SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn Hydro, County of Bute, During the MONTH of January 1906.

Lat. 55°49'50" N, Long. 5°4'5" W, Distance from Sea 132 ~~miles~~ 3rds. 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	29·854	50	29·734	56	39	34	7	7	36	35	38	33	—	ESE	3	E.	2·5	7	7	10	7	9	1	7	7	7	7	45	Dry. Almost F. Point	Dry Cold	1
2	29·472	53	29·512	61	46	36			43	40	43	41	·48	S.E.	3	S.E.	2·5			10		10						44·5	Dull, fine	Dull & damp	2
3	29·394	55	29·468	62	44	41			43	42	42	41	·45	S.E.	1	S.E.	1			10		10						44·3	" & wet	do	3
4	29·514	58	29·558	64	48	41			45	44	43	43	·28	SSE.	·5	NW.	·5			10		10						43·6	" & damp	do	4
5	29·672	56	29·634	60	45	38			40	40	43	42	·04	NW.	·5	—	—			3		10						43·5	Raw	do	5
6	29·316	56	29·566	60	44	38			40	40	41	40	—	—	—	NW.	·5			5		5						43·5	do	Dry fine	6
7	29·500	55	29·224	61	43	35			37	36	41	40	·05	—	—	S.	·5			5		10						43·5	very thick fog	Dull & Wet	7
8	29·292	55	29·458	60	42	37			39	38	40	39	·28	E.	1	NW.	1			10		6						43·5	Raw. Fog	" & damp	8
9	28·962	53	28·910	61	46	38			44	42	44	42	·38	W.	1	W.	4			8		10						43·5	Dull & damp	Wet Squally	9
10	29·280	48	29·730	57	44	38			41	38	39	37	·12	W.	3	W.	3			1		10						43·5	Damp Strong Breeze	Strong Breeze	10
11	29·768	49	29·342	56	46	38			42	39	41	40	·41	WSW.	1·5	WSW.	1			10		10						43·5	Dull, fine	Wet Squally earlier	11
12	29·500	50	29·434	55	43	38			39	38	42	38	·09	WSW.	3	W.	2·5			5		—						43·5	" wet Squally	damp	12
13	29·378	49	29·500	56	43	37			39	37	38	36	·14	WSW.	3	W.	3·5			10		10						43·5	Dull. Showery	Showery & Squally	13
14	29·662	52	29·454	59	50	37			42	40	49	46	·42	SW.	2	W.	4			8		10						43·5	fine	Mild. Strong Wind	14
15	29·342	52	29·346	58	50	39			40	39	41	38	·02	WSW.	2	W.	·5			10		8						43·5	Dull & Showery	fine	15
16	29·372	51	29·266	54	42	34			39	36	36	34	·15	WSW.	1·5	WSW.	3·5			10		10						43·2	Dry, fine.	Showers of Snow melting	16
17	29·496	49	29·694	55	45	35			41	39	40	38	·35	W.	2·5	NW.	3			8		10						43·2	Dull. Raw	Showery, Strong wind.	17
18	29·430	48	29·642	55	41	38			40	39	40	37	—	N.	1	NW.	4			8		—						43·2	do	very Cold	18
19	30·208	49	30·508	57	42	33			39	36	35	32	·02	N.	3·5	W.	·5			—		—						43	Dry Cold	fine	19
20	30·306	49	30·046	57	48	33			42	40	44	42	·17	WSW.	2	W.	2			10		8						43	Dull & damp	do	20
21	30·264	53	30·532	58	48	32			46	41	32	31	—	N.	2	SE.	·5			—		—						43	fine	do	21
22	30·568	52	30·568	56	41	28			35	34	40	39	·04	—	—	W.	·5			10		2						42·7	Foggy, Raw.	damp. Mild	22
23	30·450	55	30·390	61	44	37			40	39	43	41	·02	—	—	W.	1·5			10		—						42·7	Dull & damp	Dull & damp	23
24	30·036	56	29·582	59	50	43			46	42	46	44	·25	SW.	1	W.	3			10		10						42·5	fine	" & Wet	24
25	29·572	52	29·612	59	47	39			42	39	46	46	·06	W.	2	NW.	2			4		10						42·5	Raw	do do	25
26	29·788	53	29·770	60	50	46			49	46	49	47	·11	W.	3	W.	4·5			10		10						42·5	Dull & damp	Wet & Stormy	26
27	29·834	56	29·838	59	50	46			46	46	50	46	·15	W.	1	W.	2.			10		10						42·5	" & wet	Dry & fine	27
28	29·722	58	29·830	60	52	42			48	47	43	42	·57	WSW.	2·5	E.	1.			10		10						42·5	very wet	very wet	28
29	29·898	52	30·096	59	44	38			40	38	42	40	·13	NW.	2	W.	2			1		—						42·5	Raw	damp	29
30	30·160	53	30·324	60	47	40			43	41	43	41	·02	W.	2·5	W.	1			8		2						42·5	do	do	30
31	30·234	56	30·120	59	49	42			45	43	44	41	·07	WSW.	1	NW.	3			10		—						43·2	Dull & damp	Showery. Strong Breeze	31
Sums.	15 16 11	15	15 13 11	14	12	16			13	15	10	11	12 5·27		4		7														
	22·244	8·2	22·688	26·4	17·3	23·9			5·0	30·2	5·7	30·5			52·0		61·0			234		210									
Means.	29·718	52·6	29·732	58·5	45·6	37·7			41·6	39·7	41·8	39·8			1·68		1·97			7·5		6·8									
Corrections for Instrumental Errors.																															
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. = 29·718 − ·064 = 29·654

