

## MARLBOROUGH.

UNDER the principal headings of the general return it will be seen that the work of the year in the field consists of major and minor triangulation, with topography, 505,983 acres; section survey, 1,470; gold-mining surveys, 31 acres 3 roods 30 perches; roads, 30 $\frac{1}{4}$  miles.

*Triangulation.*—During the past season 505,983 acres of major and minor triangulation, with topography, have been completed by Mr. Wilson, viz., 363,905 acres of major and 142,078 acres of minor, at a total cost of £979 18s. 9d., at the rate of 0.25d. per acre for the major and 0.64d. per acre for the minor. This triangulation was commenced on the 21st October, 1882, and finished on the 18th October, 1883. The general features of the country covered by this work, and the survey districts embraced therein, as well as the results of the check with the base of verification at Kaikoura and the closings with the Amuri circuit in Nelson District on sides Highfield-Cookson and Highfield-Percival respectively, have already been given, in my report for 1882-83.

*Connection of North and Middle Islands' Triangulation.*—This was the next work taken in hand, in December last, by Mr. Wilson (on his return after two months' leave of absence), by means of observations taken to heliotrope signals, the results in every instance being satisfactory, and most creditable to the surveyor intrusted with the duty of taking the observations for this important work. The data used in calculating the connection across the Strait was line E-Weld cone, derived from the co-ordinate distances of the major triangulation. With this calculated base and checking through a series of triangles on E-Ref. coast, a side of the major trig., the difference was 2.1 links in a distance of 104,383 links. Again, when applied to line Kaukau-Mana, a side common to Marlborough and Wellington surveys, the difference was found to be 7.7 links less than Wellington in a distance of 84,177 links, or 0.75 links in a mile; further, when continued to the Wellington base line at Korokoro and compared with the actual measured distance, the difference was 1.3 links less in 14,270 links, or 0.73 links in a mile; and the line Kaukau-Matthews, a side of the major trig., showed only a difference of 0.8 links in 118,768 links, when calculated from Mr. Climie's co-ordinate distances. Taking side E-Ref. coast, as the basis of calculation, the result gives a still nearer agreement with the Wellington survey. The following shows the differences of the various checks, with their different bases:—

|                    |     |                                                             |                      |
|--------------------|-----|-------------------------------------------------------------|----------------------|
| E-Weld cone        | ... | 324177.4—Base from co-ordinates of major trig., Marlborough |                      |
| E-Ref. coast       | ... | { 104383.2—Side of major trig. ... }                        |                      |
|                    |     | { 104381.1—From co-ordinates ... }                          | =0.16 link per mile. |
| Mana-Kaukau        | ... | { 84177.6—From base, Marlborough ... }                      |                      |
|                    |     | { 84185.3—From Korokoro base, Wellington ... }              | =0.75 " "            |
| Korokoro-East base | ... | { 14270.0—From base, Marlborough ... }                      |                      |
|                    |     | { 14271.3—Measured base, Korokoro, Wellington ... }         | =0.73 " "            |
| Kaukau-Matthews... | ... | { 118768.2—From base, Marlborough ... }                     |                      |
|                    |     | { 118769.0—From base, Wellington ... }                      | =0.054 " "           |

During the last three months of the season Mr. Wilson has been pushing forward major and minor triangulation up the Wairau Valley to connect with Nelson circuit near Tophouse. At present there are about 370,000 acres of major and 57,500 acres of minor triangulation sufficiently advanced for observation, at a cost to date of £283 17s. These triangulations cover parts of the Onamalutu, Avon, Pine Valley, Mount Olympus, Patriarch, Leatham, Raglan, Spray, and Hodder Survey Districts. This work was commenced on the 26th March, 1884, and the country over which it is carried is generally rough and high, with bush in parts. No cadet assisting.

*Section Surveys.*—The eleven sections under this heading are separate selections in eight different localities. Ten of these adjoin old magnetic surveys, the inefficient ground-marking of which has in this, as in all similar cases, been the cause of much loss of time to the surveyor in identifying and re-establishing. The remaining seven sections are revision surveys of unconnected old surveys in various bays in the Pelorus Sound. The cost per acre of these surveys includes the cost of connection to trig. stations, and they are all heavily timbered. In these section and revision surveys there were four closed traverses; average length of each 1 $\frac{1}{2}$  miles; greatest closing error, 1.6 link per mile; mean ditto, 1.1 link.

*Mining Surveys.*—Of gold-mining surveys 31 acres 3 roods 30 perches, in three sections only, have been applied for and surveyed. In this district surveys of this character have hitherto been very limited, and, as they are generally situated in inaccessible timber country, requiring a special journey as applications are sent in, the cost of survey is therefore much greater than ordinary section survey.

*Roads.*—Thirty miles and a quarter of road surveys have been completed during the year. Twenty-eight miles of the above have been surveyed through the Kaituna and Pelorus Valleys, for the purpose of acquiring the lands trespassed on by the present line of road, and making the necessary exchanges of the old roads for the new ones. About twenty-four miles pass through partially-cleared bush and the remainder through open fern land. Throughout the whole distance this road abuts on and intersects freehold lands, 110 sections in all (chiefly granted from old defective surveys), the position of which had to be determined afresh before the intersections of the section boundaries with the road-line could be arrived at and pegged off. As the original surveys of the timbered lands were all done on independent needle bearings, and nearly all the original lines and marks were lost or obliterated, a great deal of the surveyors' time was taken up in the preliminary work of re-establishing these lines and putting them on true bearings. The office work, too, was very considerable in adjusting the old and new work, and plotting the work to three chains as well as ten chains to an inch. With these difficulties to contend with, it is not a matter of surprise that surveys of this nature are expensive to execute. Sixteen miles of this road were returned in last year's report as partly done, the field-work only being completed, at a cost of £281 15s. 4d. The balance, 2 $\frac{1}{4}$  miles, of the above is an engineering road survey, put in hand with as little delay as possible after the receipt of instructions. The particulars of the country traversed