

THREE MCGILL WEATHER OBSERVATORIES

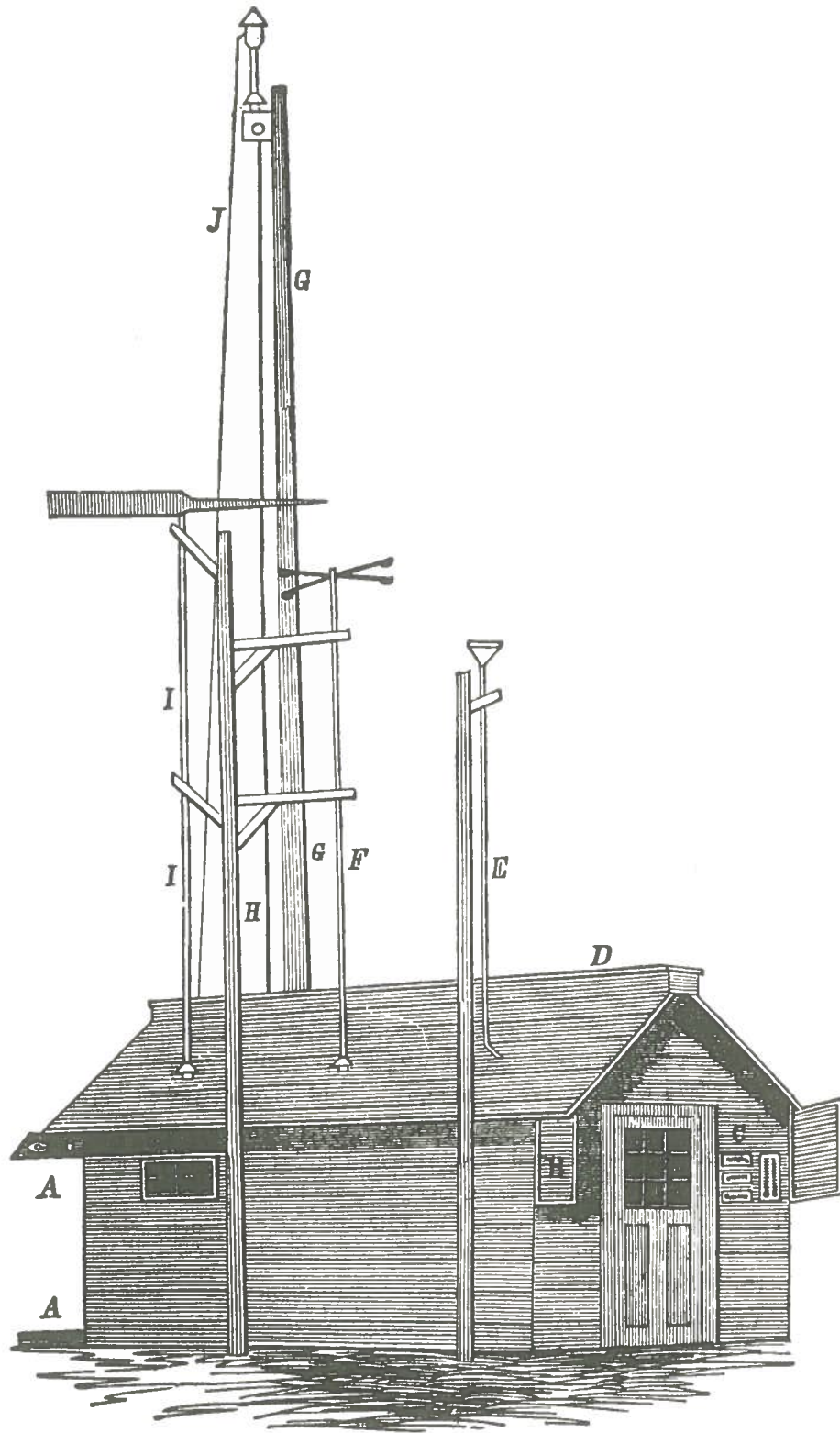
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The Smallwood Observatory at St. Martin

Charles Smallwood, M.D., built his own meteorological observatory in the 1840's, at his home in St. Martin, Isle Jesus, outside Montreal. In 1858, when 12 years' records had accrued, Dr. Smallwood wrote as follows.

