

THE MUSCLE SHOALS PROJECT

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THE MUSCLE SHOALS PROJECT

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PREFACE

The purpose of this thesis is to show the importance of the Muscle Shoals development . In order to understand the part it has played and is to play in the development of agriculture, industry and national defense, it is necessary to give the reader something of its early history, its construction, its legislation, and its operation.

Muscle Shoals was selected as an emergency war measure. The United States Government, realizing its dependence upon Chile for nitrates, built the nitrate plants, and began the construction of the Wilson Dam, to furnish power for the nitrate plants. The plants were not completed until after the Armistice was signed. A test was made to determine their efficiency, after which they remained in a "stand-by condition" for future warfare.

Soon after the Armistice was signed, long before Wilson Dam was completed, the United States Government pursued the policy of disposing of its excess war equipment. During the years following the war, and until the close of the Seventy-second Congress, various offers were submitted for the disposition. Among these was the Henry Ford offer for the purchase of the properties. Later other proposals were submitted for the lease, purchase, or for Government operation, but no success was attained until the Tennessee Valley Authority was created in the spring of 1933; then Muscle Shoals became the cornerstone of that project.

Muscle Shoals, operating under the Tennessee Valley Authority, constitutes one of the major problems of agriculture in the United States at the present time.

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Chapter I

Early History and Construction of Muscle Shoals

Muscle Shoals is situated between what is now Lauderdale and Colbert counties in Alabama, more than 200 miles below the head of navigation and more than 200 miles above the mouth of the Tennessee River.

What is known as Muscle Shoals is a stretch of river approximately 37 miles in length between the head of Brown's Island and the site of the present Florence Bridge. It is said that the Shoals derived its name from the muscular efforts required to push the water craft upstream in early days.¹

The original condition of the Muscle Shoals section consisted of a series of rock shoals with steep slopes, swift currents, and slight low water depths, separated by pools with greater depths and slight slopes. The fall in the 37 miles is 134 feet. The shoals as early as 1779 was recognized as a barrier to upstream traffic at all times and to down stream traffic except at high-water stages.²

In the early colonial days the river was considered of sufficient importance by the Government for engineering study, but very little was accomplished.

On February 14, 1814, the state of Tennessee requested its senators and representatives to use their influence in Congress

1 Muscle Shoals Commission, Muscle Shoals 1931, (Washington, 1931), p. 95.

2 War Department, Annual Report of Chief Engineers, (Washington, 1919), II, pp. 1351 and 1363.
See also House Document No. 1463, 64 cong., 1 sess., (Washington 1916), XIV, p. 7.

in urging an appropriation to remove obstructions which prevented safe navigation at Muscle Shoals.³

Muscle Shoals had its official beginning under the Federal Government on September 7, 1824, when President Monroe in his annual message to Congress presented the annual report of the Secretary of War, John C. Calhoun, recommending a survey of the Muscle Shoals as one of the three great works which he regarded as most important for the improvement of transportation conditions in the United States.⁴ As a result of these recommendations a preliminary examination was ordered on March 12, 1827; and the report of May, 1828, recommended the construction of a lateral canal with 16 locks around the Shoals. These locks were each to be 32 feet wide, 120 feet long, and have a 5-foot lift.

In 1831 the state of Alabama did this work with funds received from the sale of 400,000 acres of land located in northern Alabama and donated by the United States Government for the purpose of improving navigation around Muscle Shoals and Colbert Shoals. Before the Canal was completed, however, it was discovered that these 16 locks were only the middle link required in the canal system, and after \$644,000 had been spent, and the work was practically completed, the boats still had to wait for a rise in the river in order to get through.

3 American State Papers, Miscellaneous, (Washington, 1834), p. 234.

4 American State Papers, Military Affairs, (Washington, November 19, 1828), IV, p. 13.
J. D. Richardson, Messages and Papers of President, (Washington, 1909), II, p. 265.

Recommendations were then made in 1838, for \$750,303 more in order to complete the requisite canal system including Elk River Shoals, Big Muscle Shoals, and Little Muscle Shoals. Congress promptly declined to award this amount but appropriated \$56,769.33 to complete the original canal with 16 locks covering only the middle section of the Shoals.⁵ This left an unimproved length of the river both above and below the canal wherein navigation was difficult, dangerous, and often unpracticable. Therefore, the canal was not used for commercial purposes. Only a few boats, and they under the stress of great necessity,⁶ ever passed through it. Because no provisions were made for maintenance, and the authorized tolls proved insufficient to take care of the canal, it fell into decay and soon became unservicable.⁷

Under act of March 3, 1871, the United States engineers, directed by Major McFarland, and Lieutenants Greene and Gregory made another survey of this section of the river; they submitted a plan in 1872 for the entire reconstruction of the old state canal at a cost of something over \$4,000,000.

Canals containing 27 locks each 60 feet wide, 300 feet long, and 5 feet deep were required to surround Elk River Shoals, Big Muscle Shoals, and Little Muscle Shoals respectively. In 1875 this second canal was begun, and later as a result of examination by a board of engineering officers, the project was modified

5 House Document, No. 781, 60 cong., 1 sess., (Washington, 1908), XVIII, p. 5.

6 Ibid., p. 15

7 House Miscellaneous Document, No. 43, 30 cong., 1 sess., (Washington, 1848), I, p. 1.

reducing the number of locks to 11 and substituting open channel work for the canal around Little Muscle Shoals.⁸

The canal consisted of two sections, the Elk River division and the Muscle Shoals division. The former is 1.5 miles long and has two locks each 60 by 300 feet with a total lift of 23 feet. The Muscle Shoals division, beginning about eight miles below the Elk River Shoals, is 14.5 miles long and has been constructed by enlarging the old canal; this division contains 9 locks each 60 by 300 feet with a total lift of 85 feet. The canal had its formal opening to public traffic on November 10, 1890. Since then the locks machinery, and surroundings have been cared for and kept in a good condition. The canal embankment was inspected daily along its length for the purpose of detecting and locating leaks, and all serious ones were promptly repaired.⁹

In March, 1899, Congress granted to the Muscle Shoals Power Company, a corporation created and organized under a charter granted by the legislature of the State of Alabama, the privilege to erect, construct, and operate canals and power stations, at a point on or near Muscle Shoals, and to make such other improvements as might be necessary for development of water power and transmission lines, provided that construction does not interfere with the Muscle Shoals canal or with navigation. The Secretary of War was required to fix reasonable charges for the use of power; the plans of Muscle Shoals Power

8 House Report, No. 16396 and 16614, 69 cong., 2 sess., (Washington, 1927), pt. 3, p. 12

9 House Executive Document, No. 1, 52 cong., 1 sess., (Washington, 1892), VI, pp. 2322-2323.

Company were also to be submitted to the Secretary of War for his approval.¹⁰ The power company never availed itself of this privilege, although its time was extended by three acts: The act of June 6, 1900,¹¹ the act of March 1, 1901,¹² and the act of February 18, 1903.

It had long been recognized that there was large undeveloped water power at Muscle Shoals which could be improved by means of a slack-water system of locks and dams. In 1905 in response to the senate's request for advice as to the appointment of a commission to study Muscle Shoals with relation to power development, the report stated that the Secretary of War:

Was not aware that the United States had any right or interest in the water power developed at the Muscle Shoals, aside from its control over water ways for purposes of navigation and its ownership of canal property.¹³

Therefore, the appointment of a commission was not recommended.

The River and Harbor Act of March 2, 1907, authorized a survey of the present condition of the Muscle Shoals section of the river by a Board of Army Engineers. This survey was made with a view to permitting the improvements of this section of the river by private or corporate agency in conjunction with development of water power by means of not more than three locks and dams.¹⁴

10 Senate Document No. 173, 58 cong., 3 sess., (Washington, 1905), IV, p. 4.

11 House Report No. 1816, 56 cong., 1 sess., (Washington, 1900), VII, p. 1.

12 House Report No. 2666, 56 cong., 2 sess., (Washington, 1901), I, p. 1.

13 Senate Document No. 173, IV, p. 5.

14 House Document No. 1262, 64 cong., 1 sess., (Washington, 1916), XXV, p. 7.

This authorization came as a result of the introduction into Congress of bills to permit the Muscle Shoals Hydro-Electric Power Company, a subsidiary of the Alabama Power Company, to build three dams at Muscle Shoals for the development of power. The proposal was for joint power and navigation development with the cost to be divided between the Power Company and the United States Government.¹⁵

This investigation was the first undertaken by the United States with a view to possible development of extensive potential water power in this section of the river. The board reported that this stretch of the river could advisably be improved by means of not more than three locks and dams. They were also of the opinion that the United States Government might properly pay such portion of the expense of the necessary structure as it would cost to complete the canal system between the head of Patton's Island and the head of Elk River Shoals; this would be practically equal the amount that it would cost to construct the locks needed for the proposed three dams; the cost of every other part of the work should be paid by such private or corporate agencies as might desire to develop the water power. The findings of the board may be summarized as being favorable to the general idea of developing water power in conjunction with improvements for navigation. The plans that were submitted did not satisfactorily provide for navigation improvements.¹⁶

In May, 1908, the Chief Engineers ~~reconvened~~ this board for the purpose of securing additional information with regard to

15 Loc. Cit.

16 House Document No. 781, XVIII, pp. 2-4.

the natural features and to make further examinations of the works proposed by the Muscle Shoals Hydro-Electric Power Company. Under these instructions a survey was made which consisted very largely of a compilation of the work of 1871, and some partial surveys subsequent to that time. In addition, diamond drill borings were made. The information obtained from the diamond drill borings showed that the foundations at the proposed site were apparently satisfactory. The board also made an estimate of the cost of the works proposed by the Power Company and for an additional lock and dam necessary to provide for navigation below the series of dams proposed by the Power Company. The total cost estimated by the board for the locks and dam was \$19,300,000. The Power Company proposed to contribute \$3,000,000 to this cost, leaving \$16,300,000 to be paid by the United States Government.¹⁷

