the road and topographical traverses; thus a separate survey seldom closed on a trigonometrical point. The work was at the same time plotted by scale and compass. The field-books shown to me of this portion of the survey are generally in a fair condition, but many, having been kept in pencil, are being obliterated. The general maps, which are on a 40-chain scale, and of a large size (over 10 feet square), are decayed, but the original working plans of 10-chain scale and small size (2′ 2″ × 3′ 0″) are mostly in a tolerable condition. These small maps, however, were not continued to be made, as I was informed the office found large ones to create less confusion and difficulty in arrangement. Within the last ten years the working plans which were open to the public for selecting are of very large size (6′ 2″ × 30′ 0″); some of these are very much soiled and considerably creased.

The mode of recording applications is first to number them in ink, putting down the boundaries in pencil, which are also inked when the survey comes in. No distinguishing colour is used. In some cases these marks are now so faint as not to be recognizable. When the application map (which as stated before is also a topographical as well as a working plan) proves to be inaccurate by the traverses not closing, a separate plot is made of the sections built on these, and the Crown grants are made from such separate plots. This is owing to the impossibility of attaining any great accuracy by plotting, or owing to the roads to which the sections front not having been accurately surveyed at the beginning.

One of the worst application maps is of the Selwyn District (size 14′ × 6′), and which has been in use for twelve years. It is also plotted without triangulation, being based solely on traverse work. It is soiled and in shreds, so as to be for the most part illegible, and the marking of sections is confused and inextricable; but of this district there are separate plots in good order. The preservation of these is owing to the public only having special access to them. These separate plots are fixed by trigonometrical stations, but the bearings and distances of traverses are not given, only the sides of sections. The boundaries of these plots are irregular. All the application map is not thus plotted, but only where resurveys have been made, and which have been called for by disputes about boundaries.

Plan of Christchurch District No. 1 is also in a very dilapidated state; but there are small separate parts of it legible and in fair condition, constructed in the same manner above noted.

The Peninsula maps were originally partially triangulated in the same manner as described above. Here the section survey is very intricate, the traverses being tortuous and proceeding long distances without check or connection. In this district disputes have been endless, owing to inaccuracies thus arising. The application map of Akaroa is in the same state of dilapidation as that of Christchurch District No. 1.

Recently a minor triangulation has been executed by Mr. Walter Kitson, extending over Banks Peninsula and along the sea coast as far as Timaru, in sheets 7′ × 6′. The initial part of this triangulation is Burnham, where the true bearing was determined by the Transit of Venus Expedition. A base line was measured near Lake Ellesmere, in length 26,853 links, and which, as tested by triangulation and calculation from the Rakaia base, showed only an error of 4 links in the whole length. Test was also made of Cridland's base, near Ashburton, as follows:—

By Kitson's triangulation	24·368·5 links.
„ Cridland's measurement	24·367· „
Error	1·5

So also of Hewlings's base, near Geraldine—

By Kitson's triangulation	14·052·8 links.
„ Hewlings's measurement	14·053· „
Error	·2

This triangulation was conducted with 8″ and 6″ theodolites, but the bearings shown curiously are magnetic, valued at Burnham 16° E. of true meridian. Two verniers only were read. The summation of angles in a triangle shows an average error of only 5″ to 40″. All the stations are calculated on the magnetic meridian and perpendicular of Burnham, and to seconds, and the positions plotted from reduced tables. This is the only triangulation in the province so executed.

Recent section work has been based on this triangulation at Pigeon Bay, whose stations were Haylor, Wild Cattle Hill, Sinclair, and Pigeon Bay Peak. A subsidiary triangulation was cast to intervening points. Road traverses were run from point to point, and to which the sections were attached. The bearings and distances are not given in the maps, but references are made to the field-books, where they will be found. The traverses are not calculated on the meridian and perpendicular. This as yet has not been done anywhere.

In the safe the maps are kept in rolls on shelves. The field-books have a special place for themselves. No maps are kept in folios, nor in their special places marked or labelled.

In regard to extent of error in some districts, I first examined that of Little River. Here an error of six chains was pointed out to me in a distance of only two miles. The survey appears to be incongruous and inaccurate throughout. Thus the centre road line, instead of being straight as shown on the plan, is actually bent to an extent of five chains. Crown grants, notwithstanding this fact, are being issued. The Chief Surveyor is inundated with complaints from this quarter about disputed boundaries, both personally and by letter. A letter was shown me from Mr. A. D. Allen as an example, requesting that a surveyor be sent to place the pegs where they ought to be.

I then examined the plan of Akaroa. Here, in application 8916, differences between original pegs and present surveys were shown to amount to five, four, and three chains in different lines. The title is by Crown grant, and the actual holding exceeds in this case the land granted. This district has a most complicated system of sectional settlement, the back sections of which are especially "adrift" from their true positions.

This inaccuracy pervades all the old closely settled districts more or less, but which I need not enumerate.