

INDUSTRIAL DEVELOPMENTS.

No marked changes have taken place in the industrial position since Mr. Parry's report of 1918.

Electric power in dairying is making satisfactory progress. There are now about 548 electric milking plants in operation in New Zealand, distributed as follows:—

Thames Valley Electric-power District	..	..	..	..	..	257
Te Awamutu Electric-power District	..	..	..	..	..	48
Cambridge Electric-power District	..	..	..	..	..	50
Central Electric-power District	..	..	..	..	..	59
Tai Tapu Dairy Company's district	..	..	..	..	..	36
Eyre County	..	..	..	..	..	4
Rangiora County	..	..	..	..	..	32
Murchison County	..	..	..	..	..	4
Stratford District	..	..	..	..	..	8
Hawera District	..	..	..	..	..	50
Total	..	..	..	..	..	548

This does not include any plants supplied from private installations of which no records are available. The largest use of electric milking will be in the electric-power district areas, only a few of which are yet supplying power, and when the power districts now being formed are in a position to supply, this number will be largely increased. There are 12,468 power milking plants in operation in New Zealand, mainly driven by oil-engines, and as soon as the electric mains are available practically every one of these will be changed over to electric drive.

The treatment of phosphates for the production of artificial manure has made important progress, owing mainly to the interest acquired by the Government in the Nauru Island deposits. During the year large treatment-works have been put into operation at Auckland and Christchurch—the first supplied with power in the meanwhile from its own steam plant and the latter from the Lake Coleridge system. These plants take 200 to 300 h.p. each, and thus constitute an important load. Works for the treatment of phosphates are now established in Auckland, Christchurch, Dunedin, and Invercargill. The Wellington District is not provided for so far, and it is anticipated that when Mangahao power is available this industry will also be undertaken in this district.

One electric steel-furnace has been established during the year, supplied from the Lake Coleridge mains, and, after considerable difficulties of initiation, is now successfully converting pig iron into steel castings. A proposal has been made to utilize 3,000 h.p. for the smelting of Taranaki ironsands, and extensive and successful trials have been carried out in England on samples of the ironsands. Negotiations are now in hand as to a suitable source of electric power for this industry.

It is anticipated that when the extensions and new stations now under construction are generally completed—say, in 1925—there will be, on the whole, sufficient surplus of power to justify a campaign to develop the demand by encouraging the extension of existing industries and the establishment of new industries. Until this surplus is available the main advantage of electric power in attracting new industries cannot be realized.

It is important that every development should be laid out and the capital expenditure arranged so that the installation will prove remunerative to the supply authority. But it is equally important, from the public point of view, that the layout in every case should be capable of extension at the smallest possible capital outlay up to the full capacity of the site, whether from water or steam power, in order to meet the inevitable expansion in the industry.

Owing to the financial stringency, the question of electrification of the suburban railways has made no further progress, though the electrification of the Otira Tunnel is in hand. A special power-station with 2,400 kw. of steam-power and 250 kw. of water-power is being installed for this purpose. Automatic electric-power signalling for the railways has been introduced on the Wellington-Hutt line, and it is proposed for other sections. Though small, the demand for power for this purpose will be important as the system extends.

SAVING EFFECTED BY WATER-POWER.

With regard to the saving that is effected by the use of hydro-electric power, the actual costs of supply, including capital and operating costs of the power-stations in operation in New Zealand last year, were as follows:—

	Water.	Steam.	Gas.	Oil.
Number of stations	27	10	22	2
Average capacity (horse-power)	1,200	2,600	170	540
Average load-factor (per cent.)	48	32	25·5	32·5
Capital outlay per horse-power	£104	£69	£108	£84
Working-costs per horse-power year	£6·1	£17	£23·4	£29·4
Capital charges per horse-power year	£5·6	£6·9	£6·1	£6·5
Total costs per horse-power year	£11·7	£23·9	£29·5	£35·9

Compared with the water-power stations, at the same load-factor (48 per cent.), the fuel stations would have cost much more to operate. Moreover, the load-factor of most of the water-power plants can be largely increased at no increase in the cost of supply.

There is thus a saving in the cost of supply from the twenty-seven existing water-power plants of New Zealand as compared with the ten steam plants of £12·2 per horse-power year, and as compared with the twenty-two gas-engine plants of £17·8 per horse-power year. It must be noted that of these twenty-seven water-power plants more than one-half are old, small, and inefficient plants of 200 horse-power or less, so that the comparison is not unduly favourable to water-power.