This report, however, stated that the Power Company's proposal involved a government subsidiary for a venture, which at the time was commercially impractical, and far beyond the responsibility of the government for the improvement of the water-ways.¹⁸

Under the direction of a Board of Engineers an additional survey was made. In 1914, a number of studies for sufficient plans for improvement were made and carefully compared, and finally a plan which appeared to be satisfactory for combined power development and navigation was adopted by the board.¹⁹

17 Ibid., p. 8.

18 Ibid., p. 9.

19 Ibid., p. 9.

Advertisements were then made for the purpose of obtaining bids of cooperation between the Power Company and the United States Government. Two bids were received in pursuance of the advertisements, only one of which was favorably considered by the board. This was a new offer from the Muscle Shoals Hydro-Electric Power Company offering to lease proposed Dams No. 2 and No. 3 for one hundred years. This proposal was more generous than its predecessors and, also, took into consideration the increasing public demand for the development of the country's water power resources. It required an expenditure on the part of the United States Government estimated at \$18,701,000.²⁰

The proposal of the Power Company, although approved by the Board of Engineers for Rivers and Harbors, was not accepted as the Engineering Board recommended. The board recommended that if Congress did not adopt the project it would at least be advisable to make an appropriation of \$150,000 to provide for the completion of a detailed survey, foundation borings, and preparation plans necessary for exact estimates of the proposed works.²¹

The survey and plans were promptly made and submitted by the Army Engineers, in response to demands from Congress; on June 28, 1916, they recommended that arrangement be entered into with the Hydro-Electric Power Company. Attached to the report, however, was a recommendation that no action be taken until it had been determined whether or not the Muscle Shoals Power would be required by the government for the operation of a nitrate plant for which Congress had appropriated the sum of \$20,000,000, in

20 Ibid., p. 2

21 House Document No. 1262, XXV, p. 10

section 124 of the National Defense Act of 1916, for the making of nitrates.²² Nitrate plants were being brought into existence in an effort to gain independence of Chile in respect to nitrates necessary for war materials.²³

Realizing our dependence on Chile for nitrates, President Wilson in the spring of 1916 appointed two committees of chemical experts, including officers of the army and navy and civilians, with the instructions to report on the best method of manufacturing nitrates. He also appointed a committee, known as the Interdepartmental Board, whose purpose was to locate a nitrate plant. This Board consisted of the Secretary of War, the Secretary of Interior, and the Secretary of Agriculture.²⁴

In March, 1917, hearings were begun before the Interdepartmental Board to determine the location of the Government Nitrate Plants. On April 6, 1917, the United States declared war; and on May 11, 1917, the Committee known as the President's Nitrate Supply Committee reported in favor of using the Haber process for making nitrates, and recommended that the plants be located in Southwestern Virginia and that \$3,000,000 be spent in an experiment program.

On September 22, 1917, General Crozier, Chief of Ordinances, following the report of J. W. Joyce, United States Army Engineer, recommended Chattanooga as the site of the location of the Nitrate Plant No. 1; and on September 24, 1917, due to a request of the farm organizations, the President removed the proposed Nitrate

22 United States Statues at Large, (Washington, 1917), XXXIX, part I, p. 215.

23 W. R. McKerrell, History of Muscle Shoals, (Florence, Alabama, 1928).

24 War Department and Agriculture Department, Report on Fixation of Nitrogen, No. 2041, (Washington, 1922), p. 263.

Plant No. 1 from near Pluskia, Virginia where the site had finally been chosen, to Muscle Shoals near Sheffield, Alabama. In November, 1917, construction was begun on Nitrate Plant No. 2 at Muscle Shoals,²⁵ and arrangements were made with the Alabama Power Company to build a government unit at its Gorgas Plant for power at Muscle Shoals.²⁶

Among the main reasons for the location of the nitrate industries at Muscle Shoals are the ideal geographical location, tremendous power possibilities, abundant supply of raw materials needed for the manufacture of nitrates, and the fact that this location is well within the safety zone more than three hundred miles from any coast line. The climatic conditions also play a part since the Tennessee River never freezes. Transportation facilities were considered; in addition to railways and highways, there is an all water route to the Gulf.²⁷

In 1917, the United States Government poured thousands of men and millions of dollars into Muscle Shoals.²⁸ On the site of Nitrate Plant No. 2, the government built a complete village to accommodate the workers who came into the district at that time. Hundreds of temporary buildings were erected: theatres, restaurants, commissary stores, also a complete sewage system and

25 There was much comment by the people who opposed the development of Muscle Shoals, because the President chose Sheffield, Alabama, rather than Pluskia, Virginia, for the location of the nitrate plant. Representative Treadway from Massachusetts, said that the selection of Muscle Shoals indicated a political move.

26 House Document No. 119, 69 cong., 1 sess., (Washington, 1925), IV, p. 12.

27 Tennessee Valley Authority, General Information, (Knoxville, Tennessee).

28 Tennessee Valley Authority, (Knoxville, Tennessee).

fire department, and miles of paved streets. The nitrate plant was rush to completion and the stupendous task for which President Wilson had set aside \$12,000,000 of \$20,000,000 appropriated by section 124 of National Defense Act of 1916 to build the dam which was necessary to furnish power for the nitrate plants, was begun.²⁹

Nitrate Plant No. 1 covers approximately 1,839 acres of land. It was constructed for the purpose of manufacturing nitrates by the synthetic ammonia process which is a modified Haber Process. Plant No. 1 includes a power plant of sufficient capacity for its independent operation. The capacity of the plant is about 22,000 tons of ammonium nitrates a year. The plant buildings are of all steel-frame construction with walls of brick asbestos protected metal.³⁰

Nitrate Plant No. 2 is located at the town of Muscle Shoals, Alabama, about four miles from Plant No. 1, and just across the river from Florence, Alabama. This nitrate plant is the largest of its kind in the world and covers approximately 2,307 acres of land. It was designed for the production of ammonium nitrate by the cyanamide process and has capacity of approximately 110,000 tons a year. It contains 1,536 cyanamide ovens 1,000 of which can be in continuous operation. The liquid air plant is five times larger than any other installation of its kind in the world, and nitrogen can be extracted at one-half million cubic feet a hour normal pressure,³¹ this was proved by a two week

29 War Department, Annual Report of Chief Engineers, (Washington, 1920), II, p. 1328.

30 Muscle Shoals Commission, op. cit., p. 98.

31 Ibid., p. 90.

tests run in January, 1919.³² The buildings are of steel-frame construction with brick walls or corrugated-metal walls and substantial roofings of various types.

Connected with Plant No. 2, is a steam plant. Its steam power house has a capacity of 135,000 horse power. It was intended to supply power for the plant until the completion of the dam. It contains one of the largest steam turbins ever built, having a capacity of 60,000 horse power,³³

About 20 miles south of Plant No. 2, is located what is known as Waco Quarry, acquired by the United States in connection with the operation of Nitrate Plant No. 2. It covers an area of 460 acres, acquired at a total cost of \$52,962.82. This quarry has a crushing plant sufficient to produce 2,000 tons of crushed and sized limestone a day. The total cost of the quarry, including the building and the plant, was \$1,179,076.80. This quarry, as well as Nitrate Plant No. 1 and No. 2, were to remain in a stand-by condition in readiness for future wars.³⁴

Approximately 88 miles southeast of Nitrate Plant No. 2, is located what is known as the Government-Owned Warrior Steam Plant at Gorgas, Alabama. This plant was constructed under a contract with the Alabama Power Company December, 1917, on land owned and acquired by that company. It was built in the vicinity of the coal mine with a view to using coal direct from the mine. It has a capacity of 30,000 kilowatts. The electric power produced at the

32 W. R. McKerrell, op. cit., n.p.

33 Ibid., n.p.

34 House Document No. 167, 67 cong., 2 sess., (Washington, 1922) CXVIII, pp. 4-5.

plant is carried over transmission lines to Nitrate Plant No. 2 to furnish power for the operation of the plant. When running at capacity, this power house requires 1500 tons of coal a day.³⁵

Wilson Dam, or Dam No. 2, is the principal power dam of the project and is located two and seven-tenths miles above the railroad bridge at Florence, Alabama. Its purpose is to generate electrical power for the production of nitrates or other explosives needed for munitions of war and which are useful in the manufactures of fertilizers and other products.³⁶

This Dam³⁷ was designed by Hugh L. Cooper and built by the Engineering Corps of the United States Army. When completed it is to be a gravity type of concrete structure approximately nine-tenths of a mile long, 107 feet high from base to level of lake, and 101 feet thick at the base. It will have 58 thirty-eight-foot-wide spillways, each permitting the flow of 10,000 cubic feet of water a second at normal lake level. A 20-foot concrete roadway will cross the river along the crest of the dam. Through the entire length of this great barrier will run a nine by six foot inspection tunnel, 90 feet below the surface of the lake.³⁸

The construction of the Dam and buildings necessary for its operation will require the placing of 1,331,504 cubic yards of concrete. Extending from the south bank toward the spillway section and paralleling the dam will be a power house 1,197 feet

35 Ibid., p. 5.

36 Annual Report of Chief Engineer, (1920), p. 1326.

37 It is necessary to deviate from chronological order to give a description here of the Dam completed in 1925.

38 Tennessee Valley Authority, General Information, Wilson Dam, (Knoxville, Tennessee). p. 1.

long by 73 feet wide housing the generating machinery. As soon as it is completed there is to be installed nine turbines, four of 35,000 horsepower, four 30,000 horsepower, and one auxiliary of 1,500 horsepower making a total of 261,500 horsepower. There will be room for additional turbines, or a total of ultimate installation of 14 turbines of 35,000 horsepower, four of 30,000 horsepower, and two auxiliaries of 1,500 horsepower, making a total of 613,000 horsepower when operating at full capacity.³⁹ However, these additional turbines will not be completed for some time.

