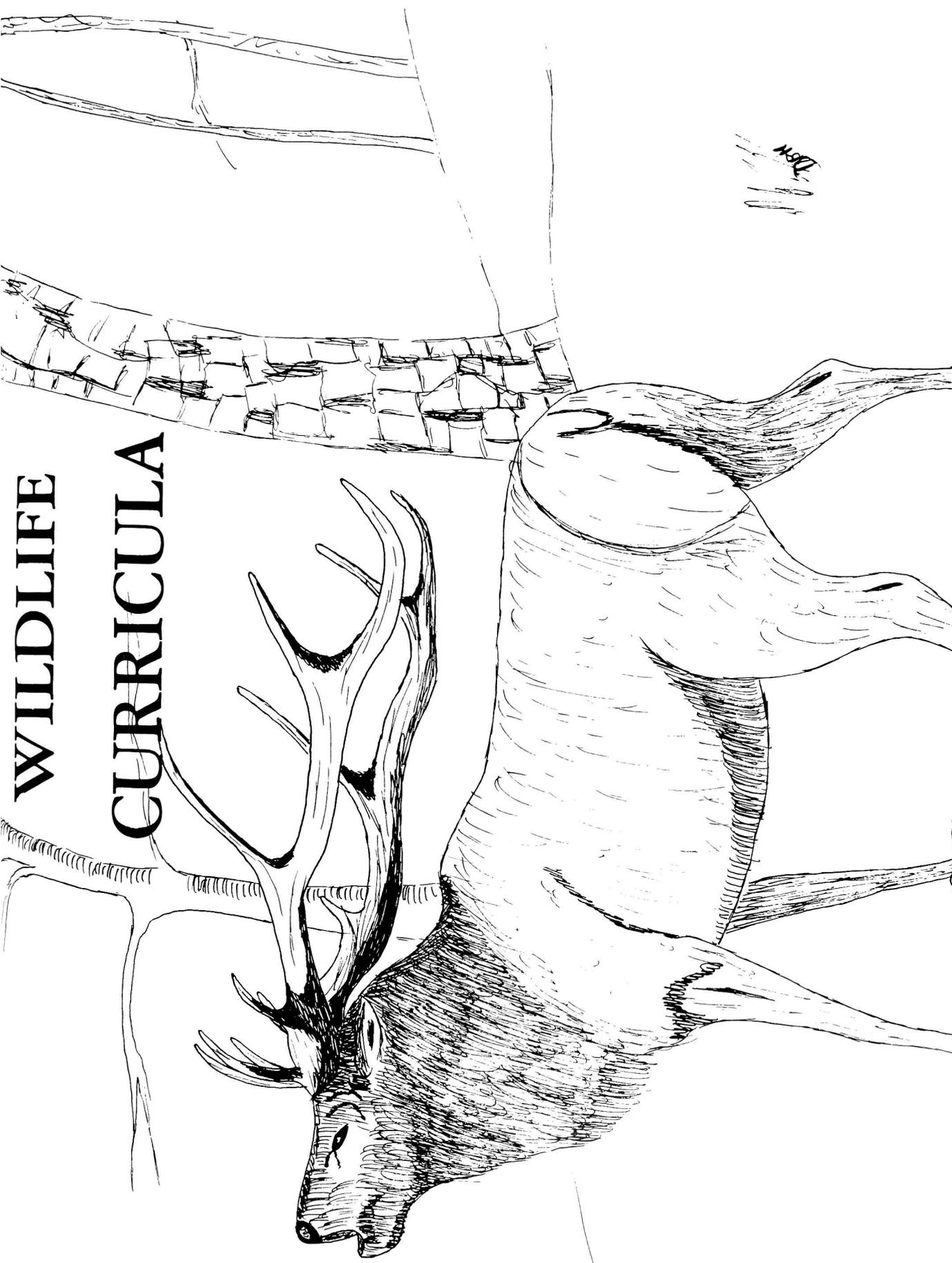


WILDLIFE CURRICULA

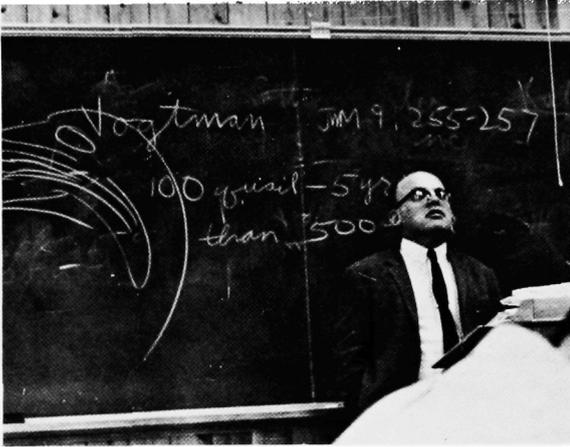


1987
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Wildlife Management

by

DAVID COURTEMANCH



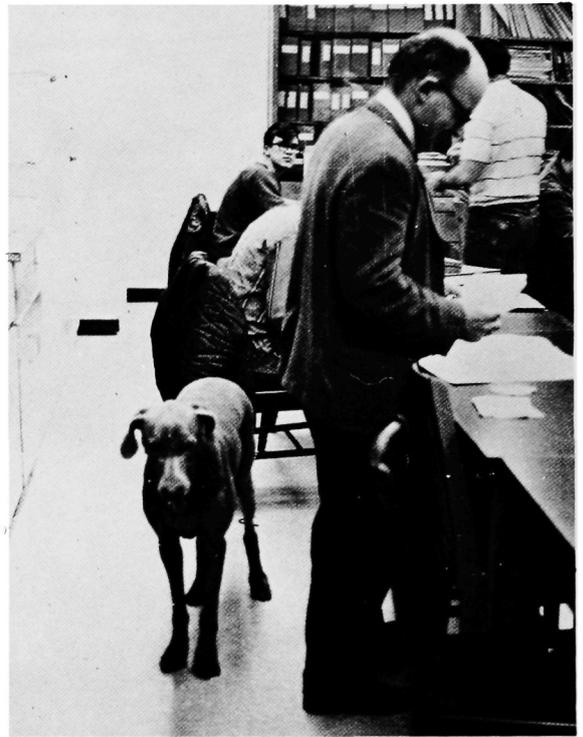
The wildlife management sequence has been designed to train students in game and land management. The curriculum offers the student a broad education while concentrating on studies in the Life Sciences.

Freshman and Sophomore years are spent in acquiring basic courses in English, mathematics, history, and government intermingled with courses in forestry, wildlife, and zoology. The first two years are usually decisive for the neophyte wildlifer. Many seek greener pastures in education, English, art, or just fade away into the Army.

