SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn Hydro, County of Bute, During the MONTH of January 190 6.

Lat. 55°49'50" N, Long. 5°4'5" W., Distance from Sea 132 3/4 ~~miles.~~ Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. 6 inches

Diameter of Rain Gauge 8 inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No.	BAROMETER. 9 A.M. Attached Thermometer	BAROMETER. 9 P.M. Barometer. No.	BAROMETER. 9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb, Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. 9 a.m. 9 p.m.	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1	30·292	50	30·414	50	40	37	+	7	39	35	37	33	–	E.	4	E.	4	+	7	9	7	–	+	7	7	7	42·5	Dry Cold – dry Cold, Hazy	1
2	30·516	49	30·486	49	38	27			31	29	27	25	–	E.	1	E.S.E.	1			2		–					42·5	Clear freezing – freezing "	2
3	30·458	47	30·410	50	35	25			30	29	24	25	–	E.	3	E.	1			–		–					42	White frost very fogg – Clear freezing	3
4	30·360	45	30·282	47	29	22			23	30	22	30	–	E.	1	–	–			5		–					42	" " " – " "	4
5	30·222	44	30·022	53	41	32			26	30	40	39	·54	–	–	S.	1			7		10					42	" " " – frost gone, Wet.	5
6	29·526	53	29·648	53	51	40			50	49	44	40	·03	W.S.W.	5	S.W.	7			10		10					42	dull & Wet – fair, Stormy	6
7	29·436	53	29·200	55	45	37			39	38	39	37	·32	E.	1	N.	6			10		10					42	" " fogg – dull & Wet. very St. Earlier	7
8	29·492	50	29·792	50	42	38			40	36	38	34	–	N.E.	7	N.	4			6		9					41·8	dry Cold, Stormy – fine, squally	8
9	29·980	48	30·224	52	41	36			37	31	34	31	–	N.E.	4	N.N.W.	2			6		–					41	Cold, frosty. – Clear freezing.	9
10	30·304	46	30·232	49	39	27			29	28	39	35	–	–	–	W.S.W.	5			8		9					41	hazy frosty. – dry Cold.	10
11	30·138	48	30·100	51	43	39			42	37	41	37	–	W.	4	S.W.	4			8		10					41	dull dry – " "	11
12	30·126	50	30·068	52	43	32			39	36	34	30	–	W.	2	E.	1			7		–					41	" " – " " freezing	12
13	29·996	49	30·064	56	44	34			38	35	43	42	·01	S.S.E.	2	S.S.W.	2			10		10					40·8	" " foggy – damp slight shower	13
14	30·050	54	29·932	56	48	42			43	41	47	46	·26	S.	1	S.S.W.	4			10		10					40·8	" " – wet, breezy, mild.	14
15	29·784	56	29·472	56	49	43			43	42	47	46	·49	W.S.W.	3	S.	8			3		10					40·5	dry, Clear. Mild. – very Stormy & Wet.	15
16	29·552	55	29·664	56	53	44			50	46	47	45	·47	W.	6	S.	1			10		10					40·5	Strong Wind damp – damp	16
17	29·520	58	29·622	58	52	46			49	48	47	42	·26	S.	5	W.	8			10		–					40·5	dull, showery. – very Stormy, Rn earlier	17
18	30·026	52	30·210	52	48	38			40	38	42	41	·01	W.	3	S.W.	2			2		3					41	bright dry – clear, fine,	18
19	30·096	51	30·150	53	46	38			41	39	39	38	·19	S	4	W.	2			8		2					41	dull " – damp, cold.	19
20	30·364	51	30·362	53	46	36			41	40	39	36	–	W.	2	S.	2			10		–					41·5	" & damp – clear, fine.	20
21	30·388	49	30·344	52	45	36			36	35	40	38	–	S.W.	1	S.	2			2		1					41·5	Clear, little frost – " "	21
22	30·264	52	30·186	49	43	39			39	37	42	40	·07	S.	4	S.E.	4			10		10					41·5	dull, Hazy – dry, Cold,	22
23	30·292	52	30·400	58	48	42			46	45	44	44	·25	S.	4	–	–			10		10					41·5	" & Wet – very black. Foggy, Rn Earlier	23
24	30·486	55	30·320	56	48	42			45	44	43	41	–	S.	1	S.E.	2			10		–					41·5	damp, foggy. – fine, but foggy.	24
25	29·964	52	30·024	54	49	38			46	43	41	39	·72	W.S.W.	5	W.S.W.	7			10		10					41·5	dull dry – Squally, Rn & Ha Cold.	25
26	29·540	53	29·812	55	49	38			48	46	43	40	·64	W.	7	W.	4			10		–					41·5	Stormy & Wet – fine	26
27	29·536	55	29·426	53	50	39			49	47	39	37	·33	W.	7	W.	10			10		10					41·5	" " – a Gale, heavy Sh. Rn & Ha Lightening	27
28	29·488	48	29·600	51	41	34			36	34	36	33	·49	W.	7	–	–			8		1					41·5	Sqs. Sl & Rn hills White snow – freez. Sn. fell 10 a.m.	28
29	29·864	48	30·172	48	41	33			36	34	36	33	·05	W.	4	N.	2			5		–					41·8	freez. White all round – Rn 2 p.m. 2½ in. melting to Sn clear freezing	29
30	29·920	48	29·832	51	46	34			39	37	43	39	·15	S.W.	2	N.	5			10		–					42	dull & showery – breezy fine, Sn. Gone	30
31	29·664	48	29·780	47	45	37			42	39	38	34	·10	W.	7	NW.	8			10		1					42	Stormy, Rn & Ha – Gale, Rn Ha & Sl.	31
Sums.	1416 h. 32·294	14	1212 h. 9 30·250	13	14	16			15	16	15	13			8		107		49		236	46					410		
Means.	29·945	50·4	30·008	52·4	44	36·0			39·7	38·0	39·2	37·1					3·5		3·5		7·6	4·7					41·1		
Corrections for Instrumental Errors.	30·000 29·978																														
Corrections for Diurnal Range.																															
Corrected Means																															

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora. d. ,, drizzling rain. f. ,, fog. fr. ,, frost. h.-fr. ,, hoar-frost. h. ,, haze. hl. ,, hail. l. ,, lightning. lu. co. ,, lunar corona. lu. ha. ,, lunar halo. m. ,, mist. p. ,, passing showers. r. ,, rain. r.² ,, heavy rain. sl. ,, sleet. sn. ,, snow. so. ha. ,, solar halo. q. ,, squall. q.² ,, violent squalls. t. ,, thunder. t. s. ,, thunder-storm.

CLOUDS.

High Clouds: Cirrus, cir. Cirro-stratus, cir.-str. Cirro-cumulus, cir.-cum.

Middle Clouds: Strato-cirrus, str.-cir. Cumulo-cirrus, cum.-cir.

Lower Clouds: Strato-cumulus, str.-cum. Cumulus, cum. Cumulo-nimbus, cum.-nim. Nimbus, nim. Stratus, str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

Force.		Force.		Force.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = —.058 = 29.920

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —.663 = 29.945

Mean at Station, corrected, and at 32°, = 29.933

Correction for height, feet above Mean Sea-level, = + .085

Mean, reduced to 32°, and Sea-level, = 30.018

Highest Reading, corrected for Index error, on the th, =

Lowest Do. Do., on the th, =

Difference, or **Monthly Range,** =

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 16 th, = 53.0

Lowest in Month, corrected for Index errors, on the 4 th, 5 = 22.0

Difference, or **Monthly Range,** = 31.0

Mean of all the Highest, = 44.4

Mean of all the Lowest, = 36.0

Difference, or **Mean Daily Range,** = 8.4

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 40.2

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =

,, ,, Mean, =

Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 39.5

Wet Bulb, Mean of A.M. and P.M. Readings, = 37.6

Computed **Temperature of Dew-Point,** =

Do. **Elastic Force of Vapour,** = 205

Do. **Relative Humidity** (Saturation = 100), = 85

RAIN fell on 19 **Days; Amount in Inches,** = 5.38

WIND. Direction.	SUMMARY. N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	0	2	5	0	7	1	13	0	2	3.5
P.M.	5	0	4	2	7	3	6	1	3	3.5
Sum.	5	2	9	2	14	5	19	1	5	3.5

Observations made and Return verified by _____

(*Signed*) _____

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W. . .	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Rothesay, County of Bute, During the MONTH of February 1906.

Lat. 55° 49' 30" N., Long. 5° 4' 5" W., Distance from Sea 132 yds ~~miles~~. Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. 6 in

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inch

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max.	Min.	Black Bulb Max. in Sun.	Min. on Grass.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. 9 a.m. 9 p.m.	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°							
1	29·980	45	30·212	47	43	37	7	7	37	33	39	34	·02	N.W.	5	N.W.	4	7	7	1	7	-	1	7	7	7	7	41·8	frosty, Cold - dry, hazy, Cold,	1
2	30·274	48	30·212	53	48	38			41	40	45	44	·12	-	-	W.	3			10		10							41·5	foggy, damp - damp Mild.	2
3	29·966	48	30·310	51	47	37			41	37	38	34	·12	NW	7	N.W.	1			6		-							41·5	Stormy, showery Rn Ha. Sl. - clear, fine	3
4	30·550	48	30·572	53	46	32			36	35	43	41	·03	N.W.	1	W.	1			6		10							41·5	frosty, hazy in Bay - [Lightening at noon] dry, fine.	4
5	30·510	51	30·546	54	48	43			45	45	46	44	·09	W.	3	W.	4			10		-							41·5	damp, misty. - " "	5
6	30·620	56	30·684	54	49	40			45	43	40	40	·03	W.	2	W.	2			6		-							41·5	dull Mild. - " "	6
7	30·598	55	30·512	58	49	40			49	47	46	44	·02	W.	4	WNW	5			9		8							41·5	" showery - " "	7
8	30·328	55	30·366	54	50	45			48	46	47	46	·08	W.	5	W.	5			8		10							41·5	" & damp - dull & Wet	8
9	30·394	55	30·350	60	48	44			45	44	45	44	·11	W.	2	W.	1			10		10							41·5	" " - damp. some Rn	9
10	30·362	56	30·400	59	49	44			45	44	45	43	·02	W.	3	W.	1			7		10							41·8	" " - " "	10
11	30·350	55	30·370	58	48	44			46	45	46	45	·02	W.	4	W.	3			10		10							42	" " - " " " "	11
12	30·352	54	30·312	59	48	42			45	45	42	40	·04	W.	3	WSW	2			10		10							42	" " - " " " "	12
13	30·132	54	30·014	57	43	37			39	37	42	41	·08	SSE.	2	S.E.	1			10		10							42·5	dry hazy - " " & foggy	13
14	29·984	54	29·808	55	49	41			44	43	45	42	·19	W.	4	W.	6			8		10							42·8	dull & damp - stormy, damp.	14
15	29·766	51	29·820	51	46	38			39	37	38	37	·25	W.	4	N.W.	6			-		8							42·8	showery - " "	15
16	29·980	48	29·946	55	46	36			42	37	41	37	·52	NNW.	7	S.	2			-		10							43	Cold stormy - dull, dry.	16
17	29·468	48	29·618	55	45	36			38	36	44	41	·20	ENE.	4	N.W.	8			10		10							43	dull rain - Stry very stormy from 8 P.M.	17
18	29·416	51	29·778	54	49	39			47	44	40	37	·02	NNW.	8	NW	4			4		6							43	stormy & showery, Cold - Cold, dry.	18
19	29·746	50	29·820	54	49	40			45	42	44	42	·11	NW.	5	NNW.	5			2		8							43	Clear, dry. - " some Rn	19
20	29·784	52	29·760	54	50	44			48	46	47	47	·14	W.	3	W.	3			10		10							43	dull & Wet - damp. Rn all day	20
21	29·576	54	29·474	53	49	41			48	46	42	38	·43	WSW	3	W.	8			9		-							42·8	" damp - dry very stormy	21
22	29·000	56	29·196	48	50	38			46	44	39	35	·26	WSW.	7	W	10			10		-							42·8	Sqs, heavy Showers - A Gale from 8 a.m. & throughout the night	22
23	29·378	45	29·420	48	45	36			38	35	38	35	·49	WNW.	8	WNW	9			2		10							42·8	" " " Ha. - blowing a Gale all day, showers	23
24	29·530	47	29·920	53	48	38			45	42	43	39	·14	WNW.	7	NNW.	8			5		3							42·8	damp, strong Wind, Thunder [& Lightning 1 a.m.] - very stormy all day, dry. [of Ha. Sl. & snow]	24
25	29·800	49	30·068	54	47	40			44	43	42	38	·11	NW.	6	NW.	3			8		-							42·8	dull & showery. - dry, Cold.	25
26	29·762	50	29·668	53	50	39			42	40	40	38	·47	SW.	3	NW.	3			10		-							42·8	" " - Showery, " "	26
27	29·388	47	29·228	45	42	31			38	35	32	30	·34	W.	7	WNW.	7			5		10							42·8	half Gale, Showery Ha & snow. - [blowing a blizzard of wind & snow all day, 1/2 in freezing]	27
28	28·858	44	29·050	46	37	31			35	32	34	31	·14	W.	5	N.	5			10		-							42·8	Showery snow 2 in. - fair freezing, snow 2 in.	28
29	29·336	44	29·520	47	42	34			37	34	37	34	-	N.	5	N.	4			5		-							42·5	thawing very, Cold. - Sn nearly gone, dry very Cold.	29
30																															30
31																															31
	15 10	11	13 11 0	15	17	12			16	12	13	12	10															14			
Sums.	26·128	20	27·944	101	20 0	25 5			78	17	50	27 1	4·59		127		114			201		173						9·6		
Means.	29·901	50·7	29·964	53·5	46·9	38·8			42·7	40·6	41·7	39·3			4·4		4·3			6·9		6·0						42·3		
Corrections for Instrumental Errors.										2·1		2·4																			
Corrections for Diurnal Range.																															
Corrected Means																															

Jan. 4 3 1 1 11 4 9 / 21.

