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NORRIS DAM AND THE BIRTH OF TVA

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NORRIS DAM AND THE BIRTH OF TVA

Norris Dam spans the Clinch River, a mountain tributary of the Tennessee River, 26 miles north of Knoxville. It is a massive concrete partition stretching 1,800 feet, or one-third of a mile, from one riverbank to the other and rising 265 feet above the bedrock, the height of an eighteen-story building. When workmen lowered the sluice gates on March 4, 1936, Norris Dam became the fourth largest water barrier in the world. It formed an 83-square-mile reservoir with 800 miles of shoreline, capable of impounding 830 billion gallons of water, or one year's worth of rainfall.¹ The Clinch and Powell Rivers were transformed into slack water lakes marked by gnarled, fingerlike inlets that reach into the hills of northeastern Tennessee. Standing as a compelling technological achievement, this mammoth "wall of masonry" represented a significant step in the nation's 100-year-old quest to turn the destructive power of the Tennessee River into a source of economic and social progress.²

But Norris Dam's historical significance, despite its awesome presence, does not reside in the technological contribution it made to the science of dam building. As the first completed project of the Tennessee Valley Authority (TVA), the dam launched one of America's most unique political experiments and emerged as a symbol of TVA's ideals and purpose. It provided a framework for structuring many of the agency's administrative procedures and policies and thus emerged as an enduring monument to TVA's accomplishments.

Created on May 18, 1933, TVA was designed as a regional agency with broad jurisdiction over resource development in the Tennessee River Valley's "butterfly-shaped" watershed, a 40,000-square-mile basin found in parts of

seven states (Virginia, North Carolina, Georgia, Alabama, Mississippi, Kentucky, and nearly all of Tennessee). Built between 1933 and 1936, Norris Dam constituted the agency's first tangible product, an explicit expression of TVA's responsibility to harness the forces of nature for the benefit of the people. With its wide fluctuations in streamflow, from 5,000 cubic feet per second to floods measuring 440,000 cubic feet per second, the untamed Tennessee River posed a threat to the people and land of the valley.³ Finally, a manmade water barrier would restrain its force. Flood control, improved navigation, and the production of hydroelectric power would be part of a unified plan for resource development in the region.⁴

Placing a dam on the Clinch River north of Knoxville had been the subject of two extensive surveys prior to the creation of TVA--a 1918 report issued by the Tennessee Geological Survey and a 1930 report by the U.S. Army Corps of Engineers. The reports concluded that extensive power, navigational, and flood control benefits could be attained from the unified operation of the Tennessee River and its tributaries. Located on the Clinch River, which fed directly into the Tennessee, the multipurpose Cove Creek (Norris) Dam would serve as a main spigot regulating the force of the entire river system.⁵

While government agencies studied the feasibility of constructing a dam on the Clinch River, Congress engaged in a lengthy and heated debate over the fate of World War I facilities at Muscle Shoals, Alabama. Section 124 of the 1916 Defense Act, passed just before America's entry into World War I, led to the construction of nitrate plants along the Tennessee River at Muscle Shoals. The act also approved the building of Wilson Dam at the site to supply a constant source of power to the nitrate plants. Congress authorized the construction because dependence on foreign sources of nitrates used

in the production of explosives and fertilizers posed a threat to national security in times of both peace and war. But before construction could be completed, World War I ended, leaving the government with an unproductive investment of \$150 million.⁶

What to do about the partially completed project at Muscle Shoals remained part of the congressional agenda throughout the 1920s. In a 15-year period between 1918 and 1933, over 100 congressional bills and resolutions were introduced to settle the debate. Private bids either to purchase or lease the property usually were motivated by a desire to exploit the power potential of Wilson Dam and, more importantly, to serve as an entry toward the wider power development of the Tennessee River. But these offers contained serious liabilities that outweighed their potential benefits. Prospective buyers asked the government to transfer the property at bargain prices, and none promised the unified development of the Tennessee River's resource potential, concentrating on profitable power production instead of the less lucrative production of nitrate fertilizers. A decade and a half of debate, including a nationally publicized offer from automobile magnate Henry Ford, left the issue unresolved. Congress could never agree to sell the dam and nitrate factories, which some politicians viewed as a white elephant and others as an opportunity for unprecedented legislation.⁷