Corrected Mean at 9 P.M., *minus* Correction for Temp. = 29·732 − ·080 = 29·652

Mean at Station, corrected, and at 32°, = 29·653

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

Mean, reduced to 32°, and Sea-level, = 29·738

Highest Reading, corrected for Index error, on the 22nd th, = 30·568

Lowest Do. Do., on the 9 th, = 28·910

Difference, or **Monthly Range,** = 1·658

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 28 th, = 52·0

Lowest in Month, corrected for Index errors, on the 22nd th, = 28·0

Difference, or **Monthly Range,** = 24·2

Mean of all the Highest, = 45·6

Mean of all the Lowest, = 37·7

Difference, or **Mean Daily Range,** = 7·9

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 41·6

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, = 41·7

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

Computed **Temperature of Dew-Point,** = 37·2

Do. **Elastic Force of Vapour,** = 223

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

RAIN fell on 27 **Days; Amount in Inches,** = 5·27

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	3	0	2	2	1	2	15	2	4	1·7
P.M.	0	0	2	3	1	0	17	7	1	2·0
Sum.	3	0	4	5	2	2	32	9	5	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.

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

BOOK POST.

Received January 1906

SCOTTISH METEOROLOGICAL SOCIETY.

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

Lat. 55°49'50"N, Long. 5°4'51"W, Distance from Sea 132 ~~miles.~~ yds 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.	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	30·300	50	29·956	56	47	41	†	†	44	41	43	41	·31	W.	3	N.W.	3·5	†	†	9	†	8	†	†	†	†	†	43·2	Some Snow. Strong breeze – do	1
2	29·756	50	29·834	51	45	36			43	38	36	34	·48	N.W.	6	N.W.	4			10		5						43·5	Snowing very Stormy – very Stormy. Sl. & ha.	2
3	29·796	48	30·082	55	42	35			36	33	38	35	–	N.	3	N.N.W.	3			—		—						43·5	Frosty Air dry – Dry. Cold	3
4	30·210	50	30·328	52	40	28			36	32	28	26	–	N.	1·5	N.	·5			5		—						43·5	Dry & Freezing – " Freezing	4
5	30·250	47	30·180	56	39	34			31	30	37	36	·08	S.	·5	–	–			10		10						43·5	Slight covering of Sn. Foggy – Foggy	5
6	30·046	52	30·210	57	45	37			43	42	39	37	·03	W.	2	N.W.	1			9		8						43·5	Showery – Dull fine	6
7	30·232	51	30·006	57	47	37			42	39	43	42	·37	W.	1·5	W.	3			7		10						43	hazy – Squally & Wet	7
8	29·460	51	29·522	50	46	31			39	36	35	34	·22	W.	9	N.W.	7			9		10						43	Gale. Ha & Sn. See other page – P.T.O.	8
9	29·734	45	29·522	52	39	29			36	32	32	31	·56	N.W.	5	S.W.	·5			4		10						42·8	Freez. ¼ inch Sn on ground – Same 9 p.m.	9
10	28·706	51	28·468	57	45	32			38	37	38	37	·08	E.	1	N.W.	·5			10		10						42·5	thawing Showery – Dull & Wet	10
11	28·980	49	29·258	51	40	34			37	34	35	35	–	W.N.W.	3·5	N.W.	4			6		4						42·5	Squally very Stormy Earlier – Cold Squally	11
12	29·390	47	29·[illegible]20	55	44	29			38	35	29	28	·11	N.W.	1·5	S.E.	·5			3		—						42	Dry & Cold – Freezing	12
13	29·232	50	29·280	57	38	28			35	34	33	32	·39	S.	·5	N.E.	·5			10		10						42	very wintery Sn. & Sl. ground slightly covered – Sn. thawing	13
14	29·410	51	29·464	55	42	33			36	35	35	34	·10	W.S.W.	1	S.E.	·5			4		—						42	ground covered with Sn. – Dry Freezing	14
15	29·438	52	29·170	56	43	34			36	35	41	39	·40	S.W.	·5	S.W.	4			9		10						42	Dull & Raw – very wet & Stormy	15
16	29·274	50	29·400	53	43	34			37	35	37	35	·29	S.W.	3	W.	3			10		1						41·5	Showery Strong breeze – Showery Rn & Sl. Squally	16
