

NOTES

Gustav H. Lentz 1894—1945

G. H. Lentz, assistant regional forester, U. S. Forest Service, Philadelphia, Pa., died suddenly on January 2 while en route to work. For several years he had had rheumatic heart trouble with complications. He was fifty years of age.

Born in Catonsville, Md., December 3, 1894, he attended Baltimore Polytechnic Institute, then prepared for forestry at the Sheffield Scientific School of Yale University, and received the Ph.B. degree. In 1917 he was graduated *cum laude* from the Yale School of Forestry with the M.F. degree.

Enlisting in Company F, 10th Engineers (forestry) in August, 1917, he subsequently was promoted to sergeant first class and spent seventeen months in France in charge of log scaling and supervising a cordwood operation.

On his discharge from the Army in 1919 he was employed as forester for a 30,000-acre estate in New York. Two years later he was appointed to the faculty of the New York State Ranger School at Wanakena, and in 1923 became professor of forestry extension at the New York State College of Forestry and director of the sophomore summer camp.

During 1928 he was granted leave from the college to carry on special investigations for the state forester of Louisiana, but returned in 1929. Effective January 1, 1930, Mr. Lentz was appointed silviculturist at the Southern Forest Experiment Station, New Orleans, and subsequently became assistant director of the forest survey of the South.

Offered an appointment as planting chief in the Division of Forestry, Tennessee Valley Authority, he accepted in October, 1933, and supervised reforestation work by 25 C.C.C. camps and technical aspects of soil erosion control.

Three years later, he returned to the Forest Service in the regional office at Atlanta, Ga., Division of State and Private Forestry. On October 1, 1941 he was named as assistant regional forester in charge of state and private forestry for the eastern region embracing 14 states.

Elected a Junior Member of the Society in 1921, he became a Senior Member in 1923. He was chairman of the Gulf States Section in 1933 and of the Southeastern Section in 1938, and was vice-chairman of the Allegheny Section at the time of his death.

He was a contributor of technical articles to the *JOURNAL OF FORESTRY*, *American Forests*, and other magazines.

Gus Lentz was one of the best known foresters in the eastern United States. A man of great technical ability and high professional ideals, he was liked and respected for his frankness and sense of fair play. Although in ill health for the past several years, he nevertheless was reluctant to give up active participation in his official work and in the affairs of the Allegheny Section. With his passing the profession has lost one of its most friendly, able, and loyal members.

HENRY CLEPPER.



Study of State Forestry Administration Begun in Rhode Island

At the invitation of Governor J. Howard McGrath, the Society of American Foresters on January 15 began a study of state forestry administration in Rhode Island. It is being made with the cooperation of the Rhode Island Department of Agriculture and Conservation, with other state and federal agencies, and with local forest products industries and woodland owners.

The object of the study is to define and establish standards necessary for the efficient administration of the state's forest resources and to make recommendations as to how these standards may be met. The project is designed to render a service to the states by providing them with an objective professional analysis of their forestry problems, and to submit recommendations as to how those problems might be solved for the state's social and economic welfare.

Austin F. Hawes of Hartford, Conn., has been assigned to Rhode Island as project representative. A graduate of the School of Forestry of Yale University, he has had thirty years' experi-

RECK INJURIES

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GERMAN EXPERTS GUESTS AT DUKE

Forestry and Wood Author-
ities on Way to Visit West
Carolina Forests

Durham, April 17.—(P)—A group
of distinguished German forest and
wood experts arrived here tonight to
begin a week's inspection tour of
North Carolina and East Tennessee
forest projects.

Coming by bus from Washington,
they were dinner guests at Duke
University and will remain over-
night to spend several hours in the
University forest tomorrow before
continuing to Franklin.

Dr. C. F. Forslian, dean of the
Duke graduate school of forestry
and president of the Society of
American Foresters, greeted the
group, as did State Forester J. S.
Holmes, **Gus Lentz** of the United
States Forest Service, Atlanta, is
accompanying the visitors on their
tour.

President W. P. Few and other

members of the University adminis-
tration and faculty, including a
number of German-speaking mem-
bers, and the forestry staff met the
visitors and welcomed them to the
University.

Mr. Holmes rlibed work in
this State and something of the for-
est resources here.