Petitions for private use of the operations at Muscle Shoals were not the only aspects of the congressional debate. As early as 1922, Senator George Norris of Nebraska urged continued government ownership of the complex. A firm advocate of the public's right to control the nation's waterways and sources of power, Norris believed that the full economic and social benefits

of Muscle Shoals, and more generally of the Tennessee River basin, could only be attained through unified resource development--a project so vast in magnitude that it required the direct involvement of the federal government.⁸ At first, the arguments presented by Norris were overshadowed by the debate over the Ford proposal. But tireless persistence gradually enabled the Senator's voice to be heard. Twice--in 1928 and then again in 1931--Norris obtained congressional approval for bills that would have sustained public ownership at Muscle Shoals. But each bill fell victim to a Presidential veto--first by Calvin Coolidge and then by Herbert Hoover.

The devastating impact of the stock market crash in 1929 sent shock waves throughout the nation. The social and economic dislocations cleared a political path for the election of Franklin D. Roosevelt. On April 10, 1933, President Roosevelt, who had been in office for just 5 weeks, called on Congress "to create a Tennessee Valley Authority--a corporation clothed with the power of government but possessed of the flexibility and initiative of a private enterprise." The President's immediate concern was to rekindle the productive use of the facilities at Muscle Shoals, but his message to Congress contained a larger agenda--the unified resource development of the entire Tennessee Valley, a watershed equivalent in size to New England. The river basin would emerge as the basic administrative unit. Arbitrary State political boundaries would give way to the natural configuration of the land.

It is clear that the Muscle Shoals development is but a small part of the potential usefulness of the entire Tennessee River. Such use, if envisioned in its entirety, transcends mere power development: it enters the wide fields of flood control, soil

erosion, afforestation, elimination from agricultural use of marginal lands, and distribution and diversification of industry. In short, this power development of war days leads logically to national planning for a complete river watershed involving many States and the future lives and welfare of millions. It touches and gives life to all human concerns.⁹

Quick action by Congress enabled the President to sign the act into law on May 18, 1933, creating the Tennessee Valley Authority. Legislative passage represented a personal triumph for Senator George Norris and marked a new chapter in the history of the Tennessee Valley. Rich in natural resources and blessed with an abundance of coal, timber, and untapped sources of hydroelectric power, the Tennessee Valley possessed enormous economic potential for the 2.5 million citizens who lived there in 1933. But the people of the valley, despite a rich and proud heritage, suffered from debilitating poverty, a consequence of profligate agricultural and timbering practices, inadequate transportation and energy supplies, and regional imbalances in industrial investment. Family income was only 45 percent of the national average. In the Norris Reservoir area, where the dam was eventually built, the 3,500 families removed from the flooded basin earned an average of less than \$100 in cash each year. Sixty percent of the people tilled the land for their livelihood, land that was becoming increasingly difficult to cultivate. Of the 13 million acres in the valley used for crops and pastures in the early 1930's, 2 million was gullied, 1 million was partially gullied, and 7 million was visibly eroded. With three-quarters of the farmland losing its fertility, the Tennessee River was literally "running away with the land." If "slash and burn" tactics were

continued, the basin would have been turned into barren rocks and stark red clay unable to sustain civilized life in a matter of decades. These deteriorating economic and environmental conditions resulted in a mass migration from the region. Between 1920 and 1930, 1.8 million people--or more than 33 percent of the region's population--left.¹⁰

