are liable to occur. Lines of precise levelling at least are advisable, intersecting if possible. In proved earthquake districts closed circuits should be aimed at. Owing to the great importance which earthquakes have on so many activities in this country, it is very desirable that the Survey Department of New Zealand should follow the example of such governmental institutions as the United States Coast and Geodetic Survey, who maintain fully equipped, magnetic, atmospheric electric, and seismological observatories in conjunction with their precise levelling and triangulation work.

An area of land in the State Forest Reserve at Eyrewell, some fourteen miles from Christchurch, has been under consideration as a site for the Observatory, where the instruments can be operated in a suitable position and housed in a manner meeting the most rigorous needs of modern investigations. Magnetic observations made at several points on this property have disclosed no appreciable local magnetic disturbance. Some eye-observations at one station with a vertical force balance did not disclose any appreciable tramway effects. The Z Adie balance has now been fitted with a separate clock drive, and is therefore available for getting preliminary test magnetograms on the site under actual recording conditions, and with higher sensitivity. These observations should definitely decide the question of the freedom or otherwise of the site from the effects of stray currents. It is worthy of note that the great city of Manchester, England, has definitely decided to abandon tramway-rails, and there is little doubt that in Christchurch electric trolley-bus extensions will be cheaper always than rail extensions with their expensive maintenance. Therefore, if our Z trial curves prove satisfactory, the Eyrewell site should remain suitable from all points of view. The site would also be suitable for other necessary services of our Department, and the installation of a first-class clock is requested, as it is necessary for the seismological and other observations. A short wave, transmitting and receiving, wireless set is also required. The determinations of precise local time will be available for the geodetic work.

A very important feature in connection with the Eyrewell site is that it will prove eminently suitable for atmospheric electric work, as it is well removed from sea, hills, and city smoke. Other countries are looking more and more to us as time goes on, to provide atmospheric electric observations from a site which is beyond cavil. Only recently the Carnegie Institution of Washington, D.C., forwarded particulars and detailed plans of their specially designed atmospheric electric house, as erected at their Observatories throughout the world in various parts. It is important that uniformity should exist among all observatories doing electric (atmospheric) work, therefore I recommend that at the new site at Eyrewell—if magnetically suitable, of course—a replica of the Carnegie Institution of Washington electric house should be provided at an early date. I consider this a matter of extreme urgency.

## Proposed Operations, 1930–31.

*Geodetic Triangulation.*—Further reconnaissance work in Taranaki and southern Auckland districts will have to be undertaken during the year, linking the Eltham base with the Matamata and Kaingaroa bases. The observations to connect the Wairarapa and Eltham bases will be continued and possibly completed.

*Precise Levelling.*—Work on this will be started should it be possible to detach a surveyor from the more urgent settlement surveys in hand. The necessary instruments are now on order, and should arrive early in the year.

*Minor Triangulation.*—No new work is proposed under this heading, nor is it anticipated that any extent will be necessary to control settlement-surveys in progress.

*Topographical Surveys.*—Plane-table work in the Auckland and Taranaki Districts is being continued under reduced staffs. Two small areas in the North Auckland District are proposed to be photographed from the air, and the resultant photograms plotted. This work is of an experimental nature to demonstrate whether aerial photogrammetry can be economically carried out under local conditions.

*Standard Surveys.*—The Auckland city suburban survey is being continued. The field-work at Invercargill has been completed and plans of same are now in hand. It is hoped to complete the Christchurch standard extension and the rural work in Taranaki this year. Rural work in Gisborne and Southland will be continued.

*Town-section Surveys.*—With the exception of 47 acres in Wellington and two small areas in Christchurch and Southland, no work is in hand under this heading.

*Rural Settlement.*—Future operations show an area of 112,000 acres under this heading, principally in the North Auckland and Otago Districts, and it is anticipated that further areas will be made available during the year.

*Native Land Court Surveys.*—Authority for the survey of 56,000 acres of Native land is in hand at the beginning of the year, and it is anticipated that the time of one staff surveyor will be required for the survey of consolidated blocks in the Auckland District.

*Office-work.*—The routine examination and recording of plans, field inspections, photo.-lithographic drawings, and the computation in connection with the geodetic, magneto, and tidal surveys will be continued in addition to the above field-work. The recomputation of the minor triangulation in the Bay of Plenty and Poverty Bay circuits is to be continued, and should be completed and results made available for use during the year.

## General.

*Map-publications.*—In the Chief Draughtsman's report appended hereto will be found details of the maps published during the year.

*Town Subdivisional Surveys.*—There was a slight decrease in the number of plans and also the total area subdivided compared with the previous year. An analysis of the number submitted and of their division into classified areas is given in the Chief Draughtsman's report.