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The Ames FORESTER

VOLUME 64 1977

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The staff would like to express sincere appreciation to Theodore Cochrane of Madison, Wisconsin for the cover design.

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The pictures submitted and the picture processing by David Thompson, Ole Helgerson, Bob Meier, Laura Knepp and the rest of the students and faculty are appreciated.

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JUST A FORESTER

J. A. Larsen

I do not own a foot of land:
Nor am I rich in earthly goods;
But this can be a blessing now
That I have learned to love the woods.

No mining stock or other shares
In oil or steel or grain I hold;
But I possess the jeweled drops
Of rain and frost of gleaming gold.

Cathedral stillness 'neath the height
Of canopy like priceless glass
In ever brilliant beams of light
Suffuse my early morning mass.

The crested mountain tops afar,
And shimmering gleam of yonder lake,
Will lure my spirit like a star.
It's there whichever trail I take.

Through hail or rain or tender snow
I step with joyful heart far more
Than he who wears his life away
Within a dark or dismal store.

I am not bound by town or state;
For cool refreshing streams I ask;
Aroma of the spruce and pine;
The trail that leads me to my task.

All these are mine, to see to feel;
To treasure, not to buy or sell;
Of Nature's priceless legacies;
All that within the forests dwell.

A gleam at sunset and the call
Of distant lonely whippoorwill;
The rumble of the water fall
When day is done and night is still.

In yonder lowly cottage gleams
My evening star, I seek my ease
Beside the lowly flickering beams;
A hut, a home, a book, and peace.
DEDICATION

The 1977 Ames Forester is dedicated to "Skipper" who was America's most senior Forester when he passed away in his hundredth year.
Dr. J. A. Larsen—

A National Treasure

George W. Thomson

Author's Note: This dedication was written one week before the death of Julius Ansgar Larsen on January 4, 1977 and was composed in the hope that he would read it at the time of his one hundredth birthday celebration. But our old friend is now at rest under a red oak tree in the University Cemetery in Ames.

Farvel, Julius. Cud velsigne deg!

Even if we could ignore our recently stimulated interest in a bicentennial of history and even if we tired of the concept of the Renaissance Man, we could scarcely overlook the long and intriguing life of Julius Ansgar Larsen. We are almost never fortunate enough to know a man or woman whose lifetime of professional activity more than spans the period through which our profession has existed. Let us look, in this one hundredth year since his birth, at that amazing forester who is known the country round as Skipper.

First called "The Skipper" and later just "Skipper" by close friends and, usually behind his back, by impudent school boys (I, myself, never got up the courage to call him Skipper until I was 51 years old), it was assumed that there was a connection to the sea. Indeed there was and from Dr. Larsen's own notes is the story:

"I was born in Drammen, in southern Norway, December 13, 1877. In Drammen the forested mountain plateau descends in gentle slopes to the brimming Drammen River and fjord inlet. Snow and ice prolong the winter; larks and song sparrows, anemones and cowslips greet the spring. Square-rigged sailing vessels lie at anchor in the harbor, readying for their summer trips to carry lumber and pulp to England, coal from England to Baltic ports—and eventually returning home with coal for the winter and toys from England for the children.

My father and older brother were seamen. They studied navigation during the winters, rising from ordinary positions to those of first mate and captain, eventually getting into the England-Australia transport.

As for myself, after finishing primary school I spent two seasons coastwise sailing with my father on his sloop, freighting sand, brick and lime to Oslo. After that, there were two seasons onboard the Alf, then the Berna, in the England-Quebec trade, with coal outward and white pine logs returning. In 1895, instead of homing for the winter, the Berna headed for Trinidad with a load of coal. We never reached that port, for one very stormy dog-watch the mainmast, sails and rigging tumbled into the ocean. At that moment two of us were aloft furling the fore-royal sail. The braces connecting the spar caused it to flutter so much as to make our hold extremely precarious. We could well have been pitched into the sea. Fortunately, after that the trade winds brought us into Bridgetown Harbor on the island of Barbados. This was shortly before Christmas. The Berna could not be repaired in this port, was judged unfit for by-the-wind sailing to reach Trinidad, and was condemned. The crew was paid off and sent home to Norway. However, I asked and received permission from the consul to travel to New York. Thus my dream of coming to America was suddenly realized, and I came to my two sisters in New Haven, Connecticut."

From 1896 to 1901 he attended evening classes for immigrants and studied English, German, Latin, and arithmetic while working days at the Winchester Arms Company. At the end of that period he attended the East Maine Conference Seminary at Bucksport, Maine to prepare for Yale entrance examinations. From 1904 to 1910 he attended Yale, first in the undergraduate school and then in the School of Forestry for graduate work. It was during this period that he became increasingly interested in nature studies from botany through geography and picked up his first formal training in sketching and the painting that was to
become so much a part of him. Finishing his forestry course work during field camp in Louisiana he prepared for and wrote his Civil Service examinations and on July 4, 1910 received his first professional appointment to the Blackfeet National Forest in Kalispell, Montana. He was now 33 years old, essentially the same age as the first forestry course in the nation—the one designed at Iowa State College in 1878. We can now observe his professional life for the next 67 years.

Let’s turn again to Skipper’s own notes:

“That first summer on the Blackfeet coincided with the very worst fire season in history—especially severe on the Northfork of the Flathead River and on the Coeur d’Alene and St. Joe Forests. During the following fall and early winter we cruised burnt timber to be sold, prepared surveys and maps for homestead applications, and made forest-type maps and ranger-area maps for the office.

In March 1911, Jenny Borghild Spieckermann came from New Haven to be my adored bride; in the spring of 1913 we and our six-weeks-old daughter moved to the new Forest Experiment Station in northern Idaho, near Priest River.

At the Experiment Station were only four buildings: office-laboratory, residence, barn and greenhouse. On the Nenton Flat nearby, and on the river bench, were plots for tests of exotic trees and a series of plots of try-outs for all representatives of Western Yellow Pine, also some Douglas Fir, and, later, installations of White Pine and Larch thinning plots. In three weather stations fully equipped by the U.S. Weather Bureau we kept records on different aspects—evaporation, temperature, wind movement, humidity, soil quality studies. When I came to Iowa, I brought a set of soils for testing in the Iowa State University laboratory. This became the basis for my own Ph.D. thesis.”

There are two fascinating points to be derived from the foregoing: Skipper Larsen became Dr. Larsen when he completed his Ph.D. thesis in 1936 using soil collected in 1920—only so scholarly and organized a man could have kept a goal so long in mind. A second notable item comes when we realize that he returned to the Priest River Station in 1976 to address the U.S. Forest Service personnel gathered there to celebrate the 65th anniversary of the establishment of the Station that Dr. Larsen had directed 54 years earlier.

After assignments throughout the Pacific Northwest in the early twenties, he went abroad in 1923 to visit forest experiment station personnel in Europe. In 1924 he was appointed by G. B. MacDonald to the staff of the Forestry Department at Iowa State. During the next forty years he was a
Professor Larsen addressing Forest Service personnel gathered to celebrate the 65th anniversary of the establishment of the Priest River Forest Experiment Station during the summer of 1976.

key staff member and a fixture in the minds of students and returning alumni.

During his tenure at Iowa State he was mostly known for his silviculture classes both on campus and at Camp, although he taught wood technology, fire protection, nursery management, cartography, drafting and almost anything else that “Prof. Mac” felt needed assigning. The day of the specialist had not yet come to forestry schools and versatility was the key to employment.

The stories about Skipper were legion just as his stories about “Priest River Country” were infinitely varied. His insistence that a silviculture student should be able to name all of the rivers in sequence between the Penobscot and the Androscoggin drove Iowa-bound farm boys to distraction, while his interrupting a class to read selections from Thurber or Benchley amazed and diverted us and created a world of literacy before our very eyes. There was not a Freshman at any of the numerous Summer Camps, at which he was either director or teacher, that did not find himself out-walked and out-climbed by the rotund, shiny-headed Skipper who seemed grandfatherly and older than his years. Probably the amazement that we all feel in celebrating Skipper’s hundredth birthday arises from the notion that all we callow youths had thought he was “old” when we first knew him.

Truly, I worked closely with Dr. Larsen from the time I was a Freshman in 1940 until I helped sponsor his last one-man art exhibit when he was 90 in 1968 and he seemed essentially changeless during that entire time. Given my own way, I would have Skipper Larsen declared a National Monument!

While students now have no way of knowing J. A. Larsen—even by legend, for most of those who knew the legends are now gone—in any given quarter they may work in one of the plantations that he planted and so carefully monitored through the years or they will be exposed to teachers, such as Dwight Bensend and myself, who took up where Skipper left off by following concepts in courses or at Forestry Camp developed earlier. Skipper wrote some forty technical articles and they mark his progress as a scientist and a scholar. An inveterate actor, raconteur and perfect host, it is not surprising that he published at least fourteen poems and continually participated in Actors’ groups.

AMES FORESTER 9
Ask not ease or wealth or wine,
Or woman to adore thee,
But the friendship of the hills
And the trail before thee.
Seek not idle merriment,
Fame or praise or glory,
But a will to which are bent
The tasks which lie before thee.

And in the 1926 AMES FORESTER, fifty years ago, when Skipper was just a tad of fifty comes this last quatrain from a poem he called, "In My Lookout Cabin":

Shadows lengthen—twilight softens
Over mountains, lakes and streams;
 Darkness 'round me; stars above me;
Life and labor melt in dreams.

Thanks, Skipper. We never expect to see another like you.
Application of Plant Tissue Culture to the Propagation of Forest Trees

David G. Thompson

Intensive culture of short rotation forest crops or the large scale replanting of forest land with selected, superior trees will depend on techniques for their practical, rapid, clonal, mass propagation. Standard methods of vegetative propagation can be used to multiply planting stock of some species, but they are not successful with many woody plant species. Plant tissue culture could provide a means for the clonal multiplication of selected individual trees in large numbers, in a short period of time and in a relatively small space. Techniques developed for tissue culture propagation of herbaceous, horticultural plants have now been successfully applied to one group of economically important woody plants, the poplars.

“Classical” plant tissue culture involves the initiation and growth of callus tissue in culture. Callus tissue does not correspond to any normally occurring plant tissue but it is most similar to the wound tissue that forms as a result of injury to the plant. Callus typically consists of parenchyma cells that grow in an unorganized mass. Callus tissue formed from tobacco stem pith cells has for many years been used to study the effects of certain chemical compounds on plant growth and development.

Auxins and cytokinins are two of the major types of plant growth regulating compounds found naturally in plants. Auxins stimulate the elongation of plant cells without an increase in the number of cells. Cytokinins stimulate the division of cells which results in an increase in the number of cells without an increase in their size. By controlling the ratio of auxin to cytokinin the growth of the callus tissue can be regulated.

When auxins alone are incorporated into standard plant tissue culture media at certain concentrations, they stimulate the formation of roots on callus of tobacco pith. Treatment with cytokinin at certain concentrations will stimulate the formation of shoots on tobacco pith cells. Sequential treatment first with cytokinin to initiate shoots and then with auxin to initiate roots can produce a complete plant from callus. Callus tissue derived from many species of plants, including several hardwood and a few coniferous tree species behave similarly.

These experiments demonstrate totipotency, or the theory that every cell within a plant has the ability, under the proper conditions, to produce a complete plant. Certain cells within a plant, however, may be able to express their totipotency more readily than other cells. The expression of totipotency seems to depend on the particular cell type and its location within the plant. Variation in the ability to express totipotency seems to be caused by blocking of a specific portion of the cell’s genetic information necessary for the expression of totipotency.

The production of shoots and whole plants from callus has not been widely applied to the propagation of plants for two main reasons. First, shoots are usually produced either singly or in low numbers from each piece of callus. Thus, the production of the large number of plants necessary to make tissue culture propagation practical is usually not possible using callus cultures. A second major problem with the use of callus cultures for propagation is that callus may not remain genetically stable when grown for extended periods of time in culture. In normal cell division the chromosomes double and divide with the rest of the cell to produce two daughter cells. Cells grown in culture commonly undergo a duplication of the chromosomes without the division of the cells. As a result, the chromosome number of the cells doubles.