To overcome these problems, TVA was granted extensive political authority and independence in programs for unified resource development. The act called upon the agency to improve flood control and navigation along the Tennessee River; to generate electricity as a byproduct of its efforts to tame the river; to research and produce improved fertilizer; to investigate the proper use of marginal agricultural lands; to reforest the denuded timber tracts; and, in general, to promote "the economic and social well-being of the people living" in the river basin. Self-consciously limited in specific requirements, the act expressed the experimental nature of the agency. Although the intent was clear, the means of carrying out responsibilities were kept deliberately vague to ensure corporate independence for the board. To circumscribe political interference from Washington, the three-member Board of Directors was given nine-year terms, extended beyond the four-year term of the Chief Executive. To avoid the potential pitfalls of political patronage and the stultifying impact of bureaucracy, the agency was directed to appoint and promote all employees "on the basis of merit and efficiency." Broad administrative flexibility and initiative were the hallmarks upon which TVA was built. President Roosevelt enhanced this flexibility through an Executive order that transferred all management responsibilities to the board.¹¹

The construction of Cove Creek (Norris) Dam across the Clinch River was one of the few projects specifically assigned to the agency in the TVA Act. Positioned at a commanding site on a major tributary of the Tennessee River, the dam would impound huge quantities of water and regulate its flow to minimize the threat of flooding and maximize the potential for navigation and hydroelectric power. Indeed by feeding water downstream during dry seasons, Norris Dam increased the dependable energy potential at Wilson Dam sixfold, to 137,000 kilowatts.

When the Board of Directors held its first meeting in Washington, D.C., on June 16, 1933, it faced a vaguely defined but enormously complicated task--one that would test the Directors' notable experience and achievements.

Arthur E. Morgan, appointed Chairman of the Board, possessed an impressive background in both engineering and education. He was a distinguished drainage engineer skilled in flood control and land reclamation and had served as President of Antioch College, where he had earned a national reputation as a thoughtful and progressive administrator. Harcourt Morgan, no relation to Arthur, was a Canadian-born agriculturalist and entomologist who was subsequently appointed President of The University of Tennessee, where he earned recognition for his sensible decisions and down-to-earth language that the people of the valley respected. The third member of the board was David E. Lilienthal, a young and aggressive graduate of Harvard Law School, who first came to public attention as a member of the Wisconsin Public Utilities Board, where he successfully negotiated substantial reductions in statewide consumer rates. The Board of Directors--with combined experience in engineering, law, agriculture, and administration--displayed complementary talents that, when fitted together, created an impressive formula for success.¹²

The U.S. Army Corps of Engineers completed extensive surveys for Cove Creek (Norris) Dam in 1930, three years before TVA was legislated into existence.

The Corps had drawn scientific specifications for the dam, but much preliminary work still had to be done. TVA borrowed staff members with extensive experience in dam building from the Bureau of Reclamation to translate the Corps' tables and charts into a blueprint for construction. Test drilling into the bedrock was undertaken to determine the strength of the foundation on which the dam would rest. As work began, TVA assembled a staff with broad expertise in issues ranging from geological formations to labor-management policies. ¹³

From May through September, meetings and discussions laid the groundwork for the dam's construction. A multiplicity of problems arose. Preliminary tests indicated that the riverbed behind the dam contained porous, limestone sinkholes that would permit seepage into the bedrock and prevent the creation of a stable water level in the reservoir. But further analysis disproved the earlier findings, and the board decided to build the dam at the site selected by the Corps. Local political figures grumbled about TVA's slow progress and voiced skepticism about the agency's ability to deliver on its promises. Arthur Morgan responded to these charges by meticulously detailing the difficult engineering and administrative task facing TVA and warning critics that haste at this early juncture might lead to an unfortunate catastrophe later. ¹⁴

In late September, TVA began to clear and excavate land around the dam site (which was renamed Norris Dam in honor of the Nebraska senator). In November, construction on the first coffer dam began, two months ahead of schedule. Within a year, the dam was one-third complete, and within two years the

2,800 Norris Dam workers assigned to the task had finished 75 percent of the construction. On March 4, 1936, President Franklin D. Roosevelt pushed a button from his Washington office setting off a siren at Norris Dam that alerted TVA workers to close the sluice gates. Water was impounded behind the dam's wall, and the first of the agency's slack water lakes began to form along the Clinch and Powell Rivers. To clear a path for the dam, workers blasted and cleared 127,000 cubic yards of earth and 158,000 cubic yards of rock. The cost of construction was \$32.3 million, \$5.0 million below the initial estimate.¹⁵

