The Coelostat telescope, Fig. 2, consists of a plane mirror 20 inches aperture, moved by clock work, so as to reflect a beam of light from the sun in a constant direction southerly to a second plane mirror of 20 inches diameter which in turn reflects it north to a concave mirror of 18 inches aperture and 80 feet focus. This latter mirror directs the beam south forming an image of the sun about 9 inches in diameter in the solar research laboratory where it or any part of it is analysed by a powerful grating spectrograph of 23 feet focus.

The meridian circle, Fig. 4, by Troughton & Simms, of London, England, is of 6 inches aperture, and about 7 feet focus. It has graduated circles of 36 inches in diameter read by 4 microscopes on each sile and is provided with a complete travelling wire micrometer and all the usual accessories. Very great care was taken in the construction of the pier on which it is mounted to ensure stability and a very complete system of azimuth marks will shortly be installed.

uninterrupted so long as the crust of the earth is quiet. Any disturbance starts the pendulum oscillating and this is immediately indicated by the sinuous appearance of the lines. The time scale is indicated by the light being occulted for a second at the beginning of each minute, thus leaving a white dot at intervals of slightly over half an inch in the lines.

Besides these principal instruments there are measuring microscopes for star and sun photographs and spectra, required and used in survey and other work done and laboratory apparatus of various kinds and the numerous uses to which it may be put may be described briefly under five different headings.

A. Astronomical and Astrophysical work.

B. Meridian Work and Time Service.

C. Geophysics including Seismology, Gravity and Magnetics.

A.—Astronomical and Astrophysical Work.

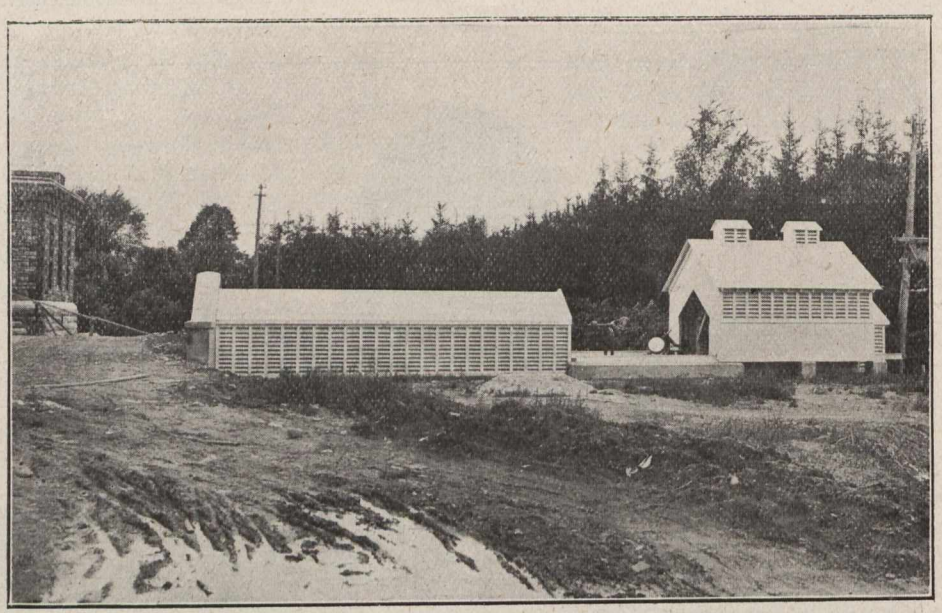

Fig. 2.—The Coelostat House.

The standard sidereal clock is by Riefler, of Munich, Germany, of his well-known type of electrical winding glass enclosed movements. The pendulum rod is of Invar, accurately compensated. The pressure is kept constant by partially exhausting the air in the enclosing glass case and the temperature is also maintained constant within about 0.01° C by a Callendar recorder in a second outer case of wood. To prevent stratification and consequent unequal temperatures between the glass and outer case, the air is kept constantly and thoroughly stirred by a fair. The clock, therefore, works under almost absolutely constant conditions and has a remarkably regular rate.

The seismograph is of the photographically registering type of horizontal pendulum made by Bosch, of Strasburg, Germany. It consists of two 200 gram pendulums one swinging in the east-west, the other in the north-south direction placed close together on the top of a solid pier sunk into the ground below the floor level of the observatory basement. A pencil of light from a single filament incandescent lamp is incident upon concave mirrors on the pendulum and is reflected back to a focus four metres away on a drum about 10 inches in diameter on which a sheet of sensitive bromide paper is rolled. This drum rotates once an hour, moving at the same time a short distance longitudinally, and the spots of light consequently trace spiral lines on the paper, which are

This, which is chiefly Astrophysical in its character is in charge of J. S. Plaskett, and embraces all the work done with the equatorial and coelostat telescopes and includes other allied spectroscopic, physical, or chemical researches. The astronomical work consists of measurements of the position, angle and distance of double stars, of the position of comets, and observations of the time of occultation of stars by the moon. The stellar camera is used by the same observer in making photographs of parts of the sky and of comets whenever visible. The greater part of the time with the equatorial, however, is taken up in making photographs of spectra of the stars chiefly of what are known as spectroscopic binaries, pairs of suns revolving around one another. These spectra are afterwards measured, the velocity of the stars thereby determined, and these velocities plotted into a velocity curve from which the elements of the orbit, the character of the motion of the binary system, may be determined. At the same time as our knowledge of the mechanical structure of the universe is thus increased, the spectra may be used in determining the chemical constitution of the heavenly bodies and in indicating their method of development. Of more direct practical bearing possibly is the research on the sun carried on with the aid of the coelostat telescope. This embraces daily photographs of the sun's surface for the determination of the disturbances present, spots, faculae, etc.,