Some students, however, seem to endure to their junior and senior years. During this time, one finds himself wearing a path between the Forestry and Zoology buildings. Courses in game, fish and forest management tie together some of the loose ends. Twenty credits of electives allow one to broaden his education, or specialize in a particular field.



During the summer between junior and senior year, the wildlife management students enjoy the experience of summer camp. Here, they learn again how to do everything they learned in Fy 1. Summer 1969, saw a progressive revision of the camp schedule. For three weeks now, wildlife students can be distinguished from the foresters. Trips to Grand Lake Stream hatchery, Machias Seal Island, Canadian Fisheries Research Center, and a day with a local warden, among many trips, introduces various problems to be encountered in the career ahead.



A large portion of education can be acquired by students who seek summer jobs in wildlife. Here, the wildlifer learns problems and procedures first hand. Contacts are made with a variety of people from sportsmen to professionals. Summer jobs are most easily obtained through wildlife department staff members.

Upon graduation, one finds he is well prepared for many jobs. His education makes him adaptable to fish and game management positions as well as forestry, land management and research. Many wildlife management students may also seek graduate school before taking employment.

Wildlife Science

by

JAMES R. KEIR

The Wildlife Science curriculum offered by the Wildlife Department at the University of Maine is designed for the wildlifer who has aspirations for something more than a B.S. degree in management will provide. The science program prepares the student for graduate work followed by a career in a research field.

If this is the type of work that appeals to the wildlifer and if he chooses this course of study, the benefits may be great; but the work required is commensurate. Some of the management-oriented courses such as law enforcement, and a few forestry courses, are dropped from the required studies. In their stead, courses such as calculus and two semesters of advanced physics are required. Like all improving programs, changes are being made. Organic chemistry may become a required course. Leeway for electives is greater

in the science program than in the management course. Among the recommended electives are biochemistry, plant and animal physiology and ecology, limnology, genetics, bacteriology, animal nutrition, advanced math, computer programming, geology, meteorology, climatology, and foreign languages. A great deal of emphasis is being placed on taking humanity courses.

Summer camp (and its nine credits) is not required for this curriculum. This allows the wildlifer to gain an added summer of experience in his field. However, the science program still requires the full 141 credits to graduate.

The wildlifer who graduates from the Wildlife Science program should be well qualified to make contributions to the advancement of wildlife conservation, and in the field of wildlife ecology.



FORESTRY CURRICULA



FOREST MANAGEMENT

by

HERBERT R. DICKEY III

It is becoming more apparent that any use of the nation's forest resources will have to be guided by well educated and highly trained managers, flexible in their judgement to respect the voice of a concerned public. The Forest Management sequence offered by the School of Forest Resources at the University of Maine provides this education and training for the future land managers of the forest.

The Forest Management Curriculum has the same courses, 64 hours, as the other forestry and wildlife programs. Botany, zoology, physics, chemistry, english, math, and public speaking are important for a broad based education in any college. Also, basic forestry courses, such as mensuration, surveying, and forestry drawing, are required as a base for subsequent studies. These core courses are usually confined to the

freshman and sophomore years with more specialized courses offered in the junior and senior years.

These specialized courses are essential to any forester and include silvics, silviculture, photogrammetry, harvesting, fire control, forest economics, forest policy and administration, and forest management. A thorough understanding of these subjects and how they effect current management problems are of prime importance to the Maine graduate.

The electives offered in the sequence are more or less left to the student's discretion. A pursuit of *nonrequired, but stimulating courses* is sometimes of more importance to the student's future than are the required courses. An understanding of these subjects related to management such as business, wildlife management, recreation, manufacturing, and writing are important if the future forest manager is to be effective.

Summer camp, offered between the junior and senior years, goes hand in hand with summer jobs in providing practical field experience. Some of the most memorable moments of a forester's life are gained during his summer employment.

Chances for full time employment after graduation from Maine are extremely good, for those trained in forest management at the School are very much in demand all over the country. It has been said that Maine grads are well trained and work hard. This training with a good professional attitude is due mainly to the rigorous curriculum taught by a very knowledgable and widely known staff.



Forest Utilization

by

GERRY HAWKES

Forest utilization is a curriculum designed to familiarize foresters with the procurement, manufacture, and use of forest products.

Courses taken by the forest utilization major in his freshman and sophomore years are identical to those taken by other forestry students majoring in general forestry or forest management. Not until the junior year do courses in forest utilization begin to differ from those in general forestry and forest management.

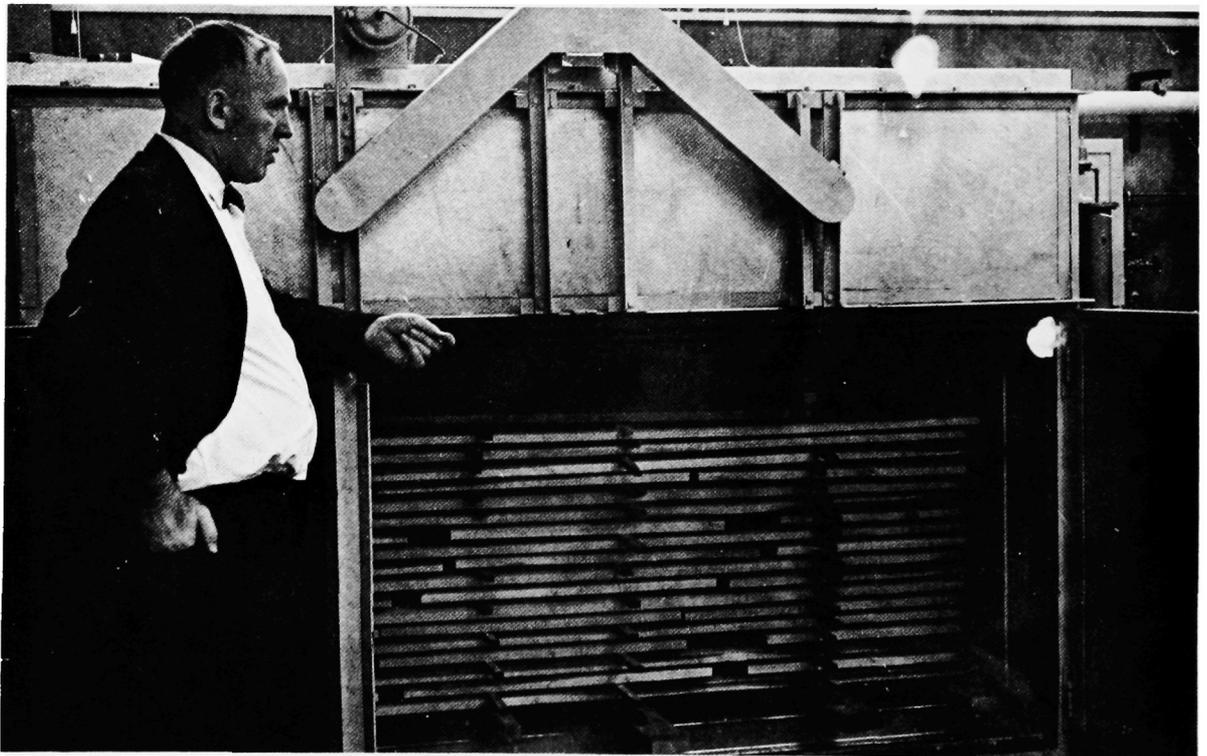
In the junior year, the macroscopic and microscopic structures and qualities of wood are emphasized in courses such as plant anatomy, wood technology I, and wood anatomy. Plant anatomy, a four credit course, deals with the development and arrangement of all tissues in seed bearing plants. Closely tying in with plant anatomy, wood technology I describes the cellular structures found primarily in the boles of trees, and relates these structures to the properties of wood and its performance in service. During the second