The water stored behind Wilson Dam will stretch up the river approximately 17 miles, covering 23 square miles, and will be 97 feet deep at the dam. The normal pool elevation will be 505 feet above sea level.

Around the North end of the Dam will be two Tandem locks that will provide means for navigation. Each lock is to be 300 feet long by 60 feet wide and will provide a depth of nine and one-half feet. The locks will be spanned by a single leaf 148-foot bascule bridge which will link the highway and dam to the shore.⁴⁰

On the shore at the south end of the Dam will be the switch house and oil circuit breaker building. This building will serve a two-fold purpose, housing the control equipment and the oil switches for the generators and outgoing lines. All important electrical equipment is to be arranged so that each phase will be located on separate floors, a precaution against short circuits.

39 Ibid., pp. 1-2.

40 Ibid., p. 2.

The high tension switch yards will extend on both sides of the oil circuit breaker building.⁴¹

South of the oil circuit breaker building will be the utility building to be used as a machine shop for servicing the dam and power houses. This structure to be 156 feet long, 48 feet wide, and 55 feet high. The main service room will be equipped with a 45 ton overhead crane and a transformer repair pit. A pump house east of the utility building will supply water requirements for the transformers.⁴²

By the close of the World War the construction of Wilson Dam No. 2 had scarcely begun. Operation had been chiefly of a preliminary nature consisting of obtaining railroad connections to the site, making shops and yards, building a camp, and constructing cofferdams to hold back the water while the men worked on the excavation for the foundation. Concrete piers were built to support three standard gauge railway tracks on which trains of cars were run, carrying buckets of cement from the cement mixer to nine electric cranes to be swung into forms for the dam.⁴³ Almost immediately upon the signing the Armistice, work on the dam was resumed on a large scale.⁴⁴

41 Ibid., p. 2.

42 Ibid., p. 3.

43 Annual Report, Chief Engineer, (Washington, 1919), p. 1361.

44 Report of Fixation of Nitrogen, p. 291.

Chapter II

Muscle Shoals in Congress

In January, 1919, Mr. Arthur Graham Glasgow, who had made a special study of the nitrogen situation abroad in the summer of 1918, visited Muscle Shoals and made recommendations regarding the future of the nitrate plants to the War Department. These recommendations were endorsed by the Conference between the Assistant Secretary of War and the Chief of the Nitrate Division.¹

In March, 1919, Mr. Glasgow, was appointed Fixed Nitrogen Administrator with the authority to act for the Secretary of War. In May, 1919, he appointed the Fixed Nitrogen Commission of army officers including Colonel J. W. Joyce, Ordnance Department, Chairman; Lieutenant-Colonel F. H. Wagner, Ordnance Department; and Captain R. S. Tour, Ordnance Department, authorizing them to inspect foreign plants for the fixation of nitrogen. The commission visited many plants in Europe, met and conferred with scientists, and gained much valuable information.²

Mr. Glasgow spent several months in an effort to interest private capital in the operation of the nitrate plants. The presidents of the Fertilizer Companies in the United States were seen, and plans were discussed with them. An effort was also made to get certain financiers in New York to form a company to operate the plants, but all efforts proved unsuccessful.

1 War Department, Agriculture Department Report, Fixation and Utilization of Nitrogen, No. 2041, (Washington, 1922), pp.310-311. Hereafter referred to as House Report No. 2041.

2 Ibid., p. 311.

On October 22, 1919, Mr. Glasgow sent a letter to the Secretary of War recommending the operation of Nitrate Plant No. 2 by Government Corporation, stating:

Unless the United States nitrate plans are brought into continuously developing service they and their products are likely to become obsolescent and useless in the strenuous competition of future warfare. . . . The only way to secure that these plants shall be always immediately available for the most efficient military service, for the most efficient and economical extension in case of need, is to operate them continuously, whether in peace or war. Fortunately, from this point of view, nitrogen is as essential in peace as in war.³

These recommendations were embodied in a bill known as the Wadsworth-Kahn Bill. This bill, endorsed by the leading farm organizations, passed the Senate in January, 1921, but was lost when the Sixty-sixth Congress adjourned without its having passed the House.⁴

The Wilson Dam was still under construction, but the funds were gradually decreasing. In February, 1921, an amendment to the Sundry Civil Appropriation Bill was made. This bill called for the appropriation of \$10,000,000 for the continuation and construction work on Wilson Dam for the purpose of providing cheap hydro-electric power for the operation of the nitrate plants. Continuation of the work, however, was opposed on the grounds that the project was without merit; and the taxpayers had rather lose what they had already spent than to put any more money into it. The amendment was lost in conference;⁵ therefore, since the funds were exhausted, work was stopped on Wilson Dam April 30, 1921.

3 House Document No. 119, 69 cong., 1 sess., (Washington, 1924) p. 18.

4. House Report No. 2041, p. 292.

5. Congressional Record, 66 cong., 3 sess., pt. 4, (Washington, 1921), LXVI, p. 2877.

Soon after Mr. Weeks assumed the duties of Secretary of War, the people interested in the development of the power plants and navigation at Muscle Shoals suggested to him that appropriations be made to complete Dam No.2. In reply to such suggestions Secretary Weeks announced that when a proposition was made for Muscle Shoals representing a reasonable return on the investments necessary to complete the project and an effective use of the plants for commercial purposes, he would send it to Congress.⁶

In response to this invitation, a number of bids were received and submitted to Congress. Only one offer was for the lease and purchase as a whole (the others only in part). This was the Henry Ford Proposal, July 8, 1921. Ford proposed a lease based on the completion of Dam No.2, and construction of Dam No. 3, and their power houses by the United States government. He offered to pay a fixed annual rental and proposed to purchase Nitrate Plant No. 1, Nitrate Plant No. 2, Waco Quarry, the Gorgas Warrior steam plant, and all transmission lines connected with the plant.⁷

Since the estimate of the Chief Engineers for the cost of completing the two dams was approximately \$50,000,000, the Secretary of War thought the return on the proposed rental was inadequate on the government's proposed investment. He suggested that Mr. Ford modify his offer so that it would be based upon an annual payment equivalent to a rate of interest on the total cost to the government of completing the projects.⁸

6 House Document No. 167, 67 cong., 2 sess., (Washington, 1922), XXVII, p. 1.

7 Ibid., pp. 1-14.

8 Ibid., p. 2.

On November 23, 1921, the American Farm Bureau Federation opposed to government control of public utilities, at their third annual meeting endorsed the Ford proposal and urged the Congress of the United States to enter into a contract with Henry Ford.⁹

On January 25, 1922, Mr. Ford presented to the Secretary of War a proposed modification of his previous offer by which he agreed to undertake the construction and completion at the actual cost and without profit of the work referred to in his offer of July 8, 1921; and when it was completed and ready for operation, to pay the United States an annual rental on the property, an amount equal to four per cent of the total actual cost of construction.¹⁰

On February 1, 1922, the Secretary of War transmitted the modified Ford proposal to Congress, and at once hearings were begun by the House Committee on Military Affairs and by the Senate Committee on Agriculture and Forestry.¹¹ On February 15, 1922, the Alabama Power Company sent a proposal to Secretary Weeks which he transmitted to Congress on February 21, 1922.¹²

On March 13, 1922, the House Committee concluded its hearings on all proposals; and on March 25, 1922, members of the Senate Committee on Agriculture and Forestry and members of the House Committee on Military Affairs made a personal visit to Muscle Shoals for the purpose of investigating conditions there.

9 "Provisions of House Resolutions," Congressional Digest, (Washington, 1930), IX, p. 148.

10 House Document No. 167, pp. 14-18.

11 Ibid., p. 18

12 House Document No. 192, 67 cong., 2 sess., (Washington, 1922), CXVII, p. 1

The Senate Committee continued hearings on the Muscle Shoals proposition for several weeks, and on April 20, 1922, the chairman submitted a report to the Senate, unanimously rejecting all bids except that of Henry Ford's and reported that the committee stood seven in favor of its acceptance and nine for its rejection.¹³

In June, 1922, Senator George W. Norris of Nebraska introduced an amendment to the Army Appropriation Bill, appropriating \$7,500,000 for continuing work on Dam No. 2. This amendment was passed by the Senate, and on June 24, 1922, was passed by the House; the appropriation, however, was not available until October 1, 1922, when work was again resumed on the dam.¹⁴ As a matter of fact, Senator H. E. Davis of Tennessee stated that the Ford offer made possible the completion of the Muscle Shoals plants.

The House Committee, after exhaustive hearings covering a period of several months, during which each of the proposals was discussed in detail, came to the conclusion that the offer submitted by Henry Ford was the only proposal sufficiently comprehensive in its terms to meet all the requirements of section 124 of the National Defense Act of August 29, 1916. The committee, having reached this conclusion, concentrated all its efforts in an endeavor to so modify the Ford proposal that a majority could join in the favorable recommendation of the bill to the House. In this the representatives of Mr. Ford were called upon to join

13 Senate Report No. 831, 67 cong., 2 sess., part 1, (Washington, 1922), II, p. 1

14 House Document No. 119, 69 cong., 1 sess., p. 19.

with the committee in making such changes as it felt absolutely necessary in order that the full intent of the parties to the proposed agreement should be clearly and unmistakably set forth.¹⁵ A number of changes were made.

The final modified offer, with one exception, was approved by Mr. Ford; this exception eliminated the Gorgas-Warrior steam plant. The offer was then sent to Congress on May 31, 1922.

