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THE EDDY TREE BREEDING STATION:
INSTITUTE OF FOREST GENETICS

Gladys Austin (Mrs. Lloyd Austin)
Frances I. Richter
William G. Cumming
Alfred R. Liddicoet
Jack Carpender
Nicholas T. Mirov

Interviews Conducted by
Lois C. Stone

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Panoramic view of the Institute Arboretum
Spring 1932

Buildings and grounds at Institute of Forest Genetics.
Taken October 22, 1942. U.S. Forest Service Photo.

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PREFACE

This volume is part of a series of oral history interviews conducted by the Regional Oral History Office of The Bancroft Library under a grant from The Forest History Society. The project on the Eddy Tree Breeding Station was begun in 1967 with interviewing and checking of the transcripts going forward during 1968. A lack of funds prevented the final typing and completion of the manuscripts until 1974 when a grant from the History Section, U.S. Forest Service, enabled the Office to finish the work and deposit the volume for research use.

Additional papers related to the Eddy Tree Breeding Station will be found in The Bancroft Library. These include the typescript of an autobiography by Nicholas T. Mirov, "The Road I Came."

Willa K. Baum
Department Head

15 May 1974
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INTRODUCTION

Luther Burbank, wizard of plant life, received a letter, one day in 1918, from James G. Eddy of Port Blakely Mill on Puget Sound. Mr. Eddy wished to consult with Dr. Burbank about the possibility of producing better forest trees through breeding experiments. Though Burbank was reluctant to encourage breeding experiments with such slow-growing genera as conifers, he was impressed with Eddy's knowledge of plant genetics and breeding experiments. Burbank had done no breeding work with conifers and he was always intrigued with a new problem. Eddy was invited to join the famous "gardener touched with genius" in his Santa Rosa home and nursery. Burbank soon discovered that James G. Eddy had read all of his published works and everything else he could find relating to plant breeding. Eddy was most impressed with Burbank's Paradox Walnut which was a hybrid cross between Juglans nigra x Juglans californica and at the age of sixteen years was twenty-four inches in diameter at a height of four feet above the ground. But the species of Juglans commonly produces flowers at an early age and Burbank thought that conifers would have to be nearly twenty years of age before producing flowers. Eddy knew differently: he had spent years timber cruising and he had seen two-year-old trees produce flowers. He had observed the very great differences, within one coniferous species, in the rate of growth, resistance to disease, and ability to withstand the rigors of climate.

James G. Eddy liked to recall that one of his grandfathers was a logger and the other was a scientist. Perhaps it was this combination of close contact with living trees plus an inquiring mind--both a part of his heritage--that caused him to develop the vision he had. For even as a youth, tramping the forests, Jim Eddy realized that America's trees could not suffice for future generations unless something was done to compensate for the increased harvesting of timber and the rising population.

Eddy came from one of the oldest timber families in the United States. His ancestor, Jonathan Eddy, founded the town of Eddington, near Bangor on the Penobscot River of Maine, and the family operated sawmills there for several generations. In 1860 James G. Eddy's father moved to Bay City, Michigan and established a large mill there. James was born in Bay City on April 8, 1881. The boy became familiar with the woods and the mills at an early age. After completing

preparatory training he matriculated at Princeton University and in due time received a Bachelor of Science degree.¹ His interest was in the timber business. In 1903 James and his brother, John W. Eddy, acquired an interest in the Port Blakely Mill on Bainbridge Island in the state of Washington. Thus, Jim Eddy was able to experience for himself the vast stretches of logged-over land, from coast to coast, that were denuding the country as the population pushed west. What could be done to correct this devastation? James Eddy knew that we could not depend on natural seedlings to replace the harvested timber. Could not some faster-growing and stronger types of forest trees be developed? This was his dream.

Luther Burbank, convinced by Eddy's facts and his determination to make his dream a reality, became an ardent supporter. Together, they spent several years exploring any ideas that might provide help in setting up breeding experiments with coniferous trees. Experts in several fields were consulted. Dean Walter Mulford, of the University of California School of Forestry contributed valuable advice about western forest species. Earle Clapp and Edward Kotok of the Forest Service aided Eddy and Burbank with much practical knowledge. Professor Ernest B. Babcock, far-thinking geneticist of the University of California, offered scientific guidance. With such strong support of his vision Eddy felt the United States government might consider the breeding of superior forest trees of sufficient value to warrant financial support. In the fall of 1923 James G. Eddy appeared before the Select Committee on Forestry of the United States Senate, meeting in Seattle. He wanted to persuade the senators of the need for a station to experiment with breeding better forest trees. Eddy told the committee that:

Before they undertook a tremendous program of reforestation in the United States, they should look to the seed and the tree species that would re-establish our forests. The Eddy family had seen the logging front move across the continent from Maine to Puget Sound. . . . /James G. Eddy stressed/ we cannot afford to reforest our lands with slow-growing trees, many of which are of inferior quality. Agriculture has produced miracles in fast-growing and valuable plants, through the skill of plant genetics; and the same can be done in forestry. Mr.

¹Princeton Miniatures XXI, "James G. Eddy '03", Princeton Alumni, LV, no. 27 (May 20, 1955), 10.

Eddy urged the senators to get to the root of our forestry problem, which is to make available the forest trees that will best meet our needs for fast growth and commercial qualities. It was the most unique and surprising statement of the entire meeting. . . It made a great impression.²

Despite the interest Eddy aroused in the Senate Committee, financial aid was not forthcoming from the United States government. James G. Eddy decided something must be done right away; he would establish and finance--with his own funds--a research station to breed improved forest trees. He asked Luther Burbank if he would consider heading such a program. Burbank declined, pointing out that he was in his seventieth year and was already involved in more experiments than he could hope to complete. Dr. Burbank suggested a young man, Lloyd Austin, who had lately been consulting with him about tree breeding experiments. Austin, trained at the University of California, had recently joined the staff of the College of Agriculture as a pomologist. Mrs. Austin recalled her husband's decision to accept the position Eddy offered:

Early in 1925 Lloyd received a phone call from Mr. James Eddy. . . . Lloyd at that time was teaching and was in charge of building up the University's fruit tree collections at Davis in anticipation of a hybridizing program and had many conferences with Mr. Burbank in regard to this program. He was 26 years old, and we had been married less than two years.

After conferences with Mr. Eddy and with University of California professors in both the forestry and genetics departments, it was decided to start the project. Mr. Eddy felt that probably the best place to implement the program was in the timber belt in one of the south-east states; he suggested Lloyd make a tour of the U.S., to talk to forestry officials and university people to get ideas on the feasibility of such studies, as well as where best to concentrate the efforts.

Immediately Lloyd asked release from his contract at

²W. B. Greeley, "Blood Will Tell," American Forests, September, 1952, 18.

U.C. Davis, and we moved to Berkeley . . . to have closer contacts with forestry and genetics officials. After a tour of the U.S., during which he was given very little encouragement for a project in tree breeding, he came to the conclusion that California offered optimum conditions for such experiments, especially on the slopes of the Sierra Nevada. Mr. Eddy concurred. / Mrs. Austin states that her husband and Mr. Eddy were both fond of writing long and detailed letters. Most of their conferences were conducted by letter.⁷ That summer Lloyd, accompanied by Prof. Woodbridge Metcalf and Prof. Emanuel Fritz, toured by car the entire Sierra Nevada area looking for the most desirable location.

The choice was narrowed down to two different sites--one in Nevada City, and one in Placerville. The Nevada City site was limited in area, with very little chance of later expansion, so the Placerville site was ultimately chosen.

The purchase, from J. W. Young for \$8,500, was made after much discussion about mineral rights. This parcel consisted of eighty-two acres, and was about four and a half miles east of Placerville. It was an excellent choice for working with pines. Mr. F. I. Righter, a former staff member, told me why:³

It was about mid-way between the top of the Sierra Nevada and the valley floor . . . It was a timber producing country; the original country there was completely timbered over. / Natural stands of the three principal pine timber trees occurred on the property: Pinus ponderosa, Pinus jeffreyi, and Pinus lambertiana in addition to eight other pine species.⁷ . . . The situation offered these two very important advantages: first of all, the products of the institute could be tested out under a wide variety of environmental conditions on that Sierra Nevada transect . . . in El Dorado County. The ecology of the high Sierra was very different from the ecology down in the valley; and you would only have to go a distance of fifty miles to get vast extremes . . . in a level country you

³The following quotations from members of the staff (or their families) of the Eddy Tree Breeding Station are excerpts from their tape-recorded interviews and written memoirs.

might have to go a distance of a thousand miles. The other advantage was that you could work up the mountain as the flowers came into bloom. The flowers . . . first to bloom were those on the trees at the lower elevations. As you went up the mountains other flowers of the same species, or different species, would come into bloom, which meant that you had a long breeding season. The breeding season on level ground would be maybe ten days to two weeks. We had a breeding season which started in February on Monterey pine down in the Sacramento Valley, and ended in July up in the high Sierra. Another advantage of the situation was that so many different trees from all parts of the world could be grown there. We did not have much really frigid weather.

The land on which the research station was to be developed was planted in a well-grown pear orchard. The first problem that Lloyd Austin faced was to find someone to uproot the pear orchard and prepare the land for planting forest trees. The man hired for this job was William C. Cumming, a genial and capable Placerville youth, who rose from a man of all work to become the superintendent of the Institute, until his retirement a short time ago.

Mrs. Austin's reminiscences continue the story of getting the Eddy Tree Breeding Station started:

We moved to Placerville about the fourth or fifth of December 1925. Our first rented home in Placerville, and the only house available at that time, was a three-story home with heating and cooking entirely with wood stoves and a fireplace. We lived on the first floor, and the offices were set up on the second floor. Work of building seed bed frames, etc., was done in the carriage house. At first I had done most of the stenographic work, but when the Lumsdens moved to Placerville, Mrs. Lumsden took over this work part time. . . . Mr. John Barnes, a forestry graduate, was employed to assist Lloyd.⁴ Lloyd had never seen pine flowers, so the day he and John discovered the baby cones and catkins was a day to be remembered!

⁴William C. Cumming was hired in December of 1925, John H. Barnes joined the staff soon after, and H. M. Lumsden came in April of 1926.

Letters were written to forest areas all over the world for seed of native evergreens, and especially pines, with the request . . . that if possible seed be collected from their best specimens. Many plans were formulated that winter /of 1925/. Seedbed frames were constructed and a pressure pump and pipelines installed. While the physical work was moving ahead, plans were underway for the layout of the . . . arboretum. This was done with the idea of putting all closely related species in adjoining plots, so as to facilitate hybridizing. The need arose for someone to be directly responsible for the physical work, so Mason Lumsden, a graduate of the University of Michigan, was employed.

Many basic problems confronted Lloyd Austin and his staff. Mr. Eddy's interest was in forest trees, but he left it to the staff to decide what kind of trees to choose. Both Austin and Eddy had been much impressed with the success of Luther Burbank's breeding experiments with walnuts and it was thought suitable to include one angiosperm genus, so Juglans was selected as one genus to experiment with. Mr. Righter has told us of the decision about gymnosperms:

Mr. Eddy, of course, was a Douglas fir man. He probably would have liked to go into Douglas fir. But there aren't very many species of Douglas fir. So that was . . . not regarded as one of the major projects originally planted in the arboretum. . . . It was decided that the major effort would be devoted to the genus Pinus. That genus is one of the most important, economically, of all the genera of forest trees. There were eight or ten local species of pines on the El Dorado transect of the national forest.

W. C. Cumming, who was helping to plant the trees, recalled:

That fall we started getting in shipments of trees from all over the country. . . . /Austin/ had gone around to . . . various nurseries where forest trees were grown and had made selections of trees and tagged them. So that when the dormant season came those trees could be dug up and shipped to us. When we started planting trees . . . we were planting pines and firstand cedars and redwoods and anything that might fall into the class of timber tree.

Many of the trees planted at this time were two or three years old; they would not have to wait too long to begin breeding experiments. Some early experiments were conducted with

other genera but soon the staff felt that efforts should be restricted to pines. Even the work with walnuts, conducted on land near Davis, was abandoned rather early.

An experimental program had to be set up. Lloyd Austin, with the collaboration of his staff, drew up a plan. Mr. Righter has commented on the implementation of the early breeding program for pines:

The first thing . . . in breeding for the improvement of a particular kind of tree is to assemble as many different species of the genus as /possible/ in one place, so that the breeding operations could be conducted right there without having to travel all over. That was one of the first big projects which was started. Mr. Barnes and Mr. Austin wrote letters all over the world to botanical gardens and seed companies and seed collectors and universities, requesting seed of various species which might be obtained readily by people in those parts of the world. The response was very generous and . . . in a short time they had fifty or sixty different species /of pine/ in the arboretum at Placerville.

This arboretum, which was later named the Eddy Arboretum, in honor of Mr. Eddy, was laid out in such a way that the species of pines were separated and segregated in the arboretum according to the relationship groups as established by Shaw.⁵ . . . These species which were more closely related to each other in a particular group were planted in a particular block of the arboretum. So the arboretum was divided up more or less according to relationship groups. The spacing had to be determined. . . . The institute couldn't give up too much room to individual trees . . . It had to reserve some land for nursery purposes and for field tests and . . . freak gardens, where abnormal forms could be planted out and watched and used in genetic studies later on. So, it was thought that fifteen feet at the start would be suitable, and if necessary thinnings could be made later on. . . . /It/ was enough space, we learned later, for individual trees to come into flower early in life. Many of them produced flowers within five years, rather than twenty years as most foresters thought. . . . That put a different

⁵George R. Shaw, The Genus Pinus (Cambridge, Mass., 1914).

light on tree breeding because these young trees flowered very abundantly at that age, producing both pollent and ovulate strobull.

By 1931 this was the most complete arboretum of pines in the world. There were more different species assembled there than had been assembled in any one place anywhere in the world, probably because it was such a mild climate . . . and the environment was so favorable to their growth . . . Pines are the second largest genus among the gymnosperms . . . distributed circumpolarly . . . from high elevations to low . . . from swamp to desert; there was impounded in that genus a vast amount of genetic diversity with which to work.

The next problem that the staff must decide was how to select individual parent trees and then to determine proper methods of pollination. One of the first approaches was to determine the fastest-growing species. Measurements were made and individual trees from different habitats, but of the same species, were compared. Most early work was confined to Pinus ponderosa, using specimens from many geographic areas.

To obtain the fastest-growing individual of a certain geographic strain the breeder may select a nursery seedling that exhibits unusual growth, or he may find an exceptionally fine tree in the forest. The usual systematic measurements and increment borings did not solve all the problems, when going into an apparently even-aged natural stand. Most such stands really include trees of several ages. To more accurately determine the age of a tree, a method was devised of measuring down eight internodes from the top of a tree. Yellow pines produce only one whorl of branches on the leader each year, thus comparison on the rate of growth for the last eight years could be made. Although favorable location and environmental factors influenced better rate of growth, there still seemed to be some individuals that showed more vigor in comparison with those of similar habitat. In order to check the tree, selected tests had to be run against controls. This is but one of the many early problems faced and overcome by the pioneer staff. Progeny tests were set up.

One of the early buildings put up was a nursery with an underground basement for storage of seed and for preserving valuable records. The office of the Station had, within the first year, been moved to an office near the center of Placerville. And while there they nearly lost all their records

when a nearby fire scorched their walls. In 1929 the need for better office facilities on the Station property seemed urgent. Plans were made for an administration building, and Mr. John Eddy, brother of the founder, donated approximately \$7,000 for this building. The staff moved into the new quarters early in January of 1930.

With a fine new administration building and a working nursery, pollination procedures were developed. Much experimentation and creative thinking was involved in developing some of these techniques. Only a few can be mentioned; coverage of most of these developments may be found in the literature.⁶ Ovulate flowers have to be protected at an early stage with strong bags--ten-ounce duck was the standard bag--and when the female cones were ripe the pollen was introduced by a method Righter devised and has described for us:

One of the main problems I worked on when I first came here was how to get the pollen into the bag without taking the bag off or letting foreign pollen in. The method which had been developed was rather crude. They took the bag off sometimes. They had a copper tube which was large in diameter and had a little hole in the bag and a flap down over that hole which they lifted up and put the tube in and then they'd squirt the pollen in. The tube was connected with a rubber ball.

But that wasn't completely pollen-proof. I conceived . . . the idea of using a hypodermic syringe with a rubber bulb, and that solved that problem. It could be punched through the fabric, and when you pull it out, you just rub the place where it went through with your fingernail and that closes up the place. Microscopic examination showed that the pollen couldn't get through there . . .

No effort will be made to follow the complete staff changes in later years, but we can mention a few early changes. John Barnes left to work on rubber trees in Sumatra. William Wahlenberg replaced him and stayed with the Station until January of 1930 when he returned to the Forest Service. By that time Clyde R. Berriman and Clark H. Gleason, Jr. had become staff members. Francis I. Righter joined the staff in March of 1931,

⁶Lucille M. Tichenor, Research at the Institute of Forest Genetics (Berkeley: U. S. Department of Agriculture, Forest Service, 1965).

leaving a teaching post at Cornell University to come to Placerville. He was to make many valuable contributions to the Institute of Forest Genetics. He has given us details of how he worked out a few of his ideas:

Another problem was the best time to put the bags on the flowers and when to pollinate and when to remove the bags. . . . They had to determine when the flowers were most receptive to pollen. If you put it on too soon the pollen is wasted and your effort is wasted. If you put it on too late the flowers are closed up. You put it on just right, when the carpels are at right angles to the axis of the cone, that's the time to do it. But they don't all ripen at the same time, so we adopted . . . as our final criterion . . . maximum receptivity and we tried to pollinate at that time, which meant going up the same tree two or three times to pollinate. Those things took time. There were about seven different stages of flower ripening which we recognized . . . We had made tests by putting bags over flowers at different stages--pollinating at different stages of the ripening. Those were some of the techniques which had to be worked out. Others involved setting up nursery tests, the evaluation of what we obtained from our control pollinations and other kinds of seed collections . . . the best size of a nursery bed of four-and-a-half feet, but it was later widened to five feet for statistical purposes and to save space, and lumber, because you had to use more lumber for more beds. . . . No other place . . . had such a well-developed and perfect method of nursery experimentation . . . It was remarked upon by many visitors who came from all parts of the world.

From the beginning of the Eddy Tree Breeding Station, until he was badly affected by the depression in 1932, James G. Eddy provided the total support for the Station. Financial support was not based on income from an endowment. Rather, it consisted of a monthly payment of costs of the program. Mr. Eddy consulted with the staff, but left the final decision of the program up to Lloyd Austin and his colleagues. This was a considerable financial responsibility; it amounted to from \$20,000 to \$25,000 or more per year. Mr. Eddy had foreseen that he could not expect to meet expenses forever.

The advisability of establishing the project on an institutional, rather than on a personal, basis had been discussed as early as 1927. The possibility of an affiliation with the University of California was taken up with Professor Mulford of the Forestry School. In 1931, when Mr. Eddy was feeling

reduced in circumstances by the depression, the matter of affiliation was taken up again with the University. The Eddy Station was offered to the Regents of the University. The Regents were very happy to accept it provided that the gift be accompanied by an endowment sufficient to maintain the plant and continue to conduct experiments in proper manner. The Regents Committee on Finance of the University determined that an adequate endowment to support the Station would amount to \$600,000. This amount could not be raised so the affiliation had to be declined.

It was then decided that the Eddy Tree Breeding Station be transformed into a national institution with control vested in a national board of trustees composed of men distinguished in the fields of science, education, and business. The reorganization was effected early in 1932 and a campaign to raise an endowment was undertaken under the office of the Tamblin, Brown & Co. The name of the Station was changed to the Institute of Forest Genetics. It was felt that it would be easier to raise an endowment if the Station bore a name that was not suggestive of one man's personal enterprise. The scientific work of the Institute was to remain the same. They would continue with experimentation for the improvement of forest trees to improve their qualities for use as timber, for resistance to disease, and tolerance of any environmental extremes.

The Institute was incorporated as a non-profit organization under the laws of California. Efforts were made to interest men of means, but scant help could be found during those lean times. Some of the staff were laid off. Others subsisted on reduced salaries. John C. Merriam, of the Carnegie Institute, was interested and arranged to advance \$10,000.

On July 1, 1934, the Soil Erosion Service of the United States Department of Interior, after investigating the suitability of the Station's facilities and organization for the purpose of producing stock which could be used for control of erosion, made \$40,000 available for that purpose for the ensuing fiscal year, and provided an official to administer the fund. During the year negotiations led to congressional legislation authorizing the federal government to accept the Institute as a gift from the Board of Trustees to the people of the United States, to be maintained by the federal government and administered by the United States Forest Service. The transfer was formally effected at a meeting of the trustees and government officials which was held in San Francisco in August of 1935. It was understood that if the government failed, over a three-year period, to carry on forest genetics studies

at the Institute, the properties would revert to the board of trustees. Thus, in essence, James G. Eddy made a gift to the people of the United States of all the property of the Institute plus all the funds he had invested in its support for eleven years--a sum in excess of \$250,000.

In one respect the Institute of Forest Genetics benefited by the depression years. Labor, available to government agencies through WPA and CCC, provided attractive and scientifically adequate buildings for their research program and also ample living quarters for visiting scholars. Lawns and perennial borders surrounded the buildings. Rock walls provided borders to walks and planted areas. Slate walks connected buildings. Gravel drives led from Carson Road in through the handsome gates to the parking areas. Regarding this degree of embellishment in a research institute, Mrs. Robert H. Weidman, widow of the man who was for years the Superintendent of the Institute of Forest Genetics, has recalled that when she lived at the Institute there were no paving, lawns, or landscaping: in dry weather red dust was everywhere. It was almost impossible for a housewife or a scientist to create an atmosphere free of this dust. It must have given much trouble in the laboratory.

And what of the scientific results? With the hybridization experiments conducted by the Institute, several hybrids of very exceptional quality were brought to light. One is a cross between the Monterey pine of the coast of California and the knobcone pine of southern California mountain areas. This hybrid displays the rapid growth of the Monterey pine plus the hardiness and frost-resistance of the knobcone pine. Another excellent cross is ponderosa pine and apache pine. A third is the cross between Jeffrey pine and Coulter pine, a fine example of hybrid vigor.

Dr. Nicholas T. Mirov has mentioned some of the most significant scientific achievements of the Institute of Forest Genetics:

During the last decade, interspecific hybridization has been the most prominent feature of the division's program. Since the founding of the Eddy Tree Breeding Station in 1925, sixty-six different hybrid combinations (F_1 's, and F_2 's, backcrossed, and 3-way hybrids) have been obtained at Placerville, and of them fifty-four were produced since 1940. Many of these hybrids have exhibited great potentialities with respect to various important characters in nursery and field tests. Most of these hybrids are more vigorous than one or the other

of the parental species and some are clearly superior to both parents in that respect; some have greater root-systems; some have more abundant foliage; one makes abnormally rapid diameter growth as well as being superior in rate of height growth and root development; one white pine cross has resisted infection by blister rust over a period of five years in a heavily-infested test plot where every other tree has been infected; two have stood up impressively against attacks of bark beetles to which one of their parents is highly susceptible; some are more frost-hardy than one of their parents, and others react similarly with respect to drought resistance. These and other results are based on the performance of hybrids ranging in age from one to twenty-three years, and some of the results have been replicated many times, and in widely separated regions of the United States. The feasibility of mass producing some of these hybrids through hand pollination has been all but demonstrated. Aside from their practical importance, these results carry implications of great academic interest. These and other considerations, including the availability of highly refined crossing technique, comprise a weighty reason for continuing to regard interspecific crossing as the division's most important field of work . . .

Biochemical studies include the studies of the chemical composition of the oleoresins of pines. The principal result of this reconnaissance has been to establish chemical composition of oleoresins as a feature which serves in most cases to distinguish species; oleoresins have proven to be much more specific than sugars or fats, . . . a routine diagnostic aid in the study of insect resistance of suspected wild hybrids and of artificially produced hybrids, and as a supplement to genetic and morphological data in taxonomic studies.

James G. Eddy lived to see his Tree Breeding Station receive the acclaim of savants from all the important genetics research centers of the world. As long as he lived, his interest in the research activities did not flag. It is fortunate that his efforts on behalf of American forestry were recognized and appropriately honored when the board of directors of the American Forestry Association, at their meeting of October 12, 1952, prepared a formal citation to signal the great contribution made by this distinguished citizen:

In recognition of notable aid rendered in furthering the cause of forest conservation in the behalf of this and

future generations of Americans, the Directors of the American Forestry Association bestow upon James G. Eddy, of Seattle, Washington, its highest award for outstanding service to American forestry. This award is in recognition of Mr. Eddy's effective efforts, continued for more than twenty-five years, in the field of forest genetics. His creative and tireless work has given to this country the Institute of Forest Genetics at Placerville, California, and a much greater interest in the opportunities for enlarging and improving the useful forest species of North America.

Characteristically Mr. Eddy replied to this great honor:

This letter is written to advise you that the writer, some eight or ten days ago, received the Special Award by the Board of Directors of the American Forestry Association.

It is now being put in a small gold frame and will be placed on the walls of my office, but subsequently it will be sent to the Institute of Forest Genetics, where I trust it will bring great satisfaction to all the men who brought about the many successful scientific steps so that the officers, the directors and the lumbermen of the American Forestry Association have approved the results so far obtained, that better and more valuable trees now and in the years ahead will be available to future generations.

I wish to express my humble appreciation for this great honor, as every word in the Award means a great deal to me personally, and to the men in the past, present and future, who gave, and will give, of their time, knowledge and their heart to such genetic efforts, and thus offer to the people of the world better commercial types of trees by the use of such genetic laws as already demonstrated by the Institute of Forest Genetics.⁷

James G. Eddy believed in the future of American forests. He believed that forest genetics could help preserve our forests. Astute businessman that he was, he believed so completely

⁷Letter from James G. Eddy to American Forestry Association, January 21, 1953, in the files of the Forest History Society.

in the value of breeding better forest trees that he was willing to spend a substantial amount to establish the first research center for forest genetics in the western hemisphere. Mr. Eddy lived to see many changes take place in his research station. The original plantings of little trees or tiny seedlings in the Eddy Arboretum have become towering testimonials affirming Eddy's vision and determination.

The Pinus ponderosa plantations at the eastern edge of the Arboretum include trees from some fifty distinct geographic areas throughout western North America. One may study extensive plantations of ponderosa pine progenies in an area southwest of the Arboretum. The nursery is an impressive development where hybrids and other pedigreed pine seedlings may be observed in various tests to determine their potential future trees. Elevational races of ponderosa pine are being studied, in another area, to determine the optimum elevation from which to collect seed.

It is of interest to view the original Monterey-knobcone cross. This represents the first artificial hybridization of pines at the institute. Magnificent specimens have grown from that pioneer cross in 1927. And one may also see the second generation of hybrids of that cross planted in 1947 from open-pollinated first generation hybrids.

Of considerable interest is the "freak garden." The staff is constantly on the alert for unusual phenotypes that may be found in the nursery beds. These trees often exhibit striking abnormalities and some of them have proved valuable for horticultural purposes. Moreover, valuable genetic knowledge can be gained from chromosomal studies of these "fræaks."

The physical plant of the Institute has expanded and improved to include not only the administration building and laboratory, but ample space for laboratory work and conferences. There are lath houses and green houses and houses for the use of the superintendent and the staff.

In the parking area a bronze plaque honoring James G. Eddy has been set up by the Native Sons of the Golden West. It was dedicated in August of 1964, a few months after Mr. Eddy passed away. Towering above it are the beautiful conifers that he so loved. The inscription reads in part:

Businessman, scientist, conservationist, and a true pioneer, his foresight and generous effort advanced the science of forest genetics many years and helped

to conserve the supply of forest products for the future.

Lois C. Stone *
Interviewer-Editor

July 1, 1969
Regional Oral History Office
Room 486 The Bancroft Library
University of California
Berkeley, California

* Portions of this introduction appeared as an article by Lois C. Stone, "The Institute of Forest Genetics: A Legacy of Good Breeding," Forest History, Vol. 12, No. 3, (October 1968).

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GLADYS AUSTIN (MRS. LLOYD AUSTIN)

We felt very fortunate in being able to interview Mrs. Austin, widow of Lloyd Austin, who had seen him plan and develop the Eddy Tree Breeding Station from its earliest conception to the ultimate metamorphosis into an important research unit of the United States Department of Agriculture.

Mrs. Austin is a warm and perceptive lady whose varied roles have included raising an active family and also assisting her husband in his demanding scientific activities. Lloyd Austin's approach to the establishment of the Eddy Tree Breeding Station was imaginative and broad. James G. Eddy had the wisdom to realize that he would gain most by letting Lloyd Austin conceive and carry out his own ideas about the station. Mrs. Austin recalls that her husband considered the development of the experimental station in forest genetics a great challenge. And Gladys Austin was as eager as he to meet this challenge.

When Lloyd Austin decided to leave the field of forest genetics and become a hybridizer and grower of iris he had an able assistant in his wife. Mrs. Austin deserves much of the credit for the fame of the Rainbow Hybridizing Gardens of Placerville. This enterprise became known right as more a scientific achievement than a business, but as a business it was a success. When fire destroyed their home, Gladys Austin helped to carry on their business, while faced with the problem of rebuilding and furnishing a house.

Talking with her in her comfortable living room, overlooking the hillsides of blooming pear trees above Placerville, one would little guess the many problems this lady has met and overcome. She has been a most understanding wife and devoted mother. Her keen mind has been used to add enjoyment and satisfaction to a demanding life.

Lois Stone
Interviewer-Editor

March 1969
Regional Oral History Office
486 The Bancroft Library
University of California at Berkeley

Written Memories of the Institute*

Early in 1925 Lloyd received a phone call from Mr. James G. Eddy, who stated that Mr. Luther Burbank had recommended him for a new project in forest tree breeding. Mr. Eddy, a lumberman, was deeply concerned about the way the nation's forests were being depleted and, at that time, nothing was being done to assure future generations of lumber supplies due to long time required from seed to harvest. He felt the need for a faster growing tree that could be harvested in a man's lifetime, and felt so strongly that the way to reach the goal was through hybridizing that he had asked Mr. Burbank to start such an undertaking. At that time, of course, Mr. Burbank was recognized as a world authority on tree breeding as his own work on tree fruits and walnuts had produced some outstanding hybrids. Colleges and universities were only just beginning to offer comprehensive genetic courses.

Mr. Burbank's immediate reaction was "you need a young man, for such a project just could not reach accomplishment in a year or even ten years." Lloyd, at that time, was teaching and was in charge of building up the University's fruit tree collection at Davis in anticipation of a hybridizing program and he had many conferences with Mr. Burbank in regard to this program. He was 26 years old, and we had been married less than 2 years.

After conferences with Mr. Eddy and with U.C. professors in both the forestry and genetic departments, it was decided to start the project. Mr. Eddy felt that probably the best place to implement the program was in the timber belt in one of the South East states and suggested Lloyd make a tour of the U.S., to talk to forestry officials and University people to get ideas on feasibility of such studies, as well as where best to concentrate the efforts.

Immediately Lloyd asked release from his contract at U.C., Davis, and we moved to Berkeley, so as to have closer contacts with forestry and genetics officials. After a tour of the U.S., during which he was given very little encouragement for a project in tree breeding, he came to the conclusion that California offered optimum conditions for such experiments, especially on the slopes of the Sierra Nevada. Mr. Eddy concurred, so that summer Lloyd, accompanied by Prof. Woodbridge Metcalf and Prof. Emanuel Fritz toured, by car, the entire Sierra Nevada area looking for the most desirable location.

The choice was narrowed down to two different sites -- one in Nevada City, and one in Placerville. The Nevada City site was limited in area, with very little chance of later expansion, so the Placerville site was ultimately chosen.

Immediately on purchase a local crew was put to work pulling out pear trees, removing brush and rocks, and getting soil in condition for the first forest tree nursery. We moved to Placerville about the 4th or 5th of December and it was about this time Mr. John Barnes, a forestry graduate, was

* The following material was written by Mrs. Austin and sent to Mrs. Stone prior to the interview. The interview was planned with the expectation that the researcher would have this memoir available also.

employed to assist Lloyd. Lloyd had never seen pine flowers, so the day he and John discovered the baby cones and catkins was a day to be remembered!

Letters were written to forest areas all over the world for seed of native evergreens, and especially pines, with the request too that if possible, seed be collected from their best specimens. Many plans were formulated that winter, seedbed frames were constructed and a pressure pump and pipelines installed. While the physical work was moving ahead, plans were under way for the layout of the present arboretum. This was done with the idea of putting all closely related species in adjoining plots, so as to facilitate hybridizing. The need arose for someone to be directly responsible for the physical work, so Mason Lumsden, a graduate of the University, Ann Arbor, Michigan, was employed.

In studying the populations of evergreen trees over the world, it was decided that the genus Pinus offered the best hope for a hybridizing program because of its many varieties and climatic variants. In contrast there were only 2 Sequoias, and 2 Pseudotsugas. So, in a conference with Mr. Eddy, it was determined to limit the effort here to the Pines, and particularly the hard pines, of which Pinus ponderosa (Western Yellow Pine) is the local species. However, the Sequoias, the Pseudotsugas and some firs, spruces, etc. as well as the soft pines are represented in the arboretum.

A nursery building was put up and this included an underground basement for storage of seed and valuable records. Fire in a theater across a narrow street from their downtown office, which scorched and charred their walls and some records showed the need for a fire proof room for records, so all buildings put up after this contained fire proof vaults.

In 1929 the crew felt the need for better office facilities, as well as facilities nearer to the physical plant. So plans were made for an administration building and Mr. John Eddy, brother of the founder, donated approximately \$7,000 for this building. The crew moved into their new quarters in early January, 1930.

Mr. Wahlenburg left the organization to return to Forest Service work, and Mr. F. I. Richter was employed. The rest of the permanent crew was composed of W. C. Cumming, Clyde R. Berriman and C. H. Gleason, Jr.

On Sunday morning, I think Dec. 11, 1932, Mr. Eddy phoned Lloyd that he was no longer able to completely finance the Eddy Tree Breeding Station, due to losses during the depression. A staff meeting was immediately called and, before the day was over, letters had been written to the Carnegie Institution and other philanthropic organizations requesting information as to the availability of funds.

The entire staff felt the work under way was important enough to warrant personal sacrifices -- Lloyd and Pete Richter took no pay at all, and other staff members and employers took half pay until such a time as adequate financing could be worked out.

Needless to say, Lloyd had been warned of this eventuality, and told to arrange for an endowment. Mr. Eddy, though, felt that he had no right to ask anyone else to help finance his dream, yet he did not feel

that he was able to provide an adequate endowment himself. So from its beginning in 1925 to that day in 1932 the Eddy Tree Breeding Station had "just grow'd like Topsy," with financing on a more or less day to day basis.

In order to facilitate the raising of an endowment fund, it was decided to elect a national board of trustees and also re-name the organization "The Institute of Forest Genetics." The Board felt that an affiliation with the University of California would be desirable, and it was with this idea, that a funding drive was launched. In the meantime, the Carnegie Institution was supplying some funds so work would not come to a complete standstill, and Mr. Eddy paid the costs of the funding drive.

However the timing was wrong, and no matter how worthwhile a cause, money for an endowment just was not available, so, reluctantly, the U.S. Dept. of Agriculture was contacted with reference to taking over the property and work of the Institute. I believe it was Dr. David Fairchild who suggested the Institute be placed under the Bureau of Plant Introduction, but in the end it was placed under the California Forest and Range Experiment Station of which E. I. Kotok was director.

Mr. John Barnes was offered a position doing breeding work with rubber trees in Sumatra, and left the organization. Mr. William Wahlenburg, from New Orleans, took over his work.

Gladys Austin

James G. Eddy: A Dedicated Man

Stone: This is a recording of the Institute of Forest Genetics, known also as the Eddy Tree Breeding Station in early days. We are recording some reminiscences of Mrs. Lloyd Austin, the widow of the first director and first employee of the Eddy Tree Breeding Station from its beginning. We are recording in Mrs. Austin's home in Placerville, California on March 21, 1968.

This recording is made by Lois C. Stone of the Regional Oral History Office of the Bancroft Library, University of California, to be deposited in the manuscript division of the Bancroft Library.

Stone: Mrs. Austin, you must have had some very early contact with Mr. Eddy and some very interesting early impressions. What sort of a man did he seem to you?

Austin: A very dedicated man. He was intensely interested in genetics and its relation to forest trees. He was very far-sighted, I thought, in his approach, because no such notion had ever occurred to anyone else: that the forest trees, our natural resources, could be improved upon.

Stone: Do you think he had this idea for some time before he talked to Luther Burbank about founding such an institute?

Austin: I'm sure he did have. He had been in the lumbering business in Seattle for a good many years. At that time he was in his mid years, probably in his early forties. Ever since childhood he had had these contacts and had been a witness to the way the forests were being depleted and the hillsides left nude, and he was concerned about his children and his children's children.

Stone: When Mr. Eddy first talked to Mr. Burbank, did Mr. Burbank give him much encouragement about the idea of founding an institute of forest genetics? Did Mr. Burbank feel that you could work with conifers in this way?

Austin: Oh, yes, very definitely he felt that any plant was susceptible to improvement and he encouraged him in that regard. But Mr. Eddy, of course, did not envision an institute the way it has grown. His idea was for one man, and he thought Mr. Burbank himself could start such a project. He felt with one man working on it that enough progress would be made so that eventually it might work into something bigger. But his original concept was for one man to work on it.

Lloyd Austin's Vision

Stone: Then it was largely your husband's thinking and dreaming that brought it into its larger development as time went on.

Austin: Yes, very definitely. Lloyd felt, as he delved into it, the need for a larger knowledge and a larger -- (Pause) of course, geneticists always work with millions of plants, millions of seeds, not just a few. And Mr. Eddy's concept was not in that direction. He understood the need for the work but not the magnitude of the work. And a geneticist felt that he must work with millions of plants and must have the background knowledge to bring it into fulfillment.

Stone: Did Mr. Austin immediately feel that he wanted to take this position? Or was he somewhat concerned about going in with Mr. Eddy on this privately supported enterprise? After all, he had a good job at the University and was giving that up if he took Mr. Eddy's offer.

Austin: It was a challenge. Anything that was a challenge, he did. He was advised that he should look into Mr. Eddy's financial background, his reliability. And some insisted that he should insist on an endowment. But there was that challenge that he couldn't ignore. It was something new. All his life he had been, apparently, just waiting for something that would challenge his ability in the genetic field.

Stone: I think he was very venturesome. He was a young man, twenty-six, when he undertook this position. The future of the Institute seemed, from the outset, a little bit dubious -- just one rich man backing it. I think your husband was very brave.

Austin: Yes, I don't know that he felt brave. But there, again, it was just the challenge of the unknown.

Stone: But you both were brave -- you were just young people -- to undertake such a venture. You must have been very much impressed with Mr. Eddy, when you came to know him, in the early meetings.

Austin: Yes we were. His dedication to his idea. And yet he was a sensitive man. He was a very wealthy man. But he felt because he was wealthy he could not invite his friends to share in his dreams of these unknown things with the questionable outcome. That was the reason the financial end of it was rather -- perhaps, bogged.

Stone: In the end. Yes, but for a long time he carried it entirely alone. And as far as I can gather there was almost no money from the outside except for the money his brother John gave, a little bit later on, to help finance the administration building. The rest of it was entirely carried by Mr. James G. Eddy. Is that correct?

Austin: That is correct. From the inception in 1925 until in the mid-Depression era in 1932.

Stone: It must mean that he gave really a small fortune to supporting this station: the men must have drawn fairly substantial salaries. Many were college-trained and able to command reasonable salaries. To say nothing of all the physical expenses of supporting the station. And, in the beginning, your husband had to plan for all the building arrangements, all the installation of electricity and water and gas and all that. It was a big order.

Austin: Yes, that is true, and Lloyd was a perfectionist and every detail had to be planned perfectly before it could be implemented. Salaries were comparable with Forest Service salaries at that time. There were several employed to take care of the physical plant, planting trees and nurseries, doing the pollinating and things of that sort, but the organization did keep getting bigger and bigger as Lloyd felt the need for more research in different phases. And it did become a burden that was unbearable financially.

Early Staff

Stone: Some of the first people who were added to the staff must have been interesting people and, probably, carefully selected. Mr. Mason Lumsden was one of the early staff members. He, you mentioned, came from Michigan, I believe.

Austin: Yes.

Stone: I suppose your husband knew something about him, or else he had recommendations from some places?

Austin: No, he was a very close friend of John Barnes, who was first employed. And John recommended him very highly. And Mace was most anxious to move his family to California, so he was glad of the opportunity.

Stone: How did you come to get John Barnes?

Austin: I believe he was recommended by Professor Woodbridge Metcalf.

Stone: Then there were others in the early days who came in -- I'm not talking about the people who just came to maintain the station -- but Howell was one who came in at an early time, too, didn't he?

Austin: Yes. He was there only briefly, that first winter, and assisted the set-up of the first forest tree nursery. I don't recall now just why he left.

Stone: Some other job?

Austin: I believe it was some other, better-paying job.

Stone: Most of these people were young men; they tended to move from job to job.

Austin: That's right.

Stone: After they came here and settled in Placerville with families they were more likely to remain?

Austin: That is true.

Stone: Employees are always something of a problem and I gather that as the Institute expanded your husband had quite a lot of choices to make in selecting employees. Mr. Wahlenberg was one of the fairly early ones. What sort of a man was he?

Austin: He was very scientifically oriented and he enjoyed the work here. But his concern was the lack of an endowment and eventually he pulled out so as to go back into the Forest Service where he felt he had better security.

Stone: He felt that the thing was not likely to last?

Austin: That's right.

Stone: Because Mr. Eddy was financing it. I see. Was he a married man?

Austin: Yes, but no children.

Stone: Still fairly young?

Austin: Yes.

Stone: Now, Mr. Cumming I know about, he finally ended up being in charge here at the end. Then you had Clyde Berriman.

Austin: Yes. I talked to Clyde very recently. I had forgotten that he came into the organization as early as he did, but it seems that Bill Cumming had contacted him and had suggested to Lloyd that he would be a good man to help with the physical work. He was with us until after the Forest Service took over. And then he felt there was an opportunity for employment in other fields, in the Forest Service, or civil service; and he was retired only a year or so ago, from other work.

Stone: From the Forest Service.

Austin: Yes.

Stone: So he was actually with you about seven years, something of that sort?

Austin: Yes.

