas drop due to falling demands on the world markets, they will become less attractive for conventional grades of paper.

Costs of capital equipment for paper production have undergone the same inflationary trends as other materials in the economy, and when coupled with the higher cost of money, have made the paper industry less attractive to investors than industries such as chemicals and drugs, which have traditionally shown higher rates of returns. Major expenditures for air improvement and water effluent treatment have added to the cost of establishing new mills and this means additional funds are required for capitalization as well as adding to daily operating costs. The new mill costs are ranging from $100,000 to $150,000 per daily ton capacity, depending on the grade of paper manufactured.

With mill costs increasing, the paper industry must look at a fiber supply that appears to be of poorer quality when one includes waste paper, wood residues, and the wider uses of hardwoods. In an effort to minimize fiber costs, all of the above must be included in the wood mix. At the same time, a premium will probably be paid for long-fibered, high strength pine fibers of the highest quality. The latter must be available to offset the shorter fiber length and strength of the residue component referred to above. Agricultural residues do not appear to be available at a competitive price in the southern United States today, but if they eventually become an important fiber source, they will require long fibers for blending to enhance overall physical strengths of the finished paper.

The other option open to the industry is to include synthetic fibers of long length at considerable higher costs in an effort to make papers of competitive strengths. As fossilized fuels become more difficult to obtain, this pathway will generally offer at higher cost pathway.

With the development of high yield specimens of southern pines, adopted to local conditions of soils, climate, diseases and insects, a continued source of paper fiber of superior strength will be insured. If the long fibers of the pine could be genetically changed to produce thinner walls, the properties of fine papers would be enhanced.

DIALOGUE, DILEMMA, AND DELUSION

by R. C. Bryant

S "Prof, something bothers me. You tell me that detailed management plans are important to show where, how much, when, and how timber should be treated and harvested over a period of years. Right?"

P "You are quite correct. I have taught you about various systems of inventory, growth, stand conditions and treatments, forest models, harvesting systems, and market systems. They are among the many things needed if you are to properly manage a forest to approach "normality" and sustained yield. Why do you ask?"

S "I know you have had some experience in these things, but I'm beginning to believe much of what you say is irrelevant, unnecessary, and doesn't make much sense in actual practice!"

P (Huffishly) "That's pretty strong language for a student. You, of course, have some good arguments in your favor! Speak up."

S "I'll use the School forests as an example, Prof., and I don't mean to be impertinent. Let's look at what has happened in the last few years. This year there are forty-five bark beetle attacks on the Hill Forest, five on the Schenck, and an undetermined number in Hope Valley and on the Goodwin. I think Larry Jervis said that they have salvaged three or four at reduced stumpage prices. Right now there is no market for sawtimber and pulpwood production is severely limited. Some 300 cords of pulpwood and 12-15 M of sawtimber are involved. The School now is searching for funds to treat the spots without benefit of any income. What does this do to your management plan?"

P "The Hill Forest is probably the hardest hit in Durham County, and we hope it doesn't get worse next summer."

S "You didn't answer my question, but consider these, too. In 1973 because of high stumpage prices the School sold an unscheduled 100 M ft.b.m. of sawtimber and got $68.55/m for it. I guess this was a smart move, but not in the management plan! In the same year about 3 acres of beetle killed timber was salvaged on the Schenck, part of it in the natural area registered with the SAF and reserved under the management plan. To complicate the Schenck forest even more, the SCS planned to flood the rest of the natural area with a dam!

Then in 1972 the City of Durham threatened to flood most of the Hill by a dam above Lake Michie. Plans were held off for two years pending some final decision—still not made. On the Hill wildfire required further salvage of timber.

Remember in 1971 when the Corps of Engineers informed the School they were taking 1412 acres of the original 1757 acres of Hope Valley for the B. Everett Jordan reservoir? I understand from the files that most of the timber was then cut below the property line.

In 1970, as I recall, and you should, a prescribed fire got a little hot and Ips completed the disaster. You had to salvage the timber. The same year I understand Maki's fertilizer plots were cut after ice and Annosus root rot had done their work.

Just one more, Prof. I have seen pictures of the damage of that bad ice storm on the Hill in 1967 which required salvage of about 25 acres of plantations which were just approaching maximum C.A.I.

I won't embarrass you with more, Prof. My argument is this. Really all you need is a simple inventory of stands to guide salvage or harvest operations, isn't it. I expect a portion of prayer helps too. Do you really believe intricate management plans are needed, Prof.?"

P "Man, Thompson was really hot last night, wasn't he? Right on Big Red!"

RECREATION & PARK ADMINISTRATION

by Phillip McKnelly

Dr. Frank W. Suggitt at Texas A&M University usually concludes his graduate course in Recreation Resources Administration with the following problem:

> You have just concluded two weeks in Europe investigating the leisure service industry of France. As you drive to the airport, your host takes advantage of his first opportunity to ask you about recreation and parks in the United States. His initial question is, "can you describe the basic organizational structure of the leisure service system in your country for me?" (You have about fifteen minutes for your explanation and only the back of an envelope on which to write.)

Dr. Suggitt is not looking for a correct answer—there is none. Instead he is frustrating grade conscious students into the realization of how unwieldy the leisure service profession has become. One does not have to look hard to find confusion in the recreation and park profession, but perhaps the best way to examine the problem would be to attempt a response to Dr. Suggitt's question.

A logical starting point would seem to be professional organizations, particularly the National Recreation and Park Association (N.R.P.A.). The concept of a professional umbrella covering all leisure services appears healthy enough. However, anything more than a cursory glance would uncover the inner turmoil currently sweeping through the N.R.P.A. The organization is heavily in debt financially, and the membership is divided maong seven branches which are often more concerned with their specific problems than those of the broader organization. A recent reoganization of the headquarters staff has caused such upheaval that effective leadership from the national professional organization isn't likely to improve in the near future. To compound the problems already mentioned, the American Association of Health, Physical Education and Recreation offers a second alternative for a national professional body.

At any rate, if our professional organizations cannot offer effective leadership for a leisure service system, the next logical place to look would seem to be the federal recreation and park agencies. But which one? The National Park Service (N.P.S.), U. S. Forest Service (U.S.F.S.), and Corps of Engineers all provide leisure services and are national in scope, yet they are in three different cabinet level departments. From a numbers standpoint, the Department of the Interior with the N.P.S., Bureau of Outdoor Recreation, Bureau of Land Management and others would seem to fit the leadership role yet the Department of Agriculture (U.S.F.S.), and Department of the Army (Corps) certainly cannot be overlooked. Add to these interagency difficulties the problems within the separate bureaus and the profession sinks a bit deeper.

A recent history of leadership in the National Park Service underscores the administrative difficulties within these federal agencies. Earlier this year Gary E. Everhardt was appointed Director of the N.P.S. He replaced Ronald H. Walker,

who had held the position since replacing George B. Hertzog, Jr. in December, 1972. On the surface a two-year turnover in a political position may not appear too extreme but a look into the background of the individuals involved brings up additional questions. The three men were educated as a Civil Engineer (Mr. Everhardt), Insurance Executive (Mr. Walker), and Lawyer (Mr. Hertzog). These men were not educated for positions in park administration or directly related fields yet each has served as director for the federal park system.

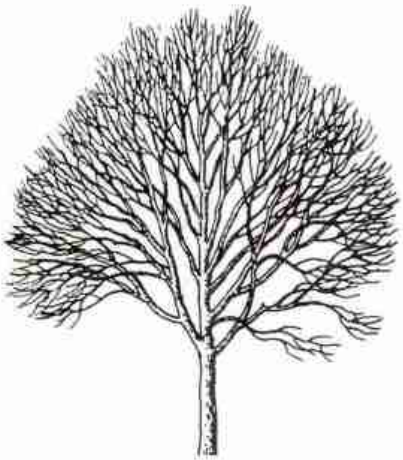
This line of thought involving confusion and misdirecton tends to paint a very dim picture of recreation and parks in our country; yet, if that picture is real, why does the profession continue to mushroom? Perhaps it's time to turn the discussion around a bit and examine the positive side.

To begin with, the roots of the recreation and park system are strong. City and county departments continue to grow even in a period of economic recession. Organization among these units is not apparent but communication lines are open and professionals are concerned. In North Carolina the state convention and Municipal and County Executives Conference draw more delegates than ever before and continuing education programs are overcrowded. It is these roots that will determine the future direction of the profession.

The problems at the national level, discussed earlier, might be attributed to simple growing pains. The National Recreation and Park Association is approximately ten years old and has already had three Executive Directors. Partially due to the musical chairs approach to leadership at the N.R.P.A. headquarters, the organization has shifted from a service-oriented association to a fund-raising body that is attempting to give professional direction to the seven individual branches. Perhaps it is time the N.R.P.A. recognized that the branches are too diverse to fit into one tight professional mold and concentrated on such tasks as lobbying on behalf of recreation and park-oriented legislation and provide a clearing house for professional information.

Finally, the leadership of federal agencies is already taking a positive turn. For example, Jim Watt, Director of the Bureau of Outdoor Recreation, is making a concerted effort to respond to all charges given to that organization some ten years ago. This is a refreshing change from the first several years when the B.O.R. concentrated on administering the Land and Water Conservation Fund Act. Also, our new National Park Service Director, the Civil Engineer, was promoted from within the agency. Mr. Everhardt has had seventeen years of experience with the N.P.S.—besides that, he is a graduate of North Carolina State University.

There is a light at the end of the tunnel.



FOREST RESOURCE EDUCATION AT NORTH CAROLINA STATE UNIVERSITY

by R. J. Preston

This paper attempts to bring together the important steps in the development of programs in forest resource education at N. C. State. Space permits listing only faculty during early years of the program or of long tenure, however, data for all faculty members are covered in some detail in the articles by Dr. Hofmann in the 1954 and 1961 Pinetums, and by the author in the 1961 Pinetum and progress reports in Pinetums from 1949-1969.

The College Program

The Early Years

The first effort in forestry education at N. C. State was a one term course for seniors offered in the 1905-06 academic year by Professor F. C. Reimer of the Department of Horticulture. This course continued for six years. In 1911, Professor J. P. Pillsbury, also in the Department of Horticulture, took over this course in farm forestry, which included mensuration and woodlot studies, and continued offering it each year through the 1924-25 school year.

In September 1925, Fred H. Claridge (later State Forester of North Carolina) was appointed Assistant Forester in the Division of Forestry of the Department of Conservation and Development. Under an agreement with State College, he spent half time teaching farm forestry at the College and half time developing the first state forest nursery on the college campus. This continued only two years, being terminated in 1927 for lack of funds.

During this period a committee of the North Carolina Forestry Association was urging that North Carolina establish a formal curriculum in forestry at N. C. State. Approval for such a curriculum leading to the Bachelor of Science degree was approved in 1928. On February 1, 1929 Dr. J. V. Hofmann, then Assistant Director of the Forest School at Mont Alto, Pa., was employed to start the forestry program the following September.