Mr. Ford proposed to form a corporation, representing a capital stock of \$10,000,000 and bind himself, his heirs, representatives, and assigns, the stock company's heirs and its successors and assigns, to do the following:¹⁶

1. To complete Dam No. 2, and construct Dam No. 3 as soon as possible without profit, and in accordance with plans and specifications of the Chief Engineer. To lease both dams for one hundred years from date when 100,000 horse-power is installed and ready for service at Dam No. 2.
2. To pay the government four per cent on the entire cost of completing Dam No. 2 and constructing Dam No. 3, including both locks and power house facilities, except that no interest is paid while the dams are being built, and payments are not made at the rate of interest of four per cent during power-loading period of six years at Dam No. 2, and three years at Dam No. 3. To set up a sinking fund which will return to the government the entire cost of both dams so that at the end of the lease period the government will receive the full amount of investments in these dams, and thereafter the water power will be free of interest charge. To pay for the maintenance and operation of locks and dams to the extent of \$55,000 annually. To furnish without cost to the Government all power required for the operation of the navigation locks during the period of the leases. To pay \$5,000,000 for the nitrates plants No. 1 and No. 2, together with their steam plants, the Waco Quarry, and such rights and ownership as the government has in the steam plants and transmission line at Gorgas, Alabama.

15 House Report, No. 1084, 67 cong., 2 sess., pt. 2, (Washington, 1922), III, pp. 1-2.

16 House Report, No. 143, 68 cong., 1 sess., (Washington, 1922), I, p. 8.

3. He further agreed to maintain Nitrate Plant No. 2 or its equivalent in its present state of readiness for immediate operation in the manufacture of material necessary in time of war for the production of explosives.
4. To manufacture nitrogen fertilizers and other commercial fertilizers either mixed or unmixed, with or without a filler according to demand, using the most economical source of power available. The annual production of these fertilizers shall have a nitrogen content of at least 40,000 tons of fixed nitrogen, which is the present capacity of the Nitrate Plant No. 2. This is equivalent to 250,000 tons of Chilean nitrate, which is the entire amount of Chilean Nitrate used annually by the American farmers in normal times.
5. To limit the profit made in the manufacture and sale of all fertilizers produced so it shall not exceed eight per cent of the fair actual annual cost of production. To determine by research on a commercial scale the methods of fertilizer manufacture by which fertilizer compounds of higher grade may be produced at a lower price, and to reasonably make such improved methods as are found successful.
6. To see that fertilizer provisions in his contract limiting his profits to a maximum of eight per cent and providing equitable distribution of the products are faithfully carried out. Mr. Ford agreed to a board of nine members, seven to be members of the three leading farm organizations, who are to be nominated by the President with the consent of the Senate. The Board is to determine whether or not prices are fair and to have power to regulate both the prices and the distributions of fertilizers.

This offer was presented for acceptance as a whole and not in part. Hearings were at once begun by the House Committee on Military Affairs. It reported the McKenzie Bill, House Report (11903), accepting the Ford bid as revised, and it was referred to the Senate Committee on Agriculture and Forestry. It submitted a report favoring the proposal August 3, 1922, but Congress adjourned on March 4, 1923, without consideration of the Muscle Shoals legislation; and the problem which had caused so much national discussion was still unsolved.

The Muscle Shoals problem had been widely discussed, and public opinion had been for months demanding Congress to take some definite action. On September 24, 1923, Secretary Weeks sold to the Alabama Power Company the government's interest in the steam plant at Gorgas, Alabama, for \$3,472,487.25. The government had agreed to eventually move or sell it to the company.¹⁷ There was much comment throughout the United States on this sale from both those who favored and those who opposed the Ford proposal. The spokesman for the National Farm Bureau Federation insisted that the auxiliary plant was vital to the Ford offer.¹⁸ President Coolidge stated that he considered the offer unharmed by the sale of the Gorgas,¹⁹ but a number of newspapers in the South called the sale fatal to the Ford Plan.²⁰

Mr. Ford came out with an attack on Secretary Weeks saying:

Long ago Mr. Weeks matured in his mind the plan to break up Muscle Shoals and dispose of it piecemeal. When he sold the plant at Gorgas, he pulled the first stitch in unraveling the greatest single prospect ever held out to the American farmer and manufacturer. The plan was formed by John W. Weeks for the purpose, as he thought, of injuring Henry Ford, which shows how much a Boston Bond Broker knows about industrial problems. But injury has shot past him and landed on the farmer. I was willing to demonstrate at Muscle Shoals that power and fertilizer would be produced at a much lower cost than now and the government be assured of an adequate supply of war nitrates. Muscle Shoals intact would be the greatest munition plant on earth. Muscle Shoals in its nitrate production is our greatest insurance against war, or if war should come, our greatest assurance of victory, but apparently this does not

17 House Report No. 1084, 67 cong., 2 sess., p. 29.

18 "Ford Politicians in Muscle Shoals," Literary Digest, October 27, 1923, LXXXIX, p. 14.

19 Loc. cit.

20 Ibid., p. 15

count with the head of the War Department.²¹

However, Mr. Ford stated that his offer was still before Congress, and he would not withdraw it, but he also went on to say:

"If we get Muscle Shoals, we shall run lines two hundred miles in every direction. We have been working and know how to send power long distances without losses by leakage."²²

Secretary Weeks, in his reply to what he called Mr. Ford's personal attack filled with reckless assertions stated:

"The government could not avoid living up to the contract to sell the Gorgas property to the power company and amount paid by the power company would be deducted, if Mr. Ford desired, from his original offer."²³

He denied that the Gorgas steam plant was essential to the Ford plans in the manufacture of nitrates for fertilization purposes and also stated that he had never opposed Mr. Ford's securing the use of the water power or any equipment for that particular purpose. He further stated, according to expert advisers, that it was not possible to economically make nitrates by the use of steam power.²⁴

21 Ibid., p. 14.

22 Ibid., p. 15.

23 Ibid., p. 15.

24 Ibid., p. 5.

Mr. McClung, in his interpretation of the Ford idea for wanting Muscle Shoals, said was Ford's plan to build a seventy-five-mile city for the promotion of direct and permanent co-operation between farming and industrial activities. Factories always before have robbed the farm of its best man power. In this scheme Mr. Ford will have the factory and farm work together,²⁵ Mr. Ford, the world's largest employer of men, wants to give the worker an opportunity to labor in a semi-rural environment, making the home largely maintain itself while the surplus money is earned in the factory, and at the same time, to supply the farmers over America with concentrated fertilizers at the lowest possible prices; in order that they may increase their yield per acre.²⁶

Thomas A. Edison declared that Congress should complete the project and lease it to Henry Ford for three reasons:

First, the capacity of the power here and the industrial plants built make this the greatest munition plant in the country; its possibilities for providing quickly and in tremendous quantities all sorts of war materials is almost incomprehensible. It would be the greatest insurance against war we have. Second, to get the property is one thing; to operate it successfully is another, Ford is known as a great manufacturer, with great conception who moves rapidly to their realizations. He is the one logical man to do the thing. Third, The whole country has an abiding faith that Ford will not operate it to get every dollar possible out of it for himself. He will make it an American institution doing the greatest good for the greatest number.²⁷

Henry Ford then stated that he never needed Muscle Shoals, but that the government invited him to bid for the property, and

25 Littell McClung, "The Seventy-Five-Mile City," Scientific American, (September, 1922), CXXVII, pp. 156-157.

26 Ibid., p. 157.

27 "Henry Ford Bids for Muscle Shoals," Literary Digest, (January 28, 1922), LXXII, pp. 9-10.

he finally did this because he saw that it would give him an opportunity to awaken the whole American people to what they could do if they would study and utilize the water possibilities of the country. He said that the more he investigated the more he saw the great waste going on. He believed it his duty to remedy some of the waste.²⁸ He also stated that the completion of Muscle Shoals was of really great importance to the entire country and not only to the people of the South.²⁹

In regard to the statement that fertilizers could not be made on a profitable commercial basis at Muscle Shoals, Henry Ford declared, "Thomas A. Edison says it can."³⁰

With the opening of the Sixty-eighth Congress a number of new offers were presented. On January 15, 1924, the Alabama Power Company and two associates, the Tennessee Electric Company and the Memphis Light and Power Company, submitted a proposal to lease Dam No. 2 at an annual rental of \$2,000,000 and to lease Dam No. 3, when completed by the government, at a maximum rental of \$1,200,000. They agreed to furnish 60,000 horse power for fertilizer from Dam No. 2 and 40,000 horse power from Dam No. 3, and to spend \$1,000,000 for agricultural research.³¹

On January 21, 1924, the Union Carbide Company submitted a proposal to lease 50,000 horse power from the United States for

28 Ibid., p. 11.

29 Congressional Record, 67 cong., 2 sess., pt. 4, (September 22, 1922), LXII, p. 13177.

30 "Henry Ford Bids for Muscle Shoals," Literary Digest, (January 28, 1922) LXXII, p. 11.

31 House Document No. 158, 68 cong., 1 sess., (Washington, 1923), XII, pp. 1-6.

their own purposes, and an additional 50,000 for the production at Nitrate Plant No. 2 of fertilizer having a nitrogen content of about 20,000 tons of fixed nitrogen. They agreed to pay for the power on a sliding scale.³²

On January 24, 1924, the Alabama Power Company and its associates presented a supplemental offer to organize a corporation to manufacture nitrogen and fertilizer in Nitrate Plant No. 1, retaining Nitrate Plant No. 2 for National defense purposes.³³

On January 29, 1924, another offer was received. Messrs. Hooker, Atterbury, and White agreed to organize a million dollar corporation to operate the Muscle Shoals properties at the expense of the United States with a division of the net profits.³⁴ On February 2, 1924, the house committee on Military Affairs again reported the McKenzie Bill No. 11903, which had been reintroduced for acceptance of the Ford offer. It was necessary to reintroduce this bill, since Mr. Ford's offer included the taking over of the government's interest in the Gorgas-Warrior steam plant for the purpose of furnishing auxiliary power to the plant at Muscle Shoals.³⁵ After striking out section 19, and inserting the amendment known as the Madden Bill, the McKenzie Bill No. 11903 was known as McKenzie Bill No. 518.