17	29·604	48	29·826	54	46	35			39	37	36	35	·01	W.	1	S.	·5			5		—						41·5	Showery – Dry Frosty	17
18	29·858	51	29·720	56	45	31			38	37	38	35	–	S.	·5	S.	·5			10		—						41	Dull & damp – fine	18
19	29·626	51	29·788	55	40	36			39	37	38	36	·35	S.E.	·5	W.	3			10		2						41	do – damp. Rn Earlier	19
20	29·962	48	30·154	56	44	31			36	34	31	30	–	W.	1	S.E.	·5			—		—						41	Freezing – Cold Freezing	20
21	30·192	49	30·182	53	44	29			34	33	31	31	–	–	–	–	–			—		–						41	Bright Freezing – do	21
22	30·042	48	29·854	55	44	29			35	32	36	34	–	N.E.	2	E.	1			5		–						41	do – Raw. hazy	22
23	29·760	47	29·688	54	41	29			35	32	29	27	–	N.E.	·5	–	–			1		–						41	do Bright Freezing	23
24	29·554	47	29·328	56	39	25			31	30	38	37	·60	W.N.W.	·5	S	1			9		10						41	do – very Wet Sn earlier	24
25	28·966	50	29·132	53	45	35			37	35	38	35	·40	W.	3	W.	3			10		1						41	Ra & Ha Stormy – Showery	25
26	29·160	48	29·168	55	43	31			38	36	32	31	·15	W.	2	N.W.	·5			8		2						40·5	very wet Rn & Sl. – Raw Freezing.	26
27	29·278	50	29·700	55	43	30			36	35	31	28	·09	N.E.	·5	–	–			9		–						40·5	Raw – Cold "	27
28	29·498	48	29·570	53	46	28			38	37	40	35	·28	W.	1	W.N.W.	7			10		–						40·5	very Wet. Cold – Showery & very Stormy	28
29																															29
30																															30
31																															31
Sums.	13 m 9 / 17414	10 / 259	12 13 10 / 18310	12 / 125	12 / 85	14 / 61			16 / 203	12 / 143	14 / 157	13 / 110	5·30		6 / 550		5 / 525			10 / 192		3 / 111						7 / 550					
Means.	29·622	49·3	29·654	54·5	43·0	32·2			37·3	35·1	35·6	33·9			2·0		1·9			7·7		6·7						42·0		
Corrections for Instrumental Errors.																															
Corrections for Diurnal Range.																															
Corrected Means																															

S 8
A 2
t –
l 5
o 9,1
f
g 3

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. = 54 = 29·568

Corrected Mean at 9 P.M., *minus* Correction for Temp. = 56 = 29·586

Mean at Station, corrected, and at 32°, = 29·577

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

Mean, reduced to 32°, and Sea-level, = 29·662

Highest Reading, corrected for Index error, on the 4 th, = 30·328

Lowest Do. Do., on the 18 th, = 29·468

Difference, or **Monthly Range,** = 1·860

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 1 th, 7th = 47·0

Lowest in Month, corrected for Index errors, on the 24 th, = 25·0

Difference, or **Monthly Range,** = 22·0

Mean of all the Highest, = 43·0

Mean of all the Lowest, = 32·2

Difference, or **Mean Daily Range,** = 10·8

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 37·6

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, = 36·5

Wet Bulb, Mean of A.M. and P.M. Readings, = 34·5

Computed **Temperature of Dew-Point,** = 31·6

Do. **Elastic Force of Vapour,** = ·179

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

RAIN fell on 20 Days; Amount in Inches, = 5·30 ✓

WIND. SUMMARY.

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

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 entered 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.

On Feb 8th the most violent Storm of the Winter broke over here early that morning from the West & veering Round to N.W. about 9 A.M. the Gale attained its height about 10 A.M. when the velocity of the wind was about 35 Miles an hour & at times reaching about 50 Miles and maintained its fierceness the whole day there was bitter Showers of Snow & hail at short intervals,

Rothesay
Feby 1906

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 March 1906.