Thus, diploid (2n) cells of a freshly initiated callus may become tetraploid (4n), hexaploid (6n) and eventually polyploid (many n) the longer the cells are kept in culture. Polyploidy may result in the loss of the cells’ ability to express their totipotency and as a result the callus may not be able to form shoots or roots. Perhaps more importantly, polyploidy may result in the formation of plants that are genetically different from the parent tree and thus its desirable traits may be lost.

To determine if these techniques could be applied to woody plants, I collected shoot tips of the poplar clone Tristis #1 from an experimental plot north of Ames in mid-August. The shoots were brought back to the laboratory where they were dissected down to a shoot apex 1-2 mm tall. Each apex was then placed in a test tube containing a medium for their growth which is basically a nutrient solution consisting of inorganic salts, several vitamins, different combinations of auxin and cytokinin, sugar as a energy source and a gelling agent solidify the medium. The different
combinations of different concentrations of auxin and cytokinin were tested to determine the concentrations best for the multiplication of shoots. One apex was planted per tube and they were then placed in a growth chamber under controlled light intensity, photoperiod and temperature.

After 4 to 6 weeks in culture, several of the apices had developed small buds on the callus that formed at the base of the original shoot apex (Figure 1). The various auxin-dytokinin combinations differed greatly in their ability to produce these adventitious buds. One particular combination resulted in the formation of between 8 and 12 of these adventitious buds from each original apex (Figure 2). This particular combination was selected as the shoot multiplication medium to be used in all further experiments with Tristis #1. As these buds grew, they developed into a mass of shoots that surrounded the original apex (Figure 3). At this time I could separate this mass of shoots into individual shoots and either place them on a fresh tube of multiplication medium or on a rooting medium.

If I placed the shoots on a fresh tube of multiplication medium, they could produce another 8 to 12 adventitious shoots at several points along their edge within 4 to 6 weeks (Figure 4). The rooting medium consisted of the same basic medium as the multiplication medium except that it contained high levels of auxin to stimulate root formation and contained no cytokinin. If individual shoots were placed on the rooting medium, a normal looking root system complete with lateral roots formed within 2 to 3 weeks (Figure 5). After the roots began to appear, I removed the plants from their containers, washed the medium from the roots and planted them in peat pellets under a shaded mist system in the greenhouse to condition them slowly to the environment outside the test tube.

![Figure 1. Poplar Tristis #1 shoot apex after 4-6 weeks in culture. Arrow indicates the meristematic areas developing on the callus at the base of the original shoot apex. Scale equals 1 mm.](image1)

![Figure 2. Average number of adventitious shoots produced on excised poplar apices placed on the 30 different auxin (IAA) and cytokinin (BAP) combinations (mean of three replicates).](image2)

![Figure 3. Mass of leaves produced from the adventitious buds in figure 1 after 6-8 weeks in culture. Scale equals 1 mm.](image3)

Although most poplars are easily propagated through traditional techniques of vegetative propagation, shoot apex propagation offers several advantages to the plant propagator. First, using standard shoot tip cuttings, each Tristis #1 shoot tip will produce only one plant. Using shoot apex
culture, each Tristis #1 shoot apex can produce between 8 and 12 shoots each of which can be rooted to produce a complete plant or if the individual shoots are placed on fresh multiplication media, each one will produce another 8 to 12 shoots. Thus, with each such transfer to fresh multiplication media, the number of plants produced increases geometrically. It is in this way that one million Gerbera daisy plants can be produced from one original shoot apex in only one year.

A second advantage of shoot apex propagation is that it does not require a large amount of space. The growth and multiplication of shoots takes place in test tubes grown on shelves illuminated from above by fluorescent lamps mounted on the bottom of the shelf above. In this way it has been estimated that a room 13' x 13' x 9' could contain about 10,000 tubes and in the case of Tristis #1 each tube would contain between 8 and 12 shoots, each capable of producing a complete plant. An equal amount of space in the greenhouse could support 150-200 stock plants, each capable of producing 10 to 20 shoot tip cuttings. Obviously shoot apex propagation is capable of producing many more propagules in a given space. Greenhouse space in an apex propagation system would be necessary only for the maintenance of stock plants and for a mist system where the rooted plants are grown before planting out.

Third, shoot apex propagation could be used in the production of pathogen-free plants. For standard multiplication purposes the apex is dissected down to 1-2 mm tall and consists of the apical dome and several leaf primordia. For a pathogen-free plant the apex is further dissected down to between 0.05-1.0 mm tall and consists only of the apical dome. The use of the smaller apical dome makes possible the production of plants free of fungi, bacteria, viruses, viroids, mycoplasmas, spiroplasmas and rickettsias. These organisms cause plant diseases and restrict the growth and productivity of the host plant. The apical dome is one of the few parts of the plant that may be free of these organisms. Pathogen-free plants may exhibit an increased growth rate for a time after they are planted in the field, until they become naturally reinfested. The increased growth rate after planting, however, may be critical to their survival and subsequent growth. Plants so produced could also meet the pathogen-free requirements encountered in the international exchange of plant material, an important component of many tree improvement programs.

![Figure 4. An adventitious shoot separated from a mass of shoots and placed on fresh multiplication media after 2-3 weeks. Arrow indicates the original adventitious shoot with new adventitious shoots developing from its edge. Scale equals 1 mm.](image1)

![Figure 5. An adventitious shoot after 3 weeks on a rooting medium showing the formation of a root system with lateral roots. Scale equals 1 mm.](image2)

Tissue and shoot apex culture at this time appear to be easiest with species of herbaceous and woody plants whose cutting can be rooted easily. The experimental work reported here with poplar demonstrates that the basic techniques developed for herbaceous plant propagation via shoot apex culture can be successfully applied to at least some woody genera. Perhaps with further experimentation these techniques can be applied to other woody genera. The development of a similar propagation system for the conifers would be of
great importance because most are difficult to propagate vegetatively.

Vegetative propagation makes possible the multiplication of plants before they reach the age of flowering and seed production and in trees this can mean a substantial saving in time. It also ensures that the trees produced will be identical genetic copies containing the desired traits of the original selected tree. With seed propagation, the resulting trees usually will not be identical to the parent tree. Shoot apex propagation has a potential for the large scale, clonal propagation of selected trees. It has the advantage over standard methods of vegetative propagation in the production of a large number of identical plants in a short period of time and in a relatively small amount of space. The availability of mass propagation systems for select, superior trees would help make possible their use in large scale intensive silvicultural systems as well as large scale replanting of forest land with superior trees.

**Literature Cited**


A native of Staten Island, New York, Mr. Thompson received a Bachelor’s degree in biology from Wagner College in 1971. He received a Master’s degree in botany and plant pathology from Iowa State in 1974. Since that time he has been employed as a Research Associate with the Department of Forestry. His main research interest is in the tissue culture of plants, in particular woody plants, and its application to tree propagation and studies of the physiology of tree growth and development.

**Test Tube “Seed” Orchards!?**

**Richard B. Hall**
Assistant Professor of Forestry

**Introduction**

The preceding paper by David Thompson has explored the potential for mass producing selected trees by tissue culture. Here I will suggest using tissue culture in the processes of tree breeding and “seed” production. A few years ago the first plant hybrid was produced by a tissue culture technique called parasexual hybridization. Leaf cells were isolated from two species of tobacco, their cell walls were enzymatically removed, and they were induced to fuse into new hybrid cells that could be carried on through tissue culture techniques to become new hybrid plants (3). In this paper I want to suggest that an adaptation of this method for bypassing sexual reproduction could become the method of choice in the breeding of some pine species. My argument to this effect will consist of two parts: 1) Problems with the current approach to tree improvement that might be solved by the new approach, and 2) special features of the pines that might fit them especially well to the new technique. Some of the techniques and advantages described could also be applied to other conifer genera.

**Current Breeding Procedures for Pines**

Different pine species reach reproductive maturity at anywhere from 2 years under intensive culture to more than 50 years in some high latitude regions. On a normally growing pine the reproductive structures, especially the female cones, are produced well out of efficient research for the forest geneticist. Selected parental material for a pine breeding programs may be growing at widely separated locations; indeed, some interspecific breeding programs require parental material from different continents. Consequently, the first step in a pine breeding program is the establishment of a breeding or seed orchard where all the selected
parent trees can be maintained on a common site. This requires significantly large acreages devoted to the orchards and their surrounding buffer zones. For example, the three major cooperative pine breeding programs in the South operate at least 7000 acres of seed orchards (10).

These orchards may be established either with mature scions or with seedlings, but in either case there is at least a five or more year interval from the time of orchard establishment until sufficient female cones are available for breeding work to begin. Establishment and maintenance costs can be considerable. For loblolly pine Porterfield (8) has estimated that in the 10-year period that it takes to bring a seed-orchard into commercial production, total costs for establishment, maintenance and progeny testing will run about $86,000 per acre (1972 data) exclusive of land costs.

To produce large amounts of seed by the controlled crossing of two selected parents is prohibitively expensive and can be practiced only in labor intensive economies. Hence, most progeny testing and certainly commercial seed production in this country must be limited to open pollination among seed orchard plants. To some extent this is not as great a problem as it would be in an agronomic crop, because in forestry practice more variability can be tolerated in the growing stock. In fact, substantial variability may be essential in a crop that must survive many growing seasons before the final harvest. It has been suggested however, that this maintenance of variability might be better achieved by the planting of multi-clonal lines where the proven genetic quality of each clone was known and maximized as nearly as possible (9).

Under natural conditions, pines flower only during a brief period in the spring, severely limiting the control led pollinations that can be made even in the absence of cost considerations. Pines might be induced to flower at other times of the year under controlled environment, but this would be impractical for large scale breeding.

A final problem in the conventional approach to pine breeding is that it takes a year and a half from the time of pollination to seed maturation. During this time the seed crop is open to the ravages of climate, insects, and animals. Furthermore, climatic cycles and nutritional balances in the trees usually cause a 2 to 5 or more year periodicity in heavy cone production.

Proposed Breeding Procedure for Pines

As a striking alternative to the current breeding procedure for pines I propose that an approach analogous to the tobacco hybridization technique (5) may eventually be practical and even preferred for the breeding of pines. I will not call this technique parasexual or even somatic hybridization because it is centered on the fusion, growth, and differentiation of gametophytic cells. In the Gymnosperms the nurse tissue surrounding the embryo of a seed is derived solely from the female parent. It has exactly the same genetic constitution as the egg cell does prior to fertilization. It is referred to as the female gametophyte. In essence then, this gametophytic hybridization would mimic regular sexual reproduction, but move it from the realm of the tree tops to the test tube. In outline, the method consists of the following steps:

1. The collection of a few female cones from each tree selected as a parental stock.
2. The aseptic isolation and growth of the female gametophyte.
3. The removal of cell walls from the gametophytic protoplasts that are to be used for a specific "cross".
4. The mixing of parental protoplasts in a solution conductive to fusion between protoplasts.
5. The planting out of these mixtures for the growth and selection of hybrid tissues—the "seeds" for a new improved crop of trees.
6. The differentiation of hybrid tissues into hybrid seedlings.

The collection of a few female cones from each tree selected in a breeding program would require no more effort than the conventional approach to pine breeding does in its initial stage. Providing that female gametophyte tissue can be continuously maintained and increased by subculturing, the collection of cones should be necessary only once from any given parent tree. Since each entire female gametophyte usually develops from a single product of meiosis each gametophyte cultured represents a stock of a specific gamete (egg cell). By initially culturing the gametophytes from many seeds of a selected tree the value of an array of its gametes could be determined. Then only those gametophyte cultures which had a high "breeding value" need be retained.