32 Senate Document, No. 105, 68 cong., 1 sess., (Washington, 1924), XXII, pp. 1-12.

33 House Document, No. 173, 68 cong., 1 sess., (Washington, 1923), pp. 1-4.

34 "Rival Bids for Muscle Shoals," Literary Digest, (May 10, 1924), LXXXI, pp. 10-12.

35 House Document No. 173, XXII, pp. 3-8.

The Madden Bill stated that a site on the Warrior River and a right of way for a transmission line to Muscle Shoals be acquired and conveyed to Mr. Ford in place of the Gorgas-Warrior steam plant. The expenditures on the part of the government should not exceed \$3,472,487.25, the amount received by the government from the Alabama Power Company.³⁶

The majority of the committee after hearing the evidence and after considering all the proposals reached the same conclusion as the Committee on Military Affairs of the first session of the Sixty-seventh Congress, that the offer of Henry Ford was the only proposal which met with the requirements of Section 124 of the National Defense Act of 1916. It was found satisfactory in all respects.³⁷

The following is a comparison of the Ford offer with that of the Associate Power Company which was considered its nearest competitor by the members of the House Committee.³⁸ First, The Power Company's offer lacks adequate guarantee, while the Ford offer is backed by Henry Ford and his estate as well as a \$10,000,000 Corporation. Second, The Power Company's definite offer is limited to an agreement to operate only one unit of the Nitrate plant which has a capacity of 5,000 tons of nitrogen annually. Ford's offer guarantees the production of 40,000 tons of nitrogen annually. Third, Under The Power Company's offer the maintenance of the Nitrate Plant No. 2 is to be either at the expense of the farmer, or of the government, and they do not

36 Ibid., p. 2.

37 Ibid., p. 51.

38 This is a brief comparison of the two offers. For more complete comparison see House Report No. 143, 68 cong., 1 sess., (Washington, 1924), I, part 1, pp. 55-61.

obligate themselves to keep the plant up-to-date. Under the Ford proposal, maintenance of Nitrate Plant No. 2 is to be at the expense of Henry Ford or his Corporation. He obligates himself to keep the plant up-to-date. Fourth, The Power Company asks larger profits on fertilizers. It asks a maximum of eight per cent of the fair actual annual cost of production and sale. Ford asks a maximum of eight per cent of the fair actual annual cost of production. Fifth, The Power Company's Board of Farmers lacks supervisory power and the members may be removed or appointed at any time by the Secretary of Agriculture. Mr. Ford agrees that the Board of Representative Farmers may regulate prices, sale, and distribution of all fertilizer products; and they are free from the jurisdiction of any political appointee. Sixth, The Power Company's offer specifies a fifty-year lease period, while the Ford offer specifies a one-hundred-year period. The greatest item entering into the cost of hydro-electric power under the present methods of financing is the interest on the investments. This can be greatly reduced through operation of a long time sinking fund to retire the capital invested. Such a retirement can be set up over a hundred year period for about one-seventh of that annually required for the fifty year period. Seventh, The Power Company's offer comes under the Federal Water Power Act; the property affected must be purchased if lease is to be terminated; therefore, the offer might be made a perpetual lease instead of a fifty years lease. Ford's offer does not come under the Federal Water Power Act, and the lease can be terminated at the end of one hundred years with no obligation on the government to buy out the property. Eighth, Property damaged by the sale of property taken at the end of the

lease is entitled to severance damages under the Power Company, while no property is to be purchased and no severance damages are to be paid under the Ford offer. The Power Company does not recognize the principle of amortizing and retiring the capital invested. The Ford offer provides for a sinking fund, to retire the capital invested, to relieve the consumer of the interest charges which form a large part of the cost of generating and distributing water power. Ninth, The total return in fifty years for the Power Company was \$160,775,974, and for the Ford offer for one hundred years, \$344,991,935.

On February 7, 1924, Senator Norris, who favored government operation, introduced, for the second time, his bill for government operation of the Muscle Shoals properties; and on April 24, 1924, he introduced, by request, a second bill providing for government operation of these properties; yet his second proposal differed from the first.³⁹ There was still much discussion of the Muscle Shoals offers. Pressure was brought to bear on the Committees to which the proposals were referred; telegrams and representatives were sent to Washington by people favoring the Power Company's offer, urging its acceptance; at the same time people favoring the Ford proposals were also urging Congress to accept the Ford offer.⁴⁰ In fact, it was principally a fight between the Power Company's Trust, the Fertilizer's Trust, and those who believed in cheap fertilizers for the farmer in time of peace and air nitrates for explosives in time of war.⁴¹

39 House Document No. 119, p. 20.

40 Congressional Record, 67 cong., 2 sess., p. 13178.

41 "Rival Bids for Muscle Shoals," Literary Digest (May 10, 1924), ~~LXXXI~~, p. 10

Governor Pinchot of Pennsylvania, who was opposed to the lease of Muscle Shoals to Henry Ford, said that it would lead to an agricultural hamstringing of the South; and James Garfield, former Secretary of the Interior, said that he feared the acceptance of the Ford offer would lead to the greatest power trust in history.⁴²

Sympathetic Southern editors look upon the Ford offer as bona fide and other bids as smoke screens. The Nashville Banner says:

"There are also intimations that the Southern Power Companies in particular are conducting poison gas. These companies oppose the Ford offer because they fear his competition."⁴³

On March 9, 1924, the McKenzie Bill No. 518 for the acceptance of the Ford offer passed the House and was sent to the Senate. It was referred to the Committee on Agriculture and Forestry on May 31, 1924. On June 10, 1924, the Senate Committee on Agriculture and Forestry reported McKenzie Bill 518 by striking out the Ford offer and substituting the operation of Muscle Shoals by a Federal Power Corporation.⁴⁴ Congress adjourned without settling the Muscle Shoals problem.

On October 18, 1924, Mr. Ford withdrew his offer, saying:

"What should have been a simple matter of business has become a political affair, and I am in business, not politics."⁴⁵

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42 Ibid., p. 10.

43 Ibid., p. 11.

44 Senate Report No. 678, 68 cong., 1 sess., (Washington, 1924), II, p. 1.

45 "Ford Withdraws from Muscle Shoals," Outlook, (October, 1924), XIII, p. 272

He also stated:

When he made his offer, he had the welfare of the South in mind and he was not giving that up since the coal lands and the power they can generate on them are in easy reach of the South. He could generate electrical power cheaper elsewhere than he could under the Muscle Shoals bid.⁴⁶

When the second session of the Sixth-eighth Congress met in December, the amended McKenzie Bill No. 518 was brought into the Senate by Senator Norris from the Committee on Agriculture and Forestry. It was further amended by the Senate in Conference and failed to pass. Once more Congress adjourned without having reached a decision in regard to the Muscle Shoals question.

On March 2, 1925, the House passed House Resolution 457, requesting the President to procure through a Commission such information as in his judgment was necessary or desirable in order to determine the best, cheapest, and most available means for the production of nitrates at Muscle Shoals.⁴⁷ On March 26, 1925, President Coolidge appointed this committee with John C. McKenzie, Chairman; Nathaniel B. Dial, Harry A. Curtis, William McClellan, Russell F. Bowers, Willis G. Wallis, Technologists; and William E. Murray, Secretary. The members of the commission developed conflicting opinions which could not be reconciled. The majority favored agriculture and the minority industry. The President, in his efforts to reconcile, partially agreed with both.

46 Samuel Crowther. "Henry Ford Tackles New Job," Collier's, (October 18, 1924), LXXIV, pp. 5-6.

47 House Document No. 119, 69 cong., 1 sess., p. 1

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He concurred with the majority that the property should be used primarily for the production of nitrates for fertilizer, and incidentally for power purposes, but he agreed with the minority that it would be best to permit the property to pass to private ownership.⁴⁸

The final report of the commission on November 14, 1925, recommended that private operation would be the most advantageous course possible, both for the government and for the public. In case of failure to obtain a lease the President should have the authority to cause the plants to be immediately operated by government enterprise. The commission stated that to permit this great investment to stand idle, when it could be of the greatest service to the people, would be a great calamity; and that legislative action was imperative and delay expensive.⁴⁹

By the last of October, 1925, work was practically completed on the Wilson Dam. The first four electrical generating units were installed and were being tested as arrangements had been made with the Alabama Power Company to sell the power tested to the Company.⁵⁰ After the testing period was over another agreement was made in which the government agreed to continue furnishing power to the Alabama Power Company.

In the early part of 1927 various bills for the acceptance of the offers for Muscle Shoals were introduced. The Associated

48 "Still Bickering Over Muscle Shoals," Outlook, (December 16, 1925), CXLI, p. 580.

49 House Document No. 119, pp. 5-6.

50 "Present Status of Muscle Shoals," Congressional Digest, (Washington, May, 1930), IX, p. 135.