semester of the junior year, wood anatomy stresses the differences in cellular arrangement and fiber characteristics of various species of wood.

Courses in the junior and senior years such as forest harvesting, forest products, and lumber manufacture, acquaint the forest utilization major with the problems and techniques of harvesting wood and manufacturing it into a variety of products.

Even in the junior and senior years, several of the courses in the forest utilization curriculum are the same as those in the forest management and general forestry curriculums (for example, forest economics, forest policy and administration, silvics, silviculture, timber manager and valuation, and forest fire control and use).

The courses common to all three curriculums provide a working knowledge of forestry upon which the specialized courses of a curriculum, such as forest utilization, can be based.



Wood Technology Curriculum

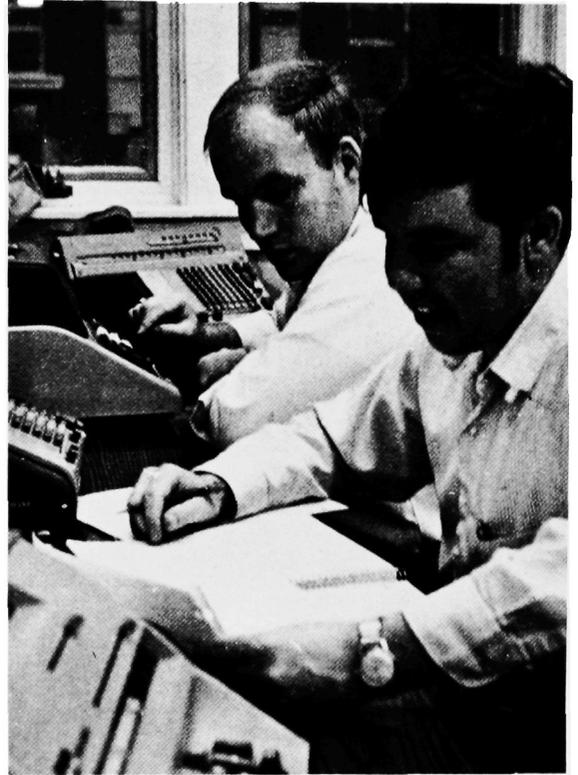
by

ROBERT A. KELLY

Wood Technology is fundamentally a study of wood and wood composites. It involves an understanding of the physio-chemical nature of wood and its response to environmental, physical and chemical influences. Wood Technology also deals with the mechanical properties of wood and wood composites and their use in structural applications. The core of the sequence is designed to provide the student with an adequate general background of basic professional and supporting courses. Additional elective courses permit the student to pursue his particular area of interest; Wood Science, Wood Engineering, or Wood Utilization. The individual's professional interests, ranging from basic laboratory research to a career in retail sales may be emphasized with the proper combination of core and elective subjects.

The Wood Technology Department is equipped to present the student with a basic background in tests and testing procedures that will possibly be encountered later when the student is employed by industry. A typical laboratory exercise would involve the testing of various wood species for particular strength properties depending on section cut, moisture content and specific gravity determinations. In working out the laboratory exercise, the student will gain a richer and more meaningful concept of how wood reacts under internal and external influences.

Since the practice of forestry for a Wood Technologist is more often found in the context of a research or industrial organization, an optional alternative to the School's 8 credit hour summer camp program (Fy 41s) is available to those in this program. The student may elect a two-credit hour program, the requirements for which are met by the presentation of an oral and a written report, based on employment under certain specified conditions during the summer of the Junior Year. This summer camp option offers the student an opportunity to gain work experience and to become more aware of his particular interests. The written report is primarily aimed at a depth study into some phase of the company's operation in line with the student's interest without revealing any confidential information about the companies concerned. If the school summer



camp program (Fy 41s) is chosen, this also offers the student a richer background in forestry along with 8 additional credit hours required for graduation. With the summer camp option, a total of 6 additional credit hours of class work are required by participants to supplement the two-credit hours received for the work experience option.

It should be emphasized that the Wood Technology program is an extremely open course of study. One is not restricted to a future of basic laboratory research, although this aspect is an important phase of the profession. A career in the areas of Product Development, Retail Sales, Industrial Management, Public Relations, and many others, are available for an individual receiving a degree in Wood Technology. Therefore anyone pursuing this course of study should find a future that would prove very rewarding.

This Is The Society of Wood Science and Technology

by ALBERT N. FOULGER,

Executive Secretary

The objectives of SWST are to foster education in the field, establish professional standards, promote research into the better use of wood, and provide a medium for the exchange of ideas and technical information. In addition, the Society aims to promote the wiser use of wood through improved technology and an education program for the general public.

The Society was founded in June 1958 as the American Society of Wood Engineering. Because of the limiting nature of the original name, the organization became the Society of Wood Science and Technology on January 1, 1970.

The Society, with the aid of an annual grant from NSF, has sponsored a Visiting Scientist program since 1960. This program enables colleges with wood technology, wood science, or related programs to be visited by eminent scientists from other institutions and from industry. Usually the visit lasts for about 2 days. During this time the visitor delivers one or two formal lectures, participates in informal group discussion, and discusses research problems with staff and students. During the 1968-69 academic year, 12 speakers visited 18 colleges.

Also in the field of education, the Society conducted the first comprehensive study of educational needs in wood science and technology. This work, supported by an NSF grant of \$29,900, was started in 1961. The 187 page report entitled "Education in Wood Science and Technology" was published in 1964 and has been in wide demand by institutions and individuals both in the United States and abroad. The report made recommendations as to curricula prerequisites in associated sciences and humanities and staffing requirements for adequate teaching of wood science and technology.

