

to date in the mobilization of manpower, is the greater use made in Canada of direct compulsion upon employers and employees in mobilizing manpower for industry and agriculture and the lesser or later use made of direct compulsion in mobilizing manpower for the armed forces. In succession, the issuance of the War-time Salaries Order in November, 1941, the establishment of the National Selective Service in March, 1942, the amendment of the National Selective Service Regulations September 1, 1942, and the issuance by the Minister of Labour on April 24 of the orders in council providing the procedure for the compulsory transfer from less essential to more essential employment<sup>4</sup> have represented the forthright acceptance in Canada of the necessity of governmental direction and control over the role of each citizen in the war effort.<sup>5</sup> Through employment stabilization agreements

established in most urban centres of war industry similar controls have been exerted, within the limits of these communities, in the United States. They have been obtained, however, through agreement by employers and labor in the area affected. As yet each successive proposal that government in the United States be authorized by legislation comparable to the Canadian National Selective Service Act to see that each citizen serves where needed has been defeated or deferred.

In the post war period comparative appraisal of methods used for manpower mobilization and their relative success in these two democratic countries will offer a significant analysis of democratic processes. Before then, however, it is to be hoped that the experience in each country with manpower mobilization will enable us to cope with the equally difficult tasks of demobilization with less hesitation and uncertainty.

(4) As described in *The Labour Gazette*, Vol. XLIII, Nov. 4, April, 1943, pp. 449-50.

(5) See also *Canadian Regulations for Employment of Civilians*, *Monthly Labour Review*, Vol. 56, No. 4, April, 1943, pp. 673-677.

## Ten Years of Tennessee Valley Authority<sup>\*</sup>

By JOSEPH S. RANSMEIER

ONE of the most interesting proposals of the recent "American Beveridge Plan"<sup>1</sup> prepared by the National Resources Planning Board, was for establishment of joint public-private corporations to administer certain businesses in which the federal government will be deeply involved at the close of the war. Another suggestion of the report was for establishment of a number of regional public authorities to deal with the problems of conservation and development of natural resources

within drainage basin areas. In the light of these proposals it may be timely to survey the program of the TVA the nation's first great regional public corporation, which this spring is celebrating its tenth birthday.

The passage of the TVA act by Congress and the signing of this measure by President Roosevelt on May 18, 1933 terminated a legislative debate as to federal policy on the Tennessee River which dated from the conservation struggle at the turn of the century. The controversy had become particularly severe after the first World War had left as a legacy a great half-finished hydroelectric-air nitrate project at Muscle Shoals near Florence, Alabama. Partisans, on the one side, had urged that the government should dispose of this plant to the highest bidder; advocates on the other had urged that the

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\*For information here presented which has not before been published the author is indebted to the kindness of the Tennessee Valley Authority. For a more complete treatment of the same subject see *The Tennessee Valley Authority* by Joseph S. Ransmeier (Nashville: The Vanderbilt Press, 1942)

1. The plan is discussed in an article by Eveline Burns on p. 190

project should be integrated into a comprehensive program for conservation of the land and water resources of the entire Tennessee basin. The long-stalemated issue was finally resolved when President Franklin D. Roosevelt addressed to Congress a message urging establishment of a public corporation to be charged with responsibility for planning the proper conservation and development of the natural resources of the entire Tennessee River drainage basin, and to be broadly empowered to carry these plans into effect. In response to this request Congress adopted an act setting up a new federal corporation to be known as the Tennessee Valley Authority and to be administered by a board of three directors. The new agency was directed, among other things, to develop the Tennessee River for the purposes of navigation, flood control, power generation, national defense, and fertilizer production; to experiment with the manufacture and sale of fertilizer products; to cooperate with other agencies in preventing soil erosion; and to make surveys and plans looking toward the orderly physical, economic, and social development of the Tennessee basin and adjoining territory.

