A Brief Biography of Clement Mesavage

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Long-time Southern Forest Experiment Station (SOFES) researcher and administrator Clement Mesavage, Sr., was born on October 29, 1911 in Glen Lyon, PA and received his forestry education at Pennsylvania State University. After graduating in 1936 with a bachelor's degree (Anon. 1971), Mesavage first worked as a junior forester with the U.S. Department of Agriculture Forest Service's Allegheny Forest Experiment Station in Huntingdon County, PA and Wilkes-Barre, PA. A precocious researcher, Mesavage's first publication came the year he graduated with an article (Mesavage 1936) that described using the "Koch profile method" for visibility maps from topographic maps as a firefighting aid presaged both his career as a mensurationist and a practical forester working to develop new forestry tools.

Mesavage's early working years were in northeastern Pennsylvania, a region known for its anthracite coal production that had suffered many hardships during the Great Depression. His labors to assist landowners with their forest resources (Allegheny Forest Experiment Station 1940, Mesavage 1942)—aided by his brother and fellow forester Stanley—were credited by some with helping to boost congressional support for the Allegheny Forest Experiment Station (Schrepfer and others 1973). During his time in the Allegheny Forest Experiment Station, Mesavage began working with James W. "Jim" Girard, a legendary timber cruiser and assistant director of the Forest Service's national timber survey program. With abundant drive and plenty of experience, Girard was a self-taught Tennessean with only a sixth-grade education who literally wrote the book (Girard and Gevorkiantz 1939) on timber cruising. Mesavage (1942) adapted Girard's work on tree form class to generate volume tables for Allegheny tree species, and Mesavage and Girard later cooperated on a number of other volume tables.

Mesavage's move to the South came in 1943, when he transferred to the SOFES office in New Orleans, LA. In doing so, Mesavage joined I.F. Eldredge's forest survey staff to work on "forest depletion" (later called "growth and drain") and the SOFES's Products Supplies Survey, part of the Station's war support efforts. Although successful for its time, the Forest Service's initial (1930s) southern forest survey lacked the desired rigor and did not come with sufficient resources or even a directive to continue (Barnett 2023). By 1943, the Federal Government determined it needed a better and more complete—and continuous—assessment of the forest conditions and timber production in support of the war effort. With additional resources (including funding from the War Production Board), work began in 1943 and the efforts to revive and modernize the forest survey program continued into 1944 (SOFES 1944). Mesavage was one of the staff assigned to help the SOFES reorganize and re implement a southern forest survey (Anon. 1971).

Clement Mesavage scaling a large longleaf pine (*Pinus palustris*) in Georgia to check its form class. Mesavage spent much of his career in the field working on improving the data and technology related to mensuration and inventory. (USDA Forest Service photo taken by C.R. Lockard in July 1945)

During the war, Mesavage (1944) observed increasing requests received by the Station for forest growth and yield information and where to find timber. Following the end of World War II, the Nation transitioned back to peacetime production and concerns about timber scarcity returned. A modernized forest survey had improvements in theory and design to ensure rapid, low-cost data collection (SOFES 1944). Such tasks were well suited to Mesavage, who with a number of other SOFES staff formed a quantitative cadre that helped advance the rigor of southern forest science (Barnett and others 2023). For instance, they contributed to the Forest Service's national timber "reconnaissance" (USDA Forest Service 1946) that helped determine the growth and drain of forests across the South (SOFES 1945, Mesavage and Duerr 1946). According to SOFES (1945), these timber estimates were greatly facilitated by both improved sampling techniques and the volume tables developed by Mesavage and Girard, which increased the speed, accuracy, repeatability, and affordability of these measurements.

Top: The development of large-scale forest surveys, tools, and techniques to better quantify individual trees helped to both recover and sustain timber industry in places such as the Arkansas Ozarks. (USDA Forest Service photo taken by Clement Mesavage in 1951)

Bottom: Meeting of the Central Ozarks Branch advisory committee composed of representatives from local agriculture, forestry, and industry interests. (USDA Forest Service photo taken by Clement Mesavage in 1950)

Mesavage had taken Girard's approach to tree form class designation and developed it into a series of reasonably robust and applicable tables (Mesavage 1946). In using this generalized form class approach, the cubic foot (Mesavage 1947) and board foot (Mesavage and Girard 1946) volume tables were widely applicable and did not need to be custom developed for each stand or forest type. Yet this improved approach did not earn immediate acceptance in many quarters of the agency. Even though these publications eventually became used across the Eastern United States, according to Reynolds (1980) both Mesavage and Girard were disappointed that the Forest Service did not initially embrace their volume tables, delegating this work to a lesser status by not giving it a publication number and labeling it for "administrative use."