The Society publication "Wood and Fiber" came into existence only last spring. It appears quarterly and, in addition to technical articles, contains news of general professional interest and of particular interest regarding Society members and meetings. Its pages are open to articles from members as well as nonmembers of the Society. The customary \$25.00 per page charge may be waived at the editor's discretion should a publishable paper be submitted by an author unable to

pay the charges. The criterion for inclusion in "Wood and Fiber" is quality of material, not the author's ability to pay.

Local chapters of the Society are centered at Moscow, Idaho; Madison, Wis.; Richmond, Calif.; and College Park, Pa. These groups hold meetings and sponsor activities in the area of wood science and technology. For example, the Madison chapter in cooperation with the U.S. Forest Products Laboratory has organized a course for Milwaukee vocational teachers, bringing them up to date on new research findings and how these may be applied in their work. The course was begun at the request of the Milwaukee Public Schools System and was presented in the fall of 1968 and again in 1969.

The Society annual meeting is held each year immediately prior to the Forest Products Research Society annual meeting. There are close ties between the two societies and this year, at Miami, Fla., there will be a joint SWST-FPRS symposium on "Advances in Woody Plant Research." This symposium will summarize present research in wood and bark structure and chemistry of the cell wall, and discuss the future of wood research.

A Society committee is investigating the possibility of setting up an information retrieval system to serve the entire profession. With new information on wood and its uses coming from research and a growing number of uses for wood alone and in combination with other materials, there is a real need for a source of information which can be readily kept current.

This brief outline should serve to give you at least an introduction to the Society. SWST is young, it is growing, and there is both a need and a place for new ideas. One can hardly abuse the kindness of the "Maine Forester" by inserting a free advertisement, but annual dues are \$12.00 for full members, and \$4.00 for students. In both cases this includes a subscription to "Wood and Fiber." If you would like additional information about the Society, write to the Executive Secretary, P. O. Box 5062, Madison, Wis., 53705. We will be glad to hear from you, and we are egotistical enough to believe that you will be pleased that you took the trouble.

The Forest Science Curriculum

by

GEORGE HODGSON

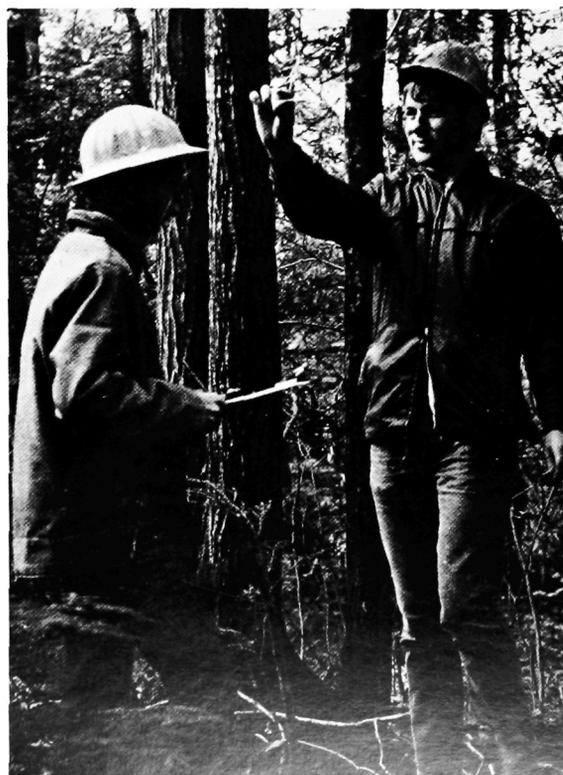
One of the more unusual aspects of the forest science sequence is its unpopularity with the students. Last years graduating class had one man enrolled in forest science while this year, the number has doubled; there are now two men enrolled in the sequence. I, being one of the two, find it rather difficult to determine the basis for this unpopularity; for the science sequence most adequately fulfills its purpose of providing the student with a varied technical background in tree growth and management principles.

A foundation in the technical sciences is provided with one year of chemistry, one year of physics, and a year and a half of math. In addition introductory courses (1 semester) are required in engineering drawing, surveying, and engineering geology. To obtain a better understanding in how trees grow and function, a semester is required in soils, introductory botany, plant physiology, silvics, dendrology, and wood technology. Thus every facet of a tree, its growth other life functions, and cell structure, are touched upon along with every facet of the tree's environment, the soil in which its roots grow, the atmosphere in which its crown lives, and the surrounding biological community with which the tree competes. From the standpoint of forest management, the forest science sequence provides all pertinent courses as provided in the management sequence except for a semester of accounting, forest pathology, photogrammetry, and forest fire control. The student is exposed to economics, entomology, statistics, mensuration, silviculture, planting, harvesting, timber evaluation, and forest policy. In general, it can be said that this sequence concentrates on and attempts to tie together three different areas of study: (1) technology, (2) management principles, and (3) tree growth and anatomy.

So now knowing what the forest science sequence is all about, what kind of student is it designed for? In simple terms the sequence is designed for the student who desires to do graduate work in tree growth research. It is designed for the student who has a keen interest in the tree itself instead of what products can be made from it or what administration problems are in-

involved in growing it. To be sure, one must be aware of the problems of the forest and plant managers to conduct more meaningful research, but yet the prime interest still lies in working with the tree itself. The sequence is designed for the student who desires a broader education with a less limited field of view. Twenty-nine hours of electives permit the student to explore a number of interests. The sequence is general enough to appeal both to a five year pulp and paper man as well as a person interested in forest management.

High grades are required for this sequence and may be the reason for its previously mentioned unpopularity. However, aside from a semester of calculus and a year of physics with engineering students instead of fellow foresters, the forest science sequence is no more demanding than any other sequence. Perhaps, the grade requirement should be more flexible in order to permit more students to benefit from this well planned curriculum.



The General Forestry Curriculum

by

DAVE STRUBLE

Of the seven sequences offered in the School of Forest Resources, General Forestry is the least publicized. The attitude seems to be one of avoidance of the sequence if at all possible. I feel that the General Forestry sequence has as much to offer the sincere student as any other sequence, and should be given equal consideration.

The value of a general sequence lies in the flexibility of the program to meet the objectives of the individual. Above and beyond the 91 credit hours of core courses required of all foresters the only requirements are 15 hours of forestry courses and a combination of 6 credit hours in botany, geology, and soils courses. These requirements leave the student a minimum of 29 credit hours of electives to attain the 141 credit hours necessary for a degree in forestry. Since these electives can be from any area of study the student can either take a broad variety of courses and widen his spectrum of understanding or specialize in one area of study.