In the spring of 1929 the Forest School at Mont Alto was abolished and a committee of students and faculty from Mont Alto visited N. C. State and urged the college to expand its program so as to accommodate the Mont Alto student body. Dr. E. C. Brooks, President of N. C. State, approved the request but no funds were available for additional staff, classrooms, or laboratories. The problem was presented to Governor O. Max Gardner, and he provided the needed funding to start the program. Temporary space for the new program was provided in the north half of the third floor of Ricks Hall. These supposdely temporary quarters served the forestry program from 1929 to 1952.

In September 1929, the Department of Forestry opened its door with 24 freshmen, 13 sophomores, 17 juniors, 17 seniors and one graduate student. Two members were added to the faculty, Professor Ralph W. Hays as Professor of Forestry and D. Y. Lenhart as Teaching fellow. The curriculum was assisted by courses taught in the Departments of Botany, Engineering, Soils and Zoology.

The forestry club was organized in the fall of 1929 and has continued as the student forestry organization to the present.

The North Carolina Forestyr Foundation was incorporated on April 15, 1929 as an agency for purchasing land for demonstration and research purposes. The immediate purpose of the Foundation was to purchase a 75 acre tract near Raleigh known as Poole Woods. This tract was sold in 1940-41.

In the spring of 1930, Mr. George Watts Hill gave the College title to 378 acres of his Quail Roost Farm for use as a forestry camp. He also worked with

Dr. Hofmann in purchasing additional acreage through sale of timber from the original tract until today the School operates the 1500 acre Hill Forest.

The Decade of the 1930's

Mr. Tom Evans, who received the B.S. degree in the first class of 1930 and his Masters in 1931, joined the faculty in the fall of 1930 as Teaching Fellow, succeeding D. Y. Lenhart.

In 1931 the forestry program was elevated to the rank of Division of Forestry in the School of Agriculture and Forestry.

In June 1931 Mr. George K. Slocum, BS 1931 and Master of Science 1932, was appointed a Teaching Fellow. After spending 1932-33 with the CCC, he returned to the faculty as Assistant Professor and remained continuously on the faculty until his untimely death in January 1959. Prof. Slocum served as Director of the Summer Camp and as Advisor to the Forestry Club and was deeply loved and respected by students, alumni, and faculty.

On March 28, 1932 a timber tract of 1564 acres in Hyde County was purchased from Senator Angus D. McLean by the Forestry Foundation. After acquisition of the Hofmann Forest this tract was sold in 1942.

The first Rolleo was held in 1932, organized by the Forestry Club and patterned after Rolleos at Mont Alto.

A senior trip to visit forestry activities in the Southeast was instituted in 1934. Also in the spring of 1934 the first Pinetum was printed and Prof. Hays resigned to head the Forestry School at Louisiana State University.

On August 20, 1934, the deed to the 70,000 acre Hofmann Forest was completed, ownership being in the N. C. Forestry Foundation. The interesting history of this Forest was published in book form by the Foundation in 1970. During the summer of 1935 Mr. G. E. Jackson was appointed first supervisor of the Hofmann Forest and remained in this position until March 1, 1944.

Professor Lenthal Wyman replaced Prof. Hayes in 1934, remaining on the faculty until his retirement in 1956. He passed away March 29, 1966.

Dr. William D. Miller was appointed to the faculty in September 1935 to fill a new position in the field of Silviculture, remaining in this position until his retirement in 1963.

During the 1936-37 academic year some 250 acres of the Prison Farm near the State Fairgrounds was turned over to the Division of Forestry and became known as the Richlands Creek Forest.

The Division was accredited by the Society of American Foresters during the 1937-38 year.

The Decade of the 1940's

On April 22, 1940 Mu Chapter of Xi Sigma Pi, the National Honorary Forestry Fraternity, was established at N. C. State.

Assistant Professor J. W. Chalfant joined the faculty in 1941. He resigned in 1952.

The outbreak of World War II interrupted the forestry program and in 1942 the Senior Class graduated early. Classes were curtailed in 1942 and 43 and no classes were offered in 1944. The education program began again in 1945.

During 1944 the Hope Valley Forest near Chapel Hill, consisting of 1750 acres, was deeded at N. C. State College and turned over to the Division of Forestry.

Dr. C. M. Kaufman joined the faculty in 1944 as a research professor.

In the fall of 1947 the Department of Industrial and Rural Recreation was established in the Division of Teacher Education (now the School of Education)

and Prof. Thomas I. Hines was employed as Department Head. Thirty-three students enrolled the first year.

Dr. J. V. Hofmann retired as Director on June 30, 1948 and was succeeded by Dr. R. J. Preston. In the fall of 1948 Prof. R. M. Carter joined the faculty and programs in Wood Technology and Lumber Products Merchandising were initiated. In 1949 Dr. J. S. Bethel joined the forestry faculty and Prof. L. L. Miller joined the Department of Industrial and Rural Recreation. That same year the legislature apporpriated funds for a Forestry-Horticulture Building and a mountain camp at Devotion, N. C. was made a part of our summer program through facilities provided by Mrs. E. D. Reynolds on her 11,000 acre forest. Also cooperative work-study programs were initiated. The decade ended with 205 students enrolled in the Division of Forestry.

The Decade of the 1950's

On July 1, 1950 the long sought status of School of Forestry was obtained, making the forestry program one of the six degree granting schools at N. C. State. Also during this year construction started on Kilgore Hall and the programs of the school were reaccredited by the Society of American Foresters. Charles G. Stott and Albert R. Crawford joined Professors Hines and Miller in the Department of Industrial and Rural Recreation.

In 1951 the Student Chapter of the Forest Products Research Society was formed. Dr. Kaufman resigned to become director of the School of Forestry at the University of Florida and was succeeded by Dr. T. E. Maki. Dr. R. C. Bryant joined the faculty in 1952.

The first honorary doctorate in forestry at N. C. State was awarded to Colin Spencer in 1951 and in succeeding years to Dr. Carl Alwin Schenck, Inman F. Eldredge, Walter J. Dantoft, and E. L. Demmon. In 1959 the Doctor of Science was awarded to Dr. F. X. Schumacker, in 1961 to Irvine T. Haig and in 1967 to V. L. Harper.

The program in Pulp and Paper Science and Technology was initiated in 1952, following meetings with Mr. Reuben B. Robertson in the summer of 1951 and meetings called by Mr. Robertson at Lake Logan that fall and at Paper Week in New York in early 1952. Five executives joined with Mr. Robertson at this meeting in agreeing to support the College in initiating this new program. Prof. C. E. Libby, then in charge of a similar program at Syracuse, joined the faculty on May 1, 1952 and the legislature appropriated funds for a pulp and paper building that spring. At about the same time the Southern Regional Education Board recognized this program as the one to serve the Southeast. The program opened in 1953 with five students and that year the Reuben B. Robertson Professorship was established and awarded to Prof. Libby. In 1954 Prof. Robert G. Hitchings was added to the faculty and 17 students enrolled. The Pulp and Paper Foundation with 54 company members was established in February 1955 to support the program. The Reuben B. Robertson Pulp and Paper Laboratory was dedicated October 25, 1957.

In 1954, the 25th anniversary of the forestry program at N. C. State, the School was granted authority to offer the Ph.D., Professors A. C. Barefoot and C. A. Hart joined the faculty, Mrs. Frances Liles joined the staff in charge of student records, and a mountain camp at Wayah Bald was established to replace the Devotion camp.

Significant program in Tree Improvement was initiated during the 1956-7 year, supported by eleven pulp and paper companies. Dr. B. J. Zobel joined the faculty to head this program and R. L. McElwee was appointed Liaison Geneticist. Prof. H. D. Cook joined the pulp and paper faculty this year, and Prof.

R. J. Thomas and R. C. Gilmore joined the Wood Products faculty in September 1967. The Fourdrinier Society was organized in 1957 and the 1957 legislature appropriated funds for a Wood Products Laboratory.

An exciting chapter in the history of the School started in 1952 when the honorary Doctor of Science degree was conferred upon Dr. Carl Alwin Schenck, the founder in 1898 of the Biltmore Forest School. The loyal Biltmore alumni adopted the School of Forestry as a continuation of their pioneering school and this resulted in the establishment of the Carl Alwin Schenck Professorship in 1955 (first awarded to Dr. Maki), the renaming and dedication of the Richlands Creek Forest in 1957 as the Carl Alwin Schenck Memorial Forest (Dr. Schenck's ashes were scattered here), and in 1958 the establishment of the endowed Biltmore Scholarships and the Biltmore Library Fund to enhance the School library. The Biltmore program was completed with the magnificent gift of Edwin Conger in 1961 which endowed the Conger Professorship and the Conger Scholarships.

As the decade drew to a close, growth of the School necessitated reorganization and in 1958 two departments were established: the Department of Forest Management with Dr. Maki as Head and the Department of Wood Products with Dr. Bethel as Head. Forestry Extension formally became a part of the School's program with two sections established under Extension Forester John L. Gray; the Forest Management Section under Walter M. Keller and the Wood Products Section under George W. Smith. Honors Programs were initiated in 1959 and the Slocum Memorial Area on the Hill Forest was dedicated in November of that year. Dr. A. J. Stamm joined the faculty in July 1959.

The Decade of the 1960's

Space requires that only highlights of the 1960's be covered. Dr. J. O. Lammi, Dr. T. O. Perry and Prof. C. G. Landes were appointed to the faculty in 1960. Prof. Libby retired and Dr. Bethel resigned to become Dean of the School of Forest Resources at the University of Washington. On May 25, 1960 the Brandon P. Hodges Wood Products Laboratory was dedicated.

In 1961 Dr. E. L. Ellwood joined the faculty as Head of the Department of Wood Products. Dr. Arthur Kelman and Dr. Maurice Farrier became jointly associated with their original departments and the School of Forestry in the areas of Forest Pathology and Forest Entomology. They were joined in July 1962 with the appointment of Dr. Charles B. Davey in the field of Forest Soils. Dr. B. A. Jayne joined the faculty in the fall of 1962 and Dr. Stamm was awarded the Reuben B. Robertson Professorship.

In 1963 Dr. John W. Duffield joined our faculty, replacing retiring Dr. Miller. Dr. Gene Namkoong, an employee of the U. S. Forest Service stationed at N. C. State, was jointly appointed to the Department of Genetics and the School of Forestry. Dr. L. C. Saylor was made a joint appointee of the School and the Department of Genetics. To further strengthen the field of forest biology, Dr. A. W. Cooper (Ecology) and Dr. James W. Hardin (Botany) were formally associated with the School. Dr. Zobel became the first recipient of the Conger Professorship.

A Revenue Sources Management School was started in 1963 by the Department of Recreation and Park Administration. This School, held at Oglebay Park, West Virginia, has continued to the present.