Following the dinner, Dean Kors-
tian gave an illustrated lecture on
the work being done in Duke forest.

The German forest experts, who
included estate owners, university
professors, and government officials,
asked many questions regarding
forest problems in this region, ob-
serving that they have many similar
conditions to meet in operating their
forests.

From Durham the group will go
to Franklin, in Western North Caro-
lina, then will visit the Coweeta ex-
perimental forest and the Joyce Kil-
mer forest tract, the Nantahala Na-
tional Forest, and on Tuesday and
Wednesday will go to Knoxville and
Norris, Tenn., to inspect TVA forest
enterprises. They will return to
North Carolina on Thursday for a
tour of the Smokies and the forest
products plants in Western North
Carolina before going into Virginia
next Sunday by way of Blowing
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Obituary

Gustav H. Lentz

Funeral services for Gustav H. Lentz, 51, prominent forester, who died Wednesday at Upper Darby, Pa., will be held at 1 P.M. tomorrow. The service will be conducted here in the chapel of Lorraine Park Cemetery.

A native of Catonsville, Mr. Lentz attended Baltimore Polytechnic Institute and Yale University.

He was a member of the faculty of the University of Syracuse before becoming chief of the division of State and private forestry of the United States Forest Service, Region 7, the position which he held at the time of his death.

Surviving are his wife and three daughters, the Misses Mary A. Lentz and Elizabeth S. Lentz, of Upper Darby, and Mrs. J. S. Slicer, Jr., of Birmingham, Ala.; his mother, Mrs. Paula Lentz, and two brothers, William and Christian A. Lentz, all of Baltimore.

Region 8Southern Region

Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, eastern Oklahoma, Puerto Rico, South Carolina, Tennessee, and Texas. Office, Glenn Building, Atlanta, Georgia.

JOSEPH C. KIRCHER, regional forester; Herbert O. Stabler, associate regional forester; Mary E. Hamme, secretary.

LAW - Edward F. Mynatt, regional law officer; Florence Cameron, clerk.

OPERATION - J. P. Brooks, assistant regional forester; Donald E. Clark, assistant; W. R. Paddock, fire assistant; Geo. T. Pettay, ERA assistant; R. J. Riebold, training officer; Frank C. Stone, administrative officer; Betty Wootten, Elizabeth Balzen, Laura Duncan, Ocie Bates, clerks.

Information - _____, in charge; T. S. deJarnette, Ruby L. Farr, clerks.

Maintenance - G. C. Bell, chief; Helen C. Thran, Angie B. Hansen, Eliza N. Matthews, H. C. Bradshaw, Frank D. Rimer, Jr., clerks; William H. Malpasse, storekeeper, Kenneth Coleman, head messenger.

STATE AND PRIVATE FORESTRY - C. F. Evans, assistant regional forester; W. R. B. Hine, assistant; L. B. King, R. L. Meyerhardt, C. W. Caudle, G. M. Cory, M. F. Moore, N. Wooddy, clerks.

Cooperative Fire Control - H. J. Eberly, in charge; Willis C. Branch, J. W. K. Holliday, inspectors.

Private Forest Management - Gustav H. Lentz, in charge; E. T. Hawes, E. J. Schlatter, Clinton G. Smith, Carl W. Strauss, foresters.

State Forest Purchase, Farm Forestry, Coop. Forest Planting - W. R. B. Hine, in charge.

TIMBER MANAGEMENT - A. C. Shaw, assistant regional forester; Bennett O. Hughes, senior logging engineer; A. J. Streins, Floyd M. Cossitt, inspectors; Rachel L. Lincoln, Sarah J. Thurman, clerks; Rachel P. Lane, librarian.

RANGE AND WILDLIFE MANAGEMENT - A. C. Shaw, assistant regional forester; E. A. Schilling, inspector.

LANDS - William P. Kramer, assistant regional forester; P. J. Paxton, assistant; W. I. Stevens, S. D. Beichler, inspectors; Louisa O. Burkholder, Edna Mutz, Lena G. Loflin, Margaret Collins, Margaret M. Rung, Clark H. Streetman, clerks.

GA-B1-1

GUSTAV HERMAN LENTZ

c/o Region 7, U. S. Forest Service, 724 Ninth Street, N.W., Washington, D. C.

Residence: 5457 Nebraska Avenue, N.W., Washington, D. C.