That the isolation and culture of the female gametophyte of pine is practical has already been demonstrated (1,2). However, there is still some question whether this is best accomplished from mature or developing seed. Also in need of study is the long term culture and amplification of gametophyte tissue. Instability of chromosome number is a frequent problem in cell culture, so some method of preventing these changes may need to be developed. In any event, the large, easily studied chromosomes of the pines would facilitate

AMES FORESTER
the necessary monitoring of tissue lines to be sure chromosome aberrations were not occurring. Spontaneous doubling of the chromosome number of pine female gametophyte cultures has been observed (2), and some means of preventing this would be necessary.

Steps 3 and 4 of the method should be straightforward applications of the protoplast isolation and fusion techniques that have been used for other plants.

The key element in Carlson and co-workers’ success in producing the tobacco hybrid was the culture media they used. Only the hybrid cells were capable of growing on the regeneration medium, so a very selective screen was available for sorting out the cell mixture resulting from the fusion step (3). The lack of such a fortuitous nutritional screen may hamper the application of protoplast hybridization in many cases. In the case of pines however, there is the potential for a screening system nearly as good as the one used with tobacco. In the cell mixture resulting from the fusion step there should be a collection of haploid cells from both parents that did not undergo fusion, diploid cells from the fusion of “like” and “unlike” parental protoplasts, and possibly auto- and hybrid polyploid cells from multiple fusions. Haploid cells and diploid cells of “like” fusions will be complete homozygotes (i.e. there will be none of the intracellular genetic variability that is considered very important in the pines). Present knowledge of the severe inbreeding depression in most pines suggests these cells would be inviable or grow very slowly as differentiated plants. Cells having more than the normal number of chromosomes (polyploids) should also be at a marked growth disadvantage since there appears to be a barrier to polyploid success in the pines (5). Only the diploid hybrid cells should thrive.

The final step in the proposed scheme—the differentiation of tissue cultures into seedlings—is currently receiving a good deal of attention. Several conifer species have recently been handled successfully through this stage. Considerable development of techniques should occur in the next few years.

The use of the gametophytic hybridization technique would eliminate many of the problems of the conventional pine breeding procedure. Large acreages of seed orchards would not be needed. The attendant climatic, pest control, and periodicity of flowering problems would be eliminated. To be sure, a substantial investment in laboratory and culture room space would be necessary, but an economy of scale might make this practical by combining many regional breeding programs into one laboratory complex. Potentially, the material currently growing in a large seed orchard could be condensed to the size of a single growth chamber. By spreading the breeding period out over the entire year this method would allow a constant sized work force specifically trained for the breeding procedure.

The time from pollination to growing offspring might also be reduced. It is probably dangerous to extrapolate from tobacco to pines, but Nagata and Takebe report that their plated-out protoplasts grew into a large enough tissue for differentiation within six weeks (7). If we could come anywhere near being that speedy in the pine work, then gametophytic hybridization would significantly improve the speed of off-spring production.

And of course, the major advantage of gametophytic hybridization is that not only would it make controlled (full-sib) hybridization feasible, it would also allow “identical-sib” production. Once a particular “gamete” stock or a particular cross is proven to be of special value, then the maintained tissue culture stocks should make it possible to reproduce the identical “gamete” or cross whenever desired. Subculture of the hybrid tissue or plants would also allow proliferation of promising genotypes.

Given the current status of our technical knowledge, the practicality of gametophytic hybridization in pine breeding is certainly not yet proven. However, I think the unique features of pine which I have outlined in regard to such a breeding approach are sufficient to justify further consideration and research in this direction.

Literature Cited


Dr. Richard B. Hall is a native of north central Illinois, La Moille. He graduated with a B.S. in Forestry from the Iowa State University in 1969, and was awarded the Ph.D. from the University of Wisconsin-Madison.
Forestry Extension in Iowa

Present Focus and Future Trends

Dean R. Prestmon & Paul H. Wray
Professor of Forestry & Assistant Professor of Forestry
Extension Foresters

Forestry extension in Iowa has thoroughly re-examined its educational role in recent years. Traditionally, extension programs have focused on woodlot management for timber production, windbreak establishment and care, Christmas plantation establishment, and timber processing. During the past 10 years, a program element relating to proper use of wood in building construction was added. Beginning in 1974, major program emphasis has shifted and now presents some differences both in type or program and in concentration of resources.

Staffing pattern and personnel have been adjusted to meet revised objectives. The forestry extension staff consists of two professionals plus one half-time graduate assistant. Each of the two professionals holds a 75 percent extension appointment; one has a 25 percent teaching appointment and the other has a 25 percent research appointment. This limited staffing requires careful allocation of time and other resources to specific programs if maximum impact is to be realized.

Currently approximately 25 percent of staff time is devoted to woodland management and tree plantings. Impetus for continued strong input into this program area was provided by the recent forest survey results. Iowa lost approximately 1.5 million acres of land classified as forest during the past 20 years. This program element focuses attention on management of wooded areas for a variety of uses (timber production, recreation, aesthetics, erosion control, wildlife production), timber marketing, plantation and windbreak establishment, and proper use of native lumber. Information delivery systems include conventional, meeting-room educational sessions as well as field days and demonstrations. Interest in forestry in Iowa has increased rather dramatically in recent years; for example, forestry field days held at two state forests during 1976 each drew an audience of 75 people. An additional two forestry field days are scheduled during the fall of 1977.

Another important program element to which we have allocated 20 percent of total forestry extension effort is continuing education programs for professionals. Forestry extension has provided training for most of the field staff of the Soil Conservation Service, during the past year. We have sponsored an annual continuing education session for the forestry section of the Iowa Conservation Commission. Forestry training for country and area extension field staff is also a priority program. In cooperation with the Iowa Conservation Commission, forestry extension sponsored a week-long hardwood lumber grading short course in 1975, 1976, and 1977 for processors and distributors. The thrust in this part of the forestry extension program is toward multiplying efforts by wholesaling information.

Approximately one-fifth of staff time has been allocated to proper use of forest products in building construction. Area conferences in different parts of the state have been organized for home builders, material suppliers, and financing institutions. Six area conferences have been held this past year with an average of about 75 people. A topic of real interest today relates to energy conservation;
the merits of wood and frame construction have been discussed at many of these programs. Proper use of wood in new construction and maintenance of wood in housing have been considered at several meetings for the consumer. Several support publications have been developed.

Conservation education for youth has consumed approximately 15 percent of staff time. The two major efforts in the work with youth include our participation in the Career Workshop at the Trees for Tomorrow Environmental Center at Eagle River, Wisconsin, and the Iowa 4-H Conservation Workshop. The Trees for Tomorrow Career Workshop involves cooperation with two other universities and permits participation by 20 outstanding Iowa high school juniors. The Iowa Bankers Association cooperates in the support of this program. The 4-H Conservation Workshop also provides an excellent opportunity to educate youth on forestry. In addition, forestry extension participates in several outdoor classrooms for elementary, junior high and senior high boys and girls each year.

A new, multidiscipline Community Tree Program was initiated in 1976. This program is designed to assist small Iowa communities improve and expand public tree resources. Several extension specialists from different departments on campus have been involved in this effort. During the first year, a total of 20 different meetings were held in 13 Iowa communities. It is projected that about 10 to 20 new communities will be involved each year. Forestry extension has taken a leadership role in this educational endeavor; 20 percent of our time is allocated to this effort.

The residual time is primarily consumed by handling specific requests for information through personal counseling and answering letters. In addition, radio and TV programs are presented periodically. Major efforts have been made toward the development of supporting forestry extension pamphlets in recent years; forestry extension has also developed a new mode for providing specific information through "Forestry Extension Notes."

Specific federal legislation has been proposed to expand forestry extension throughout the country. If increased funding permits expansion of staffing, forestry extension in Iowa is likely to focus those additional resources on community tree programs and on conservation education.

The future is bright for forestry extension in Iowa. We are convinced a major contribution is currently being made and expanded opportunities are ahead.
Ecological Principles behind Fire in the Forest
Gary A. Knutson

From the time white man first set eyes on the new world called America, he was awed by it's tremendous wealth in forests and wildlife. As people began to colonize the new world, they became acutely aware of what they considered a detriment to the forests: fire. Lightning caused fires have been around for 12,000 years, roughly since the last ice age (8). These fires would move across the forests and eventually burn themselves out, started and stopped without man's help. In the far western Sequoia mixed conifer forests, white settlers discovered something they couldn't quite believe. They American Indians that lived in and around the Sequoia forest were seen occasionally setting the forest on fire (3). These ignorant savages! Why did they burn their forest and drive away wildlife?

Gradually the "civilized" white man organized and developed techniques and equipment for combating the wasteful fires. Today fighting fires is a big expensive business and has successfully reduced the size of most fires to a national average of only nineteen acres.

Now ecologists are beginning to question whether the prevention of naturally occurring fires is doing more harm than good. This is the problem I will investigate; the ecological principles behind periodic controlled burning of the forest. First let's explore the effects of complete fire prevention, and then what burning of the forest can do.

In the unburned forest, the amount of dead trees, limbs, needles, and other forest litter accumulates to very large amounts. Some measurements show that this fuel has built up to 50 tons per acre in some areas (8). The litter build up depends on dampness and warmth to aid bacteria and fungus growth (8). Natural rot reduces forest litter to an acceptable accumulation in some areas, but other areas depend on fire to reduce the layer. A deep litter layer has many detrimental affects to the forest ecosystem.

When a fire does occur with large amounts of litter on the forest floor, its chances of developing to a crown fire are magnified enormously. The number of these serious crown fires have increased since all natural burning of the litter layer has been controlled by man (1). Crown fires generally completely destroy most of the organisms in a given area (10), including large economically important trees that survive natural ground fires.

The litter layer, being a thick vegetative mat, is generally not a good rooting media for tree seedlings (9). Research has also found that hydrocarbons contained in the needles of ponderosa pine, and some other conifers, are actually poisonous to seedlings (8). These hydrocarbons leech into the soil and make it deadly to new plants. Thus, this excessive litter layer is not conductive to the starting of new pine trees, but instead favors tolerant herbaceous and woody undergrowth plants.

The extensive litter layer serves as an environment for seed eating rodents such as deer mice, vole and western chipmunks. These mammals can cause tremendous damage to prospective seed crops and in conjunction with all the other detrimental factors of a thick litter layer, make the establishment of the desired trees almost impossible.

As mentioned previously, the deep litter layer allows for the growth of dense herbaceous and woody plants that grow rapidly and compete with the trees. Abundant historical records indicate that the landscape depended on fire as a source of disturbance to rejuvenate the quality, quantity and distribution of vegetative composition to which wildlife responded (4). Without fire, animals such as moose, elk and deer move out of the forest and try to find browse elsewhere.

The ecological pluses of burning are just now beginning to be identified and put into proper management use.

Elimination of the deep litter layer is a good preparation for establishing seed beds for forest reproduction. This type of site preparation is accepted and used quite widely by foresters today. Burning also eliminates the habitat and destroys many damaging insect populations.

Several studies have been done on small mammal populations after burning of the litter layer. These studies showed that the small mammals are decimated by the ground fire and that populations stay low for as long as ten years (2). The notable exception to this is the deer mouse whose population increases rapidly after a burn and decreases only after the tree seedlings are well established and growing (5).
Burning of the litter layer releases nutrients pent up in the needles and other litter on the forest floor. In 1972, a group of scientists burned a plot of Montana forest and discovered that a fire hot enough to consume all litter, left 3,000 pounds of nutrients per acre available to be dissolved by rain, and absorbed back into the soil (8). Burning also breaks down the previously harmless nutrients, and returns them to the soil as basic elements for a fertile seed bed (8).

A surprising discovery was made by Dr. John Parameter, plant pathologist at the University of California at Berkeley. Parameter burned pine needles in smoke chambers and piped the smoke onto various plant parts to measure its effect. He discovered that even a sixteen minute exposure to smoke would reduce spore germination of cereal smuts, forest tree rust and common mold by as much as 79 percent. Even a small forest fire produces lots of smoke. It drifts for miles and lingers in low places for days. The antimicrobial effect of smoke in western forests must have held rust and smut in check for thousands of years. Without fire, chemical sprays become the obvious alternate to widespread infections (8).