Perhaps this disappointment explains Mesavage's next career move. Following a post war realignment of experiment station territories, northern Arkansas was transferred from the Central States Forest Experiment Station to the SOFES. By January 1, 1946, the SOFES had set up an advisory committee for the Central

Ozarks Branch headquartered in Harrison, AR (Anon. 1956). At this time, the Central Ozarks Branch included only the Sylamore Experimental Forest, which had been established in late 1933 to study the hardwood-dominated forests of the region. In 1947, the Central Ozarks Branch needed a new leader after their former leader, Philip R. Wheeler, moved to New Orleans, LA to become the SOFES Forest Management Division Chief. About this same time, the SOFES pared back their efforts and staffing in forest survey work because of agency funding cuts (SOFES 1947).

While a person as accomplished as Mesavage could have stayed with the reduced SOFES forest survey, it may be that the disappointment over his volume table publications coupled with uncertainty about the agency's diminished interest in forest inventory work pushed him toward this new opportunity. Mesavage accepted the assignment as the SOFES's Research Center leader, a position he held until 1962. His efforts during this period included quantitative studies of species such as shortleaf pine (*Pinus echinata*), eastern redcedar (*Juniperus virginiana*), and oaks (*Quercus* spp.) (Maple and Mesavage 1958). Remarkably, little of this management-oriented research was published by Mesavage, although his contributions on eastern redcedar were significant and he probably turned some of his work over to others to complete (Arend 1946, Ferguson and others 1968).

Mesavage's duties at the Central Ozarks Branch also included expansions of the Station's experimental forests. During the post war period, the Federal Government broadened its efforts to use forestry as an opportunity to improve the economic circumstances of much of the rural parts of the Nation, especially where row crop agriculture provided few viable options, but timber production was possible (Barnett and Bragg 2023). The Ozarks had long been considered an area of need, with exploitive lumbering of the original forests of this region having long since depleted the forests. The 2,925-acre Sylamore Experimental Forest, formally established on March 28, 1934, was not sufficient to meet all the needs of the SOFES's planned research program in the Ozarks, so the search began for a new experimental forest. In 1949, the Forest Service purchased a small (~750 acre) parcel of land near the Buffalo River by Harrison, AR that met the research program needs. In September 1950, Mesavage hosted a ceremony for local foresters and dignitaries to dedicate the new Henry R. Koen Experimental Forest, named in honor of the former Ozark National Forest supervisor (Anon. 1950).[1] On October 22, 1954, the Sylamore Experimental Forest was re-established, with additional lands, bringing its area up to 4,180 acres.

Mesavage's research center in Harrison, AR also grew to encompass experimental forests in the Ouachita Mountains of Arkansas. Established on July 19, 1940, but inactive by the end of World War II, the Irons Fork Experimental Forest had had no meaningful research conducted on it for years. According to correspondence on file, in January 1956, Mesavage proposed reactivating work on the Irons Fork Experimental Forest, but by September of that year he had cooled to this remote forest, with its rugged and less-timbered slopes (Mesavage 1956). Mesavage soon identified a more suitable research site in the Ouachita National Forest, and in

Top: Example of some of the quantitative silvicultural studies being conducted on an experimental forest in northern Arkansas. (USDA Forest Service photo taken by Clement Mesavage circa 1950)

Bottom: Photograph of the entrance to the Henry R. Koen Experimental Forest, established as one of two experimental forests developed to be representative of the millions of acres of "depleted" hardwood forests of the Arkansas Ozarks. (USDA Forest Service photo taken by Clement Mesavage in 1950)

[1] The official establishment report for the Henry R. Koen Experimental Forest would be signed on September 17, 1951.

A stand of mature high-quality sweetgum (*Liquidambar styraciflua*) and tupelo gum (*Nyssa sylvatica*) in the Apalachicola River bottoms of northern Florida. (USDA Forest Service photo taken by Clement Mesavage in 1946)

1958 this location for watershed- and silviculture-based studies became the Alum Creek Experimental Forest.

Starting in the 1950s, Mesavage worked closely with Lewis R. Grosenbaugh, a fellow mensurationist who started his Forest Service career on the national forests in Arkansas. Together, they worked on ways to improve the cruising and sampling of various forest types, including Ozark hardwoods (Mesavage and Grosenbaugh 1956). This highlights another key aspect of his talent as a scientist; years later, Grosenbaugh's retirement memo mentioned Mesavage as first in a list of "foresters who grasped the potentialities and acted as exponents" of his pioneering mensuration (Grosenbaugh 1974: 5).