The program which TVA has developed pursuant to the authority of its organic act has been determined, to a great extent, by the nature of the region for which the Authority has been directed to plan. The dominant physical characteristic of this region is the river from which it takes its name. This is formed at Knoxville, Tennessee by the confluence of the French Broad and Holston rivers, which are in turn formed from streams rising on the western slopes of the lower Appalachian Mountains. It flows in a southwesterly direction, westward across Alabama, and then northward across Tennessee and Kentucky to empty into the Ohio River at Paducah. Over its 652 mile course it falls approximately 500 feet. Equivalent and even greater drops occur on shorter distances along some of its major eastern tributaries. Its drainage area, including parts of seven states, is approximately 40,600 square miles. One of the region's

most abundant original resources, timber, has now been heavily depleted, and the predominantly rural population is faced with increasing difficulties in dealing with the tolls of soil erosion. Commercial development of other of the region's resources, including a number of minerals, has only recently been begun.

TVA has epitomized its program by stating that it is designed to broaden democratic economic opportunity for the people of the Valley. This it does by carrying out a wide variety of activities which may be classified under four major headings: soil protection, technical research, stream resource conservation, and the marketing of power. Occupying a key position in the program for soil protection are a large number of test demonstration farms. These are owned by farmers, both within and outside the valley, who have become interested in soil preservation and rebuilding and have agreed to manage their farms in accordance with progressive principles of soil conservation. These principles include terracing, ploughing with the contours, elimination of row crops on sharply sloping ground, and planting of grassy crops and legumes wherever possible. In return for their cooperation, including the opening of their farms to their neighbors and the keeping of careful records, the Authority makes available to these farmers substantial quantities of concentrated phosphoric fertilizer which it produces at the Muscle Shoals plant.

Although the test demonstration farms have been outstandingly successful from a financial point of view, the nature of the prescribed program has made it difficult for many poorer farmers operating smaller units to participate, for this class has traditionally relied upon erosive row crops, such as corn and tobacco, for the bulk of its money income. Here is an evident dilemma; continued cultivation by these farmers along accustomed lines threatens a declining standard of living with eventual soil bankruptcy; but renunciation of traditional practices promises immediate financial ruin. To resolve this dilemma by introducing new

sources of money income to eliminate the long-standing dependence of the small farmer on cash crops, TVA has pursued its program of technical research. While this program is still young, it has already yielded substantial results. Among its accomplishments have been the development of a furrow-seeder to permit the planting of small grains in legume grass on hilly farms, a small thrashing machine for mountain farming, a greatly improved process for quick-freezing of fruits and vegetables, a new process for the curing of sweet potatoes, and an electric hay drier costing less than ten per cent of the cheapest drier previously available. Not only have these and other similar contributions directly benefited the population which has used them, but by releasing the patented processes for manufacture of these devices to local businessmen the Authority has assisted in furthering economic diversification in the region.

While the major purpose of the TVA soil program has been to preserve against water erosion topsoil that would require centuries to rebuild, this program makes a valuable incidental contribution to the Authority's work in stream control. Run-off from grassed lands, detained by foliage and ground debris, is much slower than is run-off from bare fields or fields planted to row crops, and a far greater proportion of precipitation is either returned to the atmosphere by evaporation or is passed down to ground water storage.

The phase of TVA's activities in which the Authority has invested the bulk of its appropriations and which has earned for it an enviable reputation as an efficient and skillful construction organization is the program for stream control. This is carried out by two major classes of projects, the first of which is a series of large storage reservoirs located on the several more important tributaries of the Tennessee River. These reservoirs are operated according to seasonal rule curves, being filled by the high stream flows of the winter and spring rainy season and depleted during summer and fall in order that capacity may be available to catch the following year's floods. Not only does

this method of operation permit control of the river's greatest floods within crests which can be contained by moderate levees at key points, but by spreading the year's stream flow evenly it permits economical power operations. There is also a series of nine dams along the main Tennessee River. Each of these has been constructed so as to provide permanent storage adequate to carry a nine-foot navigable channel to the next project up-stream. In addition, each project provides a limited amount of variable storage that may be operated for power and flood control.\*

The chain of artificial lakes along the main Tennessee River will provide perhaps the finest navigation improvement of an inland waterway in the world. The generous dimensions of the river channel and its long straight reaches, the limited number of necessary lockages, and the comparative stability of river elevation are among its unusual advantages. While the project for a slack-water channel along the entire length of the stream is not yet fully complete, increases in river commerce have already been remarkable. Between 1933 and 1941 annual ton miles of river freight increased four-fold. More significant than simply the amount of the increase was the fact that new classes of commodities, which had not before moved by water at all, began to be shipped into and out of the region. Both new and well-established industries throughout the Tennessee Valley are already benefiting from this new and economical highway to the markets of the entire Mississippi Valley and the Great Lakes region.