- Stone: And all that time he did mostly just the physical work, the upkeep?
- Austin: Yes, his job was mostly the upkeep of the complete arboretum and the gardens, whereas Bill Cumming was involved more with the pollination and the hybridizing, seed care and things like that.
- Stone: Now, what about Mr. Gleason? He was also one of the early staff members. Was he more the scientific type or was he doing physical work?
- Austin: I believe he was an ecologist, and he was hired to do work in that field. I do not recall. He was not here too long, and I do not recall. He was a young man just out of college, with very little experience, so I'm not sure just what he contributed to the Institute as a whole.
- Stone: I gather he wasn't here very long.
- Austin: That is true.
- Stone: Did you have some interesting visitors in the early days, aside from Mr. Eddy, of course, who came very often?
- Austin: Yes, there were many visitors. I did not have as much contact with them, of course, because I was tied up with small children. But from mostly the universities in the East and the Midwest, and a lot of Forest Service people visited us from time to time. But the station was not known world-wide at that time, so we didn't have any foreign visitors that I can recall offhand.

Pioneering Work in Pollination

- Stone: It must have been exciting to these foresters and to the geneticists in the United States to realize that something like this was going on.
- Austin: Yes, that is true, and a lot of them came who questioned the advantages to be gained by such a study. But I believe they were impressed with the feasibility, the way the experiments were working out, even in those early days.
- Stone: Perhaps some of them didn't realize that working in California, in such a site, would be better than in some eastern situations, where a more rigorous climate would limit the kind of experiment that could be done. Also, it's possible that some geneticists didn't even realize that under some conditions coniferous trees would produce flowers and seed at an early age.
- Austin: Well, it was interesting. When Lloyd first took up this work, he had never seen the pine flowers, to recognize them, what they were.

- Austin: And the excitement when he first saw them was immense. Then came the study. I think that many felt that because the pollen was so very fine and windblown that the chances of getting control conditions would be almost impossible. There, again, the study of different materials -- a lot of materials were tested to make the bags. Paper bags were out of the question because they would be immediately torn by the wind. To get a suitable bag that would protect the flowers until they were ready for pollination and allow a visual view of the flower during the pollination technique. By working it out, using very, very tightly woven canvas bags with a cellophane window, and a hypodermic needle injected the pollen into the opening flower. It was amazing the new techniques that they worked out in those early days.
- Stone: Really, very clever, very imaginative. It was a creative sort of a research project, wasn't it?
- Austin: Yes, it was, because there was nothing to work from -- no guidelines at all. In all the fruit tree pollination that Lloyd had helped with they could use paper bags. The flowers are emasculated and then paper bags put over them. The pollen was carried by bees, so all they did was protect the flower during a short period of time. But with the windblown pollen wind constantly was a menace. They had to evolve a different procedure entirely.
- Stone: Mr. Austin's work at Davis was almost entirely with fruit trees, then?
- Austin: Yes, it was. He was in the pomology division.
- Stone: Did he work particularly with pears, apples? Or did he have any speciality?
- Austin: Well, I think it was more peaches, probably, but he was in charge of the entire fruit orchards and the building up of the new varieties for a future hybridizing program there.
- Stone: In the very early days of the Institute there was a little plantation of walnuts, too. There was some thought of studying walnuts as genetic material. That wasn't carried on very long, I gather.
- Austin: I don't believe so. The idea, of course, was to carry on Luther Burbank's work. He had evolved the Paradox Walnut, which was a black walnut which was much larger and meatier than the native black walnut.
- Stone: It was derived from the native black walnuts?
- Austin: Yes, It wasn't suitable to carry it on here so a plantation was set up at the state nursery site near Davis. And I did not hear what eventually became of that plantation, whether it's still there or if it was completely abandoned.

Stone: I suppose the Institute couldn't spread itself out too far when things got too big, and especially after they settled on the genus Pinus.

Austin: Yes, that is true.

Stone: So you needed to concentrate your activities on one thing or another. It certainly seems that your husband made the ideal selection of a site here; because of the possibility of studying trees from lower altitude to higher altitude and having the long growing season here in addition to the variety in slope.

Austin: That is true. But here he had the help of Professor Metcalf and Professor Fritz, who toured the whole Sierra Nevada with him that first summer for the purpose of choosing a suitable site. And here on Highway 50, with its elevation from practically sea level to 10,000 feet appeared the climatic changes and the rigorous winters as well as the milder weather, so that all possible combination could be endured by their potential progeny.

Stone: It certainly has worked out magnificently. I feel that your husband had a very great deal to do with it, in spite of the help he got from these two forestry men who were involved. Because it was the genetics point of view that he brought to it, and that was very important in thinking what was going to happen.

Now, when they started bringing in seed and small trees, in the beginning, they hadn't narrowed it down to the genus Pinus at that time, at all, had they? I understand they brought in all sorts of coniferous trees.

Austin: Yes, that is true. The idea was to work with the evergreen forest trees. The hardwoods, I believe, were eliminated practically at the beginning, except for small work with the walnuts. But the field appeared to be so immense. And yet at the same time the genus Pinus offered such variableness, both in varieties and in climatic variance, that the potential there appeared great enough so that it was felt that it would prove best to concentrate the efforts there.

Stone: So rather soon this was narrowed down.

Austin: Yes.

Stone: Do you think Mr. Eddy was disappointed that your husband chose the genus Pinus rather than the Douglas fir, for instance, which was his own forest tree, we may say, in the lumber business?

Austin: I don't recall. I know that the decision was unanimous. I believe, knowing the reasons for it, he was very much in favor of it. Because of course, the Pseudotsuga taxifolia had only one other variety

Austin: [species] and there was so little chance for great variation.

Stone: Yes, there's just that one in southern California. I believe there are other species in the world, but not in the Western Hemisphere. So it gave you little opportunity to do much genetic work with a number of species.

Austin: That's right.

Stone: Mr. Eddy must have spent a lot of time in California in the beginning stages.

Austin: Well, perhaps not as much as you think. Lloyd was quite a letter writer and Mr. Eddy replied in lengthy fashion also, so that a lot of the problems were resolved by correspondence. But he was here probably three or four times each year and was always intensely interested in the progress.

Stone: Did Mrs. Eddy come with him, or the girls?

Austin: Mrs. Eddy came only once, that first spring, or the spring of 1926 she came with Mr. Eddy and he wanted her approval of the program and of the site. That is the only time I recall meeting her. Of course, Lloyd met her a number of times when he went up to Seattle for conferences with Mr. Eddy and he knew the other members of the family. I did not, until the summer that Mr. Eddy's son [James G. Eddy, Jr.]"Jack." worked here.

Stone: Yes, Jack worked here, I guess, when he was in college?

Austin: Yes, that is right. He spent two summers here.

Stone: He seems to be, still, intensely interested in the Institute. He was very pleased to hear that we were recording these reminiscences of early-timers because he felt it was unfortunate that something hadn't been historically recorded about the early days of the Institute and about the really great contribution that his father had made. So I think he's going to be particularly pleased that you're taking part in it, too, participating in this historical record. [Interruption].

Depression Problems

Stone: Now, when Mr. Eddy called up on Sunday morning and said he would no longer be able to carry the financing of the station -- that must have been a very shocking thing for your husband to contemplate, and a great worry to him. Did he get a very favorable response at all from the Carnegie Institute? I know they sent somebody out. Did they send out Dr. Herbert or somebody to look at the situation?

- Austin: Yes, there was a Mr. Herbert who was here and acted sort of as a manager to see that the funds were put to good use, and he assisted a good deal in the work, in the management of the office work, actually, a very capable person. The staff all cooperated just unbelievably well with Lloyd's suggestion that sacrifices were necessary. It was all voluntary.
- Stone: Some of them actually took other jobs. Mr. Cumming said he went into another job at that time.
- Austin: Yes, that is true.
- Stone: To lighten the burden.
- Austin: I believe the CCC camps were being formulated, and he went as manager there to relieve the financial strain here.
- Stone: Mr. Eddy, during this period, did continue to provide what support was given, except for the little bit that the Carnegie Institute was able to put into it. Or did you get some other government help?
- Austin: There was no other government help, no. I was just trying to remember. I don't believe there was any appreciable income from Mr. Eddy. He did finance the drive. I believe the funding company [Tamblyn and Brown] asked \$10,000, and that was about as much as he was able to do at that time. I think the funds came mostly entirely from the Carnegie Institution.
- Stone: That really cut the income of the Institute of Forest Genetics practically down to nothing.
- Austin: It was just a trickle. There was a little money came in, a few people did donate a few hundred dollars, but it was infinitesimal in relation to the need.
- Stone: Mr. Richter told me about going around to the various rich men in San Francisco, hopeful of getting a little donation. And your husband, I guess, did that in southern California. He felt it was a very disappointing enterprise to try to get anything out of these rich men.
- Austin: That is true. It was just the wrong time to try to raise an endowment fund.
- Stone: It must have been a very discouraging time for your husband. Did he at any time during that period consider that he should try to get into some other work himself?
- Austin: Not once, not once. He was too dedicated to the Institute by that time, that I doubt that it even occurred to him to try to get into other work. We had a small savings account and

Austin: we lived on that. Then we took \$100 a month, I believe it was, after the Carnegie Institution supplied us funds, so we managed, personally.

Stone: But it must have been a worrisome time for you, with children to raise and so little money to go on, and not knowing what the future would be.

Austin: Yes, you learn to cut corners.

Institute Goes Under the U.S. Forest Service

Stone: Now, when it came to the time of its [The Institute] being put under the government, there were these two choices: the Bureau of Plant Introduction [now the Bureau of Plant Industry] or the Forest Service. I gather your husband favored the Bureau of Plant Introduction if that could have been managed, in the first place, because it was more scientific in a sense.

Austin: Yes, that's right. He felt that the genetics would get more favorable treatment through the Bureau of Plant Introduction. Of course, he had met Dr. Fairchild and he had done a lot of testing of varieties that Bureau of Plant Introduction had shipped into the country and he felt that the genetics approach was more important than the forestry approach. And he did strongly favor, and there was quite a little pressure brought to bear, but eventually the Forest Service won the battle, shall we say? And the California Forest and Range Experiment Station was placed in charge.

Stone: I suppose in a way Mr. Austin was relieved that something had been settled even though he had favored the Bureau of Plant Introduction as being the more genetically inclined. But was he happy with the arrangement? Of course, the way the Forest Service is set up, they have somebody in charge and a little Institution of this sort just is working under something higher up in the Bureau. This puts you under Kotok. I suppose he didn't know much about genetics, did he?

Austin: No.

Stone: It was new to them to have genetics.

Austin: It was definitely new to them. Of course, it meant a lot of pressure on Lloyd because it put him under a good many other people. The organization was already set up.

Stone: That's right. He'd always been the boss.

Austin: And independent. Up until that time, he had such a great degree of independence. Mr. Eddy was very appreciative of the ideas and problems and gave him a lot of latitude to carry on. Then to be suddenly placed under the direction of so many higher ups was a little bit difficult to take.

- Stone: Yes, that's bureaucracy. How did the Forest Service seem to adjust to the idea? Did they take this favorably and give it lots of support, or were they a little bit reluctant to give support to scientific work, do you feel?
- Austin: They were perfectly willing to give support. It was quite a feather in their cap to have the Institute placed under the California Forest Range and Experiment Station. And they gave it support, both financially and otherwise. But of course they had their own ideas about how the administrative programs should be continued, and there was conflict.
- Stone: There was no curtailment in the scientific work, though, at that time.
- Austin: No.
- Stone: That's good. I wondered whether they would graciously accept something that is so -- well, purely scientific as genetics; the Range and Experiment Station was more practically oriented.
- Austin: Yes.
- Stone: They always had been. Even in 1935 the idea of forest genetics was still new enough that possibly they didn't consider it a wholly worthwhile project.
- Was Mr. Eddy happy about this solution, do you think?
- Austin: He was resigned to it.
- Stone: He knew somebody had to do it and he couldn't.
- Austin: That's right.
- Stone: Did he continue to come down pretty often, in those later years, after it went under the Experiment Station. Let's see, he passed away in '64, I believe, something like that.
- Austin: It was only a few years ago, yes.
- Stone: So he lived quite a number of years after it went under the Forest Service. I wonder if you saw very much of him during those later years.
- Austin: Yes, he was here at least once or twice a year. And he contributed in a small way. He set up a fund to buy some books that Lloyd needed and there were other small things that he contributed to that were not available through the Forest Service.

Stone: Then, he also was allowed to make suggestions and to work with your husband in planning some of the scientific work here.

Austin: Yes.

Stone: As he had done heretofore, before the government took it over.

Austin: Yes.

Stone: It was fair that he would have a part in the planning in later years.

After the Forest Service took over and your husband had, as you say, the problem of working under many different higher-ups, I suppose he had quite a lot of paper work and quite a lot of bother from the bureaucrats higher up and possibly that interfered with his own ideas about carrying on the scientific work. Did he find it something of a bother and think of getting into some other kind of business?

Austin: Yes, the red tape of any government agency, the need for reports on all the different phases of the work, did require an excessive amount of time. And also, from the time he could remember his whole life had been beamed towards beautifying the world.

Austin Establishes Iris Breeding Business

Stone: You were just saying your husband had always looked toward beautifying the world. And I can believe that, certainly. He has created a beautiful place here.

Did he think, of going into some other type of plant breeding to allow himself to continue with this pleasure of beautifying the world?

Austin: Yes, he did think some of it, yet his heart was tied up with the Institute, so nothing concrete was done about it until the conflicts became too great.

Stone: And then he undertook this iris project?

Austin: Yes.

Stone: This was before he'd really separated himself from the Institute?

Austin: No, not until after, actually.

Stone: Oh, I see. Then he went into the iris business.

Austin: As a full time commercial, rather than as a hobby.

Stone: And you both worked together?

Austin: Yes.

Stone: I think that that must have been an entirely happy and rewarding experience for you, though, wasn't it?

Austin: Yes, it was, and it was a challenge because it was a new field, a scientific man entering into business. But here again he was a perfectionist and every detail was planned so that the business could not help but be a success.

Stone: He had run the Institute for so long, he certainly was used to handling people and organizing things and setting up a plant that would run. Besides he had you to help him with all the office work.

Austin: I had been a trained office worker before my marriage, so that it came naturally and was no actual burden. Our children were then almost grown. The youngest daughter was still in high school, the older daughter in college, and our son in the army, so that we didn't have the care of a family and could concentrate our total efforts on making a success of the business.

Stone: Well, it was really very nice for you at that time, then, because you had a chance to exploit your early training and keep busy with something that was rewarding. So many women, when their children are gone, when the birds have flown the nest, are left high and dry with nothing to do. And you had a full-time job.

Austin: Very definitely.

Stone: I think you have had a very happy life here in Placerville, you might say almost from beginning to end, with maybe a few little disappointments here and there, but on the whole it's been a very satisfying situation, hasn't it?

Austin: Yes.

Stone: And in a very beautiful environment which you have done a great deal to add beauty to.

Austin: Yes, and it was rewarding for Lloyd, too. Because these last years he was able to work with perennials rather than forest trees, which is a lifetime project. He saw the results of his work within a few years, rather than waiting generations.

Reorganization meeting when the Eddy Tree Breeding Station was changed to the Institute of Forest Genetics, April 26, 1932. Left to right: John Dierdorff, Walter A. Starr, James G. Eddy, Walter Mulford, Donzel Stoney, Lloyd Austin, J.H. Hutchinson, G.O. Tamblin, James A. Irving, Francis I. Richter, Clyde R. Berriman, William C. Cumming.

Lloyd Austin, James G. Eddy, William C. Cumming, Freshpool Plantation. October 1930.

NOTES ON INSTITUTE OF FOREST GENETICS

[Following the interview, Mrs. Austin
sent the following notes to Mrs. Stone.]

Mr. Eddy's determination to get something under way can be attested by the fact that he waited two days in Santa Rosa before he was able to get an appointment with Mr. Burbank.

Our first rented home in Placerville, and the only house available at that time, was a 3-story home with heating and cooking entirely with wood stoves and a fireplace. We lived on the first floor, and offices were set up on the second floor. Work of building seed bed frames, etc., was done in the carriage house. At first I had done most of the stenographic work, but after the Lumsdens moved to Placerville, Mrs. Lumsden took over this work part time.

Before we had been here a full year, though, the house was sold and we had to find other quarters. Our next house was too small to house the office too so office space was rented in the Farm Building near the center of town. One of the secretaries employed during this period was Doris Liddicoat, whose husband later became a full time employee. Offices remained there until administration bldg. was ready in early 1930.

In retrospect the trip East may have been after the California tour with Profs. Metcalf and Fritz. Mr. Eddy had taken his family to Europe that summer, and the plan was for Lloyd to meet him in New York -- then, together, they could see Forestry and Genetics experts in the East. But Lloyd did not receive Mr. Eddy's cablegram advising date of arrival, so both were disappointed. I do not believe, though, that a decision about land purchase was made prior to the eastern trip.

In rethinking the period between Dec. 1932 and the time the Carnegie Institution came to our rescue I believe Mr. Eddy did send a minimum of funds each month, for most employees were given half pay. Lloyd, though, took no pay from that date until perhaps October or November of 1933, when funds were available, and then not a full salary (only \$100 a month) until the Forest Service took over.

After Institute Was Taken Over By Forest Service.

There followed a period of re-orientation in the program, plus great activity re-building the facilities. A librarian and a qualified taxonomist (Palmer Stockwell) were added to the staff.

Due to the depression the Federal Government was employing many men under the WPA program, so, by taking advantage of this, a new administration building was built first, then a residence for the Superintendent, plus roads, rock walls, fences, etc. The old buildings were destroyed. Other buildings were added as funds became available.

The experimental program was evaluated. At that time Lloyd wished to postpone the project he had started of trying to locate superior seed trees by testing their progeny, until he could report on the projects under way or completed, but Mr. Kotok felt this important work should not be stopped. Hybridizing work to produce new hybrids was energetically carried forward under Pete Righter.

Then the question arose as to whether the administrative staff should have its headquarters in Placerville, or be more accessible to Forest Experiment Station and University contacts at Berkeley. Lloyd felt strongly that the staff, which was not only administrative but was also the scientific staff should be headquartered at the site of the laboratory (the arboretum), with trips as necessary to Berkeley for conferences, rather than vice versa. However, he was in the minority, so arrangements were made for the Institute library to be moved. Also Pete Righter and Palmer Stockwell took up residence in Berkeley, though Lloyd was allowed to remain temporarily at Placerville. Eventually, though, Lloyd resigned as Director, and remained on the staff as a Geneticist, with headquarters at the Institute.

But without his former control he was increasingly frustrated when help was not available to take records or analyze existing records. So much of his time was necessarily spent taking detailed records, or making the many reports required by the Experiment Station, that writing for publication was delayed and interfered with to the extent that he received a low personnel evaluation.

Even though Lloyd was unhappy over the turn of events, he had not seriously planned to quit his job, for he felt obligated to write up his findings. But in the end he was not allowed the opportunity to do so, and the thesis he spent many months writing was, eventually, never published.

Gladys Austin

of the SPANISH IRIS
Second and Hybrid Beauties
with Largest Array of
BLOOMING IRIS: Summer,
Fall and Winter Twice-Bloomers
Bicolors, Ombels, Dwarfs,
Bons, Laced, Greens, Novelties

World Headquarters for Exquisite Iris

IRIS OF RARE BEAUTY
From 'Round the World
For Bloom 'Round the Year
For Every Garden Situation
For Prize-Winning Exhibits
For Flower Arrangements
For Your Hybridizing

LLOYD AUSTIN'S

RAINBOW HYBRIDIZING GARDENS

PLACERVILLE, CALIFORNIA, U.S.A.

April 6, 1968

Dear Mrs. Stone:

Do you mind if I ramble a bit? I'm afraid my thinking is more about Lloyd than about the Institute.

I always thought that Lloyd was a genius, and he was definitely a perfectionist. Unfortunately he was not an easy man for other workers to get along with. It was just not possible for him to turn projects over to others completely, and this was a source of discontent. Complaints were made directly to Mr. Eddy — but Mr. Eddy never once interfered with Lloyd's decisions in hiring or firing, or in the division of labor. He showed great confidence in Lloyd's integrity and ability.

There were not too many face-to-face meetings with Mr. Eddy — perhaps 2 or 3 times a year; but he was kept informed, opinions asked, and authority for projects requested, in long detailed letters. As I remember Mr. Eddy answered in kind. This habit of writing long, detailed letters was partly responsible, I think, for the lack of regard shown Lloyd from the Berkeley office — I doubt they ever took time to read them carefully. Face to face meetings were not easy for Lloyd, for he was a slow, careful thinker, and often was not able to answer criticisms on the spot.

The manuscript mentioned was written at great personal sacrifice. Mr. Talbot (then director of the Regional office) and Palmer Stockwell (director of the Institute) believed Lloyd should do his writing in Berkeley, where library facilities were immediately available, so insisted that he live temporarily in Berkeley — as I recall he was away from home several months, and came home rarely. When the manuscript was finished, shortly before he left the Institute, it was turned over to Palmer Stockwell for his approval before publication.

I do not know what happened to the manuscript, but think Mr. Stockwell was so involved in the cork oak project, which included a trip to Spain, that it just sat around until the data became so old it was not worth publishing! I'm only surmising, of course. About a year ago I asked Pete Righter about the manuscript, and he said the data was obsolete, so it was not published. I was sorry to learn this, but realized that Pete always believed Lloyd's Progeny Test not worth the time given to it, and he did not hesitate to say so. I do feel, tho, that Lloyd should have had this recognition as a partial reward for his personal sacrifices and for his long hours (usually from 5:00 AM to 6:00 PM, often 7 days a week) of dedicated work. I understand the manuscript is in the Institute files and available for researchers. I do not recall its title.

After regular salaries were available to Institute employees, Pete suggested, and Lloyd concurred, that employees who had been getting half pay should be reimbursed, and this was done by Pete and Lloyd out of their own salaries.

I want to assure you that I am not in the least bitter about Lloyd's ouster, for soon his health improved and, above all, he was happy to be his own master again and in rewarding work with perennials. I feel sure he would not have left the Institute of his own accord.

Those first years in the Iris business were difficult, and our two daughters were still in school needing financial help -- but it was not too long before Lloyd was well known for his daring and vision. He first tackled the little-known Aril Iris; he coined the word to cover the Oncocyclus Iris from Palestine, the Regellias from Turkestan, and the hybrids of these two, termed Oncogellias. Before that there had been no term which linked these Iris, with identical culture requirements, and the distinct white collar on the seeds. Lloyd developed many beautiful hybrids that are still in commerce.

But, reluctantly, he gave up the Arils, as they were so difficult to grow in most areas that they proved not commercially feasible -- and sales had to support the fun of hybridizing! Then he turned to his second love -- the Re-Blooming Iris. On the side, all of this time, tho, he was quietly working with his own special Iris -- the Space Age Iris, with beards elongated into horns or flourishes, some blooms almost double the flouncing was so heavy. But, again, he was ahead of his time, and even today the American Iris Society hierarchy have not accepted his new forms -- but here he did not have to rely on the AIS, for his recognition came from the general gardening public, and his new forms are widely accepted and loved.

During these years Dr. C. M. Goethe, a philanthropist in Sacramento, was deeply interested in Lloyd's work, so after Lloyd's death he suggested, and financed, a Memorial Iris Garden in the C.M. Goethe arboretum at Sacramento State College. The Memorial was dedicated on March 28, 1964, on Dr. Goethe's 89th birthday.

The stone reads:

LLOYD AUSTIN
MEMORIAL IRIS GARDEN
FEATURING HIS IRIS CREATIONS
1898 - 1963

With his vision and scientific daring,
as a hybridizer and geneticist
he created new beauty in Iris,
and organized Forest Genetics research
in 15 years of dedicated service to the
Institute of Forest Genetics,
Placerville, California

Presented by
DR. C. M. GOETHE

Dr. Goethe believed in Lloyd and was a great help, thru correspondence and personal visits (never any financial help) in keeping Lloyd's spirit of adventure in creativity alive.

I doubt these notes are of any help to you, except, perhaps, to give you a better picture of Lloyd. By the way, Lloyd had his picture taken about 1937 and I have been thinking of having an enlargement made for the Institute. Would you like a copy?

Tristatically,

Gladys E. Austin

Mrs. Lois C. Stone
The Bancroft Library, 400 Doe Hall
University of California
Berkeley, Cal. 94720

FRANCIS I. RIGHTER

Because Mr. Righter was our principal interviewee for the series on the Eddy Tree Breeding Station: Institute of Forest Genetics, we had several interviews and various additional meetings with him. Our first encounter with "Pete" Righter was in Berkeley. In appearance and in dress he looked like a retired professor. A handsome white-haired gentleman, with an intelligent face and careful scholarly manner, we were not surprised to learn that he had given up a teaching position in a university to join the staff of the Institute. He had been wise enough to realize that duties of a rising academician were less well suited to his talents than the activities of a research scientist in a field station. Perhaps his choice of career can be explained by his poetic nature -- for "Pete" is a poet. He is also an historian and a man of broad artistic and scholarly interests. "Pete" Righter appreciates the world of living things with more than a scientific passion. He knew he would be happiest working with the trees and studying them in their native habitat.

Had Righter continued his academic career he would likely have become a dean, or a college president. He has a most remarkable gift for getting along with people and adjusting to the limits of the agency he is working for. This has been shown, during his supervision of genetics work at the Institute, as he coped with the occasional financial and personal problems.

Some later meetings with F. I. Righter were in his attractive residence in Sacramento. Here "Pete" and his wife Jean have arranged a comfortable home for retirement years. Nothing more refreshing could be imagined than to come from the heat of Sacramento Valley to their house, and to be invited to visit the refreshingly cool "Bamboo Room" with its unusual decor. "Pete's" adjoining study affirms the fact that he has not laid aside his scholarly interests.

Lois Stone
Interviewer-Editor

March 1969
Regional Oral History Office
486 The Bancroft Library
University of California at Berkeley

(November 6, 1967)

Family Background and Childhood

Stone: This tape is a recording of Mr. Francis Irving Righter of Sacramento, California, recorded in Berkeley, California by Lois C. Stone. The interview concerns the history of the Institute of Forest Genetics at Placerville, California. This station was originally known as the Eddy Tree Breeding Station. The recording is made on November 6, 1967.

Now, Mr. Righter, would you like to start in by telling us something about your childhood, your family background?

Righter: Yes, indeed. I was born in Port Jervis, New York on September 22, 1897. My birth is not registered but it probably could be found if necessary in one of the censuses. My father was Irving Righter. My mother's maiden name was Lizzie Condit Towell. I had two brothers and two sisters. The older of the brothers was George Edgar Righter. The next in line was Harry Mulford Righter; then an older sister, Caroline Righter; and a younger sister, Lilian Elizabeth Righter.

Stone: Were there some special influences in your childhood, people who were important?

Righter: Yes, there were. I was more influenced, I think, by things than by persons. My father was a civil engineer and both of my brothers were civil engineers. I worked with them and decided that I did not want to be a civil engineer. The special influences in my early youth were mountains and rivers and woods and things like that. I spent much of my time along the Delaware River in the summer, and even in the winter, in skating. As I grew older, in the grammar school age and the high school age, the local library -- the Carnegie Library -- in Port Jervis was the thing that had the greatest influence on me, I believe.

My education consisted of kindergarden, I suppose, and grammar school and high school. I went to the Port Jervis High School, and there I took what was known as the college preparatory course. I went out for athletics there and led a practically normal life for a young boy. Then I became a lumberjack for about a year. The war started in 1917 and I enlisted shortly after the declaration of war and stayed in until the end. I had some education at Harvard University, where I was transferred near the end of the war to study for a commission. Then when the armistice was signed it was back to civilian life again.

University Education and Early Employment

Righter: After an interval of almost a year I entered Cornell University as a forestry student, graduating in 1923. I returned the next year for a year of graduate work in the same field of study.

Then I had a brief spell of work with the Boy Scout Foundation of Greater New York at Kanawaki Lakes, near Tuxedo Park, after which I took a job with the United Fruit Company in Cuba, where I became timekeeper on a sugar plantation.

After about a year in Cuba I was offered a position in Hawaii at the Pioneer Mill Company at Lahaina on Maui, another sugar company. I decided to accept that and went to Hawaii in the summer of 1925.

After two years in that sort of work as a section "Luna," which is actually an overseer of a section of a plantation on one, and assistant agriculturist on another, the Oahu Sugar Co. plantation at Waipahu on Oahu, I felt that what I had learned in Cuba and Hawaii respecting methods of producing sugar canes had application to forestry. For I learned in Hawaii, very shortly, that they were growing about five times as much sugar cane per acre there as in Cuba. And a large amount of that increase in yield per acre was due to the fact that they were intensively breeding sugar canes. It was these superior sugar canes which were producing much of the increased yield. So I decided to return to Cornell and do some more graduate work, specializing more in genetics, and finishing up my master's in forestry.

When I completed the work for a master's degree there were no jobs open in forest genetics. At that time forest genetics was almost unknown and no forestry school had courses in that field of work. Genetics was not a required subject in the curricula of forestry schools in the United States, and probably not in any other part of the world, either. The only place where very much of that sort of work was being done, as I recall, was in the East Indies in connection with breeding of rubber trees, and in Brooklyn, New York, at the Brooklyn Botanical Garden where in 1924 the Oxford Paper Company had established a poplar breeding program, which was being carried out by one of the botanists at the Botanical Garden, and Dr. Ernst Schreiner, a forest pathologist, who is now the dean of tree breeders in this country, and at the Eddy Tree Breeding Station, which was established in 1925 at Placerville, California.

I therefore took the Civil Service examination for a position in the Forest Service, and was accepted and spent about a year at the Southern Forest Experiment Station at New Orleans, Louisiana.

While in the Southern Forest Experiment Station in New Orleans I was unable to do any genetics work because such studies were not on the official program of the station. Rather, I was

Righter: there engaged in forest management research. That is, research into the management of forests, particularly the silvicultural operations such as thinning, and I helped out in turpentine studies also. Such work was not particularly to my liking since I studied genetics and wanted very much to get into genetics.

Lloyd Austin Offers a Position at the Eddy Station

Righter: Mr. Lloyd Austin, who was the director of the Eddy Tree Breeding Station, wrote asking me if I would be interested in a position with that Station. I wrote back and told him I would be interested.

Shortly after that I received a telegram from Professor Hosmer of Cornell University requesting me to come back to serve as an acting Assistant Professor of forest management for three terms. This I declined because I felt that I didn't know enough about the subjects I would teach there if I accepted. But my refusal was not accepted. I received a long letter from Professor Hosmer afterward, again requesting me to reconsider, so I did.

Mr. Austin wrote me after that and offered me a position and I told him I had accepted another position; there was a little misunderstanding about it but that was cleared up and he decided to offer me the position again and hold it open for three terms, until I finished my work at Cornell in February 1931. That is what eventually ensued, and I reported for duty at the Eddy Tree Breeding Station in March of 1931.

Background of the Eddy Station

Righter: The Eddy Tree Breeding Station was founded by Mr. James G. Eddy, a Washington timber man, in 1925. He had, for a long time, been considering such a project. He knew, of course, that the curricula of the forestry schools and the programs of the experiment stations were devoted to the study of the environmental relationships of the growth of trees and that the genetics side of the study of forestry was being completely ignored all over the world, except perhaps in those places which I mentioned previously. He therefore, after a long time, extending back at least to 1918, decided to establish the Eddy Tree Breeding Station. He did, as I said, in June, 1925, do this.

Mr. Eddy, in view of the obvious difficulty of applying genetic principles to the improvement of trees, must be considered a very exceptional individual, if not a very

Righter: eccentric one. He was cautious about this and he sought the advice of people who were supposed to be conversant with the problems and the possibilities in that field of work. There is no question in my mind that he encountered a great deal of discouragement from some of the scientists he met, though this discouragement was not handed out point-blank to him but more in the method of answering his question than in the type of words used. However, one distinguished scientist in a great university said, "Young man, if you go ahead with your project you will fail."

The reason for that, of course, was that forest trees -- those which are of importance economically -- are slow to attain economic maturity as well as reproductive maturity. Consequently the problem seemed similar to one of breeding the seventeen year locust or the century plant.

When he first went to Luther Burbank, Luther Burbank was skeptical about such a project, although he had, himself, done work in the breeding of walnuts. The reason for this was, as I have said, the long time lapse between generations, which was generally accepted by foresters and botanists alike.

Mr. Eddy, however, had observed at various places in the woods, where the trees were not crowded, that timber trees were capable of producing flowers when very young. And that made all the difference in the world to him. And I think, myself, that it is actually the thing which convinced him that it would be a feasible project. When he told Luther Burbank that he had seen small trees with flowers on them, Luther Burbank said, "Well, in that case it's all right to go ahead!" and did give him some encouragement. But I am sure that Mr. Eddy would have gone ahead anyway because he was incandescent with the subject, virtually burning with it. I think that much of his conversation with his colleagues and his associates, in those days, must have been on the breeding of forest trees. What I mean by that is his social associates.

Lloyd Austin Hired to Head Station

When, in 1925, Mr. Eddy decided to go ahead with his project, he visited Mr. Burbank and asked him to head up the project. Burbank, of course, had his own project going there and was an older man than Mr. Eddy, and [he] felt that a much younger man would be more suitable. Mr. Eddy asked him to recommend one. Mr. Burbank thereupon recommended Lloyd Austin, who was at that time working in pomology at the University of California at Davis. Mr. Austin had had no forestry training whatever. But he was very much interested in breeding, and had made numerous visits over to see Luther Burbank and discuss his work, and find out about such things. So Mr. Eddy approached Mr. Austin and offered him the job. Mr. Austin was at first

Righter: very reluctant to accept such a position because Mr. Eddy did not put it up as an endowed position. It was a thing that would go along from month to month, from year to year, to see how it was working out first. Mr. Austin held out for an endowment. Mr. Eddy said, "I'll refer you ..." etc. That sentence is not a verbatim quote from his letter but only a memory of the substance of a statement in one of his letters to Mr. Austin. So I suggest this revision: Mr. Eddy then -- in his answering letter -- referred him to people who knew about his financial status, so that he could contact them about his ability to support the project, at least for the time to find out whether something can be accomplished in this field."

So he gave Mr. Austin these references and Mr. Austin, of course, looked them up and learned that Mr. Eddy was a multi-millionaire. After much argument, which lasted over a period of some weeks, Mr. Austin finally decided to go along, and accepted the position.

Once the decision had been made by Mr. Austin to go ahead with the work, Mr. Eddy immediately implemented the project financially. Mr. Austin did a very good job in working out the details of the financial arrangements. In the end, this cost him a lot of time because no specified monthly or annual budget was set up in advance. So he had to send Mr. Eddy a record of expenditures every month with explanations for some of the items as well as reasons, justifying proposed expenditures for major new items. In addition, he reported on the progress of the work, outlined needed new projects, etc. But the main decision other than that was where to establish the Station, and after that, what to do at the Station. Mr. Austin made a trip around the United States to look into various sites which might be suitable for such a Station. He had the problem of deciding on what to do about the selection of a site, which he did almost immediately upon returning. He had had some work up at Placerville, or near Placerville -- at Camino, above Placerville -- in a pear orchard up there. He was struck with the suitability of that sort of a location for the work of the Eddy Tree Breeding Station.

Placerville Favored as Site

The situation at Placerville was that it was about mid-way between the top of the Sierra Nevada and the valley floor -- fifty miles from each would bring you to Placerville. It was a timber producing country; the original country there was completely timbered over. There were good stands of timber, mostly above, but some second growth below Placerville. The situation offered these two very important advantages: first of all, the products of the institute could be tested out under a wide variety of environmental conditions on the El Dorado transect of the Sierra Nevada. The environment of the high Sierra was very

Righter: different from the environment down in the valley; and you'd only have to go a distance of fifty miles each way to get vast extremes. But in a level country you might have to go a thousand miles to get such a thing as that. So the side of a big mountain range was considered a very good place to put such a station.

The other advantage was that there you could work up the mountain as the flowers came into bloom. The flowers which were first to bloom were those on the trees at the lower elevations. As you went up the mountain other flowers of the same species, or different species, would come into bloom, which meant that you had a long breeding season. The breeding season on level ground would be maybe ten days to two weeks. But there we had a breeding season which started in February, on Monterey Pine, introduced down in the Sacramento Valley, and ended in July up in the high Sierra.

So the decision was made to establish the station at Placerville. Actually, Placerville is at about 1800 feet elevation, and the experimental tract was situated four miles east of Placerville, at 2760 feet elevation. Another advantage of that situation was that so many different trees from all parts of the world could be grown there. We did not have much really frigid weather, that is, it seldom got below 20° below 0° Fahrenheit. A good many species of timber trees would be capable of surviving that. As it turned out, that proved to be the case.

Site Chosen, Staff Hired, and Work Begun

Having decided where to locate the station, a site was established four miles east of Placerville, as I said, on a ridge top, and Mr. Eddy purchased, in the end, about 106 acres of land there -- not all at once, but at two times; and we can give you the dates of those later.

The first job after that was to determine what genera of trees would be investigated and worked with. Mr. Eddy, of course, was a Douglas fir man. He probably would have liked to go into Douglas fir *Pseudotsuga minziesii*, but there aren't very many species in *Pseudotsuga*. So that was considered but not regarded as one of the major projects, although a few collections of Douglas fir seed were made and some Douglas firs were originally planted in the arboretum. Finally it was decided that the major effort would be devoted to the genus Pinus. That genus is one of the most important, economically, of all the genera of forest trees. There were eight or ten local species of pines on or near the El Dorado transect of the Sierra Nevada. It was felt at the time, too, that they should go into the breeding of a hardwood genus, and they finally selected walnuts for that. The purpose there would be not to produce walnuts, but to produce walnut timber of superior or particular utilization characteristics.

Righter: Having decided that they would go into those two different genera the first job was to organize a staff. Mr. Austin canvassed the forestry schools. He obtained Mr. John Barnes, who was a forestry graduate at the University of Michigan; and after that Mr. Mason Lumsden, who was also a Michigan man, to come there and help get the arboretum established and the program going. Of course they had to recruit people to do the laboring work also. Mr. William C. Cumming was first employed as a man who would do odd jobs around there, things of that sort. He came on as a regular staff member and was a charter member of the Eddy Tree Breeding Station staff.

First Projects of Station

Righter: The work of establishing a breeding project on the site selected consisted of, first clearing off the pear trees which were there -- the pine trees had been removed to plant pear trees -- and now the staff was removing the pear trees to replant pine trees there. That was a job in itself, and one which was readily accomplished in a short period of time. The next job was to determine what the breeding and genetics program would be, and from that decide what had to be done. Austin drew up programs after collaboration with his staff. Once a program was settled upon, what had to be done came along almost automatically. The first thing a breeder would do in breeding for the improvement of a particular kind of plant, is to assemble as many different species of the genus as he could in one convenient place, so that the breeding operations could be conducted right there without having to travel all over. That was one of the first big projects which was started. Mr. Barnes and Mr. Austin wrote letters to botanical gardens and seed companies and seed collectors and universities all over the world, requesting seed of various species which might be obtained readily by people in those parts of the world. The response was very generous and very quick, so in a very short time they had fifty or sixty different species of pine represented in the arboretum at Placerville.

Arboretum Established

Righter: This arboretum, which was later named the Eddy Arboretum in honor of Mr. Eddy, was laid out in such a way that the species of pines were separated and segregated in the arboretum according to the relationship groups of the pines as established by Shaw at the Arnold Arboretum. His book The Genus Pinus* was used as a guide. Those species which were more closely related to each other were planted in a particular group in a particular block of the arboretum.

* George R. Shaw, The Genus Pinus, Cambridge, Mass., 1914.

Righter: So the arboretum was divided up more or less according to relationship groups. The spacing had to be determined. It was figured that the trees would grow to a large size and take up lots of room. In order to accommodate all the trees that would be needed it would be necessary to plant them not farther than fifteen feet apart. You see, there's a problem! The spacing arrangement was finally decided to be fifteen feet between trees. This was because trees, as they grow larger, take up much more room and require more room, and yet the Institute couldn't give too much room to individual trees. Otherwise it would soon be out of land. The land would all be occupied, and it had to reserve some land for buildings, nursery purposes, field tests and suchlike things, and for freak gardens where abnormal forms could be planted out and watched and used in genetic studies later on. So, it was thought that fifteen feet at the start would be suitable and if necessary thinnings could be made later on. Fifteen feet was enough space, as we learned later, for individual trees to come into flower early in life. Many of them produced flowers within five years, rather than twenty years as most foresters expected. And that put a different light on tree breeding because these young trees flowered very abundantly at that age, producing both pollen and ovulate strobili.

Stone: Why do you think that was? More light?

Righter: Yes, more light, space and special care.

The Walnut Plantation

Righter: The walnut plantation was established on land leased from the State Department of Forestry at Davis. Austin himself did most of the work in assembling the walnut materials. Walnuts can be easily propagated through buddings. All they had to do was to get cuttings of different species of walnuts and walnut hybrids and assemble them at Davis. Later on a small plantation was also put in up at the Institute.

Pines in the Arboretum

Righter: In Shaw's The Genus Pinus sixty-some different species are recognized, and all the other pines which had been observed up to that time were regarded as varieties or forms of those species. Some species of pine included one or more varieties. Indeed, the Montezuma pine of Mexico was so endowed with varieties that it was long regarded as the most variable of species of pine. Since then, some of these different varieties have been elevated to species rank. Dr. Mirov can straighten you out on this, as he's made special studies of those things.

Nursery Building - Eddy Tree Breeding Station
July 1930

Francis I. (Pete) Righter
April 1931

Pollination technique. Bag, hypo, and Bill
Cumming holding syringe. 1932

F.I. Righter transferring from climbing
rope to limb. May 1948.

Righter: The upshot of this work in assembling an arboretum was that the arboretum at Placerville, in a very few years -- by the time I arrived there in 1931 -- was the most complete arboretum of pines in the world. There were more different species of pines assembled there than had been assembled in any one place anywhere in the world, probably because it was such a mild climate there and the environment was so favorable to their growth. Some of the high elevation cold climate trees wouldn't grow there and some of the tropical trees didn't do well there. So they were missing.

Stone: Did you include the white pines as well as pitch pines or hard pines?

Righter: Yes, the white pines as well.

Stone: Did you continue with walnut breeding?

Walnut Studies Discontinued

Righter: The work in the walnuts was not carried on for very many years. It was found that we had all we could do with the pines with the money available and staff available. But the pines are the second largest genus among the gymnosperms, consisting, as is recognized now, of some ninety different species. They were distributed circumpolarly in the northern hemisphere from high elevations to low elevations, from swamp edges to desert edges -- so there was impounded in that genus a vast amount of genetic diversity with which to work. And genetic diversity, of course, is the raw material of the breeder and the geneticist.

Techniques Developed by Staff

Tree Climbing

Righter: Another problem was to work out the various techniques which would be required in the experimental program. Everything had to be reduced to a technique, you might say. Tree climbing itself -- an occupation which required considerable agility and strength and endurance, and was dangerous -- had to be mastered. That meant people would have to familiarize themselves with climbing these trees -- what had to be done, how best to climb, and this thing and that -- and work out some sort of ideas and at least give the neophytes in that field the benefit of their experience and knowledge. We know that the limbs of the white pine, for instance, are more brittle than those of the hard pines. And the wood is softer as a rule, and things like that. Other techniques involved the collection of seed--cones usually grow out on the ends of the limbs. Actually the ovulate flowers in the pines are produced up in the top part of the tree and pollen is generally produced mostly in the lower part of the tree.