With the inherent flexibility of the General Forestry sequence the student is able to focus his attention upon the fields of study which he feels are of interest and importance. Fields to which forestry relates range from agricultural resources economics to zoology. With the realization that the forests, and therefore forestry, are related to the rest of the environment comes a need to study these relationships. There is, I feel, a def-



inite need for trained professional foresters to integrate the problems of forestry with those of other fields. As the population level rises and the associated social problems become more complex this will expand. With the increase in specialization there is a need for the "jack-of-all-trades" who can interconnect the many facets into a solid construction, and thereby get a glimpse of the totality of the problems of today's forestry. It is my belief that the General Forestry sequence can produce such people.

The general sequence also offers a great deal of opportunity to the student who is interested in some area of forestry for which the School does not as yet have a regular curriculum. Such a program does not take the place of graduate study but it does allow the student to specialize. Linked with the basic background courses specialization allows the student to prepare for graduate study or a specialized job.

From the one extreme of generalization to the other (specialization) the possible course coordinations are infinite. In this flexibility of developmental approaches lies the promise of the General Forestry sequence.



5th Year Pulp and Paper Program

by

JOHN CARPENTER

When the 5th year pulp and paper program is mentioned to many students their immediate reaction is "Fifth year! I'll be lucky to get thru four years." But to those of you who have a vague idea that you might be interested let me give you a few hints. If you have any interests in the program you should first discuss it with your advisor as soon as possible for though you can enter the program during any year it is best to enter as early in your school career as possible so that the necessary courses in chemistry and calculus can be scheduled.

Probably many of you after reviewing the course list will decide that this isn't for me. But wait a minute before you jump to that conclusion, look at some of the advantages. First, after the 5th year not only do you have the field of forestry from which to choose your profession but you also have other fields related to the pulp and paper industry or a combination of both. Your pay will be higher and also you will be of more value to your company because you will have the knowledge to relate many of the import-

ant aspects of both industries. You may be able to act as an intermediary between the foresters, the technologists, and management and thereby increase the efficiency of the whole organization.

Next let's look at what the fifth year includes. There is a core of 15 credit hours of pulp and paper courses and then there are 15 credit hours of electives. In the pulp and paper courses you study the manufacture of pulp and paper, pulp testing, paper testing, and the problems encountered in these processes. The aim of this program is to give a person a working knowledge of these processes in the hope that he will be able to combine them with his own field in order to increase the efficiency of the over-all pulp and paper program.

Well what do you think? Not too bad for one more year, is it? But there is still one additional benefit, this program is highly subsidized by the paper companies so that there is little or no cost to the student for this additional education. Don't you think you ought to at least look into it?

Forest Technicians at Maine

by

PROF. A. G. RANDALL

The School of Forest Resources in the fall of 1968 added a two year, associate degree program to its educational opportunities. Forestry became one of 6 two year curricula offered in the College of Life Sciences and Agriculture. As of February 1970, we have 27 upperclassmen and 30 underclassmen. All are from the State of Maine. Professors Randall and Robbins are assigned to the program by the School. They are responsible for 21 credit hours of forestry courses. The remainder of the 64 hours required is taught in other departments of the University. In addition, 6 weeks of summer camp (8 credits) is required.

The objectives of the University in offering this program are to increase the opportunities for post high school education and for subsequent career satisfaction, as well as to help meet the needs of employers in Maine and elsewhere for technically trained personnel. While experience is as yet lacking as to how well these objectives are being met, we can say that interest has been strong on the part of both high school graduates and potential employers.

Students other than commuters have been housed at South Campus. Many classes are held there while others are held at Orono. Classroom facilities in Eastport and Caribou Halls are excellent. Laboratories are held at Orono. During each of the first two semesters, one 4 hour laboratory a week is on the University Forest. Schedules are arranged so that not more than one bus trip a day from South Campus to Orono is necessary. Students have accepted the inconvenience of bussing well.

The forest technician works at a level below the professional forester but above the trained forest worker. He will assist the forester but much of the time will be working alone or with other technicians or will be in charge of a group of workmen. Many technicians will work at the foreman level after a varying amount of experience and after demonstrating competence. Only one option, Forest Management, is available at present. It is anticipated that duties of technicians will include timber cruising, marking

and scaling, maintenance of boundary lines, equipment maintenance, forest recreation, and foreman level jobs in establishing, protecting, improving and harvesting timber stands. He may be a research assistant. Employers will also expect him to be able to contact the public, to write reports and to keep financial records.

Studies have indicated that from 2 to 5 technicians will be needed to each professional. Based on 20,000 professional foresters (1965), the potential need is great. It may be concluded that the number of technicians will increase faster than the number of professionals. A study was undertaken at the School before the program was started: "Technical Education Needs and Employment Potential in Forestry Based Occupations in Maine" by Burnett, Corcoran and Shottafer published as Bulletin 650 of the Maine Agricultural Experiment Station. The study found a need for 42 technicians in 1967 and openings for 155 over the next 5 years in forest management alone.

The kind of candidate desired for technician training is a high school graduate with good grades, not necessarily as high as for a bachelor program. He should have had at least 3 units of English and 2 of Mathematics. At least one year of a science is desirable. He should be in good physical condition and have an interest in forestry. He should have knowledge and appreciation of forestry as a basis for a decision to enter the field. A mere liking for the out-of-doors often is not enough. The person who lacks the grades to enter a 4 year curriculum or who flunks out is not a good candidate for forest technician. The technician program is a terminal one and not a back door to the bachelor program. No transfers are made. However, those who show ability (a B average) and wish to continue their studies may apply for readmission as a 4 year student. It is anticipated that after the associate degree, 3 years will be needed to obtain the bachelor degree.

After approximately 1½ years of experience with the program, the following comments may be of value in answering some questions that have been raised:

(1) The technician is not a second class citizen. True, he must be prepared to accept a lower average starting salary than the professional. He will generally work at the foreman and supervisor level rather than that of manager or scientist. Nevertheless, the importance of his work and the opportunity for career satisfaction will be fully as great. Few if any employers will close the top ranks of their organizations to men who demonstrate ability merely because they hold only an associate degree.

(2) The educational process is not completed with the granting of the associate degree. The rapidity of technological and other changes in our society make it necessary that the technician continue to improve his knowledge and skills throughout his life. He should take full advantage of training programs such as short courses and technical meetings.

(3) The technician should become more skilled than the professional forester at most forestry techniques. This is because he performs them more often. It is not because he has gained this proficiency in school. Due to the numerous jobs held by technicians and the need for including communications, administration and citizenship in the curriculum as well as technical skills, there is too little time to provide extended practice in any one of the numerous jobs he may hold. He has a basis for developing his job skills with practice, training, reading and thinking.

