

in the difficult country they have had to encounter. I must also notice with approbation the excellent out-turn of work furnished by the young officers, Mr. H. M. Skeet, of Taranaki, and Mr. T. Brodrick, of Canterbury.

SETTLEMENT SURVEYS.

The operations under this designation comprehend the laying-out of road-lines, and the subdivision of rural, suburban, and town lands into sections for sale and occupation. Of rural and suburban lands, 534,209 acres were subdivided and marked on the ground into 4,344 sections, and 514 acres of town lands into 1,025 sections. These surveys are all under trigonometrical check, the starting and closing points of the traverses being the stations of the minor triangulation. The traverses are reduced and tabulated on the meridian and perpendicular of the trigonometrical survey, and compared directly with it. The limit of error allowed is 8 links to the mile, or 1 in 1,000; but in practice the error is usually well within this limit, except in rough bush country. In open land, and even in ordinary bush, by taking the angles of the slopes, and using the steel tape, the error can easily be kept under 4 links to the mile. As a matter of fact the error of many of the more experienced surveyors does not usually exceed 2 links to the mile. This accuracy is not the result of any finical painstaking—for the most accurate surveyor is also, as a rule, the most expert—but is the outcome of method, the possession of good instruments, and, above all, the acquisition of the trained habit of accuracy. The necessity for precision in the settlement survey of a new country becomes obvious when it is considered that there are no time-honored land-marks, as in an old country, defining the boundaries of property, but, instead, a blank wilderness, on which the surveyor creates boundaries, the surface-marks of which must often get obliterated before the settler has thought of securing them. These boundaries, once lost, could never again be restored with any confidence but for the possession of the plan and mathematically-reduced traverses of a correct original survey. With such data the lost boundary can be reproduced within a narrow limit of error. The successful working of the land-transfer system very much depends on the rigid accuracy in the execution and record of the sectional surveys. The system of relying on protractor and scale for check in traverse surveys does very well for topographical details, but for boundaries it is simply a convenient way of ignoring errors and covering them up, to perplex the surveyor who may be employed afterwards to restore lost boundaries, or subdivide and deal with the land under the Land Transfer Act.

The Ordnance survey of the United Kingdom is, so far as the survey of properties is concerned, a survey by plot and scale. By adopting a large scale for the plot the evils of the system are mitigated, and an accurate topographical map is produced; but, should the land-transfer system of the colonies ever be introduced, and much subdivision of land take place, the system of survey and plot hitherto pursued would be found quite inadequate to the necessities of the case.

In bush surveys where, on account of felling, clearing, and burning, the marks of the sectional surveys are so liable to obliteration, iron-tube pegs are inserted at the main traverse points and their adjacent stations, so that the survey, once made, is never lost, but can be picked up again, and the intermediate points re-established if necessary. This precaution is also adopted in the survey of new townships, for in them the buildings and enclosures soon cover up or remove the survey points.

NATIVE SURVEYS.

During the year 34 blocks, comprising 43,026 acres, were surveyed for the Native Land Purchase Department, and 98 blocks, representing a total of 148,459 acres, for investigation of title by the Native Land Court. "The Native Land Court Act, 1880," by enabling the Native owners to have the cost of survey defrayed in the first instance by the Government and registered as a lien on the land, has, with other favouring causes, led the Natives to avail themselves more and more of the opportunities of proving title, thereby rendering their land negotiable. The liens registered for survey up to the 30th June last amount to a total of £44,682, of which £1,526 has been paid off in cash, and £20,338 has