

formed, proved itself capable of resolving these singular stellar curiosities—the double stars.

Dr. Smallwood certainly deserves great credit for his perseverance of a favorite study, under the most unpromising circumstances; but in nothing is he so remarkable as in that peculiar ingenuity which has led him to overcome difficulties in the prosecution of scientific inquiry, which, to most minds, would have been utterly discouraging.

The Natural History Society of Montreal have petitioned the legislature for a grant of money to enable them to publish Dr. Smallwood's tables of observations for the last twelve years. This is a measure, on which no difference of opinion can be anticipated, and must meet with the support of every man who has the welfare of science in Canada at heart.

DESCRIPTION OF THE OBSERVATORY BY DR. SMALLWOOD.

The observatory is placed in the magnetic meridian, is constructed of wood, and has an opening in the roof, furnished with sliding shutters for taking observations by means of the Transit Instrument, of the passage of a Star across the meridian for the purpose of obtaining correct time.

It is also connected by the Montreal telegraph with the principal places in the United States; the wires being laid into the Observatory. It has also a seven-inch achromatic telescope, 11 feet focus. The object glass, by Fraunhofer, of Munich, is mounted equatorially and possesses right ascension and declination circles; and observations are taken on the heavenly bodies as often as there are favourable nights.

Observations for the purpose of Meteorology, are taken by the usual instruments, at 6 and 7 a.m., 2, 9 and 10 p.m. daily, besides extra hours, on any unusual occurrence. Constant tri-daily observations are also taken on the amount and kind of atmospheric electricity, also on the amount of Ozone, and likewise particular attention is directed to the phenomena of thunder storms—all of which observations are regularly recorded. Besides these daily observations, record is kept of the temperature of springs and rivers, and the opening and the closing thereof, by ice; also on the foliation and flowering of plants and trees, and the periodic appearance of animals, birds, fishes and insects, besides the usual observations on auroras, haloes, meteors, zodiacal light, and any remarkable atmospheric disturbances.

Many of the instruments are self-registering and, to some, the photographic process may be applied, being constructed for that purpose.

The Observatory is furnished with four barometers. 1. A Newmann standard, 0.60 of an inch bore; the brass scale extends from the cistern to the top of the tube, and is adapted for registration by the photographic process. 2. A Negretti and Zambra's tube, 0.30 of an inch bore; another of a small bore, and also an Aneroid. The cisterns are all placed at the same height (118 feet.) above the level of the sea and are read at each observation.

Thermometers of Sixes, Rutherford, Negretti, &c., the readings

of which are corrected, with the standard instruments of the new observatory, and most of the scales are engraved on the stem of the tubes. Care is taken to verify them twice a year, they are placed four feet from the ground, and have occupied the same position for some years, being placed free from radiation, and carefully shaded from the sun and rain.

The *Psychrometer*, consists of the dry and wet bulb thermometer; the scales of which are coincident, and have been carefully read together. There is also a Saussure's hygrometer. In Winter the wet muslin is supplanted by a thin covering of ice which require frequent renewal.

For solar radiation a maximum Rutherford's thermometer is used, with the bulb kept blackened with Indian ink; the tube is shaded by a piece of glass blackened also with Indian ink, which prevents the index from adhering to either the tube or the mercury, as is often the case when not shaded.

Terrestrial radiation is indicated by a spirit thermometer of Rutherford, which is placed in the focus of a parabolic mirror, 6 inches in diameter and of 100 inches focus.

Drosometer or dew measurer.—One is of copper, like a funnel, the inside of which has been exposed to the flame of a lamp and has been coated with lamp black; the other is a shallow tin dish painted black and ten inches in diameter.

Rain-gauge.—The reservoir is thirteen inches in diameter, and is placed 20 feet above the soil. It is self-registering, and is attached to the anemometer and shows the beginning and ending of the rain and the amount of precipitation, in inches, on the surface.

The *Snow-gauge* presents 200 square inches of surface, and is placed in an open space. The surface of the snow requires to be lightly levelled, before taking the depth, which is recorded in inches. A tin tube, 3 inches in diameter and 10 inches long, is used for obtaining snow for the purpose of reducing the amount to the relative amount of water. The tin tube fits in another vessel of tin of the same diameter, and the snow is easily reduced and measured.

The *Evaporator* exposes a surface of 100 inches, and is carefully shaded from sun and rain. It is made of zinc and a

glass scale, graduated in inches and 10ths, is well secured in front of it, a strip of the metal being removed, the glass scale supplies its place, so that the amount evaporated can be easily read off. Its place is supplied in water by a pair of scales, upon one of which is placed a disc of ice, and the amount of evaporation from the surface is estimated by being very accurately weighed.

The *Ozonometers* are Schonbein's and Mollat's. The solution consists of one drachm of starch, boiled in one ounce of distilled water, to which is added, when cold, 10 grains of the Iodide of Potassium—this is spread on sized paper, which is found to answer better than bibulous or unsized paper, for the solution is more equally distributed over the surface, whereas on bibulous paper it is very difficult to spread the solution equally. It is cut into slips