In 1919, Gus was with the Forester Harriman Estate in New York, where he stayed until 1920. From 1921 to 1930, he was Professor in the New York State College of Forestry; and until 1933 was with the U. S. Forest Service, in the Research Department, in New Orleans; and was then with the T. V. A. as Forester in charge of watershed protection section until 1936. Since that time he has been Assistant Regional Forester, Region 7, U. S. Forest Service, in charge of Division State and Private Forestry. He is very much interested in the Society of American Foresters and gardening. During the World War, Gus was Sergeant 1st Class, Company "F", 10th Engineers Forest, and overseas 17 months in France. His marriage to Margaret S. Kummer took place September 1, 1917, and seems to be specializing in girls. He has three daughters: Margaret O., born January 3, 1920, who has had two years in college; Mary Augusta, born January 5, 1925, and Elizabeth S., born July 25, 1926, who attend high school.

CLIFFORD S. LEONARD

College of Medicine, University of Vermont, Burlington, Vermont

Residence: 31 Cliff Street, Burlington, Vermont

As Second Lieutenant with the Sanitary Corps of the United States Army, Clifford was busy from 1918 to 1919. From 1920 to 1921 he was Research Chemist with the American Scandinavian Foundation Fellow Company in Sweden; from 1921 to 1922 he was Research Instructor in the University of Wisconsin; and Associate Pharmacologist with the United States Public Health Service from 1922 to 1923; from 1923 to 1925, he was with the National Research Council Fellow in Medicine; and Instructor Pharmacology of the Yale Medicine School until 1926, and Assistant Professor in Pharmacology and Toxicology, at the Yale Medicine School from 1927 to 1928. He was Director of Research, Laboratories of Burrough Wellcome & Company, U. S. A., Inc. from 1928 to 1935; Director of Spectrometric Research, White Laboratories, Inc. from 1936 to 1938; and Assistant Professor of Pharmacology, College of Medicine, University of Vermont until the present time. He is the author of over forty scientific papers, chapters in scientific books, and one book, translation from Swedish. Clifford was married on December 18, 1926 to Nita Amanda Wallis. They have one son, Clifford Shattuck, Jr., born April 22, 1928, who attends grammar school.

SAMUEL KENRIC LESSEY

The Electric Storage Battery Company, 25 West 43rd Street, New York City, New York

Residence: Old Kipp Road, Chappaqua, New York

"K" from April 1918 to July 1919 was with the 104th Engineers, 29th Division and before that time from 1915 to 1916 was with the American Brass Company; from 1916 to 1918 he was with the Philadelphia Electric Company in Philadelphia; and since 1920 has been Sales Engineer for the Electric Storage Battery Company, interested mostly in battery plants and installations in telephone service. He was married on October 2, 1922 to Ruth Turner. They have one son: Samuel K., Jr., born October 9, 1923, who attends the Chappaqua High School. "K" is interested in wood working and landscape gardening, but insists he is "strictly amateur."

HENRY FREDERICK LEUPOLD

National Oil Products Company, Harrison, New Jersey

Residence: 284 High Street, Nutley, New Jersey

On April 27th, 1927, Spike was married to Anna D. Brinkman. They have two sons: Philip Harry, born February 11, 1928, and Robert Paul, born November 18, 1929. During the World War, Spike was a Private with the Chemical Warfare Service, stationed at Astoria, Long Island for eleven months during 1918 and 1919. From 1917 to 1932, Spike was with Cheney Brothers, Manchester, Connecticut and since that time has been with the National Oil Products Company, Harrison, New Jersey, where he is Chief Textile Chemist. The company manufactures oils and specialties for textile cloth. Tennis and gardening are Spike's favorite recreations.

SOLOMON LEVENSTEIN

Business: 205 Church Street, New Haven, Connecticut

Residence: 34 Colony Road, New Haven, Connecticut

Levy attended Yale Law School from 1915 to 1918, and has been practicing law in Connecticut since 1918, where he has a general practice. On November 30th, 1933, Levy was married to Mildred Julia Katz. They have one son: Marc, born September 4th, 1935.