In conclusion, Mr. Robbins and I have enjoyed working with the first class of forest technicians both in the classroom and at summer camp, and we believe they will make a real contribution to forestry in the state of Maine and elsewhere.



FEATURE ARTICLES

GUEST ARTICLE

Introduction

The people of our country are presently demanding that the environment be cleaned up and maintained in a satisfactory state. The President echoed these desires in this year's State of the Union Message. Why are the people concerned about this problem? In keeping with this nationwide trend, we have suggested, "The Pollution of our Environment" as the topic of this year's guest articles. It is hoped that the information presented in these articles will enable us to understand the pollution problem.

Taking a nationwide perspective, Dr. Leslie L. Glasgow presents the pollution problem of the United States with reference to Maine.

Dr. Leslie L. Glasgow, 54, of Baton Rouge, Louisiana, has been teaching for the past 20 years in the fields of fisheries, wildlife and forestry. He is presently the Assistant Secretary of Interior for Fish and Wildlife, Parks and Marine Resources.

He was formerly Professor of Wildlife Management at Louisiana State University for 18 years. In 1966 he became Director of the Louisiana Wildlife and Fisheries Commission.

Dr. Glasgow has spent 18 years in research on wildlife wetlands management at the LSU Agricultural Experiment Station, and was formerly a waterfowl biologist in the Indiana Conservation Department. He was winner of the Governor's Award of the Louisiana Wildlife Federation in 1967.

A native of Portland, Jay County, Indiana, he was graduated from Purdue University in wildlife and forestry, obtained his master's degree in wildlife at the University of Maine, and his doctorate in wildlife management at Texas A&M University.

Dr. Glasgow had a graduate teaching assistantship while at the University of Maine, was named the Outstanding Louisiana Conservationist by the State's outdoor writers in 1958, and has been awarded membership in several chapters of the Louisiana Wildlife Federation.



Dr. Glasgow is a former president of the Louisiana Wildlife Biologists Association and the Southeastern Section of the Wildlife Society. He is and has been a member of the American Fisheries Society, the Gulf States Marine Fisheries Commission, the Gulf and Caribbean Fisheries Association, the Southeastern Association of Fish and Game Commission, International Association of Fish and Game Commission, Sigma Xi (National Research Fraternity), Louisiana Stream Pollution Control Commission, Louisiana Forestry Commission, and the Louisiana Tourist Development Commission.

In 1943-1944, Dr. Glasgow was employed as a civilian by the U.S. War Department at Deep River, Connecticut, and during the next two years saw military service with the U.S. Army Air Force.

Dr. Glasgow and his wife, the former Garnet Lucile Confer, are the parents of three sons, Vaughn, 24; Hugh, 21; and Robert 16.

The Pollution of Our Environment

by

DR. LESLIE L. GLASGOW

"Perhaps an article dealing with the pollution of our environment would be appropriate," *The Maine Forester* suggested in its invitation to do a piece for the 1970 yearbook.

Obviously the idea originated with some bright professor-watcher, knowledgeable about our breed's compositional drives. Almost any one of us would be intrigued by a topic so sweeping. It is as though one were offered the opportunity to label his course "Survival of Mankind, Basic." The subject is literally bigger than all outdoors, for it includes the indoors as well, the ocean depths, the resources underground, the skies above and the very conservation conscience of Man.

But the teacher-watcher who advanced the suggestion was also prudent enough to impose space restrictions to insure the essay a satisfactory brevity.

In my time at the University of Maine in the late Forties, Man was still cranking up his technological apparatus which by now is roaring along so efficiently we have the capability to poison ourselves. In the Dismal Sixties we rammed our environment-destroying supermachinery into high gear. In the Seventies we either slow it down and reverse some of its revolutions, or the Eighties could be too grim to contemplate.

I happen to stand with those who believe that since we were smart enough to get ourselves into this mess, we are smart enough to get ourselves out.

But it will be no easy rectification. This is no time to be lulled. President Nixon has used his office as the magnifying glass to focus national attention on our environmental illnesses. The only other instance of such White House attention on conservation issues was that of President Theodore Roosevelt's, in the first decade of this century.

The average American, I believe, is awakening to the dangers that threaten his environment. Some of us have been nagging him for years. And the environmentalist might say, as the farmer said when he hit the balky mule over the head with a two-by-four, I think I have his attention at last.

The quality of life in the world will continue to deteriorate unless the educated and trained people bring their skills and knowledge to bear on protecting their world. I am preaching now not only to, or at, students in forestry schools or the biological and associated disciplines, but also to all those in the other departments. The person majoring in business administration breathes the same air and drinks the same water as the botanist down the hall.

The clever editor who put a word-limit on this essay thus neatly prevented any attempt to recite once again the litany of environmental crimes which have become standard inserts in environmental sermons. With this audience there is no need to plow again the same statistical field. Its members must know that we have sinned against Nature in such a variety of ways that it is likely we do not yet recognize all our errors.

Some are hidden, not so obvious as, for instance, the ways we used to eliminate the Atlantic salmon from the streams of Maine. A Federal hatchery was built at Craig Brook, Maine, in 1871 and engaged in salmon plantings. But as the years passed salmon runs were destroyed in river after river by dams and sawdust and other pollutants, until all salmon work at the hatchery ceased in 1938.

The salmon had too many fishermen clamoring for it for the fish to be abandoned. Hatchery propagation was resumed, with the University of Maine cooperating with State and Federal agencies to restore this great sport species. We have not yet won the restoration battle, but we can have high hopes for eventual victory. It was a case where the damage was reversible.

Our job is to avoid irreversible damage, to understand consequences of our industrial development, population growth, housing concentration and resource uses before the damage is done beyond repair; to make our plans so that uses are compatible rather than wastefully consumptive or needlessly destructive.

Now that the Chief Executive has marshalled a nationwide alert, it is astounding to see the rush among converts to become instant experts on the environment. For years there has been a certain amount of loneliness among the foresters, biologists, wildlife administrators, park managers and other scouts who were sounding warnings all over the maps against the growing destruction of the basic resources of life itself. Today the stampede is on, and those pioneers are joined by swarms of enthusiasts lately enlisted in the environmental crusade.

Welcome, welcome to all! As a long-time educator, who has also put in some years of public service, I know that educating the public is an indispensable ingredient to the success of any major social reform. The environmental crusade is not the exclusive preserve of any group, nor does any part of the country have a monopoly on environmental problems. There is more than enough work to go around. The physical scientist has no reason to look down his test tube at the social

scientist scrambling for a place on the environmental bandwagon, and both of them need to lend a hand to the non-scientist who is galloping to get aboard.