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora.
d. ,, drizzling rain.
f. ,, fog.
fr. ,, frost.
h.-fr. ,, hoar-frost.
h. ,, haze.
hl. ,, hail.
l. ,, lightning.
lu. co. ,, lunar corona.
lu. ha. ,, lunar halo.
m. ,, mist.
p. ,, passing showers.
r. ,, rain.
r.² ,, heavy rain.
sl. ,, sleet.
sn. ,, snow.
so. ha. ,, solar halo.
q. ,, squall.
q.² ,, violent squalls.
t. ,, thunder.
t. s. ,, thunder-storm.

CLOUDS.

High Clouds.
Cirrus, ... cir.
Cirro-stratus, . . cir.-str.
Cirro-cumulus, . . cir.-cum.

Middle Clouds.
Strato-cirrus, . . str.-cir.
Cumulo-cirrus, . . cum.-cir.

Lower Clouds.
Strato-cumulus, . . str.-cum.
Cumulus, ... cum.
Cumulo-nimbus, . . cum.-nim.
Nimbus, ... nim.
Stratus, ... str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = ... — .058 = 29.843

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ... — .066 = 29.898

Mean at Station, corrected, and at 32°, ... = 29.871

Correction for height, feet above Mean Sea-level, ... = + .085

Mean, reduced to 32°, and Sea-level, ... = 29.956

Highest Reading, corrected for Index error, on the th, ... =

Lowest Do. Do., on the th, ... =

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

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 8 th, 20, 22, 26, ... = 50.0

Lowest in Month, corrected for Index errors, on the 27 th, 28 ..... = 31.0

Difference, or **Monthly Range,** ..... = 19.0

Mean of all the Highest, ... = 46.9

Mean of all the Lowest, ... = 38.8

Difference, or **Mean Daily Range,** ..... (+3.3) = 8.1

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), ... = 42.9

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, ... =

" " Mean, ... =

Black Bulb, Max. in Sun, Highest in Month, ... =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, ... = 42 2/3

Wet Bulb, Mean of A.M. and P.M. Readings, ... = 39.9

Computed **Temperature of Dew-Point,** ..... =

Do. **Elastic Force of Vapour,** ..... = 22.1

Do. **Relative Humidity** (Saturation = 100), = 83

RAIN fell on 29 **Days; Amount in Inches,** ..... = 4.59.

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	3		1		1	1	17	5	1	4.4
P.M.	4	0	0	1	1	0	16	7	0	4.3
Sum.	7	0	1	1	2	1	33	12	1	4.4

Observations made and Return verified by .....

(*Signed*) .....

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example, | Cir. W. . | 4 | / | Cum. Str. S.W. | 2 | would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn, Rothesay, County of Bute, During the MONTH of March 1908.

Lat. 55° 49' 50" N, Long. 5° 4' 5" W, Distance from Sea 132 yds ~~miles.~~ Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. 6 in.

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No. ____	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ____	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. 9 a.m. — 9 p.m.	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.												°	°	°	°	°		
1	29·594	47	29·800	52	43	36	x	x	40	35	38	33	–	N.	4	N.	1	x	x	5	7	–	x	x	7	x	7	42	Dry Cold – dry cold	1
2	29·774	46	29·760	54	45	35			38	35	40	37	–	N.	3	N.E.	3			5		10						42	Clear frosty – " "	2
3	29·768	49	29·768	53	44	34			41	36	37	36	–	N.	3	E.	4			3		–						42	" – " foggy	3
4	29·780	47	29·840	53	43	34			36	34	35	33	–	E.N.E.	4	S.E.	1			10		–						41·8	dry foggy – " fine	4
5	29·816	49	29·558	52	42	32			36	34	40	39	·31	E.	3	S.	2			10		10						41·8	foggy, white frost – dull & wet	5
6	29·348	48	29·584	54	43	37			37	36	40	37	·06	E.N.E.	5	N.W.	1			10		10						41·5	dull & wet – " & damp	6
7	29·622	46	29·666	51	45	34			36	35	40	38	·56	N.W.	2	–	–			–		10						41·5	clear frosty – " fine	7
8	29·368	52	28·750	52	50	39			46	45	45	43	1·25	S.S.W.	3	S.W.	4			10		10						41·5	very wet – very wet	8
9	28·786	50	28·896	50	46	39			41	40	44	40	·18	W.	7	N.W.	7			10		5						41	stormy & very wet – Stormy fair	9
10	29·224	48	29·572	55	46	39			44	40	42	39	·01	W.N.W.	6	N.	2			4		8						41	" dry – fine	10
11	29·804	52	29·918	54	49	32			39	37	33	32	–	–	–	S.W.	1			–		–						41	frosty, hazy – dry freezing	11
12	29·994	48	30·058	56	51	30			38	36	38	35	–	–	–	–	–			–		4						41	Hazy, white frost – " fine, frosty	12
13	30·092	49	30·094	59	47	29			37	32	40	37	·02	–	–	S.E.	1			–		10						41·5	" frosty – fine	13
14	30·164	54	30·232	59	47	33			39	36	33	33	–	E.	4	–	–			5		5						41·5	foggy – foggy, frosty	14
15	30·130	52	29·990	57	44	31			39	37	39	37	·08	E.	3	E.	1			7		10						41·5	foggy – " cold	15
16	29·956	51	29·956	54	47	37			37	36	39	37	·01	E.	3	–	–			10		–						41·5	dull & damp – clear fine	16
17	29·860	51	29·950	52	47	31			40	38	40	38	·04	E.	1	N.N.E.	1			10		10						41·5	Raw hazy – foggy	17
18	29·940	51	30·024	55	45	38			39	38	38	36	·03	–	–	N.E.	2			10		10						41·5	foggy & wet – " dry	18
19	30·038	49	29·984	54	41	31			37	34	36	33	–	E.	3	N.	2			2		10						41·5	clear cold & frosty – " cold	19
20	29·894	47	29·880	51	43	31			34	32	30	29	–	E.	3	S.	1			7		–						41·5	foggy " " – cold & frosty	20
21	29·868	49	29·772	50	47	30			38	35	39	35	–	S.W.	2	S.	2			3		–						41·5	hazy frosty – " " "	21
22	29·380	49	29·268	53	44	37			41	36	42	41	·22	S.E.	4	S.S.E.	1			10		10						41·5	" very cold – dull & damp	22
23	29·622	53	29·874	56	54	42			45	43	45	43	·20	S.W.	2	S.W.	1			10		–						41·5	dull, dry – fine warmer	23
24	29·882	53	30·016	56	47	41			44	43	41	40	·78	S.S.W.	2	N.N.E.	4			10		10						41·5	" & wet – wet all day	24
25	30·018	54	29·992	54	43	38			39	37	40	39	·38	N.	3	N.E.	3			10		10						41·5	" " – Raw & very wet all day	25
26	30·030	52	30·056	54	45	39			41	39	41	40	–	E.	4	–	–			10		10						41·5	Hazy fine – fair dry wet from 1 pm	26
27	29·794	53	29·766	53	46	38			45	43	38	37	·54	W.S.W.	4	S.W.	1			8		10						41·8	fine frosty & clear – damp Rn. & clear	27
28	29·832	49	29·696	55	48	33			42	39	46	44	·09	W.S.W.	2	S	4			5		10						41·8	dull & wet – Wet Rn Ha, & snow	28
29	29·488	54	29·586	54	50	37			47	44	36	34	·35	S.W.	4	W.	3			10		10						41·8	dry clear – very wet, blowy a gale	29
30	29·512	51	28·900	54	49	35			42	38	43	41	·66	S.W.	2	W.	8			3		10						42	Ha showers, cold, strong wind – breezy some Rn & Ha, cold	30
31	29·330	48	29·584	52	47	38			41	37	41	38	·18	N.W.	6	W.	5			6		2						42		31
Sums.	29·704	01	29·790	11 8	188	160			309	230	289	224	6·05		92		66			203		204						17·5		
Means.	29·732	50·0	29·735	53·8	46·1	35·2			40·0	37·4	39·3	37·2			3·0		2·1			6·5		6·6						41·6		
Corrections for Instrumental Errors.										2·6		2·1																			
Corrections for Diurnal Range.																															
Corrected Means																															

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora. d. ,, drizzling rain. f. ,, fog. fr. ,, frost. h.-fr. ,, hoar-frost. h. ,, haze. hl. ,, hail. l. ,, lightning. lu. co. ,, lunar corona. lu. ha. ,, lunar halo. m. ,, mist. p. ,, passing showers. r. ,, rain. r.² ,, heavy rain. sl. ,, sleet. sn. ,, snow. so. lu. ,, solar halo. q. ,, squall. q.² ,, violent squalls. t. ,, thunder. t. s. ,, thunder-storm.

CLOUDS.

HIGH CLOUDS: Cirrus, cir. Cirro-stratus, cir.-str. Cirro-cumulus, cir.-cum.

MIDDLE CLOUDS: Strato-cirrus, str.-cir. Cumulo-cirrus, cum.-cir.

LOWER CLOUDS: Strato-cumulus, str.-cum. Cumulus, cum. Cumulo-nimbus, cum.-nim. Nimbus, nim. Stratus, str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = —·058 = 29·674

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —·068 = 29·667

Mean at Station, corrected, and at 32°, = 29·671

Correction for height, feet above Mean Sea-level, = + ·083

Mean, reduced to 32°, and Sea-level, = 29·754

Highest Reading, corrected for Index error, on the th, =

Lowest Do. Do., on the th, =

Difference, or **Monthly Range,** =

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 23 th, = 54·0

Lowest in Month, corrected for Index errors, on the 13 th, = 29·0

Difference, or **Monthly Range,** = 25·0

Mean of all the Highest, = 46·1

Mean of all the Lowest, = 35·2

Difference, or **Mean Daily Range,** = 10·9

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 40·7

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =

,, ,, Mean, =

Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 39·7

Wet Bulb, Mean of A.M. and P.M. Readings, = 37·3

Computed **Temperature of Dew-Point,** =

Do. **Elastic Force of Vapour,** = ·198

Do. **Relative Humidity** (Saturation = 100), = 80

RAIN fell on 20 **Days; Amount in Inches,** = 6·05

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	4	0	10	1	2	4	4	2	4	3·0
P.M.	5	3	2	2	5	4	3	2	5	2·1
Sum.	9	3	12	3	7	8	7	4	9	9·6

Observations made and Return verified by _____

(*Signed*) _____

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W.	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn Rothesay, County of Bute, During the MONTH of April 1908.