Following a reorganization of Forest Service research in 1962, the administrative structure of the Harrison Research Center was changed into one driven by research projects (Barnett and Bragg 2023). In June 1962, Mesavage was temporarily appointed as the forest management project leader, but only until E.R. Ferguson moved to the Harrison Research Center a few months later. In 1963, the Harrison-based Mesavage was charged with running the SOFES's newly established mensuration research project located in Hot Springs, AR (SOFES 1963). Mesavage's pursuit of adapting existing technology to improve forest mensuration is expressed repeatedly in his publications. For example, Mesavage (1965b) recognized the inherent weaknesses of using stand tables to estimate tree volumes—something he based much of his earlier work on—and helped Grosenbaugh adapt the sophisticated tools and analysis techniques related to 3P sampling and the use of dendrometers in a manner that field foresters could appreciate.

His capacity for technological adaptation was more than just academic or conceptual. For most of his career, Mesavage was a tinkerer, and built a number of tools to help make the sometimes arduous and physically demanding work of forest measurements easier and more repeatable. As an example, Mesavage (1942) designed a ternary chart that could be used to facilitate conversion of tree volumes between one Girard Form Class to another. In 1949, Mesavage received U.S. patent 2,471,491 for a tree volume calculator based on Girard's form classes. Later, Mesavage (1965a) published the design for a "taperscope" adapted from an Abney hand level to compare bole diameters to help identify merchantable tree height in standing timber. Mesavage developed some of the equipment and techniques that supported Grosenbaugh's work with 3P sampling (Mesavage 1965b, 1967a, 1969c). Mesavage was also key to the development of a number of modifications to the Barr and Stroud dendrometer (realized in the FP12 and FP15 models of that product) and Zeiss Telemeter Teletop instruments to make them more conducive to use in typical forest conditions (Mesavage 1967a, 1969b, 1969c). About this same time, Mesavage (1967b) "devoted much personal as well as official effort" to design a mechanical random number generator (for up to 5 numbers) that made randomization a much easier and less cumbersome task in the field (Grosenbaugh 1965). As with many of his fellow scientists, Mesavage was also an avid and capable photographer, with some of his pictures of forest conditions and study treatments appearing in Forest Service publications.

In June 1966, Mesavage left the SOFES to work as a forester with the Division of Timber Management for the Forest Service's National Forest System. In this

capacity, Mesavage worked on the application of timber volume and value determination tests for use by field foresters (Anon. 1970, 1971). Although no longer in the research branch of the agency, he also continued to publish on some of his earlier studies, including a paper on the value of accurate bark thickness measurement (Mesavage 1969a). After 34 years, Mesavage retired from the Forest Service (Anon. 1970). On April 2, 1971, Mesavage died suddenly at his home in Harrison, AR of an apparent heart attack (Anon. 1971). Only 59 at his untimely death, Mesavage had left a remarkable legacy for the SOFES and the forestry profession.

REFERENCES

Allegheny Forest Experiment Station. 1940. Survey of forest employment possibilities in the anthracite region of Pennsylvania. Anthracite Survey Paper 1. Wilkes-Barre, PA: U.S. Department of Agriculture Forest Service, Allegheny Forest Experiment Station. 7 p.

Anon. 1950. Forest dedicated at Ozark meeting. Journal of Forestry. 48(11): 814.

Anon. 1956. Advisory Committee, Central Ozarks Branch, Southern Forest Experiment Station. In: Committee on Government Operations. Replies from Executive Departments and Federal Agencies to inquiry regarding use of advisory committees (January 1, 1953 to January 1, 1956): Part 1—Department of Agriculture. 84th Congress, 2d Session. Washington, DC: Government Printing Office: 502–505.

Anon. 1970. Mesavage retires after 34 years. Journal of Forestry. 68(9): 599.

Anon. 1971. Clement Mesavage (1911-1971). [Obituary]. Journal of Forestry. 69(6): 386.

Arend, J.L. 1946. Growing eastern red cedar on the farm. Southern Lumberman. 173(2177): 240, 242, 244.

Barnett, J.P. 2023. The first southern forest survey. In: Bragg, D.C., ed. Celebrating 100 Years of Forest Science: An Abridged History of the Southern Research Station. Gen. Tech. Rep. SRS-272. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station: 115–122.

Barnett, J.P.; Bragg, D.C. 2023. An abbreviated administrative and organizational history of the Southern Forest Experiment Station. In: Bragg, D.C., ed. Celebrating 100 Years of Forest Science: An Abridged History of the Southern Research Station. Gen. Tech. Rep. SRS-272. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station: 123–162.

Barnett, J.P.; Leduc, D.J.; Bragg, D.C. 2023. Some early developers of statistical and mensuration techniques at the Southern Forest Experiment Station. In: Bragg, D.C., ed. Celebrating 100 Years of Forest Science: An Abridged History of the Southern Research Station. Gen. Tech. Rep. SRS-272. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station: 107–113.

Ferguson, E.R.; Lawson, E.R.; Maple, W.R.; Mesavage, C. 1968. Managing eastern redcedar. Res. Pap. SO-37. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 14 p.