Power Companies, the Farmers Federated Fertilizer Company, and the American Cyanide Company all presented bids. These bids were discussed in the Senate and the House, and on February 2, 1927, the House Committee on Military Affairs appointed a subcommittee, with Frank James of Michigan as Chairman, to consider various house bills under the following limitations:

First, that the property be at all times kept available for the production of the government of nitrate or other components of munitions of war. Second, that the purchasers of leases be obligated to manufacture fertilizers in time of peace. Third, any acceptance must be for the entire property, with the exception of the Gorgas steam plant. Fourth, that strict terms be laid down covering the control of the amount of nitrates to be manufactured. Fifth, that any bid must contain a provision for the forfeiture of the power and fertilizer rights in the event of failure to manufacture 40,000 tons of nitrate per year.⁵¹

On March 3, 1927, the subcommittee reported to the full committee that none of the offers were satisfactory, and recommended that if a suitable offer was not received by the time the last session of the Seventieth Congress convened in December, 1927, an operating contract for the Muscle Shoals should be sought; that if none could be arranged, the committee should give full and careful consideration to the operation of Muscle Shoals by government corporation. The full committee adopted the report of the subcommittee and laid it before the House.⁵²

On December 15, 1927, the Norris Resolution, providing for the completion of the Muscle Shoals project by the Secretary of War, and its operation by the Secretary of Agriculture, with an initial appropriation of \$10,000,000, was introduced and referred

51 House Report No. 2303, 69 cong., 2 sess., (Washington, 1927), pp. 1-2.

52 Ibid., p. 7.

to the Senate Committee on Agriculture and Forestry.⁵³ On January 13, 1928, the House Committee adopted a resolution similar to the one adopted on February 2, 1927. This resolution contained the five essential points necessary for the adoption of a bill.

The Committee on Agriculture and Forestry reported the Norris Resolution to the Senate. On March 6, 1928, it was passed and referred to the House. On May 25, 1928, a conference report on the Norris Resolution, adjusting the difference on a compromise plan, was approved by both houses and sent to the President. The amendment provided that instead of Muscle Shoals being operated by the Shoals Corporation of the United States, it should be operated by a Government Corporation composed of three members.⁵⁴ On May 29, 1928, Congress adjourned. President Coolidge did not sign the Norris Resolution; this action constituted a pocket veto.⁵⁵

When the next session of Congress met, the House Committee on Military Affairs reported the Madden Bill, House Report No. 8603, which provided for acceptance of the bid of the American Cyanide Company.⁵⁶ This bill complied with the five essential points set forth by the Military Affairs Committee in February, 1927.

53 Senate Report No. 228, 70 cong., 1 sess., (Washington, 1928), I, pp. 1-4.

54 Senate Document No. 118, 70 cong., 1 sess., (Washington, 1928), XI, pp. 1-8.

55 "Present Status of Muscle Shoals," Congressional Digest, IX, p. 132.

56 House Report No. 2564, 70 cong., 2 sess., (Washington, 1929), XI, p. 1.

The Norris Resolution, which had been vetoed at the end of the first session of the Seventieth Congress, was re-introduced. Senator Norris had delayed re-introducing it to see if the resolution received a pocket veto.⁵⁷ Each house passed its own bill and appointed members of a conference committee to work out a compromise. The House conferees had insisted that a year should be given to the President in which he might, if possible, negotiate a lease with private interest for operating both the chemical and the power plants. At the end of a year, if no such arrangements were made, Senator Norris' Plan of Government Operation was to go into effect.

This Compromise Bill was sent to President Hoover for his approval on March 3, 1931. The President vetoed it, and in returning it, suggested to Congress that the states of Alabama and Tennessee, which were the ones primarily concerned, should set up a commission of their own representatives together with representatives from the National Farm Organizations and Corps of Army Engineers, with full authority to lease the plant at Muscle Shoals in the interest of local community and general agriculture.⁵⁸

As a result of these recommendations the legislature of Tennessee appointed Mercer Renolds of Chattanooga, Vance J. Alexander of Nashville, and W. A. Caldwell of Jackson as their commissioners. Mr. Caldwell and Mr. Alexander, being unable to serve, the Governor appointed R. L. Moore of Jellico, Tennessee,

57 "Present Status of Muscle Shoals," Congressional Digest, (Washington, May, 1930), IX, p. 132.

58 Muscle Shoals Commission, Muscle Shoals, 1931, (Washington, 1931), p. 101.

and J. F. Porter of Columbia to fill the vacancies. The governor of Alabama with the consent of the legislature, appointed three commissioners, W. F. McFarland of Florence, Will Howard Smith of Prattville, and S. F. Hobbs of Selma.⁵⁹ The President appointed Edward A. O'Neal, President of the Farm Bureau Federation; Colonel Harley B. Ferguson, Corps of Engineers, United States Army; and Lieutenant Colonel J. T. McMullen, office of the Judge Advocate General of the United States Army.

The purposes of the commission was to inquire into the problems of applying the benefits to agriculture available at the United States plants at Muscle Shoals, and to consider the development of the resources of the Tennessee Valley in the interest of agriculture and industry.⁶⁰

The commission recognized the fact that any successful plan for the operation of the properties must be based on sound economic principles. With that thought in mind, the commission considered the industrial possibilities of the plan and all available practical data relative to the engineering. Careful consideration was given to the reports of surveyors and past investigators relative to fertilizer and power industries. Additional surveys were made to obtain specific data in regard to the situation. Various technical experts and industrial concerns were consulted. The advice of agronomists and representatives of farm organizations were sought for the purpose of determining the views of individual farmers. Public hearings were held in various cities in Alabama and Tennessee.⁶¹

59 Ibid., pp. 106-107.

60 Ibid., pp. 106.

61 Ibid., p. 16.

Through the press and mail, the general public and all industrial organizations which might be interested were solicited to submit bids and proposals for operation. Eight bids and proposals were obtained but none were sufficiently satisfactory to warrant the endorsement of the Commission.⁶²

The report of the Muscle Shoals Commission was referred to the committee on Agriculture and Forestry on December 17, 1931.⁶³ On March 9, 1932, the Senate Committee on Agriculture by an unanimous vote favorably reported to the Senate the Norris Muscle Shoals Resolution, which was identical to the one which President Hoover vetoed at the last session of Congress. This measure provided for government operation of the \$150,000,000 power plant and nitrate plants at Muscle Shoals, unless the President was able to negotiate a lease for the nitrate plants within a year. It also provided for Government manufacture of power at Muscle Shoals, and the construction of Government transmission lines for its distribution with preference to states, counties, and municipalities.⁶⁴

This committee in reporting the bill put aside a measure, introduced by Senator J. R. Kean from New Jersey, to carry out the recommendations of the commission appointed by President Hoover and the governors of Tennessee and Alabama. The commission recommended operation of Muscle Shoals by farmer controlled organizations.⁶⁵

62 Ibid., p. 17

63 Senate Document, No. 21, 72 cong., 1 sess., (Washington, 1932), Vol. I, p. 1.

64 Senate Document No. 423, 72 cong., 1 sess., (Washington, 1932), I, pp. 1-5.

65 "Muscle Shoals," Congressional Digest, (Washington, 1932), XI, p. 122.

On April 4, 1932, a new Muscle Shoals Bill was introduced by Representative Lester Hill from Alabama, differing from the Norris Plan in the Senate but containing Government-operation alternate to private operation. This bill passed the House May 5, 1932, and was referred to the Senate;⁶⁶ but a decision was not reached before Congress adjourned.

In January after President Roosevelt was elected, he made a visit to Muscle Shoals to investigate the conditions. A few days later, in a speech at Montgomery, Alabama, he declared that it was distressing to him and other members of his party, to see so much of the great plant lying in idleness. He also stated that he visioned two things; first, putting Muscle Shoals to work; and second, making Muscle Shoals a part of an even greater development that would take in all of the Tennessee River from mountains of Virginia to Ohio and the Gulf. He further stated that Muscle Shoals is more than an opportunity to do a good turn for the people of one or two states by tying industry, agriculture, forestry, and flood control into one great development, and afford a better pace for millions yet unborn.⁶⁷

The people of the Tennessee Valley were highly elated over the President-elect's speech. The Norfolk Virginia, Pilot (Indiana Democrat) states:

This was a blow to release Muscle Shoals from the bondage into which it has been jammed.⁶⁸

66 House Report No. 1005, 72 cong., 1 sess., (Washington, 1932), II, pp. 1-2.

67 "Smashing Muscle Shoals Deadlock," Literary Digest, (February 4, 1933), CXV, p. 9.

68 Loc. cit.

However, the opponents of the Federal competition with private industry and the staunch adherents of Mr. Hoover taunted Mr. Roosevelt. Washington Post (Indiana) states:

There is no more reason why the government should be in the power business at Muscle Shoals than at Niagara Falls or any other site. Aside from the question of Government competition with private industry. There is only one important question involved in the Muscle Shoals problem. It is shall Congress in this period of hard times waste the taxpayers money on this futile project.⁶⁹

On March 4, 1933, President-elect Roosevelt entered office, and, true to his promise to the people of the South, he sent a message to Congress suggesting that they create a Tennessee Valley Authority, a corporation clothed with the power of the Government but possessed of the flexibility and initiative of private enterprise. Because the general social and economic welfare of the nation is so important, this Tennessee Valley Authority should be given the power of planning for paper construction and development of the natural resources of the Tennessee River drainage basin and its adjoining territory.⁷⁰ This Authority should also be given the necessary power to carry these plans into effect. Its duty should be the rehabilitation of the Muscle Shoals development and coordination of it with a wider plan.⁷¹

69 Loc. cit.

70 Congressional Record, 72 cong., 1 sess., p. 2, (Washington, April 10, 1933), LXXVII, p. 1423, and also page 1451.

71 Ibid., 1451.

In the Seventy-third Congress the Hill and the Norris Bills were reported. As these bills differed on only one or two important points, these differences were finally adjusted; and on May 17, 1933, the Norris bill was passed, and signed by the President on May 18, 1933. This bill created the corporation known as the Tennessee Valley Authority, which was to have general supervision of the entire project. 72

72 "Musole Shoals," Congressional Digest, 73, cong., XII, (Washington, 1933), p. 187.