Lat. 55°49'50"N, Long. 5°4'5"W, Distance from Sea 132 yds. ~~miles.~~ Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. 6-in

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. 9 A.M. – 9 P.M.	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1	29·776	47	29·850	54	51	37	7	7	43	39	43	42	·19	W.N.W.	4	S	1	7	7	–	7	10	7	7	7	7	7	42	fine – dull & Wet	1
2	29·600	49	29·584	57	52	43			50	49	46	42	·25	W.S.W.	3	W.	3					10		10					42	dull & Wet – " " damp	2
3	29·498	49	29·718	54	49	42			46	43	44	41	·14	W.N.W.	5	W.	6					4		6					42	Cold & showery – Cold showery, & Stormy	3
4	29·918	52	30·050	50	49	41			45	40	41	37	–	N.	5	N.	3					3		2					42	Char. fair – breezy, Cold, dry	4
5	30·174	47	30·324	54	53	38			44	38	41	37	–	N.E.	2	E.	1					1		6					42	" Cold " – fine	5
6	30·406	50	30·446	54	52	33			43	38	32	31	–	E.	1	–	–					–		–					42·8	dry bright – Clear frosty	6
7	30·400	47	30·340	57	55	30			42	40	45	42	·01	–	–	–	–					–		10					42·8	hazy. frosty Earlier – fine	7
8	30·206	53	30·114	54	51	44			45	44	47	46	·17	–	–	–	–					10		10					43	" fine – very foggy & Wet.	8
9	30·046	53	30·038	53	52	43			44	42	43	40	–	N.W.	3	N.W.	2					7		–					43	dry but Cold – fine but cold	9
10	29·934	51	29·800	52	50	33			46	42	44	41	·18	S.S.W.	2	S.	1					3		10					43	slight haze, fine – fine	10
11	29·772	51	29·928	54	47	41			43	42	44	43	·03	S.S.E.	1	–	–					10		10					43	hazy, damp. – foggy & damp	11
12	30·128	53	30·166	56	50	38			43	40	43	41	·02	E.	3	E.	1					1		10					43	" fine – " Cold	12
13	30·226	53	30·328	52	49	40			41	39	43	38	–	E.	3	E.	1					10		10					43·8	" damp – hazy, dry.	13
14	30·428	50	30·438	52	53	38			44	40	43	38	–	E.N.E.	3	E.	1					–		8					43·8	bright, dry. – " "	14
15	30·428	50	30·460	51	46	38			43	39	43	41	·01	E.N.E.	4	E.	4					9		8					43·8	dry & Cold – " " Cold	15
16	30·348	50	30·532	55	54	40			47	40	43	40	–	E.N.E.	3	E.	1					–		–					44	" bright – Clear fine	16
17	30·410	52	30·144	55	61	34			46	42	48	46	–	–	–	N.N.W.	4					–		10					44	slight haze – dull Cold	17
18	30·170	53	30·044	55	54	40			44	37	41	37	–	E.	3	E.	1					5		5					44	dry clear – fine	18
19	29·912	53	29·944	55	51	34			46	40	41	34	–	N.	4	N.E.	5					5		1					44	breezy Cold – breezy, dry, cold.	19
20	29·930	53	29·836	54	50	38			45	39	44	41	–	N.	3	N.W.	5					6		1					44	" " – " " "	20
21	29·780	51	29·756	50	53	40			46	40	43	38	–	N.E.	2	N.W.	2					4		6					44	bright, dry. – fine	21
22	29·700	51	29·756	49	49	36			43	37	35	33	·11	N.	2	N.E	1					4		10					44	dry, clear, Cold. – Rain, Sn. & sleet from 12·30 noon, hills covered with snow, Cold	22
23	29·762	45	29·632	49	43	30			37	32	30	28	·02	–	–	N.W.	2					–		–					44	Clear frosty. – Cold frosty heavy showers Snow at intervals	23
24	29·432	44	29·422	44	41	34			32	32	30	29	–	E.	4	N.	1					–		–					44	hazy frosty – Clear, freezing, Cold.	24
25	29·358	45	29·582	52	46	26			37	35	35	34	·03	E.	1	E.	2					–		–					44	" " – hazy " "	25
26	29·592	48	29·632	54	49	35			41	37	39	35	–	E.	2	–	–					10		–					44	dull fine – dry fine	26
27	29·698	51	29·708	56	55	30			47	42	44	41	·28	E.	3	E.	4					6		10					44	dry hazy – " Cold.	27
28	29·706	51	29·760	52	48	40			42	40	43	39	·02	E.	4	E.	2					10		10					44	dull & Wet – " "	28
29	29·950	51	30·012	53	49	41			45	41	46	45	·27	E.S.E.	3	E.	1					10		10					44	hazy damp – " "	29
30	29·930	53	29·982	57	54	45			48	47	51	50	·38	E.	3	E.	1					10		10					43	dull & Wet – dull & Wet all day	30
31																														31
Sums.	28·838	06	29·326	100	16	212			108	6	55	270	2·11		76		56					138		183					1041		
Means.	29·961	50·2	29·978	53·3	50·5	37·1			43·16	40·2	41·8	39·0			2·5		1·9					4·6		6·1					43·4		
Corrections for Instrumental Errors.											3·4	2·8																		
Corrections for Diurnal Range.																														
Corrected Means																														

1 2
0 0
0 3
0 8
1 3
1 0
13

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora.
d. " drizzling rain.
f. " fog.
fr. " frost.
h.-fr. " hoar-frost.
h. " haze.
hl. " hail.
l. " lightning.
lu. co. " lunar corona.
lu. ha. " lunar halo.
m. " mist.
p. " passing showers.
r. " rain.
r.² " heavy rain.
sl. " sleet.
sn. " snow.
so. ha. " solar halo.
q. " squall.
q.² " violent squalls.
t. " thunder.
t. s. " thunder-storm.

CLOUDS.

HIGH CLOUDS.
Cirrus, . . . cir.
Cirro-stratus, . . cir.-str.
Cirro-cumulus, . . cir.-cum.

MIDDLE CLOUDS.
Strato-cirrus, . . str.-cir.
Cumulo-cirrus, . . cum.-cir.

LOWER CLOUDS.
Strato-cumulus, . . str.-cum.
Cumulus, . . . cum.
Cumulo-nimbus, . . cum.-nim.
Nimbus, . . . nim.
Stratus, . . . str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = ...—.048 = 29.903

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ...—.066 = 29.912

Mean at Station, corrected, and at 32°, ... = 29.908

Correction for height, feet above Mean Sea-level, ... = + .083

Mean, reduced to 32°, and Sea-level, ... = 29.991

Highest Reading, corrected for Index error, on the th, ... =

Lowest Do. Do., on the th, ... =

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

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 17th, ... = 61

Lowest in Month, corrected for Index errors, on the 14th, ... = 24

Difference, or **Monthly Range,** .... = 37

Mean of all the Highest, ... = 50.5

Mean of all the Lowest, ... = 37.1

Difference, or **Mean Daily Range,** .... = 13.4

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), ... = 43.8

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, ... =

" " Mean, ... =

Black Bulb, Max. in Sun, Highest in Month, ... =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, ... = 42.7

Wet Bulb, Mean of A.M. and P.M. Readings, ... = 39.6

Computed **Temperature of Dew-Point,** .... =

Do. **Elastic Force of Vapour,** .... = 211

Do. **Relative Humidity** (Saturation = 100), = 77

RAIN fell on 16 **Days; Amount in Inches,** .... = 2.11

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	4	2	14	0	2	0	3	1	4	2.5
P.M.	3	2	12	0	2		2	4	5	1.9
Sum.	7	4	26	0	4	0	5	5	9	2.2

Observations made and Return verified by .....

(Signed) .....

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W.	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Glenburn, Rothesay*, County of *Bute*, During the MONTH of *May* 190*8*.

Lat. *55° 49' 50" N*, Long. *5° 4' 5" W*, Distance from Sea *132 yds* ~~miles.~~ Height of Cistern of the Barometer above Mean Sea-Level *76* feet, above Ground *3* feet. *6 inches*

Diameter of Rain Gauge *5* inches. Height of Rim of Gauge above Ground *12 inches*

The Hours of Observation are of Greenwich Time.

Days of Month	Barometer 9 A.M. Barometer (inches)	Barometer 9 A.M. Attached Thermometer (°)	Barometer 9 P.M. Barometer (inches)	Barometer 9 P.M. Attached Thermometer (°)	Self-Registering Thermometers (Read Daily, at 9 P.M.), Protected in Screen, 4 feet above Ground: Max. (°)	Min. (°)	Black Bulb Max. in Sun (°)	Min. on Grass (°)	Hygrometer 9 A.M. Dry bulb (°)	9 A.M. Wet bulb (°)	9 P.M. Dry bulb (°)	9 P.M. Wet bulb (°)	Rain: Amount at 9 A.M. (inches)	Wind 9 A.M. Direction	9 A.M. Force Scale of 0–12	Wind 9 P.M. Direction	9 P.M. Force Scale of 0–12	Anemometer 9 A.M.	Clouds 9 A.M. Species and Direction	9 A.M. Amount (0–10)	Clouds 9 P.M. Species and Direction	9 P.M. Amount (0–10)	Sunshine Hours	Thermometers under Ground 9 A.M. 3 ins. (°)	12 ins. (°)	22 ins. (°)	36 ins. (°)	48 ins. (°)	General Remarks 9 A.M.	General Remarks 9 P.M.	Days of Month	
1	30·118	58	30·136	59	59	49	+	+	53	52	53	53	·02	-	-	[illegible]	-	+	+	10	+	10	+	+	+	+	+	43·8	foggy & wet	dull & damp	1	f
2	30·106	58	30·138	61	59	45			52	51	45	43	·03	E.	1	N.E.	4			10		10						43·8	dull & damp	" dry cold	2	
3	30·038	57	29·930	61	46	42			43	41	42	41	·16	E.	4	N.E.	2			10		10						43·8	" & wet	" & wet	3	
4	29·714	55	29·500	55	49	42			44	42	45	44	·39	E.	3	E.	1			10		10						44·5	" & damp	" "	4	
5	29·328	55	29·190	57	56	45			48	48	50	48	·13	S.E.	1	S.	1			10		10						44·8	" & wet	" & damp	5	
6	29·220	57	29·420	59	57	46			51	49	47	45	·06	S.S.W.	2	N.W.	2			10		10						45	" & damp	" "	6	
7	29·644	55	29·672	55	56	42			45	43	50	45	·06	W.	3	-	-			4		10						45	fine	" fine	7	
8	29·566	57	29·390	59	58	45			49	48	51	50	·55	-	-	S.W.	1			10		10						45·5	wet & foggy	very wet	8	f
9	29·588	57	29·620	59	60	47			54	49	50	46	·04	W.	4	S.	2			4		10						45·5	bright fine	dull fine	9	
10	29·672	60	29·740	65	57	41			53	47	49	46	·03	W.	2	S.	2			2		10						45·5	fine	" "	10	
11	29·846	59	29·846	58	61	41			54	49	47	44	·11	S.W.	3	S.W.	1			6		2						46	bright dry	fine	11	
12	29·780	60	29·740	58	55	44			49	47	47	46	·03	E.	2	-	-			10		8						46	hazy	"	12	
13	29·712	57	29·612	60	60	45			51	48	47	45	·–	E.	2	E.	2			4		10						46·5	" dry	Hazy "	13	
14	29·582	56	29·586	60	60	44			48	46	48	46	·01	E.	3	E.	2			8		10						46·5	" "	fine	14	
15	29·608	58	29·794	59	59	47			55	50	48	46	-	-	-	S.E.	1			6		-						47	hazy fine	Hazy "	15	
16	29·988	58	30·142	60	59	44			51	51	51	49	·32	S.W.	1	-	-			10		10						47	" "	dull & damp	16	
17	30·108	58	30·158	65	62	49			55	54	57	55	·06	W.	4	W.	3			7		10						47	dull & damp	" "	17	
18	30·256	61	30·330	61	61	51			54	51	51	48	·07	W.	4	W.N.W.	2			10		-						47·5	" fine	fine, mild	18	
19	30·256	60	30·246	62	60	46			50	48	51	48	-	W.	1	W.N.W.	1			10		10						47·8	" wet	"	19	
20	30·284	59	30·020	61	58	45			53	47	50	46	·01	W.	2	S.W.	2			6		9						48	" fine	"	20	
21	29·786	58	29·628	59	57	41			50	46	41	40	·03	W.	3	S.W.	1			5		5						48	" "	some R? thunder & lightning 7 P.M.	21	Rs
22	29·746	57	29·938	60	57	39			52	45	48	44	-	N.W.	2	N.W.	2			3		-						49	"	fine cooler	22	
23	30·036	57	30·014	62	57	39			54	47	51	49	-	W.	2	S.S.W.	2			6		10						49	"	dull	23	
24	29·682	59	29·574	58	56	47			51	49	46	45	·43	S.W.	2	-	-			10		10						49	dull "	" & damp	24	
25	29·592	55	29·818	58	56	41			51	45	45	43	·03	W.	4	W.	1			4		4						49	"	fine	25	
26	30·010	56	30·276	61	59	41			49	48	54	52	·04	-	-	W.	1			10		10			1	0		49	" & wet	dull "	26	
27	30·506	60	30·560	63	68	51			57	54	52	50	-	W.	2	S.W.	1			9		-			Δ	0		49	fine	fine	27	
28	30·536	63	30·486	70	77	46			66	60	62	56	-	E.	1	S.W.	1			-		8			r	2		49	Hazy "	"	28	
29	30·458	67	30·368	67	74	55			64	57	60	54	-	E.	2	E.	3			-		-			b	2		49	" "	hazy "	29	
30	30·272	64	30·108	67	71	49			57	53	62	54	·09	E.	3	E.	4			-		9			o	15		49·5	" "	" "	30	
31	29·972	64	29·965	69	73	55			62	59	61	59	·02	E.	1	S.E.	1			9		10			f / 9	2 / 0		50	dull fine	some R? thunder in the distance	31	t.
Sums.	15 15 14 / 25·008	17 / 265	14 14 11 / 27·945	14 / 28	16 / 307	14 / 164			12 / 75	16 / 284	11 / 11	15 / 240	9 / 272		64		46			213		235				7		8 / 30·0				
Means.	29·903	58·9	29·901	60·9	59·9	45·3			52·4	49·2	50·4	47·7			2·1		1·5			6·9		7·6				–		46·0				
Corrections for Instrumental Errors.										2·2		2·7																				
Corrections for Diurnal Range.																																
Corrected Means																																

General Remarks: Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc.