"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."



Two wood engravings show the Smallwood Observatory and the disposition of its equipment as described in 1858. Regarding the external view, the small wooden building faces north, and comment can be related to the letters on the engraving.

(C) The thermometers for measuring air temperature and the dry and wet bulb thermometers for humidity are on the north wall, shaded from sun and rain. They have occupied the same position for some years, four feet above the ground, and have been verified twice a year. On summer evenings, of course, the north end of a house is in sunshine. The shading of the thermometers from this evening sun is provided by screens of Venetian blinds on either side of the building, at B.

(A) For measurement of solar radiation, another thermometer is set out from the southern end, its bulb kept blackened with Indian ink.

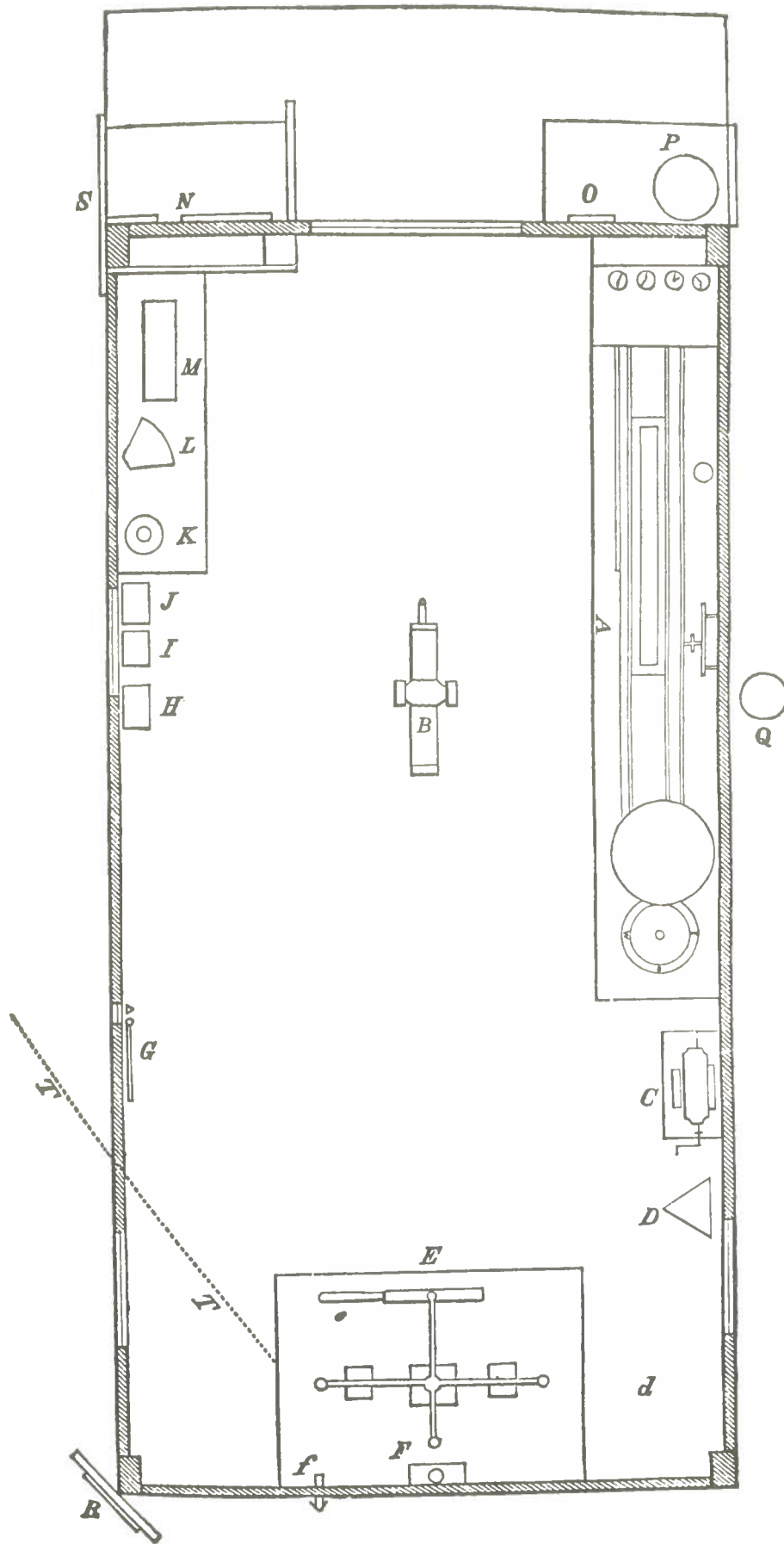
(D) An opening runs along the ridge of the roof allowing use of a transit telescope inside the building for time from the stars. Shutters cover this opening when it is not in use.