Prior to the creation of TVA, Norris Dam was perceived solely as an engineering problem. No attention was paid in the design to cultural and social factors. Planned by the Bureau of Reclamation, blueprints called for a classical revival dam with the powerhouse draped in a column-like facade similar to the design of Wilson Dam in Muscle Shoals. TVA's principal architect, Roland Wank, studied the plans and made two important changes. First, he freed the design from its neoclassical motif, emphasizing instead sleek, functional forms of rectangular, rough-textured blocks; second, he transformed Norris Dam into a "people's dam" by making the structure accessible to the public. Wank added to the powerhouse a visitors' center with a simple and intelligent architectural design characterized by clean and efficient details that corresponded to the functional purpose of the facility. Enclosed within the powerhouse, the visitor feels a sense of orderliness and control, necessary prerequisites for the awesome task performed by the dam and its workers. Materials such as aluminum and marble speak of its permanent nature; and the use of warm, neutral colors and large, light-emitting glass doors places visitors at ease.¹⁶

Wank also introduced planned circulation routes for both pedestrians and automobile drivers. People could stride past the crown of the generators, stand beside the dam's concrete walls, peer at the top of the spillway, or look down at the sluice gate outlets. If the generators were in operation, visitors could watch the swirling action of the river as it swept by the waterwheel on its journey downstream. Workers and visitors mingled with one another without inhibiting the dam's operation. After touring the powerhouse, visitors could drive on the roadway atop the dam to a lookout. From there, a person enjoyed a "bird's-eye view" of the entire facility--the dam, powerhouse, generating station, transmission lines, Norris Lake, and the recessed paths of the Clinch and Powell Rivers, all encased in a natural mountainous setting. Wank, who assumed that "the public would be interested in resources and in public policies relating to their development," designed a dam that would reflect and accommodate these concerns. The architecture at Norris Dam expressed TVA's philosophy "to work in partnership with people." It combined the precise, scientific approach of the engineer with the artistic perception of the architect to create a structure that harmonized with the forces of nature and technology in a way that conveyed the basic working principles of TVA.¹⁷

In building Norris Dam, the agency also initiated administrative procedures that served as long-lasting precedents for this unique federal agency. In November 1933, Chairman Arthur E. Morgan declared that the construction of Norris Dam would enable "the people of the region" to recognize TVA "as a competent administrative organization." Since the dam would emerge as the primary vehicle through which TVA would translate its lofty goals into a discernible form, the process by which it was built became just as significant

as the final product. The task at Norris would come under close scrutiny by the people of the valley and the entire nation to determine if the agency could fulfill its responsibilities.¹⁸

To attain greater control over the construction schedule and its work force, TVA implemented "force contracts," which meant that the board could hire, train, and supervise its own staff instead of contracting work out to private bidders. TVA assembled a permanent pool of employees, a procedure that reduced costs and facilitated planning. The end result was that Norris Dam was completed one year ahead of schedule and with a price tag \$5 million below original estimates.

TVA was determined not to achieve its social and economic goals on the backs of its labor force. As David Lilienthal asserted:

If we fail to establish fair and decent relations between human beings working on the job, the whole project in my judgement would be a failure even if every other objective were reached. What permanent good will it do our country to save soil, to control floods, and to distribute cheap electricity if those goals are reached through the exploitation of labor?

