may be shortly stated as meridian and parallel; of ours, meridian and perpendicular, termed meridional circuit.

The average cost of the two systems may be stated as follows:—

New Zealand.

	£	s.	d.			
Standard	0	3	6¼	per square mile.		
Trigonometrical (2½-mile sides)	3	12	2	,,	,,	
Sectional (20 to 200 acres more or less) ...	32	0	0	,,	,,	or 1s. per acre.

American.

	£	s.	d.			
Standard (24 miles apart, average Colorado) ...	0	6	11¼	per square mile.		
Mile blocking	6	13	4	,,	,,	
Sectional (40 acres)	14	11	8	,,	,,	or 5½d. per acre.

Thus it will be seen that our standard and intermediate processes are cheaper than the American. This is mainly due to our fixing fewer points; while our actual or sectional process is more than double the cost, due to the greater labour taken in marking out roads, traversing the ridges, and designing the sections in relation to the complex configuration of the surface, and also in a great measure due to the Americans allowing of no isolated or spotting surveys, but on the contrary having, in their land laws, enactments stringently forbidding surveys "unless within the range of the regular progress of the public "surveys embraced by existing standard lines or bases for the township or sub-divisional surveys." Also, where special surveys are made under the above conditions, settlers depositing cost have no priority of claim or right to purchase the land.*

Before leaving this portion of the subject, it will be well for me to remark that both the American and our system of settlement survey being primarily based on astronomical data, the connection of the actual surveys with these are made in the same manner. What has been done in this branch here has as yet been preliminary, but with the approval of Government, I trust soon to be in a position to commence the operations with the best class instruments for observing latitudes, and for ascertaining electric difference in longitude of Initial Stations of Circuits from the Central Observatory, besides for observing the absolute longitude of the latter. It must also be noted that our actual survey is systematically subject to mathematical reduction and test; so also are the elements correctly made subservient in their geodesical values to the primary astronomical determinations as already hinted. The actual surveys in America, being so closely in connection with astronomically-observed true meridians, appear not to have mathematical reduction applied, but I observe by the specifications of the Canadian Surveys that their execution, as actual surveys, is unexceptionally careful, and that the work could be submitted to mathematical reduction if necessary; though from reading, I cannot learn that this is the case. Their standard lines, however, being chained, could not rank with our triangulation in this branch.

But it may be asked—is there no other comprehensive system of settlement survey besides those described? I know of none. Besides Canada and the United States, the only expansive modern settlement surveys that are going on are to be found in Australia.

Turning to New South Wales, and looking at the report of the Commission that enquired into the Surveyor-General's department there in 1855, we find the methods that had been used up to that time condemned as inaccurate and imperfect; and next, looking at the Instructions for Surveyors, dated 1872, we note that so far from the Commissioners' recommendations of 1855 (which were to carry out a general Major Triangulation) being found applicable to the wants of the people, we gather from certain clauses that the American system, or rather a modification thereof, has been decided by matured experience to be the most appropriate. Thus, in Clause 117, it is directed that "the plans for convenience in compilation "(are) to be plotted in sheets, and no one sheet (is) to embrace more than six miles of longitude." "Meridian lines are to be drawn through stations at which meridian observations have been taken, also "through stations at or near the extremities of each sheet, the lines to extend to the limits of the paper, "and the angle made with one of the adjacent traverse lines shown." Meridians are thus as contiguously observed in actual survey as in America, and their convergencies noted and allowed for, and to which end simple tables have been drawn up for the ordinary surveyors by which they can—by observing greatest elongations of circumpolar stars—obtain true meridian, with a degree of approximation attainable by small instruments; thus, in primary principle, their actual survey system is the American.

Then examining the survey system of the next great colony of Victoria, we find in the Report on the General Survey there, presented to both Houses of Parliament in 1859-60, the system previously in operation also condemned, and what is called a geodetic principle proposed; but in the Inspector-General's letter to Government, dated Melbourne, 12th June, 1876, we find it reported to be a failure, and a system identical with our own proposed in lieu. Thus referring to the report on the Land Act of Victoria 1869, dated 31st December, 1873, under the heading "Instructions for the Guidance of Surveyors," the Clauses bearing on the subject are to the following effect: "with the plan must be sent "in a copy of the computation of the figure and its area in the usual form for computation by reduction "of traverse and double areas. The two first columns shall contain the actual bearings and distances "noted in the field-book; the second two the same corrected for small practical errors (where neces- "sary). The other eight columns shall contain the usual northings and southings, eastings and westings, "double longitudes and double areas."

In regard to the Geodesical branch, Inspector-General Allen says that he, in 1859, pointed out the impossibility of the Geodetic system, and recommended instead "*the establishment without the least delay*" of true meridians in central localities all over the country, and of "*uniform chain standards.*" Thus we now see in the other great colony of Australia the Meridional Circuit system had recourse to, identical

* See Section 10, Land Act, 1862.