Mention the hour at which Storms, including Thunder and Lightning, began and ended.

NOTATION USED IN GENERAL REMARKS.

a.	*denotes* aurora.
d.	,, drizzling rain.
f.	,, fog.
fr.	,, frost.
h.-fr.	,, hoar-frost.
h.	,, haze.
hl.	,, hail.
l.	,, lightning.
lu. co.	,, lunar corona.
lu. ha.	,, lunar halo.
m.	,, mist.
p.	,, passing showers.
r.	,, rain.
r.²	,, heavy rain.
sl.	,, sleet.
sn.	,, snow.
so. ha.	,, solar halo.
q.	,, squall.
q.²	,, violent squalls.
t.	,, thunder.
t. s.	,, thunder-storm.

CLOUDS.

High Clouds.

Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.

Middle Clouds.

Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.

Lower Clouds.

Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0–12).

Force		Force		Force	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = —·082 = 29·821

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —·087 = 29·814

Mean at Station, corrected, and at 32°, = 29·818

Correction for height, feet above Mean Sea-level, = + 83

Mean, reduced to 32°, and Sea-level, = ·901

Highest Reading, corrected for Index error, on the th, =

Lowest Do. Do., on the th, =

Difference, or **Monthly Range,** =

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 28 th, = 77

Lowest in Month, corrected for Index errors, on the 22 th, 23 = 39

Difference, or **Monthly Range,** = 38.

Mean of all the Highest, = 59·9

Mean of all the Lowest, = 45·3

Difference, or **Mean Daily Range,** = 14·6

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 52·6

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =

" " Mean, =

Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 51·4

Wet Bulb, Mean of A.M. and P.M. Readings, = 48·4

Computed **Temperature of Dew-Point,** =

Do. **Elastic Force of Vapour,** = ·305

Do. **Relative Humidity** (Saturation = 100), = 80.

RAIN fell on 23 **Days; Amount in Inches,** = 2·72

WIND. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0–12.
A.M.			10	1	1	3	11	1	4	2·1
P.M.		1	6	2	4	6	5	2	5	1·5
Sum.	0	1	16	3	5	9	16	3	9	1·8

Observations made and Return verified by { ______

(Signed) ______

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W.	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn, Rothesay, County of Bute, During the MONTH of June 1906.

Lat. 55°49'50" N, Long. 5°4'6" W, Distance from Sea 132 ~~miles~~ chs. Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. 6 inches

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. 9 A.M. – 9 P.M.	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.												°	°	°	°	°		
1	29·984	65	29·966	65	64	54	7	7	57	55	55	53	·06	E.	2	E.	5	7	7	10	7	10	7	7	7	7	50·6	Hazy Cool – Some showers	1
2	29·986	63	29·932	65	57	52			56	54	53	54	·33	E.N.E.	4	E.	4			10		10					50·8	dull fine – Showery A.M. & P.M. 12 noon	2
3	30·088	62	30·080	61	70	52			58	57	60	58	·03	W.	1	~~N.N.W.~~	–			10		2					51	" Hazy – fine	3
4	30·122	64	30·128	64	60	49			58	56	50	46	–	W.	3	W.N.W.	4			10		6					51	" " – "	4
5	30·072	58	29·968	58	56	47			52	47	49	44	·02	N.W.	4	N.W.	4			4		10					51·5	dry Clear – dry Cold	5
6	30·112	56	30·146	58	62	47			55	48	50	45	–	N.	1	N.	4			–		3					51·5	" " – " "	6
7	30·116	58	30·000	59	56	45			51	46	47	45	·19	N.W.	3	W.	1			9		10					51·5	Cool – dull & damp	7
8	30·000	58	30·090	58	54	45			50	47	48	46	·26	W.	3	–	–			7		10					51·5	Cool Showery – " "	8
9	30·090	58	30·204	59	59	45			56	55	55	54	·02	W.	2	W.	1			10		10					51·5	dull & Wet – " "	9
10	30·172	61	30·028	61	63	53			62	58	57	53	·50	W.	3	S.W.	2			4		10					51·5	dry bright – fine	10
11	29·900	61	29·946	61	57	46			51	50	45	45	·26	N.W.	3	W.	1			10		–					51	dull & Wet – "	11
12	29·946	57	29·834	61	61	43			53	49	51	48	·38	W.	4	W.	1			4		9					51	Showery – dull some R.	12
13	29·498	58	29·296	59	56	49			51	51	50	49	·76	S.W.	3	W.	1			10		10					51	dull very Wet – " & damp	13
14	29·592	57	29·824	58	59	46			57	50	50	47	–	N.	1	W.N.W.	1			5		3					51	fine – Colder	14
15	29·692	58	29·434	58	54	47			52	49	52	47	·21	S.W.	3	W.	3			10		10					51	Dull " – dull fine – Wet Wet Early	15
16	29·538	58	29·762	57	59	46			52	50	49	46	–	W.	3	N.W.	2			7		1					51	" Showery – fine	16
17	29·914	59	29·942	59	61	43			51	48	50	46	–	E.	3	N.E.	1			9		10					51	" dry – "	17
18	29·916	57	29·714	57	55	46			50	47	48	47	·48	E.	1	–	–			10		10					51	" " – dull & Wet	18
19	29·630	58	29·824	59	60	47			50	48	52	49	·07	S.W.	3	N.W.	2			10		10					51	Showery – fine	19
20	30·010	58	30·164	58	68	41			59	54	53	50	–	–	–	W.N.W.	1			4		1					51·5	Hazy, fine – "	20
21	30·102	58	30·102	60	69	42			59	54	53	50	–	E.	1	–	–			1		–					51·5	fine – "	21
22	30·072	62	30·118	66	67	49			64	57	54	53	·21	S.W.	2	N.	2			–		10					51·5	" " – damp, R. Earlier	22
23	30·220	63	30·336	60	68	47			59	53	51	48	–	N.	2	N.W.	3			–		–					51·8	" – fine	23
24	30·400	61	30·422	63	68	49			59	52	52	49	–	N.	2	N.W.	2			5		–					52	" – "	24
25	30·388	62	30·376	64	69	50			58	55	59	58	–	W.	2	W.	1			10		1					52	" – "	25
26	30·400	62	30·430	70	75	54			64	61	61	60	–	–	–	–	–			–		–					52·5	Hazy very foggy Earlier – fine, Hazy	26
27	30·460	70	30·414	71	77	60			71	66	61	60	–	E.	1	–	–			–		–					53	" warm – " "	27
28	30·370	71	30·318	70	79	57			69	65	63	60	–	E.	1	E.	4			–		–					53	" fine – Cooler fine	28
29	30·312	68	30·312	70	75	56			64	60	59	57		E.	3	E.	5			–		10					53·5	" " – fine breezy	29
30	30·312	67	30·346	70	75	54			64	58	63	56		E.	3	E.N.E.	3			–		–					54	" " – " hazy	30
31	12/28	15	13/112	12																											31
Sums.	1·366	28	1·456	56	16 113	15 261			21·2	14 99	11 100	15 22	3·75		57		58			69		66					17·9		
Means.	30·046	609	30·049	61·9	63·8	48·7			57·1	53·3	53·3	50·7	3·73		2·2		1·9			5·5		5·5					51·6		
Corrections for Instrumental Errors.									3·8		2·6																				
									3		2																				
Corrections for Diurnal Range.									3·8		3·6																				
									7·7		8·2																				
Corrected Means																															

1 0
2 0
3 1
4 7
5 10
6 4
7 0
8 0
9 0
10

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora.
d. ,, drizzling rain.
f. ,, fog.
fr. ,, frost.
h.-fr. ,, hoar-frost.
h. ,, haze.
hl. ,, hail.
l. ,, lightning.
lu. co. ,, lunar corona.
lu. ha. ,, lunar halo.
m. ,, mist.
p. ,, passing showers.
r. ,, rain.
r.² ,, heavy rain.
sl. ,, sleet.
sn. ,, snow.
so. ha. ,, solar halo.
q. ,, squall.
q.² ,, violent squalls.
t. ,, thunder.
t. s. ,, thunder-storm.

CLOUDS.

HIGH CLOUDS.
Cirrus, ... cir.
Cirro-stratus, . . cir.-str.
Cirro-cumulus, . . cir.-cum.

MIDDLE CLOUDS.
Strato-cirrus, . . str.-cir.
Cumulo-cirrus, . . cum.-cir.

LOWER CLOUDS.
Strato-cumulus, . . str.-cum.
Cumulus, ... cum.
Cumulo-nimbus, . . cum.-nim.
Nimbus, ... nim.
Stratus, ... str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = —0·87 = 29·959

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —0·00 = 29·959

Mean at Station, corrected, and at 32°, = 29·959

Correction for height, feet above Mean Sea-level, = + 82

Mean, reduced to 32°, and Sea-level, = 30·041

Highest Reading, corrected for Index error, on the th, =

Lowest Do. Do., on the th, =

Difference, or **Monthly Range,** =

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 28th, = 79

Lowest in Month, corrected for Index errors, on the 20th, = 41

Difference, or **Monthly Range,** = 38

Mean of all the Highest, = 63·8

Mean of all the Lowest, = 48·7

Difference, or **Mean Daily Range,** = 15·1

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 56·3

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =

" " Mean, =

Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 55·2

Wet Bulb, Mean of A.M. and P.M. Readings, = 52·0

Computed **Temperature of Dew-Point,** =

Do. **Elastic Force of Vapour,** = 347

Do. **Relative Humidity** (Saturation = 100), = 80.

RAIN fell on 15 **Days; Amount in Inches,** = 3·73

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	4	1	8			4	8	3	2	2·2
P.M.	3	1	5			1	9	6	6	1·9
Sum.	7	2	13	-	-	5	16	9	5	2·1

Observations made and Return verified by _____

(Signed) _____

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

Fortin Barometer.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the Board of Trade pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the Maximum Thermometer may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The Minimum Thermometer registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W.	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A Maximum Thermometer, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A Minimum Thermometer on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

Rothesay
Jan to June
1908

THE SECRETARY.

Scottish Meteorological Society,

122 *George Street,*

EDINBURGH.

EDINBURGH JY 4 08

ROTHESAY 10 15 AM JY 4 08

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn, Rothesay, County of Bute, During the MONTH of July 1908.