Righter: It meant climbing up and getting these cones and being sure that they were not mixed with cones of neighboring trees: you didn't just throw them down on the ground. You had to collect them on the tree and put them in bags there as a rule, if you wanted to keep the seeds separate by seed parent. So there was much to be done on learning how to do these things. We didn't have large ladders that we could easily handle out in the woods. It eventually meant climbing with ropes, which we learned to do.

How to Determine Ripe Cones

Another thing was to determine when the cones were ripe for collecting. You couldn't trust the squirrels, because they went in too early sometimes. That required a little observation and testing -- when to collect the cones. The extraction of seed was another problem that had to be gone into. Because in almost any collection of seed that you make from a pine tree you get seeds which are hollow and seeds which are sound. We had to separate the sound from the hollow and we didn't want to waste seeds, particularly hybrid seeds because they were very valuable seeds, or waste time on hollow seeds. So that had to be worked out.

And the collection of pollen was another thing. That wasn't too much of a problem, except that the isolation of the pollen from a single tree was difficult because pollen grains are about thirty microns in diameter, very small. They get all over everything -- in your clothes, and in any bags you may have. Foreign pollen can easily get in.

Those things were eventually worked out and reports were made on them, articles were published and so on, but it took time, lots of time. The control of pollination was partially worked out when I arrived. What has to be done is to put a pollen-proof bag or barrier around the ovulate strobili of the pines. How best to do that had to be determined; and the kind of bag which would be suitable had to be worked on. A heavy bag on small limbs would bend them down, out of shape. If there were storms they would bend the limb down maybe and break it off, or thrash it around and hurt the flowers -- things of that sort. They had a very good bag, called the standard bag, made of ten-ounce army duck. Its specifications are given in publications which have been issued, and it has been widely copied throughout the world. Actually it was my favorite bag. Other people like to use sausage casings which were developed later.

One of the main problems I worked on when I first came here was how to get the pollen into the bag without taking the bag off or letting foreign pollen in. The method which had been developed up to then was rather crude. They took the bag off sometimes. They had a copper tube which was large in diameter and there was a hole in the bag and a flap down over that hole, which they lifted up to put the tube in, and then they'd

Righter: squirt the pollen in. The tube was connected with a rubber ball.

Hypodermic Pollen Technique

Righter: But that wasn't completely pollen-proof. I conceived of the idea of using a hypodermic syringe with a rubber bulb, and that solved that problem. You see, that could be punched through the fabric. And when you pull it out you just rub the place where it went through with your fingernail and that closes up the small hole. Microscopic examination showed that the pollen couldn't get through there. It was a perfect way of solving that problem.

At about the same time people doing breeding work in pecans had also adopted the hypodermic syringe. So it wasn't a unique adaptation of a medical instrument. In fact, very shortly after I went to Placerville and got acquainted with some of the problems of controlling pollination I made a trip to Sacramento to visit a medical supply store to see what would be suitable for application to our problems up there. I came up with this idea of the hypodermic syringe, which worked out fine.

The testing of pollen had to be perfected. That was another problem I worked on. My rather practical method of doing that has been widely copied and much used since. It has been described in publications and so on.

The Time to Pollinate

Righter: Another problem was the best time to put the bags on the flowers and when to pollinate and when to remove the bags. That took studies of several years. They put bags on certain flowers of one tree, and on the same tree they'd bag them but at a different time, to see how the flowers ripened. They had to determine when the flowers were most receptive to pollen. If you put the pollen on too soon the pollen and your efforts are wasted. If you put it on too late the flowers are closed and no longer receptive. You put it on just right -- when the carpels are at right angles to the axis of the cone, that's the time to do it. But they don't all ripen at the same time, so we adopted that as our final criterion of what we call maximum receptivity and we try to pollinate at that time, which of course meant going up the same tree two or three times to pollinate.

Righter: Those things took time. The flower ripening process has been described and published and our application of this description and the various stages -- I believe there were about seven different stages which we recognized, from bud closed to buds open, to things like that, maximum, partly closed, closed. It was finished after a few years. We had made tests of putting bags over flowers at different stages -- pollinating at different stages of the ripening, seeing how they came out.

Those were some of the techniques which had to be worked out. The techniques in setting up nursery tests, the evaluation of what we obtained from our control pollinations and other kinds of seed collections had to be worked out -- the best size of a nursery bed. At first it was deemed to be the standard nursery bed of four feet, but it was later widened to five feet for statistical purposes and to save space, and lumber, because the smaller size required more beds, and hence, more space and lumber. Various things like that, those things were all worked out in due course.

At the time I arrived there, the nursery experimental work had been developed so highly that there was no other place I knew of which had such a well-developed and perfect method of nursery experimentation with tree seedlings -- no other place in the world like that. It was remarked upon by many visitors who came from all parts of the world.

Stone: Who was responsible for setting up the nursery?

Righter: The forestry people did that, John Barnes, and Mr. Austin supervised it very closely but he was so busy with the office work, the accounts and working on the programs and working on the library work and all this business that he didn't get out into the field, very much. They did a good job, whoever did it. Wahlenberg was very prominent in that, I suppose. The record will tell. But at any rate, there was a tool available for anybody that had ideas on how to set up breeding tests and go ahead with the work. All you had to do was to adapt the proper statistical designs for your particular test, and the nursery technique was there.

Depression Problems (October 27, 1967)

Reorganization of Station

Righter: One of the most interesting periods of our history at Placerville was during the Depression. Shortly after I arrived in 1931, it became quite evident that the Depression was having its effect on Mr. Eddy, because of financial circumstances. When he started the station it was learned by Mr. Austin, the first director, that he was a multimillionaire, but he evidently lost quite a lot of money. And even before the Depression started -- in fact in 1928 -- he had come to the realization that this program of genetic studies and systematic breeding for the improvement of forest trees was bound to be something that would, in its requirements, exceed his financial capacities.

Thus, before I arrived on the scene at Placerville Mr. Eddy had broached the possibility of affiliation with some outstanding educational or research institution, such as the Carnegie Institution of Washington and the University of California at Berkeley. It was clear to him then, and to the staff, that something like that might eventually have to be done. In 1932 the situation became such that it was necessary to lay off several members of the staff, just keep a skeleton staff there to keep the premises in order, and to see what they could do about raising funds to carry the Institute along.

This was a problem that necessitated reorganization of the Eddy Tree Breeding Station because it wasn't likely that, if we ran a campaign to raise funds, other people would be interested in contributing to Mr. Eddy's pet project. So the reorganization idea was considered intensively by Mr. Austin, myself, and others. We felt that we should go ahead with the reorganization of the station. Mr. Austin started immediately, with Mr. Eddy's approval, to do that. The idea being that once the station was reorganized into a national Institute of Forest Genetics, we could then go out and try to raise funds for an endowment, the interest of which would give us the money needed for our operations.

The first problem was to get a national board of trustees. That was done; and incidentally, this is something that's of record and can be copied down as it was in the by-laws and articles of incorporation of the institute. A very

Righter: distinguished board of trustees* was assembled after a period of time. And then the problem of raising an endowment fund of a million dollars was tackled, it being supposed at that time that the interest on a million dollars would carry us along quite well for a number of years.

Fund Raising

So we employed the fund-raising concern of Tamblin and Brown to carry on this campaign. Tamblin and Brown was a very successful fund-raising concern. It had raised twenty million dollars for Yale University and the money for the cathedral of St. John the Divine in New York City, and suchlike things and was currently in 1932 conducting a campaign to raise funds for the Stanford Medical College. They sent their representatives; we didn't actually sign a contract for the complete campaign which they proposed because Mr. Eddy didn't feel that he wanted to put fifty thousand dollars into it during a Depression. People were rather reluctant at that time, as we certainly found out later, to donate money to anything in those days. But Mr. Eddy put \$3,500 into it. That was sufficient to have a staff member of Tamblin and Brown sent to Placerville, go over our work there, and learn what our objectives, and methods, and so forth were. He wrote up a booklet, Science Seeks New Trees for the Forests of the Future [Placerville, Calif. 1933]. Once the booklet was prepared, it was feasible to send copies of this booklet to people whose names Tamblin and Brown & Company had in their files as being interested in conservation and philanthropy -- and request consultation, or engagements, or appointments with Mr. Austin and myself to go over our program with them to see if they would give us money. That was done, they [the booklets] were sent out in due course and then arrangements were made to visit the offices of distinguished men who were in this particular category. Austin took southern California and I took northern California and we went around and explained our program and our needs to these men.

Now, in San Francisco, for instance, I went to Timothy Hopkins, who was one of the trustees of Stanford University. I announced myself to his secretary there, overlooking San Francisco Bay, high up in a Sutter Street building. He said, "Oh, come in, Righter, I've been expecting you." I went in and I saw on his desk he had rows of big balls of tin foil. He had a paper cutter and he was going through a pile of things, which were tinfoil wrappers partly, and was separating the paper from the tin foil. He saw my look of amazement and he said, "Oh, my wife makes me do this. She thinks it'll help in the Depression somehow or other. I have read over your prospectus and I like it very much. If we weren't in a Depression now I would contribute substantially to it. But I've sewed up my pocketbooks and declared a moratorium on my debtors and if everybody'll vote for Herbert Hoover everything'll

* Complete list of trustees in Appendix.

Richter: be all right." Then we talked about fishing and things like that for a while, and I left. That was one of the things.

Then I went to Mr. Hill, of the Hill's Brothers Coffee people. He was very glad to see me and very cordial. He was interested in our pollination technique. He said, "By the way, Mr. Richter, I knew you weren't a salesman the minute you came in my office." Well, of course we had been cut down in salary and I was a little bit threadbare around here, [his coat cuff]. A salesman doesn't look that way. So then I went to many other people over there and it was always the same. One fellow almost kicked me out of his office. He said, "Nobody's got any money for this sort of thing in these times." That's one of the episodes.

Austin didn't do any better down south. Another man I went to was the brother of Mortimer Fleishhacker. I didn't even get to him; I just got to his secretary.

Stone; Didn't you get any money?

Richter: We got maybe several hundred dollars, I guess; not much.

Another man that I visited in San Francisco was Mr. Kent, a son, I believe, of former U.S. Senator Kent. He was greatly interested in this program but he took the attitude that our work should be conducted by the United States Forest Service. We didn't at that time feel that we wanted to get into the Forest Service, we'd rather remain a private institution. He and I argued all morning long on that point. We got nowhere of course. He gave me very good ideas which were later used in working out the destiny of the Institute of Forest Genetics.

The Interim Period (Feb. 28, 1968)

Stone: The last time we were recording, you told about efforts to raise money and they turned out to be unsuccessful. Obviously, you had to make some other plan for the Institute. What did you do, finally, to bring it into the U.S. Forest Service? What happened next?

Richter: The next step was more or less unpremeditated. We did make a request to the Carnegie Institution of Washington that they investigate the Institute for the purpose of ascertaining whether they would want to affiliate it with the Carnegie Institution or aid it financially. The Carnegie Institution sent Dr. Herman Spoeher, who was in charge of the Carnegie establishment at Palo Alto, and Dr. I. W. Bailey of Harvard University to investigate the Institute. I have forgotten the date of this, but it can be obtained from the records.

Richter: They spent a day or two at the Institute going over the premises, the facilities, the program, and talking with the staff, and then disappeared. After a while we received a grant of money from the Carnegie institution to keep us going for a while. And I believe that one or two or several more grants were subsequently made by the institution to the Institute. So evidently these men made a favorable report to Dr. Merriam, who was the president of the Carnegie Institution at that time.

Stone: Dr. C. Hart Merriam?

Richter: It was John Merriam, I think; wasn't it?

Stone: Did this money support the Institute of Forest Genetics adequately?

Staff Layoffs

Richter: No. In 1932, the policy adopted by Mr. Eddy, who had suffered heavy losses in the Depression from various causes, was that various staff members would have to be laid off and just a skeleton crew kept on to keep the Institute going, until some other measures for obtaining funds or becoming affiliated with some other organization could be worked out.

So various men were let off. And you can get their names from the records. But several were kept on, including Mr. Austin, Mr. Richter, Mr. Berryman (probably), and the clerk. And the grants from the Carnegie Institution kept the work going for a while. People had to be employed, from time to time, to carry out some of the work. But eventually things became so bad that Mr. Austin wrote a very gloomy letter to Mr. Eddy.

At that time I was generally asked by Mr. Austin to go over all the correspondence before it went out, make any changes or suggestions which I deemed appropriate. And I felt that this letter was couched in such strong and impressive terms that it should not be wasted on Mr. Eddy alone, since he had already expressed his views that he had to put us in snug harbor for a while, but that it should be sent to Professor Mulford at the University of California. Mr. Austin accordingly sent a copy of the letter to Professor Mulford, and from that act the United States government did take action to keep the Institute going.

Stone: Did that happen immediately?

Richter: No, what happened was that before this time -- No, while we were on the Carnegie fund, I believe it was, Mr. Knowles Ryerson, (Dr. Knowles Ryerson, who was then in charge of the Bureau of Plant Industry) came through and inspected our premises there. And later when he was head of the Soil Erosion Service -- now the Soil Conservation Service -- he was approached,

Righter: apparently by Dr. Merriam in Washington, I believe, who had been notified of our circumstances by Professor Mulford. He [Dr. Ryerson] had received quite a bit of money to establish nurseries around the country. And since he had seen the place he decided to make available \$40,000 for one year -- fiscal 1934 -- to keep the Institute going, and to grow soil erosion stock for planting out, for erosion-control purposes.

In the meantime it was determined that influential people in Washington would work with the Forest Service in getting legislation through Congress to accept the Institute of Forest Genetics, as a gift from the board of trustees, to be operated by the branch of research of the United States Forest Service.

That happened in 1933 or 1934, so that by the beginning of fiscal 1935 the money which was available was allocated to the Institute for use in fiscal 1935. This was used largely for experimental purposes. It enabled us to take on several of the members of the staff who had been laid off.

Stone: Who were some of those who'd been laid off?

Righter: Bill Cumming.

Stone: Oh, he'd been laid off!

Righter: Yes. Al Liddicoet.

Stone: Oh, I see. They went on to other jobs.

Righter: I guess Clyde Berriman may have been kept on. I don't know, I'd have to check. But several of them were laid off. Then we could take them back on.

Stone: Mr. Cumming said, for instance that he worked for the

Righter: State Forestry Division, yes.

Stone: Yes. He told me about how you came after him to get him when he was fighting a fire.

Righter: Oh, yes. You see, the Soil Conservation Service sent Fred Herbert out to supervise the expenditure of this \$40,000, to be sure that it would be used in the proper way; no foolish use of it. And Fred Herbert had a man working with him down at Taft whom he wanted to put on the staff. And I did not think that this man -- although he was a good man -- would be the equivalent of Mr. Cumming. So I prevailed upon Mr. Austin and Mr. Herbert to at least consider Mr. Cumming again. And finally we decided that since Mr. Cumming had been a charter member, and was so experienced in the work -- had the experience that this other man lacked, and everything, and was a very likeable man, and a hard worker -- that we should put him back on instead of this other man.

Cumming and Liddicoet Return

- Righter: Fred Herbert and I went down to where Mr. Cumming was working with the California State Division of Forestry and persuaded him to come back up to the Institute, which he subsequently did. And that happened in June or July 1934. That's that little incident.
- Stone: And Mr. Liddicoet came back, too, about the same time?
- Righter: He may have come back even sooner, I'm not sure. I think he did.
- Stone: Now, by that time, were you securely under the U.S. Forest Service?
- Righter: No!
- Stone: That was just temporary.
- Righter: The legislation was passed during this period when we had the funds, in fiscal 1935; that's when it was passed, not '33. The funds which became available July 1, 1934, for that fiscal year, 1935, were available until July 1, 1935. And in the meantime legislation was put through Congress to accept the Institute as a gift from the board of trustees to the people of the United States, to be operated by the Forest Service.

And then the propositions of the United States Forest Service had to meet with the approval of the board of trustees. So, you see, there was a back and forth correspondence between Mr. Eddy and the board and also the people in Washington, to determine just how this would work out, before they would turn it over to the government. And there was quite a bit of argument back and forth.

The Institute Given to the U.S. Forest Service

We would have preferred, at that time, to have stayed under private auspices. But there was nothing else that we could do. The Carnegie people wouldn't take it on because we were engaged to a large extent in the practical application of science, not pure science as they are engaged in. And the University of California wouldn't take us on because, we didn't have \$600,000 (endowment) to give them. This was the last hope for us. It took quite a bit of time to reach an agreement between the members of the Institute, the trustees of the Institute, and the officials of the government; to reach a conclusion as to what should be put into the documents which

Righter: would effect the transfer. And those things are all on record, of course, now. In August, 1935, agreement on all sides was reached. The Board of Trustees [of the Institute of Forest Genetics] met with the Forest Service officials in San Francisco. There they signed the various agreements and documents which had to be signed, and the transfer was officially completed there.

Stone: Now, from that time on, it has been officially under the Forest Service?

Righter: That's right.

Funding of the Institute of Forest Genetics, U.S. Forest Service

Stone: Has the Forest Service entirely funded the Institute?

Righter: No, not entirely.

Stone: There has been some funding from the outside?

Righter: Oh, yes. Mirov got quite a lot of money from grants, you know.

He got grants from the Rockefeller Foundation and the Resources for the Future. He got \$30-, 40-, or more, \$50,000 -- I don't know how much.

And then some extra money was provided by other people who became interested in our work. One very surprising and conspicuous example of this was a contribution from Mr. Fred Searles, who was a director of the Boyce Thompson Institute at Yonkers, New York. There they were engaged almost entirely in pure research. Mr. Fred Searles was a very wealthy mining man who was born in Grass Valley and who had extensive holdings in mineral wealth throughout the country, if not throughout the world.

He became interested, and he sent, unbeknown to us, a Mr. Mann who was superintendent of the Empire Star Mine at Grass Valley, over to inspect the Institute one afternoon. Bill Cumming brought him out. We were working in the nursery. And he asked me if I would show him about and I did.

When he left he said that he was manager of the Empire Star Mine, and he thanked me for showing him about. Later on we received from Fred Searles, Jr. \$10,000 gratis, with no strings attached at all. We could use it any way we wanted.

Stone: Just for the Institute?

Righter: Yes. Those gifts were especially welcome because they're very different in their handling from the funds which were allocated by the federal government. Because, everybody knows, in a case such as ours, the appropriation which is made by Congress for a certain fiscal year has to be used only in that fiscal year, and it cannot be overdrawn. To have a fund like Mr. Searles sent is a sort of a cushion. We could start studies which could not be covered entirely by the Forest Service appropriation, and could be carried on through by his fund if we didn't have enough government money. That was a wonderful thing to have, you know.

And Mr. Eddy often gave us money to carry us over, too.

Stone: I was going to ask that.

Righter: Many contributions by Mr. Eddy. Not large ones, but they were something we cherished and found very useful.

Stone: How about the Board of Trustees which functioned? There was some money that came into their hands from other sources, too. Was there any kind of an endowment fund?

Righter: I don't remember anything of that. But subsequently -- this happened long afterwards -- not too long after Fred Searles' first contribution. The reason Mr. Searles made this contribution was that he and several other directors of the Boyce Thompson Institute felt that the work at the Boyce Thompson Institute was not practical enough. It didn't seem to be directed to some practical ends, they couldn't see it. That is the way of many businessmen, I guess. At that time, they liked to see practical results, and didn't appreciate fully the importance of fundamental work.

And so he was looking around for something else to put the money in, or for another field of work which could be adopted at the Boyce Thompson Institute, you see. That's the reason he liked trees, having been born up at Grass Valley where these nice forests existed. So we got that grant. Apparently he didn't at once succeed in having the Boyce Thompson Institute go into forest tree breeding, and forest genetics. And so eventually he made another grant of \$20,000 to the Institute through the Forest Genetics Research Foundation.

He actually made it to the Institute. This is another long story. Mr. Wycoff, who was then director and about to retire, was going to be executive vice-president in charge of the Forest Genetics Research Foundation and he wanted to have this fund to show that the Foundation was doing something, so it came through the Foundation.

Stone: Oh, Brownie points for the Foundation.

Righter: Yes. So we got from Mr. Searles \$30,000 altogether.

Stone: That's wonderful.

Funds for Extra Land

Righter: Then, of course, Bill and I raised \$25,000 up there for land.

Stone: How did you raise that? Oh, going around to various people.

Righter: Well, yes, you might say -- we wrote to them. This is a long story. I don't know whether I told you about it or not.

Stone: Not that, no.

Righter: Well, you see, the Institute had 107 acres of land and Mr. Eddy bought ten acres more and gave it to us. The Forest Service needed that for their nursery up there. So we leased it to them for fifteen years.

Then a ranch up -- about three miles -- from the Institute on the same kind of land which we have at the Institute was put up for sale. The owners were three sisters back in Indiana who wanted to sell it over a period of four years. Bill didn't tell you about this?

Stone: He told me something about it, but you didn't say anything.

Righter: Well, Bill impressed me with the value of this land for our purposes. And all I had to do was go up there to look at it to see it was so. He said, "This is our chance to get some new land. And we gotta try to raise some money for it." And I agreed with him.

So I took it up with the director, who was Dr. Arnold. I told him that this land was for sale and we needed it because our own land was being filled up with plants and stock and pretty soon it would be all filled up. And I said, "I have certain ideas about how to go out for this fund, but if you have other ideas, why I'll be glad to go along with your ideas."

He said, "No, you do it the way you want to."

So, we started in. Bill told me about a man up at Winters who had known Dr. Stockwell, good friends with him, and had met Bill, and he recently had been up to the Institute. This was around in 1957. And Bill said, "Did you ever meet Charlie What's-his Name? This man up there at Winters? Charlie Lambert?"

I said, "No, I heard about him. Palmer spoke about him, Palmer Stockwell, but I never met him. And I don't remember that he ever came to the Institute when I was there."

Righter: Bill says, "No, he didn't, but he was up here recently. And when we were driving away he saw some bags high up on a big tree alongside the driveway into the Institute on the left-hand side there, as you go out. And he looked up at those bags and he says, 'How'd you get those up there?' And Bill says, 'We put them up.' And he says, 'The hell, you say.' And he says, 'We sure did.' And he says, 'Well, I'm not going to let you do that anymore, I'm going to buy you a mounted ladder.'"

And Bill told me that he wanted to meet Mr. Eddy, too.

So, I asked him, "Do you think we should go to him for funds?"

And he says, "No, I don't think so, not right away, anyway." But we had to do something, and one day I decided I'd call him up. And he was a rough and ready old fellow. I called him up. And he says "Who're you?" "Who the hell're you?" he'd say.

I told him -- I asked him if he remembered Dr. Stockwell.

He said, "Sure, I remember him. He was a great friend of mine."

I said, "Well, when Dr. Stockwell died, they put me in his place. So that's who I am."

He says, "Are you a good fellow?"

"Well, I don't know if I'm a good fellow. You'll have to ask some of the people at the Institute."

You know, it's hard to go asking people for money.
[Laughter]

And he says, "Well, what do you want?"

And I says, "Well, uh, Bill Cumming told me that you wanted to meet Mr. Eddy. And I think I can arrange that for you the next time that he comes down. And also I think I can save you some money."

He says, "Oh, yeh? How?"

I said, "Well, Bill said that you're going to buy us a mounted ladder to work around in the arboretum with."

He says, "That's right, I'll do that."

I said, "Do you know how much that'll cost you?"

And he said, "No."

Righter: I said, "Well, I looked it up. It's \$12,000."
And I said, "We could use about half that much for a much better purpose and that would save you some money."

He says, "You could!" And he asked, "What is it?"
And I told him this land was for sale and we were trying to raise money for it. And he says, "Well, I'll contribute."

But actually, Mr. Lambert had had cancer already, and he died from cancer, before he could do anything about it. And that fell through. We had a few disappointments like that.

Another one was Mr. West of the Placerville Lumber Company who agreed to give us one quarter of it, but his colleagues in the company objected to it, and that offer was withdrawn.

Stone: What company was that?

Righter: Placerville Lumber Company. Then, before that -- some years before that -- I received a letter from Mr. Bloedel, Prentice Bloedel, whom I didn't know. But I looked him up afterwards and found he was in Who's Who a prominent lumberman, and everything. He wanted to know if he could visit the Institute one Sunday, and so I made arrangements with him to meet in Sacramento and take him to the Institute. And I said, "Surely I'll be there."

So I picked him up at the Senator Hotel and took him up there and showed him about. And you knew you were in the presence of an exceptional personality there, refined and gentlemanly, and everything, you know. At the end of the show-me trip he indicated that he might make a contribution. "Well, I would like to make a contribution."

This was a little bit unexpected for me. I knew we needed contributions. But at that time we hadn't started on this thing for land and I never felt that you should go out for small contributions. Make it big. So I thanked him but made no suggestions then. And I said, "I'll keep that in mind." And so I wrote him a letter and explained everything. He wanted to know a little more about it.

Dr. Arnold was to meet him at a meeting in the Olympic Hotel in Seattle one night but that didn't come off. Mr. Bloedel -- some of his most important holdings are up in Vancouver and he'd come down from Vancouver and apparently missed Dr. Arnold there, or they didn't connect and so nothing came of that and I didn't do anything. I felt that he would eventually contact me, which eventually he did, by telephone. He said, "Do you still need money?"

And I said, "Yes."

And he says, "Well, I'll pay one quarter."

Righter: And I said, "Well, we need someone to start it off with."

He says, "I'll make the first payment."

And then Bill Cumming had had contact with one of the men from the Winton Lumber Company. That's an outfit that has its headquarters back in Michigan I believe, or Wisconsin, or some place like that. And we had had quite a bit of doings with them, we'd planted on their land and things like that, our tests, you know. Their manager at that time apparently seemed to regard our wishes, or our needs, as something very important.

So Bill says, "Let's go down to Martil -- it's just this side of Jackson, and see him."

And we went down there. And he said he'd give one quarter.

Then the director of the Morton Arboretum, in Illinois was out here -- about that time, or a little earlier -- a year or two earlier -- to a meeting of the Shade Tree Association in Yosemite Park. And after that he came up, on Saturday, and spent the morning with me at the Institute. And after I showed him around he said, "How are you for finances?"

I says, "Well, we need money all the time. We never have enough."

He said, "I have it running out of my ears." You know, Mr. Morton is the salt man. And his grandfather was the founder of Arbor Day and so on, and secretary of agriculture.

So I thought of that occasion and I wrote a letter to the director of the Arboretum there, who was Dr. Gottschalk, asking him if he would mind if I went to Mr. Morton for a grant. And he wrote back and says, "No, I'll do it myself." And he wrote to Mr. Morton and explained the situation and Mr. Morton came through with \$5,000, although he was then over in Europe.

The final disappointment was that we had gone down to see a doctor down below Santa Cruz. We had pretty good hopes that he would give us the other quarter, but he died of a heart attack a couple of days after Bill and I were there. So something drastic had to be done. I went back to Mr. Bloedel and told him the circumstances.

It just happened that his father-in-law, who was Mr. Merrill of Merrill and Rink Company, had some years previously, at the constant instigation of Mr. Eddy, decided to visit the Institute. Mr. Merrill was a Douglas fir man. He was about eighty-five years old, or so then. Or maybe a little younger.

Righter: He was a big tall fellow, a handsome man, alert, vigorous and perspicacious. He came in a Cadillac with a chauffeur. He got out of his car and he said, "You got anything here that'll beat Douglas fir?"

And I said, "Well, I don't know much about Douglas fir, but I'll show what we have."

So we had some very good looking hybrids out in the nursery. I took him out and showed him these hybrids. They were really up there. He looked up at them and he says, "How old are they?"

And I told him and he said, "Yep, that'll do it." He got out his European camera, which he didn't know how to use -- and I didn't either, but after some time, figured it out and got it going, he took some pictures of it. And then he went away. Next year he came back and he asked, "You got those trees still here?"

And I said, "Yes."

He said, "I'd like to see them again." So we went out there and saw them. Again, he took more pictures. And then the third time he wrote beforehand, gave us notice he was going to be here and he had a little job he wanted us to do. So we did it for him before he came so that he wouldn't have to stay overnight.

Stone: What kind of a job was that?

Righter: Something about some correspondence of his -- to try to get it out of the Placerville Post Office, or something. He came on a Sunday that time and Bill has these connections, he could do anything up there -- like getting mail out of the Post Office on Sunday. That's what I mean by a fellow who's a good public relations man. So he [Merrill] came through this third time and then left.

I learned in the meantime that he was Mr. Bloedel's father-in-law. So I felt that Mr. Bloedel might go back to him, which he did. And we got \$6,000 worth of stock from Mr. Merrill. The little that Mr. Merrill saw was apparently all that was needed to convince him of the value of our work.

Stone: What did you say the company was?

Righter: Merrill and Rink. Or Rink and Merrill. One or the other.

Stone: Well, now, that gave you quite a bit of money. Did that cover all the money you needed?

Righter: Well, no. Mr. Eddy gave some. And then we got some from the Calaveras Land and Timber -- Mr. Eddy's was one of the company's stockholders -- \$300 from them and \$300 from a local man. We needed \$300 finally. And Bill said, "Well, if

Righter: that's all you need, let's go down and see this man downtown."

So we went down to his office and Bill introduced me to him. And Bill said, "We come down here about the matter I spoke to you about before."

And the man asked me, he says, "How much you need?"

I said, "\$300."

He said, "All right, I'll give it to you." Just like that.

Stone: I guess Mr. Cumming did mention this. He did tell us in general that you got some of the money from Morton and so on, but he didn't go into all these details you have. He's more taciturn.

Righter: Laconic.

Later Staff Changes

Mr. Austin leaves, 1940

Stone: Well, now what was happening with the staff during that period? You still had Mr. Austin?

Righter: We had Mr. Austin. He was in charge until 1940. Then on July 1, 1940, well, he asked to be relieved of his job as head of the Institute, or division chief.

There was a lot of trouble there. They wanted him to move down to Berkeley. And he didn't want to move down Berkeley. He refused to do it.

Stone: Why did they want him to move to Berkeley?

Righter: Well, because they have a policy of having their technically trained men in a place where there's a good library and where you can have contacts with other scientists, and that sort of thing. It's invaluable, you know. And we did have library privileges, some faculty privileges, things of that sort then.

Stone: But he didn't care to move?

Righter: He didn't want to move, no. He fought it right to the end, and he wouldn't move. And, of course, having the head of affairs down at Berkeley was more convenient for the director because he could get to him right away if something came up, instead of trying to get it through mail or calling him up on the telephone, and this and that.

Righter: So, there were many advantages. There were some disadvantages, too, to being in Berkeley. But I think the advantages [were greater.] At the time, when the big argument about where the headquarters would be located was in progress, I was at first in favor of Placerville but after I'd been in Berkeley a while I saw the wisdom of being down here.

You see, I used to attend the genetics seminars, and other seminars, and meet the people, and get ideas that way. Invaluable -- and you could use the library more conveniently and so on.

Stone: But Mr. Austin didn't care for that sort of life.

Righter: No. Against their express request he built his house up there, you know. And finally -- they may have made it hard for him so that he wanted to be demoted. I don't know what it was there. But at any rate, it came out that he'd asked to be relieved of his job as head so that he could go on and work on back data and things of that sort and bring his tests up to date and write articles about them.

Palmer Stockwell made Director, 1940-1950.

Stone: So then somebody else became director.

Righter: Yes. Dr. [Palmer] Stockwell came in in 1937. He'd been with us three years before he was made [director] -- you see he wasn't a forester and he wasn't a geneticist, although he'd studied cytology and maybe some genetics. But he came on the staff as cyto-taxonomist. He had gotten his degree at the University of Arizona, I think. And perhaps he did some work at Stanford. But at the time he came with us he was working as an assistant in the Carnegie Institute Lab down there at Stanford, Palo Alto. He was the head of the Institute of Forest Genetics for ten years.

Well, they were really called Division Chiefs in those times although we weren't recognized as a special division. Later we were. But he had the status of a Division Chief. And he may have been called "in charge," or something like that, but actually in effect he was Division Chief.

Stone: So that was until 1950?

Righter: From 1940 to 1950 was his.

Stone: And then what happened in 1950?

Righter: Well he died.

Stone: Oh he died?

Righter: Yes, he got some kind of a cancerous condition late in 1949. And in May, the 20th, 1950 he passed away. But most of '50 he couldn't do anything, I had to take over his work and do my own too. So that's what happened to Palmer, who, I think, was a highly effective leader.

R. H. Weidman Becomes Superintendent

Stone: Now, where does Weidman come in?

Righter: Well, you see, Weidman was a former director of a station up at Missoula, Montana, had published an important bulletin relating to tests in our field of work. And we needed a manager, who had technical training, at the Institute of Forest Genetics, what they call a superintendent, which Bill Cumming later was. And for some reason or other Mr. Weidman was demoted. They have a system whereby you're offered a job somewhere else and you either take that or you're not employed anymore that's what they do. So he accepted this job down here. He had Bill's job for about ten years, 1937 to about 1947, somewhere in there.

Stone: So you had a division chief and a ---

Righter: Superintendent, yes.

Stone: And a superintendent.

W. C. Cummings Made Superintendent

Righter: And when Weidman retired, Palmer got Bill in as superintendent -- something we all wanted, you know. Although Bill didn't have technical training he was a pretty important man in that position because of his knowledge of people around town and could get things done, and this and that for us.

Righter becomes Director, 1950-1960.

Stone: He must've been very good. Well, now, after Dr. Stockwell died, who took his position?

Righter: I did. They put me in charge then. And then I was on for ten years. A year longer than I wanted to be. You see, I wanted to be relieved of my job when I got to be sixty-two, but Keith Arnold [Director of Pacific Southwest Forest and Range Experiment Station] wanted me to stay on another year, until they could get a good man. So I did, and I left in the following year, 1960. I was on from 1950 to Sept. 20, 1960.

- Stone: And all during that time the relations with the U.S. Forest Service were good?
- Righter: Oh yes, we had ups and downs. During the war the appropriations were down. That was when Mr. Austin was laid off. We didn't have enough money, and[Pause]
- Stone: But in general, the support was good?
- Righter: Yes, it was very good as a rule.
- Stone: And there weren't any hard feelings with the people down in Berkeley who were in charge of the Institute's program?
- Righter: No, no, no. Everything went along, as far as I know, pretty smoothly then.

Organization of Forest Service Research

- Stone: What was the general organization plan for Forest Service research?
- Righter: When the research work of the Forest Service was brought under systematic organization, Dr. Earle Clapp was put in charge. The country was divided up into a number of forest regions and experiment stations were established in each of those regions. Some of these regions were the Pacific Northwest, which included the forests of Oregon and Washington. Another region was the California Region, which was just California. And the specification, I suppose, for these stations was that the personnel of the various stations would do work in those regions.

And another requirement, which was put into the program by Dr. Clapp, was that where possible these regions would have the headquarters in cities where there were universities. Because he felt that the contacts, which I have gone over previously in this talk, were very important and it would be advantageous to have the various stations operate on a cooperative basis with some university in that region.

In the California Region for example, the California Forest and Range Experiment Station had a loose affiliation with the University of California. And their offices were housed on the campus at Berkeley for many years, in fact, until about 1958. That is from 1926 or '27 to 1958.

So, the headquarters being in Berkeley, it was felt that the man in charge of the work, and the other technically trained staff members, should be in Berkeley also, for about the same reasons. But particularly anyone in charge of the work, because there the director of the whole station would have ready access to the Division Chief and the other

Righter: members of the staff any time he wanted to. And that was a great convenience, and it was insisted upon by the Forest Service. So, really it was a matter of moving down here or else.

Austin Declines to Leave Placerville

Righter: But Mr. Austin would not do this. He insisted on building his own house at the Institute. You know where it is. It was sort of an eyesore, I suppose, to Mr. Kotok, who was under orders from Washington of course. That did create quite a bit of friction, I suppose. It could not have helped but be an important factor in relationships between Mr. Austin and Mr. Kotok. So there was quite a bit of criticism on both sides. I don't know, myself, how much bad feeling; I think they got along all right together without coming to blows, but there was a big disagreement there.

Stone: Do you think Kotok had a great deal to do with Austin's leaving?

Righter: Oh, not necessarily so, no. It was something which the Forest Service requires of the Division Chiefs all over the United States, in all of their stations. There wasn't any particular reason why they should make an exception here. In other words -- and I went along with the Forest Service on that -- here we were proposing marriage with the Forest Service and he wanted to determine how they were going to run their household. See what I mean?

Stone: Yes, I see. Well, Mrs. Austin also indicated to me, and maybe she had a good point here, that her husband was not one who would work well in an organization. She said he just didn't have the right constitution.

Righter: Well, apparently that was it. And he had a long argument with Dr. Claude B. Hutchison, you know, the dean of the agricultural college and the experiment station. I guess he was acting vice-president at one time. Well, he argued all morning with Hutchison about the matter. This was a different matter, though. Mr. Austin said it's a national station, and he kept insisting on it, that it be a national station.

And Dr. Hutchison said, "Well, if you're getting money from the University of California, you're staying right in California to do your work." You see what I mean?

Stone: I see.

Righter: That's where you work. It isn't a national thing, its a California thing. And they had a big argument about that. No hard feelings though, just wasted a lot of somebody's time, to reiterate something like that all the time, insist on its being national when it wasn't national, when it couldn't be national in the University of California.

Stone: But, at the end now, when you were in charge and Bill Cumming was up there, everything worked out smoothly and nicely.

Righter: Well, no, you can't say it was entirely smooth. A lot of time was spent just traveling back and forth.

Jack Duffield Made Geneticist

Righter: And Dr. Jack Duffield, or Mr. Duffield, as he was at that time, he was a very able fellow, he was also from Cornell. (I coached him in track back there, I guess, when he was a freshman.) He stayed down -- he had his headquarters down in Berkeley just like everybody else. But when Mr. Weidman left, why, Bill didn't want to move into Weidman's house, so that house was vacant and Duffield asked permission to move up there. And Stockwell gave it to him. Duffield said, "I spend all together too much time traveling back and forth." So, he felt it was more important to be up there than it was to be down in Berkeley.

Stone: And Duffield's position at that time was ...?

Righter: He was geneticist. He was a darn good man. He's a full professor of silviculture at North Carolina State now.

Stone: Yes, as a matter of fact, I wrote to him.[It was he, Mr. Maunder said who gave the first enthusiasm to get started with this, gave Maunder the first enthusiasm.]

Righter: He's a very good man, Jack Duffield. He did some wonderful work for us. A very wonderful personality, too.

Stone: He started in up there when he was just a youngster, before he finished his dissertation?

Righter: Well, no, he was a ...

Stone: Graduate student?

Righter: Yes. He was studying at the U.C. in Berkeley in 1936 when I moved to Berkeley from Placerville.

Stone: You said he didn't have his Ph.D. yet.

Righter: Yes. He didn't have it in 1936. He was taking the necessary courses in genetics, cytology, etc., at that time. Later on, Dr. Ernst Schreiner, who was then in charge of the genetics program at the Northeastern Forest & Range Experiment Station at New Haven -- it was then loosely affiliated with Yale University -- wrote to me, asking if I knew of anyone who could do cytological work. I told him about Jack

Righter: Duffield, and he offered Jack the position of cytologist, and Jack accepted it. I think he'd recently married and needed the money. That was quite displeasing to Stebbins who didn't like to lose a student that way, especially a good one.

Stone: G. Ledyard Stebbins, you mean?

Righter: Yes. Stebbins may have known that I recommended Jack to Schreiner. Anyway, some years later, he told me he didn't like to have a man drop out that way.

As Duffield was a reserve officer, he left the Northeastern Station to serve throughout W.W.II in the Army (Quartermaster Corps) in the North Africa and Italian campaigns. When the war ended, Dr. Stockwell arranged for him to join our staff. So he came to Berkeley early in 1946 and occupied my office and caught up on the literature, etc. until the beginning of the fiscal year on July 1 when he was put on our payroll as geneticist. That's how he became a member of the Institute's staff with headquarters in Berkeley where he shared offices with me until he moved to the Institute as mentioned previously [page 51]. Some time later he resumed (in his spare time) his graduate work with Dr. Stebbins. And eventually got his Ph.D. in genetics. At the same time he did a great deal of very valuable work at the Institute.

Stone: His name is on a lot of papers, I notice, in the bibliography.

Johnson Takes Cumming's Place as Superintendent

Stone: And then of course, after Cumming left, this young man, [LeRoy] Johnson, went on?

Righter: Yes, he studied forestry. I've forgotten just where.

Stone: Oregon, I believe.

Righter: And he had been working on the Forest Service payroll as one of their tree breeders. You see, we had several hybrids which were being mass-produced for planting in the region, and he was assigned to that work. When this job at the station became vacant with Bill's resignation they put him there because he knew something about it by that time.

Callahan as Project Leader

Stone: You said you thought there was some other reason for Cumming resigning another than this business about Liddicoet's accident. Was there some other problem? Did they put some pressures on him?

Stone: I don't remember saying that Liddicoet's accident had anything to do with Bill's resigning when he did. Bill was on a trip with a man from the Berkeley Station when that accident happened. That was the only "last time" accident Liddicoet had throughout his federal employment at the Institute. It may be that Bill came under criticism because of the accident; but, if he did, I did not hear of it.

Righter: I don't know. I said there might have been.

Stone: Oh, I see. You just didn't know specifically.

Righter: I know that he was disturbed even before Echols, Dr. Robert Z. Callaham was ragging him a little bit. I don't think Bill got along too well with him. Of course those men -- now Dr. Callaham was a very capable fellow you know. But sometimes you get a stricter man in charge, you know, and Stockwell had always been free and easy. Now here's a difference that we felt, and Stockwell felt, and I felt -- Mr. Austin did too -- that it was to our advantage to have distinguished scientists come there and stay overnight if they wanted to. We'd get ideas from them. They could look over our work and see what was being done. You'll read that thing there. [Reference to a visit from an Australian savant.] He stayed overnight. He was a distinguished forester down in Australia.

Stone: I think its a wonderful idea.

Righter: I was told by someone that the Institute was not to be run as a hotel anymore. I was under the impression that the statement or decision came from Washington and applied to all; but I may have been mistaken: it may have applied only to Regional Office personnel in San Francisco and on the National Forests. Many of the RO (Administration) men stayed at the Institute while visiting the Eldorado National Forest or passing through, when I was there.

Stone: When did that happen?

Righter: Some of them stayed -- we had some foreign fellows stay there for a year almost -- not quite maybe. Dr. Sin Kyn Hyun of Korea. And Dr. Chiang or somebody, who's down at the University of Singapore now. And we had others for two weeks or a month, as the case may be. And overnight.