As water is routed downstream from the great reservoirs on the tributary streams, abundant supplies of hydroelectric power become available. This energy is disposed of by the Authority almost entirely at wholesale to two major classes of customers. The first of these are a limited number of great industrial plants, some

\*Particularly important from the flood control standpoint is the Kentucky project which is located only a few miles above the junction of the Tennessee with the Ohio River and which will, upon its completion, provide storage adequate to reduce crests along the Mississippi River by as much as two feet between Cairo and the mouth of the Arkansas River.

of which have been attracted to the Valley during the last decade primarily by the prospect of abundant supplies of secondary power at attractive rates. Because of its interruptible nature, such power is not satisfactory to the Authority's other class of customers which is accorded preferential status by the statute. This is a group of municipally and cooperatively owned distribution agencies that purchase power after transmission and distribute it (subject to certain provisions of supply contracts with TVA) at promotional rates to domestic, commercial and small industrial consumers. Although the level of rates charged by the contractors is substantially below that which was general at the time the rates were promulgated, they have returned revenues adequate to cover all necessary costs, including purchased power, interest, depreciation, amortization and payments in lieu of taxes. The success of these resale rates is a validation of the premises on which they were formulated, viz., that consumption would increase greatly in response to drastic rate reduction, and that costs of power distribution would rise much less rapidly than kilowatt hour sales. Rates charged the contractors by the Authority have also been adequate to cover all costs fairly allocable to the power program including interest, depreciation, and payments in lieu of taxes.

The standard resale rate schedule for sales of energy to domestic customers has been termed the "yardstick" In addition to providing a spread above the purchase prices of power adequate to permit contractors to meet their costs, the yardstick rates are such that an efficient privately owned power company, with a conservative capitalization, could adopt them and still cover all necessary costs involved in serving domestic consumers. It is to the credit of the yardstick that after TVA resale rate schedules were announced there began a period of radical downward revisions of electric rates charged by privately owned power companies located throughout the southeastern United States. Of these companies some that had made almost no rate reductions be-

tween 1924 and 1932 slashed rates by amounts approaching fifty per cent between 1932 and 1940. Despite these drastic revisions in power charges, and the fact that the companies in the same period were obliged to adopt more stringent methods of accounting for depreciation and to pay steadily increasing taxes, no one of six leading southeastern power companies experienced a deficit in net income either during or after the Great Depression.

The orderly and comprehensive program outlined above was conceived to foster economic expansion and to conserve the natural resources of the Tennessee Valley. Today this peace-time orientation temporarily has been laid aside as the Authority has thrown itself into the nation's war-time mobilization. Confronted with a tremendous expansion of war production in the Valley, the agency has brought in new power sources rapidly enough to meet all demands so that no plant has ever been forced to curtail operations for lack of energy. The magnitude of this achievement may be judged by the fact that at the peak of its expansion program the Authority had under construction a great steam generating station and twelve major hydro projects requiring, in the aggregate, material equivalent to eight Boulder Dams. Three-quarters of the agency's annual power output of nearly ten billion kilowatt hours is now employed in war production of such essential commodities as aluminum, chemicals, airplanes and parts, shells and explosives, and military clothing. The old Muscle Shoals nitrate plants which the Authority had converted to produce triple super phosphate fertilizers, have been modernized and expanded. On a restricted scale fertilizers are still being manufactured to make their contribution toward easing food problems of the United Nations. But in addition the plants are now producing elemental phosphate for smoke screens, incendiary bombs and tracer bullets, and calcium carbide for synthetic rubber. The Tennessee River has become a military highway. In addition to bulk foods and raw ma-