Lat. 55°49'50" N, Long. 5°3'6" W, Distance from Sea 132 ~~miles~~ yards. Height of Cistern of the Barometer above Mean Sea-Level 46 feet, above Ground 3 feet. 6 in

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. *Mention the hour at which Storms, including Thunder and Lightning, began and ended.*	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°	9 a.m. — 9 p.m.	
1	30·378	68	30·378	73	79	55	7	7	68	60	61	58	–	E	2	W.	1	7	7	–	7	–	7	7	7	7	7	54·5	fine, hazy – fine, hazy.	1
2	30·396	70	30·368	73	83	53			72	64	65	60	–	–	–	E.	2			–		–						54·8	" " – " "	2
3	30·306	71	30·194	74	83	53			70	63	64	60	·07	N.E.	2	E	1			–		2						55	hazy – Warm – thunder & lightening 3 to 4–30 pm very wet	3
4	30·092	69	30·078	68	75	58			64	60	59	55	–	E.	3	E	1/4			8		9						55	" , fine – dull, fine.	4
5	30·078	66	30·062	66	64	56			58	55	56	53	·03	E.	3	–	–			10		10						55·8	dull, " – " "	5
6	30·062	65	30·012	66	63	52			54	51	55	52	–	E.	2	W.	1			10		–						56	" hazy – fine	6
7	29·908	62	29·866	65	67	45			60	54	46	45	–	–	–	–	–			4		–						56	fine – "	7
8	29·728	62	29·606	63	61	45			59	54	54	53	·65	E.	2	N.E.	3			6		10						56	" hazy – very wet pm am	8
9	29·714	61	29·720	64	63	50			52	50	55	54	·22	E.	3	E.	1			10		10						56	dull & damp – dull some Rn	9
10	29·498	65	29·374	63	64	53			54	53	57	56	·19	E.	4	–	–			10		10						55·8	" hazy & showery – very wet	10
11	29·474	63	29·444	64	64	53			58	57	56	55	·23	W.	3	–	–			10		10						55·5	" & wet – " "	11
12	29·500	64	29·586	64	63	55			59	57	58	57	·01	S.W.	1	S.E.	1			10		10						55	" dry – dull & wet	12
13	29·668	62	29·722	62	62	53			55	53	56	54	–	E.	4	E.N.E.	1			10		10						55	" hazy – fine	13
14	29·776	64	29·812	63	64	51			53	51	53	49	–	–	–	N.W.	1			10		–						55	" fine – "	14
15	29·826	64	29·634	64	61	47			56	50	54	53	·59	W.	1	S.	1			7		10						55	" " – very wet	15
16	29·594	63	29·234	64	58	52			55	54	56	56	·62	S.W.	1	–	–			10		10						55	" & damp – " "	16
17	29·256	63	29·636	64	66	55			58	57	57	54	–	W.	3	N.	3			7		9						55	" dry – fine	17
18	29·874	62	30·096	65	69	52			60	54	56	52	–	W.	4	N.W.	1			–		–						55	fine – "	18
19	30·200	65	30·164	62	65	45			60	55	55	54	–	N.W.	1	W	1			1		10						55	hazy " – damp foggy in Bay	19
20	30·212	62	30·230	59	62	52			59	53	53	49	–	N	4	N.N.W.	4			4		–						55	dry Clear – dry Cold	20
21	30·200	61	30·118	65	67	49			57	53	56	54	·07	W	1	–	–			8		–						55	" dull – fine	21
22	30·046	56	29·980	68	60	51			57	56	56	55	·53	S.	1	W.N.W.	2			10		10						55	" & wet – damp very wet Earlier	22
23	30·000	64	30·038	63	64	53			58	56	56	55	·03	W.	2	–	–			8		10						55	" dry – " dull	23
24	30·002	64	29·838	63	61	53			60	58	58	58	·64	S	3	S.W.	1			10		10						55	Hazy – dull & wet	24
25	29·842	63	30·100	60	62	50			60	59	51	50	·05	S.W.	1	–	–			10		–						55	dull wet Earlier – fine	25
26	30·114	64	30·082	63	61	48			56	54	54	52	·02	–	–	W	1			10		8						55	" & dry – dull, dry.	26
27	30·048	63	30·088	64	68	53			54	56	54	53	·04	S.	2	–	–			10		1						55	" & wet – fine	27
28	30·206	63	30·398	60	63	52			58	55	55	52	–	W.	3	N.W.	1			10		10						55	" dry – "	28
29	30·422	62	30·276	63	66	46			61	56	57	55	·20	S.	2	–	–			–		10						55	dry bright – very wet	29
30	30·250	63	30·214	58	64	53			59	55	53	51	·05	W.	4	N.W.	4			4		5						55	" breezy – dry strong Wind	30
31	30·252	59	30·284	59	60	53			57	53	54	51	·01	W.	5	N.W.	3			8		2						55	dull " – fine	31
Sums.	11 13 13	11	11 16 14	12	12	11			15 27 0	12 16 6	16 18 0	12 11 5	7 3·95		67		38		215		180							3 5·44		
Means.	29·965	63·6	29·952	64·2	65·5	51·5			58·7	55·4	55·8	53·7			2·2		1·2		6·9		6·0							55·2		
Corrections for Instrumental Errors.										3·2		2·1																		
Corrections for Diurnal Range.									·395		·387																			
Corrected Means									79		86																			

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora.
d. " drizzling rain.
f. " fog.
fr. " frost.
h.-fr. " hoar-frost.
h. " haze.
hl. " hail.
l. " lightning.
lu. co. " lunar corona.
lu. ha. " lunar halo.
m. " mist.
p. " passing showers.
r. " rain.
r.² " heavy rain.
sl. " sleet.
sn. " snow.
so. ha. " solar halo.
q. " squall.
q.² " violent squalls.
t. " thunder.
t. s. " thunder-storm.

CLOUDS.

HIGH CLOUDS.
Cirrus, . . . cir.
Cirro-stratus, . . cir.-str.
Cirro-cumulus, . . cir.-cum.

MIDDLE CLOUDS.
Strato-cirrus, . . str.-cir.
Cumulo-cirrus, . . cum.-cir.

LOWER CLOUDS.
Strato-cumulus, . . str.-cum.
Cumulus, . . . cum.
Cumulo-nimbus, . . cum.-nim.
Nimbus, . . . nim.
Stratus, . . . str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = ... — .94 } = 29.871

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ... — .95 } = 29.857

Mean at Station, corrected, and at 32°, ... = 29.864

Correction for height, feet above Mean Sea-level, ... = + .82

Mean, reduced to 32°, and Sea-level, ... = 29.946

Highest Reading, corrected for Index error, on the th, ... =

Lowest Do. Do., on the th, ... =

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

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 2 th, 3 ..... = 83

Lowest in Month, corrected for Index errors, on the 7 th, 8 ..... 9 = 45

Difference, or **Monthly Range,** ..... = 38

Mean of all the Highest, ... = 65.5

Mean of all the Lowest, ... = 51.5

Difference, or **Mean Daily Range,** ..... = 14.0

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), ... = 58.5

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, ... =

" " Mean, ... =

Black Bulb, Max. in Sun, Highest in Month, ... =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, ... = 57.3

Wet Bulb, Mean of A.M. and P.M. Readings, ... = 54.6

Computed **Temperature of Dew-Point,** ..... =

Do. **Elastic Force of Vapour,** ..... = 391

Do. **Relative Humidity** (Saturation = 100), = 83

RAIN fell on 19 **Days; Amount in Inches,** ..... = 3.95

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	1	1	8		4	3	9	1	4	2·2
P.M.	2	1	5	1	1	1	5	5	10	1·2
Sum.	3	2	13	1	5	4	14	6	14	1·7

Observations made and Return verified by .....

(*Signed*) .....

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W.	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.
Alder,				
Ash,				
Beech,				
Birch,				
Elm,				
Larch,				
Lime,				
Oak,				
Sycamore or Plane,				

CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Barley,				
Bere or Bigg,				
Oats,				
Wheat,				
Beans,				
Pease,				
Potatoes,				
Turnips,				
Rye Grass,				

SHRUBS, ETC.	First in Blossom.
Barberry,	
Bourtree or Elder,	
Broom,	
Hazel,	
Hawthorn,	
Holly,	
Laburnum,	
Lilac,	
Mezereon,	
Mountain Ash or Rowan,	
Red Flowering Currant,	
Rhododendron Ponticum,	
Whin,	

FRUITS.	First in Blossom.	Fruit Ripe, generally.
Apple,		
Black Currant,		
Cherry,		
Gean,		
Gooseberry,		
Peach,		
Pear,		
Plum,		
Strawberry,		

MIGRATORY BIRDS.	First Arrival.	Departure.
Cuckoo,		
Curlew,		
House-Swallow,		
Lapwing,		
Plover,		
Sand-Martin,		
Starling,		
Swan,		
Rail or Corn Crake,		

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn Hydro, County of Bute, During the MONTH of Aug 1908.

Lat. 55°49'50" N, Long. 5°4'5" W, Distance from Sea 132 ~~miles~~ yds. Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. 6 in

Diameter of Rain Gauge 5" inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No.	BAROMETER. 9 A.M. Attached Thermometer	BAROMETER. 9 P.M. Barometer. No.	BAROMETER. 9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. 9 a.m. 9 p.m.	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1	30·284	60	30·326	62	66	51	7	7	57	55	58	57	-	W.	1	N.W.	2	7	7	9	7	9	7	7	7	7	7	55	Dull, fine — fine, lightening.	1
2	30·442	62	30·400	68	75	51			65	62	58	56	-	-	-	W.	1			-		-						55	" " — "	2
3	30·346	67	30·246	67	67	54			64	62	60	58	·04	W.	2	-	-			9		10						55	" " — "	3
4	30·100	61	30·054	64	61	54			58	57	54	52	·10	W.	2	N.W.	4			10		9						55	" Showery — Showery all day, Cold.	4
5	29·984	60	30·182	66	67	53			60	55	53	51	-	N.	4	W.	1			3		-						55·5	dry bright — fine	5
6	30·182	63	30·218	66	73	46			63	56	56	54	-	-	-	W.N.W.	2			-		-						55·8	" " — "	6
7	30·228	64	30·284	63	66	52			59	57	57	54	-	N.W.	4	W.	1			5		-						55·8	" breezy — "	7
8	30·200	65	30·046	63	64	53			60	57	56	55	·03	W.	3	W.	3			10		10						55·8	dull fine — dull & damp	8
9	29·992	63	29·742	65	65	50			59	54	61	59	·35	W.	2	-	-			1		10						55·8	" — very wet	9
10	29·686	61	29·940	61	62	50			54	51	50	47	·29	W.	4	N.W.	3			4		-						55·8	Showery — Clear Cold	10
11	30·026	58	30·224	61	59	46			53	49	50	47	-	N.W.	4	N.N.W.	3			3		-						55·8	" — " "	11
12	30·236	58	30·132	59	59	42			53	50	58	52	·11	-	-	N.W.	1			10		10						55·8	dull, fine. — wet	12
13	29·980	60	29·950	65	68	51			56	55	53	52	-	-	-	N.W.	1			10		-						55·8	Hazy, " — fine	13
14	30·002	60	30·062	65	71	47			62	58	57	54	·04	N.W.	1	E.	3			-		-						55·5	dry & bright — "	14
15	30·134	63	30·146	65	70	54			58	56	56	54	-	E.	4	-	-			8		-						55	Hazy, fine — "	15
16	30·194	65	30·214	67	73	51			63	59	59	57	-	-	-	-	-			-		5						55·5	" — Hazy, fine.	16
17	30·218	65	30·208	67	66	50			56	53	60	56	-	E.	2	E.	1			10		10						56	Hazy " — " "	17
18	30·288	66	30·308	64	68	51			56	54	56	52	-	-	-	-	-			10		-						55	" " — " "	18
19	30·286	65	30·230	66	66	53			57	54	54	52	-	-	-	S.	1			10		10						55·5	" " " "	19
20	30·170	64	30·032	62	60	52			53	51	53	50	-	E.	4	S.E.	4			10		10						55·8	" " — " Cold	20
21	29·868	63	29·800	62	61	51			56	52	55	54	·05	E.	4	-	-			6		10						55·5	breezy " — " fine	21
22	29·800	62	29·786	58	64	51			56	51	52	49	·24	W.	3	N.W.	2			2		8						55·5	" — Showery	22
23	29·700	66	29·722	62	64	46			55	52	58	56	·24	N.E.	1	-	-			1		10						55·5	fine, R.P. Perlin — dull fine	23
24	29·662	62	29·468	65	66	51			56	55	56	55	·26	E.	1	S.W.	1			7		10						55·5	hazy, damp. — Showery	24
25	29·374	65	29·542	62	63	51			56	55	56	55	·05	S.W.	1	W.N.W.	4			10		10						55·5	dull showery — "	25
26	29·584	62	29·158	65	62	52			58	54	59	58	1·24	W.	1	N.W.	5			8		10						55	" dry — very Wet, Strong Wind	26
27	29·334	61	29·320	63	60	51			53	51	55	51	·06	W.	4	W.S.W.	2			7		6						55	Showery — fine	27
28	29·356	62	29·142	65	63	51			57	53	53	51	·45	W.	4	W.	3			1		7						55	dry bright — heavy Shrs at intervals	28
29	29·336	59	29·636	57	57	48			56	52	48	46	·04	N.N.W.	5	W.N.W.	1			2		-						55	Showers — fine	29
30	29·708	60	29·790	59	59	48			54	51	49	47	·04	N.W.	3	-	-			4		10						55	Slight Showers — Wet	30
31	29·700	59	29·632	60	63	46			54	51	50	48	·53	S.W.	3	E.	9			4		10						55	dull heavy dew — very wet blowing a Gale	31
Sums.	29·212	71	28·740	103	148	09			225	133	159	89	4·75				67		58	174		184		91	14		10				10·7	
Means.	29·942	62·3	29·927	63·3	64·8	50·0			57·3	54·3	55·1	52·9			2·2		1·9	5·6		5·9								55·3		
Corrections for Instrumental Errors.									3·0		2·2																				
Corrections for Diurnal Range.									·382 81		·371 85																				
Corrected Means																															

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora.
d. " drizzling rain.
f. " fog.
fr. " frost.
h.-fr. " hoar-frost.
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lu. co. " lunar corona.
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m. " mist.
p. " passing showers.
r. " rain.
r.² " heavy rain.
sl. " sleet.
su. " snow.
so. ha. " solar halo.
q. " squall.
q.² " violent squalls.
t. " thunder.
t. s. " thunder-storm.