A member of the National Academy of Science, Dr. Brink of the University of Wisconsin, stayed there for a week, with another man he brought out. They were setting up a forest genetics research organization at the University of Wisconsin. They don't have a forestry school there, but they wanted to go into forest genetics. So, when it was decided to do that, he wrote Dr. Stockwell and asked if he could come out and have the advantage of seeing what we were doing and talking with us, and bring the man who was going to head up the work there. Of course Dr. Stockwell was agreeable to that. And he came

Righter: with Mr. Hitt and they stayed there for a week. Had a good time with them. They were very wonderful men.

Stone: Well, Mr. Johnson was extremely cordial about letting us stay.

Righter: Well that was a special case. Maybe now, but for a while they didn't.

Stone: It seemed to me he went out of his way to be cordial about it.

Righter: And the Forest Service people from the Regional Office used to go there and stay overnight. I don't know whether they do anymore.

Stone: Dr. Mitrov does.

Righter: Yes, but he's one of the collaborators of the station.

I don't know what the policy is now, but for a while they ceased doing that. If they have done it again, have gone back to the old system, it's fine as far as I'm concerned.

Stone: I don't know exactly what they did before, but this time we took our own food, and they had sheets and linens and things and we put them on the bed and we cooked our own meals.

Righter: And made your own meals?

Stone: Made our own bed and cleaned up after ourselves -- they had brooms and things there. But that was all.

Righter: Sure. That's all we ever did. Some place where they could stay. And they could go in town and eat or prepare and eat their own food in our kitchens there, and use the labs and offices for study, and things of that sort. They received a Forest Service key -- those that stayed for a week or more -- to get into the building and all that sort of thing.

We had many distinguished men stay there. [G.L.] Stebbins used to bring his class up there and stay overnight. Professor Howard McMinn used to bring his girls up there. That was a good time. [Laughter] You know McMinn in botany [at Mills College]?

Stone: Yes.

Righter: He used to come up there. In fact the man down there now, "Baki," is doing it.

Stone: I illustrated a book for McMinn. That's the first illustrating job I ever did, before I even graduated from the University.

Righter: He used to bring his class up there quite often. And now I understand Baki who took McMinn's place is doing it too.

Stone: Well, Dr. Mirov has done it recently because a young woman I talked to in the library told me that she'd been up there. She's a graduate student in geography, but she was taking a seminar with Dr. Mirov, and he took a group of students up and they stayed in this dormitory arrangement.

Righter: Could be.

Stone: But apparently they're doing it again.

Foreign Visitors

Righter: Well! good. There was a man from Mexico brought his class up. Several years. And other people just came and stayed a short time. They didn't use the buildings at all much. Such a one was Professor Harold P. Olmo -- the grape man at Davis -- he used to bring his class in viticulture up there, every year to look over our experiments and show them practical applications of genetics and so on. In fact, one of his students, I think, one year, was an Egyptian. A year or so after that I got a lot of literature, speeches by Gamal Nasser, you know, and several copies of their weekly news magazine, which was published in English, and everything. It was a propaganda thing. I still have those things up at home.

Stone: Was this man a forest geneticist, the Egyptian?

Righter: No. All I know is that he was a member of the class. But he brought them up there, the professor did, every year to look at our experiments, show them something about statistical work and that sort of business.

Stone: Aside from the Korean and the other Oriental geneticist who were there, and this Australian, were there some other distinguished visitors you recall from foreign countries?

Righter: Oh, yes, many of them. For instance Risto Saarvis from Finland. He's in charge of forest research over there. He was there for about a month. I can give you a whole list of these, everybody that's been there up to 1960.

Stone: Oh, that would be very interesting. I think that would be helpful to have in the record, to know just exactly who came.

Righter: And Dr. Syrach Larsen, of Denmark.

February 28, 1968

Comments on Mr. James G. Eddy (February 28, 1968)

Mr. Eddy's Diet Ideas

Stone: Now, Mr. Richter, you were saying something about Mr. Eddy's peculiar and unusual feelings about diet. Were there any special ideas of diet that he had, that you recall?

Richter: Yes. He had very definite ideas about diet. One of the things he emphasized, in talking to us about diet when we would go into a restaurant or hotel for meals, was that there's nothing more important to you than what you put in your stomach. He kept himself on a very strict diet. He always talked about a balance, presumably between the alkaline and the acid sides, and tried to maintain a balance between them, as I understood his talk. He was a great advocate of soybean products, particularly soybean bread. He carried a lot of soybean bread about with him. He got the soybean bread from a little store down on Shattuck Avenue (Berkeley), diagonally, across from the American Bank building. That's where he got it. This bread was sent up to him by mail, to Seattle. He maintained that relationship with them for a long time. They may remember it down there even yet. But he always had soybean bread with him, slices or a loaf. When the waiter came to get our orders he would take out this loaf of soybean bread from his overcoat pocket and tell the waiter to take it back.

One time, as I recall, he did that. And after the waiter left he decided he'd go out and show the cook how to do it, how thin to cut it. After a while he came back, chuckling. He said, "You know, I think I sold the cook on soybean bread."

But he was convinced that if mankind had hit upon using soybean products instead of wheat and other cereal grain products, the history of the world would have been very different from what it has been. He mentioned that quite a number of times to me.

Some other very interesting things about Mr. Eddy were that we would go into a restaurant up here on Telegraph Avenue and the students would be coming in. The first thing they'd do would be to bring out their cigarette cases and cigarette lighters and light up, boys and girls together. He remarked one day, "Sometimes I wonder if I'm the same genus with them."

Stone: He didn't smoke at all?

Righter: No, he drank wine at dinner sometimes.

Eddy's Ideas on Government

Stone: You said something, too, about his ideas on voting and on forestry education that were quite forward.

Righter: His ideas on voting were what we divined rather than heard. He probably believed more strongly in an aristocracy than he did in anything else. But he never imposed his views over all these years on us. Probably few of us voted the same ticket with him, but there was never any effort on his part to impose a political view on any of the staff members, that I know of.

Stone: And this was during the Depression, too.

Righter: That's right. Not only during the Depression did he feel that way, but during all the time that I knew him subsequently, that was one of the things that he avoided in his intercourse with us, so far as my experience is concerned.

Now, Mr. Eddy was regarded by many as rather eccentric because of his views about the possibility of breeding forest trees for practical purposes, and his desire to study the genetics of such organisms. This is a mistake. He should not be regarded as an eccentric. But I suppose that is the penalty of most people who think ahead of the time.

Mr. Eddy's Thoughts on Forest Schools

Mr. Eddy knew, of course, that the forest schools in the United States, and even in foreign countries, did not include in their curricula courses in genetics, and they did not recommend genetics to the forestry students. Therefore the subject of breeding forest trees was in those days regarded with considerable skepticism by people who knew anything at all about the reproductive cycle of forest trees, and the time required to bring forest trees to economic use, and the principles of genetics.

He felt that the research work which was being done in the United States on forest trees was devoted almost exclusively to the study of the environment. That is, their purpose was to try to ameliorate the environment so that the product could be produced more economically. Which of course means quicker, and you'd get a better product through these practices.

Righter: That was a one-sided view. A very lopsided one because it left out the important factor of heredity entirely. The best results would be expected from work in both the fields, environment and heredity. So that by improving both, or modifying a variety of trees or a species of trees, through breeding, so that its range could be extended, or so that it could be used in some other place, or so that it would produce a different kind of a product, was very important. Those things can be brought about only through genetic research and breeding.

So in that sense he was far ahead of his time. And the proof of that is now, in practically all the countries of the world where forestry is important, the forest schools are concerned with both the heredity and the environment of forest trees, and much intensive experimental work is done in both fields.

In the affairs of most organizations it is very likely that there will be strong differences of opinion among the colleagues who are working in an organization. And these differences sometimes become rather pronounced. There were such, of course, at the Institute of Forest Genetics. And perhaps some of these will be brought out later in talks with the various staff members and former staff members.

Mr. Eddy always kept himself from such troubles, unless they were brought directly to his attention, so that he had to do something or other. Except for those occasions, which were very rare -- I can't think of any -- he kept his hands off and allowed the staff to work these things out for themselves.

Stone: You have another story about Mr. Eddy now that you'd like to tell us?

Mr. Eddy and the Seedling

Righter: Mr. Eddy sometimes made himself inscrutable, which is all right, and rather instructive at times. The old saying that the face of the king is inscrutable is very apropos to Mr. Eddy, although he was not averse to expressing his opinions about this and that and the next thing as he went along, and coming up with some very surprising statements sometimes. But I'm reminded of an incident which was reported to me by the manager of the Calaveras Land and Timber Company. That company's field manager, when Mr. Eddy visited his company -- Mr. Eddy was one of the big stockholders of the company at that time -- the company was located down near the Calaveras State Park. And the field manager would like to take Mr. Eddy out and show him the fine timber, these great big trees that went up two hundred feet, without any limbs -- clear for a hundred feet. Well, he was pointing this wonderful tree and that wonderful tree out to Mr. Eddy; these trees were the perfect concept, so far as a lumberman is concerned, of a good tree.

Righter: They like to see trees which are straight-stemmed, without any branches, because branches make knots, and knots detract from the quality of the lumber. And those trees are very beautiful, to foresters and lumbermen anyway, though they are not necessarily so to artists, who often seem to like crooked-stemmed things.

But as this manager of the company was pointing out these trees to Mr. Eddy, Mr. Eddy was not looking at the trees; he was looking down at the ground. And after a couple of attempts to get Mr. Eddy to look at the big trees he noticed that Mr. Eddy was looking at the ground. Finally he became so inquisitive about the matter that he said, "Why do you look at the ground? Why don't you look at these big trees?"

And Mr. Eddy kept looking at the ground, and this made the man even more exasperated. And finally he asked him again to tell him what he saw down on the ground which interested him so much rather than the large beautiful timber which would make wonderful saw-timber and other products.

Finally Mr. Eddy said, "I like to look at that little tree down there because it has a future."

Stone: Was it a little seedling?

Righter: Yes, a seedling, "that little seedling down there, because it has a future."

And actually, I think that may be one of the secrets of why Mr. Eddy came down to the Institute so often and spent so much time there. He felt that the Institute had a future.

WILLIAM C. CUMMING

Mr. Cumming is the son of California pioneers. He is tall and strong, with the impressive physique of his pioneer stock; and his face shows the strength of character we associate with men of such background. Raised in the Placerville region, his associations with, and understanding of the local people have been a valuable asset to the Institute of Forest Genetics. He came to the Eddy Tree Breeding Station in his youth and saw it change from a pear orchard to a significant research center. It was no chance matter that Mr. Cumming was, for many years, supervisor of the Institute of Forest Genetics. His abilities in handling problems of planning and in carrying out the varied activities of the Institute were remarkable. The smooth partnership of Cumming, as supervisor, and Richter, as scientist in charge of forest genetics experiments, allowed the institute to progress through many productive years.

During the period of his administrative responsibility Mr. Cumming was able to turn his contacts with local people to the advantage of the institute by arranging to acquire, for a reasonable figure, some valuable additional land for the experimental station. And his connections with local politicians and ranchers were constant insurance of the ready acceptance of researchers in the area. Colleagues like to recall that "Bill" Cumming could always work faster and longer than any other man on the most difficult jobs. More than that he is a hero. Twice he has saved the life of a younger worker, unskilled in tree climbing, by his dauntless courage and quick thinking.

Now "Bill" Cumming is retired and lives with his wife, "Will," in their charming home overlooking their pear orchard. My favorite memory of "Bill" Cumming is the time I stopped to see him and found him working his tractor in the family pear orchard--all abloom with pale pink blossoms. He is endlessly kind to any neighbor in time of need and will always be admired and respected by his associates.

Lois Stone
Interviewer-Editor

March 1969
Regional Oral History Office
486 The Bancroft Library
University of California at Berkeley

WILLIAM C. CUMMING

(January 19, 1968, Placerville, California)

Family Background, Education and Early Work Experience

Stone: Where were you born, Mr. Cumming?

Cumming: Garberville, Mendocino County.

Stone: Oh! You're a Californian!

Cumming: Native son.

Stone: And your folks, where were they from?

Cumming: My mother was from Texas and my father was from Canada.

Stone: What was the date of your birth?

Cumming: June 24, 1904.

Stone: And you attended school in Garberville and lived there?

Cumming: No. Most of my schooling was here in El Dorado County, although I started to school in Sacramento County.

Stone: Your folks lived in Sacramento for a little while?

Cumming: For a short time, four or five years.

Stone: And then they moved up to El Dorado County?

Cumming: Right.

Stone: In the Placerville area?

Cumming: Yes.

Stone: Now, Mr. Cumming, when you came to Placerville, you were about how old?

Cumming: Probably six.

Stone: So you must've started school here in the first grade, right?

Cumming: No. Probably either the second or the third.

Stone: You were precocious. [Laughter] And then you went all the way through school here?

Cumming: Yeah.

Stone: And high school too?

Cumming: Right.

Stone: Then, did you have any jobs along the way?

Cumming: Yes, after I finished high school I worked for a time with my father on the ranch. And then I went in to the assessor's office in Placerville as the deputy assessor to Elmer Scott, who was elected that year as the assessor of El Dorado County.

Stone: How old were you then?

Cumming: About eighteen.

Stone: And what sort of work did you do there?

Cumming: That was regular county assessment, taking care of making plots of property and running down records on property and making maps and collecting personal property taxes and writing assessment sheets.

Stone: How long did you work in the assessor's office?

Cumming: Two years.

Employed by Eddy Station

Stone: And what did you do then, after that?

Cumming: Well, then after that my father, in addition to having this place, had rented a ranch over just north of Placerville. So I went over there and helped him with that. After his lease expired there I was at loose ends for a month or so. And then I was helping a rancher up in this part of the country. I was coming home from work one day and I met a neighbor by the name of Jack Young. He asked what I was doing and I told him. And he said, "Well, you're about through there, aren't you?"

And I said, "Yes."

Well, he said, "You know, I own this old Aikins place over here, Bill, and I've just sold it to some people that are going to make an experiment station out of it. And Mr. Austin, the man who is heading it up, asked where he could get some help and I told him about you and he says he'll look you up."

So he looked me up and he said, "I'll have about two weeks' work for you."

That was in the fall of 1925. It was probably about April or May of the following year that he told me, "Well, I guess that finishes the job, Bill."

So I went home that night. That, as far as I can remember, is the first time I was ever fired. About a half an

Cumming: hour after I got home I heard a car come rattling in the old rocky road down there. And here was John Barnes, who was also one of our staff. And he said, "Did Austin fire you today?"

And I said, "Yeah."

"Well," he said, "we had quite a discussion." And he said, "You be there at eight o'clock in the morning."

I said, "For what?"

Well he said, "I asked him who's going to do the work up here. So we decided that you'd better come back."

So I stayed there until I retired, about two years ago last December.

Stone: You were one of the very first staff members, then, along with Barnes and who else?

Cumming: Austin was here first. And as near as I can remember I was the second one that went to work.

Stone: And then Barnes came?

Cumming: Barnes came in later.

Stone: And then the three of you were the essential staff in the beginning.

Cumming: That's right. There was a man by the name of Joe Howell came in some time that spring. But he only stayed a few months. He and Austin didn't seem to hit it off very well. Then he was replaced by Mace Lumsden.

Stone: What sort of a man was Austin?

Cumming: Well, he was a scholar from Davis who apparently had impressed Luther Burbank very highly. And when Mr. Eddy was trying to get Burbank interested in the work he said, "You don't want me up there. I'm too old." And he recommended Lloyd Austin, who at that time was employed at the University Farm at Davis.

Stone: Now Mr. Eddy conceived this idea almost without any help, didn't he? Of having the Institute of Forest Genetics. I know he consulted with various people.

And then he hired Austin to help him out.

Cumming: After Burbank had recommended him. Apparently they had a few conferences, he and Austin. And finally they got together on a permanent basis. Austin, I think, immediately, started

Cumming: searching throughout the United States for a suitable location to establish the Station.

Stone: Do you know how he happened to choose this area?

Cumming: Well, there were several things that he was interested in. One thing was the length of the growing season. And one thing that surprised me shortly after I went to work there, he told us that the growing season here was longer than the site which they were considering in Georgia. That surprised me quite a lot because I didn't believe -- well, I thought down South things grew forever, they didn't have any killing frosts and so forth. Another thing was accessibility to good roads, schools, and towns that would be reasonably close. By that, I mean a town large enough to have doctors and so forth.

Stone: This was for the convenience of the staff primarily.

Cumming: Right.

Stone: Now, Mr. Eddy had been, I know, in the lumbering business in Washington. And this is essentially the source of his money. He was primarily noted for his work there in raising and harvesting Douglas firs. Is that correct?

Cumming: Well, I wouldn't say -- sure he was interested in lumbering in Washington. But I think even before they came to the coast here, he was in the same business in the east. And they moved out here. And at the time he started the station they had quite a large operation at Port Blakely Mills.

Establishing the Tree Farm.

Stone: Did he immediately, when he decided to go into forest genetics, think of using the genus Pinus? Or was he considering many other genera?

Cumming: At that time I wasn't too familiar with what their plans were. I was just a man hired to do whatever had to be done. To begin with that was a pear orchard up there. And that was my first job, getting rid of those pear trees. My dad, having a ranch over here and also needing a little source of income, I got him and his team up there and we got rid of the pear trees. And then the next job was to cut brush and burn it so that we could put a fence around a portion of the property.

Stone: And then you had to plant the trees.

Cumming: That fall we started getting in shipments of trees from forest nurseries all over the country. That is one of the things that Austin had done: he'd gone around to these various nurseries where forest trees were grown and had made selections of trees and tagged them. So that when the dormant season came those trees could be dug up and shipped to us.

Stone: Oh, they were fairly good-sized trees then?

Cumming: I would say they run from, oh, possibly one to three years old. You asked about the species. When we started planting trees up there we were planting pines and firs and cedars and redwoods and anything almost that might fall into the class of timber tree.

Stone: Then they probably hadn't really decided on the species they would be dealing with ultimately.

Cumming: That's right. I would say that it is probably -- six or eight years after the station was started when they decided that that was such a big field that if they were going to get any place they would have to concentrate on one particular species.

Stone: Or one genus at least.

Cumming: Or one genus, yes. That's when we started moving a lot of trees around and getting them out of the way, in filling up our blocks with pine trees.

Stone: You did work with Juglans for a while, with walnut, too?

Cumming: We had a plantation at the Division of Forestry headquarters between Sacramento and Davis. I believe there was probably about between two and three acres. And those were walnuts that had been selected from pretty well all over this coastal region, wherever walnuts were growing. All the way from Washington clear down into San Diego County.

Stone: This would have included introduced species as well as indigenous species.

Cumming: Right.

Mr. James G. Eddy

Stone: Now, I suppose Mr. Eddy came around pretty frequently when the thing was getting started. Do you recall when you first met him?

Cumming: I think I probably had been working there for at least six months before I met Mr. Eddy.

Stone: Was he very excited about the station and how it was progressing?

Cumming: Well, I think he was, yes. Of course I didn't see too much of him then because any time that he came he and Austin were usually busy some place other than where I was working. And I just knew that he'd been there and occasionally saw him. Once in a while he had to be taken some place, maybe to Berkeley or to Sacramento to meet a train or something and I was elected to chauffeur to see that he got there.

Stone: How did he impress you?

Cumming: Very favorably. I always enjoyed his company.

Stone: Was he a fairly different and eccentric individual?

Cumming: Well, he was different, there was no doubt about that. I would hesitate to say he was eccentric. He was always pretty sharp, I thought.

Stone: It has appeared to me very unusual that a man of his wealth and station in life would decide to do a thing like this, to put his money into something like genetics. It doesn't happen so often.

Cumming: Well, I think he saw the handwriting on the wall. In other words, since he had been in the lumbering industry in the east and came clear across the country and was located up here and saw what had been vast forest areas being completely deforested, he could see the need of something being done. And because of the work and the success that Burbank was having with the fruits and vegetables and so forth, that's where he went for his first -- what would you call it?

Stone: Consultation?

Cumming: Yes.

Stone: And Luther Burbank gave him encouragement on that?

Cumming: Well, I think Mr. Eddy had probably made several trips there before Mr. Burbank actually encouraged him very much. At first, I have the impression that he thought, "Well, here's a wealthy man that wants a little notoriety or something." And I think probably after about the third trip he became convinced that Mr. Eddy was really trying to do something for the good of the country. So then he gave him his unqualified blessings.

Stone: I understand that Mr. Eddy also had a swing at breeding horses in line with his interest in genetics. Do you know anything about that?

- Cumming: Oh, I know he was quite interested in horses.
- Stone: What kind did he breed? Racehorses, trotters?
- Cumming: Trotters.
- Stone: It's an interesting kind of horse.
- Cumming: There was a ranch down just this side of Sacramento, I believe it was called the Crawford Ranch, where some of his horses were kept I know.
- Stone: Did he race them, enter them in contests, or ...?
- Cumming: I'm sure he did.
- Stone: Then he paid considerable attention to their breeding?
- Cumming: I believe so, although I'm not too familiar with that.

Early Staff Members

- Stone: I have a list of the early staff members. Aside from yourself there was Lloyd Austin, John Barnes, W. G. Wallenberg, Lumsden, Mr. Richter, and Clyde Berriman. Were there some others in the early days?
- Cumming: W. Palmer Stockwell came I think shortly after Mirov came.
- Stone: What did he do?
- Cumming: He came in, he had been employed by the Carnegie Institution prior to coming to the Eddy Station. At the time that the Station was taken over by the government, Austin was devoting considerable of his time to writing up experiments and so forth, and Stockwell became the Division Chief.
- Stone: Oh, I didn't know.
- Cumming: In other words he replaced Austin under the government as the chief.

- Stone: When did that happen, roughly?
- Cumming: I would have to go into the records.
- Stone: I can check it out.

Cumming: Fine. W. Palmer Stockwell.

Perfecting Pollination Techniques

Stone: You were doing quite a few things along in that period. You did some work in pollination at an early point, didn't you?

Cumming: Yes.

Stone: Those were interesting experiments. I read about your early work in developing some of the techniques. Very interesting.

Cumming: It was very interesting. It was hard work, but it was so new and the possibilities seemed so great that in spite of it being hard work, everybody gave all they had to just try and keep the ball rolling. It wasn't long before -- I guess maybe because I knew the country quite well and I knew all the roads and where to find different trees, and lots of the property owners. I was also big enough that I could climb trees pretty easy and didn't mind doing it -- that I kind of gravitated naturally towards the tree-climbing part of it. And I never felt better in my life than when I was climbing trees, although it was really tough going.

Stone: You had to do with developing some of the techniques where they stuck the thing way out on poles? Did you work with some of that technique?

Cumming: Well, now, what are you speaking of on the poles?

Stone: Didn't they have a bag to collect the pollen?

Cumming: Well, we collected the pollen in bags. But rather than to stick the pole out and collect it, we climbed the trees and picked the catkins and put them in paper bags which we carried with us. And if there were branches out there that we wanted to use for this work we had long wires with hooks on the end that we could reach out and grab the end of the branch and pull it in and wrap it around our body or a leg or anything to hold it in while we were working on it.

Stone: That was very clever.

Cumming: Well, we got results.

Stone: With a lot of hard work.

Cumming: Lots of hard work.

Stone: Then you were also involved in setting up the nursery, weren't you? And the arboretum, in the early days.

Cumming: Yes. That was one of the things, that after we got the fence in then these various fields had to be surveyed out and staked so that we could go on and plant the trees. And there were a few jobs like that that my dad and I took contracts on. Austin and some of the others did some work on it and they knew how time-consuming it was. So my dad and I talked it over. And we knew that we could save a lot of time and do just as good a job as they were doing. So we took some contracts on some of those jobs and did a good job and made ourselves some money and everybody was happy.

Stone: Good idea.

Cumming: I don't know whether Mr. Austin was too happy when he saw how quick we did the work. But actually we did it cheaper than he was able to do it.

Stone: Were there some staff changes during those early days?

Cumming: The first staff change was when Joe Howell left. And John Barnes had gone to school with Mace Lumsden back in Michigan and he had recommended Lumsden and so Lumsden replaced Howell. In the late twenties Mr. Barnes took a job with one of the rubber companies and he left to go to Sumatra.

Stone: Was that just a better job, or was there some feeling in the staff, was he unhappy?

Cumming: Oh, no, there was no bad feelings or anything. It was a better job. It was the same type of work to a certain extent -- selection and breeding in of rubber plants. And he was a young man and it looked like a chance to make some money. And also to do some valuable work.

The Station During the Depression

Stone: Very good. And then along about the end of the twenties there came to be a worry about money.

Cumming: Yes. It was a little worse than a worry. It was a pretty serious situation. Apparently Mr. Eddy was finding it difficult to keep the station going. So when Mr. Austin was discussing it with us and wondering what we were going to do, I finally got a piece of paper and went around to the various staff members and people that were working there and asked them what would be the minimum that they could get by with. Then I turned this list in to Mr. Austin and -- we decided in other words that we didn't need to draw our full salaries if this thing was a matter of keeping it alive or it going on the rocks, why we were all for keeping it alive.

Stone: That was a very noble effort.

Cumming: So we found out that we could keep things alive that way. And then it got even worse after that so three of us -- Al Liddicoet, Clark Gleason, and myself -- told Austin that he could take the money that we were drawing and use it to keep the station going and we would find other jobs. So Gleason went to work with the El Dorado Forest. And Al Liddicoet and I went to work for the State Division of Forestry. That was about June of '32.

Stone: And then the Carnegie people came in to help you a little bit, didn't they?

Cumming: Yes. They came in before we left. They had put up some money to help operate the station.

Stone: Was that when Stockwell came, or had he been here earlier?

Cumming: No.

Stone: You said he worked with Carnegie, so I thought perhaps he had.

Cumming: I can't recall. That'll have to come from the records.

Stone: The Carnegie Institute funds didn't hold you for very long, I gather. It was a small amount.

Cumming: That's right.

Working with the CCC

Stone: After that you got some government help involved with the blister rust control. The CCC crews?

Cumming: Yes. After, I think it was in early '33 or the later part of '32 -- it was early '33, I guess, that the state labor camps came into being. While I was working for the Division of Forestry here in El Dorado County, that fall we established up here at Mt. Danaher, about a mile above Camino, one of the first labor camps. And that was made up of men that they just picked up off the streets down in the cities and brought them up here and promised them a place to live and get food and clothing. And I believe they got five dollars a month.

Stone: These were men of all ages.

Cumming: Of all ages. We had fellows anywhere from twenty to sixty or seventy in the camp.

Stone: This was not the same thing as the scrub camps of CCC days then?

Cumming: No. Those were stub camps.

Stone: Stub camps! You had those, too?

Cumming: Yes.

Stone: And what did those boys do?

Cumming: They might have been called spike camps, too.

There were many camps located -- after these labor camps, then the CCC was started. And I went from the labor camp here at Danaher over to Indian Diggings and the CC Camp. Then there was another CCC camp over at Calador and one up above Riverton. And from one of these camps some of those boys came down here to the Institute and worked on planting trees and watering trees and cultivating and various jobs that had to be done.

Stone: And you supervised them?

Cumming: No. At that time I was away. At that time our senator from this state I believe was Sam Shortridge. I don't know who approached him but it was through him that the station was first connected with the government through the Soil Erosion service. And a man by the name of Fred Herbert came out here from Washington as the superintendent. I was working then with the state and I was in a stub camp over at Mokelumne Hill. We were on a fire there one night. I guess it was about two o'clock in the morning somebody came up to me and said, "Bill, there's a couple of men in a car down on the road. They came over here from Placerville and they want to see you."

So I went down to the road. This was about two-thirty in the morning as I recall. Pete Righter and someone else was in the car. And they told me that the Soil Erosion service was going to be able to support the Institute and they wanted me to come back immediately. They were going to have a big seed collection program that year. So I told them, "Well, I can't pull out of here in the middle of fire season without giving these people notice."

"Well, that's all right. You go ahead and give them notice and you get over there as soon as you can."

Returning to the Institute

Cumming: So it was along in August when I left the Division of Forestry and came back to the Eddy Station. That's when I met Fred Herbert, who was the superintendent there for the Soil Erosion Service.

It was in '35 I think then that the Forest Service took over the station. And Mr. Herbert then went to Watsonville with the Soil Conservation Service. And Mr. Austin was our boss up there.

Stone: Mr. Austin continued for some time after the Forest Service took over the station.

Cumming: And I think it was during the war, maybe around '42 or '43, that Stockwell took his place as chief.

Cumming Becomes Superintendent

Stone: When did you start as director?

Cumming: I was the superintendent. Stockwell and the director and I were walking in and Palmer said, "Bill, are you going to take this job?"

I said, "Well, Palmer, do I have to live here?"

"No, you don't have to live here."

"It's all right for me to take the job and live over at the ranch, or downtown?"

"Sure, sure."

I says, "All right. On that basis, I'll take it."

Up until then we'd found that somebody had to be there all the time. If Weidman was going to be away at night then it behoved some of us -- and for some reason or other I seemed to be the goat most of the time -- to come up and stay there. And on weekends somebody had to be there. So as I saw it if the superintendent had to live there he had a twenty-four-hour-a-day job seven days a week. And I had been there long enough then that I knew I couldn't take that. So since he said that wasn't necessary why I agreed to take it. And, that's it.

Stone: You took it on the basis of living at the ranch and then going up there. Did you have a man on duty all the time? How did you arrange that?

Cumming: We had enough living quarters up there and we had enough people -- for instance we had a man by the name of Bud Seward -- his wife was our secretary and Bud was our maintenance man there and they were looking for a place to live, so we arranged for them to live in the three-room house there. So that eliminated the necessity of having anyone be there at night. Also on weekends. And if they were going to be away then we arranged for somebody to be there.

Then shortly after that we had another man who also wanted to find a place to live. So we had him there too. And that made things so that there was somebody there all the time. And that took a lot of the pressure off of me, designating somebody or else going up myself, every night the place was vacant, or every weekend, and taking care of the visitors.

Stone: When did you start in as the boss of the Institute?

Cumming: Mmmm. Gee. I don't know... I must've been the superintendent there for about seventeen or eighteen years.

Stone: So you started in some time during the war period. '42, something like that maybe?

Cumming: Oh, probably maybe '45 or '46.

Stone: That's a long period to run an organization like this. You must've had a lot of staff changes during that period.

Cumming: Well, yes, we had some staff changes. And we had a lot of scientists coming from different universities throughout the country and visitors in fact coming from all over the world. And I don't mean overnight visitors. They would come there for maybe from anywhere from a week or two to several months. In fact one man from Korea I think spent better than a year there.

Stone: Doing research?

Cumming: Yes. And then he went back to Korea and started the Institute of Forest Genetics in Korea.

Stone: And how about Mr. Eddy during this period. Did he come very often?

Cumming: Oh, yes. Eddy came quite frequently. Although his home was quite a ways off and he used to drive his own car, or he would put the car on the boat and bring it down so that he had it here. And then the last few years he didn't bring his car. He would come down by train and go to Berkeley. And then, since that was our headquarters, somebody there would bring him up. Or if it wasn't convenient some of us would drive a car down and get him and bring him up.

Stone: Had he become ill in his later years?

Cumming: Well, when Mr. Eddy's wife died it struck him pretty hard and he was, you might say, almost lost.

Stone: Was there some kind of a heart involvement? Something was mentioned in some of the correspondence about digitalis and I thought maybe he had a heart condition.

Cumming: Not to my knowledge.

Stone: But he just wasn't well. Of course he wasn't as young as he used to be.

Cumming: That's right. He was getting along in years. And then all of a sudden when she passed away it made a big change in his life. The first time I saw him after that I could see a big change in

- Cumming: him. His mind wandered a lot to other things; it was harder for him to concentrate on the Institute. He still had his interest here. But things he didn't used to have to think of would confuse him.
- Stone: It's pretty hard, I think, for an older man to lose his wife anyway. It always is. And she may have been a tremendous help to him.
- Cumming: Sure, she was.
- Stone: Was she as interested as he in the station, do you think?
- Cumming: No, I don't believe so, to the extent that he was. I visited one time. I'd gone up north to visit several of the nurseries in that part of the country. And I stayed overnight at his place in Seattle. That's the first time, I guess, that I had met Mrs. Eddy. She was quite interested in anything that he was connected with, but never to the extent that he was in the Institute.
- Stone: She must have had some interest in trees.
- Cumming: Oh, yes, sure.
- Stone: Being connected with a lumbering family. He passed away about 1962 or something of that sort? Or was it earlier?
- Cumming: No, that must've been pretty close to it.
- Stone: And he kept coming pretty much until the end, do you think?
- Cumming: No, no. There was quite a spell there at the last that we didn't see him. During the exposition up there -- I didn't attend that but both Pete Righter and Nick Mirov went up -- and while they were there Mr. Eddy at that time was staying at a rest home or a convalescent home.
- Stone: He'd grown pretty frail by that time.
- Cumming: Yes. They went out and visited with him a while. And we knew from the reports that they brought back that Mr. Eddy's days were limited.
- Stone: But he must've had a lot of satisfaction in his later days thinking how well the station had prospered. And the Institute under your supervision was going along so nicely. I can imagine this was a very satisfying thing to him.
- Cumming: I'm sure.
- Stone: Because everything did go very well, I think, toward the end, didn't it?
- Cumming: That's right.

Stone: You had a good staff and they worked well and there weren't overly many changes.

Cumming: And they were getting results.

Stone: Yes. The results speak for themselves, the publications and the many visitors you had.

Acquiring the Caldwell Property

Stone: Do you have any general feelings about the Institute now, about what they are doing or what they may be doing in the future?

I would like to ask you about the acquisition of the Caldwell property. I know you had a great deal to do with that. And Dr. Mirov said this was something it would be very interesting to hear from you.

Cumming: Well, the Caldwells were good friends of mine for a number of years, for many years. After Mr. Caldwell passed away, Mrs. Caldwell had considerable illness and Mrs. Weidman, who was the wife of Bob Weidman, the former superintendent of the Institute, was appointed the administrator of the estate.

After Mrs. Caldwell passed away Mrs. Weidman continued to operate the ranch up there until such time as she could dispose of it. And that was quite a job for a woman who had never had any experience ranching. Frequently she would ask my help and advice on different things that would come up. And occasionally I would go up there and go over the property with her and make suggestions.

And one time it occurred to me that since most of the Institute plantations were scattered around the forest where they were comparatively inaccessible during the wintertime, it would be a wonderful thing to have some ground that was right next to the highway which would be accessible the year around. So I suggested to Pete Righter the possibility that if we could find some money that might be a good piece of property to acquire. And he agreed with me but we didn't know what to do about getting the money. One of our plantations was established on property over in Amador County, on the Winton Lumber company holdings.

And one day when their representative was in the office I asked him if he thought the Wintons might be interested in helping to buy a piece of property that was available for the Institute up above El Camino. And he thought it would be well worth our while if we would come over and talk to the superintendent at Martell. He thought there was a chance that we might get considerable cooperation.

Cumming: So I got in touch with Righter and we made an appointment and went over and talked with him. And he was very sympathetic with our cause and agreed to take it up with the Wintons. The Wintons agreed to put up a quarter of the purchase price.

We discussed this with Mrs. Weidman, and being the wife of a former superintendent and very interested in Forest Service affairs, she agreed that she would like very much to see the Forest Service acquire the property and that if we could raise the money she would cooperate with us as much as she could.

Mr. Righter had a few people in mind who might help to raise this money. I mentioned to him one time that we had a friend over in Willows by the name of Charlie Lambert who had one time visited us and suggested he would buy us a mechanical ladder to use for climbing trees. And perhaps he might be persuaded to put that money into the property instead of into the ladder. So Pete phoned him and introduced himself and told him what he wanted. And Mr. Lambert said sure, he would put up a quarter of the purchase price.

And then Mr. Righter got in touch with some lumbermen in Washington and they also agreed to help. Mr. Lambert at Willows phoned us one night and said that after the result of an examination with his doctor in Berkeley that apparently his health was in pretty precarious condition and that he probably wouldn't be able to help us out. And it was only a few months after that that Mr. Lambert passed away with cancer.

Mr. Morton of Morton salt put up a portion of the money. At the end when we were almost where we could see daylight -- we still lacked a few hundred dollars. So I believe Mr. Righter and I went down to the office of the Hazel Valley Lumber Company in Placerville and talked to Seth Beach, the owner. He asked us how much we still had to raise and we told him and he says, "All right, I'll furnish it."

So that took care of the finances and the deed was executed to the property and it was turned over to the government.

Stone: That was a nice piece of work. You must've felt good about that.

Cumming: I did.

ALFRED R. LIDDICOET

Mr. Liddicoet was interviewed in the library of the Institute of Forest Genetics. He is a handsome man of middle years. His manner is gentle and thoughtful. One would scarcely guess, from his friendly and cooperative expression, that Mr. Liddicoet still suffers much pain from the accident that caused him to terminate his employment with the Institute.

"Al" Liddicoet's former colleagues were quick to tell me that he was a person of extreme modesty. I learned how true this was when I urged him to tell me something of his imaginative contributions to the research activities at the Institute. Liddicoet is inclined to belittle his achievements, and even to refrain from speaking of them, unless he is begged to do so. One can only guess the role he has played in the research of the experimental station by scanning the literature. Had we been able to plan more than the one brief interview with Mr. Liddicoet he might have been persuaded to give more interesting details about some of his ingenious ideas.

An additional point of interest in Liddicoet's connection with the Institute is that his wife, (Doris Cribbs Liddicoet), was, for many years, a secretary to Lloyd Austin. She was able to give him considerable background about problems of the Institute and about the discussions that went on between Austin and James G. Eddy.

Liddicoet was the son of pioneers, his grandfather had come to California to mine gold and had remained to become a settler and rancher. "Al" Liddicoet, himself, was born in the foothill town of Sutter Creek not far from Placerville. The Liddicoet family was much respected in the Mother Lode. Included among its members were several who attained considerable distinction in academic fields. "Al" Liddicoet's choice of a career brought an intelligent aid to the Institute.

Lois Stone
Interviewer-Editor

March 1969
Regional Oral History Office
486 The Bancroft Library
University of California at Berkeley

ALFRED RAYMOND LIDDICOET

(January 20, 1968)

Family Background and Childhood

Stone: This is a history of the Institute of Forest Genetics, formerly known as the Eddy Tree Breeding Station. We are recording the reminiscences of an early scientist in this station, Mr. A. R. Liddicoet. We are recording at the Institute of Forest Genetics and the interview is being conducted by Lois C. Stone on January 20, 1968. Mr. Liddicoet is now ready to answer some questions. Where were you born, Mr. Liddicoet?

Liddicoet: I was born in Sutter Creek, Amador County, California, on January 22, 1907. I was raised in that town and had my education there through high school.

Marriage and Early Employment at Eddy Tree Breeding Station

Liddicoet: But in the meantime I had married in the summer of 1928. My wife happened to be Mr. Austin's secretary at the Eddy Tree Breeding Station. And in that way, I became acquainted with the Eddy Tree Breeding Station and in the winter of 1928-29 I started work for the Eddy Tree Breeding Station during the winter months, and then returned to the California Door Company in the summertime, during their operating season. Then in 1930 -- it was during the start of the Depression -- the California Door Company stopped operating their logging and sawmill operation. And Mr. Austin asked if I would come and start permanently with the Eddy Tree Breeding Station. That's how I came to the station.

Stone: What was the first work that you did?

Liddicoet: The first work was measuring seedlings in the nursery and out-planting in the present Eddy Arboretum. These measurements were height and diameter -- and, oh, the counting of the cotyledons, the number of needles per sheath, and other work pertaining to forest nursery and outplanting practices.

Stone: Did you do some of the early pollination work, too?

Liddicoet: The first year or so, I was only here during the winter months. The pollination season would be just about starting when I would leave to return to the California Door Company. I got familiar with collecting the catkins for pollen, but that was about as far as I got until after 1930.

Eddy Station Work and Staff

Liddicoet: Then I went into all the phases of the work, from then on.

Stone: You lived in Placerville?

Liddicoet: Yes, that's right.

Stone: Did your wife continue as secretary for a while?

Liddicoet: She did for a while. And I don't remember just what year she left the employment of the Eddy Station. But then she went to work for the Extension Service in Placerville, Mr. Lilly was the Farm Advisor. But I continued on at the Institute. It became the Institute of Forest Genetics in 1933, I believe, '2 or '3 -- someplace along in there.

Stone: Yes, I think that's right. You and Mrs. Liddicoet must have both been very close to Mr. Eddy -- because of her association and then yours.

Liddicoet: That's right.

Stone: What was her maiden name, incidentally?

Liddicoet: Doris Cribbs.

Stone: Did Mr. Eddy come up quite a bit in the early days?

Liddicoet: Oh, yes. I can remember my wife talking about meeting Mr. Eddy and then writing lots of letters to him from Mr. Austin and Mr. Lumsden, who was the nurseryman, and John Barnes who was our forester. And of course Mr. Cumming, Bill Cumming, who was John Barnes's assistant at that time. I became acquainted with Mr. Eddy before I ever met him, though my wife.

Mr. Eddy as a Person

Stone: Mr. Eddy must have been a most unusual, fascinating man.

Liddicoet: He was, sure enough. That's right.

Stone: He had a great deal of vision.

Liddicoet: Oh, tremendous! I mean it, I would say probably very few people have the vision that he had.

Stone: Was he an interesting man to be with?

Liddicoet: Very interesting. You bet he was. I can remember in later years that Mr. Cumming and Mr. Eddy and myself, and I believe another person -- I'm not sure who it was now -- but we went on a trip through the Sierras here in Eldorado County, in this Eldorado Region. And he was enjoying the wonderful timber that we have in this part of the Sierras. He was a very very interesting person, yes.

Stone: What was the reason for this trip?

Liddicoet: Well, he just wanted to go out and see nature, I think. He was that sort of a person. And he wanted somebody to go along and drive for him, and so that he could talk to the people that had worked for him, you might say, on this research. And I think he just wanted to get acquainted with the personnel. That was the main thing.

Stone: Was it a fairly extensive trip?

Liddicoet: No, not really extensive. It was only a day or so. But we covered -- not so much ground, in mileage, but we covered a lot of subjects.

Stone: Did he want to stop often and look at specimen trees?

Liddicoet: Yes, he did. That was one of the things. He would stop and look at trees.

Stone: What sort of things fascinated him?

Liddicoet: Timber and, of course, the view and the beauty of the surrounding areas, and so forth and so on.

Stone: Was he also interested in undergrowth and the smaller plants?

Liddicoet: He seemed to be interested in the whole setup, as it was naturally.

Stone: He enjoyed seeing the birds and the other things.

Liddicoet: That's right. The whole picture, I mean not just one individual thing, like timber, or flowers, but all of nature's beauty and restfulness.

Stone: When you went on an outing like this, I suppose he was the host and paid all the bills.

Liddicoet: Well, no doubt. [Laughter] I don't recall exactly. But I'm quite sure he did.

Stone: He was a man of considerable means.

Liddicoet: Yes.

Stone: And he probably enjoyed entertaining his staff a little bit.

Liddicoet: That's right.

Stone: This was when he was still financing everything?