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 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.	Attached Thermometer	9 P.M. Barometer. No.	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	29·582	51	29·636	56	42	37	†	†	40	39	39	36	·03	W.	2	NW	·5	†	†	10	†	10	†	†	†	†	†	40·5	Dull & showery	Dull & damp	1
2	29·900	49	30·210	54	45	29			33	30	29	27	–	N.	·5	N.	·5			–		–						40·5	Freezing Slight fall Sn	Freezing. Sn. melted	2
3	30·210	50	30·258	55	46	28			40	38	45	44	·02	W.	·5	W.	2			10		10						40·5	fine	Dull & damp	3
4	30·166	55	30·030	57	49	42			45	43	44	43	–	S.S.W.	1	S.W.	1			9		10						40·5	do	fine	4
5	29·826	55	29·836	58	49	42			44	42	48	46	·13	S.W.	1·5	W.	1			10		8						40·5	do	Dull & damp	5
6	29·896	56	30·020	60	52	46			51	49	47	45	–	W.	3	W.	1·5			10		–						40·5	Dull. Mild	fine	6
7	29·874	54	29·736	59	52	43			48	46	44	42	·20	S.W.	3·5	W.N.W.	3			10		2						40·6	" Squally	Showery	7
8	29·612	51	29·426	54	52	34			43	41	37	35	·59	W.	2	N.W.	5			10		5						41	wet	Sq. Rn. Sn. & Hail	8
9	29·562	47	29·850	52	44	34			38	36	34	33	·14	W.	4	N.W.	·5			5		–						41	Squally Rn. & Sn	damp Squally earlier	9
10	29·886	48	29·678	53	44	30			36	33	38	36	·26	N.N.E.	1	S.W.	·5			8		1						41·5	Raw Foggy	fine	10
11	29·010	50	29·024	51	40	33			35	34	37	32	·35	E.	3	N.W.	4			10		–						41·5	Dull & wet-Stormy	Stormy from early morning to 3 p.m. Rn & Sn. Very windy	11
12	29·650	42	29·820	50	38	29			32	32	29	28	–	N.	4	N.W.	1			–		10						41·5	Frosty Sn & hail	Freezing very cold	12
13	29·776	40	29·794	48	38	26			30	32	28	26	–	N.	1	N.	·5			–		–						41·5	Freezing very hard	Freezing hard	13
14	29·920	42	29·612	52	38	20			30	32	36	35	·66	–	–	S.S.E.	1			–		10						41·5	do	5 See over	14
15	29·300	49	29·512	55	52	35			40	39	39	37	·28	S.	2	W.	3			10		–						41	very Wet Sn. all away	Showery	15
16	29·594	51	29·680	59	52	38			42	41	51	50	1·20	S.W.	1·5	W.	2			10		10						41	Showery	very wet	16
17	29·600	55	29·780	58	52	43			46	45	43	42	·02	W.	3	W.	2			9		–						40·5	Dull & wet-Squally	Showery	17
18	29·912	52	30·096	56	46	37			44	39	40	36	·07	N.W.	2·5	–	–			5		–						40·5	Cold & Showery Rn & Sn.	Dry fine	18
19	30·346	48	30·462	56	43	33			40	35	33	30	–	N.	2	S	·5			–		–						41	Dry fine	Freezing Bright	19
20	30·322	54	30·322	59	53	29			44	41	44	42	–	N.W.	3	N.	2			8		–						41	do	fine	20
21	30·336	52	30·340	57	52	33			43	40	37	36	–	N.E.	·5	N.E.	·5			–		–						41	"	"	21
22	30·312	49	29·992	52	46	29			39	37	40	38	·04	–	–	N.W.	2			10		–						41	"	Dry Cold	22
23	30·132	49	30·138	54	52	37			40	37	41	36	–	E.	1	N.E.	1			4		–						41·2	Dry Cold	"	23
24	30·034	47	29·970	48	43	36			39	33	37	32	–	N.N.E.	3	E.	2			2		–						41	"	"	24
25	29·938	47	29·952	47	45	35			39	33	36	32	–	N.E.	2·5	E.	2·5			2		–						41	"	"	25
26	30·020	45	30·120	47	46	35			39	34	38	34	–	N.E.	2	E.	1			8		–						41·5	"	" Hazy	26
27	30·156	47	30·224	50	49	30			39	35	30	28	–	–	–	S.	·5			8		–						41·5	fine	Freezing	27
28	30·166	45	30·132	54	50	26			40	37	43	41	–	N.W.	1	N.W.	1·5			–		–						41·5	Dry Cold	dry Cold	28
29	30·196	49	30·246	56	51	32			44	39	43	40	·05	N.	1	N.W.	·5			4		4						41·5	"	fine	29
30	30·200	52	30·250	55	52	31			45	42	43	41	–	N.W.	1·5	N.	1			8		5						41·5	Slight Showers	Cold	30
31	30·322	55	30·370	62	57	38			46	43	45	42	–	N.N.W.	·5	N.	1			9		10						41·5	Dull fine	Dry fine	31
Sums.	14129	14	14148	15	12	15			12	13	15	12	3 6		5		6			8		95						3 10			
	28646	296	29416	124	224	120			14242	28824			4·04		540		450			189								323			
Means.	29.924	496	29.949	54·0	47.2	33·9			40·5	37·8	39·3	36·9			1·8		1·5			6·1		3.2						41·0			
Corrections for Instrumental Errors.																																
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. = ...—.56. } = 29.868