A new cooperative program in Hardwood Management and Utilization was initiated in 1963 under the direction of R. L. McElwee assisted by E. M. Jones. Robert C. Kellison replaced McElwee in the Tree Improvement Program. Prof. C. E. Libby died May 26, 1964.

Dr. Kelman resigned in 1965 and was replaced by Dr. Ellis Cowling. Mr. Ray Smith was appointed Executive Secretary of the Pulp and Paper Foundation and Dr. R. L. Barnes and Dr. L. J. Metz of the U. S. Forest Service were appointed Adjunct Professors. On August 17, 1965 Dr. J. V. Hofmann died.

The 1965 legislature appropriated funds for three purposes: a new forestry building including a third floor for Robertson Laboratory; modernization of the George K. Slocum camp at the Hill Forest; and development of research laboratories in the Hodges Wood Products Laboratory.

New faculty added during 1966 year were William L. Hafley, D. H. J. Steensen, K. A. Argow, J. W. Johnson, J. H. Robards, and Benee Swindel, the latter an employee of the U. S. Forest Service. On July 1, 1966 Dr. Saylor served as Assistant to the Dean on a half-time basis. Robert Sternloff and Roger Warren joined the faculty of the Department of Recreation and Park Administration.

Of major significance was the transfer of the Department of Recreation and Park Administration from the School of Education into the School of Forestry on February 1, 1967. In 1967 Gordon Hammon was appointed to the recreation faculty to develop the Natural Resource Recreation Management curriculum. Double major programs were initiated in several fields in 1968 and a new curriculum in Conservation was established jointly in the Schools of Forestry and Agriculture and Life Sciences. The expanded scope of our programs resulted in changing the name of the School to the School of Forest Resources.

The James L. Goodwin forest of 1122 acres in Moore County came to the School upon the death of Mr. Goodwin on March 2, 1967.

In 1967 Prof. H. D. Cook retired, Dr. B. A. Jayne resigned and Dr. H. T. Schreuder was appointed to the faculty. Four adjunct professors were appointed: Dr. G. H. Hepting, Dr. B. A. Jayne, Walton R. Smith and Dr. Thomas Ripley. In 1968 Dr. Stamm retired, seven new faculty were appointed and there were four additional adjunct appointments. Four new faculty were appointed in 1969.

A new Forest Fertilization Cooperative under the direction of L. W. Haines was initiated in 1969.

The decade drew to a close with 709 students enrolled in the fall of 1969, faculty and staff totaling 116, and an operating budget in excess of $1,300,000.

On July 1, 1970 Dr. Saylor was appointed Assistant Dean, Dr. Maki returned to teaching and research and Dr. C. B. Davey was appointed Head of the Department of Forestry. Biltmore Hall was dedicated on November 6, 1970.

This history of the School ends with the retirement of Dean Preston on June 1971 and the appointment of Dr. Eric L. Ellwood to carry forward the administrative leadership of the School of Forest Resources.

The Extension Program
The Early Years

Farm Forestry Extension in North Carolina was undertaken as part of the agricultural extension program under the Smith-Lever Act of May 8, 1914. On July 1, 1917, North Carolina became the fourth state in the nation to initiate a forestry extension program with the appointment of J. S. Holmes (later State Forester) as extension forester. Mr. Holmes resigned one year later and the position was filled by Harry B. Krauss, who remained on the job for three years.

After a lapse of no activity Mr. H. M. Curran was appointed Extension Forester December 1, 1922, continuing in this position until his resignation June 30, 1925. In December of that year Mr. R. W. Graeber, a county agent, was made Extension Forester and continued in this position until his retirement in 1953.

The Decade of the 1930's

Activity during the early years of the 1930's consisted of the missionary efforts of Mr. Graeber to stimulate interest in forestry practices through the counties of North Carolina. In 1934 W. J. Barker, a 1934 alumnus of N. C. State was appointed as Assistant Extension Forester, holding this position for one year. He was succeeded by Rufus H. Page, Jr., a 1935 alumnus of the Forestry Division, who remained in this position until entering service in 1941.

The Decade of the 1940's

With the initiation of the Cooperative Forest Management program during World War II which was first administered in Extension, J. E. Hobbs was appointed to the extension program in 1942, John E. Ford in 1944 and John L. Gray in 1945. A number of other foresters were assigned to this program and remained in Extension until the program was transferred to the State Forest Service in 1948. Three foresters joined extension in 1948, Ross L. Douglas, J. C. Jones, and George W. Smith. Walter M. Keller was added to the program in January, 1949.

The Decade of the 1950's

Mr. Graeber retired in 1953 and was succeeded by John L. Gray. John Ford resigned in 1954. During the 1950's several additional forest management positions were filled, Fred E. Whitfield in 1950, E. M. Jones in 1954, John H. Gilliam in 1956 and W. M. Stanton and L. A. Hampton in 1958. George Smith rejoined the Extension Service in 1955 to initiate the Wood Products Extension program, the first program in the country to bypass the County Agent approach and work directly with industry. He was joined in 1956 by L. H. Hoggs and in 1959 by Wm. E. Keppler.

The Decade of the 1960's

On July 1, 1960, Dr. George Smith was promoted to Assistant Director of the Extension Service and William E. Keppler replaced him as head of the Wood Products Extension Section. W. T. Huxster, Jr. was employed to take over Keppler's work on the Agricultural Marketing Act contract. On October 1, 1960, the management foresters were reassigned to different geographic areas and to a specific specialization. Also in 1960, the Richardson Foundation agreed to a series of eight generous grants to provide graduate study for the extension staff over a period of years.

John Gray resigned as Director of Forestry Extension in 1963, to become Director of the School of Forestry at the University of Florida. He was replaced in 1964 by Walter Keller. The Wood Products Section completed a Federal Extension Contract to develop a model program to aid other states to initiate work with industry.

In 1964, Wm. B. Stuart replaced John Gilliam and Fred E. Whitfield was made a joint appointee with the Department of Entomology.[

Nicholas Weidhass and Ronald Thomason were added to the staff in 1966 to develop a special utilization program in the Appalachian Counties. This brought the number of graduate foresters in the Extension program to thirteen.

Faculty changes were numerous during the 1967-68 year. Wm. B. Stuart, N. Weidhass and R. Thomason resigned and T. J. Fetters, A. G. Mullins, S. J. Hanover, and L. W. Haines were appointed. Hugh Fields, Wildlife Specialist, was transferred to Forestry Extension in September 1968. Also in 1968, Mullins transferred to teaching and research and was replaced by James Hedgecock. In 1969 J. C. Jones was promoted to Chairman of the Northeast Extension District and in 1970 W. T. Huxster succeeded Jones as Head of the Forest Management Section. W. E. Keppler died unexpectedly in July 1970.

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Things do not change;
we change.

Thoreau

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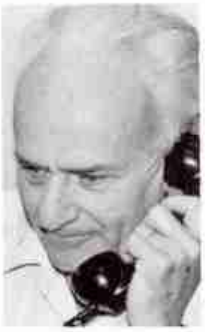

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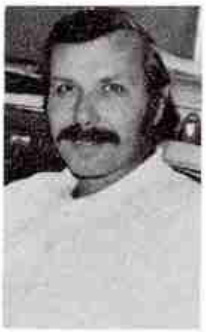

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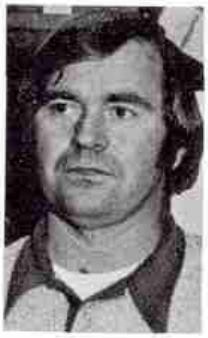

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Angeline Brantley
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Wood Products
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Grayce Broili
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Recreation Resources
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Cooperative Programs

Sam Clark
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Pam Davis
Secretary
Forest Fertilization
Cooperative

Tyson Dublin
Genetics Gardener

Sarah Eure
Student Affairs
Dean's Office

Margaret Grier
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Alice Hatcher
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Martha Holland
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Cooperative Programs

Carol Holland
Secretary

Marilyn Horne
Secretary
Wood and Paper Science

Sue Johnson
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Forestry

Edith M. Jones
Research Technician
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Forestry

Jackie Rawls
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Recreation Resources
Administration

Nancy Roberts
Secretary
Dean

Valda Schmidtt
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Sharon Sanderford
Research Technician