Chapter III

Muscle Shoals at Work Under the Tennessee
Valley Authority

The Tennessee Valley Authority was established for the purpose of maintaining and operating the Government properties at Muscle Shoals, Alabama in the interest of national Defense, and for agricultural and industrial developments, and to improve navigation in the Tennessee and Mississippi river basins.¹

Congress authorized the President to place the administration of this program in the hands of three directors, appointed by himself and with the approval of the Senate.² On May 19, 1933, the President appointed these members: Arthur E. Morgan, Chairman; Harcourt A. Morgan, and Daniel E. Lilenthal.

The long drawn out problem, which had caused so much discussion in Congress for more than twelve years, was at last settled; and the nitrate plants and Wilson Dam, which had remained idle for several years, were now put to work.

The work of the Tennessee Valley Authority revolves around three critical national problems, concerned with basic resources upon which the well being of the entire country depends:

1. Control and proper use of water resources.
2. Conservation and preservation of land resources.
3. A more widespread use of electrical energy.³

1 United States Statues at Large, Tennessee Valley Authority Act 1933, pt. I, (Washington, 1934), LXVIII, pt. 58.

2 Ibid., p. 59.

3 Ibid., p. 69.

The solution of the first of these problems has involved the development and execution of a unified plan, in the interest of navigation and flood control, for the entire river system.

Congress directed the Authority to improve navigation facilities, and to adopt effective measures for the control of destructive water by means of construction of dams.⁴ But this discussion deals principally with the second and third major portions of this program: the utilization of the war built nitrate plants at Muscle Shoals, and the disposing of the electric power generated at Wilson Dam.⁵

On July 1, 1933, the two nitrate plants at Muscle Shoals were put under the control of the Authority.⁶ In releasing these Congress required that they be used for fertilizer experimentation and production.⁷

Study was immediately begun to determine their usability for experimental fertilizer production. Nitrate Plant No. 1 was found to be an experiment in the manufacture of ammonium nitrate by synthetic process. The experiment was not a success; so the plant is now obsolete and its operation is out of the question.⁸

Nitrate Plant No. 2, (as stated above) is for the purpose of producing ammonium nitrate by the cyanamide process.

4 Ibid., pp. 67-68

5 It is necessary to take up the work of the nitrate plants, and then the work of Wilson Dam.

6 Tennessee Valley Authority, Annual Report, 1935, (Washington, June 30, 1935), p. 18. Hereafter referred to as T.V.A. Annual Report, 1935.

7 United States Statutes at Large, pt. 1, LXVIII, p. 65.

8 T. V. A. Annual Report, 1935, p. 18.

The Authority under Dr. Curtis, Chief Chemical Engineer, studied the advisability of producing nitrogen at Nitrate Plant No. 2. He reported that since the government factories were built, new processes for the fixation of atmospheric nitrogen have been developed to such a point that the operation of the plants built at the time of the World War would prove, from a commercial standpoint, to be uneconomical. He also stated that America can now manufacture cheap nitrates adequate for any conceivable demand.⁹

The Tennessee Valley Authority after taking the findings of Dr. Curtis, the Department of Agriculture, the land grant colleges, and other agencies and individuals, and also since nitrate production had increased to a point where there was no danger of peace time deficiency, decided that to continue using the Muscle Shoals plant for the production of nitrate fertilizers would be contrary to congressional mandates, the improving and the cheapening of the production of fertilizers and fertilizers ingredients. Since no chemical nitrate plant could compete with legume crops, the average farmer could best maintain the nitrogen content of his soil by growing nitrogen fixing legumes alternately with other crops. Therefore, it was not advisable to use the plant for the production of nitrogen.¹⁰

On the other hand, phosphorus is a crucially important plant food and most of the soils in the Tennessee Valley; and

9 A. E. Buchanan Jr. "Uncle Sam Enters the Fertilizer Business," Scientific American, CLI, (November, 1934), p. 263.

10 T. V. A., Annual Report, 1935, pp. 38-39.

elsewhere are deficient in phosphorus, the element of the greatest concern in a program of soil economy. More than one-half of all the fertilizers used in this country today is phosphatic in character, and the bulk of this tonnage is produced as superphosphate, containing 16 or 20 per cent of available plant food. This percentage is low and immediately suggests the desirability of producing a more highly concentrated superphosphate as a means of reducing the cost of this important plant nutrient to the farmer.¹¹

Research work undertaken by the Authority has centered upon the problem of producing triple-superphosphate by a more economical method than those known. The first step was to determine how a higher strength of phosphoric acid would react on rock dust. The second step was to select the proper process for the manufacture of concentrated phosphoric acid. The electric-furnace method of smelting phosphate rock seemed to offer the necessary possibilities, and appeared advantageous because it would permit the use of low cost power developed at Wilson Dam. Consequently, a commercial size plant having two 6000-Kilowatt electric furnaces ~~were~~ built utilizing two of the electric carbide furnaces in Nitrate Plant No. 2, and other apparatus and buildings in the plant; in this way a part of the expenses of the new, large scale machinery was avoided.¹²

With respect to sources of raw materials, the Authority is fortunately situated, in that Muscle Shoals facilities are

11 Ibid., p. 9.

12 Ibid., p. 19.

near the middle Tennessee beds of phosphate rock. The Authority has leased several thousand acres of this phosphate bearing lands. The farmers owning these tracks mine the rock, under contract and ship it to Muscle Shoals.¹³

The process for the production of triple-superphosphate requires smelting rock with coke and silica, in electric ovens at a temperature of approximately 2,750 degrees Fahrenheit. The coke used is procured from the Birmingham district and the silica is obtained from Iuka, Mississippi.

Several research projects have been undertaken to develop further the method of manufacturing phosphatic fertilizers, and within a short time these developments have proved successful on a small scale.¹⁴ By the fall of 1934 the Authority had succeeded in turning out a product which contained about 45 per cent of available plant food.¹⁵

Further progressive steps have been taken to develop more highly concentrated phosphates in an effort to reduce transportation charges. The limit of such concentration would be the element itself. A method has been devised to produce this element in conjunction with one large commercial electric furnace now in operation. The production of this element will be of the great importance to national defense, because of its value in chemical warfare.¹⁶

13 Ibid., pp. 19-20.

14 Ibid., p. 20.

15 Annual Report, 1926, Tennessee Valley Authority, (Washington, June 30, 1935), p. 42. Hereafter referred to as T.V.A. Annual Report, 1936.

16 T. V. A. Annual Report, 1935, p. 21.

The phosphate fertilizer produced by the Authority must be tested on growing crops under a variety of conditions, for it differs from ordinary superphosphates and other phosphate carriers in that it contains gypsum. Consequently, the effect on soils and the crops may be different, and systematic experiments must be carried out.

During the fiscal year ending June, 1934, the Authority made an allotment of \$4,000 to the Agricultural Experiment Stations of each of the seven Valley States to conduct the experiment in order to avoid the expenses of setting up experimental equipment of its own.¹⁷ In the 1934 season 188 experiments were carried on by the seven state experimental stations. While definite conclusions cannot be drawn from the results of the first year, indications are that the new phosphates compare very favorably in their effects on the soils and crops with standard materials which have been used.¹⁸

In the spring of 1935 practical field use of fertilizers was begun. The program completed the location of approximately two thousand community demonstration farms in the valley, on which fertilizer would be demonstrated. The planning and coordination of these projects is done by the Authority, and the actual management is handled by various state agricultural colleges.¹⁹ The new phosphate fertilizer is provided for use only on crops which are the most effective in control of erosion; such as, grasses, pasture or hay fields, legumes in

17 Loc. cit.,

18 Loc. cit.

19 Loc. cit.

mat-planting, and small grains. No phosphate is provided for use on inter-tilled crops.

The farmers organized soil conservation associations, and by June 30, 1935, ninety-five associations had been set up. Committees are chosen in each community to select the demonstration farms.²⁰ A plan is worked out for each demonstration farm, covering the scheme of cropping, and the combination of fertilizer, and limiting materials which should be used to suit the needs of the farm and the community. The farmer on whose land the demonstration is conducted agrees to carry out the injunctions and to keep records on crop yields in consideration of the fertilizers received and the other assistance given.

The distribution of the Authority fertilizer is handled directly by the Authority which makes the triple super-phosphate available, not to the individual farmer but to county organizations, through state extension and farm organizations. Arrangements have been made in a number of counties for local storage of phosphate, so that it will be available when needed. The farmer pays the transportation cost on the phosphates and the cost of supplementary materials and storage.²¹

By the last of June, 1935, a total of 984 demonstration farms had been selected, and on 126 of these farms necessary maps had been prepared of their layouts and land use; and phosphate had been distributed to the amount of 1,986 tons. These demonstration farms are to be continued over a period of three years. In 1936 more than 25,000 tons of phosphate were shipped out for use in the demonstration fields. In the past year, 1936, the research at

20 Loc. cit.

21 Ibid., p. 22.

Plant No. 2 has developed, what appears to be, a satisfactory phosphatic fertilizer with more than 65 per cent of available plant food, which will soon be ready for large scale demonstration.²² At the present time fifty thousand tons of triple- superphosphate are ready for distribution.²³

The Tennessee Valley Authority Act required the Authority to undertake experimentation in nitrogen products for military purposes; and for the United States Government, in case of war, to take possession of any property described or referred to in the Act, for the manufacturing of explosives or for other war purposes.²⁴

Nitrate Plant No. 2 had been built for the purpose of producing ammonium nitrate; but other materials vital in war such as, calcium, carbide, production of electric steels, and certain ferro-alloys, or manufactured abrasives and refractories, may be produced.²⁵ Due to instructions of the Act, the Authority has undertaken to maintain nitrate Plant No. 2 in stand-by condition. This plant has been maintained in a satisfactory condition, but many facilities have inevitably deteriorated due to weathering and other exposures.²⁶ The Authority recently proposed to Congress that the ammonium nitrate section of the Plant No. 2, the portion which would be needed immediately in case of war, be reconditioned

22 Tennessee Valley Authority Report, 1933-37, (Knoxville, Tennessee, 1937), p. 46. Hereafter referred to as T.V.A. Report, 1933-37.