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ...—.66. } = 29.881

Mean at Station, corrected, and at 32°, ... = .875

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

Mean, reduced to 32°, and Sea-level, ... = 29.960

Highest Reading, corrected for Index error, on the 19 th, ... = 30.462

Lowest Do. Do., on the 11 th, ... = 29.010

Difference, or **Monthly Range,** ..... = 1.452

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 20 th, ... = 53.0

Lowest in Month, corrected for Index errors, on the 14 th, ... = 20.0

Difference, or **Monthly Range,** ..... = 33.0

Mean of all the Highest, ... = 47.2

Mean of all the Lowest, ... = 33.9

Difference, or **Mean Daily Range,** ..... = 13.3

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), ... = 40.6

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, ... = 39.9

Wet Bulb, Mean of A.M. and P.M. Readings, ... = 37.4

Computed **Temperature of Dew-Point,** ..... = 34.1

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

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

RAIN fell on 15 **Days; Amount in Inches,** ..... = 4.04

WIND. Direction.	SUMMARY. N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	7	4	1	–	2	4	6	4	3	1·8
P.M.	4	2	3	–	3	2	8	8	1	1·5
Sum.	11	6	4	0	5	6	14	12	4	1·6

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,	24th			
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,	30th	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,	7th						
Rhododendron Ponticum,							
Whin,	24th						

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

ADDITIONAL REMARKS.

March 14th Exposed Thermometer three feet from ground
14 Degrees Frost at 7 A.M. Snowing from 4 to
7 P.M. 1/2 inch. Rain after
Crocus in full Bloom Mar 12th
Flowering Currant in full bloom Mar 24th
Primrose & Daffodil in bloom Mar 30th
Thorn or Quick breaking into Leaf Mar 30th