DANIEL FREDERICK LEVY

Physician, 5 College Street, New Haven, Connecticut

Residence: 81 McKinley Avenue, New Haven, Connecticut

Dan enlisted as a private in the Medical Reserve Corps and was honorably discharged after the Armistice. Dan is a graduate from the Yale School of Medicine, and served his internship at the Campbell Gold Medal Hospital in New Haven, and has been practicing medicine. He is Attending Physician at the Grace Hospital, and Secretary of the Professional Staff of Grace Hospital since 1933.

Paper Mill Machinery and numerous shorter articles of technical nature published in the trade press of the pulp and paper industry.

WILLIAM S. KNICKERBOCKER, born in New York City, January 7, 1892. Student, Bible Seminary of New York 1911-14. Columbia University (B.A.) 1917, (M.A.) 1918; Proudfit fellow 1918-20, (Ph.D.) 1925. Instructor in English, Dartmouth College 1918-19; assistant professor, English and registrar, New York State College of Forestry, August 1, 1920; resigned September 30, 1926; professor of English and head of the department, University of the South, 1926 to date. Editor of the *Sewanee Review* since 1926; exchange professor of English with English and Scottish Universities 1935. Contributing editor, *Institute of Current Literature*. Author and editor of *Culture and Anarchy* by Matthew Arnold 1925, *Classics of Modern Science* 1927. Author of *Creative Oxford* 1925. Member, Modern Language Association of America, American Association of University Professors, Phi Beta Kappa, Alpha Xi Sigma.

PAUL R. GAST, born in Fitchburg, Mass., January 7, 1897. Brown University (Ph.B.) 1920; Syracuse University, New York State College of Forestry (M.S.) 1922; Harvard University (D.Sc.) 1927. Assistant in forest botany, New York State College of Forestry 1920-22; research assistant, Harvard Forest School, Harvard University 1922-24; instructor in forestry 1924; assistant professor 1930; agent, U. S. Forest Service 1924-29. National Research Council fellow to Sweden 1929-30.

GURTH A. WHIPPLE, born in Salamanca, N. Y., September 7, 1876. Salamanca High School 1895; Eastman Business College 1895-96; New York University Law School 1896-98. Member of the 71st Regiment, New York Volunteers, Spanish-American War 1898-99; assistant clerk, general superintendent's office, New York Telephone Company 1896-98, 1898-1908; secretary to four Conservation Commissioners 1908-11; feature writer for Knickerbocker Press (Albany, N. Y.) 1911-14. Secretary to Willis Sharpe Kilmer 1914-18; feature writer, Binghamton Press; member Company B, 336th Battalion, Light Tanks, U. S. Army American Expeditionary Force in France 1918-19; assistant advertising manager, Syracuse Herald 1919-21; assistant professor of forest extension January 1, 1921; associate professor 1931. Author of *Fifty Years of Conservation in New York State*, *The Road Beautiful Pays*, *Arbor Day Exercises*. Voluminous writer popular articles on forestry; director, publicity relations of the College; member, Onondaga-Cortland Council of Boy Scouts, holder of silver beaver award, Society of American Foresters, Alpha Phi Omega, Alpha Xi Sigma, Robin Hood; representative of St. Lawrence County Conservation Council, Commodore Cranberry Lake Boat Club.

GUSTAV H. LENTZ, born in Catonsville, Md., December 3, 1894. Baltimore Polytechnic High School 1912. Yale University (Ph.B.) 1915; (M.F.) 1917. Enlisted in the 10th Forestry Engineers and saw 18 months service with the American Expeditionary Forces in France 1917-19. Forester for the Arden Estate at Harriman, N. Y. 1920-21; appointed professor of forestry at the New York State Ranger School,

Wanakena, N. Y., February 1, 1921; transferred to the extension department as professor of forest extension and director of the Sophomore Camp 1923; resigned December 31, 1929; silviculturist, U. S. Forest Service, Southern Forest Experiment Station, New Orleans, La. 1929-33. Since 1933 he has been with the Tennessee Valley Authority and is now chief of the Reforestation and Soil Erosion Section with headquarters at Knoxville, Tenn. Member, Society of American Foresters, Committee on Forest Influences, vice-chairman of the Appalachian Section, past chairman of the Gulf States Section, Sigma Xi, Gamma Alpha.

