

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Inverurie, County of Mid Lothian, in Lat. 55° 50' 20" N, Long. 3° 2' 40" W, Height above Sea Ninety feet.
Distance from Sea One mile. During the MONTH of January 1859.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				WIND.				RAIN.		CLOUD.	SUNSHINE.	THERMOMETERS, under Ground.			SEA.		OZONE.	ELECTRICITY.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which these began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	9 h. A.M.		9 h. P.M.		PROTECTED.		EXPOSED.		9 h. A.M.		9 h. P.M.		Average 9 h. A.M.		Average 9 h. P.M.		Days on which it fell.	Amount.			h. A.M.			Temperature.	Density.					0 to 10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.	Highest in Air.	Lowest in Air.	Max. Black bulb in Sun.	Min. Black bulb during Night.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force ††	Direction.	Force ††					3 inches.	12 inches.	22 inches.							A.M.	P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Barometer, mean corrected reading of Column No. 1 (A.M.),.....=

Column No. 3 (P.M.),.....=

Barometer, Highest observed reading of Month,.....=

on the

Diameter of tube.....inch; correction for capillarity to be added,.....+

Capillarity,.....= +

Lowest do. do. do.,.....=

on the

Correction for Temperature from Column No. 2 to be deducted,.....= -

Temp. from Col. 4,.....= -

Difference, or Monthly Range,.....=

Sum,.....

Sum,.....

Mean of the above

Correction for Height above Sea-level,.....feet, to add,.....

Barometer corrected and reduced to 32° and Sea-level,

SUMMARY OF THE WINDS.									
Direction.	N	NE	E	SE	S	SW	W	NW	Mean Force.
A.M.									
P.M.									
Mean.									

Dry bulb Thermometer (mean of Cols. 9 and 11),*.....

Wet bulb Thermometer (mean of Cols. 10 and 12),*.....

† Dew-point Temperature,.....

† Elastic Force of Vapour,.....

† Weight of Vapour in a Cubic Foot of Air,.....

† Additional Weight required to Saturate a Cubic Foot,.....

† Degree of Humidity (Saturation 100),.....

Highest Reading Self-Registering Thermometer in Air and Protected,.....on the

Lowest do. do. do.,.....on the

Difference, being Monthly Range,.....

Mean of Self-Registering Thermometers in Air and Protected,.....

Mean Daily Range in Air and Protected,.....

Greatest Daily Range, do.,.....on the

Highest Reading Self-Registering Black Bulb Thermometer in Sun,.....on the

Lowest do. do. from Radiation during Night,.....on the

(Signed)

(Designation)

N.B.—This Schedule should be returned (post-paid) as early as possible after the completion of the Month, with the Sums correctly added, and the Means deduced. No Wax or Wafers ever to be employed in closing the Schedule—the Gummed Corner to be alone used.

M. Macdonald

[illegible]

FOREST TREES.	Alder,	Ash,	Beech,	Birch,	Elm,	Larch,	Time,	Sycamore or Plane,
In Flower.								
In Leaf buds								
In Leaf								
Dressed of Leaves.								
CROPS.								
mountain variety.	Barley,	Bare or Bigg,	Oats,	Wheat,	Beans,	Pease,	Potatoes,	Turnips,
								Hay Grass,
Planting.								
Sowing or sowing above Ground.								
In Ear or Flower.								
First Cut or Raised.								

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

INSTRUCTIONS FOR MAKING METEOROLOGICAL OBSERVATIONS.

Those persons who kindly furnish Monthly 'failures' of the weather to the Scottish Meteorological Society are requested to attend to the following Instructions, seeing that one of the most important ends of Meteorological Observations is their being comparable with one another; and for this purpose it is requisite that all should, if possible, observe at a like hour, and in a like manner, and have their instruments placed, in so far as circumstances allow, in a like position :

Hour of observation.—All instruments which are observed twice a day, should be read at the same hour morning and evening. In order to furnish neat results. The Society recommended *quarters before nine o'clock morning and evening*, as the most convenient hour; but should this be inconvenient for the observer, another hour may be chosen, attending, however, to the above rule, that the evening and morning readings be taken at the same hour, and this hour entered on the schedule.