Rotherham March 1906

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 April 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 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	30·420	51	30·496	54	60	39	7	7	46	43	42	39	–	–	–	S.E.	·5	1	4	10	4	5	4	4	4	4	4	4	41·5	Dry fine – Dry Cold	1
2	30·522	50	30·470	52	63	31			41	39	33	32	–	–	–	–	–			10		–							41·5	" Hazy – Foggy freezing	2
3	30·424	51	30·242	53	56	32			43	39	41	37	–	S	1	S.W.	·5			–		–							41·5	Hazy fine – Dry fine	3
4	29·862	51	29·780	55	57	32			46	42	47	43	–	S.W.	1	S.	1·5			5		6							42	do – Dull "	4
5	29·794	52	30·126	59	57	41			44	40	43	41	–	S.	·5	–	–			10		–							42	Dull fine – Dry fine	5
6	30·374	51	30·438	53	58	31			49	44	38	36	–	–	–	–	–			–		–							42	fine do	6
7	30·344	50	30·388	53	58	31			46	43	47	46	·10	–	–	–	–			–		10							42·2	Dry Hazy – Dull & Wet	7
8	30·594	54	30·704	60	58	39			48	46	40	38	–	S.	·5	–	–			9		–							42·5	fine – Dry Hazy	8
9	30·694	53	30·596	57	59	33			46	44	43	41	–	–	–	W.	·5			–		–							42·5	" Foggy – " fine	9
10	30·488	54	30·378	55	60	34			47	45	40	38	–	–	–	–	–			–		–							42·5	" Hazy – do	10
11	30·330	52	30·212	60	63	33			50	44	40	37	–	–	–	–	–			–		–							43	Dry fine – do	11
12	30·064	54	29·964	56	63	39			50	42	42	40	–	E.	1	S.	·5			–		–							43	" Hazy – " Hazy	12
13	29·942	55	30·224	53	57	38			51	48	40	37	·03	S.W.	·5	W.	1			–		–							43	fine – Dry Cold. Rn Earlier	13
14	30·452	50	30·478	53	55	34			48	42	44	41	–	W.	1	W.	1			–		–							44	do Dry fine	14
15	30·412	52	30·330	57	54	43			48	44	49	46	·09	W.	1·5	W.	1·5			9		10							44	do " Cold	15
16	30·114	55	30·000	53	51	41			49	48	42	40	·12	W.	2	S.W.	1·5			10		1							44	Dull & wet - fine, Rn Earlier	16
17	29·946	52	29·902	52	48	33			44	41	38	37	·35	N.E.	·5	–	–			3		10							44	Dry fine – Dull & wet	17
18	29·990	50	29·988	50	48	35			39	36	38	35	–	E.	1	E.	·5			8		–							44	Dull & damp - Dry Cold Showers Rn Earlier	18
19	29·924	48	29·774	49	49	32			41	36	42	38	·22	E.	·5	S.W.	1			–		10							44	Dry Hazy – Dull & wet	19
20	29·682	52	29·682	57	54	31			49	47	49	47	·41	W.	3	W.	3			10		10							44	Dull & damp - Dull Raining	20
21	29·522	54	29·588	57	51	39			47	46	40	38	·16	W.	3·5	W.	1			3		–							44	Showery – Showery Rn. & ha	21
22	29·700	51	30·036	62	50	39			47	41	40	36	–	N.	2	N.	2			3		–							44	do – Dry Cold	22
23	30·130	51	30·018	52	50	37			42	36	41	39	·10	N.N.W.	3	N.	1			5		9							44·5	Dry Cold – Dull & damp Rn Earlier	23
24	29·990	48	29·838	52	48	35			40	36	39	36	–	N.	1	E.	1			5		–							44·5	do - Dry Cold	24
25	30·080	48	29·728	51	48	35			43	36	39	36	·14	N.E.	·5	N.E.	1			–		10							44·5	" fine - Dull & wet	25
26	29·580	49	29·804	53	57	38			43	38	44	41	–	N.	2	–	–			–		–							44·5	Dry Cold - fine	26
27	29·666	51	29·360	56	49	37			47	43	41	39	·55	W.	1	N.W.	2			10		1							44·5	Dull fine – Showery very Wet Earlier	27
28	29·220	51	29·188	52	44	34			41	37	35	33	·13	W.	1	W.	1			9		10							44·5	fine - Showery Rn Ha & Snow	28
29	29·108	49	29·430	54	50	34			39	37	37	35	·06	S.E.	1·5	–	–			10		3							44·5	Cold Hills in distance Coated with Sn – Dry fine	29
30	29·564	50	29·654	52	49	31			38	37	42	39	–	N.E.	1	N.E.	·5			10		8							44·5	Foggy & wet – Dry fine	30
31																															31
Sums.	16 15·9	8	14 15·13	11	14	13			15	14	11	16	2·46		4		4			5		3			6	11			10	7		
	1032	39	0816	112	95	161			152	39	36	260			305		223			139		105			0	2			10	12		
Means.	30·034	51·3	30·027	53·7	53·2	35·4			45·1	41·3	41·2	38·7			1·0		0·8			4·6		3·5							43·4		
Corrections for Instrumental Errors.																															
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. = ·61 = 29·973
Corrected Mean at 9 P.M., *minus* Correction for Temp. = ·67 = 29·960
Mean at Station, corrected, and at 32°, = 29·966
Correction for height, feet above Mean Sea-level, = + ·084
Mean, reduced to 32°, and Sea-level, = 30·050
Highest Reading, corrected for Index error, on the 8 th, = 30·704
Lowest Do. Do., on the 29 th, = 29·108
Difference, or **Monthly Range,** = 1·596

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 11 th, 12 = 63·0
Lowest in Month, corrected for Index errors, on the 2 th, 30 = 31·0
Difference, or **Monthly Range,** = 32·0
Mean of all the Highest, = 53·2
Mean of all the Lowest, = 35·4
Difference, or **Mean Daily Range,** = 17·8
Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 44·3
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, = 43·2
Wet Bulb, Mean of A.M. and P.M. Readings, = 40·0
Computed **Temperature of Dew-Point,** = 36·2
Do. **Elastic Force of Vapour,** = ·213
Do. **Relative Humidity** (Saturation = 100), = 77
RAIN fell on 13 **Days; Amount in Inches,** = 2·46

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	4	3	3	1	3	2	7	–	7	1·0
P.M.	2	2	2	1	2	3	7	1	10	0·8
Sum.	6	5	5	2	5	5	14	1	17	0·9

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.

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.

Rothesay
April 1906

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

BOOK POST.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn Hydro, County of Bute, During the MONTH of May 1906.