The effect of fire on wildlife browse is also quite surprising. In a controlled burn on the Selway-Bitteroot Wilderness conducted by Robert Mutch and David Aldrich of the Northern Forest Fire Laboratory, a Forest Service Research Center in Missoula, Montana, many new discoveries were made. Red stemmed ceanothus, the most important browse for deer and elk, needs heat to crack its seed coat so moisture can be imbibed for germination. In areas where fire intensity was low, 9,000 sprouts per acre were found, in high intensity areas 80,000 sprouts per acre were counted (8). This type of study shows how wildlife are attracted to burned areas to feed on the post-burn vegetation.

The Jack Pine (Kirtlands) Warbler has been put on the endangered species list, and almost became extinct because of man's prevention of forest fire, an environmental must for the warbler (7). Many other species such as muskrat, woodcock and quail depend on periodic fires to maintain their habitats and provide them with food from vegetation that sprouts after such fires (6).

Other types of vegetation are adapted to periodic forest fires. Two notable ones are the jack pine and the southern longleaf pine. The jack pine needs heat in excess of 80 degrees for dispersal of seeds, and the seeds grow best without organic matter, on mineral soil (1).

The terminal buds of the longleaf pine are fire resistant. The pine develops an extensive root system while exposing only the terminal bud to fires that used to eliminate young deciduous trees that would eventually cause shade and prevent the development of the young pine seedlings (10). When the root system is fully developed, the tree shoots up very rapidly to a height above the danger level for ground fires (1).

We can see by this evidence that fire indeed is a very important factor in the ecology of forest lands. It eliminates much of the litter layer, thus reducing the threat of severe, damaging crown fires. Fire prepares the way for new trees by allowing the seeds to settle on the soil surface, eliminating insect pests, small mammal pests and releasing needed nutrients to the soil. Wildlife is also attracted to burned sites because of the increased habitat and browse available.

I must emphasize that these fires should be carefully planned and executed, and are not needed everywhere. An accurate determination should be made by foresters and ecologists as to what that particular community needs are, and how they can best, and most naturally be met.

The role of fire in the forest ecosystem was recognized by the Indians of the giant Sequoia forests hundreds of years ago. It's time "civilized" man began to realize the potential ecological plus of controlled fire, and use it.

**Literature Cited**


This paper was prepared as part of the requirements for For 101 (Introduction to Forestry) The author Gary Knutson is a junior.
Notes on the Life and Times of a Caterpillar

Joel S. Tuhy

You’re probably wondering why I’m sitting here talking to you now. Truth is, I want to tell you all about myself. My entomologist acquaintances call me Malacosoma disstria Hubner. The fact that everyone else calls me a forest tent caterpillar is sort of misleading, because I don’t make silk tents like some of my equally illustrious cousins do. I would like to tell you about some of the natural advantages and disadvantages I have in maintaining myself in my niche here on the earth.

I eat leaves for a living, lots of them. You’ll find my brothers and sisters throughout most of the United States and Canada, eating the leaves of a variety of hardwood trees. Why are we successful? First and simplest, we caterpillars are blessed with mouths that can bite and chew fragments of leaves, and since leaves provide us with a source of proteins and nutrients and chemicals known as steroids, we find them to be ideal foods.

Our life cycle and the forms we take in it are advantageous. For example, the adult of our species, which I will later become, can fly. Such flight can spread our future generations into areas in which we haven’t yet feasted; if our food runs out where I am now then we can fly, hopefully, to more food. And our adults are colored inconspicuously, so they won’t be likely to be trapped for food themselves. Also, the adults don’t compete with us caterpillars for our leaf-food; in other words, when I become an adult moth I’m not going to make it hard on next year’s caterpillars by eating a lot of their food.

The eggs that our adults lay, and from which I hatched, can survive the winter cold; and they are really cemented together so they won’t come loose from the twigs they are laid on. Our female moths are pretty good about laying eggs near a supply of food; some insects lay eggs anywhere without regard to what the next generation will eat upon hatching.

Our species is affected, to our benefit, by light. As we all know, plant activities are seasonally regulated by photoperiod; so we key on this and match our activities to the activities of our host plants. When our eggs hatch in the spring, the little caterpillars feed on the tree buds that are beginning to swell. Then as those caterpillars grow their appetite changes to the liking of leaves, which I eat, because the tree also has turned its attention to producing a crop of leaves.

Another advantage we have, that we share with all insects, is that we are “cold-blooded,” rather than having to maintain a certain body temperature (within limits of course); so we have a wide range of temperatures that we can live in. And when the temperature does get dangerously hot or cold we can move to areas in the tree or forest that help counteract the temperature, like getting out of the sun on a hot day.

There are many trees that we caterpillars eat the leaves of. This works to our benefit; for example, if some of my brothers in the South are eating some sweetgum leaves and find that there aren’t enough in one place, then they just switch to tupelo gum or black gum or some oaks there which are equally palatable, and they don’t go hungry.

But alas, life is not a bed of aspen leaves for us forest tent caterpillars. For some reason we make men mad at us so they try to stop us from eating our leaves. But we have had problems long before men invaded our native woods. Such natural disadvantages to life are several.

For one thing, the weather doesn’t always cooperate. Like I said before we are cold-blooded, but if it gets as cold as it has some places this winter then we aren’t going to have as many little caterpillars hatching next spring as we usually do. Hot temperatures in the spring and summer can be just as bad for us mature caterpillars and the adults, especially if it is as dry as it has been here in the middle-west the past several summers. The high temperatures speed up our metabolisms so we need more water, but it’s hard to get much water from dried-out leaves. And freezing weather in the spring after the little caterpillars hatch out can really wreak havoc on them. You see, even though the actual low temperature may not kill them, the suddenness of the drop can. Or if the temperature doesn’t affect us caterpillars at all it can kill the leaves we need for food. Last year the little ones got lucky on this account because the spring was so warm.

As if the cold or heat wasn’t enough we’ve got other climatic woes. Driving rains and wind can knock us right off our leaves and trees; hailstones do
the same, plus they can deliver fatal poundings to us and/or to our leaves.

Our voracious appetite sometimes leads to our undoing. Sometimes we'll feed in huge masses in hardwood stands and eat so much that there is nothing left. Our polyphagous habit doesn't do us much good then; there could be plenty of trees around but there are some leaves that we can't stand to eat, so we starve. If we caterpillars eat everything and manage not to starve, then the next generation that we propagate will surely starve.

When our population densities on an area get really high, we are past our optimum level (or carrying capacity, if you will) and are ripe for destruction. Birds and mammals may eat us, but they aren't our major enemies.

We caterpillars can be decimated by virus diseases, especially nuclear polyhedrosis virus diseases. We may be diseased by bacteria or by pathogenic protozoa. Cool, moist springs and summers may cause prolonged developmental periods of the little caterpillars; such conditions make them targets for fungus diseases. Some of my Canadian ancestors were wiped out by an epizootic of the fungus *Entomophora megasperma* in 1949-1952.

We caterpillars are victims of parasites, ranging from nematodes to hymenopterous and dipterous larvae that kill us by developing inside us. We may also be victims of various predators: mainly insects and other arthropods, plus the birds and mammals I mentioned earlier. These diseases, parasites, and predators can not only strike singly, but in combination as well. Here in a native natural situation, these disadvantages to survival would generally balance the advantages that we have that I mentioned earlier. The reason you hear so much about us forest tent caterpillars is that man and his practices have tipped the balance in our favor and against our enemies. Thanks.

References


Joel Tuhy, a senior in Outdoor Recreation, wrote the preceding paper for For 416 (Forest Pathology/Entomology).
FACULTY & STAFF

(from left) George Thomson, Debbie Krogmeier, Paul Wray, David Countryman, Dean Prestemon, Robert Meier, Richard Faltonson, Dwight Bensend, H. S. McNabb Jr., Wendell Beardsley, Marcia Fisk, Fred Hopkins, Steve Jungst, Richard Hall.

Forestry Association of Graduate Students

Forestry Association of Graduate Students (F.A.G.S.): (from left) Don Howlett, Carl Ramm, Ho Shinn, Jeffrey Dawson, Ole Helgerson, Gene Campbell, Don Koo Lee, Jim Aldeman, Marcia Fisk, Carol Cochrane.
A Special Man

Dr. Dwight Bensend was honored with an Outstanding Teacher Award. One of six ISU faculty so honored, he was selected by the College of Agriculture.

The staff of the Ames Forester joins the students and faculty of the Forestry Department in wishing Dr. Gordon continued success in his professional endeavors.

Departing Faculty

At the end of February 1977, John C. Gordon left Iowa State University to accept a position as head of the Forest Science Department, Oregon State University School of Forestry.

Dr. Gordon received his B.S. in Forest Management from Iowa State University, went to the University of Helsinki to study silviculture, then returned to Ames to earn his Ph.D. in Plant Physiology-Silviculture in 1966. He was an Instructor of Forestry at I.S.U from 1965-1966, then spent four years with the U.S. Forest Service, N.C. Station investigating the physiology of wood formation. Dr. Gordon returned to I.S.U. in 1970 as an Associate Professor of Forestry, and was promoted to Professor in 1973.

Xi Sigma Pi

Christopher Walker
Chapter Forester

This society was set up in 1908 at the University of Washington to encourage and foster high standards of scholarship and personal performance in the forestry and natural resources profession. Here at Iowa State University we have a chapter, Alpha Gamma, which was established in 1965. Since then, Juniors and above who show excellence...
in the field of natural resource management, and who show those character traits indicative of high performance potential, have been invited to become members.

Those who accept the invitation to join undergo an initiation consisting of dressing neatly for a week (a considerable hardship to some!) and wearing a wooden tree (6" or 7" long) hung around the neck on a white and green ribbon. The new initiates must meet as many current members as possible in the week, and obtain their signatures on the back of the tree. This tradition helps old and new members to become acquainted. The $5 national dues cover life membership and there may be local dues for active membership in any year.

Each year the members select an individual as the Outstanding Sophomore of the Year. The name of the winner of this honor is inscribed on a shield given in memory of Keith A. Bauer, a Xi Sigma Pi member of this Chapter who was tragically killed in an automobile accident in September 1965. At present the nominee is not awarded a prize, but recently members have agreed to begin raising a fund for investment, the interest from which will be used to purchase books to enhance the recipient's library. Ways of raising this money are under discussion.

The society awards a $200 scholarship to an undergraduate student member from each of the six regions. Within our region there are six other universities. The administration of the award is done on a rotation system by one of the chapters in the region. Each of the other chapters is allowed to submit one candidate, and since the administering chapter is not allowed to submit a candidate, the chances of winning the scholarship are one in five—not bad odds! We have nominated a member this year and the announcement of the winner should be made sometime in March.

There are four elected officers—Chapter Forester, Associate Forester, Secretary/Fiscal agent, and Ranger. Currently they are respectively myself, Marcia Fisk, Carol Cochrane and Chuck Maynard. Elections will be held for 1977/1978 officers before the end of May. Our faculty advisor is Dr. Larry Promnitz.

President Review
Forestry Club
Bob Meier

The Forestry Club faced many changes and enjoyed many successes during the past year.

We were fortunate to have Mr. Steve Jungst join Dr. Hall as a faculty advisor to Forestry Club. They have both been a great help to the Club.

There have been many changes in the Forestry Department during the past two years which have affected the Forestry Club. One of these changes has been the opening of the departmental decision making process to students. Thanks to Dr. Thomson the Forestry Club president participates in faculty meetings and students participate in the selection process for new instructors. These changes have given students more opportunities to exercise and expand their decision making and management abilities. I feel this is an important addition to the educational process.

During the past year the Forestry Club has remained very active and has added several new activities. We placed third in the Spring-Fling competition sponsored by the Agriculture Council. The Student-Faculty Skating Party went well. I hope this type of activity can be increased. The Loquacious Loquat newsletter has been started up again and is keeping the students informed about Departmental and Club activities. We cannot forget the addition of snow at the skiing party, even if it was artificial.