Demonstration.—Barometers of Messrs. Adie and Sott's construction are recommended: but any instruments may be used which have adjustable surfaces, and have been compared. Before this instrument is used for use it should be examined, in order to ascertain whether the space above the mercury is free from air. This is done by inclining the instrument somewhat from the vertical position, when, if free from air, the mercury will strike against the upper end of the tube with a sharp tap. The strike should then completely fill the tube. If any air has got admittance, it should be driven out and the ciseben by reversing the instrument, and tapping it gently with the hand. If it cannot be thus expelled, the instrument is useless till repaired.

The Barmeter should be hung in a good light, and particularly perpendicular, as ascertained by the plumb line; and it ought always to be gently tapped before taking the reading, to prevent adhesion of the mercury to the tube. In reading the eye ought to be placed on the exact level of the top of the column of mercury. The reading of the attached Thermometer ought always to be the first taken, as the heat of the breath, or the proximity to the person, are apt to influence its readings.

The corrections necessary to be applied to the Barometric readings depend on the form of the instrument. The mode of making these corrections, and the tables employed for the purpose, will be found in the "Report of the Committee of the Royal Society on Physics and Meteorology," 1840, page 18. The daily readings given by the Barometer ought to be entered on the *Schedule as read off*, and the corrections only applied to the mean for the month. *Self-Registering Thermometers and Hygrometers.*—These should never be placed alongside of each other, in a place freely exposed to air; but protected from sunshine and from reflected heat, as well as from radiation and from rain, and as near as may be *fixed* from the general surface of the ground.—Different countries furnish various uses are used for this purpose, either a double ventilated box with louver-boarded sides, fixed at a north window, and projecting 12 inches from the wall so as to allow a free current of air to pass between the box and the wall; or in a double meat-scales ventilated box with louver-glass. Whatever means are finally adopted, and the position of the instruments should be mentioned, and should not be changed (without the notice being given to the Secretary), in order that the results of one month's observations may be strictly comparable with those of another.

The *Sel. Theatrum Thermometrorum* should be placed exactly horizontal. In the case of the ordinary *maximum* thermometer, with clay, glass, or steel index, the bulb may be very slightly elevated, in order that the mercurial column may be somewhat guided by the force of gravity in pushing toward the float on the right. In the case of the *minimum* thermometer, the bulb must be slightly depressed, to prevent a draining of the spirit so heavy on the tube, and also that any part raised in vapour may return to the column. These *Thermometres*, if read once a-day, should be *always be read on the openings* so that the temperatures marked by the floats indicate the minimum and the maximum of the day on which the reading is taken. N.B.—The readings of these instruments are taken from that extremity of the float which is nearest the *head of the column* of mercury or of spirit.

The *maximum* registering thermometer, for marking the extreme heat of the sun's rays, should have its bulb lashed and the surface rendered dull, and it should be mounted in a blackened box, whose sides should be so high as to protect the bulb from wind. It should be so placed that the sun's rays have free access to it during the heat of the day.

The minimum registering thermometer, for ascertaining the lowest temperature during the night from radiation, should have its bulb similarly blackened and rendered dull, and be similarly mounted. It should be laid out, about sunset, over grass, in a place freely exposed to the sky, but raised on wooden supports a few inches above the surface, and removed during the day.

Higpona.—The wet bull requires the muslin covering it to be often changed. In towns once a month, or oftener, if the weather is dusty, and the muslin gets foul; in the country, whenever the muslin seems to be foul. The muslin should always be thoroughly wetted, and freed from starch, before being used; and the cotton wick which conducts moisture to it should be thoroughly wetted, else it will contract, the moisture cannot pass, and the muslin will become dry and brittle. It is perfectly, and yield false results. The cotton wick is best, and is attached by passing its extremity through an aperture in the centre of the muslin, spending that portion out so as to apply usually round the bulb, and then tying the muslin over the bulb. In frosty weather, water must be poured over the wetted bulb, so as to form a thin film of ice on the muslin, the extra-water, from the ice going on from the simply wetted bulb.

Rain Gauge—As a "Fleming's Rain Gauge," seem to possess several advantages over the other gauges, the Society gives the preference to them; but whatever form be employed, in order that all the stations may yield comparable results, it is recommended that the gauge be sunk in the ground, so that the top of the receiver is nearly on a level with the top of the highest *grass out grass*, in a place as distant as possible from trees, houses, high walls, and irregular or broken ground, and the *quantity of Rain, should, if possible, be registered daily*. When more than one Rain Gauge is kept, they ought to be placed near each other, but at different heights above the ground, and their indications noted in the *general remarks*, mentioning their height above ground—the regular column in the Schedule being reserved for the ground Rain Gauge alone.

