

Block almost throughout its entire length—the lines being generally carried along the river-beds, and the ends closed on to the most convenient trig. stations. As soon as each subdivision survey was completed, the surveyor prepared the map and handed it to the Commissioners, who were thus able to conclude their adjustments block by block.

The total area of the territory described in the schedule to the Act of 1896 is 656,000 acres; the actual area surveyed is 700 acres more. The cost incurred for the work amounts to £4,311 4s. 2d., or a trifle over 1½d. per acre. With the conclusion of the Commissioners' duties and the completion of the subdivision surveys, portions of the large area dealt with will be available for the purposes mentioned in the Amendment Act of 1900, for the subdivision and disposal of the country in small grazing-areas, such as prevail under Part V. of the Land Act of 1892, on leases for periods of twenty-one years, and the setting apart of village sites in approved positions for the use and benefit of the Native owners.

STANDARDS.

Some attention was drawn to the well-known fact that there is no refined and costly standard bar of reference in this colony for the determination of measurements of length. Such bars are usually designated and referred to by special letter and number, as for instance, o1₄ (the Sydney 10-foot bar), and are constructed with elaborate skill, subsequently marked with the greatest precision, and placed in specially erected and equipped buildings such as that at the Ordnance Survey Department, Southampton. Moreover, provision has to be made to insure freedom from vibration, and change of temperature; appliances must be available to enable the temperature of the bars to be raised or lowered, and maintained at any required point for purposes of comparison and determination of the coefficient of expansion of the material of which they are constructed. The comparisons require also special apparatus, with micrometer-microscope attachments to measure and record infinitesimal differences of length. All this involves considerable expenditure of money, and is an absolute necessity in the unit of measurement for a great national survey such as is undertaken to determine the form and dimensions of the earth. So far, the surveys of this colony, in accordance with the principles laid down by the late J. T. Thomson, Esq., F.R.G.S., have been confined to the practical and utilitarian purposes of ascertaining the physical and topographical features, and reliable information as to the character of the country and its soil, vegetation, minerals, and other productions, with all other available information. After being duly recorded on maps and other documents, the Government and people were enabled to apportion the colony into political and civil divisions; to deal with the public estate on broad and intelligent lines, conserving and guarding what was most necessary in the public interests. It was possible also to deal with the subdivision and settlement of the lands in the manner most conducive to their proper utilisation, and the advantage of the settlers and the community as a whole.

Economy, expedition, and reasonable accuracy were the chief factors considered by the designer of the survey system. The accuracy prescribed for the foundation triangulation was 4 links per mile, reduced subsequently to 2; that of the sectional or settlement surveys was fixed at 8 links per mile at first; now the limit is 4 links (in practice more generally 2 links). As pointed out by my predecessor, each provincial or land district had already an established standard chain of reference, which necessarily varied from each other. As might be expected, the so-called permanent standards laid down at the survey offices are liable to disturbance. It has been decided to adopt one uniform standard of length throughout the colony, and that for the practical purposes of ordinary settlement surveys, 100 ft. steel bands, with principal divisions marked, duly certified to as correct, will suffice for the present. Five-chain steel bands of absolute correct standard length are not procurable in England. The Ordnance Department do not test such apparatus for outside surveys, though Colonel D. A. Johnston, Director-General of the Ordnance Department, has most courteously offered to furnish full particulars and assistance in the event of the colony deciding to obtain a 10 ft. standard bar similar to the bar o1₄ supplied to New South Wales in 1858, and the O1₆ bar furnished to Victoria in 1862. The Board of Trade (Standards Department), 7, Old Palace Yard, London, can only certify to standards 100 ft. and under, and the kind offer of the Superintendent of Weights and Measures to verify standard tapes of that length for New Zealand will be gladly availed of.

Inquiries are being made as to the production and distribution of bands (100 links to 500 links) made of nickel-steel, mentioned by the celebrated American authority, J. B. Johnson, C.E., which both he and Mr. Arch. McDowall, Surveyor-General of Queensland, mention as being the most stable of alloys under variations of temperature.

I am indebted to the Hon. G. F. Richardson, president of the New Zealand Institute of Surveyors, for valuable papers and suggestions received from Mr. McDowall, Mr. John Allan (Secretary to the Queensland Institute of Surveyors), Mr. F. J. Charlton (Queensland staff surveyor), and Mr. W. E. Hill (Queensland staff surveyor); and also for the loan of two standard tapes from Brisbane, which will be fully availed of and utilised for comparison and check when opportunity offers. Immediately a five-chain standard band for New Zealand has been adopted, similar bands, duly compared and authenticated, will be available for distribution, not only for comparison but also for general use. The offer of the Surveyor-Generals of New South Wales and Queensland of further aid in this important matter is most acceptable and valuable; and is indicative of the advantage of the reciprocity established between Australia and New Zealand in regard to the licensing of surveyors. This leads to consideration of the working of the Surveyors' Board.

Surveyors' Board of Examiners.

This Board was constituted under "The New Zealand Institute of Surveyors and Board of Examiners Act, 1900," and consists of two members nominated by the Hon. Minister of Lands; two by the Council of the New Zealand Institute of Surveyors; and the Surveyor-General. It