Roman Sopko
Research Technician
Wood and Paper Science

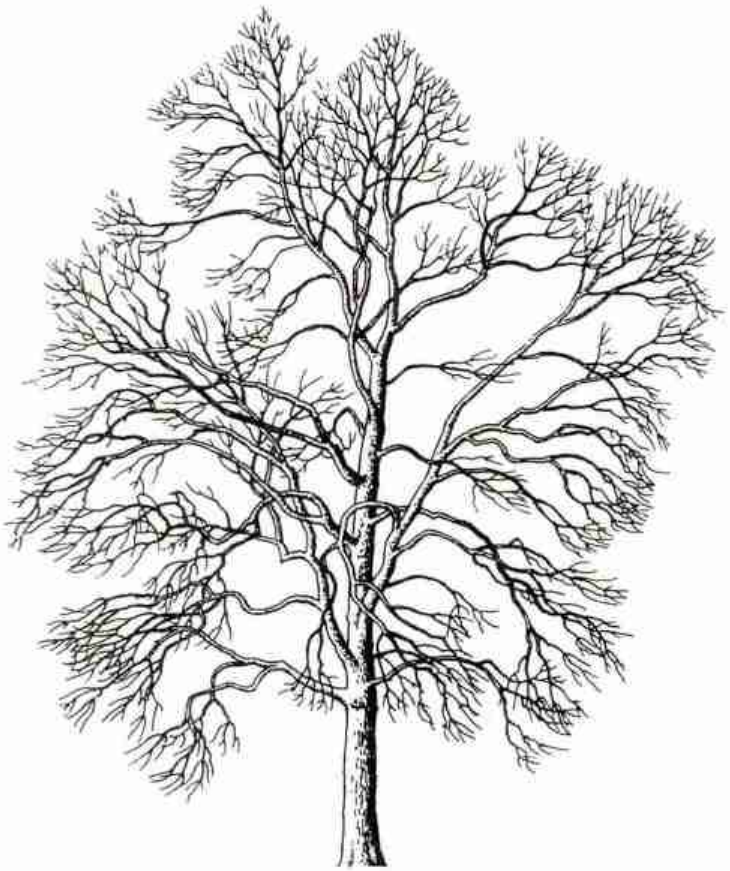
Rebecca Wagner
Tree Improvement

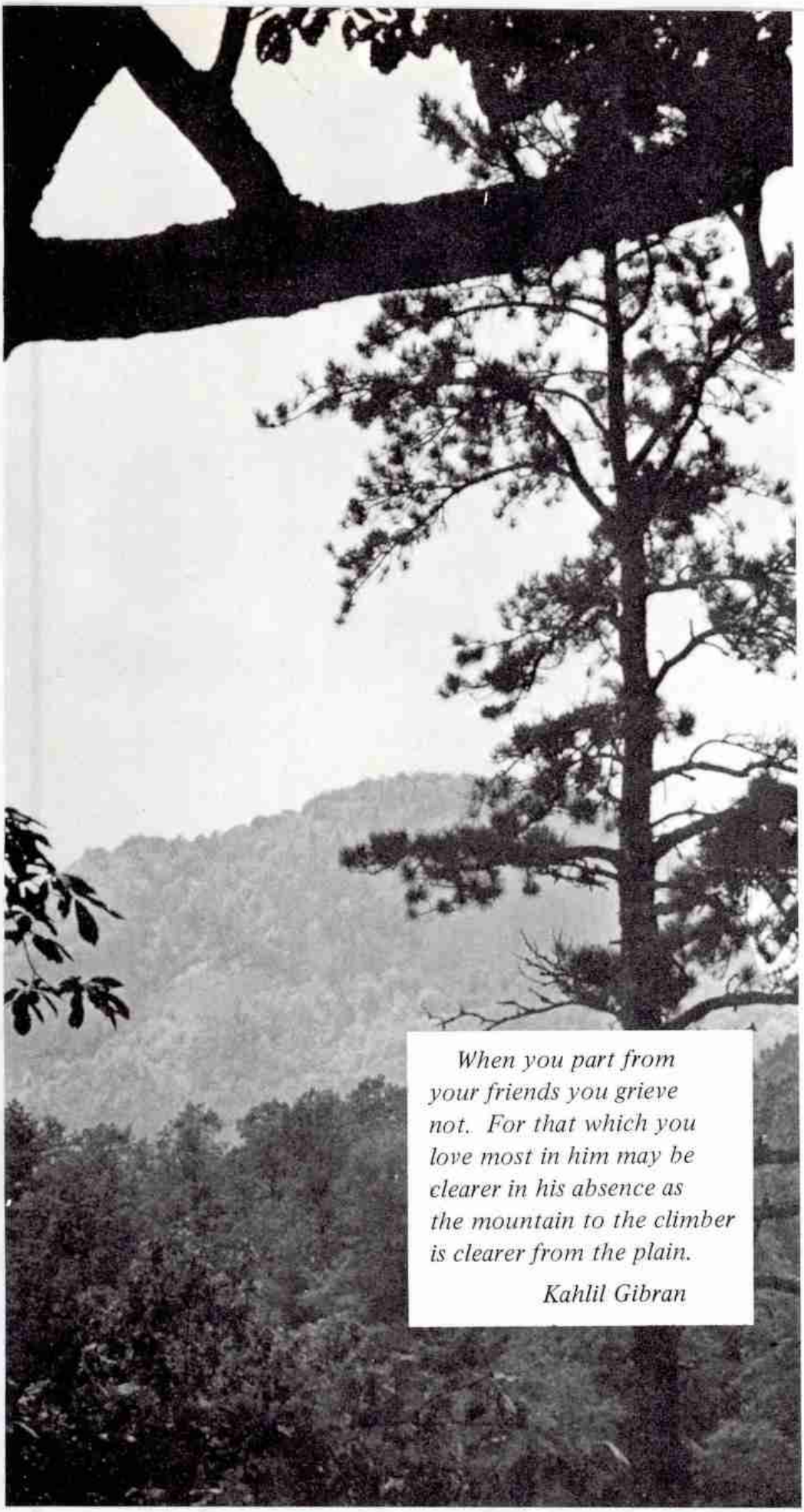
Mary Walker
Budget Clerk

Delores Watkins
Secretary
Pulp and Paper Science

Elizabeth Wilson
Lab Technician
Wood and Paper Science

Judy Williams
Secretary
Extension Forest
Resources Department





When you part from your friends you grieve not. For that which you love most in him may be clearer in his absence as the mountain to the climber is clearer from the plain.

Kahlil Gibran

Robert M. Abee
Morganton, N. C.
Conservation
Xi Sigma Pi

Chris Anderson
Raleigh, N. C.
Forestry & NRR
Forestry Club

Kenneth B. Askew
Winton, N. C.
WPS (PPT)
Tappi, Circle K

Fred H. Baggott
Winston-Salem, N. C.
Forestry & NRR
Xi Sigma Pi, POA, OKO, TKE

John Baker
Reidsville, N. C.
Forestry & Wildlife Bio.
Leopold Wildlife Club

Steve Baker
Pilot Mountain, N. C.
Forestry
Xi Sigma Pi (Asst. Forester), Blue Key, PKP, Alph
Alpha Zeta

Wayne Barney
College Park, Md.
Forestry & NRR
Xi Sigma Pi, Pi Theta Alpha,
Forestry Club

Bruce Bayle
Baltimore, Md.
Forestry
SAF, XSP

Martin Botkin
Mt. Airy, N. C.
RRA
Xi Sigma Pi, Rho Phi Alpha

Dave Bradley
Pleasant Hill, Ohio
WPS (PPT)
Tappi (Program Chairman)

Elton Brame
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Xi Sigma Pi, Forestry Club, SAF

Jim Brooks
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Forestry & Ag. Econ.
Xi Sigma Pi, Student Senate, WKNC-FM, For. Council

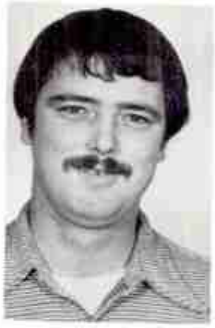
Bruce Brown
Raleigh, N. C.
Forestry
Mu Beta Psi

James Burnett
Bryson, N. C.
Forestry & NRR

Karl Busick
Cary, N. C.
Forestry
Forestry Club, SAF

Bill Champion
Lawndale, N. Y.
Forestry
Xi Sigma Pi, Forestry Club, SAF

Gary L. Cobb
Cliffside, N. C.
Conservation
Baseball, Football



Roger Corbin
Asheville, N. C.
RPA
Air Force ROTC

Charles Cox
Moncure, N. C.
Forestry
Xi Sigma Pi, Gamma Sigma Delta

Jim Crane
Charlotte, N. C.
Forestry
Forestry Club (Sar. Arms), Forestry Council (Treas.)

Tom Crews
Lillington, N. C.
Forestry
Xi Sigma Pi, Forestry Club, For. Council, Res. Hall Gov't.

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Statesville, N. C.
PPT
Tappi

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Mt. Holly, N. J.
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Mike Dennison
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PPT
Xi Sigma Pi, Tappi, For. Council, Circle K

R. Lindsay Dietrich
Weddington, N. C.
Wood Science
Xi Sigma Pi (Pres.)

Robert Durland
Langhorne, Pa.
PPC
Tappi, Alpha Zeta, AICHE

Bill Gardner
Raleigh, N. C.
Forestry
Xi Sigma Pi

Harold W. Goff, Jr.
Rocky Mount, N. C.
WST
Xi Sigma Pi, For. Council, TKE (Pres.), FPRS (Pres.)

Kathleen Gylnquist
Pensacola, Fla.
PPC
Tappi (Pres.), AICHE (Pres.), Fellowship Christian Athletes, N. C. Fellows

Patricia Hall
Charlotte, N. C.
RPA

John R. Hall
Fayetteville, N. C.
Forestry
Forestry Club (Vice-pres), SAF Student Chpt. (Asst. Vice-chr), Leopold Wildlife Club

Glenn Harmon
Lenior, N. C.
WPS
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Jan Harris
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RRA
Xi Sigma Pi, Mu Beta Psi

David Harris
Baton Rouge, La.
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Forestry Club, SAF

Doug Hathcock
Concord, N. C.
Forestry
Forestry Club

Richard Hazard
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NRR

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TKE

Ray Hope
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Conservation & RPA

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Forestry & Wildlife Bio.
Xi Sigma Pi, Forestry Club, SAF

David Howell
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PPT
Tappi

Howard Hull
Mt. Airy, N. C.
Forestry

Joseph Hunt
Glen Spey, N. Y.
Forestry & Conservation
Xi Sigma Pi

Phillip R. Hunnicutt
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Forestry Club, SAF, Leopold
Wildlife Club

Bill Jenkins
Milwaukee, N. C.
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Xi Sigma Pi

Jeff Jensen
Erie, Pa.
WPS (PPT)
Tennis

Wayne Jones
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OX, FPRS

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Roxobel, N. C.
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Dennis King
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SAF, Wildlife Soc., Phi Kappa Tau, Dorm House Coun.

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John P. Lollis
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Xi Sigma Pi, Forestry Club

Danny Maness
Robbins, N. C.
Forestry
Xi Sigma Pi

Early McCall
High Point, N. C.
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Xi Sigma Pi, Forestry Club, SAF, Band, *Pinetum* (Business Mgr)

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Xi Sigma Pi

David McGrew
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Forestry & Wildlife Bio.
Xi Sigma Pi, Forestry Club, Outing Club

Ed Minton
Lewiston, N. C.
Wood Science Technology
Xi Sigma Pi, Alpha Zeta
FPRS (Sec.), For. Coun. (Vice-pres.)

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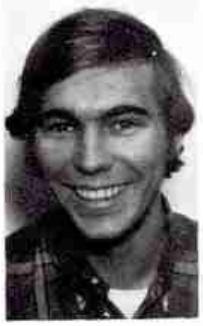
Lanham, Md.
Forestry
Xi Sigma Pi

Johnny Nobling
Raleigh, N. C.
WPS
FPRS (Vice-Pres.)



David Nielson
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Xi Sig ma Pi, Tappi, AICHE

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Forestry & SSC
Xi Sigma Pi

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Cary, N. C.
Forestry

Harold Park
Woodstock, N. Y.
Forestry & SWB
Xi Sigma Pi

John Peeler
Salisbury, N. C.
Forestry

John C. Poole
Raleigh, N. C.
RRA
Xi Sigma Pi, Rho Phi Alpha

Chesley Powell
Suffolk, Va.
Forestry
Xi Sigma Pi, Tappi (Sec.)

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Mt. Gilead, N. C.
Conservation
SAF

Jim Reavis
Winston-Salem, N. C.
Forestry

Martin S. Revis
Saluda, N. C.
Forestry

Curtis Scott
Charlotte, N. C.
Forestry
Xi Sigma Pi

David Senter
Raleigh, N. C.
Forestry & RRA
Track, Cross Country,
Xi Sigma Pi

Walter Skipper
Abbottsburg, N. C.
PPT
Xi Sigma Pi, Tappi (Treas.)

Chris Smith
Plymouth, N. C.
Forestry
Xi Sigma Pi, Tappi
(Vice-pres.)