Last Spring the Forestry Club was active with the Game Banquet, the Seedling Project, and the Veishea Display. Fall started with Freshman Welcome at Soper's Mill. The Conclave Team returned from Michigan Technological University at Houghton, Mich. without the Bear Skin after scoring several points. Holst Tract was the scene for Fall Foresters Day. Christmas Tree Sales and the Skiing Party finished out the year. We were again active in a wide range of intramural sports with the hockey team earning an 11-1 record.

The future of the Forestry Club looks good. A new constitution will help alleviate some of the problems encountered during the past year. Participation has been good with over forty members attending many meetings. After a year of working with the people who will be leading the Forestry Club next year I am confident that Forestry Club will continue its success.
Forestry Club Members
1976-1977

Freshman and Sophomores: (first row from left) Dennis Haugen, Sue Mellerup, Koral Santman, Joyce McClure, Elaine Caldbeck. (second row) Sue Kleitsch, Kirsten Held, Laura Knepp, Carole Gillespie, Connie Reints. (back row) John Natvig, Nita Rauch, Klint Johnson, John Crane, Dave McCoy, Robert Harrington, Keith Walton, John Jennett.

Juniors: (from left) Craig Boldman, Mike Cloughesy, Terrie McCoy, Robert Harrington, Keith Walton, John Jennett.

Seniors: (front row from left) Dale Leeper, Dan Jondle, George Ivory, John Swenson, Bob Houseman. (second row) Clark Tiecke, Mary Blenkush, Mike Vorwerk, Carla Derby, Bob Meier, Bob Hinchberger. (back row) Brian Heuer, Lance Logan, Joel Tuhy, Mark Lieurance, Mike White, Ray Dirksen, Dwight Lundquist, Mark Webb.

not pictured:

The 1976 Game Banquet holds a rare distinction. It was probably the first one held in two rooms of the Memorial Union in the same year. At 5:30 p.m., March 28, everyone gathered in the Sun Room for the awards and results of the club elections. Later we went to the Campanile Room for the meal and speaker.

Jim Jaminet was the master of ceremonies for the program in the Sun Room. Past Club President Chip Scott announced the results of the club election. Awards and scholarships followed.

At 6:30 everyone moved into the Campanile Room for the meal. This year we were well-stocked with fish and lesser amounts of buffalo, pheasant, deer, squirrel, and rabbit. Also on the menu was mashed potatoes and gravy, jello, three-bean salad, and cherry-topped vanilla pudding.

Dean Bennie Mayberry from the Tuskegee Institute in Alabama then spoke on the involvement of minority groups in resource management. Co-chairman Lance Logan and I went to thank everyone who came and helped make the 1976 Game Banquet a success.

The winners of the awards are as follows:

Keith A. Bauer — Teresa McCoy
Hoo Hoo — Paul Schroeder
J. Milton Cone — Keith Walton
S.A.F. — Dan Garst

With the Upper Iowa River at flood stage, 40° weather, and driving winds and rain, 12 brave(?) souls headed for the Kendalville put-in point on the spring canoe trip. Friday night the group camped out after a meal of soggy stew and biscuits. Since the weather looked even more dismal in the morning the group, of course, went 13 miles. Later, sanity prevailed and the Saturday night cookout was held in a warm kitchen in Ames. The trek was declared a rewarding experience in spite of obstacles.
Spring Fling—May 2, 1977

Our Team: (front from left) Mary Blenkush, Carla Derby, (back) Diann Spoerl, Jim Jaminet, Dave Binegar, Bob Meier.

... and their mighty efforts ... captured third place!

Veisha Seedling Sale—1976

Veisha Display 1976

... Profitable sales on Campus.
SUMMER
CAMP 1976
Carole Gillespie

Don't be chained to desk, machine or store counter. Many forestry men hunt mountain lions, wrestle bears, parachute from planes to help marooned animals or save injured campers. Live the outdoor life you love. Sleep under pines, catch breakfast from icy streams. Feel and look like a million. Live a life of thrills and adventure. Become a Forester and get all this plus more.

This past summer at Cloquet, Minnesota, no one became a Forester. Well, at least not in that sense. But we did become more aware of what a profession in Forestry really involves and what to expect in the “outside” world. Field experience taught us not how to parachute from planes, arrest violators or any of the other things you can do when you become a Forester, but the skills we will actually use on the job such as surveying, tree identification and even the art of hazelbrush clearing. Most importantly, summer camp gave us the chance to meet with other Foresters and learn how live with them, literally.

Before I came to Cloquet I was led to believe that Cloquet was a one horse town and the only places to go for excitement were the laundromat and the firetower. Fortunately, I was pleasantly surprised to see no less than five horses and some dogs and even people running around. It did take a while (one day?) to find that Cloquet did have, along with the laundromat and firetower, a fairly good selection of bars to go to if class work got to be too much. The most frequented bar was the Viking. Many Foresters could be found there almost anytime, with a beer in hand playing pool or fooseball.

The firetower was another favorite place for those of us who wanted to see the sun set or for some (not many) die hards who wanted to see the sun rise. The “Red Forest” (actually Norway or Red pine) below the fire tower was also a good place to go through if you wanted to see what the kids of Cloquet did after dark. Almost every night, starting around dusk, a beer bash would get going. From the fire tower you could hear music and occasionally a crash as a car missed a turn and hit a tree, missing (hopefully) the Wolf Trees.
During the week, we covered a lot of miles in the truck and vans for our Wood Utilization and Multiple Use classes. Blandin paper, Koppers, Erie Mining, some soggy bogs, and Superior National Forest are some examples of the places visited. In Cloquet, Potlatch and Diamond Match also lent themselves to field trips.

For the most part, people stuck fairly close to camp during the week, but when Saturday noon rolled around camp was nearly deserted. Some favorite weekend spots included a drive up the North Shore, going to Duluth or heading out to Perch Lake.

Our Summer Camp Staff: Winkin', Blinkin' and Nod: the Babes in the Woods.

Front, Neal Saul, (1st row L to R) Roy Schwenke, Dan Jondle, Gary Schrock, George Ivory, Bill Boslet, John Jennett, Wayne Armstrong, Mike Cloughes, John Natvig, Bob Hinschberger, Diane Schmidt, Mike Dawson, Joyce McClure. (2nd row L to R) Dr. Hall, Dan Newquist, John Stasi, Mike White, Curt Krambeer, Jerry Gibson, Dale Leeper, Jim Crawford, Elaine Caldebeck, Carole Gillespie, Terrie McCoy, Dr. Bensend. (back L to R) Jim Funck, John Crane, Dave Watson, Mike Milota, Dave Schramm, Clark Tiecke, Brian Heuer, Fred Bagnall, Peter Boedeker, Rick Walters, Dennis Dwyer, Ron Bockhaus, Jeff Olson, Russ Foust, Steve Junst. Missing, Sue Kleitsch.
Perch Lake has a lot of tales surrounding it. It has been told that if the Indians ever caught you fishing back there they would beat you up and burn your car. Fortunately, we never had to put this story to the test since we never saw anyone or anything back there but the fishes. And boy were there fishes!!!!! For a few weekends the avid fishermen in our group would go back to Perch Lake and haul in the Northerns. In fact, they caught enough fish for a fish fry the last weekend we were in residence. There also was a tale told of a Minnesota Jaws in the lake, with quite a selection of hooks and flys in it's mouth. Although the most anyone ever saw were the Minnesota Guppies, the tale of the "Jaws" will live on.

Along with the Northern that lived quite abundantly around Cloquet, the Minnesota State Bird also thrived. OFF mosquito repellant took the place of deoderant (almost), and no one but the brave or foolhardy went out without their coveted supply of Cutters.

On our two day weekend, once again the camp was deserted. Some went home, some went up the North Shore again, some went to the Boundary Waters Canoe Area and fourteen of us went canoeing down the St. Louis River. The weather was just right for sunning and all of us got sensational burns. (Noxema was the most coveted item this time). Although the St. Louis wasn't the BWCA, the scenery and the rapids made the trip worthwhile. (It might be profitable for the State of Minnesota to start mining the rapids for aluminum). We started thirty miles up river from Cloquet and spent two days making our way downriver, floating, swimming and enjoying our break from the "map war." Unfortunately, the last three or four miles were the worst forty miles ever canoed. It was amazing how fast the wind could come up out of nowhere, but all too soon break was over and were back in the wars.

A weird thing at camp was if you were early for anything you were on time and if you were on time, you were late. But when it came to meals, no one was late. We learned from the start that survival of the fastest or he who hesitates... applied and if you wanted anything to eat the first time around, you had to make a wild grab for it. This theory of survival of the fastest applied especially to milk. Milk was a highly sought after item, and if by chance you missed the first carton, you'd have to shanghai the cooks into giving you another and if that failed, go begging at other tables. Quite a few times you would end up with water.

Survival of the fastest also applied to our leaf collections for Dr. Hall's Forest Ecology. If you put off collecting leaves until the last moment, your tree may have already been nearly defoliated. There are a few trees around the compound that are missing bark or limbs within an arms reach high.

All too soon, August 6 rolled around and we had to say "Good-bye" to all our friends, enemies, Dr. Bensend, Dr. Hall, Steve Jungst, the cooks and the "Wreck of the Edmund Fitzgerald" who made everyones stay at Cloquet an experience to always remember and also made this year's summer camp the best ever!!!!!!

**SUMMER JOBS**

*A Summer with Weyerhaeuser*

**Bob Meier**

A Weyerhaeuser Internship, a lake side house, and several friends combined to make a great summer for me. I worked out of Mountain Pine, Arkansas as a Summer Forestry Intern. Ray Dirksen, John Swenson, and myself all from ISU and Mike Patneande from the University of Minnesota lived in a house on Lake Hamilton just outside of Hot Springs. The lake was on one side of the house and there was a swimming pool about fifty feet in the other direction.

Needless to say we spent a lot of time in or on the water. I did some bass fishing southern style and learned how to water ski during the summer. We tried to enter a canoe race in Little Rock. It had been canceled due to high water which had caused many drownings. While in Little Rock we met some local residents who recognized us for the "professional" canoeists we were not. They recommended several rivers that had only had a few drownings on them. Being men of action we proceeded to De Gray Lake for an afternoon of floating on air mattresses in calmer water. We also spent a lot of time enjoying the mountains and other lakes around Hot Springs.
Back to the job. The Intern program included working about one week in each of a wide variety of forest management related areas of the company. I also spent one week in optional assignments and another working on a special project. There were also seminars and tours of company facilities almost every week. We were often treated to catfish, fried chicken, hush puppies, and peach pie alamode before the seminars. They wanted us northerners to eat some good southern cooking and it was very good.

On the job I had many interesting experiences including working on a controlled burn, sitting in on logging and mining contract talks, and touring the Magnolia Nursery and Seed Orchard just to mention a few. My most memorable experience was riding in the helicopter during spraying runs. I had never flown before, but within a few seconds of leaving the ground I was ready to fly for the rest of the day.

Unfortunately the summer had to come to an end. I had met a lot of wonderful people, made some new friends, had a great time, and learned a lot about forestry and Weyerhaeuser.

A Summer as a Logging Intern
Ray Dirksen

With a crash and often refreshing breeze the trees crash to the ground in the usually sweltering stands owned by Weyerhaeuser Company near Hot Springs, Arkansas. For most of the summer such action was a standard daily occurrence. An unusual part was that the trees were felled via a mechanical harvester made by the Drott Company. The Drott was impressive to watch but following it as a cutter to trim the fallen trees was a demanding job. At six in the morning such work makes school seem a lot nicer.

The job provided an exposure to Southern Forestry both from the logging standpoint with actual work experience and overall view via seminars and tours. It was a big change from working at Holst Tract as some of the plantations were twelve feet tall at the end of three years.

The only failure of the summer was learning the knack of bass fishing. It seems an investment comparable to a new car’s cost is needed for the proper equipment. At least I got a good sun tan from those weekends on the lake.