If we are going to meet the or-else challenge of the Environmental Seventies we must make the maximum use of the entire range of disciplines and skills over the sweep of the total environment. Heretofore we have dribbled out an under-used bit of too few disciplines and not enough skill over one piece of the problem at a time. While we were saving an acre of waterfowl marsh here a thousand acres were drained and gone forever there. While we expanded the outer rings of our urban centers the inner-city rotted. We preserved a tiny estuary while miles of coastal areas were dredged and filled.

We must realize the environmental dam is so full of holes it needs sandbagging its entire length. All forms of pollution must be attacked. Our customary hit-and-miss skirmishes must be replaced by a thoroughly systematic approach.

Any tract of land has a limited carrying capacity for wild animals. And there are finite limits on the planet's capacity for humans. Further deterioration lowers the earth's capacity to support additional people. It has become painfully obvious we must institute better land planning through zoning. The nationwide imposition of this important step would slow the rate of environmental degradation; then refined planning would eventually curtail it. Any rational plan for maintaining the quality of life, much less improving it, must assume that Mankind can cope with popu-

lation growth. The massive aid our Nation has poured out over the years to India has failed to benefit that unhappy country because its population overtook and erased the gains that were intended.

In the next 30 years more than 100 million children will be born in our Nation. The United States had better improve in those three decades over the past 30 years' history of population distribution. In that period people streamed out of vast rural areas into the central cities, and these metropolitan cores became the glaring No. 1 failure of our society.

America, with seven million students and half a million faculty in its colleges and universities, has undertaken a mass educational program unmatched anywhere else on earth. It has been said that the average faculty member is by instinct not inclined for the rough and tumble of the non-academic life. My own present position might serve as a measure of refutation but I don't know that my services as defense counsel are required. At any rate, our undergraduates and graduate students, and the legions in high schools ready to follow them, are fit enough for the fray, and they give us a mighty cadre for directing the national effort.

It is a cause big enough and noble enough to meet the loftiest ideals. We are not a Nation of supermen, but we do have a great and good country, and I am square enough to be utterly convinced we are smart enough and strong enough to keep it and improve it.



Alewive
(photo)
nam Harbor
3: Langer, Chicago-Sun Times)



Above: Stream Pollution
(Photo by: Interior-Sport Fisheries
and Wildlife, Rex Gary Schmidt)

Below: Air Pollution
(Photo by: U. S. Department of
Interior, Cecil W. Stoughton)



GUEST ARTICLE

Introduction

The entire country we live in has pollution problems, and Maine has its share. In keeping with the theme of the feature article, "The Pollution of our Environment," Mr. Richard B. Anderson discusses this topic with special reference to the State of Maine. From his article we can see the many problem areas that do exist in Maine, and the need for much work in this field.

Richard Anderson graduated from the University of Maine in 1957, with a BS degree in Wildlife Conservation. Shortly after graduation, he was employed by the Maine Department of Inland Fisheries and Game as a Fishery Biologist. While he was employed as a Fishery Biologist, he was director of the Sebago Lake Salmon Restoration Study.

Mr. Anderson was one of the original directors of the State Biologists' Association. He edited their newsletter for many years and is presently serving as Vice President. He also serves as director of the Coastal Resources Action Committee. Mr. Anderson was recently appointed by Governor Curtis as the Conservation representative on the Maine Mining Commission.

Mr. Anderson served on the board of directors of the Maine Audubon Society-Portland Society of Natural History for two years and was a member of the Executive Committee in June 1969.

Mr. Anderson resigned his position with the Maine Department of Inland Fisheries and Game after 12 years of service and accepted the position of Associate Director for Conservation of the Maine Audubon Society-Portland Society of Natural History.



IT'S YOUR WORLD

by

RICHARD A. ANDERSON

Adlai Stevenson once said, "We travel together, passengers on a little space ship, dependent on its vulnerable supplies of air and soil, all committed for our safety to its security and peace, preserved from annihilation only by the care, the work, and I will say the love, we give our fragile craft."

You, as college students and college graduates, and thousands of other young people like you throughout the world are now in the challenging position of having to clean up the fantastic heritage of blighted landscape which your forefathers have bequeathed to you.

Concern for our ravished environment is no longer enough. Action is imperative. We presently have over 300 billion dollars worth of deferred maintenance on the United States environment, and it has become a matter of national survival to catch up on this maintenance.

According to "US News & World Report," we are presently producing 350 million tons of residential and industrial rubbish and sewage annually and pouring 142 million tons of toxic exhausts from a variety of well known sources into our vital air. A recent issue of "Newsweek" magazine awarded Maine's Androscoggin the dubious distinction of being one of the nation's ten filthiest rivers, and it is interesting to quote here from a Report of the Commissioners of Fisheries and Game of the State of Maine in 1884.

"On the Androscoggin, our poverty of resource has ever prevented our properly stocking those waters. We have two very important and valuable fishways at the mouth of the river at Brunswick. Obstructions multiply on the river more rapidly than our ability to cope with them. Manufacturing enterprise not only obstructs the river with its monstrous dams, but, by the criminal neglect of the Legislature in providing no restrictive laws, the bed of the river is covered with waste matter that destroys both the spawning ground of the fish as well as the productive field of fish food. Poisonous matter from the Brunswick factories destroyed the spawning ground of the shad and drove them away."

Eighty-five years later, Fisheries Biologist Stuart DeRoche writes:

"Not only have man-made obstructions blocked all migrations of anadromous fish

and free movements of resident fish, but pollution from various industries and municipalities has destroyed the very habitat where fish live. Conditions are so deplorable on the main river from Berlin to Brunswick that all benefits normally contributing to the recreation industry are lost."¹

From Berlin to Brunswick, from Livermore to Lewiston, the fetid Androscoggin writhes its way to the sea, there to deposit the unwanted byproducts of the most affluent society in the world.

The Androscoggin's banks are liberally sprinkled with other evidence of man's lack of consideration for God-given gifts: chutes extending from porches overhanging the river, where the daily accumulation of household solid wastes is matter of factly deposited into the swirling gray-black waters, rusting carcasses of unwanted horseless carriages hang precariously from eroding banks or, like some prehistoric turtle, raise their rusty heads from the murky blackness, from every nook and cranny, where otters and mink once played and raised their young, the ubiquitous household sewer pipe pokes its ugly head and spews forth its burden of human wastes into a mass of the same material already floating below.

Paper companies located along the river add tremendous volumes of oxygen-demanding materials to an already oxygen-depleted watercourse. A number of other industries add their contribution to the reeking fluid. Even the Little Androscoggin collects filth along its journey from Albany to Auburn and gives it up to its larger brother.

And over it all hangs a pall of fetid smoke.