Liddicoet: About the time it transferred to the government.

The Station Becomes a Federal Institute

Stone: I know it was a slow process. Before it was actually transferred, there was the worry about where it should go and who was going to take over.

Liddicoet: That's right. There was quite a lot of discussion about it. And I think they were a little afraid that if it was transferred into the government that they would lose their identity in the maze of departments and so forth and so on.

Stone: Well, that is often a valid worry.

Liddicoet: That's right.

Stone: Nobody wants to give up the autonomy that you have in an independent setup.

Liddicoet: And they had just got it started to the point where there might be some results to begin to be shown, and they didn't want it to be lost right before it got started, you might say.

Stone: You don't like to see worthwhile projects just blocked by bureaucracy.

Liddicoet: That's right.

Stone: It might have gone to the University, had they been able to raise the money.

Liddicoet: I would think that it probably would have. You see, they tried to raise an endowment, before it was ever transferred, I believe. That was during depression time, and they just couldn't, couldn't swing it. That was all.

Stone: Mr. Righter told me that he and Mrs. Austin went around, to various wealthy people, asking them for little

Liddicoet: Yes, that's right.

Stone: And then finally, it was decided that it would go to the Forest Service.

Liddicoet: That's right.

Stone: And you continued on.

Liddicoet: Yes.

Stone: With the setup the way it was.

Liddicoet: That's right.

Stone: Now, after it went to the Forest Service, Mr. Austin still remained for a while.

Liddicoet: He was still project leader, or division chief, or whatever you might want to call -- I forget the [title].

Stone: Under the Berkeley office.

Liddicoet: Yes. And he remained until during the Second World War sometime. I know I happened to be in India at the time. I was away over three years.

Stone: Oh, you went into the service.

Liddicoet: Yes. And I think Mr. Cumming wrote to me that Mr. Austin had resigned, or something. I don't know all the particulars. I wasn't here at the time.

Stone: He had this iris business started? [Mr. and Mrs. Austin were breeding and selling hybrid iris].

Liddicoet: Yes.

Stone: I gather that Mr. Austin was never too happy after it went under the government. He felt the restraint.

Liddicoet: I mean they dictated what they could do and what they couldn't do. I think he felt as though he was being kind of -- you might say hog-tied.

Stone: Well, he'd been here since the very beginning.

Liddicoet: That's right, since 1925.

Stone: He was the original man.

Liddicoet: That's right.

Stone: And I suppose it was a little hard to take.

Liddicoet: That's very true.

Stone: Mrs. Austin thought it was injuring his health. And he was becoming nervous and upset about it and felt that he couldn't do

Stone: the right job because of this.

Liddicoet: I kind of think that probably was the truth all right. Because I talked to him after I came back from the service. He didn't discuss that part at all. He just, as an old employee, or friend, and me as a returning G.I. had quite a chat together. But nothing personal about whether he resented it, how he happened to leave, or what. But he had his own business established at that time.

Stone: That was probably a very happy solution for him.

Liddicoet: Yes, I'm quite sure that was so.

New Interest at the Institute

Stone: And then you came back to the Institute after you finished your service -- and continued with your scientific work.

Liddicoet: That's right.

Stone: And everything was reasonably comfortable and happy.

Liddicoet: That's right. It was very, very good to be back.

Stone: You did a lot of work then. I know, because a great many papers came out with your name on them.

Liddicoet: Yes. I had -- well, worked in the weather department during the service. Before that, I had taken weather records, here at the Institute. And so that part was put into my hands, which I learned like during the service. Then I gradually was shifted into the pollination part. They gave me a choice of whether I wanted to take charge of the nursery department or the field department. Mr. Cumming had been in charge of the field department before but he was going to be elevated, and they gave me the choice and I chose the field department, pollination.

Stone: Yes, many of the papers relating to pollination you're author or co-author of.

Liddicoet: Yes.

Stone: Is there anything in particular about the developments there that you'd like to comment about, or the people you worked with? Some people who were particularly skillful or clever, or?

Liddicoet: Well, our pollination crew as a rule wasn't very large. We were always understaffed, it seemed, from lack of money, which was generally the case all through our history here, it seems like. We, after the war, mean Mr. Cumming got ahold of a young fellow that's still here with the Institute, Jack Carpenter. He worked under me. And between Bill and myself, we trained him. He turned into a very good field man and pollinator.

Developing a New Records System

Liddicoet: Then later, their keeping of records of hybrids and so forth here had become quite a problem. And I think Mr. Righter devised the original system of keeping track of the hybrids, while Mr. Austin had instigated the system for keeping the records on the species and progeny tests. And as time went on, it got to be like a snowball going down the hill. And it got more complicated and it got to the point where you couldn't identify the trees out there without taking the number off the label and going back into the records and pawing through a bunch of ledgers to find out what, actually, the parentage was of the tree. Actually we were using three different recording systems, Hybrids, Species and Progeny.

And so I -- I think, I probably had the first insight into it that it had to be changed some way or other. And so I give it considerable thought for a couple of years, and finally come up with an idea of changing the system so one would do for all out-plantings. And Mr. Righter came in one day, after he'd been out in the field, and he couldn't tell what the parentage of the tree was until he'd go back through all the records to find out. And he said something had to be done about it, that was all there was to it! So I told him what I had in mind.

And he said, "Just write a little note about it, and let me look it over." And he says, "If it's suitable why, we'll adopt it."

So I did. I wrote, what I had in mind for keeping track of them so that you could tell as soon as you looked at the label in the planting, what the parentage was, and how many of that hybrid or species had been outplanted. More detailed information is kept in ledgers and on individual tree cards.

Stone: That's very good.

Liddicoet: And they accepted it.

They gave me, I believe a \$150 reward, which was quite a surprise to me for developing and putting the system in operation. I didn't have that in mind at all. I just knew that we had to make a change, and thought of this.

Stone: Well, you made a great contribution.

Liddicoet: Well, I don't know whether it was so great, but it just -- was one of those things, I guess you might say American ingenuity. If you work with something and you find that it isn't working, you try to devise some way of making it work.

Stone: Yes.

Liddicoet: Or changing it so it will work.

Stone: Well I admire your having devised this. Oftentimes people just let things go, you know.

Liddicoet: Well, I suppose but if you're working and are conscientious you will try to do something about it.

Stone: Were there some other little incidents about devising of new ideas or about problems that you figured out solutions for? I think you have a great deal of ingenuity here.

Liddicoet: Well, I wouldn't say that. But whenever you're working with problems of this sort there's always little things that come up that maybe you can change or add to to improve the work or the conditions. I don't know, I suppose I have contributed a little bit to the advancement of the work.

Devising Pollination Techniques

Stone: You did a lot of work in pollination. Did you devise some of that technique?

Liddicoet: I guess maybe I had a hand in some of the early development of the techniques of extraction, and things like that, of the separation of pollen from the catkins.

Stone: How did you do that? In a bag, didn't you?

Liddicoet: Yes. Mr. Richter worked with it quite a lot to start with. And then it gradually, I guess, kind of shifted onto my shoulders and we gradually changed things so that we got better production of pollen from the amount of catkins that we would gather. We would get more pollen, and probably a little cleaner pollen. So we wouldn't have the trouble of plugging the needles when we'd go to pollinate the female flowers.

I can remember working on some of the early extractors, the pollen extractors, things like that. I don't know. I don't think they were all my ideas. I think they were everybody's ideas. Maybe I executed some of them.

Stone: Well, the pollen extractors, so-called, is that a kind of a bag device?

Liddicoet: A funnel with screens in, and then a canvas bag on the top of that so that the air and the moisture could be dissipated out through the bag, but still foreign pollen in the air couldn't contaminate the pollen that you wanted.

Stone: What sort of a canvas did you use?

Liddicoet: We used just ordinary white duck canvas, I think it was ten weight or maybe it was twelve weight -- no, ten weight. Because the twelve weight proved too heavy, and it was hard to put the bag over the funnel part of the extractor, so we finally settled on a ten weight bag.

Stone: Suppose you had a rain or something.

Liddicoet: After we'd picked the catkins we'd bring them in and wash the catkins and then put them in these extractors and then hang them in rooms where there was heat and air circulation.

Stone: But when you were actually collecting the catkins from the trees, how did you do that?

Liddicoet: You just picked the catkins and placed them in paper bags and brought them into the extraction rooms for processing.

Stone: Just ordinary paper bags?

Liddicoet: Yes. But then you washed the catkins before you put them in the extractors, if they happened to have any foreign pollen on the catkin you'd wash it off with water. As a rule the catkins hadn't started to open yet. Just before they were open in the proper stage.

Stone: This meant an awful lot of work, watching the trees day by day?

Liddicoet: Well, yes, you had to watch your trees so you could get the catkins at the right maturity. Otherwise, if you picked them too green they'd shrivel and wouldn't shed their pollen at all.

Stone: Somebody would have to go out almost daily?

Liddicoet: Just about daily. That's why most of our collecting of pollen was done in the arboretum, here on the grounds so that you could keep watch of the catkins as they matured.

Stone: Otherwise if you sent into the field and collected, you just hit or miss?

Liddicoet: Yes. In a way hit or miss. Of course, a particular tree might have some catkins that were quite green and others that were open, so's you could hit some on the tree that were right for picking, if you were anywheres close to the maturity time, or you might say you learn, well by experience, if they are such and such a stage now, if the weather stays so and so, why in five days, or ten days, they'll be just right.

Stone: I can see how your skill in weather forecasting and knowledge was very important.

Liddicoet: It came in handy. We also kept a record of pollen collection dates so over a period of years you would know pretty closely the time when pollen would be ready for collection.

Co-Workers at the Institute

Stone: Then during this period, after you came back from the war, you were responsible for this program.

Liddicoet: Yes. That's right. They gave me that choice. When I came back from the service, Dr. Stockwell and Mr. Cumming came into my home and wanted me to come back to work and they presented the choice then: whether I wanted to be in charge of the nursery or in charge of the field work. And I'd worked with Mr. Cumming before the service time, in the field, and I liked that, and so on.

Stone: I should think he'd be a very good man to work with.

Liddicoet: Wonderful. There's no better.

Stone: He gets along with everybody very well.

Liddicoet: Oh, yes, he does. That's for sure.

Stone: And he has a good sense of humor.

Liddicoet: Very good and he's one of those men that you never can quite equal as far as amount or quality of work he accomplishes. I mean, when you're out on a job, why if you climb three trees during the day he'll climb four, and so forth and so on. And if you pollinate, or bag, a hundred bags on a certain tree, why he just does that much more 'cause he's that much bigger and stronger and he's just -- well, he's growed up with this work, you might say. Bill doesn't excel in this work, just to show how good he is but rather as an inspiration to his fellow workers.

Liddicoet: There's no one like him, I don't believe. You see, he started in 1925. That's the year that the place was started, although Mr. Austin had been working with Mr. Eddy on selection of sites before that. But Mr. Cumming came in 1925.

Stone: You weren't too much behind him.

Liddicoet: Not too much.

Stone: But considering your wife's association you really had, the two of you, a real pioneer place in the Institute.

Liddicoet: That's right.

Stone: Well, did you continue mainly with the pollination work?

Liddicoet: Pollination and records. And records had become a big job. And the more years that went on, why the job got that much larger. And now I believe they have separated the jobs, so that the field man doesn't have the records to take care of. I think the records is just about a one-man job now.

Stone: I can imagine there were some solutions that had to be worked out for keeping the records in the early days, too.

Liddicoet: Oh! Well, that was quite true, I guess it would be in any organization, especially in research, records would become one of the biggest problems.

Stone: Precise, scientific work, demands care.

Liddicoet: Yes. I think that Mr. Richter was at some meeting one time where geneticists were gathered. And I believe there was a Dr. Fischer who was talking to Mr. Richter. And he asked Mr. Richter where he was working, and he told him. He was working in genetics, Forest Service. I believe it was Dr. Fischer told him his biggest worry would be his records,

One of his biggest jobs. And apparently it's getting to that point, I mean, it takes one man practically all his time to take care of just the records.

Accident at the Station

Stone: You were here until four years ago or so, until you had the accident?

Liddicoet: Yes. My accident was in May of '63 and I was off six months. Then I came back and tried to work, and I just couldn't. I could've stayed on and maybe taken care of records for a while, but it was standing in the way of some of the other personnel, so I didn't think it was right. So they decided to put me out to pasture.

Stone: It probably wouldn't have been good for you to undertake that responsibility.

Liddicoet: I don't think it would have been. And I don't think I'd have been entirely satisfied. And I probably ... Well, I just can't sit by and see work that should be done and not be able to pitch in and try to help do it. I just never have been of that nature and I guess never will be.

Stone: You had lots of years of service.

Liddicoet: Well, yes, you see -- of course, I only had a little over thirty years of government work, although I had about five other years, so I had about thirty-five or thirty-six years, or a little more of actual work here, but it wasn't all government.

Stone: Oh, that's the first part -- when you were just under Mr. Eddy didn't count.

Liddicoet: It didn't count.

Stone: All of you were handicapped in that respect.

Liddicoet: Yes. That's right.

Stone: Mr. Cumming and everybody who was.

Liddicoet: Yes, Mr. Cumming, Mr. Austin, all those fellows in the pre-government or early days of the Institute.

Stone: You had no coverage as far as retirement in those days.

Liddicoet: No, of course in those days there was no coverage for anyone to speak of.

Stone: But in any case, with your accident having occurred while you were on the job, you must have come out fairly well.

Liddicoet: Well, you see, they still carry me on compensation, although they have retired me. Now, that's one thing I shouldn't have let them do, I shouldn't have let them retire me.

Stone: Oh, the compensation is a better deal?

Liddicoet: Well, yes. Because they are carrying me on compensation. But if I ever become well enough to be taken off of compensation, why then they would put me on regular retirement and all these years from the time they let me off to now, or whenever that day comes, wouldn't count as far as retirement.

Stone: But, still, you must have had enough years of service, so that --

Liddicoet: No, I'm not hurting or anything like that. Even if they took me off of compensation.

Stone: It could have been better.

Liddicoet: Well, in this respect. Maybe not any for me, because they may continue to carry me on compensation, retirement, I don't know. Because I'm still under a doctor's care, and they still pay the doctor and so forth.

Stone: Well that's important, now!

Liddicoet: Yes, because, you see it was pretty near two years after the accident they found some other things besides the compression fracture of the back. It turned up that there were some internal injuries too. But they recognize it, so . . .

Stone: What was the circumstance when the accident occurred? Mr. Cumming said you were up on this ladder doing some work all by yourself.

Liddicoet: Yes, I was collecting catkins. And we were quite rushed. Our Division Chief at that time was Callahan. He's in Washington, D.C., now. He was striving to get to Washington, D.C., at that time, I guess. He had made up the program because Dr. Critchfield had been sick. And he had made up such a tremendous program that our personnel just couldn't take care of it. I was working by myself while two of the other fellows were working [in another area]. We were using this -- oh,-- antiquated truck -- ladder on an old truck, and the ladder, I guess the Institute'd bought it in 1934. Oh, it was a monstrosity. And we had had money to buy a new one, a hydraulic or an electrically operated one. They converted the money to some other pet project, so we just got along with our old equipment. And apparently I backed this truck in close to a tree and the ladder leaned up against this dead branch. After lunch I went back and climbed this ladder, and apparently just as I was getting ready to hook on my safety belt -- because when they found me the safety belt had been unhooked but it hadn't been looped into the loop on the ladder -- and apparently the limb broke and flipped me clear off the ladder.

Apparently the pressure of my weight with the ladder on the limb was too much so the limb broke, sort of whipped me off. I suppose I had one hand on the belt, getting ready to loop it onto the ladder.

I apparently caught something on the way down because my right shoulder was partially dislocated, or something.

I took therapy treatments six months or so afterward to try to get in shape so as I could get it above my head. And it's pretty much normal now. It's not as good as it was, but I'm not complaining. They said I shouldn't live, anyway: the doctor told my wife that there wasn't no chance for me to live, but ...

Stone: You fooled them.

Liddicoet: [Laughter] Well, I did I guess.

Stone: Well you really look pretty well now. I know you're still having trouble.

Liddicoet: Oh, yes, I feel very well. I still have lots of pain. But I can live with it. If I don't get overambitious, I get along real well.

Stone: But it is too bad that this accident had to occur. And apparently might not have occurred had the equipment been good and the program not so rushed.

Liddicoet: Well, on that program business, Dr. Critchfield came back in my office after he got well and got back on the job -- and that was before I was hurt -- and he told me in my office, quote "Al, I just don't know what Callaham was thinking about by putting on such a program." But Callaham had told him, he says, "The more you give those guys to do, the more we'll get accomplished."

And Critchfield says, "Well, I don't agree with that." He told me that right in my office.

Stone: And this was before the accident?

Liddicoet: Yes.

Stone: At least made himself clear to you.

Liddicoet: Yes! And it wasn't his doing. And I don't think -- I'm sure Callaham wasn't malicious in making the program that large --

Stone: Just ambitious.

Liddicoet: -- just ambitious. And I don't hold any resentment at all. But it's just one of those things. But it did some good. Because right afterward they got a new piece of equipment for the boys to use.

Stone: We don't like to have to get equipment on that basis. I hope they cut down on the overly ambitious program, too.

Liddicoet: Well, they Yes! I'm sure they did because I've heard it said since that Dr. Critchfield says that we don't realize how much pressure you put on people in the field when you build up the program so large. Because apparently he had made a program a year or two or three later and it wasn't nearly the size of that one. But he said it's just a little too heavy because the fellows just -- if you have a conscientious crew, even though they know they are not forced to accomplish all of it -- it's humanly impossible, maybe -- but they just strive to get as much as they can done, and do it as well as possible under the conditions.

Liddicoet: I'll say that, that this crew that we've had around here, they were all pretty conscientious. You give them a job to do and they went out and they would try to do it to the best of their ability and as soon as they could.

Stone: I wonder if some of these people who are mainly in the office, might fail to realize what the demands are in field work. They didn't ever actually get out in the field and do anything themselves, did they?

Liddicoet: Oh, I guess a little bit Callaham did a little bit, but not very much. In fact I understand he was climbing a tree down here before he became Division Chief or anything like that. And he apparently fizzled out climbing the tree and started to fall and he clung on to a dead branch, and after he rested a bit he finally got down. His strength just gave out on him. I suppose, he hadn't hardened up to it and he was trying to do more than he should have for his physical condition.

Stone: Well, some of those city boys get to a point where they are just sitting around meetings.

Liddicoet: Soft.

Stone: They have the illusion that somebody who's hardened to it can just whiz through.

Liddicoet: Just go, go, go.

Stone: But you can't do that in the field. You have to look for the things and you have to size things up. You learn that even just as a botany student, collecting plants.

Liddicoet: I'll bet you do. Because you can trample over these hills looking for certain plants. And maybe this day you'll have gathered a lot of them. And maybe the next day you travel all day and put in a much harder day, and you haven't got much to show for it.

I think it's good if the office man can get out and get a taste of what the field man has to encounter. And -- not the hardships, that isn't the right word, but the problems that he has.

Stone: That's one thing that's particularly significant about Dr. Mirov, I think. He always wants to get into everything.

Liddicoet: Yes, and he was a good man to work for. I mean, I've done not a lot of work for Dr. Mirov, but some. And of course, Mr. Righter, he would rather do the work in the field than do the office work.

Stone: He said he just loved to climb trees.

Liddicoet: Oh, yes! That was just his first joy, I would say.

Stone: Well, these people are probably a little bit rare in the higher echelons. Career types prefer to sit in the office chair rather than getting into the field; it leads to misunderstandings and to wrong interpretations of what the field crew can and should do.

Liddicoet: Should do, that's right. I don't think we've ever had a man like Mr. Righter, that liked the field work as well as he did. That is, I mean of the professional man. You take most of your college men that come here to be trained and things like that, or get on the staff. They work one or two seasons in the field, just so they get to know just about what it's all about. And then you never see them in the field any more. There he is setting at his desk doing book work or paperwork. Maybe it takes all the time, I don't know -- and it probably does.

Retired Life

Stone: Do you have any hobbies?

Liddicoet: Oh, yes, I have some.

Stone: So many people who are interested in forestry are really basically naturalists. Do you find an interest in birds or anything of that sort?

Liddicoet: I have a little plot of property down below Placerville, out on Forni Road, between Placerville and the Fair grounds. I have a bunch of little trees and I put out a few each year. Mostly firs and a few pines for Christmas trees. I also like to fish, even though I can't get around in rough terrain any more.

And then I'm interested in weather and I'm taking weather records for my own pleasure, and listen to the weather reports each morning. I keep busy.

Stone: Were your parents pioneers?

Liddicoet: Well, I think my father was born in Amador City. And I am sure his father came from England.

Stone: Then your grandfather must have been here in Gold Rush days.

Liddicoet: Yes, I imagine so.

Stone: What did your grandfather do? Was he involved in mining or did he have a business?

Liddicoet: He had a homestead up in the mountains over here around Omo Ranch. But he was involved in mining, gold mining, yes. Because I know him and his brothers worked in the gold mines in the Mother Lode area. My mother's parents who were from the eastern part of the United States, came to California probably in the 1860's or 70's. And my mother's stepfather -- I don't know when he came here, but he had a homestead up in the mountains some place and he was here during the Gold Rush time. His name was Wilson. And I can remember my mother talking about him. He could have homesteaded land in what is now just this edge of Sutter Hospital, when he first came here. But he wanted to be up in the mountains.

Than in 1925 I moved to Placerville and became employed with the California Door Company. I worked with the California Door Company up until 1930 during their operating season.

JACK CARPENDER

Jack Carpenders is another native son. His family ranch is located at Smith Flat, a former gold camp not far from Placerville. Carpenders is still employed by the Institute of Forest Genetics and is really not old enough to be considered an "old-timer," but he joined the staff when he was very young. The principle staff members of the Institute, then, were the old group who are now in retirement. Thus, Jack Carpenders is able to consider the changes that have occurred, since his earliest days there, with considerable perspective. He is also able to compare the Institute of the former days with the current research activities, and this provides a valuable point of view.

Our interview was conducted in the library of the Institute of Forest Genetics and had to be brief as it was fitted into the time left, after Mr. Carpenders had finished his necessary pollination work and before he had to leave. He is a dedicated worker in the field of forest genetics and considers his attention to the trees of first importance. His skill and experience make him a real asset to the Institute. He is sturdy and possessed of great endurance.

It was interesting to learn his feelings of the present and future prospects for the Institute in comparison to earlier experience. Clearly, he misses the "old gang" and thinks with nostalgia of the events that took place when they were all together. But he has a healthy point of view about the Institute's future. His wit and friendliness as well as devotion to the Institute have won Jack Carpenders the right to be counted as one of the pioneers who have made a valuable contribution to the experimental station.

Lois Stone
Interviewer-Editor

March 1969
Regional Oral History Office
486 The Bancroft Library
University of California at Berkeley

JACK CARPENDER

(March 22, 1968)

Background and Joining the Staff

Stone: Mr. Carpenter, when did you join the staff?

Carpender: July 1, 1946.

Stone: Had you been in the service?

Carpender: Prior to that, yes, for three years in the air corps.

Stone: Had you had any previous experience as a tree breeder or geneticist?

Carpender: No, not necessarily. I had a father that worked for the Forest Service for years and I used to travel around somewhat in the summer with him and became acquainted with some of the Forest Service activities, you might say. I did work one summer, in 1941, digging gooseberries. This would be Ribes.

Stone: Oh, yes, in the blister rust control. Had you any special interest in biology or science when you were in school?

Carpender: No, the fact is in the high school I went to here in Placerville they did not offer any subjects in this. There were relatively no subjects in forestry or science at all.

Stone: Your home was in Placerville, then?

Carpender: Yes, I was born in Placerville and lived in Smith Flat, which is about one-half mile southwest of the Eddy Arboretum.

Stone: You're really a local boy. Like Bill Cumming.

Carpender: Bill was born just out of Sacramento, by Mather Field. He moved up here as a young fellow and I guess he would be the next closest that we have.

Stone: Now, when you first came here, the boss was Palmer Stockwell.

Mr. Austin had already left to go into his iris-breeding business.

Carpender: That's right, yes.

Stone: And he had his home outside the gate here, where it is now?

Carpender: Yes, just adjacent to our property.

Stockwell's Leadership

Stone: And how did you find Palmer Stockwell as a man to work for?

Carpender: Actually, I never knew him too well. But I would say he was one of the very best bosses I ever had.

Stone: Who else was here at the station at that time?

Carpender: Dr. Mirov, Francis Righter, Jack Duffield -- Dr. Jack Duffield, Bob Weidman, Bill Cumming, Al Liddicoet; Emily Kimborough, and Mary Jane Elliott was the secretary.

Stone: What did Kimbrough do?

Carpender: Actually Emery was in charge of the nursery, that was his main phase. He was nurseryman.

Stone: And you worked on what phase of the operation here?

Carpender: Actually, I guess I was hired to be a tree breeder. A younger fellow, at that time I was twenty-one and they were looking for some young blood to train as a tree breeder. That was probably my number-one reason for being hired. Of course naturally I worked with him (Kimbrough) in the nursery and in several other phases of work. But during the tree breeding season, this is where I was normally allotted.

Stone: You helped with collecting the pollen, pollinating, climbing the trees, and all that?

Carpender: Yes, the whole phase.

Stone: They need young blood for that, I know. [Laughter] And how did you find these other people to work with?

Carpender: I guess that's the reason I'm still here. I have very few kickbacks on any of them. Actually they were a wonderful group. The fact is, I miss them now.

They're all gone, I'm the only one left.

Stone: Yes, you're the only one from that group. That's why, I think, Dr. Mirov said that I should interview you. He said you really belong in the older group, although you were very, very young when you started in.

- Carpender: Yes, there was quite an age difference. I guess Jack Duffield would have been the next youngest, and he would be at least -- probably -- ten years older.
- Stone: Yes, and the other men were about in their forties, at least.
- Carpender: Yes, probably were.
- Stone: And, did you continue pretty much with that sort of work as long as the older echelon were here?
- Carpender: Yes, you might say that. The fact is, as time went on I became one of the -- we'll say -- crew leaders in breeding work. We would split up into maybe two or three crews and eventually I acquired a crew. In other words, Al Liddicoet would have his crew and I had mine, but at that time, until Al retired, he was in charge of the tree breeding.
- Stone: And then what happened as far as the people in charge, in Berkeley planning the thing? I know part of the time Righter was in charge there, essentially. But who were some of the others?
- Carpender: You mean as project leaders?
- Stone: Yes.
- Carpender: Well, I think "Pete" [Righter] followed Dr. Stockwell when Palmer passed away. And then after Pete we had Bob Callahan, Dr. Callahan.

Dr. Callahan: Project Leader

- Stone: How did he work out as a project leader?
- Carpender: Hmm. Very ambitious.
- Stone: And did he come up often to the Institute and work with the fellows in the field, or was he mostly down in Berkeley? I know Righter came up a great deal.
- Carpender: I think you might say Bob [Callahan] came up quite a bit. The fact is, once in a while he would make a field trip with us.
- Stone: Did he like to climb trees the way Righter did?
- Carpender: No, he didn't, although he did climb.
- Stone: And he did phases of the work, all sorts of things.
- Carpender: Well, yes.
- Stone: Entered into everything. He didn't last for very long, did he? He went on to something else.

Carpender: Yes - he passed on up the ladder. Climbing on up the ladder. He was only our project leader probably two or three years.

Stone: And then who did you get as project leader after that?

Echols: Project Leader

Carpender: Dr. Echols.

Stone: Oh, he was the next in line. How did he work out?

Carpender: He was also very ambitious.

Stone: About what year did he come?

Carpender: Let's see, I would take a guess at about four years ago, '64 or '65, probably.

Stone: And the projects and so on that he set up, did you consider them overly ambitious? I know that Mr. Liddicoet indicated that there was a possibility that some responsibility for his accident was due to the fact that Callaham had set up a rather overly ambitious program.

Carpender: Yes, but, actually Callaham was project leader when Al had his accident. Bob Echols was never heard of here at that time.

Stone: Yes, that's right. No, it was Callaham he was speaking of. And Liddicoet really felt that that had something to do with the fact that he had the accident.

Carpender: Well, that's true.

Stone: Because he was working alone and the equipment was old and the pressure was on. Did Echols turn out to be equally as ambitious? Or high-pressured in his work, do you think?

Carpender: Actually, Bob started several new projects. but I don't think he put any more pressure on than any other project leader. They were both ambitious young men. They had, naturally, their goals to achieve. The fact is, going back to Callaham, in later years it came out from another professional man that Bob always tried to keep more than we could possibly do lined up ahead of us so that we would always have plenty to do. And naturally the men tried to fulfill all of his requirements. I feel that this is perhaps where Al ran into trouble. He was just overloaded -- [pause].

Stone: It wasn't intended.

Carpender: It wasn't intended, and yet it threw the responsibility in our laps because at that date we did not realize what his thinking was.

- Carpender: On the other hand, I have made several field trips with Callaham, some of them as long as two weeks at one time, and I know when we put in a day's work Bob was as willing to quit as I was. In other words, he didn't actually drive himself too far, and those were days when he was young and full of vim and vinegar. So, I think probably the mistake was made, if any, that it wasn't clarified to the men. In other words, we have always been led to believe that when we get a work order we try to accomplish it.
- Stone: Righter probably didn't ask you to do more than was reasonable.
- Carpender: That's true, although naturally the more we'd do the better he liked it.
- Stone: Well, EchoIs, then turned out to be just as good in the field and working with the men, as Callaham, or do you feel there was much choice?
- Carpender: Yes, I would say they were very similar type men. In other words, they would both be willing to get right out in the field and work with you.
- Stone: What kind of a staff did you have during these later years? Did you have a lot of interesting new people coming in and interesting scientists coming in to work with you at times?
- Carpender: Well, you get this every year, but I think there has been a bigger turnover with sub-professional men and possibly professional men. Well, let's look at it this way, years ago, when you hired on you stayed for -- forty years, in Bill Cumming's case, and -- let's see, Bill came in 1925 and Al in 1929, so naturally Al [Liddicoet] would have been here thirty-five years. Emory Kimbrough came here in 1937 and put in thirty years before he passed away. He was still on the job when he passed away. And "Pete" [Righter] came here in the very early thirties, and Nick [Mirov]. Let's face it, they all stayed a long time, so nowadays when a person stays, I'd say five years, he's an old-timer [Laughter]
- Stone: Everybody operates that way. It's the way it's done, everybody comes and goes rather rapidly.
- Carpender: Yes.
- Stone: But on the whole, do you feel that there are big strides being made in the Institute these days and it's going ahead and doing exciting things in the same way that it used to?
- Carpender: It's probably spread out more so. Actually, we have many more things going than we used to.
- Stone: More diversity?

Carpender: Yes. That's true. Perhaps it arises from younger professional men with newer ideas, and possibly broader backgrounds. But I feel that we're spread out more than we used to, if that answers your question.

Possible Discontinuance of Institute

Stone: Did you at any time -- oh, along about 1950 -- ever hear of any possibility that the Forest Service would discontinue all support of forest genetics?

Carpender: Well, possibly there was rumors of it, but I really can't say for sure. Being in my category, perhaps, I never had much opportunity to hear these things.

Stone: It seems to have been something that was rumored, but very little known except the very higher echelons. And I just wondered if there were any subsequent occurrences of that sort when people were worried that the whole thing might be dropped?

Carpender: I could put it this way: for years, if we wanted our mail we would go get the mail in our own private car, we were so broke. We didn't go to town and buy a screwdriver, that's for sure.

Stone: Your budget was so low.

Carpender: Our budget was so low that we just operated on a bare minimum. This existed several years.

Stone: This might indicate that they were trying to close it out.

Carpender: In other words, we were lucky if we could scrape up enough money to hire a seasonal man to help us in the summer, which would be our bumper load of work. We just wouldn't have enough money to hire a fellow.

Older Out Plantings

Stone: Now, with all the time that you've been here, you must be finding some very interesting results with the breeding. I mean in the sense that you now have trees that have been developed from seeds that were planted in the early days, and they're now producing seed. So you have a chance to breed, crossbreed back, and that sort of thing and get some astonishing data that wouldn't have been possible in the earlier days.

Carpender: Actually I get a kick out of going to some of the out-plantings that perhaps were put out twenty years ago, or so. Actually, I don't think we were in much of a mass-production time until just after the war, when Pete and Jack Duffield and Al Liddicoet and myself and Bill Cumming, did an awful lot of mass producing of hybrids to establish plantations throughout this forest and other forests. And it's nice to go back to those plantings now. You can see what you have accomplished and compare them with native trees. I would say this, to me, probably is one of the more interesting results. On the grounds you see changes, but you live with them every day and you don't realize what has changed.

Stone: That's right. It's like seeing friends that you haven't seen for a long, long time.

Carpender: Yes, go back to a planting that you put in twenty years ago and see the size of the seedlings that were seedlings and now are trees -- why it is interesting. You feel you've accomplished something.

Stone: And then this in turn gives you ideas of things you'd like to do, experiments you'd like to see carried on for the future, too, in the way of tree breeding.

Carpender: In some cases.

Present Staff Problems

Stone: Do you find it difficult to get good men to help you now, or is it relatively easy to get good people to come in with the tree breeding work?

Carpender: No, I believe you still get good men. Naturally they're a younger type and they have a different outlook, perhaps on their whole life and the future of the genetics. But I do feel that in a matter of time (which consists of more than one year) they, more or less, become -- shall we say -- a company man and actually donate more of their time and their thoughts to genetics.

Stone: Are these young men people who have some college training usually? Or are they usually high school boys who have an interest in this.

Carpender: Both, really.

Stone: They want to make a career in Forest Service. Now, of course one can select forest genetics if you want to. In the old days there was no such thing and you just kind of worked into it.

- Carpender: The trouble is with a subprofessional man to come here and start at a low salary, which we are practically forced to start quite low. By changing jobs, possibly, we'll say, they can't make a comfortable living for a few years. You might say five or ten years before you get up far enough where you can make good living. So therefore you are kind of limited to the fellows you can hire. Your selection isn't as great.
- Stone: So you're restricted more or less to the very young men and probably the men of lower educational level.
- Carpender: That is true, yes.
- Stone: Maybe mostly just high school graduates these days.
- Carpender: That is true.
- Stone: Or boys who've had a few years of college.
- Carpender: That would be the case of probably four or five of us on the staff now.
- Stone: Well, yes, but in those days it was different because people didn't tend to get so much education.
- Carpender: That's true, too.
- Stone: Do you have any feelings about what you'd like to see the Institute do in the future in ways of experimentation or expanding? Or any particular thoughts of a direction you'd like to see it take?
- Carpender: Well, there's one thing I've always favored would be selection in tree breeding. In other words, choosing better-formed trees in trying to develop nicer shaped trees.
- Stone: You're thinking of this to help develop something that would be better for use as a forest timber tree?
- Carpender: Well, they would naturally make better logs. The way it has been in the past, in many cases we aren't necessarily using a great deal of selection. More or less, just to acquire a source of the species. Therefore we make the cross. But in later years it shows up with poor formed type trees. If you could combine the two, when possible, even less breeding, but more selection -- I think we would be gaining some.
- Stone: Well, I don't want to take any more of your time. It's really about quitting time. Do you have any particular words you'd like to say about anything or anybody connected with the Institute? Especially in the past, because we're interested in history.

Carpender: No, not necessarily. I would say that I do notice a great change since all of the fellows left. You might say you just have to change and go with the trend if you want to get along

Stone: When you say all of the fellows, you mean Mirov, Righter, Cumming.

Carpender: All of the fellows I mentioned.

Stone: And the change is something that you feel unhappy about? They were your friends, of course.

Carpender: Well, at times, yes. It doesn't necessarily mean that they were my friends, but it's a different regime all together. In other words, I would say that if the older fellows were to come back they would also find the same.

NICHOLAS T. MIROV

Dr. Mirov was awarded his Ph.D. in Plant Physiology at the University of California and was a research scientist at the Institute of Forest Genetics for twenty-four years. He had generously agreed to act as our advisor and guide in developing the history of the Institute and recording the reminiscences of its pioneers. Dr. Mirov's present appointment of Research Associate in Geography is for life. Our first meeting was in his office in the Earth Sciences building, overlooking San Francisco Bay. In addition to shelves of books and manuscripts there were several paintings and other art creations. It soon appeared that these were Nick's work.

Dr. Mirov looks much like Maurice Chevalier and has a comparable charm. One quickly learns that he is a man of great wit and intelligence. His amazing bibliography indicates the varied and imaginative range of his research interests. In addition to his artistic gifts -- admirable in several modes of expression -- Nick has exercised his talents as a popular writer. You might expect a gentleman of such taste and distinction to behave in a somewhat distant manner with his associates at the Institute: this is far from true. Mirov's warmth and human understanding are his key to achieving immediate rapport with all. Everyone at the Institute holds the warmest feelings for him and he is always called "Nick." He has probably learned more of the background, worries, and personality problems of the Institute than any other individual. His astute understanding of people allows him to evaluate these difficulties with meaningful perspective. When we visited the arboretum with Nick it was clear that his sensitivity to trees was equally extraordinary.

We deeply regret that limitations of this project prevented us from completing a thorough report on the life of this remarkable man, who left his native Russia to carve for himself an enviable niche in the United States of America.

Lois Stone
Interviewer-Editor

March 1969
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Group in front of Institute of Forest Genetics Administration Building, September 20, 1946. Rear: Nicholas T. Mirov, Palmer Stockwell, J.M. Miller. Front: Phillip Wagner, Aldo Pavgri, R.H. Weidman, John W. Duffield.

Dr. Nicholas T. Mirov
June 1931

NICHOLAS T. MIROV

(March 12, 1968)

Mirov: Always a Middleman

Stone: We are preparing a history of the Institute of Forest Genetics, formerly known as the Eddy Tree Breeding Station, of Placerville, California. We are today, March 12, 1968, recording an interview with Dr. Nicholas T. Mirov, a geneticist who has done much important research at the Institute and who is famous for his work with the genus Pinus. The interview is being recorded by Lois C. Stone. We are doing the recording in Dr. Mirov's office on the Berkeley campus of the University of California.

Dr. Mirov has been acting as our advisor for this project and has kindly consented to give a brief introduction to the series of recorded reminiscences of senior staff members and associates with whom we have been talking in recent weeks.

Advisory Role

Stone: Now, Dr. Mirov, we are recording.

Mirov: To begin with, I wanted to tell you that when I was younger I did some consulting work for the Sunset. An editor of the Sunset, Mr. Doty was his name, always told me that I'm a valuable man for him because I always act as a middleman, always tell him whom to see, to whom to talk. I did exactly the same thing with you. When you phoned me the first time I just suggested to you to see [W.C.] Cumming and [F.I.] "Pete" Righter, and now this lady [Miss Anne Avakian] as I mentioned today.

Stone: That was very helpful.

Mirov: [Laughter] That's why I'm middleman.

Stone: Well, you understand people.

Mirov: I don't know. [Laugh] I don't know. No, I think I know who knows about certain subjects -- I mentioned to you that Righter would give you the basis of the genetics project. Not exactly genetics -- tree breeding. He is a tree breeder, not a geneticist, of a laboratory type. But Bill Cumming would give you the whole local atmosphere, which Pete really couldn't give you. And Jack Carpenter will give you even more.

Stone: I'm glad you mentioned him. [Carpenter]

Mirov: It's very recent. He's been connected probably for the last fifteen years, since the Station became the Institute, part of the Forest Service.

Program of the Institute of Forest Genetics

Stone: Now perhaps you'd like to tell us something about your thoughts on the Institute and your work there, or maybe your feelings about the scientific significance of the work they have done.

Mirov: I joined the Institute after about ten years of work in the Forest Experiment Station, mostly with erosion control and forest influences. In 1937 I was transferred, as a plant physiologist, to the Institute of Forest Genetics. A year before I had received my Ph.D. in plant physiology. At that time I was only one of the two plant physiologists in the whole U.S. Forest Service and they didn't know what to do with me. [Laughter]

At the Institute the program, from the beginning, was based on selection. This was Mr. [Lloyd] Austin's point of view, to select better trees and propagate them somehow for the benefit of mankind. When Lloyd Austin left, Righter [following Palmer Stockwell] was in charge and Righter emphasized the breeding rather than selection.

So the whole program was revamped to cater to the breeding of forest trees. The balance swung too much to one side. In my opinion it should be selection and then breeding. But I always felt that the geneticist's job was only a matchmaker - to help male and female trees to meet and to produce the progeny. From then on the geneticist's work like that of a gynecologist is completed. From then plant physiologists take over, or soil men, or taxonomists.

So that was my job there, to be plant physiologist at the Institute of Forest Genetics. By that time the whole program was not developed long enough, it was not ready for the physiological work at the Institute. It was mostly accumulating the material, breeding more and more species. Nevertheless, there were some useful physiological projects. For instance making the seeds to germinate in a certain period, they call it a "after ripening," or "stratification," or "chilling," all those are misnomers. But I solved this problem quite well and now they use it at the Institute.

Then came the problem of vegetative propagation of plants. It is a very tempting method because if you see the superior tree you propagate it as you would propagate your rose or chrysanthemums, vegetatively, and then you have superior trees. But with pines it is difficult to propagate vegetatively. They are extremely reluctant to strike roots.

Stone: I didn't know you could do it at all.

Mirov: Nobody knew much about it but practical gardeners, but practical gardeners don't publish.

Stone: Did they use a hormone?

Mirov: No, it isn't so much hormone. It isn't exactly science, but an art to take into consideration the maturity of your material and the physiological fitness, and so on. I rooted many of them and grafted many of them. But I don't think that the results of my work at that time have been applied much; because, as I said, the Institute has not been ready. Now, more and more, vegetative propagation is practiced in forestry. Well, those were two practical tree breeding projects.

Mirov's Study of Chemical Composition of Pines

So I had much free time [and] I decided to invest it in studies of the chemical composition of pines: for genetic purposes, for taxonomic purposes, and so on. I had been interested, for many years, in the chemistry of turpentine, a product which you use in painting kitchens. In fact, I accumulated so many samples of turpentine that sometimes I would paint the kitchen with a Pinus montezumae turpentine or my living room with Pinus teotecote from Mexico. In different species, turpentines are different. They are very easy to work with.

I gradually accumulated a great deal of data, first on a very modest scale without much laboratory. Then I continued my work mostly on outside money from Rockefeller Foundation grants and completed it. Now this chemistry of turpenes is used to great advantage by many scientists in different fields: in entomology, in forestry, in taxonomy. Still a great deal has to be done in this field, but we were trail blazers at that time. [laughter] Which means, you know, it was rough going and the results sometimes were not statistically good. But for a beginning it was good. At least it stimulated a good deal of interest.

Influence of Eucalyptus Work

I was influenced very much by work down in Australia with Eucalyptus. They have continued this work since the end of the nineteenth century, applying the chemistry of the turpenes -- (turpenes are ingredients of turpentine) -- to the taxonomy of Eucalyptus, (genus Eucalyptus.) What they have done with the genus Eucalyptus I did with the genus Pinus.