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 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	29·622	49	29·560	53	52	30	7	7	44	40	35	33	·05	N.	1	W.N.W.	1	7	7	—	7	—	1	7	7	7	7	45	Dry Cold	Dry Cold	1
2	29·520	50	29·328	51	47	30			44	41	46	45	·73	S.E.	1·5	S	·5			—		—						45·5	"	very Wet	2
3	29·466	52	29·512	56	55	38			48	47	48	46	·13	S.	1·5	S	1			10		10						45·5	Showery & Hazy	Slight Showers	3
4	29·644	55	29·582	57	50	41			47	46	42	40	—	W.	2	N.W.	1			10		—						45·5	Dull Showery	Dry Cold	4
5	29·956	52	29·774	57	48	34			47	45	47	47	·60	S.	1·5	S.E.	·5			10		10						45	Showery Cold	Damp. Rn Earlier	5
6	29·734	57	29·778	60	56	46			52	51	53	52	·27	S	1	W.	1			10		—						45	Dull & damp. Rn. Earlier	Showery	6
7	29·962	58	30·068	61	58	47			52	50	50	48	·01	S.W.	2	—	—			9		10						45	Dry fine	Dry fine	7
8	30·082	57	29·982	59	59	46			50	49	48	46	·04	—	—	W.	·5			10		10						46	Hazy fine	Dull & wet	8
9	29·884	57	29·872	55	52	41			47	43	46	40	—	N.	2·5	N.	2·5			9		9						46	Dry Breezy	Dry Cold	9
10	29·736	56	29·650	56	52	37			50	42	41	38	·01	N.W.	2	N.W.	·5			—		1						45	fine	fine	10
11	29·556	53	29·678	57	47	36			45	42	46	45	·50	S.E.	·5	E.	·5			10		10						45	Dull Raw & Wet	Dull & wet	11
12	29·848	54	30·014	58	58	45			50	49	53	51	—	S.E.	·5	E.S.E.	1			10		—						45·5	Hazy damp	70993	12
13	30·124	58	30·114	62	64	51			57	53	52	48	·01	N.E.	·5	N.W.	·5			3		—						46	Hazy fine	Dry very Mild	13
14	30·140	58	30·088	60	61	46			53	47	47	44	—	N.E.	1	E.	·5			5		—						46	Dry fine	Hazy	14
15	29·778	57	29·586	56	57	39			47	45	46	43	·09	W.	2	N.W.	3·5			10		10						46	Slight Showers Cold	Showery & Squally	15
16	29·606	53	29·650	53	52	42			46	41	42	39	—	N.	3	N.	3			8		9						46	Squally & Cold	Squally & Cold	16
17	29·516	50	29·520	53	51	40			42	38	45	40	·20	N.W.	3·5	N.	2			9		5						46	do do	Cold Squally Earlier	17
18	29·646	53	29·800	58	55	41			45	42	48	45	·35	N.E.	3·5	N.E.	·5			8		10						46	Showery Squally Cold	Hazy dry Rn. Earlier	18
19	29·778	55	29·864	58	50	43			46	45	46	46	·14	—	—	E.	·5			10		5						46	Dull & very Wet	Dry Mild	19
20	29·922	53	30·024	60	59	41			47	45	45	41	—	E.N.E.	1	S.S.E.	·5			1		—						46·5	Dry fine	Dry fine	20
21	30·000	55	29·926	55	49	37			44	40	44	41	—	E.	·5	N.N.E.	·5			10		10						46·5	do do	do do	21
22	29·926	54	29·828	57	51	40			48	43	44	41	·06	E.	1·5	E.	2			—		10	t	1				47	do do	Dull & Wet	22
23	29·854	54	29·790	55	47	40			45	42	46	44	·16	E.	2·5	N.E.	4			8		10	h	5				47	Dry & Cold	Cold & Stormy	23
24	29·700	54	29·674	54	51	44			47	46	47	47	·41	N.E.	4	E.	3			10		10	o	17				47	Wet Cold & Stormy	Dull & Wet Thunder & Lightning Earlier at a distance	24
25	29·782	54	29·800	60	66	46			53	50	47	46	—	S.S.E.	1	S.E.	·5			5		9	f	2				47	fine Mild	fine	25
26	29·820	57	29·794	58	60	40			50	48	48	47	·19	S.S.E.	·5	S.S.W.	·5			10		9	g	0				47	fine	fine	26
27	29·764	58	29·766	60	65	41			52	51	52	50	·69	—	—	—	—			9		8						47	Showery	fine	27
28	29·846	60	29·868	63	57	47			51	50	53	52	·53	—	—	—	—			10		10						47	Hazy Showery	wet	28
29	29·868	61	29·832	61	54	50			52	52	51	51	·20	—	—	W.S.W.	1			10		10						47	damp very wet Earlier	Dull & Wet	29
30	29·858	59	29·716	60	58	48			51	50	51	50	·12	W.	2	S.S.W.	1			10		10						47	Dull & wet	Dull & wet	30
31	29·570	60	29·488	58	57	46			50	48	46	45	·18	W.	2	W.	1·5			4		10						48	Showery	do do	31
Sums.	20 14 13	14	19 16 12	13	13	11			12	11	14	11	6		6		8			7		5						13				
	24·508	163	24·426	231	136	52			262	181	215	149	5·67		44·5		35·0			228		205						184·5				
Means.	29·791	55·3	29·788	57·4	54·4	41·7			48·5	45·8	46·9	44·8			1·4		1·1			7·4		6·6						46·0				
Corrections for Instrumental Errors.																																
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. = ...—.... = 29·719