CLOUDS.

High Clouds.

Cirrus, . . . cir.
Cirro-stratus, . . cir.-str.
Cirro-cumulus, . . cir.-cum.

Middle Clouds.

Strato-cirrus, . . str.-cir.
Cumulo-cirrus, . . cum.-cir.

Lower Clouds.

Strato-cumulus, . . str.-cum.
Cumulus, . . . cum.
Cumulo-nimbus, . . cum.-nim.
Nimbus, . . . nim.
Stratus, . . . str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

Force.		Force.		Force.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = ... — 91 } = 29·851

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ... — 91 } = 29·833

Mean at Station, corrected, and at 32°, ... = 29·842

Correction for height, feet above Mean Sea-level, ... = + ·02

Mean, reduced to 32°, and Sea-level, ... = 29·844

Highest Reading, corrected for Index error, on the th, ... =

Lowest Do. Do., on the th, ... =

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

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 2 th, ... = 75°

Lowest in Month, corrected for Index errors, on the 12 th, ... = 42

Difference, or **Monthly Range,** ..... = 33

Mean of all the Highest, ... = 64·8

Mean of all the Lowest, ... = 50·3

Difference, or **Mean Daily Range,** ..... = 14·5

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), +0·7 ..... = 57·6

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, ... =

" " Mean, ... =

Black Bulb, Max. in Sun, Highest in Month, ... =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, ... = 56·2

Wet Bulb, Mean of A.M. and P.M. Readings, ... = 53·6

Computed **Temperature of Dew-Point,** ..... =

Do. **Elastic Force of Vapour,** ..... = ·378

Do. **Relative Humidity** (Saturation = 100), = 84

RAIN fell on 18 **Days; Amount in Inches,** ..... = 4·75 4·45

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	2	1	5			2	10	4	7	2·2
P.M.	1		3	1	1	1	9	7	8	1·9
Sum.	3	1	8	1	1	3	19	11	15	2·1

Observations made and Return verified by .....

(*Signed*) .....

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W. . .	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn Rothesay, County of Bute, During the MONTH of Septr 1908.

Lat. 55°49'50" N. Long. 5°4'3" W., Distance from Sea 132 yds ~~miles.~~ Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3½ feet.

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month	Barometer 9 A.M. (inches)	Attached Thermometer 9 A.M. (°)	Barometer 9 P.M. (inches)	Attached Thermometer 9 P.M. (°)	Self-Registering Thermometers, Read Daily, at 9 P.M. — Protected in Screen, 4 feet above Ground: Max. (°)	Min. (°)	Black Bulb Max. in Sun (°)	Min. on Grass (°)	Hygrometer 9 A.M. Dry bulb (°)	9 A.M. Wet bulb (°)	9 P.M. Dry bulb (°)	9 P.M. Wet bulb (°)	Rain: Amount at 9 A.M. (inches)	Wind 9 A.M. Direction	9 A.M. Force, Scale of 0–12	Wind 9 P.M. Direction	9 P.M. Force, Scale of 0–12	Anemometer 9 A.M.	Clouds 9 A.M. Species and Direction	9 A.M. Amount (0–10)	Clouds 9 P.M. Species and Direction	9 P.M. Amount (0–10)	Sunshine Hours	Thermometers under Ground 9 A.M. 3 ins. (°)	12 ins. (°)	22 ins. (°)	36 ins. (°)	48 ins. (°)	General Remarks (9 A.M. – 9 P.M.)	Days of Month
1	29·210	59	29·662	58	62	48	+	+	55	50	51	46	·01	N.	6	N.W.	4	+	+	8	+	2	+	+	+	+	+	55	dull Stormy – dry Cold	1
2	29·738	57	29·920	58	57	44			51	46	50	47	·16	N.W.	6	N.	4			2		-						54·8	Showery " – " "	2
3	29·920	57	30·010	58	55	43			49	46	51	46	–	E.	4	E.	2			10		10						54·8	hazy, damp. – dull, fine.	3
4	30·048	56	30·150	57	57	45			49	47	45	43	·03	–	–	N.N.W.	1			8		–						54·5	dull, fine. – dry, cold.	4
5	30·092	57	29·900	59	56	39			50	48	55	55	·68	W.	2	W.N.W.	5			9		10						54	" & damp – very Wet all day, Strong Wind	5
6	29·940	59	29·900	62	59	54			56	56	55	44	·63	W.	5	–	–			10		10						54	" & Wet – Rn more or less all day	6
7	29·694	63	29·622	65	61	54			59	58	57	57	1·91	W.	2	–	–			10		10						53·8	" very Wet – very Wet, third day of continuous Rn	7
8	29·512	62	29·262	64	59	54			56	56	55	54	·62	S.W.	3	S.	1			10		10						53·8	dull showery – Raining, very heavy earlier	8
9	29·234	60	29·530	66	56	47			52	51	47	43	·04	N.	4	N.W.	5			10		–						53·5	" & damp – breezy, clear Cold.	9
10	29·636	56	29·802	57	60	47			52	48	50	47	–	N.N.W.	4	N.W.	3			10		10						53	" dry – dry "	10
11	29·846	55	29·928	59	56	41			52	47	48	44	·03	N.	2	N.	2			5		–						53	dry bright – " "	11
12	29·984	54	30·080	57	59	36			50	46	46	45	·06	N.	2	–	–			–		10						53	" " – " fine	12
13	30·062	55	30·020	63	57	46			52	51	54	53	·52	W.	2	S.	1			10		10						53	dull & damp – dull misty	13
14	29·958	55	29·780	62	60	54			55	54	56	55	·34	W.	2	S.W.	1			10		10						53	" & showery – & damp	14
15	29·824	61	29·960	60	59	48			53	52	49	47	·01	W.	3	W.	1			3		–						53	damp – fine	15
16	29·930	57	29·678	62	60	45			51	50	59	58	·72	S.W.	2	S.W.	1			10		10						53	dull & showery – very Wet	16
17	29·708	62	29·832	62	64	56			62	60	57	56	1·04	S.S.W.	5	S.	1			5		10						53	hazy damp – " "	17
18	29·848	62	29·880	68	59	56			57	56	57	56	·20	S.S.W.	2	S	1			10		10						53	dull, damp very Wet earlier – damp & Misty	18
19	29·950	61	30·040	63	64	54			59	58	56	55	–	S.W.	2	S.W.	1			5		9						53	hazy, damp – fine, mild	19
20	29·972	62	29·958	68	64	54			60	58	60	59	·41	E.	1	–	·			10		10						53	dull fine – damp, foggy mild	20
21	30·024	66	30·044	66	62	56			59	58	57	56	·13	E.	2	S.E.	1			10		10						53	Misty damp – very Wet.	21
22	29·942	62	29·914	67	59	46			53	52	56	55	·12	–	–	E.	3			10		6						53	foggy " – fine Colder	22
23	29·906	66	29·974	66	60	52			54	53	54	54	·03	E.	2	E.	1			10		10						53	hazy, showery. – dull, hazy, & damp	23
24	30·014	66	29·970	63	59	53			56	55	53	52	–	E.	2	E.N.E.	3			10		10						53	" dull – fine	24
25	29·844	64	29·642	63	59	53			54	53	54	52	·39	E.	2	S.	3			10		10						53	" " – dull showery	25
26	29·510	61	29·603	62	54	50			54	53	53	51	·06	S	1	W.	2			10		8						53	dull & wet – " & damp	26
27	29·732	61	29·832	60	61	45			53	52	48	46	·05	–	–	–	–			4		–						53	fine – Clear fine	27
28	29·822	65	29·832	66	61	56			55	54	59	58	·09	E.	1	S	2			10		10						53	dull & wet – dull & damp	28
29	29·840	63	29·842	65	61	57			58	58	58	57	·16	S.	4	S.	4			10		10						53	" damp – " "	29
30	29·943	63	30·002	67	62	56			60	59	59	58	·01	S.W.	4	S.W.	3			10		10						53	" " – " "	30
31																														31
Sums.	191110 24·683	12 07	1811 5 25·569	15 73	14 282	14 289			12 126	14 85	15 109	15 49	69 8·45		77		56			249		225						4 11·2		
Means.	29·823	60·2	29·852	62·4	59·4	49·6			54·2	52·8	53·6	51·6	✓		2·6		1·9			8·3		7·5						53·4		
Corrections for Instrumental Errors.										1·4		2·0																		
Corrections for Diurnal Range.										380		355																		
Corrected Means										91		86																		

NOTATION USED IN GENERAL REMARKS.

a.	denotes	aurora.
d.	,,	drizzling rain.
f.	,,	fog.
fr.	,,	frost.
h.-fr.	,,	hoar-frost.
h.	,,	haze.
hl.	,,	hail.
l.	,,	lightning.
lu. co.	,,	lunar corona.
lu. ha.	,,	lunar halo.
m.	,,	mist.
p.	,,	passing showers.
r.	,,	rain.
r.²	,,	heavy rain.
sl.	,,	sleet.
sn.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

High Clouds.	
Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.
Middle Clouds.	
Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.
Lower Clouds.	
Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

Force		Force		Force	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = —84 = 29.739

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —90 = 29.762

Mean at Station, corrected, and at 32°, = 29.751

Correction for height, feet above Mean Sea-level, = + 83

Mean, reduced to 32°, and Sea-level, = 29.834

Highest Reading, corrected for Index error, on the th, =

Lowest Do. Do., on the th, =

Difference, or **Monthly Range,** =

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 17th, 19, 20, = 64

Lowest in Month, corrected for Index errors, on the 12th, = 36

Difference, or **Monthly Range,** = 28

Mean of all the Highest, = 59.4

Mean of all the Lowest, = 49.6

Difference, or **Mean Daily Range,** = 9.8

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 54.5

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =

" " Mean, =

Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 53.9

Wet Bulb, Mean of A.M. and P.M. Readings, = 52.2

Computed **Temperature of Dew-Point,** =

Do. **Elastic Force of Vapour,** = 367

Do. **Relative Humidity** (Saturation = 100), = 88

RAIN fell on 26 **Days; Amount in Inches,** = 8.45

WIND. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	5		7		4	4	6	1	3	2 6
P.M.	3		4	1	7	4	3	3	5	1 9
Sum.	8	0	11	1	11	8	9	4	8	2·3

Observations made and Return verified by

(Signed)

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W. . .	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn, Rothesay, County of Bute, During the MONTH of October 1908.

Lat. 55°49'50"N, Long. 5°4'57" W, Distance from Sea 132 ~~miles~~ yds. Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3½ feet.