(E) The rain gauge has a receiver 13 inches in diameter twenty feet above the soil. A recording device inside the building shows the beginning and ending of the rain and the amount of precipitation. There is a separate snow-gauge, placed at ground level in an open space. The amount of snow is measured in such a way that it can be reduced to the corresponding amount of water. The wind is recorded continuously both as to speed and direction.

(F) is the rotating wind-velocity shaft surmounted by three hemispherical metal cups. These are similar in construction to those of the Reverend Dr. Robinson of Armagh, in the northern part of Ireland. The other rotating shaft, at (I), coming down from the large weather vane, gives the wind direction.

At (G) is an eighty-foot mast. A copper lantern is raised to the top of this mast by the cord at (H), for measurements of atmospheric electricity. (The flame of the lantern provides the ionisation around the lantern needed so that an electric current can be exchanged between the atmosphere and the lantern.)

At (J) a conducting wire leads down to a gold leaf electroscope and three electrometers. The Volta's electrometer, Dr. Smallwood notes, may be rendered self-registering with great facility, by the photographic process.



The inside of the observatory is shown in plan. Here (A) is the rather large recording machine for the anemometer. (B) is the transit telescope, under that opening along the ridge of the roof. C, D, E, F are all parts of the atmospheric-electricity measuring system. Small (e) is a spark-discharging apparatus with an index playing over a graduated scale, to measure during thunderstorms the force of the electric fluid by the length of the spark.

A visiting committee commented that the whole of this apparatus is the result of Dr. Smallwood's own handicraft. That the whole arrangements of the little room are a signal proof how much a man may do unaided and how well he can effect an object, when thrown entirely on his own resources. The committee took particular note of (T), an iron rod beneath the surface of the ground, connected with the spark discharger to ensure safety. They could not avoid a reflection in this context on an unfortunate Mr. Richman. One presumes that the unfortunate Richman had lacked any such grounding device.

H, I, J, K are barometers. (L) is a quadrant and artificial horizon, (M) a microscope for ascertaining forms of snow-crystals. (O) is a chemical ozonometer: one ounce of starch boiled in distilled water, with 10 grains of Iodide of Potassium added, spread on sized paper, which is found better than bibulous or unsized paper. One piece of this paper is mounted at (O), another at the top of the mast, for comparison. Concerning ozone, a paper published by Dr. Smallwood is quite closely au courant today.

In 1856 Dr. Smallwood, M.D. of the University of London, received an honorary LL.D. from McGill and an appointment as Professor of Meteorology. This was honorary too, in the sense that no salary went with it.

Just a few years later it was proposed by the President of the Grand Trunk Railway that there be an observatory in Montreal, and that the University might offer a site. All the American railways were proposing observatories in those days, astronomical observatories to provide reliable time-keeping. Dr. Smallwood's meteorological observatory already was taking this time service seriously. In addition to the transit instrument, there was also a seven inch achromatic telescope, eleven-inch focus. Already, wires from the Montreal telegraph had been laid into the Smallwood Observatory, to connect it with the principal places in the United States.



Dr. C. Smallwood - 1872



Prof. C.H. McLeod - 1889