This is not the River of the Damned. It is the Industrialized Androscoggin.

It hasn't been easy to kill the Androscoggin. It took the combined effort of thousands of people about 100 years to do the job. *We cannot look with pride at our accomplishment.*

The Androscoggin is but one thin thread in our total environment, but it is used here to illustrate the problem. We must act now to preserve what we have, the splendor of a Mount Katahdin or an

¹"Fishery Management in the Androscoggin River," Stuart DeRoche, Maine Department of Inland Fisheries and Game, 1957, page 5.

At the same time, however, no longer can we tolerate the
indiscriminate destruction of our natural heritage.

Let me here quote several paragraphs from
the United States Department of the Interior Year-
book #5:

"The conservation goal of America's third
century as a nation must be the development
and protection of a quality environment
which serves both the demands of nature
for ecological balance and the demands of
man for social and psychological balance.

The landscapes and cityscapes that comprise
the face of our continent present a partial
statement about the state of our civilization,
in much the same manner as the cut of a
man's clothes tells something of the man
himself. As the republic nears its 200th birth-
day, the cut of the countryside bespeaks am-
bivalence.

The need for a new national attitude toward
our environment has grown until today it is
an absolute necessity for human survival.
Technology has stretched and magnified our
natural resource potential in many areas.
It has also supplied a harassed people with
an infinite number of painkillers and tran-
quilizers. But it cannot provide us with one
square inch of additional planetary surface,
nor do more than gloss over the mounting
environmental insults to humanity.

It becomes increasingly apparent that run-
away population, noise and psychological
pressures of too-close living will eventually
run us out of space and nervous energy
even if food and minerals and fuels were
never to flag.

Any new national attitude toward natural
resources must take into consideration at
least two factors—the quality of human
life we seek to establish, and the specific
meld of environmental ingredients that make
up that quality. Both of these goals require
methodology if we are to achieve them.

First, in order to identify the standard of
quality we seek, *we must set up a whole new
value system*, with indices for measuring the
"desirables" (i.e., serenity, beauty, quiet,
etc.) and the "undesirables" (noise, clutter,
pollution, congestion, etc.); and then we
must come to some workable national con-
sensus as to where, on this quality scale, we
would peg our environment.

Do we want *all* water pure enough to drink,
to swim in, to boat on (and so on, down a
sliding scale to the dead oxygenless fluid
that passes as "water" in too many stream-
sewers today)? If not, then *which* waterways
should be of what standard of purity and for
what purposes? These are the *kinds* of ques-
tions we must ask ourselves and answer be-
fore we can fulfill the first requirement for
a new national attitude toward natural re-
sources.

Second, we need a *system of measurements*
to determine which value takes priority over
another, or which of several values can be
combined, to assure the use of available
space and resources in a manner that will
result in the environmental quality we have
previously agreed upon as our goal.

Admittedly, this is no small order. But con-
sider the alternative.

Today we are allowing priorities in use (and
abuse) to be established by default, instead
of assigning them with some rationale and
purpose. The movers and effectors of these
priority decisions are haphazard, dollar-di-
rected, first-come-first-served, and utterly
disconnected from any overall consideration
of either life or the land, let alone the two
interconnectedly."

Stuart Udall

The period in our history that has been char-
acterized by the uninhibited despoliation of our
natural environment has ended. We are now be-
ginning to take the first small steps to correct the
errors of the past. It is our national and personal
interest to see that no one gets away with saying
it is either pickerel or payrolls. *We must have both.*

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EDITOR'S PAGE

The class of 1970 leaves the University of Maine at a time when students of the School of Forest Resources are beginning to take an active interest in the events around them. The events that are discussed by many and participated in by only a few are those which will be of greatest importance to the future.

The Student-Faculty Curriculum Advisory Committee is something most students have an opinion about; but few venture forth to have their opinions heard and discussed at one of the meetings. Improvement coming from within is of the highest quality. Whether it be an individual, industry, or an educational institution, this type of improvement cannot be effective until complaints are heard and remedies are suggested. At the School of Forest Resources, we are fortunate to have a forum for these ideas, and yet few people come forward to express their views. Maybe everyone is satisfied, but this is not likely. Just open your ears while waiting for a Forestry class, and listen to your neighbor complain about the raw deal he just got in lab. Sure your buddy sits there, but why not express your views to those who listen?

One of the many things I talk about is the Environmental Awareness program. As is brought out in the article concerning this program, the environment we live in is something we cannot escape, and if we are to make the place we live in a little more pleasant, we will have to do it ourselves. As this program is directed at young people with receptive minds, which are not cluttered with the snow jobs that we as college students can remember, a program of true and meaningful proportion can be presented to inform them that the environment is important, at least for tomorrow, and maybe the day after.

In the frenzy to save the environment it should be remembered that if timber and wildlife are properly managed they can be harvested like other crops. If these resources are not utilized, their potential value is not being realized, and a great deal is being lost. Some areas should be set aside to be forever wild, but one should not preserve the entire forest and let many of its values go to waste.

I hope the class of 1970 becomes interested and concerned with the events around it rather than being apathetic about the things that influence our lives. We have the information and facts to suggest and provide constructive ideas and programs, especially on how forest resources should be managed. If anything is to improve someone will have to let other interested people know of the constructive ideas we have to suggest.

As editor of the *1970 Maine Forester* I have come to understand myself to a greater degree through the actions of others. I have been fortunate enough to be in a position where I could see the way people act in different situations. Some people had to be pushed a little, others did what they said they would, and still others accepted additional tasks.

At a time when words seem to mean so little as many of the things I have stated may just be empty words, I want to thank all of those whose assistance helped to make the *1970 Maine Forester* a publication we can be proud of.

I wish to express special thanks to John Sutton, Dick Wagner, Tris Manchester, Director Nutting, Dr. Coulter, Prof. Hale, Mr. Robbins, and Dr. Shot-fer for the special assistance they have contributed.

Thanks to Mr. Richard Anderson and Dr. Leslie Glasgow for their excellent articles concerning the pollution of our environment. A great deal of assistance was extended by these gentlemen in understanding the problems which arise in publishing a yearbook.

To the faculty and staff, your guidance and advice was truly appreciated. Many of the articles presented would still be on the typewriter if it hadn't been for your assistance.

Thanks to the staff of the *1969 Maine Forester*, especially Peter Brewitt (editor). With a fine issue like that edition to use as a guide, how can anyone go wrong.

To the advertisers and contributors, any efforts that we have made would not have been possible without your generous assistance.

There were times when many felt *The Maine Forester* would never make it to the printers, and to those who showed confidence in what we were doing, it is your success!

WILLIAM D. LILLEY

Again just a simple and honest thank you.



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