23 A. W. Taylor, "Court Thwarts Tennessee Valley Authority Extension," Christian Century, LIV, (January 20, 1937) pp. 4-5.

24 United States Statutes at Large, XLVIII, pt. 1, p. 61.

25 T. V. A. Annual Report, 1935, p. 23.

26 Loc. cit.

and modernized by expenditures of \$9,000,000. The Authority is now preparing detailed plans for such rehabilitation, at the request of the War Department; and thus improvement may be made soon.²⁷

The Wilson Dam, Hydro-Electric Plant was turned to the Authority September 1, 1933,²⁸ Congress made a complete provision for the generation, transmission, and distribution by the Authority of surplus hydro-electric power generated at Wilson Dam, and other dams which might be constructed by the Authority in the Tennessee River watershed, for navigation, national defense, and flood control.²⁹

The Act authorized the board to complete the power plant at Muscle Shoals by the installation of additional hydraulic turbines and generators, hydro-electric plant, and steam-electric generators in the stam power plant situated there.³⁰

Power generated at Wilson Dam was needed for operation of dams and locks for experiments in aiding national defense and for the operation of experimental fertilizer plants at Muscle Shoals. However, a very large surplus would remain, and this surplus would necessarily increase as the new dams were built and the river brought under control.³¹

27 T. V. A. Report, (1933-37), p. 56.

28 T. V. A. Annual Report, 1935, p. 24.

29 United States Statues at Large, pt. 1., XLVIII, p. 67.

30 Ibid., p. 67.

31 T. V. A. Report, (1933-37), p. 5

When the power distribution program of the Authority first started, transmission was effected largely over the lines of private power systems, by means of interchange agreement; but the Authority was given power to unite various power installations by transmission lines to assure a market for surplus power.³² The principal line in this program is a 154,000 volt tie transmission line some 230 miles in length, connecting Wilson, Wheeler, and Norris Dams. This line will be used to interchange power between the interconnected powerhouses, in order to obtain the maximum use of water resources and to equalize the load.³³ This transmission line project has been divided into three construction units, one extending 119 miles from Dechard, across the Cumberland mountains, to Norris, Tennessee, and was let to contract. The other two sections from Wilson to Wheeler, a distance of 143 miles, and from Wheeler to Dechard, a distance of 98 miles, are being constructed by the Authority's own forces. For a time Wheeler Dam construction and operation was served by a wood pole line, which will be used for local service to feed the rural line when the main tie line between the dams are completed.³⁴

By June 30, 1935, the Authority had constructed 7 transmission lines, totaling 120 miles in length; and 3 lines, totaling 299 miles, were under construction.

Construction on a 154,000 volt transmission line, 45 miles in length, connecting Wilson Dam with Pickwick landing, was completed in September, 1935. This line supplies power direct from Wilson to

32 United States Statues at Large, XLVIII, pt. 1, p. 67.

33 T. V. A. Annual Report, 1935, p. 25.

34 Loc. cit.

Pickwick, the construction operation, previously was supplied from Burnsville, Mississippi. The line will also give a more direct supply of power to North Mississippi and be of value for possible future service to West Tennessee.³⁵

The power generated at Wilson Dam reached the consumer through four principal types: Municipalities, County electric power associations, Intrim-power districts (temporary direct operation), and private power companies.³⁶ The greater part of power generated by the Authority in the fiscal year ending June 30, 1935, was for governmental use. The Authority used thirty-four and seven-tenths per cent for fertilizer works and for other Authority activities twenty-seven and nine-tenths per cent. Municipalities, County Power Associations, and other electric corporations purchased at wholesale sixteen and three-tenths per cent of the power generated by the Authority, and temporary and direct sales of three and two-tenths per cent.³⁷

The Authority has directed special attention to the problem of rural electrification, and by June, 1935, 200 miles of rural electric lines had been built and 181 additional miles are in process. The electric rates established by the contractors are substantially lower than the average rates throughout the United States,³⁸ and these lower rates have increased the power demands.

On August 31, 1935, the Tennessee Valley Authority was amended. It contemplated: 1. The integrated control of the Tennessee River and its tributaries; 2. The use of this integrated control to

35 Loo. cit.

36 Ibid., pp. 26-27

37 Ibid., p. 29.

38 Ibid., p. 31.

accomplish a number of purposes. On the one hand, the development of the entire system was treated as a single project, and on the other hand each major unit of that project had more than one function. The act named several objectives: navigation; flood control; agricultural and industrial development; and national defense. The Authority was also directed to make a survey, which would aid the conservation and development of the Tennessee River drainage basin and its adjoining territory which might be related to, or materially affected by, the development, and also to provide for the general welfare of citizens of that area. Incidental to these and in order to avoid the waste of public property, it authorized the development of electrical power and the transmission and sale of such part of that power as might be needed for governmental purposes. ³⁹

The 154 Kilowatt line, 232 miles in length, was completed in 1936, connecting the Wilson, the Wheeler, and the Norris Dams. This line will act as a reinforcement for the existing private utility systems in the area and will facilitate the interchange of large blocks of power between the Tennessee Valley Authority and private utility systems, thereby making possible the conservation of water power. ⁴⁰

The Tennessee Valley Authority bought some transmission lines from the Alabama Power Company, but the Stock companies said their rights had been violated, and they said the sale was illegal because the Tennessee Valley Authority was itself illegal. ⁴¹ The

39 United States Statues at Large, 74 cong., XLIX, part 1, (Washington, 1936), pp. 1075-1081.

40 T. V. A. Report, (1933037), p.111.

41 "Supreme Court Uphold Tennessee Valley Authority," Scholastic (March 7, 1936), XXVIII, pp. 18-19.

argument was carried to the Federal Court, and the late Federal Judge William Gruff upheld the stockholders. It was later appealed to the Circuit Court of Appeals in New Orleans, where the decision was reversed by stating that "Wilson Dam was being primarily used to control navigation and floods." It ruled the Tennessee Valley Authority had a right to sell property obtained while exercising its legal right to control streams.⁴²

The case was finally appealed to United States Supreme Court on February 17, 1936, and the court voted eight to one in upholding the constitutionality of the Tennessee Valley Authority. Chief Justice Hughes declared: "The Tennessee Valley Authority may carry on its program at Wilson Dam on the present basis producing, selling, and transmitting power a reasonable distance to a consumer."⁴³

As a result of this decision of the Supreme Court, on May 1, 1936, the Alabama Power Company transferred 131 miles, 44 and 22 Killowatt transmission lines, and two transmission substations, 21 central and industrial step-down stations, 95 miles of telephone lines or transmission line poles, and 299 miles of rural lines, to the Tennessee Valley Authority. Immediately following the transfer a field inventory of the properties was made, and it was determined that considerable rehabilitation work would be required in order to place the system in a safe and reliable operating

42 Ibid., pp. 18-19.

43 Ibid., p. 18.

condition. This work is now in progress.⁴⁴

During the fiscal year ending June 30, 1936, the transmission system of the Authority was expanded by the construction of 540 miles of transmission lines, and 12 transmission substations, 90 miles of additional lines and four substations were under construction. Two hundred thirty miles of lines and two substations had been authorized; and the survey engineering, right-of-way acquisitions, clearing and purchase for these were under way.⁴⁵

On August 19, 1936, nineteen power companies joined in injunction suits to halt municipal projects seeking to check the Tennessee Valley Authority. They attacked the validity of the other dam buildings on the plea that they are not designed for defense, flood control, or navigation, but for the primary purpose of producing and selling electric power in competition with private enterprises.⁴⁶

On December 11, 1936, Judge Gore, at Nashville, issued an injunction which halts all expansion of authority, but allows the continuance and completion of some 35 projects in process.⁴⁷ The conflict between the Tennessee Valley Authority and the Power Companies is in a critical situation at the present time. In February, 1937, the Authority failed to renew its contract to sell power to the Commonwealth and Southern Corporation, the largest utility in the South.

44 T. V. A. Annual Report, 1936, p. 114.

45 T. V. A. Annual Report, 1936, p. 111.

46 "Tennessee Valley Progress Still Threatened," Christian Century, LIII, (September 9, 1936), p. 1293.

47 A. W. Taylor, op. cit., p. 94.

The problem is being pushed toward a showdown between the Policy of Government ownership and operation, against cooperation with private utilities. Dr. Arthur Morgan and Dr. Lilenthal have failed to agree on the question of renewing the contract. Dr. Morgan believes that the government can afford to be generous in dealing with utilities, perhaps award them a little for selling some of their properties and for buying surplus power from the government.⁴⁸ But Dr. Lienthal is very much opposed to this plan and is still an enthusiast for public ownership.

Dr. Morgan states that the proper attitude is to strive to find a basis of agreement between the Tennessee Valley Authority and private utilities, which will protect both private and public investments and will lead to the widest possible distribution of electric power and to the lowest possible rates.⁴⁹

At first, the Shoals were to benefit the South only but the World War caused the United States Government to begin development of the project for production of munitions. However, the short duration war prevented this use, and the Government was left with the expensive equipment standing idle. After 12 years more of legislation the Muscle Shoals was put under the control of the Tennessee Valley Authority. Supervised by this, these properties were put in operation; and they are now producing cheap fertilizer; they are producing electrical power for other purposes, and they are building other dams to control flood waters.

The War-built Muscle Shoals properties, which have caused so much discussion in Congress, are now taking a prominent place

48 "Tennessee Valley Authority Internal Disputes," Literary Digest, CXXIII, (February 13, 1937), p. 42.

49 Loc. cit.

in the Tennessee Valley Authority program in respect to the improvement of agricultural interest of the entire South.

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