EARL S. PIERCE, born in Frankfort, Maine, September 26, 1887. Phillips Academy, Andover, Mass., 1902-06; Yale University (B.S.) 1909 (M.F.) 1910. U. S. Forest Service, forest assistant, Bighorn National Forest 1910-13; forest examiner, Black Hills National Forest 1913-16; forest supervisor, Medicine Bow National Forest 1916-20; Washington Office 1920-21; appointed professor and director of forest extension March 1, 1921; resigned December 31, 1924; in business 1924-33; re-entered U. S. Forest Service as inspector of E.C.W. operations March 1933; forest supervisor, Superior National Forest October 1933 to January 1934; assistant regional forest of Region 9 with headquarters at Milwaukee, Wis., January 1934 to July 1935; assistant chief in branch of lands in Washington Office, July 1935 to date. He is a member of the Society of American Foresters.

RICHARD R. FENSKA, born in Mansfield, Germany, November 21, 1884. Primary schools of Stassfurt, Germany 1890-92 and Rhinelander, Wis. 1892-1900; Beloit Academy 1901-03, Warren Academy 1904-05; Beloit College (B.Sc. cum laude) 1911; Yale University (M.F.) 1913. He was instructor, Warren Academy 1904-05; field assistant in engineering Yale Forest School Summer Camp 1912; instructor in forestry, University of Wisconsin 1913-15; instructor in forest engineering, Wyman School of the Woods, Munising, Wis., 1915-17; assistant professor of forestry, University of Montana 1917-21; professor of engineering and head of the department, New York State College of Forestry, Syracuse University 1921-31. Since 1931 he has been with Bartlett Tree Expert Company of White Plains, N. Y. Member, Society of American Foresters.

RAY R. HIRT, born in Worthington, Minn., December 24, 1893. Public schools at Winthrop and Hector, Minn.; Hector High School 1912; Hamline University (B.S.) 1917; New York State College of Forestry, Syracuse University (M.S.) 1924, (Ph.D.) 1927. He taught school at Maynard, Minn. 1915-16; Hamline University Ambulance Corps 1917; transferred to University to Minnesota Unit, Base Hospital 26; served with the American Expeditionary Force in France 1917-19; principal of public school in St. Clair, Minn. 1919-21; appointed graduate assistant in the Department of Forest Botany, New York State College of Forestry, Syracuse University 1921; instructor 1921; assistant professor 1930; summer vacation periods between 1921 and date and sabbatical leave of 1933-34 spent as special agent in survey and research with the Bureau of Plant Industry, U. S. Department of Agriculture, Blister

THE TENNESSEE VALLEY AUTHORITY'S ATTACK ON SOIL EROSION THROUGH REFORESTATION

By GUS LENTZ

Forestry Division, Tennessee Valley Authority

THE control and prevention of soil erosion in the Tennessee Valley is one of the major objectives of the Tennessee Valley Authority. It has such an important bearing on the regulation of streamflow and the protection of navigation and so affects the general welfare of the entire Valley that the T.V.A. has considered erosion control a very important phase of its activities. Two divisions of the T.V.A. are actively engaged in a valley-wide attack on the soil erosion menace.

The Agricultural Division, working through the county agents and the various state extension departments, is advocating such practices as terracing, crop rotation, strip cropping, and the use of phosphates and other fertilizers to hold the topsoil in place, to increase crop yields on good agricultural land, and to help build up permanent pastures. This work is just getting under way in various counties.

The Reforestation and Soil Erosion Section of the T.V.A. Forestry Division is attacking the erosion problem, for the most part, on the sub-marginal land which is not suited to the growing of crops and is not suitable for pasture. The Forestry Division is carrying on its soil erosion control work primarily with the help of the Civilian Conservation Corps camps and by means of reestablishing a vegetative or forest cover on the sub-marginal land.

There are no existing accurate reports on erosion conditions throughout the Valley. A few soil surveys and reports have been made of individual counties, but there never has been a soil survey of the entire 28,000,000 acres lying in the Tennessee River watershed. Extensive reconnaissance, county by county, has been used as a basis for locating C.C.C. camps and for selecting

their work areas. The control work by the camps, with the exception of that on land purchased by the T.V.A., has been on privately owned lands. The Forestry Division's approach to the erosion problem is from the standpoint of proper land use. The basic ideas are to keep the best land in cultivation, keep a permanent sod on areas too steep for cultivation but still required for pasture land, and restore the forest cover on sub-marginal lands and those too steep for either cultivation or pasture.