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Richmond, Va.
RPA
Xi Sigma Pi, Rho
Phi Alpha

William Swint
Bethesda, Md.
Forestry & WST
Forestry Club, Bag Pipe Band

Randall M. Thompson
Roxboro, N. C.
Forestry

George Vandusen
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Xi Sigma Pi, Phi Kappa Phi

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Harrisburg, Pa.
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Jim Vining
Tryon, N. C.
PPT
Tappi, Treas. Farm House Frat.

Robert Warden
Jacksonville, N. C.
Forestry
Rugby Club

Dave Warren
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Vann Waters
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Xi Sigma Pi, Outing Club

Dwight Williams
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NRR
Rho Phi Alpha

Buren Lamar Wortman
Shelby, N. C.
Conservation

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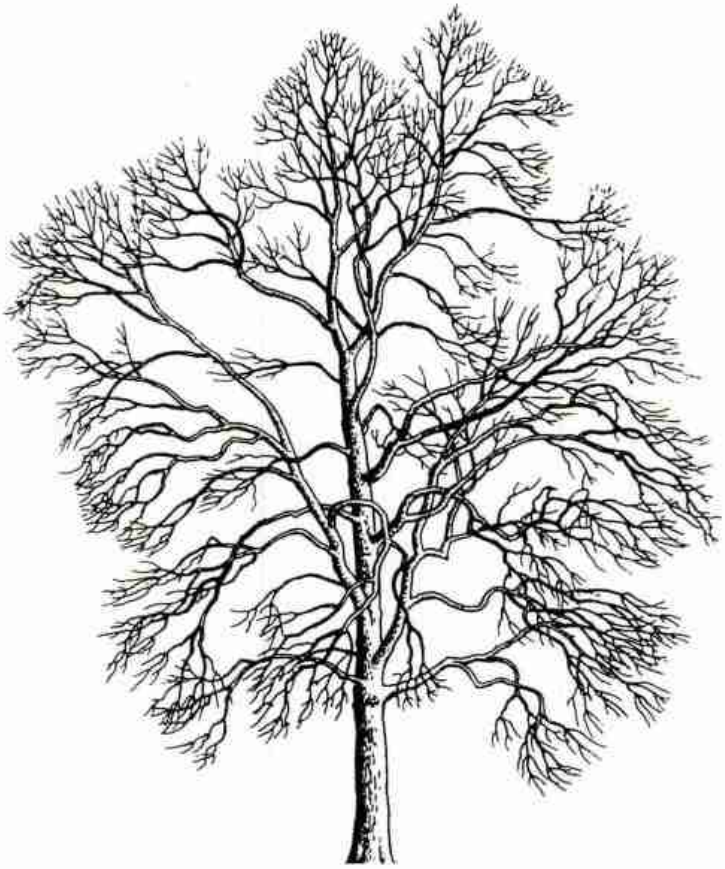
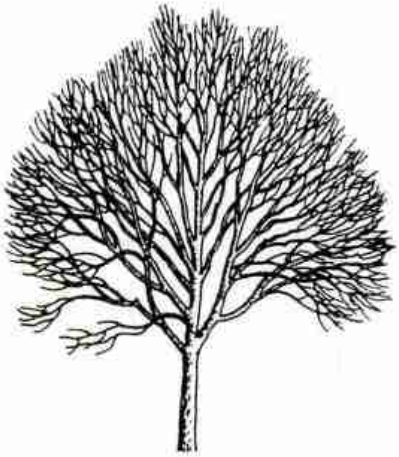
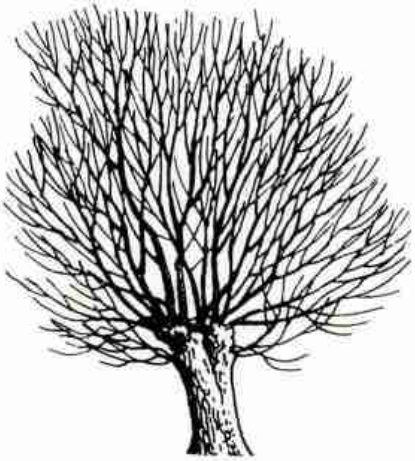
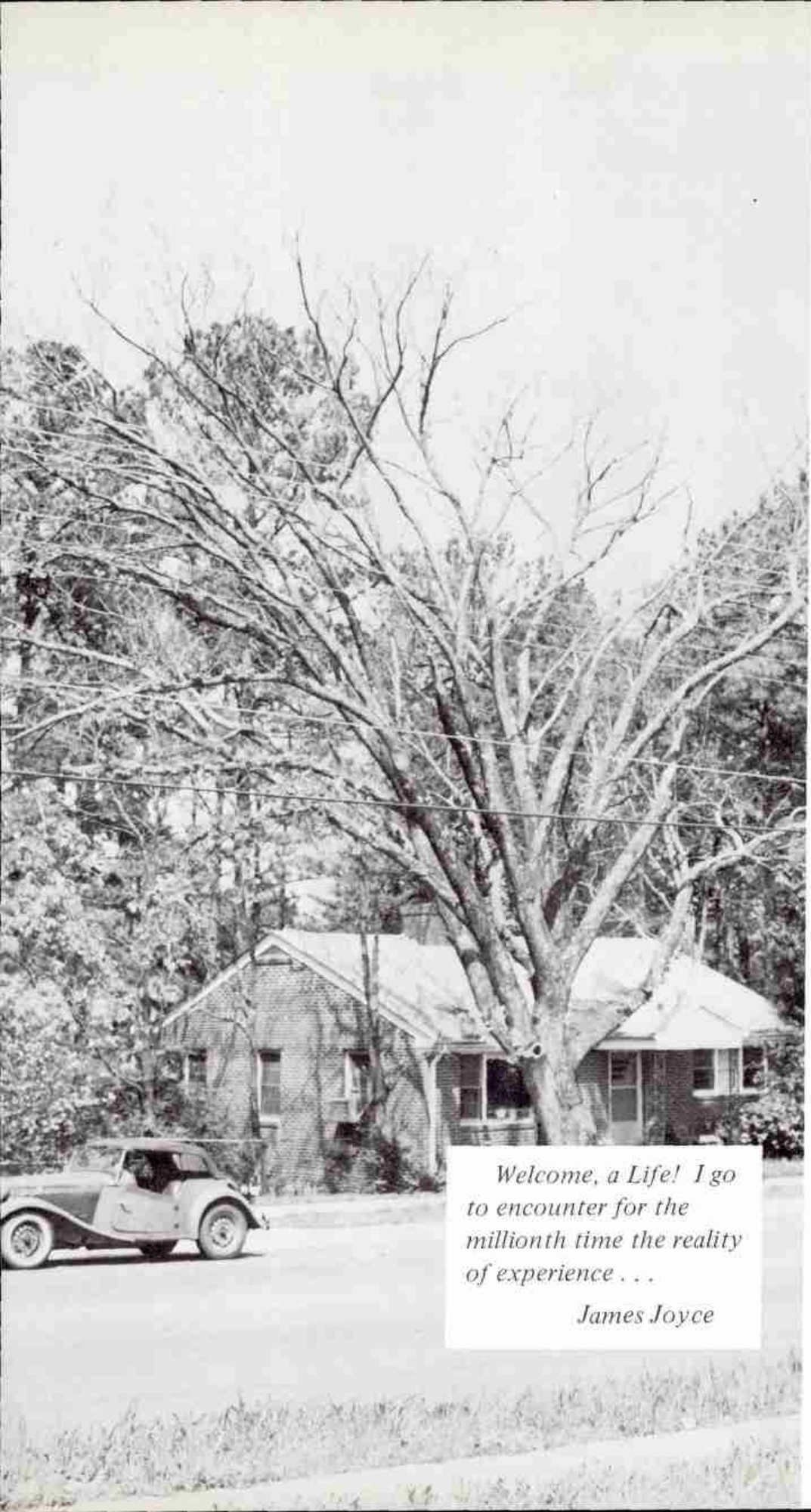
Ali, Jameel Ahmad	RPA	Kaminskas, Judd Vincent	PPT
Anderson, Pamela S.	RPA	Kaylor, Joseph Hountha, Jr.	RPA
Arthur, Adlai Michael	CON	Lucas, Martin Reb	WST
Ashley, Joseph Oren	FOR	Malphrus, James Simmons	WST
Brinson, William Irby	RPA	Massey, Frank Thomas	CON
Burnette, William Allen	RPA	McMillan, Martha Nan	RPA
Carpenter, Robert Dwight	RPA	McQueen, Harvey Gordon	RPA
Chappell, Frank Scot	CON	Mobley, Phillip Warren	RPA
Connolly, John Patrick	RPA	Morgan, Reed Folsom	NRR
Cooper, John Phillip	RPA	Noyes, William Richard	FOR
Coward, Raymond Lynn	RPA	Oakley, Stephen Leroy	RPA
Crawford, Clyde Eugene	RPA	Owen, Harold Thomas	RPA
Crompton, John Richard	RPA	Parks, Daniel Broyhill	RPA
DeBruyne, Dorothy Anne	CON	Pegram, Timothy Wayne	RPA/NRR
Dickinson, Charles Edward	RPA	Platner, Larry Don	RPA/NRR
Dixon, William Stanley	RPA	Rector, Joseph	PPT
Donnell, James Harper III	FOR	Reilly, Ann	RPA
Dornbush, Robert M.	RPA	Reynolds, Jimmy Michael	RPA
Dunn, Stephen Wright	RPA	Roberts, Mary Sawtelle	RPA
England, Charles Brownlee	RPA	Rodgers, Steven William	FOR
Gardner, Kate Wagner	RPA	Roeck, Peter Garwood	FOR
Garrahan, Timothy James	FOR	Rogers, Pamela Gail	RPA
Gillette, John Burton	RPA	Royal, Nathan Michael	RPA
Goff, David Newton	RPA	Scheier, Arthur Frank	PPT
Gray, Frederick Hugh, Jr.	RPA	Seli, Robert Carroll, Jr.	FOR
Hall, Louise Anne	RPA	Shimp, Kirby T.	RPA
Harmon, Thomas Knight	FOR	Shockley, Terry Wayne	RPA
Hensley, William Kimberly	CON/RPA	Smith, Christian Arthur	PPT
Hicks, Robert Shields	NRR	Smith, Danny Marcus	RPA
High, Walter Bankston	FOR	Snell, Keith Spencer	FOR
Hoell, Hubert Douglas, Jr.	RPA	Steelman, Max Hall	FOR
House, Claude Halford	CON	Strickland, Rickey Lane	RPA
Howard, Harold Bruce, Jr.	RPA	Stuart, Adrian	PPT
Howell, Rebecca Ann	RPA	Thornton, Timothy Bruce	CON
Howerton, Henry Willard	RPA	Tilley, Thomas James	RPA
Huckabee, David Davenport	RPA	Trexler, Gary Goodwin	PPT
Hudson, Kent	PPT	Voelker, Mark Thomas	RPA
Hunt, Debra Nemchip	CON	Walker, Judith Carol	FOR
Jackson, Lance Edward	RPA/NRR	Weaver, Jeffrey Lamar	RPA
Jordan, Irene Eugenia	RPA	Weller, Peter Authur	FOR
Judge, Barry Lorayne	RPA	Wesson, Grady Morgan	RPA







STUDENT LIFE



Welcome, a Life! I go to encounter for the millionth time the reality of experience . . .