Arthur Morgan stated the issue more simply: "How we do our work is no less important than what we do." Indeed the agency established a "yardstick" for wages that exceeded the depressed wage levels prevalent in the private sector. For example, TVA paid skilled machine workers at Norris Dam \$1.00 per hour compared to a pay rate of \$.35 to \$.70 per hour established by private utilities. TVA common laborers received \$.45 to \$.55 per hour; in private

industry within the region, workers received \$.15 to \$.35 per hour for the same work. The board also recognized the right of TVA employees to engage in collective bargaining as a method of redressing grievances and protecting their rights. It worked cooperatively with labor councils representing TVA workers to forge articles of agreement that outlined worker-management relations. These articles, drafted during the construction of Norris Dam, served as a platform of principles from which negotiations were launched.¹⁹

When TVA came into existence in 1933, both the nation and the region faced difficult economic circumstances. With 12 million people--or one-quarter of the work force--unemployed, the Depression threatened to unravel the nation's economic and social fabric. As a pocket of poverty amidst the prosperity of the 1920's, the Tennessee Valley's deeper, more intractable problems were compounded by the impact of the Depression. Although given a broad mandate, TVA could not sidestep the compelling need to put people back to work. To increase the total number of TVA employees, a 5½-hour day, or 33-hour workweek, was established. Tests were given to 50,000 applicants to determine their skills and competence. These tests served as guidelines enabling management to match agency needs with the ability and experience of the valley's labor pool.

Spreading the work among more hands not only attacked the unemployment problem, but also provided the administrative framework for attaining TVA's social goals. The agency developed educational programs for its workers as a method of improving the technical skills of the valley's work force. These skills, acquired during off-hours, advanced productivity and work performance during the construction of Norris Dam. When construction was completed, workers could then transport these skills to other jobs and, in the process,

increase their own value to society and the collective value of the society itself. The educational programs, ranging from carpentry to management techniques, proved an effective tool for melding self-interest and community interest into a single administrative framework.²⁰

The residential setting for these programs was not a temporary construction camp but, rather, a permanent community. Norris, Tennessee--a planned rural village designed by Earle Draper, a prominent planner in the first half of the twentieth century--was built to provide a stable home environment for TVA's work force at Norris Dam and to serve subsequently as a convenient place of residence for the administrative and maintenance staff needed to run the facility. A State and National Historic Site in its own right, the town was nevertheless a byproduct of the construction of the dam, another example of the way the concrete water barrier gave tangible form to TVA's principles.²¹

To accomplish its tasks, TVA had to analyze a wide range of environmental factors that impacted on both the land and people of the valley. If rains pelted a denuded mountain slope, silt would collect in the reservoir and reduce its capacity. TVA planted millions of trees, seeded thousands of acres of thick-rooted legume plants, and constructed hundreds of check dams along the banks of Norris Lake--not only to curtail erosion and to protect the soil, but also to retain the maximum capacity of the slack water lakes and to provide a shoreline park for public use. This single task affected a number of resources in the valley and illustrated how a single agency dedicated to unified resource development could make one activity work in a number of different ways. Construction at Norris Dam required substantial quantities of electricity. To reduce the price of energy and the ultimate cost of the dam, TVA drew powerlines a distance of 225 miles from Wilson Dam

in Muscle Shoals to the work site in eastern Tennessee, thus initiating its powerline distribution system. Norris Dam was a massive excavation and building project that dislodged thousands of people from their homes and, in many instances, uprooted residents from an environment cherished for its family heritage. TVA made an effort to retain the sacred heritage of native Tennesseans by developing a relocation program to minimize Norris Dam's impact. Between three and four thousand residents within the reservoir range were moved to other locations, and the bodies of their relatives--five thousand in number--were reinterred. Excavations at Norris Dam also unearthed artifacts of the valley's prehistoric inhabitants. To preserve the past, the agency contracted with archaeologists to investigate the culture of the region's earliest residents.

