character indicate that such water as they do contain may be controlled and utilized at reasonable expense, so that a comparatively small amount of water may, by falling a long distance, do the same amount of work as a large quantity of water with a shorter fall, and at relatively less expense due to the smaller structures involved.

A third feature is the abundance of lakes and ponds, which even in their native state very materially aid in maintaining a regular flow of water in the various rivers on which they exist, and most of which may at small expense be utilized to a much larger extent for this purpose.

The efficacy of these artificial reservoirs has been questioned by some in this province. This is the most remarkable in that artificial control of water supply has universally been used in this province for many years to a greater or less extent in lumbering and milling operations; to say nothing of municipal water supply systems. The practical effect of artificial pondage either for seasonal or daily purposes may be seen at any time in the hundreds of small mills and log driving dams throughout this country. To go further afield, it is a fact that with few exceptions such as those on the Great Lakes waterways, which lakes are themselves the largest natural storage reservoirs in the world, all larger water power plants depend to a greater or less degree on artificial reservoirs for a dependable water supply. For example, the government of the province of Quebec has just recently completed the second largest artificial storage reservoir in the world at a cost of about $2,000,000. The capacity of this reservoir exceeds that of the great Assouan reservoir in Egypt, used for irrigation purposes, and is only exceeded in capacity by the great lake above the Gatun dam, forming part of the Panama Canal. This Quebec reservoir is near the head of the St. Maurice River at La Loutre, and is used in connection with the large power plants at Shawinigan and Grand Mere.

Opportunities Investigated

Investigations of the nature indicated were undertaken early in 1915 by the Water Power Branch of the Interior Department, Ottawa, at the request of and in co-operation with the Nova Scotia Water Power Commission. These investigations are still under way and so far as measurement of water supply is concerned will be continued for some time.

Therefore, with over four years' actual measurements of water supply in various streams throughout the province, including a period in which rainfall records, extending over a much longer period, indicate to have been almost if not quite the driest experience in some fifty years, and in instances where sufficient surveys and investigations regarding head or fall and storage capacity have been made, we are in a position to make estimates of dependable power capacity which may be accepted with considerable confidence.

The basis for such estimates may need some explanation, that is to say, the estimated quantity of a site will vary in accordance with the use to be made of the power derived therefrom. Pulp mills and some other industries utilize power at practically a constant rate over the whole twenty-four hours of the day; some other industries use power for only eight hours in the day and that at varying rates. A reasonable assumption is that the average power demand for diversified industries will be 40 per cent. of the maximum demand, and machinery must be installed correspondingly if the full benefit is to be derived from a given site. Any estimates that follow are therefore given on that basis, that is to say, the commercial capacity of the site is taken to be 2½ times the average continuous capacity, since practically all the sites discussed have ample pondage capacity to store water at periods of low load for use at periods of heavy demand.

Considering in detail the water-power resources of the province we find four natural divisions based on typical characteristic rivers and general topography.

Atlantic Drainage Area

Another natural division of the province may be termed the Atlantic Drainage, covering roughly the counties of Guysborough, Halifax, Lunenburg, Queens, Shelburne, Yarmouth and Digby, and embracing the largest rivers of the province such as the Tusket, Liverpool, Medway, Lahave, Sheet Harbor and St. Mary rivers. This division forms by far the largest part of the province, and by reason of the fact that it is studded with lakes and rivers of considerable size, has large power resources. The possible power developments are of much the same type, being of low or medium head, ranging from 30 to 70 feet, with a few exceptions up to 160 feet head.

Capacity of Large Rivers

The estimated capacity of a few of the larger rivers may be mentioned briefly.

East River, Sheet Harbor, has a capacity in two developments of 15,000 horse-power, or if the West River, immediately adjoining, be included, a capacity of 17,500 horse-power. The heads utilized on these rivers would be 60 to 100 feet.

Two rivers flowing into St. Margaret's Bay, the Indian and Northeast, present exceptions to the general type of power rivers in the Atlantic drainage area in that they are comparatively small rivers. They have large storage facilities, however, and by a special development wherein a total head of 250 feet is utilized, the two together have a capacity of about 10,000 h.p. on the basis indicated above.

The Lahave, Medway and Liverpool rivers are all of the same type and when completely developed will supply 26,600, 35,000 and 85,000 horse-power respectively. There will be a number of power houses on each river, all of the same general type and operating under heads from 20 to 50 feet. The different power houses on the same river will, however, be so intimately connected electrically that they may be considered as a single unit. The Liverpool river is already developed to the extent of 6,500 horsepower, mostly for pulp and paper purposes.

The Tusket and Sissiboo rivers also have large power capacities, and while field surveys and investigations of these rivers have been completed, the necessary office computations have not yet been made.

Bear river, both branches, which is somewhat similar to the Indian and Northeast rivers already mentioned, will furnish about 5,000 h.p.

Valley District

The "Valley" district is so well known as to need no further description. Its power capacities lie mainly in the small but very rapid and precipitous streams which tumble from the high plateau known as the South Mountain into the Annapolis river. It presents unique opportunities for comparatively large developments immediately adjacent to thickly populated agricultural country.

Of the rivers in this particular class, falling from the South Mountain, the most important are the Lequille, Paradise and Nictaux, with power capacities of 6,500, 7,250 and 8,200 horse-power respectively. All of these developments would be cheap, that of the Paradise with a head of over 50 feet, remarkably so. The Gaspereau and St. Croix rivers are also included in this district, although the St. Croix, which is a particularly interesting stream from a power standpoint, is somewhat in a class by itself. The estimated capacity of the Gaspereau is 18,600 h.p., and of the St. Croix 8,200 h.p. on the basis already mentioned.

The Midlands

The remainder of the province which may be conveniently designated as the Midland district, embracing Hants, Colchester, Cumberland, Pictou and Antigonish counties, has no water power sites of great magnitude, although there are a large number of small sites well suited for local or private use. As in the case of Cape Breton, however, we have large coal areas in Cumberland and Pictou county upon which to fall back, and undoubtedly steam power plants in this district will ultimately be interconnected with some or all of the water-power sites mentioned.

It is an interesting fact, that in this province, as in so many other parts of the world, where we find large coal resources, we do not find large hydro-electric resources, but