James Joyce

FOREST RESOURCES COUNCIL

by Glenn Harmon

The Forest Resources Council serves as the representative and governing body of the undergraduate students in the School of Forest Resources. It also controls the dispensing of funds provided by the $2.00 semesterly school fee paid by each student in the school. This year the Council's budget was approximately $3,500.00. A large portion of this amount went to the funding of the **Pinetum.** The rest of the money was spent to support the budgets of the various clubs in the school, to sponsor a questionnaire to find student opinion of the **Pinetum** and the operation of the Forest Resources Council, to provide magazine and newspaper subscriptions for the Biltmore Library, to pay telephone service in the lobby, and to pay minor operational expenses of the Council. This year the Council put up a concession stand at the Rolleo and made a small profit. Members of the Council were also active in Career Awareness activities, in the selection of school nominees for outstanding teacher and alumni distinguished professor awards, and in the School's Grievance Mediation Committee.

The Forest Resources Council is now structured to have fourteen members: the four student senators from the school, a representative from each of the three departments, and a representative of each of the seven clubs. Most of this year's members were very active and attended regularly. All meetings are open to all members of the student body. This provides a good means for students to air their opinions and interests among other students.

Officers –1974-75
President – Glen Harmon
Vice-President – Ed Minton
Secretary – Cobie Troutman
Treasurer – Jim Crane
Advisor – Dr. L. C. Saylor

Other Members: Mike Dennison, George Melton, Hal Goff, Tom Crews, Bill Miller, Bruce Harvey, Joe Kayler, and Susan Avery.

RHO PHI ALPHA

Rho Phi Alpha is the honorary recreation and park administration fraternity. The fraternity was organized in 1958 by Professor Thomas I. Hines. He conceived the idea of an honorary fraternity and enlisted the aid of the top eleven seniors in the class of 1958 in order to realize the completion of his endeavor. These twelve people are the charter members of the Alpha chapter of Rho Phi Alpha.

The purpose of Rho Phi Alpha is the improvement of recreation and parks for all people. This purpose is achieved by setting and meeting objectives, such as recognizing and encouraging students of high moral character and devotion, and recognizing persons who have made outstanding contributions to the field.

Rho Phi Alpha participates in many activities every year. In the fall, the fraternity mans a booth at the Coliseum and Biltmore Hall for the University Open House. Pledges are initiated during both the fall and spring semesters. Activities associated with pledging include a smoker, a banquet, and a formal initiation. A spring picnic for all recreation students and the department is cosponsored by Rho Phi Alpha. At this picnic, any professor who may be retiring is honored for his service by Rho Phi Alpha. Rho Phi Alpha also honors an outstanding senior each year. Linda McCall, last year's president, was the outstanding senior for 1973-74.

Officers – 1974-75
President – Joe Kayler
Vice-President – Terry Shockley
Secretary – Pam Rodgers
Treasurer – Lance Jackson
Sergeant-at-Arms – Fred Gray
Advisor – Dr. Phillip McKnelly

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

Since its conception in 1952, the NCSU Student Chapter of the FPRS has provided a common meeting ground for students interested in wood utilization. For the past twenty-three years, chapter membership has been composed primarily of Wood Science and Technology students, but other active members have been in the Forestry and Furniture Manufacturing and Management curricula. As the first student chapter ever organized within the Society, the organization has had as its primary goal the endeavor of keeping students informed of current industrial practices in the forest products field. The result of this endeavor has been to sharpen the student's awareness during his undergraduate study of current events relative to wood utilization.

In a continuing effort to incorporate new men into the chapter, the Fall 1975 semester began with a picnic where all interested students and faculty were invited to attend and meet the present members. In October, nine students, along with chapter advisor Professor Roy M. Carter, attended the Carolinas-Chesapeake Sectional Meeting held at VPI. The chapter aided the Wood and Paper Science Department during N. C. State's Open House, a day designated primarily for high school students to visit the University and learn about different curriculums.

The first two Spring semester meetings centered around the different aspects of tropical wood utilization in the industry. A real highlight was the presentation of a walnut plaque to Mr. Lloyd Cramer, Cramer Veneer Company of High Point, North Carolina, in appreciation for his donation of $250 to the chapter. The gift was designated towards improving student interest at N. C. State in the FPRS. The semester was capped off by the annual Spring picnic.

The student members are extremely proud of the services provided by the chapter. In addition to exposing the student to new information, the chapter has functioned in a manner that has contributed to interest in Wood Science and Technology as a career. Perhaps most importantly of all, the chapter has provided a forum from which lasting friendships have evolved between men sincerely interested in the field of forest products.

President – Hal Goff
Vice-President – Johnny Nobling
Secretary – Ed Minton
Treasurer – Don Turner

SUMMER CAMP

by George Melton

Summer camp 1974 is finally over! It was, however, a fine experience. An experience all forestry students should have.

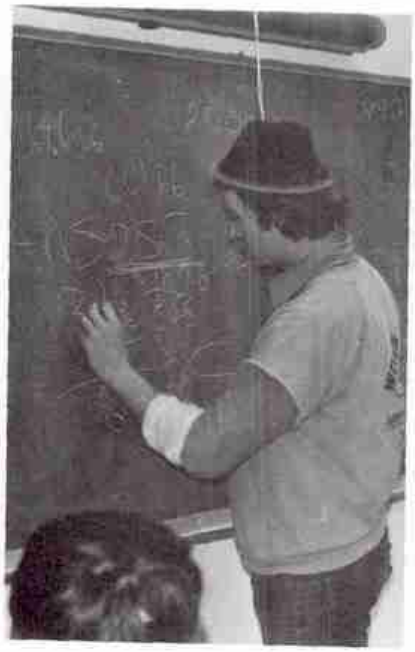
Looking back, that first day was really something. Everybody running around trying to find their cabin made the whole place look like opening day at Boy Scout Camp. Later it was to resemble the "clown ring" at the circus, or the side shows at the fair.

Life was good those first couple of days: pep talks, field trips, and our very own arrowhead hunt. Then the entertainment started. Classes in mensuration, surveying, and bugs. These were rough courses and demanded many hours of calculating, reading, and field work. There were some easier courses available though: horseshoes 101; swimming 200, and tobacco spitting 501 (graduate level course).

All this may sound dull, and it was, but there were some mighty exciting things happening daily. We all remember Sam Houston and Mike Fahey trying to catch a wild bologna eating dog in a trash can. It was smart though and got away. And who could forget Bill Miller's dendrological discovery of the decade? A Cersis bananaensis tree right in camp (funny how it looked so much like a a light pole). We were all pleased to see our resident banana picker, Senor Walter High, scale the tree to cut the Chiquita brand bananas out.

Yep, at camp we learned a lot about forestry, an awful lot. The teaching was practical, necessary, and extensive. "Book learning" was finally coordinated with field work. This is a great step to take for forestry. In the final analysis, forestry cannot be practiced in the office or classroom alone. Many schools have cut their summer camp programs out of their curriculum. This is a sad result of the expense of forestry education today.

For past classes, summer camp is over. One lesson stands out that we hope will remain in its pure form. A lesson like good moonshine, untaxed and undiluted: clear-cut & burn.




USMC232871

NORTH CAROLINA STATE FORESTRY CLUB

by Jim Crane and John Hall

The Forestry curriculum at N. C. State University offers a variety of subjects that relate directly to the individual student. With the use of dual degrees and options, students can choose related fields of study to supplement their general forestry requirements. However, the student soon learns that "book learning" supplies him with only a portion of his total education. Basic skills and techniques that one never learns in the classroom in the period of four years need to be learned, practiced, and refined to round out a student's "formal" education in Forestry. It is the desire to learn these skills that attract many new students to the Forestry Club.

In 1929, the N. C. State Forestry Club was chartered with the basic idea that forestry was a profession in which a student could be proud. They gathered and shared ideas about their individual forestry interests. They developed a unique sense of pride in themselves as individuals and as a working group of professionals.

The Forestry Club has changed in many respects since the charter year. Forestry knowledge and techniques have caused inevitable changes. However, the pride in which we were founded still exists and is exhibited in the club's activities. On many occasions, club members can be found readying themselves for such activities as tree jobs, pulpwood jobs, woodsmen's team practice, or just a a friendly get-together to discuss things that need to get done. It takes much of the student's personal time to become really involved but few rarely complain about the extra hours. Where else can a person learn how to use tree spikes in "taking down" a tree, operate a logging skidder, learn how to crosscut and bow saw, or learn minor maintenance on a chain saw—all for free.

The more time one spends with the club, the more one becomes a part of it, and the more it becomes a part of oneself. However, the real heart of the N. C. Forestry Club is the dedication of members who toil many long hours working and teaching new members so the tradition, pride, and skills may be carried over through the years. This is the success that has made our Forestry Club one of the best anywhere.

Forestry Club Officers

	Fall	Spring
President	Mark Horne	Bill Champion
Vice President	John Hall	Dave McGrew
Secretary	Don Gemmer	Sue Andrews
Treasurer	Bill Swint	Phyllis Moses
Pulpwood Chairman	Chris Anderson	Fred Hardin
Ass't Pulpwood Chairman	Fred Hardin	W. R. Halton
Tree Job Chairman	Richard Allison	Bill Miller
Ass't Tree Job Chairman	Bill Miller	Bob Ernst
Equipment Chairman	Sam Houston	George Melton
Ass't Equipment Chairman	John Lollis	Mike Weisenberger
Program Chairman	Dave McGrew	Early McCall
Ass't Program Chairman	Early McCall	Scott Sillars
Sgt.-at-Arms	Jim Crane	Chris Anderson

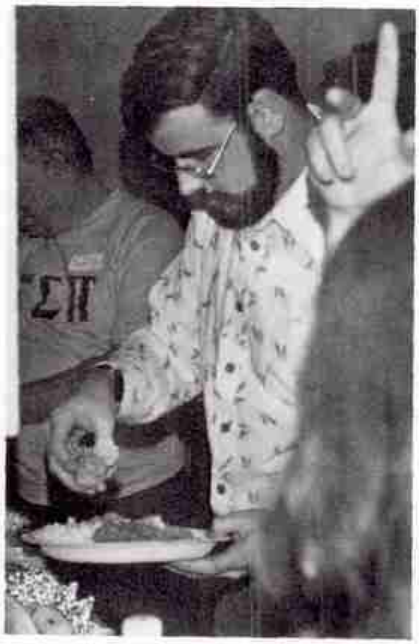
ROLLEO '74

No one is quite sure how it came about, but for the second year in a row the sun actually shined upon the Forestry Club's annual Rolleo held at the University's Research Farm No. 3.