By and large, the amount of soil lost from cultivatable land is probably greater than that carried from the sub-marginal lands. Checking this loss from crop land is not primarily a forestry problem, although some of the camps operated by the Forestry Division are building terrace outlets, taking care of the water as a community problem, and where permanent pastures are badly cut up by deep gullies, the C.C.C. boys are building check dams and are plowing in and seeding the banks in order to prevent deeper cutting. The work of the Forestry Division camps, however, has been confined largely to areas having well developed gullies or areas where most of the topsoil has washed away, leaving a barren or "galled" spot supporting little or no vegetation.

This erosion control work at the present time is carried on by 19 C.C.C. camps, located four in Virginia, thirteen in Tennessee, and two in Alabama. Requests for additional camps for Tennessee and Alabama were made as of January 25. These camps are administered by three agencies, as follows:

(1) The T.V.A. Forestry Division, through the Reforestation and Soil Erosion Section, acts in the capacity of a consulting

architect, selecting the work areas, laying out the projects, and inspecting them during construction and upon their completion. Eight foresters and eight erosion engineers carry on this phase of the work. If and when additional camps are allotted to the T.V.A., the number of foresters and engineers for this work will be increased.

(2) The U. S. Forest Service, through the men in the Knoxville office, acts as the contractor. Its function is to select the supervisory camp personnel, furnish the equipment for carrying on the work, and prepare reports on the work accomplished.

(3) The U. S. Army, operating from Third Corps Headquarters for the Virginia camps, and Fourth Corps Headquarters for the Tennessee and Alabama camps, takes care of the housing, feeding, clothing and general welfare of the enrollees. The Army also acts as paymaster to the enrollees and officers.

These three agencies in the Tennessee Valley have worked side by side and are cooperating 100 per cent on all matters pertaining to the work. The fact that each of the agencies has men in authority located at a central headquarters office enables any minor difficulties to be quickly adjusted, and appeals to higher authorities are seldom necessary.

The erosion control technique which has been developed in the Norris Lake region of the Tennessee Valley is somewhat different in its application, I believe, from that generally used on other erosion control projects. This is due, to some extent at least, to the fact that the original work carried on in the Clinch-Powell drainage basin above the Norris Dam had for its immediate objective the prevention of gravel, sand, and silt reaching the Norris Reservoir. With the date of completion of the dam set for January 1, 1936, it was considered essential to have effective means of control installed prior to that time. The steep terrain, the heavy rainfall concentrated during certain heavy showers, and the nature of the soil resulted in long, nar-

row, V-shaped gullies, with steep side walls. These conditions led at first to the construction of rather permanent and very numerous check dams built of logs, rock, and rock masonry. It was soon found, however, that this method of approach would be a costly one, and that even with nineteen camps, of which 17 were above the dam, we would not be able to accomplish our objective. A change in the technique was made, therefore, with the objective of cheapening the work and making the man-days of work available more effective. The method of control now being used was developed during the summer of 1934. It is not an entirely new plan, but has been adapted from experimental methods tried out at the Statesville, N. C., experiment station of the Bureau of Chemistry and Soils. The present plan of procedure, after the work areas have been selected and an agreement drawn up with the land owner, is as follows:

The forester and the erosion engineer examine the eroded area and prepare plans for the work, the engineer planning such structures as check dams, diversion ditches, etc., and the forester making the plans for reforestation. The engineering phase of the work consists of several methods of attack, depending on the nature and extent of erosion found. In cases where the washing has resulted in the formation of a series of shallow shoe-string gullies, they can be plowed in and the area planted to grass and trees. Where single deep gullies cut through an area, the control method consists of erecting check dams in the gully, plowing in the gully banks, and establishing a vegetative cover behind the dams and on the slopes of the banks. Where the gullies are more numerous, and where extensive "galled" spots occur, the procedure is a little more involved. In such cases, it consists of several steps.

The area of the drainage basin is first determined by a survey, so that the maximum amount of run-off which has to be cared for can be determined. After this

has been done, the T.V.A. erosion engineer and the camp engineer stake out the location of all dams and diversion ditches and indicate where gullies should be plowed in. Both engineers keep check on the work while it is in progress and the T.V.A. erosion engineer passes on it at a final inspection.