Treemarking on the Medicine Bow
Dwight Lundquist

This past summer was a real experience for me. Silviculture, outdoor recreation, and forest management in general were mixed together in fine fashion.

Work began June 7 with odd jobs around the station. A day or so later we started treemarking on the Brush Creek District, Medicine Bow National Forest, roughly 45 miles west of Laramie, Wyoming. We marked Engelmann spruce, lodgepole pine, subalpine fir, and snag. Now treemarking is a little bit like beanwalking. In both activities the crew worked a swath. While beanwalking, the crew member watches over 2 to 4 rows. While treemarking, the crew member watches over a 20 to 40 foot “row” and “weeds out” the wolf trees, split tops, or otherwise unwanted trees. This worked very well with four-person crews—each took a species and kept track of the number marked. We looked at the spacing, vigor, and location of each tree in deciding which tree to paint, generally following a shelterwood-type treatment.

Several Iowa Staters marked on the Brush Creek District this summer. Al Mowery, I, and Tom Jones (a University of Wisconsin student) looked after our
crew boss, Jon Wessman. Jim Jaminet painted with another crew.

We marked at altitudes between 8,500 and 10,000 feet. After a month of marking (walking about 6 hours a day at those altitudes with a back pack of lunch and several quarts of yellow or blue paint), Jim and I found out how physically fit we were. On July 24—the weekend before the Big Thompson Canyon Flood—we went through the canyon on our way to Rocky Mountain National Park and climbed the seven-mile trail up Long’s Peak (14,255 feet above sea level) in four hours. We started at 8:30 a.m. and passed gasping people who had started out at 6:30! The thrill of walking that high, however, was dampened by the wind, cold, and fog which covered the very top.

Other highlights of the summer included getting snowed in by a June 16 blizzard. Eighteen inches of snowfall blocked our way home, necessitating a party back at the other ranger station. About a month later we found a porcupine aimlessly wondering in a meadow. We were painting the boundary of a stand in blue that day. The blue porcupine was not wandering aimlessly for long.

Later in the summer I got some experience in making regeneration surveys. This entailed traversing 20-year-old clearcuts and counting the vigorous trees on each 8.61 ft. diameter plot. September 2 was my last day of work, and then it was back to the “flatlands” of Iowa.

Where Are All the Trees
Carla Derby

This summer my job took me to the beautiful land of Oregon. As everyone knows, Oregon is the land of trees, trees, and more trees. Strangely enough, this is a fallacy believed by many. My home this summer was found on the desert region of Oregon (East of the Cascade Range) in a town called Paisley with a population of 290. Paisley was one of four districts on the Fremont National Forest. When I pulled into town, I wondered in the back of my mind “If I’m on a stand exam crew, where are all the trees?” As I found out later there were more than enough trees to take inventory form. The major stands I worked in consisted of large Ponderosa Pine (great stands to work in) and Lodgepole Pine (not so jolly a time), but basically, very different to the hardwood forests I had been accustomed to.

My job consisted of taking timber inventory and writing a stand description for each stand completed. I was also given opportunities to assist my stand exam central: (from left) crew boss Mike McGee, Carla Derby, Judy Pawlak, Kevin (Irving) Morningstar, with their fearless 6 pack-leap.

boss with some of his silviculture activities which made the job more interesting. On weekends I helped the fire crews pile brush and once was sent to put out a snag that was hit by lightning.

In all, the experience was marvelous, the country was beautiful, the people I met were interesting and my crew made the summer great.

In Bridger’s Footsteps
Joel Tuhy

While many Americans were celebrating our nation’s Bicentennial last Summer, my job took me far away from such festivities to a piece of our country where men are strangers and time has no meaning: I was working for the Forest Service on a backpacking trail crew in the Bridger Wilderness in the Bridger-Teton National Forest. This 383,000-acre Wilderness is located along the west slope of the Wind River Mountain Range—a 100-mile-long chain of rugged, glaciated, 13,000-foot granite peaks forming the Continental Divide in west-central Wyoming.

The closest town, which houses the District office, is Pinedale, Wyoming; a small ranch town typical of the Great American West. My prime reason for taking the job, however, was to escape towns, which I managed to do quite effectively.

The “job” took a partner and me into this mountain wilderness for ten days at a time to work on parts of the fairly extensive trail system there. Many of those paths are steeped in the history of early Indians and explorers such as John C. Fremont, Benjamin L. E. Bonneville, and Jim Bridger. Our work of chopping trees, kicking rocks, and scraping dirt for erosion control was not...
glamorous by the location was fantastic: to look up from the dust and see snow-streaked grey peaks towering above meadows alive with the riotous blooming of wildflowers under a deep blue sky is hardly something to complain about.

We carried all our food and gear and work tools on our backs, at times lugging packs of 65 pounds or more. There were no horses available for packing, which was fine with us because they are more trouble than they are worth. Our solitary ten-day camping trips were the sort of thing that many others would pay good money to do for two weeks out of the summer; in effect, we were working and on vacation at the same time.

But the greatest moments of the summer came on the four-day weekends, when by myself or with a partner I would explore and climb some of the remote, high mountain peaks in this range, where mountaineering experiences rival those of California and Europe. One trip to note was on July 4, 1976 when by myself I trudged to the distant summit of a 13,350-foot mountain, seeing not a single person the whole time. The summer ended with my brother and I scaling the formidable Gannett Peak, at an elevation of 13,804 feet being the highest point in Wyoming. It was a trip that, in terms of physical effort, brutal terrain, magnificent scenery, and high adventure, I have never equaled elsewhere.

The work and these free-time trips were great for getting me in shape and staying healthy; the physical exercise and pure air and water were invigorating highlights of Wilderness living.

To be sure, I did learn something about the operations of the Forest Service and about wildland recreation management from working in this Wilderness Area for 2½ months. But I must be truthful and say that the mountain wilderness is what drew me west last summer and that I will surely accept another offer again for the summer of 1977 if it comes my way.

IDAHO—The Sun Comes Down the Mountain
Bob Houseman

As the close of spring quarter 1976, came into sight I was quite unaware that many of my lifelong dreams would soon unfold into reality. I had been scheduled to work on a fire suppression crew in Southeastern California but as fate would have it a call from the Avery Ranger District, Avery Idaho came through three days prior to my planned departure. I chose this position as timber cruiser with the Forest Service above the California job because I felt it would bring me better understanding of our forest systems. After finalizing my decision I embarked upon an adventure that would prove one of the most rewarding and influential experiences of my life.

Avery is a small railroad town settled within the Bitteroot Mountain range which serves as a divide between northern Idaho and western Montana. The St. Joe River flows past the town forming a beautiful river valley scene. The population of Avery exceeds between 170-180 in the summer months with most of the inhabitants working for the Forest Service, railroad or logging companies. Along with the ranger district Avery is also well known for the excellent elk hunting in fall and the monthly or weekly train derailment along the river bank.

As previously mentioned my status with the Avery district was timber cruiser. Involvement in this area of pre-sale analysis was preceded first with a week long training session in cruising which eventually would lead to certification. I received my classification as a certified cruiser along with another employee and together we worked on five separate sales between mid July and late October. Each sale was divided into individual sale units anywhere from 10 acres to 200 acres in size. Sample plots were mapped out in each unit and cruised
using variable plot sampling with a 20 to 40 BAF. Western White Pine, Grand Fir, Sub-Alpine Fir, Western Red Cedar, Western Hemlock, Engelman Spruce, and Western Larch were the most prominent commercial species managed in this region. Along with the challenges of timber cruising I was also given the opportunity to try my hand at timber marking, road layouts and traversing. This was very fortunate for me as it helped me open my mind and eyes to new and different techniques in timber pre-sale operations.

I claim this experience with the Forest Service to be a significant dream come true as I had always desired to travel to the Pacific Northwest. My travels through parts of Montana, Idaho, Washington and Oregon displayed to me the abundance and beauty of our coniferous forests in the northwest. My job alone was a bountiful and richly rewarding episode that will undoubtedly prove a tremendous asset to my future in natural resource management. The five months spent there were also enhanced because of the wonderful people I encountered and their influence on my present outlook on life. In respect to this and much more I am hoping to return this summer to a land that is truly God’s Country.

Oregon II
Mark Webb

With another full year of school behind me, I once again left the crowds and confines of Iowa State for a summer job in Oregon, this time in the sparsely populated Blue Mountain country of northeastern Oregon. The previous year, I had worked on the beautiful and water-rich west side of the Cascades, but this year I would be living in the “higher and drier” eastern part of the state. It is generally considered that everything on the east side of the Cascades in Oregon is desert, but the Blue Mountains feature snow-capped peaks, mountain lakes and streams, and vast areas of forest.

Helping protect the forest resource from fire was once again my job. I was employed with the U.S. Forest Service working out of Unity District (Ranger Ed Allen is an ISU graduate) on the Wallowa-Whitman National Forest as a Technician, and more specifically, a Tanker Foreman. One man worked with me. The two of us, along with the area Prevention Guard, were responsible for initial attack and fire suppression on the northern half of the District. We were stationed at Antlers Guard Station, 22 miles up into the mountains from Unity, where we spent the summer and fall.

Living at Antlers was like having a vacation home up in the mountains. We had a two-room cabin which featured no electricity, no phone, a wood stove, a gas refrigertor, and running water from the pump outside. We had a trailer for sleeping quarters and garage-woodshed for storage. The guard station is nestled between high hills with a large meadow across the road, a small stream alongside, and a small river just behind the station. The river provided a swimming hole right out the back gate, a fine place for a bath or swim after work.

Our main responsibility was fire prevention and suppression, but my partner and I enjoyed a variety of work. We made a number of improvements around the station by constructing a pole fence around the area and building an outdoor shower, doing some cement work, painting both buildings, reroofing the cabin, and putting up enough firewood to last a few years. We had eight small fires through the season, four of them lightning struck trees and four of them man-caused. With the end of fire season, some snow and cooler weather, we burned slash piles. That job meant three straight weeks of solid 10-12 hour days of burning piles, patrolling burned areas, and suppressing any fires that got away. I terminated just before Thanksgiving and got back on the road to Iowa to be back here in time for winter quarter.

The summer and fall provided some of the best times I’ve ever had. Being somewhat isolated from people and living and working in a mountain environment taught me a lot about myself and about nature. It was quite rewarding to be away from the many luxuries of our society, luxuries which many people now consider necessities. Taking a quarter off from school provided a good break, didn’t cause any problems, and certainly furthered my field experience and enhanced my chances for a job later.
FRESHMAN WELCOME

September 17, 1976

If we're all looking different directions maybe SOMEBODY will spot our ride.
Midwest Conclave
October 15-17, 1976

This year the Conclave team took their weekend adventure to Houghton, Michigan. The nine man team and their lady coach started early for Michigan Tech and had an enjoyable and non-rushed trip.

The trip north included a stop at “The Trees For Tomorrow Environmental Center” to visit the talking tree and a period where the excursion was going South instead of North because someone read the compass backwards. Finally the team made it to the Michigan Tech campus early enough that they were able to have a relaxing evening of pizza, beer, and strategy planning for the next day.

Saturday morning brought snow and slush to the contest grounds, but the I.S.U. team did very well considering the on and off precipitation throughout the day. In the morning Bob Meier tied for fourth in the match split and Dwight Lundquist came up with fourth in the traverse giving the team 1½ points. This concluded the points made for the day. Ohio State made 0 points so I.S.U. once again escaped getting the bear skin for the third year in a row. This year Michigan Tech took the honors of first place moving Missouri out of this place after three years.

The team was a little sad they didn’t bring the bear skin back for Dr. George Thomson, who expressed his fond memories of the bear and the bear skin at an earlier Forestry Club meeting. The weekend ended with a long, but cheery drive back to Ames.