The attention of the crowd quickly shifted from the goings on at the State Fair, just a chain's throw away, to the logger's competition as the four teams demonstrated their skill and preparation, or lack of the same, in the day's events. Pole felling headed the schedule with the juniors showing that they were not to be ignored as they netted first place in the event. The seniors weren't about to be outdone, however. Chopping and sawing on cants that were as much as twenty-one square inches oversized, they swept bow sawing, cross cut sawing, and speed chopping. Still thirsty for victory they went on to take firsts in log rolling, pole climbing, chain throwing, pulp toss, and knife throwing; leaving only axe throwing to be taken by the sophomores and log birling for the juniors. The seniors were definitely the victors of the day.

Lurking in the shadows of seconds and thirds in each event were the freshmen. As it came down to the wire a fierce battle for second place developed. The freshmen finally cashed in all those seconds and thirds as they beat the sophomores out of a second place in the pulp toss, earning them second overall. This left the sophomores with third place and the juniors fourth.

From Rolleo '74 it was off to beer at Miller's and Melton's country club in the woods and practice for the real thing: Conclave '75.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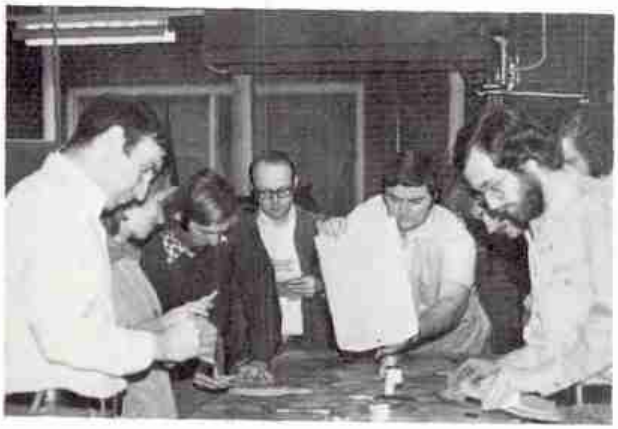
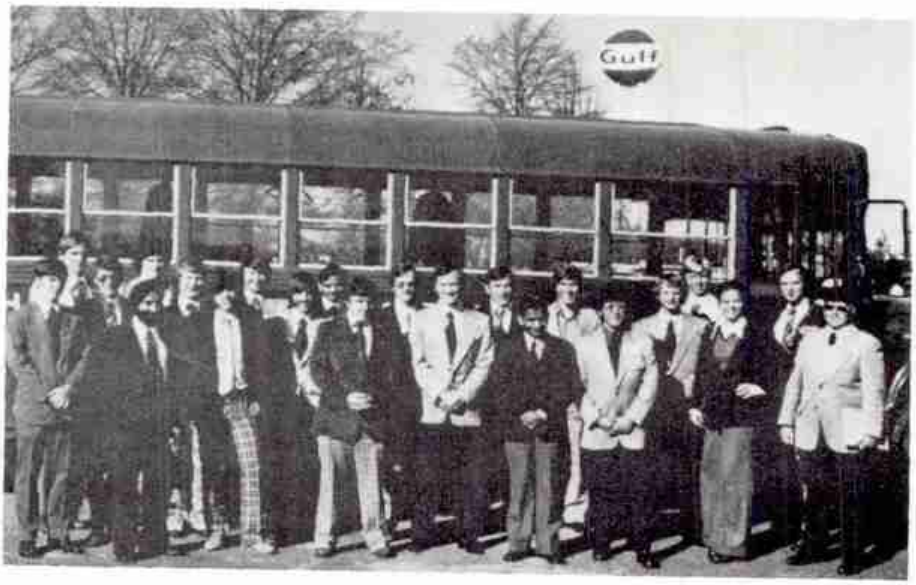


XI SIGMA PI

The Mu Chapter of Xi Sigma Pi here at N. C. State is the honor society for the entire School of Forest Resources. The functions of an academic honor society are not, however, the only purposes which Xi Sigma Pi feels are its responsibilities to fulfill. Xi Sigma Pi is also a service oriented organization in the specific area of our school within the university. Some of the services which Xi Sigma Pi provides are: awarding the Freshmen Axe to the freshman who achieved the highest scholastic average for the whole year in the School of Forest Resources, sponsoring a picnic for the seniors in the school each year, recognizing the senior who has contributed the most to our school during his student career, a free tutoring service to all people in the School of Forest Resources, a concession stand at the Rolleo and Conclave, and through our national organization the award of five regional scholarships to students in the Forest Resources curricula.

The membership of Xi Sigma Pi, whose efforts provide the above services, is limited to juniors and seniors in the School of Forest Resources who have achieved a high level of scholastic standing and are of high moral character and show promise of true professionalism.



TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY

Spring and Fall Picnics at Schenck Forest

Did the juniors, seniors, or Dr. Gratzl win the volleyball game? Chef extraordinaire R. G. Hitchings and his assistant Dr. Chang prepared the hamburgers; desserts by the wives of two favorite professors. And most importantly chairman Ken Askew ordered plenty of beer. FUN FOR ALL!

Technical Programs

"Computer Control of the Paper Machine," Mr. C. C. Joliff, International Paper, Mobile, Alabama.

"Process changes necessitated by environmental guidelines," Mr. Rick Hood, Mr. Vick Oaks, Hammermil Papers, Lockhaven, Penn.

"Management Guidelines for the Paper Industry."

"Solid Waste Management," Mr. Bob Vokes, Vice Pres., Black Clawson Company.

President – Kathleen Gylnquist
Vice-President – Chris Smith
Secretary – Chesley Powell
Treasurer – Walter Skipper
Program Chairman – Dave Bradley
Forestry Council Rep – Mike Dennison
TAPPI Advisor – Prof. R. G. Hitchings

TAPPI Members Volunteer to Make Paper at NCSU Open House
"When do you add the glue?"

TAPPI–AICHE Sports Day
"The pulp and paper boys" challenged the chemical engineers to football, basketball, volleyball, and tennis. Later a barbeque for the one hundred seven people attending started homecoming weekend with a bang! Heath "Spike" Reeves spurred the TAPPI volleyball team to victory! A sunny Carolina afternoon made the event complete.

National TAPPI
Sixty percent of the student chapter members joined.

Virginia-Carolina Sectional TAPPI
Twenty-eight students and one very loyal chapter faculty member, C. N. Rogers, braved the early morning cold to venture to Roanoke Rapids, N. C. Pulp and Paper Foundation President Libby Boinest hosted a unique mill tour of Hoerner-Waldorf followed by technical paper seminars and the TAPPI dinner that evening. A very cold forestry bus piloted by David Nielson returned to Biltmore with some very "happy" TAPPI members.

SCHOLARSHIPS AND AWARDS

UNIVERSITY SCHOLARSHIPS

Susan Claire Andrews
Timothy James Garrahan
Lance Edward Jackson
Eugenia Lee Hatley
Daniel Ray Helsey
Joseph Michael Hunt
Leo Michael Sadovy
Curtis Desmond Scott
Elizabeth Ballard Simons

PULP AND PAPER TECHNOLOGY SCHOLARSHIP

James Henry Bunch
Edward Benton Hickman

GARDEN CLUB SCHOLARSHIP

Janice Theresa Bundy
Jackie Fred Luper
Frank Thomas Massey
Karen Dianne Simpson
Margaret Coble Troutman
Dwight Foster Williams
Glenn Edward Woolard

TURRENTINE MEMORIAL FOUNDATION SCHOLARSHIP

Ricky Dean Smith

JAMES M. JOHNSTON SCHOLARSHIP

Sheree Yvonne Bowyer

SPRAGUE ELECTRIC SCHOLARSHIP

Daniel Ray Helsey

BILTMORE WORK SCHOLARSHIP

Bruce Allen Bayle
Gary Kawathen Grubbs

N. C. STATE ALUMNI ASSOCIATION SCHOLARSHIP

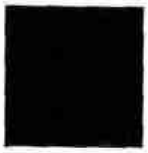
James Lawrence Norris, III

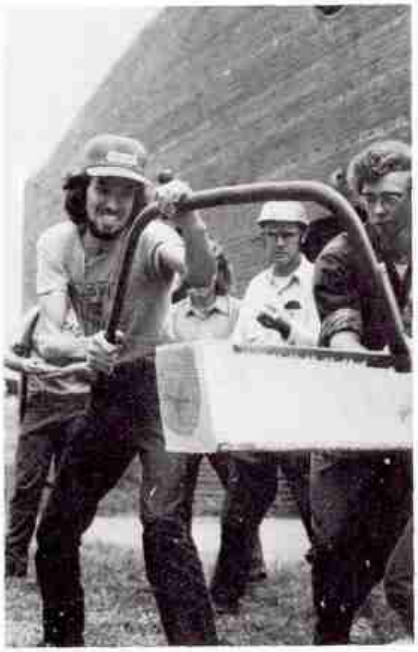
CONGER WORK SCHOLARSHIP

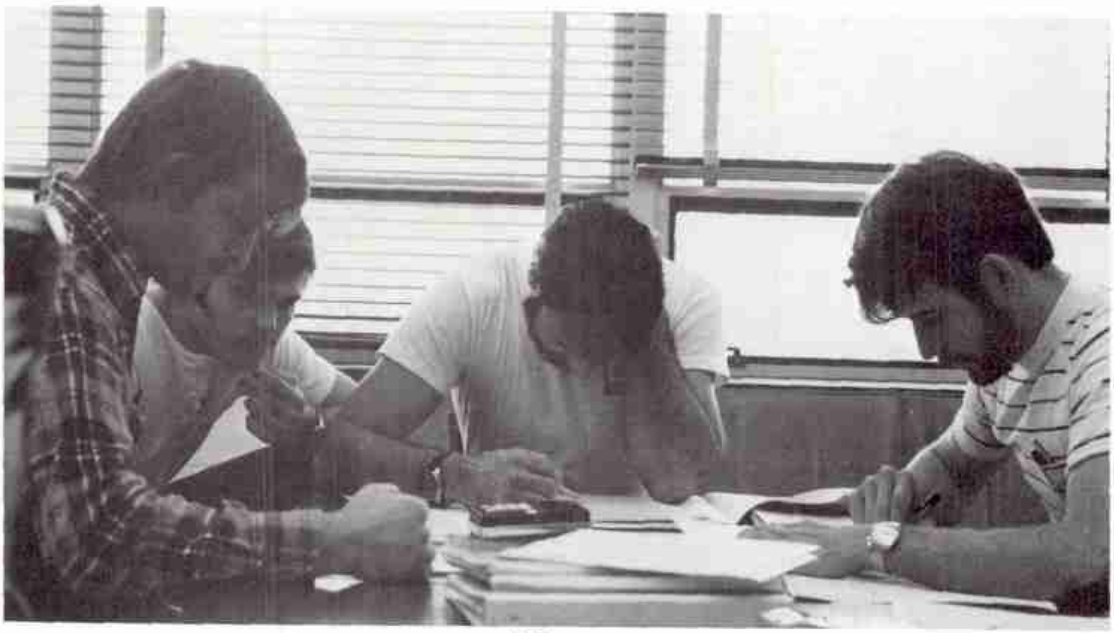
Michael Pat Pennington
Robert Houston Westmoreland