Diameter of Rain Gauge 5" inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. 9 a.m.	9 p.m.	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.												°							
1	30·105	64	30·120	57	69	57	+	+	62	60	57	56	–	SW.	3	–	–	1	1	4	1	–	1	7	7	7	7	53	Bright, dry. – dry foggy.		1	f
2	30·102	65	30·102	68	64	55			63	61	61	60	–	E.	2	–	–			6		–						53	dull, hazy. – " hazy.		2	
3	30·103	63	30·102	68	65	53			59	58	63	62	–	–	–	–	–			–		–						53		foggy, heavy dew – very foggy, heavy dew.	3	f
4	30·102	65	30·202	65	69	57			57	56	60	59		–	–	–	–			10		10						53	" & overcast – dull, dry.		4	
5	30·211	61	30·204	64	64	55			55	53	56	55	–	E.	4	E.	3			10		8						53	hazy, dull, dry. – hazy, " .		5	
6	30·105	61	30·101	63	62	54			57	55	57	56	·23	S.	2	–	–			7		10						53·5	" " " – dull & showery		6	
7	30·103	62	30·102	66	61	56			59	58	57	56	·01	SSW.	3	S.	1			10		10						53·5	dull & damp – " & dry		7	
8	30·005	62	29·805	61	61	56			58	55	55	52	·31	SSE.	2	SE.	3			10		8						53·8	" hazy – hazy, damp.		8	
9	29·802	60	29·694	62	61	54			56	53	56	54	·10	SW.	2	W.	5			5		5						53·8	" dry – breezy, fine.		9	
10	29·680	60	29·858	65	59	49			55	52	51	48	·14	W.	3	W.	5			4		5						53·8	" & damp – " showery		10	
11	29·938	59	29·922	65	59	58			56	53	57	55	–	SW.	4	W.	5			10		3						54	hazy, fine. – " fine		11	
12	29·936	62	30·028	62	62	56			57	54	55	54	–	SW.	5	W.	2			5		5						54	breezy, dry. – "		12	
13	30·010	60	29·946	63	61	51			55	53	56	55	–	S	1	SW.	1			8		5						54	hazy, dull. – "		13	
14	29·858	60	29·994	60	61	48			57	55	50	49	–	SW.	4	–	–			10		2						53·8	dull & damp – "		14	
15	30·054	62	30·042	64	61	47			53	52	56	54	·01	–	–	E.	2			4		10						53·8	hazy, heavy dew – foggy, damp.		15	f
16	29·976	60	29·942	64	59	53			55	53	56	54	·10	E.	4	–	–			5		10						53·8	foggy, dry. – wet.		16	f
17	29·940	62	29·994	64	58	53			54	52	54	53	·18	E.	4	–	–			8		10						53·5	hazy & overcast – foggy & damp		17	f
18	30·014	62	30·014	64	56	52			55	54	55	54	·69	SE.	1	–	–			8		10						53·5	" " – misty & wet.		18	f
19	30·002	60	29·944	63	58	54			55	55	55	54	·07	E.	1	SE.	1			10		10						53·5	dull & wet – foggy, fine.		19	f
20	29·882	62	29·882	62	59	51			55	54	52	50	·13	SE.	3	SE.	2			10		10						53·5	" & overcast – " "		20	f
21	30·086	58	30·372	57	53	44			49	46	44	41	–	E.	1	SE.	3			10		–						53	" " – fine, cooler.		21	
22	30·520	52	30·504	52	52	40			44	41	44	43	–	E.	3	SE.	1			6		–						53	dry cold – Clear fine		22	
23	30·466	51	30·408	54	53	41			43	40	46	43	–	E.	3	S.	1			–		10						53	dry, Misty heavy dew – misty "		23	
24	30·354	51	30·288	55	50	37			45	42	41	38	–	E.	2	S.	1			10		–						53	foggy & overcast – Clear cold		24	f
25	30·302	52	30·366	55	51	36			39	37	38	37	–	E.	2	S.	1			–		–						53·8	bright dry – " "		25	
26	30·304	53	30·212	54	52	38			45	43	50	48	–	E.	5	NE.	6			8		10						52·5	dull & cold – Strong Wind, blowing a gale 3 to 7 p.m.		26	g.
27	30·082	53	29·978	55	53	48			49	48	52	50	·03	E.	6	NE.	2			10		10						52	dull strong Wind – Wet, stormy earlier.		27	
28	29·942	54	30·026	55	55	48			49	48	49	48	·06	–	–	–	–			10		10						51·8	" & foggy – dull & wet.		28	f
29	30·046	56	30·050	58	57	49			51	50	55	55	·11	–	–	–	–			10		10						51	" " – Wet, very foggy		29	f 2
30	29·900	58	29·894	57	61	52			53	51	57	55	·03	E.	1	SW.	2			7		10						51	" " – fine		30	f.
31	30·028	57	30·142	60	58	41			44	43	46	45	–	–	–	SW.	1			–		–						51	bright, fine. – "		31	
Sums.	1410	8	1421	13	13	13			17	11	14	14	5															9					
	1·938	277	2·238	211	276	297			94	35	91	43	2·20 ✓		71		48			215		191			12.							2·9
Means.	30·064	589	30·072	607	58·9	49·6			53·0	51·1	52·9	51·4			2·3		1·5			6·9		6·2						53·1				
Corrections for Instrumental Errors.					✓	✓			1·9		1·5																					
Corrections for Diurnal Range.									·350		·359																					
Corrected Means									87		90																					

NOTATION USED IN GENERAL REMARKS.

a. denotes aurora.
d. ,, drizzling rain.
f. ,, fog.
fr. ,, frost.
h.-fr. ,, hoar-frost.
h. ,, haze.
hl. ,, hail.
l. ,, lightning.
lu. co. ,, lunar corona.
lu. ha. ,, lunar halo.
m. ,, mist.
p. ,, passing showers.
r. ,, rain.
r.² ,, heavy rain.
sl. ,, sleet.
sn. ,, snow.
so. ha. ,, solar halo.
q. ,, squall.
q.² ,, violent squalls.
t. ,, thunder.
t. s. ,, thunder-storm.

CLOUDS.

HIGH CLOUDS.
Cirrus, . . . cir.
Cirro-stratus, . . . cir.-str.
Cirro-cumulus, . . cir.-cum.

MIDDLE CLOUDS.
Strato-cirrus, . . str.-cir.
Cumulo-cirrus, . . cum.-cir.

LOWER CLOUDS.
Strato-cumulus, . . str.-cum.
Cumulus, . . . cum.
Cumulo-nimbus, . . cum.-nim.
Nimbus, . . . nim.
Stratus, . . . str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = 8.1 = 29.983

Corrected Mean at 9 P.M., *minus* Correction for Temp. = 8.6 = 29.986

Mean at Station, corrected, and at 32°, = 29.985

Correction for height, feet above Mean Sea-level, = + 84

Mean, reduced to 32°, and Sea-level, = 30.069

Highest Reading, corrected for Index error, on the th, =

Lowest Do. Do., on the th, =

Difference, or **Monthly Range,** =

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 1 th, 4th = 69

Lowest in Month, corrected for Index errors, on the 25th, = 36

Difference, or **Monthly Range,** = 33

Mean of all the Highest, = 58·9

Mean of all the Lowest, = 49·6

Difference, or **Mean Daily Range,** = 9·3

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 54·3

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =

" " Mean, =

Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 53·0

Wet Bulb, Mean of A.M. and P.M. Readings, = 51·3

Computed **Temperature of Dew-Point,** =

Do. **Elastic Force of Vapour,** = ·355

Do. **Relative Humidity** (Saturation = 100), = 88

RAIN fell on 15 **Days; Amount in Inches,** = 2·20.

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.			13	2	4	5	1		6	2·3
P.M.		2	2	5	4	3	4		11	1·5
Sum.	0	2	15	7	8	8	5	0	17	1·9

Observations made and Return verified by _____

(*Signed*) _____

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

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FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W. . .	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Rothesay, County of Bute, During the MONTH of Nov 1908.

Lat. 55°29'50" N, Long. 5°4'5" W, Distance from Sea 1/32 ~~miles~~. Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3½ feet.

Diameter of Rain Gauge 5" inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. 9 a.m. 9 p.m.	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1	30·136	57	30·128	64	53	45	↑	↑	48	47	48	44	·07	E.S.E.	1	E.	1	+	↑	3	+	-	+	↑	↑	↑	↑	5·1	Fine - Clear heavy dew	1
2	30·084	56	30·068	65	52	48			48	47	51	50	·10	E.	5	E.	3			10		8						5·1	breezy dull & Wet - damp some Rn early	2
3	30·048	59	30·058	60	54	49			51	50	56	49	-	E.	3	E.	4			7		10						5·1	hazy - - fine	3
4	30·110	57	30·160	60	52	47			47	45	49	48	-	E.	3	-	-			4		-						5·1	" dry - " but foggy	4
5	30·160	55	30·128	59	52	45			47	45	49	48	-	-	-	-	-			8		10						50·8	dull & foggy - fine, but Foggy in Bay	5
6	30·136	55	30·110	59	51	47			49	48	48	47	-	E.	3	E.	1			10		9						50·5	" " - " some fogs	6
7	30·000	55	29·884	59	50	43			46	45	43	42	-	E.	1	E.	1			10		-						50·8	" " - " but foggy	7
8	29·850	54	29·850	56	46	38			39	38	39	36	-	E.	4	S.E.	3			3		-						50·5	Hazy, fine. - Clear frost air	8
9	29·866	51	29·848	54	44	33			37	36	42	41	-	E.	1	S.E.	1			-		2						50·5	white frost - foggy in Bay, fine.	9
10	29·798	49	29·678	53	44	38			39	36	42	41	·33	S.E.	3	E.	2			3		10						50	foggy, dry. - very foggy & Wet	10
11	29·662	50	29·470	60	56	42			45	44	56	55	·26	E.	3	S.W.	3			10		8						50	" & damp - showery.	11
12	29·764	56	29·738	59	56	48			50	46	50	49	·24	W.	3	S.E.	2			6		10						49·8	dull fine - "	12
13	29·826	54	29·800	56	54	44			48	46	46	44	·03	W.	3	S.	3			4		8						49·5	dry " - fine	13
14	29·942	55	30·144	57	51	38			48	45	39	38	-	N.N.E.	2	S.	1			8		-						49	" " - clear frosty	14
15	30·140	55	30·126	57	57	36			44	43	50	46	·10	S.E.	2	S.S.W.	1			7		10						49	" hazy - fine	15
16	29·924	58	29·916	57	52	45			50	49	45	41	·18	S.S.W.	3	W.	6			10		-						49	dull & Wet - showery rather stormy	16
17	29·972	52	30·142	57	50	44			46	42	49	47	·05	W.	7	W.	6			2		-						48·8	stormy & showery - " " "	17
18	29·962	54	29·836	56	53	44			50	48	46	43	·35	W.	5	W.	3			10		4						48·8	stiff breeze " - " stiff breeze	18
19	30·028	54	30·106	57	47	40			42	40	40	38	·03	N.	2	N.W.	1			-		-						48·5	clear cold - clear cold	19
20	29·872	48	29·882	57	49	31			41	40	45	40	·21	-	-	N.N.W.	6			10		-						48·5	wet & foggy - showery	20
21	29·864	52	29·364	58	53	42			46	44	52	52	1·20	W.	3	N.W.	4			10		10						48	dull & damp - very wet	21
22	29·202	55	29·034	61	54	45			48	46	46	44	·22	W.	6	W.N.W.	9			7		10						47·8	" & stormy - blowing a gale all day showery Rn & sleet	22
23	29·872	50	29·956	51	48	39			43	37	46	43	·17	N.	5	S.S.W.	2			-		10						47·8	clear & dry - dull fine.	23
24	29·636	53	29·608	55	55	41			52	49	41	39	·54	W.	4	W.	7			10		-						47·8	dull & damp - stormy & Wet, frightening	24
25	29·646	52	29·608	52	47	38			41	39	41	38	·28	W.	6	W.N.W.	8			6		-						47	Rn & Hail showers very stormy all day Thunder & Lightening 6-30 a.m. Thunder & Lightening 4-30 p.m. Rn & Hail	25
26	29·898	51	29·986	52	49	42			44	40	49	47	·02	W.	5	S.	3			10		10						47	dull & showery - fine	26
27	29·928	53	29·720	59	53	48			50	47	53	50	·74	S.W.	4	S.W.	4			8		10						47	" fine - "	27
28	29·574	59	29·868	60	54	46			54	52	47	45	·10	S.W.	4	S.W.	3			10		-						47	very wet - "	28
29	30·122	51	30·280	59	50	43			46	44	49	45	-	S.W.	3	W.	3			-		-						47	fine - "	29
30	30·346	57	30·370	57	50	37			45	44	37	36	-	W.	3	-	-			3		-						47	dry mild - " frosty air	30
31																															31
Sums.	16411 / 27·278	14 / 120	14313 / 26·866	15 / 226	11 / 36	15 / 68			14 / 184	15 / 122	14 / 188	14 / 126	4·7 / 5·22		97		91			189		139						9 / 1·7		
Means.	29·989	540	29·896	57·5	51·2	42·3			46·1	44·1	46·3	44·2			3·2		3·0			6·3		4·6						49·1		
Corrections for Instrumental Errors.									2·0		2·1																				
Corrections for Diurnal Range.									·266		·265																				
Corrected Means									86%		85%																				

NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	
d.	,,	drizzling rain.
f.	,,	fog.
fr.	,,	frost.
h.-fr.	,,	hoar-frost.
h.	,,	haze.
hl.	,,	hail.
l.	,,	lightning.
lu. co.	,,	lunar corona.
lu. ha.	,,	lunar halo.
m.	,,	mist.
p.	,,	passing showers.
r.	,,	rain.
r.²	,,	heavy rain.
sl.	,,	sleet.
sn.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

High Clouds.

Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.

Middle Clouds.

Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.

Lower Clouds.

Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0—12).

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = ...6.6. = 29·841

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ...7.7. = 29·819

Mean at Station, corrected, and at 32°, ... = 29·830

Correction for height, feet above Mean Sea-level, ... = + ·84

Mean, reduced to 32°, and Sea-level, ... = ·914

Highest Reading, corrected for Index error, on the th, ... =

Lowest Do. Do., on the th, ... =

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

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 15 th, ... = 57

Lowest in Month, corrected for Index errors, on the 20 th, ... = 31

Difference, or **Monthly Range,** ..... = 26

Mean of all the Highest, ... = 51·2

Mean of all the Lowest, ... = 42·3

Difference, or **Mean Daily Range,** ..... = 8·9

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), ... = 46·8

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, ...

,, ,, Mean, ...

Black Bulb, Max. in Sun, Highest in Month, ...

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, ... = 46·2

Wet Bulb, Mean of A.M. and P.M. Readings, ... = 44·1

Computed **Temperature of Dew-Point,** .....

Do. **Elastic Force of Vapour,** ..... = ·265

Do. **Relative Humidity** (Saturation = 100), = 86%

RAIN fell on 20 **Days; Amount in Inches,** ..... = 5·22

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	3		9	2	1	3	10		2	3·2
P.M.	1		6	3	5	3	7	2	3	3·0
Sum.	4	0	15	5	6	6	17	2	5	3·1

Observations made and Return verified by .....

(*Signed*) .....

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W. . .	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bourtree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		Strawberry,			Rail or Corn Crake,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn, Rothesay, County of Bute, During the MONTH of December 1908.

Lat. 55°49'50" N, Long. 5°4'5" W, Distance from Sea 132 yds ~~miles~~. Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. 6 inches

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

Days of Month	Barometer 9 A.M. (inches)	Attached Thermometer 9 A.M. (°)	Barometer 9 P.M. (inches)	Attached Thermometer 9 P.M. (°)	Self-Reg. Max. (°)	Self-Reg. Min. (°)	Black Bulb Max. in Sun	Min. on Grass	Hygrometer 9 A.M. Dry bulb	9 A.M. Wet bulb	9 P.M. Dry bulb	9 P.M. Wet bulb	Rain Amount at 9 A.M. (inches)	Wind 9 A.M. Direction	Force	Wind 9 P.M. Direction	Force	Anemometer 9 A.M.	Clouds 9 A.M. Species and Direction	Amount (0–10)	Clouds 9 P.M. Species and Direction	Amount (0–10)	Sunshine Hours	Therm. under Ground 3 ins.	12 ins.	22 ins.	36 ins.	48 ins.	General Remarks	Days of Month
1	30·312	54	30·318	57	48	36	1	+	43	42	48	47	-	-	-	S.W.	1	+	+	10	+	10						47	dull & foggy – fine but foggy	1
2	30·294	53	30·256	57	49	46			47	46	46	45	-	S.W.	1	-	-			10		10						47	" " – slight fog.	2
3	30·224	57	30·180	55	48	39			41	39	41	40	·29	S.S.W.	1	E.	1			10		10						47	" " – Cold very foggy all day	3
4	30·104	52	30·114	52	51	41			45	44	47	46	·46	E.	1	S.W.	1			10		10						47	wet foggy – dull & damp	4
5	29·922	55	29·800	62	51	46			50	49	47	45	1·05	S.W.	3	S.W.	1			10		10						47	dull & wet – very wet all day - 9 p.m. showery	5
6	29·898	57	29·994	58	48	37			43	41	40	39	-	S.W.	2	-	-			-		9						47	showery – fine	6
7	29·900	55	29·698	56	50	33			41	38	49	48	·18	S.W.	3	W.	4			6		10						47	fine – strong breeze, showery	7
8	29·470	55	29·436	54	52	39			46	45	42	38	·02	W.	3	W.	4			10		-						47	dull showery – Cold, Hale shower.	8
9	29·380	51	29·280	54	44	38			40	37	39	38	·28	S.W.	4	W.S.W.	2			3		10						47	damp, clear – very wet, cold.	9
10	28·936	51	28·700	55	43	39			40	39	39	37	·09	S.	2	N.E.	1			10		4						47	" showery – cold Rn earlier	10
11	28·920	48	29·230	51	44	33			40	37	42	38	-	N.N.W.	5	N.N.W.	3			-		-						46·8	dry cold – dry very cold	11
12	29·532	49	29·494	53	43	33			38	34	40	37	·60	W.	3	S.E.	2			-		10						46·5	Clear frosty – dull & wet.	12
13	29·350	50	29·270	54	44	38			42	40	42	39	·10	W.	1	S.S.W.	1			-		-						46·5	damp, – " damp	13
14	29·276	55	29·078	55	46	39			43	42	43	42	·78	S.S.E.	1	S.S.W.	1			10		10						46	dull & showery – very wet all day	14
15	29·018	53	29·372	55	45	37			41	40	37	36	·08	S.W.	1	-	-			10		-						45·8	" & wet, – damp.	15
16	29·478	50	29·244	50	47	34			41	41	45	46	·22	S.	1	S.S.E.	1			10		10						45·8	" & Hazy – dull & wet,	16
17	29·086	51	29·196	53	48	42			45	44	43	41	·16	W.S.W.	3	-	-			4		-						45	dry clear – fine	17
18	29·462	52	29·766	52	46	39			44	43	39	37	·15	W.	4	W.	1			8		-						45	dull showery – raw & damp	18
19	29·922	49	29·962	57	50	37			41	40	50	49	·26	W.	1	-	-			10		10						45	" & wet – very wet & foggy	19
20	29·900	57	30·136	57	53	46			51	49	46	45	·03	W.S.W.	2	W.	1			10		1						45	" " – fine	20
21	30·114	57	30·014	58	52	42			48	47	51	51	·30	-	-	S.W.	5			10		10						45	" fine – damp Rn earlier	21
22	29·968	56	29·874	59	52	49			50	50	51	50	·50	S.S.W.	3	W.	2			10		10						45	" & wet – wet all damp	22
23	30·062	54	29·994	55	52	40			42	41	48	47	·11	N.	1	S.E.	2			8		10						45	" dry – " dull	23
24	29·944	54	29·960	51	49	36			41	39	36	33	-	S.	4	E.	3			10		10						45	foggy – dry cold. foggy.	24
25	30·066	48	30·044	49	38	34			34	32	35	33	-	E.	3	E.	1			-		-						45·5	frosty, foggy – freezing " "	25
26	29·936	46	29·910	52	38	33			33	31	34	37	·11	E.	2	E.	2			-		10						45·5	" – " " "	26
27	29·866	48	29·832	56	38	28			34	32	29	27	-	E.	2	E.	3			10		-						45·5	Raw Sl earlier – " " Clear	27
28	29·801	49	29·732	58	31	27			30	28	27	26	·70	S.S.E.	2	E.S.E.	7			10		10						45·5	Cold. foggy. – Sn. drifting 1½ in Com- 7·30 p.m.	28
29	29·500	43	29·776	42	29	26			26	25	27	32	·06	E.	3	E.	3			10		10						45	Still snowing 7½ in; drifting 1 to 3 ft – still snowing 9 in drifting 1 to 4 ft	29
30	29·992	41	29·874	45	41	27			31	32	41	40	·50	E.	4	S.	4			10		10						45	fair, foggy. Sn. same as last night – raining from 6 p.m. Sn. melting fast, S wind	30
31	30·014	46	30·236	50	48	40			46	44	44	43	·10	W.S.W.	4	W.	1			10		8						44	dull, fair, thawing, Sn nearly gone – fine, Sn all gone	31
Sums.	1613·0 / 29·647	14 / 46	1616·11 / 29·770	14 / 122	14 / 178	17 / 224			8 / 37	13 / 30·1	14 / 48	16 / 12	6·9 / 7·13		70		58			229		212			S 4 Δ 1 f 0 6 3 ... 16 10 1 10			5 / 28·4		
Means.	29·731	51·5	29·735	53·9	45·7	37·2			41·2	39·7	41·5	40·4			2·3		1·9			7·4		6·8						45·9		
Corrections for Instrumental Errors.									1·5		1·1																			
Corrections for Diurnal Range.									·227		·239																			
Corrected Means									89		91																			

NOTATION USED IN GENERAL REMARKS.

a.	denotes	aurora.
d.	,,	drizzling rain.
f.	,,	fog.
fr.	,,	frost.
h.-fr.	,,	hoar-frost.
h.	,,	haze.
hl.	,,	hail.
l.	,,	lightning.
lu. co.	,,	lunar corona.
lu. ha.	,,	lunar halo.
m.	,,	mist.
p.	,,	passing showers.
r.	,,	rain.
r.²	,,	heavy rain.
sl.	,,	sleet.
sn.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

High Clouds.	
Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.
Middle Clouds.	
Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.
Lower Clouds.	
Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0–12).

Force		Force		Force	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.
2	Light Breeze.	7	Moderate Gale.	11	Storm.
3	Gentle Breeze.	8	Fresh Gale.	12	Hurricane.
4	Moderate Breeze.				

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = —·62 = 29·669

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —·67 = 29·668

Mean at Station, corrected, and at 32°, = 29·669

Correction for height, feet above Mean Sea-level, = + ·85

Mean, reduced to 32°, and Sea-level, = 29·754

Highest Reading, corrected for Index error, on the th, =

Lowest Do. Do., on the th, =

Difference, or **Monthly Range,** =

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 20th, = 53

Lowest in Month, corrected for Index errors, on the 29th, = 26

Difference, or **Monthly Range,** = 27

Mean of all the Highest, = 45·7

Mean of all the Lowest, = 37·2

Difference, or **Mean Daily Range,** = 8·5

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 41·5

S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =

" " Mean, =

Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 41·4

Wet Bulb, Mean of A.M. and P.M. Readings, = 40·1

Computed **Temperature of Dew-Point,** =

Do. **Elastic Force of Vapour,** = ·233

Do. **Relative Humidity** (Saturation = 100), = 90

RAIN fell on 24 **Days; Amount in Inches,** = 7·13

WIND. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	2		6		7	6	8		2	2·3
P.M.	1	1	7	2	4	4	7		5	1·9
Sum.	3	1	13	2	11	10	15	0	7	2·1

Observations made and Return verified by

(Signed)

N.B.—**Rain** to be measured at 9 A.M. and the amount entered to the previous day.

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (——) should be entered on the Schedule rather than the figure 0.

Snow or **Hail** is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W. . . .	4
Cum. Str. S.W.	2

would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder, ...					Barley, . . .				
Ash, ...					Bere or Bigg, .				
Beech, ...					Oats, ...				
Birch, ...					Wheat, . . .				
Elm, ...					Beans, . . .				
Larch, ...					Pease, . . .				
Lime, ...					Potatoes, . . .				
Oak, ...					Turnips, . . .				
Sycamore or Plane,					Rye Grass, . .				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry, ...		Apple, ...			Cuckoo, ...		
Bourtree or Elder, . . .		Black Currant, . .			Curlew, ...		
Broom, ...		Cherry, ...			House-Swallow, . .		
Hazel, ...		Gean, ...			Lapwing, ...		
Hawthorn, ...		Gooseberry, . . .			Plover, ...		
Holly, ...		Peach, ...			Sand-Martin, . . .		
Laburnum, ...		Pear, ...			Starling, ...		
Lilac, ...		Plum, ...			Swan, ...		
Mezereon, ...		Strawberry, . . .			Rail or Corn Crake, .		
Mountain Ash or Rowan, .							
Red Flowering Currant, .							
Rhododendron Ponticum, .							
Whin, ...							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

ADDITIONAL REMARKS.

Snow melted & put in as rain

The Snow storm we had on Dec. 25/29 said to be the worst for 50 years. a great many of the Roads were blocked. Milk Carts were unable to get to town. we were thankful to see it disappear as quick as it came.

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