Stone: Did they do studies of the genetics, or species relationships, based on the turpenes?

Mirov: Well, at the start genetics had not been known at all.

Stone: No, not in 1900.

Mirov: But now, yes. This is one of the reasons I want to go to Sydney. [Dr. Mirov was about to leave for Australia.] There's going to be a reunion with the Museum of Applied Arts and Sciences in Sydney, just like our Smithsonian Institution.

Stone: They're doing this sort of work that you did with the pines there?

Mirov: Yes. But they have about seventy-five years of experience now. I think that was very stimulating. But if you don't mind me telling you, it's very interesting -- perhaps not for this record, but generally speaking -- how I was interested in turpentine.

Stone: Oh, I think it interesting.

Mirov's Early Interest in Turpentine

Mirov: When I was a student in St. Petersburg it was about 1914; in our wood technology lab the assistant gave to each student -- there were about thirty of them -- a little quantity of the oleoresin or gum, or pine pitch, and explained the theory of distillation. Each one of us had to distill his own turpentine. I'm sure out of those thirty men I was one who was extremely fascinated by this procedure. When you take honey-like pitch, distill it with water, you have crystal white turpentine -- which I used in my sketching and painting.* And the solid part which was left in the flask was rosin. It was solid and used to lubricate the violin bows. I gave it to a friend of mine, who played violin, and he said it was good. To me it was a marvel to create something which didn't exist in nature.

Stone: This was when you were an undergraduate?

Mirov: Yes. And it's interesting. [Laugh] Then, there came interference: war and revolution. But after that, no matter where I would go I would tap pine trees and then get a little bit of this pitch and then distill it. It almost was an obsession with me.

When I came to this country in 1923 somebody once told me that we have here an unusual pine, Jeffrey Pine. It has no turpentine. It has a gasoline-like substance instead. I thought it was impossible. So we went to the mountains. (I barely spoke English at that time, I was ignorant, I didn't know what board foot was, even. I thought it was some kind of wooden leg.) [Laughter] At night time I nicked a big Jeffrey Pine tree with an ax and obtained about a pint of oleoresin. It was a big gash, and when my boss saw it the next morning he wanted to fire me because it turned out to be a tree growing on private property; its wood amounted to so many hundreds of board feet, so many dollars a board foot.

Stone: What was your job then?

* Dr. Mirov paints with remarkable competence.

Mirov: I was supposed to measure the trees there, in the forest. I was beginning my forestry career. I was very much disturbed, so again, the next night -- after dark -- I went to the forest with nails and nailed the bark back to the tree, but pieces of moss and dirt around so the tree looked like new. [Laughter] I hoped they didn't send the tree to the sawmill because the saw would be cut to pieces by the nails.

Stone: But you were satisfied then.

Mirov: I was satisfied. And that opened the whole career at that time. Ethyl Gasoline Corporation wanted to get this chemical desperately, for standardization of the fuel, and they couldn't make it synthetically. Somebody told them that one pine in California produced this substance, but nobody knew how to get it then. It used to be done a long time ago. This substance, at the end of the 19th century, was [sold] under the name of Abietene* used as a cough syrup and so on, although it is just as good as kerosene for this purpose. When I came back to Berkeley I distilled this pitch and kept a little bottle of this extremely fragrant substance, which I mentioned in that article**.

My boss [in the Forest Service] said, "Let me have it," because he wanted to send a sample to Washington of what we can do here in California.

I said, "No. I won't give it to you."

He was an extremely wonderful man, extremely honest. He whispered to me, "If you give me the sample, I'll give you the job" -- a research job to do some work in turpentine. I gave him the bottle, and I had the job, and then I made good. Because otherwise they would probably [have] let me go because I hated this measuring trees and how much grief you can get with nine figures and a zero.

Graduate Studies and Research

Stone: And this was all before you got your Ph.D.

Mirov: Before, yes. A little later I got my Master's degree, based mostly on the chemistry. After I was appointed to the Forest Service -- It's quite complicated. You see, I was not a citizen, so I could not get a permanent job with the Forest Service. We [were] called then "Ninety-day martyrs" because we were supposed to work ninety days and then be fired and rehired again.

* "Abietene" was manufactured by D. F. Fryer, a Santa Rosa apothecary.

** Nicholas T. Mirov, "The Fragrance of Pines," Atlantic Monthly, September 1959.

Mirov: It was really very painful. Then, when I had my permanent appointment I resigned from the Forest Service because one big paint company, Fuller Paint Company, wanted me to build a distillery in the mountains. It's a long story -- better not to [go into] this business.

It has been written once, in one magazine, by somebody -- a certain Mr. Carruthers* of the Standard Oil Company, I think.

Then I had my Master's degree based on my technical experience with this production of the substance, called heptane, which is not turpene.

Then I started to take university work, class work. It was depression time.

Stone: This was [at the University of California] here?

Mirov: Yes. There was a depression, which Bill tells about when they laid off people there. I lost my job with this Fuller Paint Company, for whom I built the distillery in the mountains. But fortunately I had one of the fellowships for graduate work. Very few of them were given, about five.

Stone: Research?

Mirov: It is post-graduate school work. So-called Charles Lathrop Pack Fellowship. That saved me. I went to school and eventually had a Ph.D. in plant _____.

Stone: Who did you study with here?

Mirov: Dr. Bennett. These were very exciting years because at that time the University was different. When I finished my prerequisites for the final examinations -- in those days, you had to go see the dean, personally present yourself. The dean was Dean Lipman. He was a partly American Jew; and in my time there was quite a big group of Jewish students from Palestine with terrible English, mostly Eastern Jews, not Western. And Lipman hated them. So when I presented my credentials he said, "Are you a Jew?"

I said, "No, I'm sorry, I'm not, Dr. Lipman."

He said, "Sit down. Smoke?" [Laughter]

I didn't know what to think about it. I said, "Dr. Lipman, I had C in Physical Chemistry."

* Guy Carruthers, "Our Strange Debt to the 'Gasoline Tree,' Westways, 48:1 Pages 14-15, (January, 1956).

Mirov:

"Oh," he said, that's nothing." [Laughter] And he signed his name that I am admitted to the examinations and I passed them with some kind of colors -- not flying, but I think I did well in the finals. And the thesis [was] mostly on the germinating of pine seeds and growth hormones. In those days studies of growth hormones were very fashionable, like nowadays is nucleic acid. My work at the Institute of Forest Genetics was mostly on the chemistry of turpenes. I felt myself that it isn't exactly work useful for genetics at that time. But, somehow they let me do it. The director probably thought, "Well, it won't do any harm to anybody, let him do it." And he was right.

Mirov's Early Days in the United States

Stone: We've skipped over all of your studies in Russia and your Immigration to the United States. That was long before you joined the Institute of Forest Genetics, but I wondered how you first got started in the United States. You said you came in 1923.

Mirov: I missed a lot of points, of course, of my personal life. When I came to the United States as an immigrant, without much money, with a lovely young wife, my first job was to sweep the railroad cars for Southern Pacific. In a very interesting company of men: some German, some Mexican, some were some kind of native narcotics addicts. I wanted a better job, to load the cars. But it called for a knowledge of figures. So the "shed boss" said, "Do you know American figures?"

And I wanted to tell him, "Sir, they are not exactly American figures, they are Arabic." But I didn't dare because I wouldn't get the job.

But he said, "Yes, you can do it," -- when I read the calendar, "One, two, three, four, five." So I got ten cents wages more per hour.

The only strange thing was that this loading shed was located across the street from the lumber yard. And the lumber yard worked a horse, a big horse moving the lumber up and down. And we worked loading the cars. We did the same work as the horse. The same expenditure of mental energy. The difference was that the horse worked eight hours a day and I worked ten hours a day. So I envied the horse. [Laughter] This was really sad. But it's a good thing to start this way, I guess, and to appreciate what's going on at that level.

Stone: You learn a lot about people in those menial jobs.

Mirov: Yes. My boss, a Mr. Smith, said to me that we don't need men like you in this country of ours, and you better go back where you came from, you're no good. Two years later I designed the turpentine distillery for Fuller Paint Company. All the machinery was built in San Francisco and I had to supervise its loading because there were some delicate instruments. The same Mr. Smith was there, and he didn't recognize me. And I said, "Here's a cigar for you, Mr. Smith."

He said, "Thank you, sir, very much, sir. Don't worry, sir, about your freight." I had no nerve to tell him that I had worked for him.

Stone: He didn't remember you?

- Mirov: He didn't show any signs of remembering.
- Stone: It's very interesting.
- Mirov: Yes, it's very interesting. Once I wrote all my history in the form of a diary, and then I threw it in the garbage can.
- Stone: Oh, no.
- Mirov: Because so many books have been written about these immigrants -- cheerful, breezy, or stupid, or whatever you wish -- you know these books. So I thought there's really no need.
- Stone: But that's what America is.
- Mirov: Yes.
- Stone: All kinds of people who came here from everywhere, except for the poor Indians. Well, they came here too, earlier.
- Mirov: Those times were different, of course, from now. Labor -- they had no unions; they were just exploited very much.

Retires to Write Book, 1964

- Stone: Before we get back to our discussion of the Institute of Forest Genetics, I know you have recently completed a book on pines.
- Mirov: Yes, I retired from the Institute of Forest Genetics, after over twenty years of service. I joined it in 1937 and retired [1964] prematurely, three years before the deadline, which was seventy years. So I retired three years earlier because I accepted the appointment in Harvard University to write a book on pines, which I did. It was really hard labor for three years. I finished it.* I tried to approach the whole subject from quite an unusual point of view of attacking the growth of plants from different points of view. Probably influence of geographers, they take some city -- Richmond, say -- and try to learn how the city is clicking, what was the transportation, supply of fuel, labor, local politics, education and so on, schools. I did exactly the same thing with a group of plants. And I can assure you it had never been done. In Genus Pinus is approached from different anatomical, physiological, chemical, taxonomic, historical points of view.
- Stone: It's a super-monograph.

* Nicholas T. Mirov, The Genus Pinus, New York, 1967.

Mirov: It is -- reminds me of the one-man band you see in some county fairs, you know one man does everything, shaking his head with some kind of bells, and playing harmonica at the same time. I think it would probably be useful as a manual. But you know, you see after all these rambling remarks I want to impress on you, Mrs. Stone, that my chief interest was scientific, that I always thought that the more fundamental studies would do the Institute the better.

Scientific Work of the Institute

Righter did excellent work on tree breeding. What is going on now is really using Righter's material for all kinds of studies. We have very capable men there. We may say that Dr. Critchfield continues Pete Righter's work.

But the scientific achievements of the Institute never have been reported. I'm sure that in all the interviews and what you read about the work of the Institute of Forest Genetics, you never heard about the scientific achievements of the Institute.

The first one who really did scientific work was Duffield, in taxonomy, a purely taxonomic research work. He was a scholar, at the Institute of Forest Genetics. Later on he became a professor in North Carolina, you know.

That's what I want to emphasize again, that the scientific achievements of the Institute are enormous. And "Pete" [Righter] with his modesty, I guess he doesn't even realize how many important discoveries he made. For instance, he crossed our Sugar Pine with Asiatic pines, with pines of China and Japan. Sugar Pine cannot be crossed with white pines in America. It is queen of the trees, and accordingly it doesn't mix with any other pines at all. But even queens sometimes make mistakes, I guess. [Laughter] Pete found that it could be easily crossed with Pinus armandi, Armand Pine of China. This is of tremendous scientific importance. It shows that California pines are very closely related to Asiatic pines -- they are. All this breeding program probably will produce more and more scientific results. Critchfield is working on the taxonomy of the genus [pinus] based on the tree breeding work.

You should differentiate between tree breeding with the practical -- because the Forest Service is, after all, a practical institution, for the benefit of the people. Scientific research is mostly left to the universities. But even the universities depend now for their material, and previous information, upon the Institute of Forest Genetics.

I think sometimes it should be written -- the scientific achievements of the Institute of Forest Genetics.

Significance to Genetics

Stone: What about the pure genetics work? What do you think the significance of the work there was in relation to genetics progress and concepts?

How important was that?

Mirov: I don't understand exactly. Of course tree breeding is based on genetics. But the whole program is practical. They cross two pines, see how the seedlings develop, and then how they will behave in the field, in the forest, and how fast do they grow. For instance, as a by-product, it has been found that all pines have the same chromosome number -- twelve chromosomes -- twelve and [diploid] twenty-four. You know, two times, twenty-four.

Stone: Yes.

Mirov: There's no exception, all of them, hundreds of species have the same chromosome number. And they have the same morphology. We haven't done much of work in this.

Stone: You mean morphology in the cell?

Mirov: Of chromosomes, chromosome morphology. It is just the same. Sometimes it is even considered a nuisance that geneticists have nothing to lean against because they are so simple, so very simple, and so indistinct. But the geneticists, digging into this matter, they consider this as really the most fascinating problem, to learn about the heredity in pines. Because it is based mostly on the mutancy I think they don't know much about it.

But, for instance, this is a scientific fact which they sort of achieved at the Institute. Many of the California pines can be crossed with the Asiatic pines, the pines which haven't seen each other, so to speak, for at least 100 million years. But when they are brought together, lo and behold! they cross just as if they haven't seen each other for one week only. This is of tremendous scientific importance, to learn that species isolated, one from another, for millions of years nevertheless preserve the same physiology of chromosomes. It is really not yet well explored. I mentioned it in my book, this business.

But at the same time we have some [problem] species like, in California, the Bishop pine. (You know it's called Bishop Pine because it's found near San Luis Obispo.) Bishop Pine is one species, very rare in fact. Nevertheless each population [botanists recognize] several populations of this limited distribution pine -- behaves like a different species, like a different genus, they don't cross with each other. This is a really big genetic problem which has not been solved yet. But at least it has been discovered, that sometimes genetic differences disregard the boundary of the species -- Linnean species. At the same time, within a species there might be tremendous genetic differences. But in other cases, species

Mirov: separated from each other by oceans and by millions of years haven't changed much, have the same genetic setup. I guess that's about all. I guess I'm as bad as Pete. [Laughter]

Stone: I don't want to tire you out.

Mirov: I'm really, probably -- Pete is my very good friend and I know how he felt when you interviewed him. Because he just sort of thought aloud about the whole of his life.

That's what I'm doing.

Stone: That's all right, that's good.

How do you feel about the Institute of Forest Genetics now? Do you think it's going to go on to some great things.

Mirov: Oh, yes! Because, you see, one Scotchman said, "The beauty of forestry work is that you plant your tree, Jock, and then you forget about it. The tree will grow." And that's true. What Righter did, what Lloyd Austin did -- Lloyd Austin deserves a great deal of credit for selecting the right place for the first work-- but probably he outlived his usefulness. But he was very important for the first stage of work. Then Righter was very important, only he should have summarized his findings. But he is an extremely modest man. What he did, what Righter did there, he just made a very solid foundation. Don't forget that this is the first tree breeding institution in the world. And then in Sweden, and even in Denmark, they started later. If not for Mr. Eddy, no matter what kind of a man he was -- he told me once that this country made a big mistake seceding from England in 1776. [Laughter] He said it was a big mistake.

Stone: But Mr. Eddy had a great vision.

Mr. Eddy's Personality

Mirov: Oh yes, we have to talk something about Mr. Eddy. Do you know that Mr. Eddy had one very interesting side of his character. He would like to gamble on projects. For instance, that's why he decided that he should try this tree breeding. Because he was influenced by Burbank. And he did. And everybody in the family, the lumbermen, considered him out of his mind.

Yet when I worked for the Forest Genetics Institute, I became interested in one plant, a desert bush. It has a very interesting chemical composition. It's Simmondsia -- like "Simonize," Simmondsia. I have couple of reprints, if you want. I'll send you all my reprints. [Laugh] And it doesn't grow that far north. A friend of mine and I decided to make a plantation of this Simmondsia in Riverside. Mr. Eddy had an orange grove there. And he was extremely interested in my project. He said, 'You hire local men to water it and take care of it and I'll pay the expenses.' So I located one of our foresters and he would go once a week there to take care of the plantation. But it's really very interesting about Mr. Eddy that he would take a chance on any scientific project which he considered worthwhile.

Stone: Why do you think he had this scientific interest?

Mirov: I don't know, I really don't know. Scientific interest, you know, Mrs. Stone, is nothing but curiosity. Do you know that when the young scientist, graduate student writes a big thesis on some very scientific subject, he does it for only one reason: to satisfy his curiosity -- what's on the other side of the mountain. And then when the work is finished he, in small type, would say on the first page "My thanks are due to my wife who typed the manuscript." Sometimes graduate students' wives do much more than their husband.

Stone: Oh, I know.

Mirov: [Laughter] Yes, that would be another beautiful story. I wish I could write short stories. Oh, incidentally, I like to write popular articles. I wrote several of them, one like this in Atlantic, which was the beginning and ending of my career in Atlantic, I guess. It is really a very high-grade magazine.

Stone: It's a nice article. I liked it so much.

Mirov: I'm so glad that you read it. But those articles are difficult to write.

Stone: Oh, I'm sure they are.

- Mirov: I wrote another one in the Journal of American Forests. It's called "Face of the Country." Once I took a plane from Boston to San Francisco and I described what a forester could see below. I think it is a nice article. With your permission, I will send you all those things.
- Stone: Thank you, I should like that very much.
- Mirov: I guess I mentioned to you that I turned my diary over to the Bancroft Library.
- Stone: Yes.
- Mirov: But this is really my personal life, life of an ordinary man during a very interesting period of history. [Pause]
- Stone: Is there anything else you wanted to say about Mr. Eddy? I don't want to take your time.
- Mirov: No, no. One day I will find for you -- he told me I guess about the will of his father, who willed the harness to one boy and the horses to another boy in the family. I think I have some more. If I have it I'll send it to you. Because it's very interesting. Bill Cumming knows this story. Eddy was a New Englander. They moved here, I guess via lake states.

Building Hotel Claremont

- Oh, yes, a very interesting thing. Mr. Eddy when he would come here always would stay in the Hotel Claremont. Because, every time he would tell me, "This hotel has been built of our lumber, from the Port Blakesley Lumber Company." Eddy was a resident manager here in Berkeley at that time. And all those 2 x 4's and other kinds of lumber were shipped here, and he sold it for the building of the hotel. He didn't mention this to anybody, I guess. Has anybody told you about it?
- Stone: No.
- Mirov: It was an interesting thing.
- Stone: This was all Douglas fir then, the hotel was Douglas fir?
- Mirov: Yes. You raised this question, why he was not interested in Douglas fir. I guess it's Austin probably influenced him that genus Pinus is more important, more diversified.
- Stone: There are only two species of Pseudotsuga.
- Mirov: More, maybe three or four.
- Stone: But two in this country.

- Mirov: Yes. And one doesn't amount to much, in southern California.
- Stone: So you need to have more species to do anything with genetics divergence in Mexican Pines.
- Mirov: Yes. I want to tell you about one thing. In the course of work in the Institute of Forest Genetics we found that here in the United States it is usually easy to tell one pine from another; you know when you have a Ponderosa Pine, a Jeffrey Pine, or a jack pine. But in Mexico you cannot. I think I first proposed in my book the fact that a secondary center of evolution developed in Mexico. Pines reached Mexico very late, probably after glaciation -- very recent. They're still advancing south. But man, of course, stopped it. That's where a new genetic pool has been formed, where the geneticists of the future will find a lot of material. You'll be surprised how many foresters go now to Mexico to study Mexican pines. You can't tell them [apart], one species crosses with another, and those varieties intercross, and then there's really a holy mess as far as the pines are concerned. All genetic characters can be found. But [although] this is of interest, this is not about Mr. Eddy, but about scientific achievement.
- Stone: It's important because it may be that the Institute here will work with Mexican pines more. Do you think?
- Mirov: No doubt about it. The Institute probably will eventually build a plantation at low elevations. They tried to. I don't know if it exists now or not. But later on the University probably will pick it up. Because the future of the forest is very important in the southern hemisphere. That's why I'm going to Australia, to see how far towards the equator you can push pine trees. Because it [Pinus] is a northern genus and genetically it needs winter and fall and spring. But environment in the tropics is uniform, it is a clash of environment and heredity -- dialectical. [Laughter] Oh, in Russia they would make a big issue out of it. Unity of contradiction.
- Stone: Now, the recording of the history of the Institute has been, as you suggest, a little bit loaded in the direction of all the good things that happened. I don't know if you would care to go into any of the problems of personnel. Some of these have been hinted at by some of the others -- the problems of Mr. Eddy's break with Mr. Austin.

Mirov: But Mr. Eddy was a very realistic man in all. Lloyd Austin simply couldn't write up his results. They moved him to Berkeley here. He stayed here and did nothing, worried about Placerville. Mr. Eddy, mind you, was a very -- sort of rigid businessman. He knows that he turned this station to the director of the Forest Service and he is responsible.

He told me a very interesting thing. You heard about Mr. Elmore? He was the manager of a big lumber company in Arizona. And he was very efficient manager and very good. And then the company was sold to some Chicago interests, the whole holdings. And they laid him off. I told Mr. Eddy I visited Mr. Elmore and I like him very much, he was a very efficient manager and he loved his mill and his forest [near] McNary, Arizona. I said, "What an injustice is done to your son-in-law, that they let him go after the mill and company changed hands."

And to my surprise he said, "Perfectly all right."
"It's new owners, new points of view, and they wanted a new manager."

And he had not a word of some kind of sympathy with Elmore, because from the business point of view it was perfectly all right. And I'm afraid they did the same thing with Lloyd Austin when the director of the Experiment Station decided that he outlived his usefulness. Eddy endorsed it completely, no matter what Austin would write to him.

Stone: Apparently Austin was very disturbed because Mr. Eddy later on wouldn't pay him some back money from depression days.

Mirov: Yes, yes.

Stone: There was some great bitterness then.

Mirov: Yes, I know. You probably know that correspondence between ... [Austin and Eddy].

Stone: Yes.

Mirov: ... Yes I know. But, you see, those are minor things. Of course, we all are humans.

But, Mr. Eddy was a shrewd businessman. He wouldn't mind, for instance, to give, say, several thousand dollars for a certain experiment. But at the same time he wouldn't let the red cap carry both suitcases; one he would carry himself. I remember, he said, "How much?" The porter said, "Twenty-five cents." And he said, "It always has been ten cents."

Mirov: He was so upset. He said, "Those people don't realize, they just don't know their place. A girl in the office, with this coffee breaks, always asks for the increase of salary. She has to be thankful for the privilege to work for me."

This is really -- that's how the company has been built.

Stone: Was he a likeable man, though?

Mirov: Yes.

Stone: Was he charming?

Mirov: I think I'll tell a story:* [Mr. Eddy was entertaining a group of the staff at the Bluebelle Cafe, in Placerville. As usual he was the host, and he liked to exchange ideas with the staff. But he did not like to have anyone disagree with him. Dr. Mirov was new to the Institute, so he disagreed with Mr. Eddy on some point, and Mr. Eddy said, "The trouble with you scientists is that you do not understand business."

Mirov replied, "The trouble with you businessmen is that you do not understand science." It was rude of me.

Mr. Eddy, apparently, did not like that, for he put on his hat and overcoat and walked out, without saying a word. They saw him pacing back and forth outside for about ten minutes, then he came back in and shook hands with Mirov. After that they were always good friends.]

You know, I didn't know him [Eddy] as much as "Pete" Righter. But if you asked him for something, that is just a minor expenditure on his part, to pay for the men to grow the Simmondsia, to let me use about half an acre of valuable land for this purpose, but when he subdivided, and settled his estate, he just told me that he is going to pull out those bushes, twelve years old, they just reached maturity for the harvest. Well, he did. Because that was the business part of it.

Stone: So you didn't have the chance to make the final evaluation of your experiment.

Mirov: No, no. It is very interesting. But probably he was right from the business point of view. Give a start, support it for twelve years, and that's enough, then you have to be on your own, finally. It's our fault that we were not good businessmen. Neither was Pete -- I think that when Pete and Austin describe this campaign to raise the money -- it might be that the chief trouble is that they were not good businessmen.

* This story in brackets was not taped. It is inserted from notes -- ed.

Mirov:

You know you have to approach those rich people to get money gently, as my Mexican friends say, you have to open the pores without damaging the skin. This is a delicate art, you know. I learned something about it. I did most of my work on Rockefeller and Ford money, over \$100,000, I guess. But it was not easy to get; you have to be honest; you have to show the results, and you have to be sincere.

ROBERT HARRISON WEIDMAN (1886-1964)

Robert H. "Bob" Weidman, for eleven years Superintendent of the Institute of Forest Genetics at Placerville, California, died in Placerville on October 29, 1964. He headed the Institute from the fall of 1937 until his retirement in 1948. Prior to his years at the Institute he had been Director of the Northern Rocky Mountain Forest Experiment Station at Missoula, Montana, for some ten years. He had, in fact, participated in the beginnings of that station from 1921, when he was transferred from Portland, Oregon to take charge of the Priest River Experiment Station, Idaho, later absorbed as a branch of the Missoula Station. For six months, in 1937, he taught the course in silviculture at the University of Montana.

During his years in the Pacific northwest, 1914-1921, except for two years in military service, Bob worked out of the Portland District Office on silvical investigations in the ponderosa pine forests in Oregon and Washington. (As a Captain, Field Artillery, he served with the AEF in France through four major offensives, with the Army of Occupation in Germany, and on the appraisal of war damages after the armistice.)

In those early years, before the Forest Service branch of research was born, the need for silvical data, as a basis for management of the vast forest domain, was urgent. Much was expected of the relatively few men who were drawn to research, and who met the challenge with solid accomplishment. With his enthusiasm and keen observational and analytical abilities, Weidman personified the type of dedicated foresters who contributed to the reputation of the Forest Service for its high esprit de corps.

Characteristically, Bob's field notes, records, and reports were always well organized, neat, precise, and thorough--qualities which not only facilitated all future work with them but lent a touch of pleasure to the task. The publication of his research results, not voluminous but always sound, in the Journal of Forestry and in U.S.D.A. Bulletins, established him as a leading authority on the silviculture of ponderosa pine. In his letters, and often in his more formal writings, a certain felicity of phrase stems from his deep interest in the essays and letters of Robert Louis Stevenson.

Born in San Francisco in 1886, Bob was orphaned at the age of twelve, in Buffalo, New York, by the death of his widowed mother. Having no living relatives, he was placed with a guardian, and attended grammar school for a year or two. Then, while working in a bookstore, he completed a correspondence course in mechanical

drawing and found employment in that field for three years. A highlight of his brief school days in Buffalo was the beginning of a life-long friendship with Charles Kraebel who shared the interests that ultimately led them both into careers in forestry.

Weidman's progress in forestry reflects the growth of the U.S. Forest Service itself through more than half a century. His first appointment was as Forest Student in 1905 at "\$300 P.A. and expenses in the field." Working on sample plot studies in Massachusetts under a graduate forester, Bob was apparently marked by that experience for a career in forest research. The appointment was an outgrowth of his attendance for three months at the Yale Summer School of Forestry at Milford, Pennsylvania, and his subsequent employment by the Dean, Henry S. Graves, to draw illustrations for Graves' textbook Forest Mensuration. After preparatory study in a New England academy, Bob entered professional training at Yale, completed it at the University of Michigan, A.B. 1914, and won election to the scientific honor Society of Sigma Xi.

In retirement Bob continued official contacts as Collaborator with the Institute, and did some consulting. But chiefly he devoted himself to his pear orchard near the Institute, to active service with Friends of El Dorado County Library, of which he was a founding and life member, and to the culture of choice trees and shrubs of horticultural value. He was a long-time member of the Society of American Foresters, Geological Society of America, and American Association for the Advancement of Science.

Survivors include Mrs. Ruth M. Weidman, his wife, of Placerville; two sons: Dr. Robert W. Weidman, Professor of Geology at the University of Montana; and John C. Weidman, a lawyer practicing in Placerville; and six grandchildren.

APPENDIX II

Material re Special Award of American Forestry Association to
James G. Eddy

OFFICE ADDRESS:
8100 AREADE SQUARE
SEATTLE 1

JAMES G. EDDY
103 SHENANDOAH DRIVE
SEATTLE 2, WASHINGTON

January 21, 1953.

JAN 23 1953

American Forestry Association,
919 Seventeenth Street, N.W.,
Washington 6, D.C.

Attn: Mr. Fred E. Hornaday

Gentlemen:-

This letter is written to advise you that the writer, some eight or ten days ago, received the Special Award by the Board of Directors of the American Forestry Association.

It is now being put in a small gold frame and will be placed on the walls of my office, but subsequently it will be sent to the Institute of Forest Genetics, where I trust it will bring great satisfaction to all the men who brought about the many successful scientific steps so that the officers, the directors and the lumbermen of the American Forestry Association have approved the results so far obtained, that better and more valuable trees now and in the years ahead will be available to future generations.

I wish to express my humble appreciation for this great honor, as every word in the Award means a great deal to me personally, and to the men in the past, present and future, who gave, and will give, of their time, knowledge and their heart to such genetic efforts, and thus offer to the people of the world better commercial types of trees by the use of such genetic laws as already demonstrated by the Institute of Forest Genetics.

Yours very truly,

A handwritten signature in cursive script that reads "James G. Eddy". The signature is written in dark ink and is positioned below the typed name "James G. Eddy".

JGE:fd.

- Done - 11/12/52 - LH

November 7, 1952
McNary, Arizona

Mr. Fred E. Hornaday, Secretary
The American Forestry Association
919 Seventeenth St. N. W.
Washington 6, D. C.

Dear Mr. Hornaday:

Indeed I am very much touched by the information which you have outlined as to the action of the Board of Directors of the American Forestry Association at their October 12th meeting, recognizing my efforts to American Forestry of more than a quarter of a century through the accomplishments of the Eddy Tree Breeding Station and at the present time the Institute of Forest Genetics.

To have the action unanimous and enthusiastic naturally makes the resolution, which you quoted, really deeply appreciated.

I can truthfully say that all such efforts in Forest Genetics have been labors of love, as such efforts brings one closer to the great Creator.

I am also equally grateful for your personal congratulations on the occasion of the award being given to me and I assure you that I will certainly come to Washington on my next visit to the East, which I hope will be in the spring of 1953, and look forward to getting acquainted with you and other members of the Association's personnel. A more formal acceptance will be made after receipt of the citation, which you mention will be forwarded as soon as possible.

Yours very truly,

James G. Eddy

JGE:ps

DATA CONCERNING JAMES G. EDDY, PORT BLAKELY MILL COMPANY, SEATTLE, WASHINGTON

I wish heartily to second the nomination of James G. Eddy for one of the awards of the American Forestry Association for distinguished services to the conservation of American forests. The reasons for my nomination are given in the following summary of Mr. Eddy's career and activities in forestry.

- - - - -

James G. Eddy of Seattle comes from one of the old timber families of the United States. His ancestors founded the town of Eddington, near Bangor, on the Penobscot river of Maine, and operated sawmills there for many years. Mr. Eddy's father moved to Bay City, Michigan, in 1860 and established a large sawmilling business. James Eddy was born in 1881; grew up in the forest and sawmilling atmosphere of Michigan; graduated from Princeton University; and in 1903, with his brother, John Eddy, and other associates acquired the Port Blakely Mill Company on Bainbridge Island in Puget Sound.

Mr. Eddy operated the Port Blakely mills for approximately thirty years; and built up large timber holdings and logging operations in the western forest areas of Washington. The Company has ceased its manufacturing enterprises; but still has extensive holdings of timber and extensive areas of second-growth lands. They maintain the Blakely and Kitsap Tree Farms in Kitsap and Mason counties, Washington, and the Olney Creek Tree Farm in Snohomish County, Washington; and are today very active in developing forest management methods and types of logging operations adapted to the second-growth stands of timber in this region.

Mr. Eddy had always been keenly interested in geology, botany and other natural sciences. His timber-cruising and logging operations aroused his interest in the differences in growth rates and other characteristics of young forest trees; and from this interest he became an earnest student of plant and forest genetics. He followed the work of Luther Burbank in plant-breeding experiments in California closely; read everything that Burbank published; met Burbank about 1918 or 1919; and sought his opinion on the possibilities of carrying the principles and methods which he had developed in plant genetics into the field of forestry genetics. During one of his many visits to the Burbank gardens at Santa Rosa, California, Dr. Burbank showed Mr. Eddy his "Paradox Walnut," which was a hybrid and at eighteen years of age had a breast-high diameter of 30 inches. Dr. Burbank, however, was doubtful as to whether very much headway could be made in genetics with conifers because of the long time required in producing and maturing seed and many unknown factors in the techniques of experimentation. Dr. Burbank and Mr. Eddy explored this field together for several years, during which time Dr. Burbank became convinced that experimental research would be profitable with coniferous trees and gave his full backing to the project that was maturing in Mr. Eddy's mind.

When the Clarke-McNary Committee of the United States Congress held hearings in Seattle in 1923, on its investigation of forest conditions throughout the country Mr. Eddy submitted the most unique and surprising statement of the entire session. I heard it personally and was tremendously impressed by it. The Committee had been hearing for two days about the necessity of stopping forest fires and modifying prevailing methods of forest taxation. Mr. Eddy told them they must get into the roots of their problem which was the study and development of the best strain and new species of forest trees which would justify the time and cost of

Data concerning James G. Eddy

reforestation by their growth rates and commercial qualities. This rough-appearing lumberman from the Northwest gave the Senators and Representatives a rousing lecture on forest genetics, which astonished them and at the same time created great interest.

Pursuing what had now become his fixed dream, Mr. Eddy tried out his ideas on many other men. He got strong backing from Dr. Babcock, Professor of Genetics at the University of California; from Dean Walter Mulford of the California School of Forestry; and from Thomas H. Morgan, geneticist at the California School of Technology. In 1924, Mr. Eddy established the Institute of Forest Genetics, near Placerville, California, at a site selected or approved by Dr. Burbank and with a staff of four technicians, headed by Lloyd Austin, who had been selected by Dr. Burbank. From 1924 to 1935, the Institute was maintained entirely by Mr. Eddy as a personal enterprise; and during this period he expended something in excess of \$250,000 of his personal funds to maintain the Institute. He was in frequent consultation with members of the United States Forest Service; and constant help and advice were furnished by Dr. Edward Kotok and others as well as by the University men mentioned above. John C. Merriam, President of the Carnegie Institute, was also greatly interested in the Institute; and Carnegie supported its work to the extent of approximately \$10,000.

Meantime, the Institute had started a thorough-going study of the various strains or regional types of Ponderosa pine and many experiments in hybridization. During Mr. Eddy's sponsorship, the Institute established a successful cross between Monterey pine and Knobcone pine, carrying the rapid growth of Monterey and also the resistance of Knobcone. Some thirty or more other crosses were started experimentally, several of which have subsequently proven of great value. Mr. Eddy thinks that the Monterey-Knobcone cross was the convincing demonstration of the intrinsic merit of the experimental work at Placerville and of its possibilities for benefiting American forestry. He had been trying for some time to interest the United States Forest Service in taking over the Station, because he felt that the long-range planning and stability necessary in such an experimental undertaking made federal ownership and responsibility necessary. This was accomplished in 1935, since when the Institute has been operated as a project of the California Forest and Range Experiment Station, of the United States Forest Service.

Mr. Eddy's interest in this Institute and in forest genetics has remained unabated. He has been greatly disturbed by the inadequate appropriations made available to carry on the work of the Institute; and one of his chief interests presently is to build up a Foundation on Forest Genetics, that will bring together the continuing interest of a substantial group of people and necessary financial help, when needed, to prevent the promising work in forest genetics from suffering from inadequate support.

W. B. Greeley
Director
American Forestry Association

Seattle, Washington
August 15, 1951

THE AMERICAN FORESTRY ASSOCIATION

1952

Nomination Blank

FOR

CONSERVATION AWARDS IN FORESTRY AND RELATED FIELDS

Among your acquaintances there are certain individuals who render outstanding service toward the conservation of our renewable resources—forests, soil, water and wildlife. They may be newspaper men fighting tirelessly with their pens to foster a better understanding of the wise use of these resources; or, they may be industrialists who direct their companies' land management program and show that wise management pays dividends annually. They are individuals who are conservationists at heart and go beyond self to enrich our way of life.

Each year The American Forestry Association, through its magazine, AMERICAN FORESTS, searches to find individuals who have enlightened public knowledge in handling renewable resources. The purpose of this program is to present to the world those who have made significant contributions to the protection of our heritage.

A panel of conservation leaders, representing all fields of endeavor, will review and nominate candidates for consideration and approval by the Board of Directors of the Association. Their final selection will be based on the answers to the principal question of this nomination blank.

Individuals, organizations, educational institutions, industries, professions, civic organizations and others are invited to nominate candidates for these Awards. Five fields have been chosen in which awards *MAY* be given. They are: press, radio, industry, public service, education. Nominations must be received no later than August 1, 1952.

These conservationists approved by the Board of Directors will be honored at the traditional annual banquet of The American Forestry Association held this year at Asheville, N. C., October 13. Awards to be given include a plaque and Life Membership in The American Forestry Association, designating them as outstanding leaders in their particular fields of endeavor.

List chronologically contributions and achievements of the nominee in the fields of forestry, soils, wildlife and water conservation that have contributed to the general welfare:

James G. Eddy is of the third generation of a family of American lumbermen whose active business began on the Penobscot river of Maine; then moved to Bay City, Michigan; ultimately to Puget Sound. His active business career has been devoted primarily to timber ownership, logging, and lumber manufacture in Western Washington. He has been a naturalist and woodsman all his life and developed very keen interest in forest species, strains of the same species, effects of altitudes, etc. on tree form and growth characteristics.

In the course of his life mainly in the forests of the Pacific Northwest, Mr. Eddy developed a great interest in genetics; became acquainted with Luther Burbank and his experiments in plant genetics at Santa Rosa, California; read a great deal on the subject and made the acquaintance of a number of leading geneticists and dendrologists in the United States. He became convinced that there are possibilities, in forest genetics, of developing the best strains of existing species and of obtaining new species by hybridization that would be of great value to the future progress in the development of American forestry.

In 1923, Mr. Eddy expounded his convictions to the McNary Select Committee, United States Senate, at its hearings in Seattle. He told the Committee, in effect, that more important even than prevention of forest fires--in the long-range view--is the study of the possibilities of better tree species to replace the virgin forests of the United States--along the lines exemplified in many other fields of plant genetics.

Seeing little prospect of adequate interest on this phase from governmental sources as he believed, in 1924 Mr. Eddy established his own Institute of Forest Genetics at Placerville, California. In his plans, appointment of personnel, selection of the site, etc., he was guided largely by the advice of Dr. Luther Burbank.

The Institute of Forest Genetics was maintained for eleven years at Mr. Eddy's personal cost; and in 1935 was conveyed by him to the United States Forest Service to become a branch station of the California Forest and Range Experiment Station. The Institute is now being continued in that status.

During the eleven years that Mr. Eddy maintained the station as a personal enterprise, he expended approximately \$350,000 of his own funds in developing the project, all of which was turned over to the national government as a gift, without compensation. What is still more indicative of Mr. Eddy's sincerity, in my judgment is the fact that during this period he gave a great deal of his personal time and thought to the work of the Institute; participated actively in its planning; and interested many other men all over the United States in developing its program. All this was carried on during his active career as a lumberman, and executive of the Port Blakely Mill Company on Puget Sound, which was one of the large and active timber operators of the region.

It is also my personal observance that Mr. Eddy's interest in the Institute and its program has not flagged whatsoever since the project was taken over by the Forest Service. He still visits the Institute several times during the year; is keenly interested in its plans and in checking its results. He still reads largely in the field of plant genetics; and is one of the best informed men on this subject of my acquaintance.

The work of the Placerville Institute of Forest Genetics is now fully covered in reports of the U. S. Forest Service; and the progress in specific species development as well as in developing the science of experimental genetics speaks for itself. It is my understanding that several new species of pine have now been stabilized by hybridization and something like forty additional experiments in hybridization are of promise.

My recommendation for an A.F.A. award to James G. Eddy is based upon this very unique and individualistic contribution to American forestry. It impresses me as particularly noteworthy, since it comes from a background of family tradition and personal experience of forest exploitation. At the time when Mr. Eddy made his stirring appeal to the McNary Committee (which I personally listened to with amazement) there was very little experimental work in forest genetics in the United States and very little interest in the subject. Foresters were concentrating on protection from fire and the rudiments of silviculture. This man out of the logging camps and sawmills told us we should study the possibilities of growing better trees; and backed up his preaching with his own money and personal interest.

April 7, 1881
Bay City, Michigan

NAME: **James G. Eddy** DATE AND PLACE OF BIRTH

HOME ADDRESS: **1603 Shenandoah Drive, Seattle 2, Wash.** PHONE: **Minor 2224**

BUSINESS ADDRESS: **6100 Arcade Square, Seattle 1, Wash** PHONE: **SEneca 5810**

OCCUPATION OR PROFESSION: **Lumber and timber**

POSITION OR TITLE: **Vice President, Port Blakely Mill Company, and of Eddy Investment Company, both of Seattle.**

SCHOOLS ATTENDED: **Lawrenceville. Princeton**

DEGREES: **Bachelor of Science.**

CIVIC, FRAIERNAL AND RELIGIOUS ORGANIZATIONAL ACTIVITIES AND AFFILIATIONS: **Born a Universalist; educated a Presbyterian; and by marriage an Episcopalian.**

OTHER EXPERIENCES AND ACTIVITIES: **Scientific experimentation in Forestry, as Founder of Institute of Forest Genetics, and also in agriculture and fruit growing; for pleasure, gardening, golfing, and harness horse racing and breeding, and as an amateur ornithologist; also having a deep interest in Eugenics as a member of the American Eugenic Society.**

WILL IT BE POSSIBLE FOR YOUR NOMINEE TO ATTEND THE BANQUET TO BE HELD IN ASHEVILLE, N. C., ON OCTOBER 13, 1952? **Cannot definitely say "yes" or "no," as such a decision depends somewhat on health of members of nominee's family.**

Please do not attach any extra documents to pages 2 and 3 of this nomination blank. Additional documentary evidence to accompany this blank as proof of statements made on pages 2 and 3 are permissible. Information contained in these documents, however, should be contained in the statements made on pages 2 and 3. Please include 5" x 7" glossy print.

SUBMITTED BY:

NAME

ADDRESS

BUSINESS

Mail to:

THE AMERICAN FORESTRY ASSOCIATION
919 SEVENTEENTH STREET, N. W.
WASHINGTON 6, D. C.

PHONE

DEADLINE FOR NOMINATIONS IS AUGUST 1, 1952

1. NOMINATION FOR DISTINGUISHED SERVICE AWARD
2. Department of Agriculture, Forest Service
Pacific Southwest Forest and Range Experiment Station
3. NAME OF UNIT - Western Institute of Forest Genetics
4. Number of Employees: 21
5. OFFICIAL HEADQUARTERS: P. O. Box 245, Berkeley,
California, and Box 552, Placerville, California.
6. SUGGESTED CITATION:

"For pioneering the science of forest genetics and the production of pine hybrids leading to international recognition as a center for genetic improvement of the pines of the world."