Society of American Foresters
Meeting
New Orleans

Iowa State had eight student foresters representing her at the 1976 National Convention of the Society of American Foresters. Making the trip to New Orleans for the October 4-6 sessions were four Hartman-Montgomery Travel Award winners: Teresa McCoy, Keith Walton, Bob Meier, and Joel Tuh. Four other students attended on their own: Mary Blenkush, Carla Derby, Dwight Lundquist, and Ray Dirksen.

The opening sessions on the fourth of October featured a keynote address by Economist Kenneth E. Boulding of the University of Colorado.
Tuesday, the fifth of October, we went on an all-day bus trip during which we explored the world of Southern Forestry. Among other things, we toured a Loblolly Pine seed orchard, a tree-improvement center, and a harvesting operation with some fairly sophisticated machinery in use.

The final day of the Convention was spent at a series of panel discussions on the future of forests and the forestry profession, wrapped up by an afternoon technical session. Two of these final presentations, by Brock Evans of the Sierra Club and by the dynamic Dorothy Duke, Housing Specialist—National Council of Negro Council of Negro Women, were among the best talks given at the Convention.

The time finally came for us to head back to Ames and the shock of re-entering Fall Quarter. But everyone concerned would agree that missing a week of school was indeed a small price to pay for the opportunity of being at this 1976 SAF Convention.

Yes Mr. Derby, your daughter really did chop down a tree!
Our Over-all Champion

Placings:

Overall
1. Mark Lieurance
2. John Jennett

Pulp Toss
1. Boldman-Lieurance
2. Vorwerk-Jennett

One Person Buck
1. Mark Lieurance
2. John Jennett

Chain Throw
1. Mark Lieurance
2. John Jennett

Two Person Buck
1. Vorwerk-Jennett
2. Boldman-Lieurance

Traverse
1. Carla Derby
2. Mike Cloughesy

Tree Felling
1. Mike Vorwerk
2. John Jennett

Log Rolling
1. Jungst-Countryman
2. Derby-Gooch

Wood Technology
1. John Jennett
2. Vorwerk-Derby-Rediger

Speed Chopping
1. John Jennett
2. Mark Lieurance

Tobacco Spit
1. Lance Logan
2. Mark Lieurance

Bolt Throw
1. Craig Boldman
2. Mark Lieurance

Match Split
1. Mark Lieurance
2. Carla Derby

Nail Pound
1. Sue Kleitch
2. Carole Gillespie

Dendrology
1. Mike Vorwerk
2. Carla Derby

Egg Toss
1. Helgerson-Jungst
2. Ivory-Burns

Water Boil
1. Derby-Rediger
2. Meyer-Caldbeck

Dizzy Izzy
1. George Ivory
2. Dave Solen

Little Forester/Big Ax.

Big Forester/Little Saw
Christmas Tree Sales 1976

Many people seemed to have acquired a great deal of experience in this skill by the end of the evening.

Student/Faculty Relations:
Christmas Caroling

Question: What is the most efficient way to severely batter and bruise sixty foresters' bodies and yet have fun at the same time? Answer: send them to a snowy hill near Boone, Iowa armed with unfamiliar wooden and metal equipment, basically no previous experience or instructions and tell them to . . . SKI. Those native to Colorado would have called the Ski Valley ski party suicide run or simply a mad house. We who went want to thank chairman Mike White for the tasty chili, the comfortable warming house and a tow rope and hill that were pure fun.

Raffle winners were: David Menz, sleeping bag; Larry Apple, electric lantern; Diann Spoerl, hatchet; and Jeff Dawson, wineskin.

THE 1977
The Tow rope just isn’t fast enough for some people.

Carla signs up to be a “Culture Vulture,” participating in one of the department's many drawings for free tickets to local cultural events.

Student/Faculty Relations:
Roller Skating Party
January 24, 1977

Someday Sue will teach the rest of us how to skate.

Dr. Thomson seemed to enjoy skating with the young ladies.
Winter Camping: with 9° at dawn

"Jeremiah" Walton and Company.

Fried Peanut Butter Sandwiches?

"Now wait a minute, aren't we supposed to have one of the narrow ends of this thing pointing down river?"

The night before a Wood Tech test.

Life

Knothead Award . . . frequently much deserved!
The up and down of it.
S E N I O R S

STEPHEN W. ALLSOP
Cedar Rapids, Iowa
Forest Products/Industrial Engineering
Steve's summer jobs with consolidated Packing Corp. (1976), Polk county Conservation Board (1975) and the National Boy Scout Staff (1973) have given him a broad background in forestry-related activities including cruising timber, shearing Christmas trees, clearing nature trails and spraying diseased trees. He attended summer camp in Cable, Wisconsin in 1974. Steve is a member of the Forest Products Research Society. He is an advisor for Boy Scouts of America and Vice President and Social Chairman of Lamson House.

JAMES BROWN
Waterloo, Iowa
Forest Management/Soil Science
Jim was involved with timber inventory last summer in Medicine Bow National Forest, Laramie, Wyoming. The previous summer he was in Cloquet, Minnesota for summer camp. He has had experience in timber stand improvement and stand preparation. Jim is active in intramural athletics and camps, fishes and hunts.
MIKE BECKER
Garrison, Iowa
Forest Products/Business

Mike attended summer camp in Cloquet, Minnesota in 1975 and has spent his remaining summer vacations working at the Becker Sawmill in Garrison, operating a production edger, scaling and decking logs, planing lumber and serving as a sawyer part-time. His hobby is cabinet designing and building. After graduation this spring, he intends to attend the Haywood Technical Institute to learn saw filer skills.

MARY BLENKUSH
South Saint Paul, Minnesota
Forest Management/Urban Forestry

Mary has worked during the summer for the City of St. Paul on a tree maintenance crew, and hopes to continue her involvement with urban forestry after graduation this summer. She has been active in the Forestry club for four years and served as Club Secretary from 1976 to 1977. Mary went to the 1974 Summer Camp in Cable, Wisconsin.

JOHN CASTLE
Mt. Morris, Illinois
Outdoor Recreation/Fisheries and Wildlife Biology

John has worked the past three summers in an Illinois State Park and upon graduating would like to work in a State or National Park in the West. John is an outdoor enthusiast as he enjoys to hunt, fish, ski, and camp.

MICHAEL COLTRAIN
Ottumwa, Iowa
Outdoor Recreation/Biological Sciences

In the Fall of 1975 Mike was working as a check station attendant for the Iowa Conservation Commission in the Riverton and Farney Lake controlled waterfowl hunting areas. Mike and his wife Debbie have been married for a couple years, and in the Summer of 1976 he was employed by the University Married Community as an area maintenance person for the fifteen small parks and playgrounds. While attending Ottumwa Junior College in 1973 Mike was President of their Circle K (College Kiwanis) Club.
MATT CRADDOCK  
Bettendorf, Iowa  
Outdoor Recreation/Business Management

In summer 1975 Matt did timber inventory and stand improvement work at the Medicine Bow National Forest. Last summer he changed to the Bureau of Land Management in the Richfield district, Utah, to work on range inventory and range suitability studies. He will return there this summer and finish his studies in the fall. Matt is a sports enthusiast who has been on the Iowa State Cyclone Hockey Club for four years.

CARLA JAYNEEN DERBY  
West Des Moines, Iowa  
Forest Management/Quantitative Management

Carla was on the staff at the Fremont National Forest, Paisley District, last summer as a member of a stand exam crew and a weekend fire crew. Her previous experience includes work on a Land Use and Timber Inventory Survey for the State of Kentucky and counseling activities with the Trees for tomorrow program. Eagle River, Wisconsin. She was a member of the 1974 Summer Camp in Cable, Wisconsin. Carla has been exceptionally active in Forestry Club, serving as Treasurer during her sophomore and junior years and was on the staff of the Ames Forester in 1975 and 1977. She was leader of the conclave team in 1976. Carla enjoys softball, jogging, skating and stamp collecting.

JOHN DIERKSEN  
Clinton, Iowa  
Outdoor Recreation/Planning and Design

John has been active with residence hall activities on campus, serving on the Open House Committee for Residence Hall Week and acting as social Chairman for Johnson House. He was a youth counselor last summer for the Fairbanks North Star Borough Parks and Recreation Department in Alaska. John's hobbies include rock climbing, skiing and photography. He will graduate this coming fall.

RAY DIRKSEN  
Sibley, Iowa  
Forest Management/Ecology

Ray is interested in forest management research and plans to attend graduate school later on. He had a general internship with Weyerhaeuser, Mt. Pine, Arkansas during the summer of 1976 in the Logging Department; he spent the previous summer in the Coronado National Forest, working with a fire crew and doing recreational clean-up. He attended the 1974 Summer Camp in Cable, Wisconsin. Ray is a member of Theta Chi Fraternity, the Society of American foresters, and the American Association for the Advancement of Science. He has been very active in forestry club, serving as Co-chairman of the Holst Tract State Forest Committee and working on the Seedlings Project.
DENNIS FRANKS  
Bettendorf, Iowa  
OUTDOOR RESOURCE MANAGEMENT/Forest Management  
Dennis is interested in scuba diving and is President of the Scuba Club.

CHERI HINRICHS  
Newell, Iowa  
OUTDOOR RECREATION/Sociology-Psychology  
Cheri spent last summer in the Mark Twain National Forest as assistant director of a Y. C. C. camp. She is now working as a monitor in the Forestry Reading Room. Cheri plays trumpet, recorder and guitar and has been a member of the marching band for the past three years. She also enjoys painting, racquetball, skiing and climbing. After graduation she hopes to work as a ranger/naturalist or interpreter for the National Park Service.

MICHAEL HARRIS  
Haverhill, Iowa  
FOREST MANAGEMENT/Business  
Mike's interest lies in timber management. He has been involved in timber marking work as a Forest Technician at the Plumas National Forest in northeastern California, where he also did some surveying and took fuel inventories. He attended the 1975 Summer Camp in Cloquet, Minnesota. Mike is treasurer for his residence house and is a member of Forestry club. He plays racquetball in his spare time.

CHERI HINRICHS  
Newell, Iowa  
OUTDOOR RECREATION/Sociology-Psychology  
Cheri spent last summer in the Mark Twain National Forest as assistant director of a Y. C. C. camp. She is now working as a monitor in the Forestry Reading Room. Cheri plays trumpet, recorder and guitar and has been a member of the marching band for the past three years. She also enjoys painting, racquetball, skiing and climbing. After graduation she hopes to work as a ranger/naturalist or interpreter for the National Park Service.

MIKE HUME  
Elmhurst, Illinois  
FOREST PRODUCTS/Industrial Management  
Mike attended Summer Camp at Cable, Wisconsin in 1974 and has been active both in forestry club and as a Conduct Committee member in his dorm house. He plans to work for a wood-manufacturing firm after graduating, and in his free time enjoys reading, basketball, and fishing.
SUE LEVEKE
Des Moines, Iowa
Outdoor Recreation/Recreation Program Administration

Last summer Sue was a crew leader at the Hay Holler Youth Conservation Corps Camp in the Mark Twain National Forest. During the school year she participates in college intramural athletics.

LANCE LOGAN
Cedar Rapids, Iowa
Forest Management/Forestry

Lance will graduate this summer and plans to continue studying to earn his M.S. in Forestry. He was a Southern Forest Research Intern last summer with Weyerhaeuser in Hot Springs, Ark. and was with the 1975 Summer Camp in Cloquet, Minnesota. He is active in Forestry club, and his hunting and fishing prowess have contributed to the success of the game banquets he has helped to organize. Lance was elected to Xi Sigma Pi and Phi Kappa Phi.

DWIGHT LUNDQUIST
Fort Dodge, Iowa
Forest Management/Outdoor Recreation

Dwight is active in forestry club, which he has represented in Ag. Council for the past two years. He has served as Ag. Council Treasurer and was Co-chairman of the Game Banquet in 1975 and 1976. Dwight was elected to Xi Sigma Pi. During the summers of 1975 and 1976 Dwight worked at the Medicine Bow National Forest in Wyoming, first as a Forestry Aide and then as a Forest Technician. He attended the 1974 Summer Camp in Cable, Wisconsin.