Girard, J.W.; Gevorkiantz, S. 1939. Timber cruising. Washington, DC: U.S. Department of Agriculture Forest Service. 160 p.

Grosenbaugh, L.R. 1965. Three-pee sampling theory and program "THRP" for computer generation of selection criteria. Res. Pap. PSW-21. Berkeley, CA: U.S. Department of Agriculture Forest Service, Pacific Southwest Forest and Range Experiment Station. 53 p.

Grosenbaugh, L.R. 1974. Retirement and annual report covering 1973-1974. Unpublished memo from L.R. Grosenbaugh to the Director of the Southeastern Forest Experiment Station, dated 3 June 1974. https://ufdc.ufl.edu/AA00007565/00001. [Accessed: 29 August 2020]. 19 p.

Maple, W.R.; Mesavage, C. 1958. Remarkable shortleaf pine stand. Journal of Forestry. 56(4): 290–291.

Mesavage, C. 1936. Application of the Koch profile method in the construction of visibility maps. Journal of Forestry. 34(9): 870–872.

Mesavage, C. 1942. Volume tables for commercial timber in the anthracite region of Pennsylvania. Anthracite Survey Pap. 4. Wilkes-Barre, PA: U.S. Department of Agriculture Forest Service, Allegheny Forest Experiment Station. 27 p. https://doi.org/10.5962/bhl.title.121818.

Mesavage, C. 1944. Forest survey estimates of southern forest growth. Southern Lumberman. 169(2129): 168–170.

Mesavage, C. 1946. New tables for estimating board-foot volume of timber. Southern Lumberman. 173(2177): 153–156. https://doi.org/10.5962/bhl.title.127722.

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Mesavage, C. 1947. Tables for estimating cubic-foot volume of timber. Occasional Pap. 111. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 70 p. https://doi.org/10.5962/bhl.title.127722.

Mesavage, C. 1956. Letters dated January 1, 1956 and November 16, 1956 to Philip A. Briegleb. On file with: Arkansas Forestry Sciences Laboratory, Southern Research Station, USDA Forest Service, 110 University Court, Monticello, AR 71655.

Mesavage, C. 1965a. Definition of merchantable sawtimber height. Journal of Forestry. 63(1): 30–32.

Mesavage, C. 1965b. Three-P sampling and dendrometry for better timber estimating. Southern Lumberman. 211(2632): 107–109.

Mesavage, C. 1967a. Modification of FP12 Barr and Stroud dendrometer for easier field use. Res. Note SO-50. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 3 p.

Mesavage, C. 1967b. Random integer dispenser. Res. Note SO-49. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 3 p.

Mesavage, C. 1969a. Measuring bark thickness. Journal of Forestry. 67(10): 753–754.

Mesavage, C. 1969b. Modification of a Zeiss Telemeter Teletop for precision dendrometry. Res. Note SO-95. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 7 p.

Mesavage, C. 1969c. New Barr and Stroud dendrometer model FP 15. Journal of Forestry. 67(1): 40–41.

Mesavage, C.; Duerr, W.A. 1946. Timber resources of the Lower South, 1946. Forest Survey Release 55. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 6 p.

Mesavage, C.; Girard, J.W. 1946. Tables for estimating board-foot volume of timber. Washington, DC: U.S. Department of Agriculture Forest Service. 94 p. https://doi.org/10.5962/bhl.title.127722.

Mesavage, C.; Grosenbaugh, L.R. 1956. Efficiency of several cruising designs on small tracts in north Arkansas. Journal of Forestry. 54(9): 569–576.

Reynolds, R.R. 1980. The Crossett story: The beginning of forestry in southern Arkansas and northern Louisiana. Gen. Tech. Rep. SO-32. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 40 p.

Schrepfer, S.R.; Larson, E.vH.; Maunder, E.R. 1973. A history of the Northeastern Forest Experiment Station, 1923 to 1973. Gen. Tech. Rep. NE-7. Upper Darby, PA: U.S. Department of Agriculture Forest Service, Northeastern Forest Experiment Station. 52 p.

Southern Forest Experiment Station [SOFES]. 1944. Twenty-fourth annual report of the Southern Forest Experiment Station. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 23 p.

Southern Forest Experiment Station [SOFES]. 1945. Twenty-fifth annual report of the Southern Forest Experiment Station. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 54 p.

Southern Forest Experiment Station [SOFES]. 1947. Twenty-seventh annual report of the Southern Forest Experiment Station. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 90 p.

Southern Forest Experiment Station [SOFES]. 1963. 1962 at the Southern Forest Experiment Station. New Orleans: U.S. Department of Agriculture Forest Service, Southern Forest Experiment Station. 75 p.

USDA Forest Service. 1946. Gaging the timber resource of the United States. Report 1 from a reappraisal of the forest situation. Washington, DC: U.S. Department of Agriculture Forest Service. 62 p.