Nearly fifty years of history have dramatically transformed the TVA and the valley that it serves. Today the agency operates fifty-nine dams on the Tennessee River (and its tributaries) for the purpose of flood control, electric power generation, improved navigation, and recreation. The fury of the Tennessee River has been harnessed just as Norris Dam calmed the force of the Clinch and Powell Rivers in 1936. To meet the energy needs of the people of the valley, the agency has built fossil fuel plants and is now in the midst of an extensive program for the development of nuclear power. But time has not altered the appearance of Norris Dam. The checkerboard dam--still the largest dam on a tributary of the Tennessee--remains an imposing sight. But more than a technological wonder, Norris Dam symbolizes the birth of TVA. It served as a funnel through which the lofty ideals of the agency were transformed into reality, and a demonstration project that set many of the administrative procedures marking TVA's relations with both its employees and the people of the valley. As a self-conscious product of

industrial architecture, the dam conveyed TVA's philosophy, a philosophy based on a program for unified resource development that encourages participation from the residents of the region. "While most of us are dealing with figures, with blueprints, with charts, with budgets, with building things," wrote David Lilienthal in March 1936, "That is not what TVA is about. TVA is about people and for people."²² Whether viewed within the powerhouse or observed from the visitors' lookout perched above the facilities, Norris Dam conveys a sense of social purpose and unity that extends beyond the material benefits created by its precision and power. In both its form and function, the dam expresses TVA's ideals.

Footnotes

1. "Norris," TVA Information Office, Knoxville, TN. See also Barton M. Jones, "Norris Dam," Scientific American 152 (Jan. 1935), 24; "Design of Norris Dam and Powerhouse," Civil Engineering 5 (April 1935), 209; Theodore B. Parker, "The Construction Program of the TVA," Civil Engineering 9 (June 1939), 356. For a popular, largely pictorial, account of the construction of Norris Dam, see Norris Dam (Washington: U.S. Printing Office, 1936) and Geraldine Le May, The Story of Norris Dam (NY: Longmans, Green and Co., 1940). For the most comprehensive technical analysis of the Norris Dam project, see Norris Dam Project: A Comprehensive Report on the Planning, Design, Construction and Initial Operations of the Tennessee Valley's First Water Control Project: Technical Report Number 1 (Washington, D.C.: U.S. Government Printing Office, 1940).
2. As early as 1824, Secretary of War John C. Calhoun, a member of President Monroe's cabinet, recommended that the federal government improve the Tennessee River's navigability around Muscle Shoals, Alabama. In 1828, a survey was completed and construction was begun on a canal to circumvent this treacherous portion of the river. But the canal proved inadequate, the first in a long series of futile attempts to improve transportation on the Tennessee. Between 1852 and 1918, no less than 27 surveys of the river and its tributaries were authorized, but none led to a successful resolution of the problem. See Marguerite Owen, The Tennessee Valley Authority (NY: Praeger Pub., 1973). Also, "TVA," Architectural Forum 7 (Aug. 1939), 73-114; Ellis Kimble, "The Tennessee Valley Project," The Journal of Land and Public Utility Economics 9 (Nov. 1933), 325-339.

3. Parker, "The Construction Program of the TVA," 355.
4. The literature concerning the history of TVA is voluminous. For a comprehensive listing of the unending trail of books and articles on the agency, see A Bibliography for the TVA Program, TVA Technical Library, Knoxville, TN. For an account of the political debate leading to the passage of the TVA Act in 1933, see Preston J. Hubbard, Origins of the TVA: The Muscle Shoals Controversy, 1920-1932 (Nashville, TN: Vanderbilt University Press, 1961). For a highly partisan and provocative presentation of TVA's first two decades of accomplishments by one of its founding fathers, see David E. Lilienthal, TVA: Democracy On The March (1944; rpt. Westport, CT: Greenwood Press Pub., 1977). For an insightful discussion of the internal squabbling due to personalities and politics within TVA, see Thomas K. McCraw, Morgan vs. Lilienthal: The Feud within the TVA (Chicago: Loyola University Press, 1970). For a discussion of the changes in TVA policies through World War II, see Wilmon Henry Droze, High Dams and Slack Waters: TVA Rebuilds a River (Baton Rouge: Louisiana State University Press, 1965), chapters 1-3. For a surprisingly balanced analysis of TVA from an unflinching New Deal advocate and liberal, see Arthur M. Schlesinger, Jr., The Politics of Upheaval (Boston: Houghton, Mifflin Co., 1960), 362-376.
5. Norris Dam Project: A Comprehensive Report, 7-10.
6. Hubbard, Origins of the TVA.
7. Ibid.