After the size of drainage ditches and spillway notches for the check dams has been determined, one gully (in extensive areas it may be more) is selected for the purpose of carrying all the run-off water from the area to be treated. Check dams of log or rock are constructed in this gully, with spillway notches deep enough to care for the concentrated water which the gully must carry.

Diversion ditches, with a base of not less than three feet and with a grade of not over 1 per cent, are then laid out and built so as to carry the water away from the heads of all gullies except the one already referred to.

The gullied and eroded areas below the diversion ditches and the banks of the controlled gully are then plowed in, so that the steep banks are reduced to at least a one-to-one slope and so that a good seed bed will be provided for the grass, legumes, and trees which are to be planted.

The area which has been plowed is next planted to a grass mixture, which during the spring months consists of ten pounds of Italian rye grass, six pounds of perennial lespedeza, two pounds of Korean lespedeza, two pounds of Tennessee 76 lespedeza, two pounds of sweet clover, two pounds of red top, and two pounds of orchard grass. This mixture is sown at the rate of about 26 pounds per acre over all of the area which has been freshly plowed, and along the banks of the diversion ditches.

A light matting of straw or pine or cedar brush is then scattered over the freshly seeded area. In some cases this seeding and matting is done in strips, with alternate strips receiving no treatment, the strips

being about twenty feet wide. The purpose of planting grass and legumes is to furnish a protection for the freshly plowed area until such time as the trees, which are planted later, will provide sufficient cover. In cases where the land owner has no objection to its use, Bermuda grass may be established by planting rooted stolons. It is particularly recommended for use behind the dams, where it will spread and hold the collected silt.

The final stage in the control measures is planting the area to such pioneer tree species as black locust, shortleaf pine, Virginia pine, or red cedar, with a scattering of such climax species as yellow poplar, black walnut, various oaks, and in some cases blight-resistant Asiatic chestnut. The black locust is planted primarily in the gullied areas, where spacings from 3 x 3 feet to 6 x 6 feet are used, depending upon the condition of the gully and its tendency to erode. Pines are planted on the areas which have not washed so badly and where some vestige of the top soil remains. Pine is also favored in the sandier sites. Both the Virginia pine and locust are considered pioneer species and are not looked upon as trees which will make up the climax association.

In order to introduce trees of the more valuable climax species, seed spotting of black walnut, Asiatic chestnut, various oaks, and yellow poplar is carried on on favorable sites within the locust and pine plantings. Seedlings of these species are also put out in the more favorable locations which are found behind the check dams or in moist pockets where rich top soil may still be found. Most of the areas to be planted have lost the topsoil, and it would be useless to plant climax species direct. By introducing a few trees of the better species they can be depended upon to act as seed trees, and after a period of time to convert the stand from a pine or locust to a mixed hardwood stand. On some of the eroded areas a volunteer pioneer stand of hickory, persimmon, sassa-

fras, cedar, or pine may be partially established. In such cases the planting which is done is for the purpose of filling in the gaps and for the purpose of introducing trees of the more desirable species.

There are, throughout the Valley, areas on which the gullies are still in the formative stages and where extensive control work such as the placing of matting or the building of check dams is not necessary or justified. On many such areas all that is needed in the way of site preparation is the plowing of furrows along the contours, with a spacing of about six feet between the furrows. The trees are then planted in the furrows, spacing them six feet apart.

Some idea of the extent of the reforestation work carried on this year as an integral part of the erosion control program can be gained from the fact that five million trees will be planted during the 1934-35 planting season. Last season three mil-

lion trees, mostly locust, were planted. The trees planted this year were grown for the most part in the two forest nurseries at Clinton, Tenn., and at Wilson Dam, Ala. The Asiatic chestnut were grown in the tree crop nursery at Norris. Additional shortleaf and Virginia pine as well as several hundred thousand hardwood seedlings were obtained by digging wild stock on adjoining forested areas. With the further development of the nurseries the planting can be stepped up and all the required planting stock will be grown in the nurseries.

A real start has been made toward erosion control by the T.V.A. Forestry Division on lands not required for crop production. Lands which have been washing away, with gullies getting deeper and deeper, have had the erosion checked and a young stand of trees is coming along to furnish a complete vegetative cover in from three to five years.