7. STATEMENT OF ACHIEVEMENT

- A. Background

The Institute of Forest Genetics at Placerville, California, had its origin as the Eddy Tree Breeding Station in 1925. The station came into being as the result of the interest of a far-seeing Pacific Northwest lumberman, James G. Eddy. He visualized the use of genetic knowledge to improve forest trees, as was being done with other crops. Luther Burbank's horticultural wizardry inspired Eddy. They first met in 1918, and after much consultation Eddy hired Mr. Lloyd Austin. Together, they selected the site at Placerville as uniquely adapted to the purpose of growing pines. The Eddy Tree Breeding Station was privately incorporated as the Institute of Forest Genetics in 1932 with a national board of trustees. The staff started several projects. One was to assemble in an arboretum living specimens of all of the pines of the world. Another was to define geographic variation in several species; primary emphasis was placed on ponderosa pine. Hybridization between species was attempted and though generally not successful, some hybrids were produced as early as 1929.

In 1935 the Institute was deeded to the people of the United States by its Board of Trustees. Since that time the Institute has been a part of the

(Over)

Forest Service's Pacific Southwest (formerly California) Forest and Range Experiment Station. It is the principal field headquarters for research of the Division of Forest Genetics Research of this station. The unit's research has gained international recognition.

The Forest Service continued and expanded the research program of the Institute of Forest Genetics. The Institute has made a concerted effort to assemble in one place living trees and herbarium samples of all of the pines of the world. The collection now comprises the greatest such assemblage ever brought together at one location. This collection provides a unique opportunity for the world's scientists to study all manner of characteristics of pines.

Increased attention has been given to geographic variation of forest trees, including variation throughout the range of species and within small segments of their distribution. Particular emphasis has been given to the variation associated with elevation change on the west slope of the Sierra Nevada.

The most significant development during the last 30 years has been the expansion of interspecific hybridization of pines made possible by perfection of new breeding techniques. Methods for artificial crossing were developed and steadily improved. They have been copied widely. The first hybridization efforts were aimed at determining crossability between species of pines. As a general pattern of relationship between species emerged, efforts were directed to defining the taxonomic relationships subsisting among the species and two taxonomic revisions of most of the species have been published.

Several outstanding hybrids were produced during this reconnaissance of relationships within the genus, and some are now being produced for commercial exploitation. They are valuable because of faster growth, insect or disease resistance, ability to tolerate cold and drought. In recent years the emphasis on hybridization research has shifted to increase adaptation to environmental factors, to improve growth and form, and to enhance wood quality. Besides producing useful hybrids, this program has expanded knowledge of inheritance of characteristics of pines. Characteristics of morphology, physiology, biochemistry, insect and disease resistance, and others have been analyzed for their inheritance.

Research into the physiology of pines has been an integral part of the research program. Some of the first work on methods of propagating pines vegetatively by cuttings or graftings was done here. Trees over 40 feet tall have grown from these cuttings. Early studies of flower induction showed how pines could be induced to flower at a tender age and in abundance. Satisfactory storage conditions for seed and pollen have been determined. Physiology of pollen currently is under intensive study. Dr. N. T. Mirov's studies of comparative biochemistry of pine turpentine, conducted as a part of this program, were recognized by the Department's Distinguished Service Award in 1958.

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B. Achievements

The accomplishments of the Institute of Forest Genetics are told in more than 190 technical and popular published reports (Appendix F). A dozen more manuscripts are in press at the moment. The research facilities and arboreta at Placerville and Berkeley probably are the best of their kind in the world. Scanning the titles in Appendix F will show the breadth and detail of investigations. Some achievements for which the Institute is renowned are listed below:

1. Interspecific hybrid pines.

The Institute is best known for its pine hybrids, produced primarily during the last 20 years. More than 80 different hybrid combinations have been produced from controlled breeding. These hybrids are a diverse lot. Some are made between species as close as Monterey and Bishop pine which grow in the pine forests along the Pacific Coast of California. One of the newest and most extreme hybrids is the cross between red pine of the Lake States and black pine of central Europe. This is the first cross ever achieved between an American and a European hard pine.

Thirty years of this research cannot be summarized adequately in a few words, but in general the hybridization program has shown that closely related pine species from the same region of the Northern Hemisphere can be crossed; however, crosses between what were thought to be closely related species of eastern and western U. S. pines can not be achieved. The Institute's reconnaissance of the 90-species genus has led to a grouping of related species which guides hybridization programs at the Institute and elsewhere. A concentrated effort is now being made to pinpoint compatibilities within relationship groups.

Interspecific hybrids are bearing flowers; these hybrids are being used in breeding with other hybrids and with other species. Hybrids involving three and four parental species are a reality. The ultimate number of possible combinations of this type seems almost infinite; and the concomitant opportunity for improving pines through hybridization for wood production around the world is beyond our present appreciation.

Beyond its scientific inquiry with hybrids, the Institute has demonstrated that mass production is commercially feasible. Seven hybrids suitable for commercial exploitation in the United States, South Korea and other countries have been produced (Appendix I). Each of these hybrids has a unique superiority over its parents which promise financial gain. It is very likely that when tested further some of the many other hybrids produced at the Institute will prove suitable for commercial production in various parts of the world.

2. Evolution of pines

Data from the interspecific hybridization reconnaissance has proved to have evolutionary significance. Pines that cross easily are closely related in an evolutionary sense. Pines which cannot be crossed show a genetic barrier and more distant relationship. The Institute's studies of the biochemistry and distributions of pines of the world also have been used as evidence on the relationships and evolution of species. These findings rank as an outstanding contribution to knowledge of genetics and evolution, for this research is one of a few cases in the plant world where relationships within a large genus of economic import have been studied so intensely.

3. Taxonomy of pines

One of the prerequisites to studying relationships within the genus Pinus has been to define more clearly the taxonomy of the pines. Institute research has had a significant role in discriminating between species. As a result of the breeding and biochemistry research confusion in taxonomy of several species has been clarified. Included are Pinus halepensis, P. brutia, P. rudis, P. hartwegii, P. jeffreyi, P. contorta, P. arizonica, and others. Detailed studies of variation within pine species has brought to light the broad spectrum of variation within taxons. Institute investigations into ponderosa pine variations have served as a model for studies of other pines.

Members of the Institute's staff have studied or have assisted others in studying patterns of variation within pine species. The different patterns of variation found have confirmed for some western U. S. species what has been demonstrated elsewhere from other species of trees. Primarily these studies show that pines change with elevation of topography, with latitude from north to south, and with general climatic characteristics as from a maritime to a continental climate. Because of the geographic location of the Institute, its studies have been concerned primarily with variation in pines of western North America. The species studies include ponderosa, Jeffrey, Digger, Coulter, lodgepole, shore, Bishop, Monterey, and knobcone pines. The Institute's investigations with ponderosa pine were the first to show genetic gradients in forest trees correlated with change in elevation.

5. Character heritability and patterns of inheritance in pines

Controlled breeding between species and between individuals within species has demonstrated the genetic control of many characters. Data have been assembled on inheritance of morphological characteristics of needles, bud, bark, cones, stem, and root. Inheritance of some chemical characteristics has been analyzed as well. Institute studies show the inheritance of resistance to many insects including the pine reproduction weevil, bark beetles, and the pine resin midge. Institute hybrids show inheritance of resistance to white pine blister rust and fusiform rust infecting pines in Southeastern States.

6. Insect resistance

The Institute has provided plant materials and research facilities for cooperative studies by entomologists of the Department since 1945. First efforts were directed toward finding resistance to the pine resin midge. Later research was concerned primarily with resistance to the pine reproduction weevil, a serious pest of California pine plantations. Since 1950 efforts have been directed as well to tree-killing bark beetles, which plague pines around the world. Resistance to the weevil has been demonstrated at the Institute and in field outplantings. The role of pine oleoresin in controlling resistance of pines to bark beetles has just been uncovered. Geneticists will be able to capitalize on this latter finding to produce pines resistant to these tree killers. This research on insect resistance is the first of its kind

in the world. It has been cited frequently as an example of research which should be included in any tree improvement project.

7. Pine physiology

Early studies at the Institute illustrated the use of vegetative propagation in tree improvement research. Methods of rooting cuttings were employed more than 20 years ago, and many clones were produced demonstrating the genetic control of characters. Rooting of sugar pine, one extremely difficult species to root, was accomplished both by rooting of cuttings and by air-layering. This latter technique may give a means of vegetatively propagating many other species which are difficult to root. Techniques for grafting pines have been developed at the Institute over many years. Grafting now is a research tool useful for several kinds of studies.

The Institute has shown the feasibility of inducing early production of pine flowers by grafting and other treatments. More recently a concerted effort is expanding our understanding of the basic biochemical processes taking place in pine flowering.

Controlling pollination of pines to produce hybrids requires a knowledge of optimum conditions for storing pollen. The Institute has led in determining optimum humidity and temperature conditions requisite for long life of pollen. Institute studies indicate that, through freezing, pollen may retain its viability for many years. Deep freezing pine pollen now is standard procedure at some tree breeding stations.

Studies at the Institute were among the first to demonstrate the importance of environmental characteristics on the growth of seedlings. Pioneer studies showed the role of photo and thermoperiod in controlling pine growth and flowering. Further, studies of ponderosa pine using the Phytotron at California Institute of Technology proved that responses to duration of light and temperature were genetically controlled and that the response varied according to geographic source of seed. The effects of seed size and germination time on subsequent growth were defined more than 20 years ago.

The feasibility of inducing polyploidy in pine by the application of colchicine was first shown by Mirov and Stockwell as early as 1939. Later, at the Institute, Hyun developed an improved technique to produce polyploidy in several pine species and a hybrid.

8. Techniques for tree breeding

The Institute's role in developing techniques and procedures now used by forest tree improvers around the world must be emphasized. The basic techniques for controlling pollination in pines are used with a variety of adaptations in many tree improvement programs in the United States and abroad. The Institute's refined procedure for handling the nursery production of pine seedlings has brought forth many laudatory comments by foresters. It is copied in many places to minimize environmental variation which can confound genetic tests. The system of record keeping, developed over years of experience, also has been copied extensively. By this system tens of thousands of progeny pedigrees can be traced back through each year of work. The Institute's proven methods of extracting, testing, and storing pollen and seed of pines are used by many others.

9. Pine phenology

One essential tool of tree breeders is knowledge of when flowering takes place. The Institute's staff has published much information on timing of pine flowering with respect to species, to geographic source of seed and to elevation.

10. Selfing in pines

Much data have been accumulated at the Institute from controlled self pollination of pines. These data currently are being compiled to tell the story of this project. Since 1927, 31 species and 11 hybrids have been selfed (Appendix J). The results will give information vitally needed in planning for tree seed orchards.

11. The Institute as a place to study and learn

Foresters, geneticists, and other scientists have come from 27 foreign countries and the United States to study at the Institute. More than 75 men and women have stayed more than one or two days (Appendix E). Altogether they spent more than 4.3 man years at the Institute. The many who visited the Institute for shorter periods of instruction and inspiration remain uncounted. The Institute staff has provided instruction, guidance, stimulation, and counsel to all.

12. Pines around the world

As the Institute's fame has spread, the number

of requests for seed of species and hybrids has grown. Seeds cannot be spared from research for the thousands who have requested them. But Institute scientists have honored many requests from agencies and individuals here and abroad who are willing to cooperate in establishing cooperative tests (Appendix H). The Institute has supplied seed, pollen, or scions of 113 species and 68 pine hybrids, over 1,000 lots going to 46 cities in 27 countries on 7 continents. In the United States extensive distribution has been made to federal agencies, states, counties, and cities, and 39 private individuals and companies. Reports filtering back from many of these cooperative tests reveal adaptation of these new forms to varied environments.

13. Providing a research climate

A subtle contribution of the Institute has been the stimulation provided by staff and facilities for cooperative research. Many mature scientists have utilized the Institute in the course of their research. Drs. Buchholz studied embryology of hybrid pines; Dr. Hutchinson studied meiosis in hybrids; Dr. Hyun studied polyploidy in pines; Drs. Keng and Little studied needle anatomy variations in pines; Drs. Gifford and Park studied ontogeny of pine shoots; Dr. Colwell studied the pattern of distribution of radioactive pine pollen. Many graduate students have used the Institute's facilities or plant materials in the course of their work. They include Critchfield, Duffield, Newcomb, Griffin, and Zobel who studied geographic variation in pines; Libby, van Buijtenin, Baron, Haddock, and Krugman, who investigated physiological variation or processes in pines; and Winton and Saylor studying cytogenetics of pines.

C. Recognition

Acknowledgment comes to the Institute in many forms. Scientists cite the Institute's research methods and accomplishments, and they come from on far to visit this tree breeder's "mecca." Industrial foresters stress the utilitarian value of fast-growing hybrids and seek ways to improve their own forest tree stock. Educators return with their classes year after year to illustrate basic research that can increase returns from wild lands. The public press recognizes the Institute's appeal to conservationists and to those intrigued by the aim and methods of research, and the roll of visitors increases year by year (Appendix A).

Men and women come from all parts of the globe to train and study at the Institute of Forest Genetics. Group tours in recent years have included the Biosystematists, two tours of forest scientists before the World Forestry Congress in 1960, a tour of biologists after the American Institute of Biological Sciences meeting at Stanford in 1957, the 1959 combined gathering of the Western Forest Genetics Association and the Tree Improvement Committee of the Society of American Foresters. Many American scientists have returned several times to follow the progress of research since the date of their first visit (Appendix C).

Foreigners look to the Institute as one of the world's foremost centers for forest genetics research. The Institute's register of 391 foreign visitors reads like a "Who's Who" in forest genetics around the world. They have journeyed from more than 59 countries and have stayed for variable lengths of time (Appendix B). Some stay one day; others stay several weeks or a year as their schedules and interest permit. In 1960, 54 of the 1,061 visitors through November, or 5 percent, were from abroad. Several have been favorably impressed with the Institute and have described it to their colleagues at home: Fielding to Australians in 1950; Frontera to Spaniards in 1950; Bouvarel to Frenchmen in 1952; and Pavari to Spaniards and Italians in 1947. Several nations have sent their scientists to the Institute for training to enable them to conduct similar research at home.

Recognition also has come to the individuals of the Institute's staff as a result of their own research and the Institute's prominent place in the scientific world. Such recognition enhances and attests to the stature of the Institute. Staff members frequently participate in international symposia; for example, the Tree Physiology Symposium at Harvard University, 1958 (Mirov); the Tree Growth Symposium at University of Arizona, 1959 (Righter and Callaham); the Pacific Science Congress held in Hawaii, 1961 (Mirov and Callaham); the International Biochemical Congress in Vienna, 1958 (Stanley); The IX International Botanical Congress in Montreal, 1959 (Mirov and Callaham); and the V World Forestry Congress in Seattle, 1960 (Mirov, Righter, and Callaham). Righter's eminence in

the field of forest geneticists has been recognized by his appointment as an editor of *Silvae Genetica*; Mirov, Stanley, Righter, and Duffield have contributed to the Annual Review of Biochemistry, the Annual Review of Plant Physiology, and the Yearbook of the Department of Agriculture. A further evidence of recognition is continual inclusion of an Institute staff member on the Tree Improvement Committee of the Society of American Foresters (Righter, Critchfield, and Callahan).

2. Utilitarian

Leading land managers have visited the Institute to see at first hand the products of its research and the possibilities of utilizing these findings to increase the productivity of their forest lands. These have included representatives of federal, state, and local governments and of private industry. A list of visitors connected with forest industries over the last ten years includes the names of most of the large companies using wood as their raw material (Appendix D).

Land managers, impressed with what they have seen, have sent their technicians to learn the forest tree improvement methods used at the Institute. In recent years the Winton Lumber Company, the Industrial Forestry Association, the University of Idaho, the U. S. Forest Service, the California Division of Forestry and many others have benefited from this training opportunity.

Land managers and scientists also have repeatedly expressed the desire to test new improved hybrids on their land. The list of cooperators to whom seeds, pollen, or plants have been sent includes more than 150 entries. Institute pines are being tested on every continent of the world.

Where such tests have shown the superiority of hybrids over locally grown conifers, an action program has ensued to produce hybrids. Currently the lodgepole X jackpine hybrid is being produced in northern Idaho, Oregon and Wisconsin by industry; knobcone X Monterey hybrid is being produced in California and Oregon by the Forest Service and in southern Oregon by the Crown Zellerbach Corporation; the shortleaf X loblolly hybrid is being produced in the South by industry and government; the hybrid pitch X loblolly is being produced on a grand scale in South Korea for fuel wood;

in California, the Jeffrey X Coulter hybrid, prized for its weevil resistance and fast growth, is being produced by the Forest Service; in eastern Oregon, industry and the U. S. Forest Service are both working to produce the ponderosa X Apache hybrid.

3. Educational

Annual pilgrimages of science and biology classes from schools and universities attest to the significance educators ascribe to the Institute in demonstrating science in action, seeking knowledge and new practical products. In 1959 alone more than 14 classes with 298 students toured the Institute and learned. Numerous land management or conservation orientated groups also visit the Institute regularly: 14 in 1960. These include 4H, Future Farmers of America, Boy and Girl Scout groups, garden clubs, farm bureaus, and others.

4. Popular accounts

The Institute has been featured in two television productions. "Science in Action" featured the Institute and its research on a half hour educational program in 1952. In 1956 "Careers in Science" showed the opportunity for tree breeders to an afternoon audience.

Several magazines have featured the Institute (Appendix G). A few of these include recognition in National Geographic magazine for September 1956; Reader's Digest produced a feature article "New gold from Placerville" in 1951 which attracted much lay interest to the Institute. Popular Mechanics, in September 1951, devoted several pages to the Institute and its techniques. Magazines with a forestry or conservation orientation repeatedly tell the Institute story in pictures and prose: The Southern Lumberman, December 1948; American Forests, September 1952; Southern Lumberman again in May 1955.

Newspapers repeatedly tell the Institute's story in news releases and feature articles. Of course, papers close to Placerville show the greatest interest, but papers as widespread as the Wall Street Journal, the New York Times, the Baltimore Sun, the (Portland) Oregonian, and the Birmingham (England) Post to name a few have written up the Institute.

5. Contributions

Recognition of the scientific potential of the Institute has been given by financial grants from a variety of donors. The Forest Genetics Research

Foundation was the agency by which Mr. Fred Searles of New York City gave \$30,000 to the Institute to further its research. The Rockefeller Foundation granted \$31,700 to support Dr. Mirov's research on the biochemistry of pine turpentine. Resources-For-The-Future, Inc., financed a \$46,200 investigation of flowering in pines. Several good friends of the Institute recently financed the purchase of additional acreage for outplanting tests at a total cost of \$23,500. The founding father of the Institute, James G. Eddy, has financially contributed regularly to further the work of the Institute he conceived.

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APPENDIX A. Number of registered visitors to the
Institute of Forest Genetics since 1927

<u>Year</u>	<u>Number of Visitors</u>	<u>Year</u>	<u>Number of Visitors</u>
1927	88	1944	83
1928	110	1945	153
1929	109	1946	247
1930	120	1947	455
1931	95	1948	377
1932	155	1949	268
1933	82	1950	314
1934	107	1951	514
1935	119	1952	544
1936	120	1953	410
1937	111	1954	469
1938	186	1955	642
1939	213	1956	552
1940	134	1957	879
1941	175	1958	969
1942	78	1959	1,138
1943	76	1960	1,149
		TOTAL	11,241

Through 1960 by month

<u>Month</u>	<u>Number of Visitors</u>	<u>Month</u>	<u>Number of Visitors</u>
January	343	July	1,001
February	333	August	1,146
March	752	September	879
April	1,017	October	895
May	2,043	November	942
June	1,331	December	559
		TOTAL	11,241

APPENDIX B. Some of the foreign visitors to the
Institute of Forest Genetics since 1927
(*before a name shows a visit of more
than 1 or 2 days for detailed study).

AFGHANISTAN

8/13/57 *Baz Mohammad, Dept. of Agr., Kandhor, (4 days)

ARGENTINA

5/3/60 *Abelardo Ernesto Alonzo, Inst. Nat'l. de Tecol.
Agr., Buenos Aires, (37 days)
4/27/57 Osvaldo Boeldu, Buenos Aires
9/23/60 Maria Buchinger, Buenos Aires
11/8/54 *Osvaldo Buresch, Forest Service, Buenos Aires,
(3 weeks)
5/6/47 Oscar E. Colombo, Celulosa Argentina, Buenos
Aires
4/27/57 _____ Conea, Buenos Aires
4/24/48 J. Covas, Ministry of Agriculture
7/26/48 Antonio Digilio, Tucuman University, Tucuman
5/21/55 Pedro Dygadziniky, Tucuman
4/24/48 Ewald A. Favret, Ministry of Agriculture
8/16/45 Carlos Fleirta, Buenos Aires
7/26/48 Hernando Hunziker, Cordoba Univ., Cordoba
11/16/57 Juan H. Hunziker, Institute of Botany, Buenos
Aires
4/26/61 E. Iartori, Univ. of Buenos Aires, Buenos Aires
9/28/46 Abel Saint, Buenos Aires
8/14/51 Albert Sonano, Dept. of Agriculture, Buenos
Aires
6/14/48 *Rudolfo Yussum, Argentine Forest Service,
San Luis, (10 days)

AUSTRALIA

9/23/59 D. H. Ashton, Univ. of Melbourne, Melbourne
1/20/38 L. M. Bailey, Forestry Commission, Sydney, New
South Wales
4/24/48 Elared P. Baker, Univ. of Sydney, Sydney
9/12/60 *John M. Fielding, Commonwealth Forestry and
Timber Bureau, Canberra, (2 weeks)
11/6/61 R. G. Florence, Queensland Forest Survey,
Australia
3/4/48 Sir Herbert Gepp, Melbourne
8/5/49 A. J. Hedley, A.P.M. Ltd., Melbourne
8/24/40 M. R. Jacobs, Commonwealth Forestry Bureau,
Canberra
4/3/48 N. T. Jelbart, Melbourne
5/12/55 R. W. Jessup, CSIRO, Canberra
11/15/30 A. D. Lindsay, Forestry Bureau, Canberra
8/13/59 I. G. Marshall, Thepparton, East Victoria
11/2/59 F. J. McSweeney, Nannap, West Australia

APPENDIX B. (Cont'd)

- 8/15/53 *James McWilliams, Commonwealth Forestry & Timber Bureau, Canberra, (9 days)
- 6/18/47 Frank R. Moulds, Victoria Forestry Commission, Melbourne
- 5/5/40 William Douglas Muir, Forest Comm. of New South Wales, Sydney
- 11/19/56 R. H. Needham, Associated Pulp & Paper Mills, Ltd., Burnie, Tasmania
- 8/13/59 J. Pether, Thepparton, East Victoria
- 4/28/47 R. D. Pregor, Dept. Interior, Canberra
- 3/21/47 L. D. Pryor, Supt. Parks and Gardens, Canberra
- 2/11/46 H. R. Richardson, Dept. Agr., New South Wales
- 10/13/52 G. J. Rodger, Forestry & Timber Bureau, Canberra
- 5/20/40 M. Rothberg, Victoria Dept. of Agr., Melbourne
- 11/2/59 P. F. Shea, Melbourne
- 3/2/48 C. L. Y. Stephens, Waite Institute, Adelaide
- 1/25/55 T. N. Stoaate, Conservator of Forests, Perth, Western Australia
- 9/25/47 _____ Swain, New South Wales Forestry Comm., Sydney
- 4/3/48 J. W. Thorpe, Melbourne
- 7/25/55 O. H. Truance, CSIRO, Canberra
- 1/5/40 H. C. Trumble, Waite Agr. Res. Inst., Adelaide, South Australia
- 4/26/61 H. W. Tullach, Australia
- 6/25/59 J. H. Willis, National Herbarium Royal Bot. Gard., Melbourne
- 10/21/52 J. W. Youl, Victoria Sawmiller's Assn.
- 8/9/60 _____, Forest Service, New South Wales
- 8/16/53 _____, Queensland For. Dept., Bierwah

BELGIUM

- 10/16/51. Raymond Antoine, Laboratoire Forester, Univ. de Louvain
- 8/12/51 *Philippe Bourdeau, Dious, (4 days)
- 10/3/58 *Baron Alain de Jamblinne de Meux, Centride Biologie Forestier de Bokryk, Genk, (7 weeks)
- 10/16/51 Joseph Fouarge, Institute Agronomique, Gembloux
- 10/27/54 *Firmin Roper, Brussels, (7 days)
- 8/12/51 Jean Souweine, Brussels

BOLIVIA

- 1/26/48 *Edmundo Ressini, Suene, (10 days)

APPENDIX B. (Cont'd)

BRAZIL

10/16/57 Antonio Bartolon, Cacador S. Catarina
7/30/53 Yone P. de Castro, Forest Genetics Research
Federal Service
10/21/52 Ignacio Verez de Mallis, Forest Service, Rio
de Janeiro
12/8/40 C. A. Krug, Genetics Division, Institute
Agronomics, Sao Paulo
8/24/55 Jaym Viera Purheio, Sao Paulo
10/21/52 _____, Sao Paulo

BURMA

5/21/52 Bok Thein Ewe, Bogyoke Library Rangoon
11/6/61 V Htwe, Gov't. Official, Rangoon
12/22/49 Maung Kyi, Burma Forest Service, Shan State
11/6/61 V Khin Mauna, Government Official, Rangoon

CANADA

1/12/38 G. S. Allen, British Columbia Forest Service,
Vancouver
7/29/47 M. W. Bannan, Univ. of Toronto, Toronto
9/16/60 Arthur Bickerstaff, Forestry Dept., Ottawa
8/3/39 Roland D. Craig, Dominion Forest Service, Ottawa
3/28/47 Isabel Cummings, Department of Agr., Ottawa
11/2/59 L. F. Ebell, Forest Branch, Dept. Northern
Affairs, Victoria
5/6/52 *Alan Orr Ewing, British Columbia Forest
Service, Victoria, (17 days)
4/10/28 David Fairchild, Baddick, Nova Scotia
8/19/55 L. Farstad, Department of Agr., Vancouver
5/31/38 I. W. Finlayson, Univ. of British Columbia,
Vancouver
8/29/57 Donald A. Fraser, Petawawa Forest Exp. Sta.,
Chalk River
10/4/45 J. R. Garrou, Montreal
3/22/40 C. C. Heimburger, Dominion Forest Service,
Ottawa
7/28/60 *Mark J. Holst, Petawawa Forest Exp. Sta.,
Forestry Dept., Chalk River (4 days)
5/5/54 *A. H. Hutchinson, Univ. of British Columbia,
Vancouver, (5 weeks)
5/24/60 Alex Karoleff, Pulp and Paper Res. Inst. of
Canada, Montreal, Quebec
8/31/61 W. Bryce Kendrick, Canada Dept. of Agr., Res.
Branch, Ottawa
2/26/47 G. Krotkou, Queen's University, Kingston
5/21/55 J. Kuijt, Univ. British Columbia, Vancouver
3/2/61 D. S. Lacate, Dept. of Forestry, Victoria, B.C.

APPENDIX B. (Cont'd)

6/18/54 J. R. Long, British Columbia For. Ser., Duncan
 9/16/60 J. C. MacLeod, Forestry Dept., Ottawa
 8/31/57 R. G. McMinn, Forest Biology Div., Ottawa
 6/18/54 H. G. McWilliams, British Columbia Forest
 Service, Victoria
 7/31/56 P. L. Northcott, Forest Products Lab.,
 Vancouver
 6/25/53 H. A. Richmond, Forest Biology Div.,
 Victoria
 10/3/61 *K. J. Roller, University of British
 Columbia, Vancouver, (5 weeks)
 9/16/60 J. S. Rowe, Forestry Department, Ottawa
 9/16/60 H. E. Seeley, Forestry Department, Ottawa
 8/31/57 R. F. Shepherd, Forest Biology Div., Ottawa
 3/2/61 L. A. Smithers, Department of Forestry,
 Victoria
 12/5/58 H. S. D. Swan, Woodlands Research Department
 Pulp and Paper Res. Inst., Montreal,
 Quebec
 8/31/57 W. J. Turnock, Forest Biology Division
 7/28/60 *C. W. Yeatman, Petawawa Forest Exp. Sta.,
 Forestry Department, Chalk River,
 Ontario

CHILE

3/9/59 Roberto Bosse, Chillan
 4/23/57 Sicrate A. Cassoao, Agriculture Ministry,
 Chillan
 6/28/49 Tomas Clark
 1/14/59 Carlos, Crovetto, Concepcion
 6/14/41 Jorge de Cantos, Univ. of Chile, Santiago
 2/6/46 Raul Ducci, Corporacion de Foment de la
 Produccion, Santiago
 2/6/46 Antonio Fernandez, Corporacion de Foment de
 la Produccion, Santiago
 4/22/52 Carlos Freoisio, Chihuahua
 7/7/58 Guillermo Gray, Lota-Alto
 7/7/58 Paul V. Grew, Cemaycum
 7/7/58 Oscar Hoecker, Chillan
 4/22/52 Francisco Irizoryen, Chihuahua
 2/9/46 Enrique Langdon, Corporacion de Foment de
 la Produccion, Santiago
 6/5/56 Jorge Lopez H., Forest Service, Chillan
 12/8/48 Ruben Lopez, Ministry Agr., Santiago
 6/26/59 Wayne Miles, Chillan
 3/13/47 Mario A. Rogers, Ministry of Agr., Osorus
 5/3/50 Gregorio Rosenberg, Santiago
 10/17/51 Jaun Stemparte, Department of Forestry
 8/6/45 Eduardo Torricelli, Chilean Forest Service,
 Santiago
 2/6/46 Enrique Valenzuela, Corporacion de Foment
 de la Produccion, Santiago

APPENDIX B. (Cont'd)

CHINA

5/12/46 Wanchuru Cheng, Univ. of Nanking, Nanking
2/11/46 H. K. Fu, Ministry Agr. and Forestry, Nanking
3/13/48 Ren Hwa Shan, Institute of Botany, Shanghai
12/12/33 Williard J. Simpson, Changli Agr. Sta.,
Changli, Hopei
5/22/46 Kai Wang, Forest Products Laboratory, Nanking

COLUMBIA

8/25/59 A. M. Ferguson, Bogota
5/18/43 Emilio Lalure, Agronomy, Monizales.
5/1/46 E. Ruiz, Medellin
6/27/49 Gilberto Vavela L., Bogota

CONGO

9/23/46 F. H. Jurion, Agron. Institute, Nangamib
9/23/46 G. P. Tondeur, Agron. Institute, Leopoldville

COSTA RICA

5/15/60 Y. Syleenga, Interamerican Inst. of Agr.
Sci., Turrialba

DENMARK

2/14/50 Allan Heilmann, Danish Forestry Seed Committee,
Copenhagen
4/25/46 C. Syrach Larsen, Royal Vet. Col., Horsholm
8/9/49 F. Nykoleu, Faarvang
10/15/54 Bent F. Soegaard, Arboretum Horsholm
12/9/32 O. Winge, Agric. College, Copenhagen
8/24/51 _____, Copenhagen

EQUADOR

5/18/43 Gonzalo Moreno, Agronomy, Quito

FINLAND

9/18/51 Veijo Heiskanen, Forest Research Institute of
Finland, Helsinki
12/18/50 *Lauri Karki, Helsinki, (6 days)
6/22/48 N. A. Osara, Central Forestry Assn., Helsinki
8/22/60 Eino Saari, Honorary President 5th World For.
Congr., IUFRO, Helsinki
10/24/50 *Risto Sarvas, Forest Research Institute,
Helsinki, (11 days)

APPENDIX B. (Cont'd)

FORMOSA (FREE CHINA)

2/23/60 Lien-fang Chao, Taipei, Taiwan
 7/30/53 Yuan Hsing Chi, Taipei, Taiwan
 7/13/53 Hsiao-Tso Du, Taipei, Taiwan
 6/2/53 *Hsuan Keng, Taiwan Univ., Taipei, (3 months)
 6/6/55 S. H. Lui, Taiwan Forest Res. Institute,
 Taipei, Taiwan
 11/9/56 Dean P. C. Ma, College of Agriculture,
 National Taiwan Univ., Taipei, Taiwan
 3/14/55 Lin-Feng Peng, Taiwan Forest Admin., Taiwan
 3/14/55 Chia-Mui Shen, Tai-Pingshan Forest Station,
 Taiwan
 6/16/58 *Bin Yen Yang, Taiwan Forest Exp. Sta.,
 Taipei, Taiwan, (7 days)
 4/16/56 *H. N. Yao, Taipei, Taiwan, (36 days)

FRANCE

7/3/51 *Pierre F. Bouvarel, Forest Research Station,
 Nancy, (11 days)
 5/25/48 Ph. Cochin, French Forest Service, Paris
 9/19/60 Paul de Brantes
 7/2/37 Xavier de Chatelier, French Forest Service,
 Paris
 5/25/50 Xavier de Megille, French Forest Service,
 Paris
 7/10/40 G. Dufrenoy, Univ. of Bordeaux, Bordeaux
 5/25/48 P. Dutilloy, Paris
 11/10/45 A. Gelouk, Director General of French Forest
 Service, Paris
 7/5/46 Georges Maury, Paris
 9/24/48 F. R. Pourtet, French Forest Service, Nancy
 8/8/61 Henri Sanssen, Univ. of Toulouse, Toulouse

GERMANY

8/22/60 K. Abetz, Freiburg, IUFRO
 3/25/51 F. W. Bartz, Univ. of Bonn, Bonn
 4/1/58 Eberhard Boehm, Lower Saxony State Forest
 Service, Hannover
 11/10/57 Helga Friedrich, Dorhmeister
 6/3/54 Josef Koering, Westfalen
 8/22/60 *W. Langner, Schmalenbeck uber Ahrensburg,
 Holstein, (3 days)
 6/13/58 Walter E. L. Mann, Chief Forester of
 Germany, Bonn
 6/26/56 Dietrich Mulder, Gottingen Univ., Hannover
 4/27/60 R. Plochmann, Univ. of Munich, Muenchen
 12/2/51 Fritz Querenzalsser, Bonn
 2/19/60 _____ Schaefer, Faculty of Forestry
 Univ. of Gottingen

APPENDIX B. (Cont'd)

8/22/60 J. Speer, Munich
9/5/61 Klaus Stern, Institut of Forgenetik,
Schmalenbeck
9/4/27 H. F. Freihe von Maltzahn, Friehrichsman
12/2/51 Memford von Ruven, Braunschweig

GHANA

6/23/58 J. C. Ahenkorah, Nkawkaw

GREAT BRITAIN

6/8/33 C. P. Ackers, Forest Products Ltd., Gloucester,
England
8/26/38 Tom Bailey, Cambridge, England
4/6/31 R. StBarbs Baker, London, England
7/29/47 David G. Catcheside, Univ. of Cambridge,
Cambridge, England
9/4/48 Sir Harry G. Champion, Imperial Forestry Inst.,
Oxford, England
6/20/56 A. A. Cumming, Plymouth, England
6/9/51 The Earl of Dalkeith, Scotland
6/10/60 Wm. G. Dallas, N. Ireland Forest Service,
Armagh, N. Ireland
5/17/50 *R. Faulkner, Forestry Commission, Aberdeen,
Scotland (4 days)
10/5/35³⁶ R. A. Fisher, Rothamsted Exp. Sta., Harpenden,
Herts, England
9/4/48 Wilfred E. Hiley, Dartington Hall Trustees,
Devon, England
8/22/60 J. A. MacDonald, IUFRO, London, England
6/22/53 Jules Menken, London, England
11/9/59 J. D. Ovington, Nature Conservancy, London,
England
10/29/56 Major C. Seymour, Cricket, England
3/15/35 T. W. Summers, Soc. of For. of Great Britain,
Edinburgh, Scotland
11/8/57 P. F. Wareing, Univ. of Manchester, Manchester,
England
12/23/37 F. Yates, Rothamsted Exp. Sta., England

GREECE

11/1/58 A. Fasoulas, Univ. of Salonika, Salonika
11/30/50 E. B. Georgoulis, Forest Research Institute,
Athens
7/11/46 Christos Mouloupoulos, Salonika Univ., Salonika
11/7/56 *John C. Papajoannou, Univ. of Salonika,
Salonika, (17 days)

APPENDIX B. (Cont'd)

HAITI

11/3/61 Micole Jardene, Petion-Ville
4/26/50 J. P. Johnston, Port-au-Prince
9/23/48 Schillar Nicolas, Dept. Agr., Port-au-Prince

HONDURAS

8/28/51 *Fabio Gomez R., (1 month)

HUNGARY

11/3/61 Lapes Baens, Budapest

ICELAND

6/23/58)
9/2/58) Agirsh Arnason

INDIA

11/27/46 M. Ahmad, Forestry Dept., Hyderabad, Deccan
4/26/61 R. Bammi, New Delhi
12/8/47 S. G. Bhogle, Hyderabad Forest Service,
Hyderabad, Deccan
7/29/47 Kaith Bzl, Indian Forest Service, New Delhi
10/29/35 Sir H. G. Champion, Forest Res. Institute,
Dehra Dun
4/27/57 OM Prakash Gaubam, B. R. College, Agra
11/6/34 R. MacLagin Gorrie, Indian Forest Service,
Dehra Dun
5/21/48 P. C. Goswami, Indian Forest Service,
Shillong, Assam
7/16/52 Charles C. Hollervey, Forest Res. Institute,
Dehra Dun
12/8/47 M. C. Jacob, Indian Forest Service,
Shillong Assam
11/27/46 A. A. Khan, Forestry Dept., Lahore, Punjab
11/1/58 Gurden S. Khush
2/14/57 P. N. Mehra, Punjab Univ., Auritsae
7/16/52 K. R. Nair, Forest Research Institute,
Dehra Dun
6/10/55 K. K. Nanda, Univ. of Delhi, Delhi
8/31/57 R. L. Paliwal, B. R. College, Agra
6/5/56 J. N. Pandey, Deputy Conservator of
Forestry, Hazanbergh
10/1/47 S. Sekhat, Madras

INDONESIA

2/16/60 A. Hafiz, Forest Service, Djakarta
4/7/59 A. J. G. H. Kostermans, Inspector of
Forests, Bogor
2/16/60 Roekanda, Forest Service, Bogor

APPENDIX B. (Cont'd)

IRAN

5/12/54 Nr. Bizhan-Jassamy, Iranian Forest Service,
Tehran
3/11/57 Hassein Khasrovi, Forestry Dept., Tehran
3/25/53 Gobsorskhi Nasser, Point IV, Tehran
4/6/54 Iraj M. Nuban, Tehran
7/15/52 Mahmoud Zahir, Forestry Org.

IRAQ

4/6/54 Hammid Aussi,
3/28/53 Abdul Hadi I. Ghani, Zaofaranga Exp. Station,
Baghdad
6/29/53 Taha, Naji, Baghdad

IRELAND

8/8/61 *Lawrence Roche, Trinity College, Dublin (6 weeks)

ISRAEL

4/10/28 Rachel Benzelhie, Forester, Jerusalem
9/11/61 M. Bolotin, Jerusalem
6/27/49 Nathan Buras, Tel Aviv
9/27/56 Gary Dover, Forest Department
10/31/52 A. Y. Goor, Nathanya, (also in 1937 as Grosses^vsky)
6/29/53 Elkana Halevy, Tel Aviv
6/29/53 Yakor Seleg, Arcalon
12/21/29 Shahar, Acre
8/4/53 Moshe Shifrine, Tel Aviv
4/6/54 Simon Stiassney, Gedera
3/28/53 Rafael Trankel
6/17/46 B. Volcani, Sieff Institute, Lehoroth
4/27/40 Liesel Wallach, Tel Aviv
5/29/50 S. Weitz, Forester, Haifa
5/15/50 D. M. Zohary and Son, Hebrew Univ., Jerusalem

ITALY

8/22/60 Alessandro de Philippis
8/21/50 Guido Ferrara, Chief Forester of Italy, Rome
9/26/60 Ervedo Giordano, Rome
4/6/54 Romano Gropani
9/1/50 Carlo Gucci, Univ. Pavia, Pavia
5/15/54 Giuseppe Martinole, Univ. Bot. Garden, Cagliari
8/22/60 A. Metro, Rome, IUFRO
9/27/46 *Aldo Pavari, Forest Exp. Sta., Florence (4 days)
3/31/56 Ilena Morgagi Ravenna

APPENDIX B. (Cont'd)

JAPAN

11/6/57 Sumihiko Asakawa, Ministry of Agr. and For.,
Tokyo
5/15/57 Shigeru Chiba, Oji Inst. for Forest Tree
Improvement, Kuriyama, Hokkaido
3/20/41 G. Fukuyama, Hokkaido Univ., Sapporo
7/9/57 Anthony Inaber, Fukuno Toiyama
5/15/57 Mitsuo Iwakawa, Govt. For. Exp. Sta.,
Tokyo
10/12/51 Masayoshi Kitajima, Japan Monopoly Corp.,
Tokyo
6/12/50 Toshibumi Kojima, Tokyo Univ., Tokyo
12/18/51 Nobuhiko Migita, Tokyo Univ., Tokyo
5/1/53 Akito Mori, Otaru, Hokkaido
11/14/56 J. J. Murayama, Yamaguti Univ., Yamaguti
8/24/60 *Kazuyoshi Muto, Sapporo (3 days)
7/8/59 Sekikazu Nishimura, Tokyo
12/18/51 Sadao Ogiwara, Tokyo Univ., Tokyo
11/6/57 Dean Masayuki Ohsawa, Hokkaido Univ.,
Sapporo
12/18/51 Ayakina Okazaki, Kyoto Univ., Kyoto
10/30/59 Taisitiroo Satoo, Dept. of Forestry,
Univ. of Tokyo, Tokyo
12/18/51 Tsutomu Shioya, Kyushu Univ., Kyushu
1/31/55 *Nobukiyo Takahashi, Tokyo Univ. Forest,
Sorachi, Hokkaido (3 days)
5/15/57 Midori Yokoyama, Shizuoka Pref. Forest
Exp. Sta., Hamana Gun, Shizuoka

JORDAN

11/3/61 Usama A. H. Sayeh, Jerusalem

KENYA

10/26/55 Michael F. Abraham, Nairobi
6/15/51 W. E. M. Logan, Forestry Dept., Nairobi
6/4/58 K. L. Sargent, Nairobi

KOREA

4/5/51)
8/16/56) *S. K. Hyun, Institute of Forest Genetics,
9/22/60) Suwon (6 months)
5/21/58 *Kwon, Nei-Tack, Central Forest Exp. Sta.,
Seoul, (18 days)
8/26/58 Kyong Bin Yim, Seoul National Univ.,
Suwon Agr. College, Suwon

APPENDIX B. (Cont'd)

LEBANON

9/19/60 Malek A. Basbous, Director Forest Service, Bierut
4/26/61 Raja Nassar

MALAYA

5/31/51 Charles Marshall, British Colonial Forest Service,
Malaya and Fiji

MEXICO

4/10/50 *Gumersindo Borgo, Forest Service, Hermosillo,
Sonora, (5 days)
11/17/52 Pavo Byry, FAO, Mexico City
2/15/54 *Jose M. de la Puente, Mexican Forest Service,
Mexico City, (5 months)
5/28/57 Six students, Dept. of Forestry, National School
of Agriculture, Chapingo
9/29/59 Four students, Dept. of Forestry, National School
of Agriculture, Chapingo
8/24/60 Fourteen students, Dept. of Forestry, National
School of Agriculture, Chapingo
11/17/52 Luis Huguet, FAO, Mexico City
4/27/57 Agustin Rumayor, Saltello
4/27/57 Agustin Velazquez, Mexico City
5/18/54 Five Students, National School of Agriculture,
Chapingo
7/31/46 Thirteen Mexican Government Officials.