8. Norris's proposals differed from the TVA Act in several important aspects. The Norris bills would have divided responsibilities for resource development among several government agencies. A federal chemical corporation may have been established for fertilizer research and production; or the nitrate plants may have been turned over to the Department of Agriculture. Power facilities may have been leased to private companies. By placing management responsibilities within a single agency, the act advanced the principles voiced by Norris when he first presented his bills for the public ownership of Muscle Shoals. See Joseph C. Swidler, "Legal Foundations," in Martin Roscoe, editor, TVA: The First Twenty Years (Knoxville: University of Tennessee Press; University: University of Alabama Press, 1956), 23.

9. Franklin D. Roosevelt, Message to Congress, April 10, 1933.

10. Norris Dam Project, 59; Stuart Chase, "TVA: The New Deal is Greatest Asset: Landscape and Background," The Nation (June 3, 1936), 702; TVA Press Release, Sept. 21, 1933; A. E. Morgan, "Address to the National Academy of Sciences in Boston," TVA Press Release, Nov. 20, 1933. Richard Hellman, "The TVA and the Utilities," Harpers Magazine (Jan. 1939).

11. "TVA Act" 73rd Congress, Session I, Chapters 30-32, May 18, 1932, 63.

12. McCraw, Morgan vs. Lilienthal: The Feud within the TVA, 4-24; "Biographical Sketches," TVA Press Releases, June 1933.

13. TVA Press Release, July 19, 1933.

14. The Washington Star, July 30, 1933; Minneapolis Tribune, Aug. 29, 1933.
15. The Tennessean Magazine, Oct. 21, 1934; The Knoxville News-Sentinel, March 5, 1936.
16. In the waiting room of the Norris Dam powerhouse were models, photographic displays, a pictorial cross section of the dam to supply site-seers with background information. Wank, who displayed a deep understanding of the public nature of TVA projects, described visitors as "Stockholders . . . entitled to the same courtesies" given to 'plant owners.' See Roland A. Wank, "Powerhouses," by Talbot F. Hamlin, Forms and Functions of Twentieth Century Architecture (NY: Columbia University Press, 1952), 260. Also Roland A. Wank, "Norris Dam and Powerhouse," American Architect and Architecture 152 (Feb. 1938), 29-38. "Roland A. Wank, TVA's First Chief Architect," summary by Gilbert Stewart of an interview, Aug. 6, 1965; available at TVA Technical Library.
17. Roland A. Wank, Interview, Aug. 6, 1965; Kenneth Reid, "Design in TVA Structures," Pencil Points, 20 (Nov. 1939), 690-719; Talbot F. Hamlin, "Architecture of the TVA," Pencil Points 20 (Nov. 1939), 720-743; Albert Mayer and Clarence Stein, "Architecture as Total Community: The Challenge Ahead," Architectural Record 136 (Oct. 1964), 144-147.
18. A. E. Morgan, "Address to the National Academy of Sciences in Boston," TVA Press Release (Nov. 20, 1933), TVA Technical Library, Knoxville, TN.

19. David E. Lilienthal, "The Labor Policies of the Tennessee Valley," TVA Press Release (Sept. 2, 1935) TVA Technical Library; "Labor and the Tennessee Valley Experiment," Monthly Labor Review 38 (June 1934) 1279, A. E. Morgan, "The Man on the Job," Survey-Graphic 24 (March 1934), 112-116.
20. "Labor and the Tennessee Valley Experiment," 1279.
21. For discussions on the construction of Norris, see Earle S. Draper, "New TVA Town of Norris, Tennessee, American City 48 (Dec. 1933), 67-68; "TVA Town of Norris, Tennessee," American Civic Annual 5 (1934), 208-209; "TVA's Yardstick for Housing," Architectural Forum 63 (Sept. 1935), 162-170. Also Tracy B. Auger, "The Planning of the Town of Norris," American Architect 148 (April 1936), 18-26.
22. David E. Lilienthal, TVA Press Release, March 2, 1936.