ROBERT D. MEIER
Geneseo, Illinois
Forest Management/Forest Genetics

Deeply involved in Forestry Department activities, Bob was elected President of the Forestry club for 1976-1977. In the past he has been active on the Seedlings Project and the Veisha Display Committee. He received the Goke Estate Scholarship and was elected to Zi Sigma Pi and Gamma Sigma Delta. He attended the 1976 Society of American Foresters National Convention as recipient of the Hartman-Montgomery Award. Last summer Bob was involved in the Weyerhaeuser Co. Summer Intern Program in Mountain Pine, Arkansas. In 1974 he went to Cable, Wisconsin to attend summer camp. After graduation he would like to be involved in tree improvement work.
ALAN MOWERY  
Delavan, Wisconsin  
Forest Management/Pest Management  
Alan has worked the past two summers at the Medicine Bow National Forest, Wyoming on timber inventory, timber marking, and T. S. I.—thinning and harvesting. He has also been involved with planting contract inspection. He plans to return to Wyoming after graduation to accept a temporary position.

PAUL SCHOEDER  
Manning, Iowa  
Forest Management/Timber Products  
Paul attended summer camp in Cable, Wisconsin, 1974 and was on a survey crew in the Shasta-Trinity National Forest, Big Bar, California during the summer of 1976. He received the Hoo-Hoo award for 1976. A member of Gamma Sigma Delta, Paul enjoys backpacking, hunting and fishing.

STEVE PETERSEN  
Cedar Rapids, Iowa  
Forest Management/Industrial Administration  
Steve attended summer camp in Cable, Wisconsin in 1974 and has since spent his vacations working at the Vetter Parks Lumber Co. He enjoys golf and has been involved with committee work in his residence house. After graduation Steve plans to "find a job, get married, and enjoy life at a more leisurely pace."

JOHN E. SWENSON  
Austin, Minnesota  
Forest Management/Nursery Management  
John is a member of Forestry club and has been active with the seedlings committee. He was a general intern with Weyerhaeuser, Hot Springs, Arkansas and has worked as a Forest Technician and a sawyer. His summer camp experience came in Cloquet, Minnesota in 1975. After graduation he hopes to work with a logging company.
JOEL TUHY
Overland Park, Kansas
OUTDOOR RECREATION/Biological Sciences
Joel's hobby is wilderness mountaineering, and his summer work experience has included backpacking trail work in the Bridger Wilderness, Bridger-Teton National Forest and horsepacking trail work in the North Absaroka and Washakie Wilderness, Shoshone National Forest. He is a member of Forestry club and served as Publicity Chairman one year. He also served as Treasurer of Fulmer House. Joel plans to attend graduate school in forest biology or ecology.

KAREN UHLENBURG
Roselle, Illinois
OUTDOOR RECREATION/Recreation Program Administration
Karen spent the summer of 1976 as a Youth Conservation Corps Group Leader, DeSoto National Wildlife Refuge. For two summers she was a counselor and backpacking trip leader at Camp Chippewa Bay in New Auburn, Wis. She is a Resident Assistant at Wilson Hall, First Vice President of Campus Gold, and serves on the Central Committee for Resident Hall Week. Karen is a Girl Scout leader who enjoys canoeing, bicycling, skiing and guitar. After graduation she hopes to find interpreter visitor center position.

STEVEN VAN HELTON
Mitchellville, Iowa
FOREST MANAGEMENT/Business
Steve attended the 1974 Summer Camp in Cable, Wisconsin and has worked for the past several summers at Marting Manufacturing in Britt, Iowa. He was a member of the Forestry Club, and after graduating hopes to gain a position in the Forest Management profession. His main hobby or pastime is fishing.

MICHAEL P. VORWERK
Burlington, Iowa
FOREST MANAGEMENT/Forest Ecology-Silviculture
Mike's background includes a summer as Forest Technician for the Iowa Army Ammunition Plant and three years part-time experience as Greenhouse Technician at the I.S.U. Forestry Research Greenhouse. He attended summer camp in Cloquet, Minnesota in 1975. Mike is Chairman of the Seedling committee of Forestry club and was active in dormitory government prior to his marriage to Linda. He is a member of the Society of American Foresters and raises tropical fish for a hobby. His future aspiration is to find a position in a state forestry system in the Midwest.
MARK WEBB  
Decorah, Iowa  
Forest Management/Forest Biology  
Mark attended summer camp in 1974 in Cable, Wisconsin. In subsequent summers he has been involved with fire suppression work in Oregon, first in the Willamette National Forest, Sweet Home district and then in the Wallowa-Whitman National Forest, Unity District. The latter summer he was a tanker foreman. Mark is a member of forestry club and has worked on the Ames Forester. He was Sophomore representative to Ag Council. Interested in travel, Mark is considering joining the Peace Corps after graduating next fall.

VIRGIL WEERS  
Center Junction, Iowa  
Forest Management/Agronomy-Soils  
Virgil attended summer camp in 1970 in Upper Lake, New York and worked last summer at the Brayton Forest. He and his wife Rhonda plan to stay in Ames after his graduation, where he will work for the ISU Agronomy Department on a plant breeding program.

... the silent and invisible seniors

David C. Ash, Frank Boyen, Patrick Franje, Tim Gannon, Terry Humphrey, Steve Joslin, David K. Larwick, Terry K. Leppla, Mark A. Lewis, Brian Wetmore, Thomas Wattier, Paul Zaske
Alumni News

We received much response to a desire of having an Alumni activities page this year. What we have compiled is not intended to be a complete collection of all Alumni activities; instead it is an overall look at some graduates, old and new.

“...with the American Plywood Association as a Senior Field Representative in Columbus, Ohio.”

Bob Appenzeller '61

“I am now completing my second year of teaching in the Glenville State College Forest Technology Program (two-year course). Teaching responsibilities include Forest Measurements, Photogrammetry, Forest Ecology...”

Michael Bondi '73

“I have been in Virginia two years after 28 years in Northern Wisconsin, and am finding the Appalachian Hardwoods very challenging.”

Marlowe Burgy '43

“Looking forward to retirement in June. Maybe a visit to Ames will be in order. Would like to talk Peru with Fred.”

Ken Compton '36

“Am presently Forest Supervisor on the Carson National Forest, with headquarters here in Taos.”

Jack Crellin '53

“Southern ‘rep’ of engineering firm on suspension burning of wood wastes.”

Nels Glesne '40

“Retired June 1963 (after) 38 years in the U.S.F.S. plus two years five months in WW II. Play golf, do yard work, belong to too many organizations.”

Jack Hogan '26

“I have been employed by the U.S.F.S. on the Medicine Bow National Forest, Wyoming. During winter months I am working for Medicine Bow Recreation Inc., a private business venture of a ski area with little or no snow. I plan on working for the Forest Service again this spring.”

James Jaminet '76

“Chairing the 48 member Association of Retired Conservationists utilized some of my free moments during the past two years.

My book, Wisconsin's Amazing Woods, Then and Now is getting more attention than this old 1926 graduate ever thought possible. I am now working on a regional manuscript titled Indians of the Past.”

Theodore Kouba '26
"I am with BLM in Eugene (21 years)—don't get out in the woods much as I have jobs of Public Affairs Coordinator, Fire Management Officer and Safety Officer."

Sam Doran '49


Steve Lenius '73


Arlyn Perky '68

"A cold drizzle fell in Snoqualmie Falls, Washington, on the foggy Monday morning of August 24, 1936. I remember it well.

I had in my pocket a letter of introduction from the Weyerhaeuser Sales Company home office in St. Paul, Minnesota, addressed to the manager or "whomever it may concern" at the office of the Snoqualmie Falls Lumber Company.

Little could I—or anyone else—have imagined that this rainy day in 1936 would be the start of an association between Weyerhaeuser and myself which lasted for forty years... until my retirement from the... Wood Products Office at Edison, N.J., on September 1, 1976.

'Go on out west a while and see how you like it,' said Mr. Howard Kenney of the St. Paul office staff in handing the letter to me a week or so earlier. . . .

. . . I had boarded the northbound Chicago Great Western passenger train in the middle of the night in Sumner (Iowa). And, yes, father had footed the bill for the train ticket to the west coast.

So a few days later I landed in Snoqualmie Falls, a certified 'Lumber Student.' The St. Paul letter said so.

'Get your stuff up to the hotel and report to Art Benson down at the dry shed,' said D. M. Fisher, sales manager at the Snoqualmie Falls mill. 'Art will find something for you to do, and I'll tell him you're on the way.'

'And,' Mr. Fisher added, 'you'll be paid our regular hourly wage for each hour you work. The rate is presently fifty-five cents an hour.'

. . . Art found things for me to do. Pasting paper 4-Square labels on bundles of fir uppers . . . lugging the odd bundles (of lumber) to their proper bins. . . . Or, a member of the sawmill crew might be absent for a day. Art often sent the nearest 'lumber student' to the sawmill to fill in. There has never been such a haystack of lumber anywhere as the one which accumulated one day as I substituted ahead of the pony edger in the mill for an absentee member of the crew.

. . . Within a few weeks after the coming of spring 1937, . . . I was transferred to the Klamath Falls, Oregon operations of Weyerhaeuser Timber Company for a stay in ponderosa pine country. The train fare for the trip . . . came from (my) own nickels and dimes scraped together at Snoqualmie Falls.

Later, it was on to Idaho white pine operations at Lewiston, Idaho. After a while a transfer came through to Weyerhaeuser Sales Company location at Port Newark, New Jersey, but—big difference this time—the company paid the expense of the trip.

. . . And, here we are, after one east coast assignment following another and forty years later. Change has followed change in the manufacture and sale of forest products. Plywood, particle board and paneling products have been added to the basic product, lumber. Today, total content of wood fiber in a log is the sought after number, not necessarily board feet of lumber, for pulp, paper and wood chips have become vital elements to profits for all companies. Training programs have very sophisticated operations; the classification "lumber student" has long since been discarded from the table of organization of every wood products company.

I still remember fondly those days at Snoqualmie Falls."

Winn Heyer '36

Skipper Larsen

"We are saddened about Prof Larsen's passing. He surely had a full talented life and career. When he tried to teach me wood tech in 1938 I thought that he was ancient then. Now so am I."

Vern H. Cutler '40

"Skipper Larsen was a good teacher, one of several, but two things stayed with me:
At sixty he could out walk his students.
His final question on the exam, 'What do you do if faced with a crown fire?'
That he lived one hundred years surprises me not at all."

George I. Porter '43
Editor's Note: Prof. McNabb represented the Forestry Department at the XVI World Congress of the International Union of Forest Research Organizations in Oslo, Norway during June 1976. He participated in a pre-congress meeting of the IUFRO-working Party on genetic resistance in elm to disease and insects at the "Dorschkamp" Research Institute for Forestry and Landscaping in Wageningen, the Netherlands, serving unofficially as vice-chairperson of the meeting. The words below were given as a toast by the Institute Director at the banquet given by the Dutch Forest Service for the participants and their guests.

"There will always be a reason to make a feast, but I can hardly be made responsible for a feast on the outbreak of the aggressive strain of Dutch elm disease.

But as long as there will be the good cooperation between experts and as long as you will have expectations to find the solution there is reason enough to be gay.

About these expectations I would like to say something.

If what you expected was always the result of research, there would be no point of doing research, only in having expectations.

Thus research is done in order to find departures from expectation. Hence the unexpected is the whole point of scientific research.

Therefore if you expect that you will find or cross and make a Dutch elm disease resistant elm you do not find it.

The conclusion is clear. Do not expect to find the solution, then you will find it.

Although you are with so many experts together I do not expect that you will find in this week the solution of all problems, but even therefore I could hope that this expectation is wrong.

Let us then drink to your health, the health of the elm and to those unexpected results."

Ir. A. J. van der Poel, Director
Rijksinstituut voor onderzoek in de bos- en landschapsbouw "De Dorschkamp"

Wageningen, June 16th, 1976
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