MOROCCO

12/31/51 Jean Francois Lacaze, Moroccan Forest Service,
Robat

NEPAL

10/13/52 *Balarama P. Baidya, Nepal Forest Service,
Katmandu, (10 days)
6/9/52 B. Rayomajki, Ministry of Agriculture, Katmandu
10/13/52 *Rama Bahadur Thapa, Nepal Forest Service,
Katmandu, (10 days)

NETHERLANDS

1/18/61 Nelleke Burggraf, Scheveningen
5/28/57 Peter de Fremery, Telham
8/25/54 Jaap Sybenga, Wageningen
4/25/53 *Hans van Buijtenen, (11 days)
9/21/54 Baroness H. van der Borch, Verwolde G.
8/22/60 Heinrich van Vloten, Wageningen
8/19/55 Martin Witkamp, Institute Biological Field Res.,
Arnhem

APPENDIX B. (Cont'd)

NEW ZEALAND

11/5/51 W. S. Anderson, Whakataru Board Mills, Te Teko
 6/13/45 G. K. Crayfield, New Zealand Forest Service,
 Wellington
 2/10/53 Alex Entrican, New Zealand Forest Service,
 Wellington
 11/1/58 J. Fathill, Christchurch
 7/17/59 Margot Forde, Lower Hutt
 11/1/58 J. B. Hair, Dept. of Scientific and
 Industrial Research, Christchurch
 4/17/57 J. E. Henry, New Zealand Forest Products Ltd.,
 Tokoroa
 2/18/60 H. Hinds, New Zealand Forest Service, Wellington
 6/6/51 Cyril D. Knight, University College, Auckland
 7/23/56) Egon Larsen, Forest Research Institute, Rotarua
 2/18/60) * (10 days)
 7/12/50 A. W. Mackney, New Zealand Forest Products Ltd.,
 Auckland
 11/5/51 R. B. Moorhouse, New Zealand Forest Products Ltd.,
 Takoroa
 9/30/60 J. F. Mragho, New Zealand Forest Service,
 Wellington
 5/27/60 G. A. Nicholls, New Zealand Forest Products Ltd.,
 Auckland
 11/27/46 A. L. Poole, Dept. Scientific and Indes. Res.,
 Wellington
 6/13/45 G. B. Rawlings, New Zealand Forest Service,
 Wellington
 4/17/57 R. B. Schulze, New Zealand Forest Products Ltd.,
 Auckland
 6/13/45 A. N. Sexton, New Zealand Forest Service,
 Wellington
 10/13/52 G. H. Stocking, New Zealand Forest Service,
 Wellington
 12/4/39 A. P. Thomson, New Zealand Forest Service,
 Wellington, (also in 1960) *3 visits in all*

NORWAY

5/28/52 Hubmut Dejeleuirud, Norwegian Woodworking
 Institute, Blindern
 6/4/58 Ingrid Gaustad, Trondheim
 6/6/49 Liv Germeten, Steinlger
 2/11/60 Gunnar Haken, Brevik
 10/1/47 Gunnar Haug, Oslo
 10/14/58 K. Kamstad, Oslo
 5/28/52 Ole Karlsen, Norwegian Institute of
 Woodworking, Blindern
 6/6/49 Elias Mork, Norwegian Forest Exp. Sta., As
 7/16/57 Inger Prydz, Oslo
 11/26/51 *Tollef Ruden, Vollebekk, (34 days)

APPENDIX B. (Cont'd)

PAKISTAN

8/19/55 R. M. Abbasi, ICA, Dokri, West
6/21/59 M. B. Chaudhri, Lahore, West
7/20/54 M. A. Hannan, Bureau of Reclamation
1/3/58 *Abdul Wahed Khan, Pakistan Forest Service, Dacca,
(3 weeks), East
1/19/48 M. H. Khan, Soil Cons. Serv., Karachi
12/15/49 Mohammed I. Khan, Pakistan Forest Service, Lahore
6/23/53 M. I. R. Khan, Pakistan Forest Service, Lahore
9/22/55 M. Saeedsman Khan, Lahore, West
4/26/61 Faroo Lodhi, Peshawar Univ., Peshawar
4/17/52 J. R. Shairani, Quella
5/21/53 Rudval Shani, Forest Director, East Bengal

PERU

12/23/43 Mario A. Baracco, Agronomy, Lima
9/14/60 *Flavio Bazan, Forest Service, Lima, (3 days)
10/21/52 William C. Cannady, Talara
3/23/45 Ramon Ferreyra, San Marcos Univ., Lima
5/18/43 C. A. Maccedal, Forester, Lima
10/19/59 Earl E. Smith, ICA, Lima

PHILIPPINES

3/6/58 _____ Agrado, Forest Products Res. Inst.
2/27/56 Teodoro C. Delizo, Forestry College, Laguna
6/21/59 Bonifacio C. Feligardo, Forestry College, Laguna
2/27/57 Faustino C. Francia, Forest Products Laboratory,
Laguna
8/18/58 Eulogio T. Taguadar, Bureau of Forestry
8/29/57 Jose B. Viado, Bureau of Forestry, Manila

POLAND

11/1/58 W. Gajewski, Warsaw University, Warsaw
8/22/60 M. Kreutzinger, Warsaw
1/23/61 Bogustov Molski, Central Agricultural College,
Warsaw

PORTUGAL

9/21/54 Domingo Pereira Machado, Lisbon
8/29/57 Tristan M. Sampayo, National Agr. School, Lisbon
8/29/57 _____ Spellota, National Agr. School, Lisbon

PUERTO RICO

9/29/42 E. Iverson, San Juan

APPENDIX B. (Cont'd)

SPAIN

8/20/58 J. M. Fernandez Almagro, Madrid
 9/14/60 *Angel-Maria Rodriquez Arregui, Huesia,
 (3 days)
 6/26/61 Joaquin Bovifi, Talavera de la Revu:
 9/14/60 *Angel Carrasco, Sevilla, (3 days)
 6/12/61 *Gabriel Catalan, Lierising (ICA Trainee),
 (16 days)
 9/14/60 *Juan Lopez Collardo, Guadecycra, (3 days)
 6/20/56 Carlos Dafance, Forest Disease Service,
 Madrid
 5/15/59 *Marquis de Socorro, Palais de Zubieta Legueitio,
 (4 days)
 7/2/58 Antonio Alousa Fernandez, Zamora
 8/14/46 Fran-Riva, Marquis de Villa Alcazar, Rep. Agr.,
 Madrid
 6/1/48) *Bartolome Frontera, Spanish Forest Service,
 6/26/61) Mallorca, (several months)
 8/20/58 Pedro Martinez Garrido, Cuenca
 5/12/54) *Fernando Gil, Forest Watershed Service,
 4/30/57) Malaga, (4 days)
 8/31/61 Antonio Gonzales, Lerida Forestry District,
 Lerida
 7/25/56 Camilio Gonsalez, Forest Service, Madrid
 8/20/58 Salvador Ruiz Llanos, Madrid
 9/14/60 *Ricardo de Rada Martinez, (3 days)
 9/14/60 *Rafael de la Vega Menendez, Pardo (3 days)
 8/31/61 Mariano Melendo, Forest Service, Cazorla
 9/14/60 Jose Morlero, Guernica
 7/2/58 Joaquin Munos Munos, Zaraposa
 5/12/54 Jose J. Nicalas, Distrito Forestal,
 Salamanca
 8/31/61 Fernando Nicholas, Cuenca Forest District,
 Cuenca
 8/31/61 Jesus M. Pena, Forest Service, Huesca
 8/31/61 Jose Joaquin Pena, Forest Service, Bilbao
 8/31/61 Jose Ferrando Pla, Cuenca Forest District,
 Teruel
 4/30/57 *Fernando Plaza, District Forester, Orense,
 (4 days)
 6/26/61 Francisco Ramirez
 6/23/61 Fernand Robredo, Madrid
 6/23/61 Paulo Cuevas Ruiz, Madrid
 8/14/46 Pancho Sopranis, Madrid
 6/20/56 Jose Torrent, Forest Disease Service, Madrid
 3/23/59 *Eduardo Rojas Valero, Granada, (4 weeks)
 4/28/59 *Manuel Vega, Madrid, (4 weeks)
 4/28/59 Luis Vilachara, Barcelona

APPENDIX B. (Cont'd)

SUDAN

5/20/60 Hamid Hassan A. Hafiz, Khartoum
 6/21/59 A. A. Magid, Khartoum
 6/21/59 Hassan Mohammedi, Halfa
 5/20/60 Tag Eldin Abdel Rahman, Khartoum

SUMATRA

2/27/35 E. W. Bean, U. S. Rubber Co., Kisaran

SWEDEN

8/9/56 Rolf Alund, Iggesund Brot, Iggesund
 8/9/56 *Tore Arnborg, Managing Director, The Swedish
 Tree Breeding Association, Uppsala, (12 days)
 9/21/48 Gunhild Aulin-Erdtman, Swedish Wood Res. Inst.,
 Stockholm
 10/18/50 Erik Bjorkman, Royal School of Forestry, Stockholm
 4/19/58 Lars O. Bjorn, Malmo
 8/22/60 Charles Carbonnier, Stockholm, IUFRO
 8/26/60 Ake Gustafssen, Stockholm
 8/7/51 Sven O. Heilman, Umea
 7/3/58 Farbros Heinsch, Stockholm
 1/19/51 *Sten Korlberg, (5 weeks)
 9/2/59 Bertil Lindquist, Royal Bot. Garden, Goteborg
 8/4/54 J. E. Marian, Swedish Forest Products Research
 Institute, Stockholm
 1/13/38 _____ Nilsson, Svalov Plant Breeding Station,
 Svalov
 3/7/55 Helge Svensson, Baras
 11/20/47 Bertil Thunell, Swedish Forest Products Research
 Laboratory, Stockholm
 7/2/34 *Gote Turesson, University of Lund, (5 days)
 10/22/58 Dr. von Wettstlin, Genetics Dept., Forest
 Research Institute, Stockholm
 9/21/48 _____, Royal Inst. of Technology, Stockholm

SWITZERLAND

6/25/57 G. Bazzigher, Zurich
 4/19/58 Hans R. Deuller, Brugg
 5/2/51 *Fritz Fischer, Swiss Forest Experiment Station,
 Zurich, (5 days)
 11/24/61 Peter Frankhauser, Bern
 11/24/61 Ulrich Gmach, Bern
 5/17/51 Ernest Huber, Geneva
 8/15/57 Theodor Keller, Swiss Forest Research Institute,
 Zurich
 8/22/60 Hans Leibundgut, Zurich
 5/13/59 *Enrique Marcet, Inst. of Silviculture, Swiss
 Federal Institute of Technology, Zurich (5 days)
 8/20/48 Frank Perret, Geneva
 7/19/35 G. Catherine Reinfer, Univ. of Bern, Bern

APPENDIX B. (Cont'd)

SYRIA

4/6/54 Farouk Kotob, Damascus

THAILAND

8/29/57 Arth Nakornthap, Bangkok

6/21/59 Pongpit Piyapongse, Kasetsart Univ., Bangkok

TURKEY

8/27/52 Osman Aipay, Forester

8/27/52 M. Zekai Bayer, Forester

8/27/52 Kecegut Bertiok, Forester

10/26/50 *Talat Eren, Forest Research, Ankara, (5 days)

8/27/52 Kemal Erguly, Forester

12/13/51 Serri Erinc, Istanbul

8/25/59 Selaholten Inal, Univ. of Istanbul, Istanbul

6/7/50 Rahmi Jadir, Agriculture

7/5/49 Baki Kasapligil, Ankara Univ., Ankara

8/27/52 Servet Kayacas, Forester

8/31/61 M. H. Kayacik, Orman Faculty, Istanbul

8/27/52 Cevdet Ozbelge, Forester

4/26/61 Hayati Ozez

8/27/52 Burhanetlin Sarioglu, Forester

5/31/50 *Kudduri Savran, Forester, (21 days)

8/27/52 Sedat Scier, Forester

8/27/52 Lomet Tezcan, Forester

8/25/59 Tanja Tumer, Univ. of Istanbul, Istanbul

SOUTHERN RHODESIA

7/14/61 J. de Villieos, The British South Africa Co.,
Umtali

UNION OF SOUTH AFRICA

8/25/38 W. S. Cleehorne, Durban

9/19/60 Daniel Rudolph DeWet, Dept. of Forestry, Pretoria

6/27/50 James A. Dollan, Johannesburg

11/18/57 Dr. H. A. Luckhoff, Pretoria

9/4/27 R. S. Schonland, Grahamstown

9/19/60 Adalbert Ernst Sonntag, Dept. of Forestry, Pretoria

6/27/50 Stephens F. Williams, Capetown

USSR

5/3/45 L. M. Novychenko, Writer

5/3/45 P. S. Pogrebniak, Acad. of Sciences, USSR, Kiev,
Ukraine

VENEZUELA

6/21/59 Arnaldo Gorrus, Caracas

APPENDIX B. (Cont'd)

YUGOSLAVIA

11/7/56	*Milan Dudic, Forest Institute, Beograd, (16 days)
9/21/60	Djordje Jovic, Beograd
9/21/60	Dusan Klepac, Sumarski Fakultet, Fagreb
11/1/58	Itenko Knezeuie, Ptuj
10/21/59	*M. Vidakovic, Agric. and Forestry Faculty, Zagreb, (3 days)

APPENDIX C. A few of the distinguished U. S. scientist visitors.

7/1/30)	Tom Gill, Charles Lathrop Pack Foundation
5/13/53)	E. B. Babcock, University of California, Geneticist
many	G. L. Stebbins, " " " "
"	Walter Mulford, " " " " Forestry
7/27/32	Herman O. Spoehr, Rockefeller Foundation and Carnegie Institution of Washington
7/27/32)	
10/19/37)	I. W. Bailey, Harvard University
8/12/40)	
12/9/32	Jens Clausen, Geneticist (also other dates)
12/9/32	Dean Knowles Ryerson, Bureau Plant Industry, Soil Conservation Service, University of California
7/2/34	A. Blakeslee, California Institute of Technology, Geneticist
1/3/35	Col. Wm. B. Greeley, West Coast Lumber Assn., Ex-Chief Forester, U. S. Forest Service
4/16/35	R. A. Emerson, Cornell University, Geneticist
12/11/35	Donald F. Jones, University of Connecticut, Geneticist
5/8/36	Fredrich Clement, Carnegie Institute of Technology, Ecologist
10/5/36)	
12/13/40)	Everett Dempster, University of California, Geneticist
1937	H. J. Lutz, Yale University, Forest Ecologist
4/5/38	W. L. Jepson, University of California, Botanist
3/22/39	Th. Dobshansky, Columbia University, Geneticist
3/22/39	Carl Epling, University of California at Los Angeles, Botanist
7/7/39)	C. W. Went, California Institute of Technology, Plant Physiologist
8/13/48)	
6/20/42	J. T. Buchholz, University of Illinois, Cytologist
5/12/46	Richard Goldschmidt, University of California, Geneticist
5/12/46	C. O. Sauer, University of California, Geographer
5/12/46	R. C. Miller
5/12/46)	
9/18/53)	Wm. C. Castle, Harvard University, Geneticist
6/18/47)	
6/29/53)	A. J. Riker, University of Wisconsin, Pathologist
8/14/48	R. A. Brink, University of Wisconsin, Geneticist
6/9/49	G. S. Boyce, Yale University, Forest Pathologist
8/31/49	Curt Stern, University of California, Geneticist
8/31/49	Adrianne Foster, University of California, Plant Anatomist
6/18/52	R. S. Hosmer, Cornell University, Forester
5/13/53	Randolph Pack, Pack Foundation
3/30/57	George McNew, Director, Boyce Thompson Institute James Bonner, California Institute of Technology, Plant Physiologist
	R. Gustavson, Resources for the Future, Inc., University of Chicago; University of Arizona
	Edgar Anderson, University of Missouri, Geneticist
8/8/61	A. W. Küchler, University of Kansas, Plant Geographer

APPENDIX D. Some representatives of industry visiting the
Institute of Forest Genetics over the last 10 years.

ALABAMA

1/26/57 Earl Porter, International Paper Co., Mobile

ARIZONA

5/19/52 Bruce Elmore, Southwest Lumber Company, McNary

CALIFORNIA

6/13/60 R. L. Jordan, American Forest Products Industries,
San Francisco
1/26/57 Wylie R. Macpherson, Arcata Redwood Company, Orick
4/1/60 D. W. Burnett, Beach Box & Lumber Co., Placerville
11/9/54 Frank Berry, Berry Lumber Company, Pine Grove
6/8/53 Samuel Bryan, Calaveras Land & Timber Co., West Point
5/17/51 Charles Berolzheimer, Calif. Cedar Products Co., Stockton
11/14/52 E. B. Price, Calif. Christmas Tree Growers Assn., Aptos
5/13/55 California Christmas Tree Growers Assn.(27 members)Aptos
6/13/60 F. Landenberger, Calif. Redwood Association, Eureka
7/22/55 W. E. Pratt, Calif. Redwood Association, San Francisco
12/26/56 W. Hensz, Central Valley Lumber Co., Sacramento
12/26/56 J. Benedett, Central Valley Lumber Co., Sacramento
9/9/58 A. S. Russell, Christmas Tree Grower, Lafayette
11/14/51 Rolland Armstrong, Christmas Tree Grower, Coloma
3/29/56 A. H. Cross, Clover Valley Lumber Co., Portola
3/18/52 John H. Masson, Collins Pine Co., Chester
3/18/52 Waller Reed, Collins Pine Co., Chester
4/27/61 Robert Hughes, Crane Mills, Corning
10/5/55 H. C. Zellerbach, Crown Zellerbach Corp., San Francisco
10/5/55 L. J. Doherty, Crown Zellerbach Corp., San Francisco
5/12/53 H. M. Derr, Derr Lumber Company, Sacramento
5/12/53 F. N. Benton, Diamond National, Sacramento
6/13/60 Charles Arment, Diamond National, Chico
5/12/53 Jack Hackard, Economy Lumber Co., Sacramento
5/12/53 James Owens, Economy Lumber Co., Sacramento
5/12/53 Chas. Shepard, Friend & Teny Lumber Co., Sacramento
1/21/57 B. H. Critchfield, Glass Mt. Christmas Tree Farm,
St. Helena
1/21/57 H. M. Critchfield, Glass Mt. Christmas Tree Farm,
St. Helena
6/13/60 D. G. Beach, Hazel Valley Lumber Co., Placerville
6/13/60 B. E. Parsons, Hazel Valley Lumber Co., Placerville
1/26/57 Fran Holmes, Holmes Eureka Lumber Co., Eureka
6/13/60 John Sweeley, Masonite Corporation, Ukiah
1/26/57 W. S. Anderson, McCloud River Lumber Co., Fairfax
2/12/59 J. E. Nicholson, Michigan California Lumber Co., Camino
10/3/61 Ed Swartz, Lake States Conservation Co., Inc., San Jose
11/11/55 Kent Smith, Redwood Christmas Tree Farm, Miranda
4/27/61 James Nicklos, Consulting Forester, Sacramento
5/12/53 H. N. Stephenson, Sacramento Box Co., Sacramento

APPENDIX D. (Cont'd.)

3/10/60 Q. H. Burton, Shasta Forest Co.,
Fall River Mills

3/10/60 T. E. Sleen, Shasta Forest Co., Redding

6/13/60 Wm. Beatty, Shasta Forest Co., Redding

6/18/54 Ray Dougherty, Shasta Forest Co, Redding

5/12/53 A. Gustafson, Sierra Mill & Lumber Co.,
Sacramento

11/11/59 T. N. Stoate, Simpson Redwood Co., Arcata

10/23/59 John Miles, Simpson Redwood Co., Eureka

7/10/58 H. K. Trobitz, Simpson Redwood Co., Eureka

1/26/57 W. H. Holmes, Soper Wheeler Co.,
Strawberry Valley

9/29/59 D. Cosens, Soper Wheeler Co.,
Strawberry Valley

3/13/57 James E. Miller, Southern California
Edison Co., Shaver Lake

3/13/57 Wm. H. Wingo, Southern California Edison
Co., Shaver Lake

5/12/53 R. E. Tracy, Tracy Lumber Co., Sacramento

4/27/61 Del Wade, Union Lumber Co., Caspar

4/27/61 Robert Fisher, R. L. Smith Lumber Co.,
Wildwood

1/26/57 J. W. Girard, Jr., U. S. Plywood Corp.,
Redding

6/13/60 Knox Marshall, Western Pine Association,
Sacramento

12/28/55 C. E. Banks, Zellerbach Paper Co.,
Sacramento

11/16/54 R. D. Hodges, Jr., Western Pine
Association, Sacramento

8/12/52 R. A. Thompson, Western Lumber
Manufacturers, San Francisco

5/24/60 Robert Maben, Winton Lumber Co., Martell

5/24/60 C. J. Winton, Winton Lumber Co., Martell

3/11/60 John Colsail, Winton Lumber Co., Martell

3/11/60 Gil Ross, Winton Lumber Co., Martell

4/7/58 John Dittman, Winton Lumber Co.,
Sutter Creek

5/2/57 R. L. Spencer, Winton Lumber Co.,
Sutter Creek

9/28/55 John Rosenberg, Winton Lumber Co.,
Martell

8/9/55 R. S. Kearns, Winton Lumber Co., Martell

FLORIDA

11/11/59 C. J. Rogers, St. Regis Paper Co.,
Pensacola

GEORGIA

11/11/59 C. H. Driver, International Paper Co., Bainbridge
11/12/52 E. T. Hawes, West Lumber Co., Atlanta
11/12/52 C. B. West, West Lumber Co., Atlanta

IDAHO

3/29/58 E. C. Cleaveland, Boise-Cascade Corp., Boise
11/11/59 R. G. Cox, Potlatch Forests, Inc., Lewiston

ILLINOIS

8/15/51 J. W. Watzek, Jr., Crossett, Watzek, Gates, Chicago

INDIANA

7/10/53 Robert Kern, Christmas Tree Grower, Rochester

LOUISIANA

3/29/58 T. E. Bercaw, Gaylord Div. of Crown Zellerbach Corp.,
Bogalusa

MICHIGAN

10/26/51 A. J. McGuire, General Hardwood Co., Detroit
5/14/59 W. Heckrodt, Michigan Christmas Tree Growers, Midland
9/6/51 David Goldberg, Michigan Lumber Co., Detroit

MINNESOTA

9/28/55 Hans Winton, Winton Lumber Co., Minneapolis

MONTANA

4/22/59 H. H. Koessler, Intermountain Lumber Co., Missoula
4/22/59 C. J. Warren, Intermountain Lumber Co., Missoula

NEBRASKA

9/13/61 Robert McKee, Lake States Conservation Co., Inc.
North Platte

NORTH CAROLINA

6/28/59 W. W. Hicks, Halifax Paper Co., Inc., Roanoke Rapids

OHIO

11/17/59 E. P. Stephens, Champion Paper and Fiber Co., Hamilton

OREGON

3/29/58 C. W. Raynor, Booth-Kelly Lumber Co., Eugene
1/26/57 F. J. Sandoz, Booth-Kelly Lumber Co., Springfield
11/12/59 G. H. Harrington, Crown Zellerbach Corp., Gardiner
11/11/59 G. H. Schroeder, Crown Zellerbach Corp., Portland
12/28/55 D. G. Campbell, Crown Zellerbach Corp., Vernonia
1/26/57 Dugan Pearl, Evans Products Co., Coquille
7/12/59 B. Gerdes, Firseed, Inc., Eugene
6/6/53 W. D. Hagenstein, Industrial Forestry Assn., Portland
3/29/58 S. D. Waite, International Paper Co., Vernonia
10/23/59 J. F. Gartz, Simpson Redwood Co., Salem

APPENDIX D. (Cont'd)

8/5/57 Stuart Moir, Western Forestry & Cons. Assn.,
Portland
5/26/53 C. A. Rasmussen, Western Pine Assn., Portland
5/23/56 E. L. Kolbe, Western Pine Assn., Portland
3/15/55 Vern Johnson, Western Pine Assn., Portland
3/15/55 Clayton Kennedy, Western Pine Assn., Portland
5/25/59 T. J. Orr, Weyerhaeuser Co., Klamath Falls

VIRGINIA

6/4/53 Herman Work, West Virginia Pulp and Paper Co.,
Covington

WASHINGTON

3/24/57 Prentice Bloedel, Bloedel Enterprises, Winslow
8/19/55 R. C. Austin, Crown Zellerbach Corp., Camas
11/12/59 Boyd C. Wilson, Industrial Forestry Assn.,
Nisqually
11/11/59 J. W. Duffield, Industrial Forestry Assn.,
Nisqually
3/29/58 A. J. Sandoz, International Paper Co.,
Longview
10/21/59 R. Millpointer, M & D Timber Co., Bellevue
4/3/52 Frank Manning, Manning Seed Co., Seattle
4/27/61 Wm. Manning, Manning Seed Co., Seattle
3/29/58 P. F. Johnston, Manning Seed Co., Seattle
6/18/54 J. G. Cameron, Manning Seed Co., Puyallup
11/4/61 J. R. Colley, Port Blakeley Mill Co., Chehalis
11/4/61 Edward Pehola, Port Blakeley Mill Co., Monroe
11/11/59 George Thompson, Port Blakeley Mill Co., Seattle
11/11/59 Donald Malmberg, Port Blakeley Mill Co., Seattle
12/10/54 R. G. Avery, Port Blakeley Mill Co., Seattle
12/10/59 J. E. Winn, Port Blakeley Mill Co., Seattle
5/19/52 Garrett Eddy, Port Blakeley Mill Co., Seattle
5/5/53 P. H. Elfendahl, Port Blakeley Mill Co.,
Seattle
7/10/58 A. O. Pelzold, Simpson Co., Shelton
7/10/58 H. O. Puhn, Simpson Co., Shelton
7/10/58 R. J. Seidl, Simpson Co., Seattle
7/10/58 T. R. Yocum, Simpson Co., Seattle
7/10/58 C. H. Kreinbaum, Simpson Co., Seattle
4/25/56 E. G. Griggs, II, St. Paul & Tacoma Lumber Co.,
Tacoma
6/18/54 B. C. Gerdes, St. Paul & Tacoma Lumber Co., Orting
6/18/54 N. G. Jacobson, St. Paul & Tacoma Lumber Co., Tacoma
3/31/58 R. O. Cornelius, Weyerhaeuser Co., Tacoma
10/3/58 W. H. Cummings, Weyerhaeuser Co., Centralia
1/22/57 J. H. Rediske, Weyerhaeuser Co., Centralia

WASHINGTON, D. C.

6/26/51 S. L. Frost, American Forestry Assn.

WISCONSIN

5/18/59 J. P. Van Buijtenen, Institute of Paper Chemistry,
Appleton

1958 P. N. Joranson, Institute of Paper Chemistry,
Appleton

10/3/61 Bon Skaife, Lake States Conservation Co., Inc.,
Appleton

10/3/61 Wm. Skaife, Lake States Conservation Co., Inc.,
Appleton

BRITISH COLUMBIA

1/22/57 T. N. Stoate, MacMillan-Bloedel, Ltd., Vancouver

1/2/59 Hugh Weatherby, Timber of Canada, Vancouver

APPENDIX E. Persons undergoing training or studying at the
Institute of Forest Genetics for several days
to several months

United States:

Chas. A. Bigelow	U.S. Forest Service, Region 6	5/8-5/11/60 (4 days)
R. T. Bingham	U.S. Forest Service, Region 1	3/4-4/3/50 (1 month)
J. T. Buchholz	Professor of Botany, University of Illinois	Summers 1942 and 1943 (6 months)
R. A. Brink	Head, Dept. of Genetics, University of Wisconsin	1948 (7 days)
K. W. Dorman	U.S. Forest Service, Southeastern Station	6/19-6/28/50 (10 days)
T. E. Greathouse	U.S. Forest Service, Region 6	9/30-10/9/58 (10 days)
James Greene	Ida Cason Calloway Foundation	(7 days)
B. W. Henry	U.S. Forest Service, Southern Station	10/24-10/27/55 (4 days)
R. G. Hitt	Dept. of Genetics, University of Wisconsin	1948 (7 days)
E. L. Little, Jr.	U.S. Forest Service, WO, Dendrologist	6/20-7/18/56 8/6-8/9/56 (32 days)
Francois Mergen	Yale University	5/31-6/5/53 (6 days)
Gene Namkoong	U.S. Forest Service Southern Station	11/7-11/14/59 (8 days)
T. O. Perry	University of Florida	6/12-6/13/50 8/20-8/22/57 (5 days)
Frank Pitken	University of Idaho	11/15-12/7/56 (23 days)
Ralph Read	U.S. Forest Service, Rocky Mountain Station	(5 days)
John Ritchey	Calif. Division of Forestry	5/3-5/7/59 5/11-5/14/59 (10 days)
LeRoy Saylor	Graduate Student, North Carolina State College	4/5-4/19/60 3/7-4/3/61 (6 weeks)
E. J. Schreiner	U.S. Forest Service, Northeastern Station	1936 (5 days)
R. R. Silen	U.S. Forest Service, Pacific Northwest Station	6/20-6/24/55 (5 days)
E. B. Snyder	U.S. Forest Service Southern Station	(5 days)
A. E. Squillace	U.S. Forest Service, Rocky Mountain Station	3/4-4/3/50 (1 month)
P. C. Wakeley	U.S. Forest Service, Southern Station	6/19-6/28/50; 10/24- 10/27/55 (14 days)

Foreign:

See Appendix B for names marked by * for time spent in training

F.
APPENDIX G. Some popular articles about the Institute of
Forest Genetics

Magazines:

AMERICAN FORESTS - September 1952 58(9): 18, 28, illus.

"Blood will tell" by W. B. Greeley

ARIZONA FARMER RANCHMAN - September 27, 1958 pp. 36-37, illus.

"Pines with hybrid vigor" featuring hybrids of Arizona pines

FRONTIERS - A magazine of natural history - April 1952 and
October 1958

"Hybrid trees, hope of foresters" Vol. 16, No. 4 pp. 103-105,
illus.

"Breeding better, taller trees" by H. E. Jackson, Vol. 23, No. 1
pp. 20-22, illus.

GOLDEN GARDENS - an all California garden magazine - November 1951,
pp. 7, 28-30, illus.

"California Forest and Range Experiment Station at Placerville -
The Institute of Forest Genetics"

"California might be the last state in which you'd expect to find
foresters trying to improve on Nature's pines" goes on to say many
characters of our California giants could stand genetic improvement.
Describes the great diversity in pines "There's much else to in-
terest gardeners, as well as foresters, at the Institute. Next to
the hybrids themselves, the outstanding attraction is the Eddy
Arboretum."

JOURNAL OF FORESTRY - July 1959

"Forest geneticists to meet at Placerville prior to S.A.F.
meetings," Vol. 57, No. 7, p. 514, "The Institute's pioneering
work in basic forest genetics makes it the 'mecca' of American
tree breeders, thus an ideal place for the joint meeting."

THE NATIONAL GEOGRAPHIC MAGAZINE - CX(3): 287-324, September 1956

A general article on the U. S. Forest Service, "Our green
treasury, the National Forests" pp. 320-321 and photo p. 291

"Tree hybridization holds limitless promise."

POPULAR MECHANICS - September 1951, pp. 143-146, 244, 246, illus.

"They're breeding new forest trees" by Ewart Thomas "Fast-
growing pine trees that may mature in half the usual time are
being planted in America's forests. They'll be ready for the
sawmill in 40 years or less, at about the time their native con-
temporaries have emerged from the sapling stage." "Jack-in-the
Beanstalk hybrids."

PRINCETON ALUMNI WEEKLY - May 20, 1955, Vol. LV, No. 27, p. 10

"James G. Eddy '03" tells classmates of the Institute's
founder of the fruits of his vision and dedication.

APPENDIX G. (Cont'd)

PULP AND PAPER INDUSTRY - September 1946, Vol. 20,
No. 10, pp. 22-26, illus.

"Hands across U. S. California answers South's big problem." "In the foothills of California's Sierra Nevada mountains, thousands of miles away from the Southern pine pulp and paper industry, government scientists are working out the answer to the southern pulp and paper industry's most pressing question - how to produce a faster growing pine tree."

READER'S DIGEST - August 1951, 59(352): 121-123
"New yellow dust in Placerville" condensed from
Science News Letter, July 7, 1951, by Neil Hunter.

SOUTHERN LUMBERMAN - December 1948, 77 (22-25):279-281,
illus.

"Pine breeding today" by Palmer Stockwell

THE TIMBERMAN - May 1951

"Plant hybrid pines for testing." "Several of the 67 pine hybrids produced at the Institute ... are being set out this spring in field tests in various parts of the state where they will be observed for resistance to diseases and insects and for general performance."

Newspapers:

BALTIMORE SUN - Friday, April 8, 1955

"A three-species hybrid pine tree" p. 14. An editorial noting the dynamics of forest tree breeding as productive research in the natural sciences.

THE BIRMINGHAM (ENGLAND) POST - April 1, 1952

"Forests in half the time," by S. Mackie. "Genetic principles similar to those that developed the phenomenally successful hybrid maize have been applied by plant breeders in the United States to pine trees. The object has been to obtain trees that will mature in about half the usual time. In many cases resistance to insect pests and disease has been developed simultaneously."

"A hundred hybrids have been produced from about 60 species by the Institute of Forest Genetics in Placerville, Calif., by the research workers."

CHRISTIAN SCIENCE MONITOR - August 21, 1948, Magazine
Section, pH

APPENDIX G. (Cont'd)

(DALLAS) TEXAS CHEMURGIC NEWS - November 1, 1947

"Hybrid pines may replace native forests. Pacific Coast timber research leads in nation."

THE OREGONIAN (Portland) - Wednesday, June 18, 1952, p. 14

"Research on cell structure of pine trees has produced many improved varieties," by Fred M. White.

SACRAMENTO BEE - Thursday, September 27, 1951, p. 25,
1/3 page picture - story spread

SACRAMENTO BEE - Saturday, April 13, 1957, pp. C-3, 10,
1 1/4 page picture - story spread

SACRAMENTO BEE - Monday, March 23, 1959

"Lumber concern plants hybrids on Amador farm." "The Winton Lumber Company today announced plans for planting hybrid and purebred trees on its Amador County tree farm...."

SACRAMENTO BEE - Sunday, May 24, 1959, pp. F3, 4

"Yet more ranchers are expected to show interest in putting forest land back into production. They will be encouraged...by new fast growing hybrid timber trees produced at the United States Forest Service's Institute of Forest Genetics near Placerville. When some of these hybrids show their vigor...ranchers may see the possibility of forest conservation with a reasonable rate of return."

SACRAMENTO BEE - Thursday, August 13, 1959, p. C2 illus.

"U. S. nursery seeks to create hybrid pines." "The Placerville nursery of the United States Forest Service is moving to put into practical operation features concerning pine tree growth which have been proved in the laboratory of the Institute of Forest Genetics....the nursery produced 40,000 hybrids in its first year and shipped trees to all national forests in the state."

SAN JOSE MERCURY NEWS - July 10, 1955

"Pine tree breeding farm," a report of staff writer Dick Barrett's "120 mile round trip just to visit the Institute..."

APPENDIX H. (Cont'd)

Private individuals and companies:

East Bay Municipal Utility District, Oakland, Calif.
Mr. B. F. Baer, Garden Valley, California
Bloedel Timberlands Development, Inc., Seattle,
Washington
Boise Cascade Corporation, Boise, Idaho
C. Brewer & Co., Hilo, Hawaii
Boyce Thompson Institute, Grass Valley, California
Calaveras Land and Timber Corp., Mokelumne Hill,
California
Dr. J. K. Stoddard, Cashiers, North Carolina
Mr. H. S. Chase, Castro Valley, California
Mr. T. Christiansen, Garden Valley, California
Cloverdale Kiln Co., Cloverdale, California
Collins Pine Co., Chester, California
Mr. H. B. Critchfield, St. Helena, California
Crown Zellerbach Corp., Gardiner, Oregon
Mr. Roy W. Darden, Cedar Hill, Tennessee
Empire Star Mines Co., Ltd., Grass Valley, Calif.
Henry Field Seed Co., Shenandoah, Iowa
Forest Industries Tree Nursery, Nisqually, Washington
Gaylord Container Division of Crown Zellerbach Corp.,
Bogalusa, Louisiana
Mr. W. O. Hacker, South Harwick, Massachusetts
Halifax Paper Co., Inc., Roanoke Rapids, North
Carolina
Baker, Hostetler & Patterson, Cleveland, Ohio
International Paper Co., Bainbridge, Georgia
MacMillan and Bloedel, Ltd., Namaimo, British
Columbia, Canada
Mr. Jack McCaskill, Pasadena, California
Holme, Roberts, More, Owen & Keegan, Denver, Colorado
Nebo Oil Co., Natchitoches, Louisiana
Nekoosa Edwards Paper Co., Port Edwards, Wisconsin
Newont Exploration, Ltd., Tombstone, Arizona
Mr. Wilbur A. Osborne, Chatam Center, New York
Port Blakeley Mill Co., Seattle, Washington
Santa Clara Council, Boy Scouts, San Jose, California
Dr. Paul F. Sharp, San Andreas, California
Ralph L. Smith Lumber Co., Anderson, California
W. T. Smith Lumber Co., Chapman, Alabama
Southern California Edison Co., Los Angeles, Calif.
Mr. Victor J. McNitt, Sherburne, New York
Mr. Sheddie Tetterton, Camden, South Carolina
Winton Lumber Co., Martell, California

^G
APPENDIX H. Distribution of Institute seed, pollen
or plants

Foreign - 46 cities in 27 countries on 7 continents:

Buenos Aires, Argentina
Sabie, Eastern Transvaal, Union of South Africa
Brisbane, Queensland, Australia
Canberra, A.C.T., Australia
Adelaide, South Australia, Australia
Perth, West Australia, Australia
Sydney, Australia
Tasmania, Australia
Creswick, Victoria, Australia
Wagga Wagga, New South Wales, Australia
La Paz, Bolivia
Maple, Ontario, Canada
Chalk River, Ontario, Canada
Victoria, British Columbia, Canada
Combarbala, Chile
Santiago, Chile
Bogota, Columbia
Beograd, Czechoslovakia
Horsholm, Denmark
Gianadis-Ramleh, Egypt, UAR
New Waltham, Grimsby, England
Wrecclesham, Surrey, England
Kew, Surrey, England
Toulouse, France
Hannover, Germany
Schmalenbeck, Germany
Amritsar, Punjab, India
Kibutz Ha Sollelin, Doar Afula, Israel
Ilanoth, Nathanya, Israel
Meguro, Tokyo, Japan
Nairobi, Kenya
Suwon, Kyunggido, Korea
Chilpancingo, Gro., Mexico
Calle, Londres, Mexico
Dunedin, New Zealand
Whakarewarewa, Rotorua, New Zealand
Madeira, Portugal
Causeway, Salisbury, Southern Rhodesia, U.S.S.R.
Lourizan, Pontevedra, Spain
Quevedo, Valencia, Spain
El Obeid, Kordofaw, Sudan
Wad Medani, Sudan
Ekebo, Källstrop, Sweden
Stockholm, Sweden
Grup Muduru, Mugla, Turkey

APPENDIX I. Pine hybrids produced for commercial exploitation

Lodgepole x jack

University of Missouri, Columbia, Missouri
Nekoosa Edwards Paper Co., Wisconsin Rapids, Wisconsin
Inland Empire Paper Co., Spokane, Washington
Crown Zellerbach, Beaver Marsh, Oregon

Jeffrey x (Jeffrey x Coulter)

U. S. Forest Service Regions 5 and 6
California Division of Forestry

Ponderosa x Apache

Weyerhaeuser Co., Klamath Falls, Oregon
U. S. Forest Service Region 6

Pitch x loblolly

Institute of Forest Genetics, Suwon, South Korea

Shortleaf x loblolly

Gaylord Container Corp. with U. S. Forest Service, Bogalusa,
Louisiana

Knobcone x Monterey

U. S. Forest Service Regions 5 and 6
Crown Zellerbach Corporation, Gardiner, Oregon

Shore x lodgepole

Critchfield Glass Mountain Christmas Trees, St. Helena, California

I.
APPENDIX J. Pine species and hybrids self pollinated at
Institute of Forest Genetics

<u>Species or Hybrids</u>	<u>Years attempted</u>
Attenuata	1927, '47, '57
x Attenuradiata	1933, '39
Attenuata x attenuradiata	1946
Banksiana	1929, '55, '57
Coulteri	1957
Densiflora	1928, '29
Echinata	1938, '54, '55
Echinata x taeda	1946, '47, '48, '50, '53, '55
Edulis	1960
Flexilis	1955
Glabra	1957
Halepensis	1957
Halepensis brutia	1931, '38
Jeffreyi	1927, '29, '38, '39, '46, '50, '53, '57
Jeffreyi x coulteri	1960
Lambertiana	1927, '28, '39, '54, '57
Monophylla	1960
Monticola	1927, '39
Muricata	1946, '48, '52, '57
Murrayana	1927, '39, '47, '48, '53
x Murraybanksiana	1946, '47
Nigra	1943
Nigra calabrica	1940, '43, '55, '57, '60
Nigra cebennensis	1957
Nigra cebennensis x nigra calabrica	1960
Parryana	1960
Patula	1955, '57
Pinaster	1931, '54, '57
Ponderosa	1926, '27, '28, '29, '38, '39, '47, '50, '52, '53, '54, '57, '60
Ponderosa apachea x montezumae	1960
Ponderosa scopulorum	1954
Radiata	1927, '29, '30, '57
Rigida	1929, '41, '54, '55, '57
Rigida x taeda	1947, '60
Sabiniana	1927, '28, '29, '47, '55, '58
Sondereggeri F.	1959
Strobus x excelsa	1960
Sylvestris	1939
Taeda	1950, '55
Taeda x caribaea	1950
Torreyana	1955, '57
Virginiana	1954, '55

Selfing summary
31 species
11 hybrids