Winds.—Isolated Wind-gages or Weather-cocks are apt to give false indications of the general direction of the wind, in consequence of the currents of air at the surface of the wind, in consequence of the influence of the neighbourhood of hills, valleys, buildings, etc. Where low clouds are seen drifting along their direction in reference to known objects, or as noted by means of a mirror on which a compass may be laid, or by means of a cotangent screw fixed over the centre of a pocket compass, will, in general, give the true direction of the current of air near the earth's surface if these clouds are near and immediately overhead, that is, if near the zenith of the observer. The motion of the higher strata of clouds gives no such indication. Rating the clouds, the general direction of the smoke of a chimney, or of a tall chimney, gives a better indication of the general direction of the wind than any wind-vane. The observer should state whether he has ascertained the direction by reflection or otherwise. For models of estimating the force of the wind, see 4 Directions for Reading Instruments. Lind's Anemometer is commonly used for this purpose, but the best Anemometer of moderate price yet invented is Professor Robinson's Cup Wind Gage, which registers the velocity of the wind—350 revolutions of the cups, as registered by the instrument, being equal to one statute mile.

Clouds—The Society recommends observers to adopt the Howard nomenclature of clouds. The scale of cloud in the visible sky is reckoned from 0 to 10. Thus, a sky quite free from cloud is 0; a sky half covered with cloud is 5; and the three visible sky covered with cloud is 10. Clouds extend over the whole horizon or even more of the visible sky without obstructing the sunshine, so that the indications noted in the column for clouds would not necessarily express, or agree with, the column for sunshine. As the tall astronomer, so *long as it does the horizon*, is thought by some eminent astronomers to have a powerful effect in dispersing clouds, it would be well to note in the General Remarks the case may be before and after every full moon; and the same observations ought to be made at the periods of new moon.

Sunshine—The number of hours the sun shines during the day should be entered in the proper column.

Thermometers under Grow.—Though the temperature and hygrometric conditions of the air are those which chiefly influence the growth of crops, it is important for the health of the crop, and for the germination of the seed, that the soil itself should have a certain temperature. To collect facts which may illustrate this, it is recommended to have *Thermometers* sunk 3, 12, and 32 inches below the surface of the ground, to ascertain the temperatures below the soil, and to observe the changes of temperature of what may be termed the agricultural soil; and the observations should enter in the Schedule the *kind of soil*; whether drained or undrained; and whether naturally new or dry.

Temperature of the Sea.—As the meteorology of the island is incomplete without a knowledge of the mean temperature of the Ocean which surrounds it, the Society strongly recommends taking the Temperature of the Sea at a depth of 6 feet or 1 fathom from the end of all piers or rocks round the coast, where free from the influence of river water, and as near as may be about the time of high water. A *Thermometer*, with its bulb fixed in a small tin pincely covered with a sloping lid, and with a weight attached, is sunk to the required depth, and in ten minutes drawn up and read. The density of the sea water should, if possible, be taken at the same time. Conventional instruments are furnished by Messrs

Temperature of Springs.—The temperature of Springs or Wells is recommended to be taken whenever practicable, mentioning whether Spring or Well, and its depth from the surface. *Minors, Aurora Borealis, Terrible Depression or Election of Bonaparte, Remarkable Falls of Rain, Hail or Snow, Thunder and Lightning,* etc., should be specially noticed, together with the exact hour at which they were first seen, their continuance, and direction.

bear in mind that varieties of the same species of tree differ widely in their times of leafing and flowering. *Individual* Trees or Struts of each kind should therefore be chosen (if possible early kinds), and their indications should be alone noted—always the same plant from year to year being noticed.

Uzoni—I mention whether Schomheim's or Motz's scale and papers are used. Schomheim's are preferred. They may be had at Messrs Adie and Son's, 50, Princes Street, and at Mr. Bryson's, 60, Princes Street, Edinburgh.

Electricity—Pith balls suspended by a linen thread, in connection with a metallic conductor, and under cover, for the purpose of a circle being used to express the degree of repulsion, from a cheap and convenient Electrometer. Exposed glass or sealing wax, ascertains the nature of the electricity.

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