PULP AND PAPER FOUNDATION SCHOLARSHIPS

John Victor Aberton
Patricia Ann Adams
Joseph Lamar Anglin
Alan Fisher Armstrong
John Thomas Armstrong
Blas Phillip Arroyo
Kenneth Bryant Askew
William Alan Barnes
Robert Edward Barlow
David Lynn Bradley
Scott Michael Bradshaw
Carl Russell Brothers
Steven Edward Brown
Calvin Wayne Bucher
James Henry Bunch
James Alan Buzzard
James Furniss Calloway
Ronnie Wayne Campbell
Stanley Jay Carlyle
Carson Carmichael
Dale Richard Carpenter
Robert Louis Cate
John Thomas Cenicola
Edward Page Chandler
Michael Ray Clowers
William Joseph Dail
Arch Lyle Davis
Michail Eugene Dennison
Robert Eugene Dillon
Robert Earnest Durland
James Rodney Edwards
William Stephen Fruh
James Stephen Gaines
Bradford Garnett
Robert Casey Grygotis
Desi Ward Gulley
John Harry Gurganious
Kathleen The Gylnquist
Robert Stephen Hall
Glenn Sherwood Harmon
Frank David Harper
Edward Benton Hickman
Marsha Jane Hinkie
David Lee Hinton
David Mickle Howell
Kent Ogburn Hudson
Ted Sherwood James
Jeffrey Martin Jansen
Wade Darrow Johnson
Judd Vincent Kaminskas
Robert Richard Kaminskas
Michael John Kerkoff
Joan Elaine Killian
Thomas Julian Lawson
James Leo Lucus
Robin Edwin Manning
John Milton May
Andrea Jean McAfee
Edward Madison Melton
Jeffrey Charles Merck
Frank Walker Metheney
Harold Glenn Midyette
Richard Edward Milovicz
Joel Kent Monteith
Leonard Dorsey Nelson
David Allen Nielson
David Mark Osborne
Chesley Edward Powell
Thomas Richard Purnam
William Mark Ray
Joseph D. Rector
John Earl Richardson, Jr.
Dwight Carey Ryan
Tory V. Salmon
Carl Bunting Schreier
John Mark Schreier
Walter B. Schultz, Jr.
Michael David Sherril
Walter Roger Skipper
Robert Thomas Slockett
Christian Arthur Smith
Dale Ritchey St. Denis
Adrian Newton Stuart, Jr.
Wendell Arthur Sugg
Ronald Lynn Terry
Gary Goodwin Trexler
James Boswell Vining
Robert Andrew Vinson
Clayton Russell Walters
William Harrison Watson, Jr.
Michele Lee Webb
Bobby Gerald Williams
Larry Lynn Williams
Rodney Clay Williams







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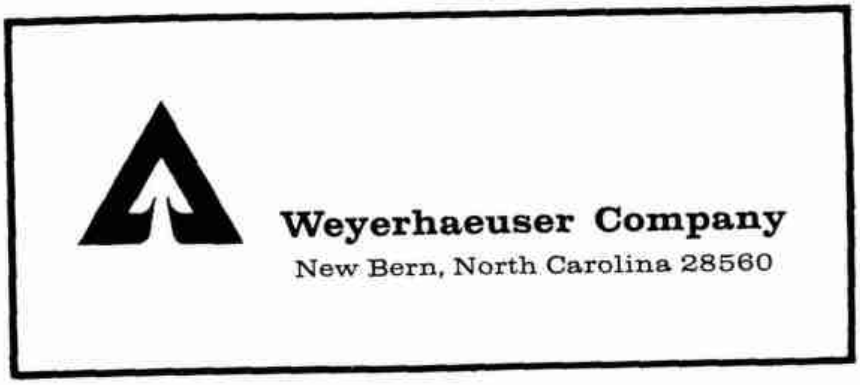
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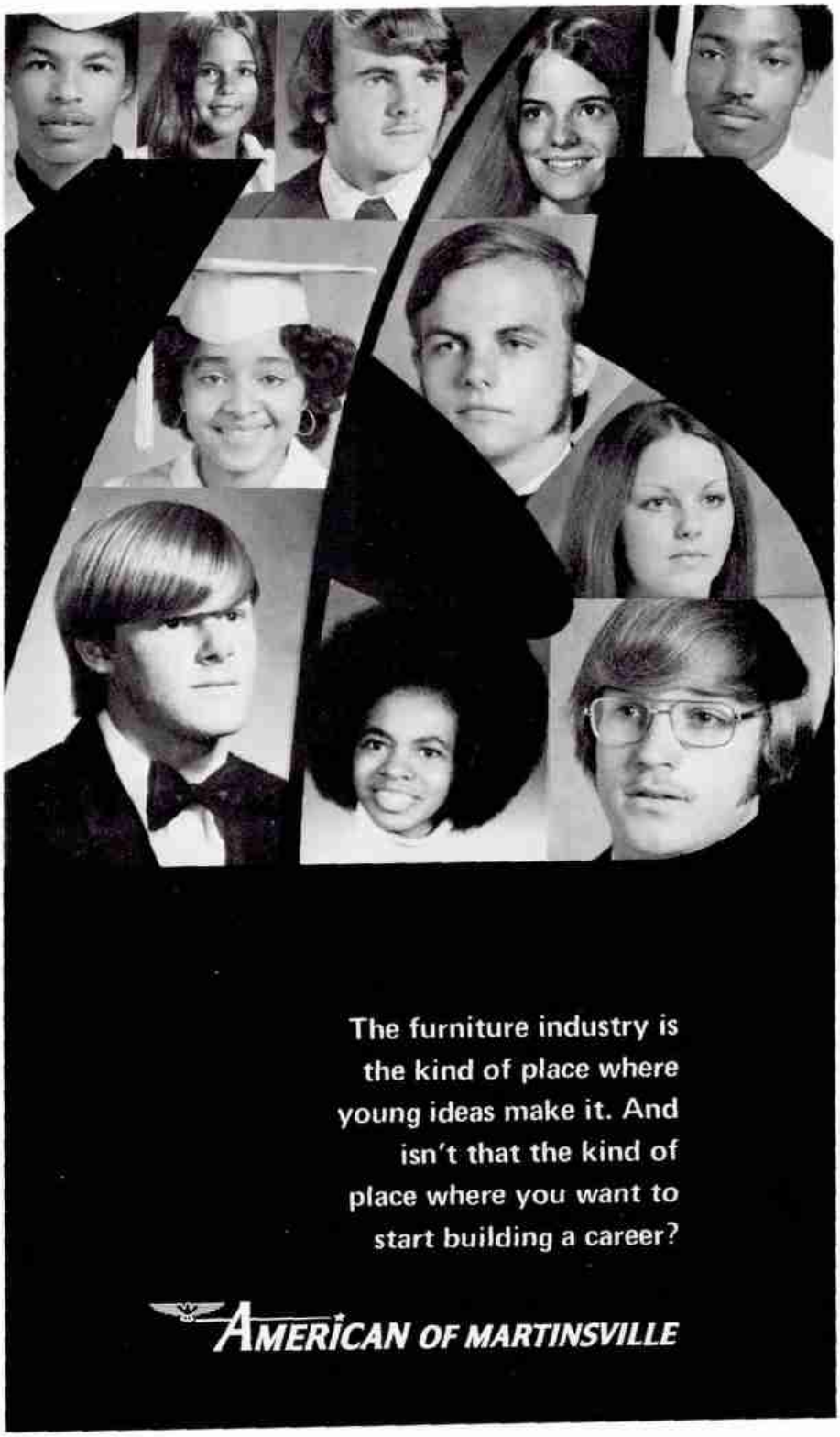
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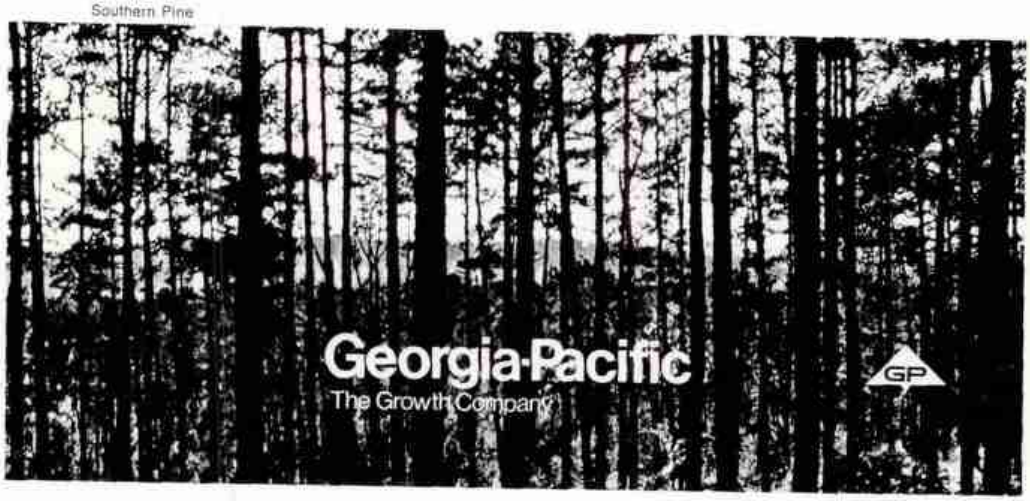

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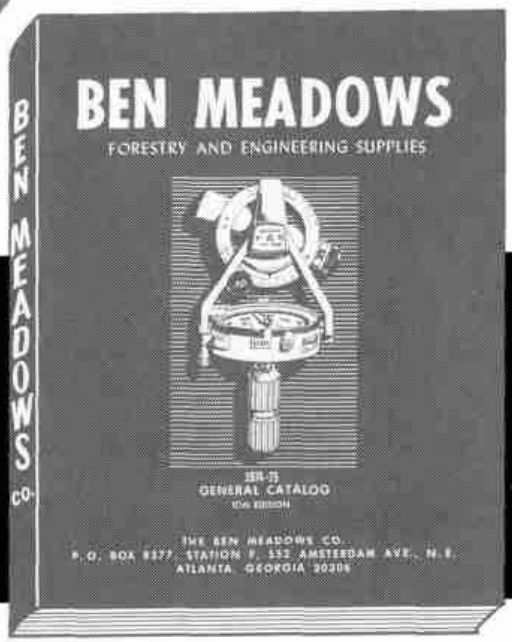

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