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ...—.... = 29·711

Mean at Station, corrected, and at 32°, = 29·715

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

Mean, reduced to 32°, and Sea-level, = 29·798

Highest Reading, corrected for Index error, on the 14 th, = 30·140

Lowest Do. Do., on the 2 th, = 29·328

Difference, or **Monthly Range,** = 1·812

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 27 th, = 65·0

Lowest in Month, corrected for Index errors, on the 1st 2nd = 30·0

Difference, or **Monthly Range,** = 35·0

Mean of all the Highest, = 54·4

Mean of all the Lowest, = 41·7

Difference, or **Mean Daily Range,** = 12·7

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 48·0

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, = 47·7

Wet Bulb, Mean of A.M. and P.M. Readings, = 45·3

Computed **Temperature of Dew-Point,** = 42·6

Do. **Elastic Force of Vapour,** = ·274

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

RAIN fell on 23 Days; Amount in Inches, = 5·67

WIND. SUMMARY.

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

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 forner 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.

Rothesay
May 1906

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 June 1906.

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 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	29·456	57	29·800	59	58	43	7	7	49	46	51	48	—	W	·5	N.E.	1	7	7	8	7	4	7	7	7	7	7	48	Dull & Showery - Dry Cold	1
2	29·994	57	30·154	62	63	47			57	51	49	46	—	N.W.	2	W.	1			—		—						48	Dry fine - fine	2
3	30·222	58	30·300	62	61	42			56	51	51	50	—	N.W	1·5	W.	1			1		—						48	" " - " "	3
4	30·366	57	30·388	64	66	37			56	50	49	47	—	N	·5	—	—			—		—						48·5	" " - " "	4
5	30·372	62	30·316	64	68	44			56	57	54	52	—	E	1	S.W.	·5			—		6						48·5	Fine Hazy - fine Hazy	5
6	30·292	64	30·262	66	68	47			57	54	51	50	·01	S.W.	·5	S.W.	·5			4		3						48·5	" " - fine	6
7	30·266	64	30·266	63	68	48			56	54	54	51	~~·01~~	—	—	N.W.	·5			10		—						48·5	" " "	7
8	30·278	64	30·286	69	71	49			62	57	54	52	—	E.	·5	W.	·5			1		—						49	" " "	8
9	30·298	67	30·320	68	70	45			61	56	58	55	—	W.	·5	—	—			—		9						49·5	" " "	9
10	30·334	67	30·334	71	74	48			65	60	61	58	—	—	—	N	·5			—		—						49·5	" " "	10
11	30·342	71	30·294	73	76	56			70	62	61	58	—	—	—	S.W.	·5			—		—						50	" " "	11
12	30·242	70	30·222	66	73	51			67	62	56	57	—	—	—	N	1			—		—						51	" " "	12
13	30·244	68	30·208	67	71	53			60	50	59	54	—	N.E.	·5	N	·5			2		7						51	" " "	13
14	30·196	67	30·160	68	71	56			60	54	56	51	—	N	·5	W.N.W.	·5			3		8						51·5	" " "	14
15	30·158	67	30·216	65	60	50			60	53	52	49	·01	—	—	N.E.	1			10		—						51·5	Dull Slight Showers - Dry Cold	15
16	30·216	65	30·150	66	71	46			63	59	57	53	~~·01~~	E.	·5	E.	1			—		9						52	fine - Dull fine	16
17	30·136	64	30·100	66	62	53			58	55	53	54	·19	N.E.	1	E.	1·5			9		10						52	Dull fine - Dull & Wet	17
18	30·144	65	30·196	66	67	51			61	57	62	50	~~·19~~	N.E.	1	—	—			—		—						52·5	Hazy fine - Hazy fine	18
19	30·240	66	30·250	65	67	44			63	57	57	63	—	S	1	S	1			—		9						52·5	" " fine.	19
20	30·234	64	30·206	66	60	53			56	55	59	58	·40	S	1	W.	·5			10		10						52·5	Dull Slight Showers - Dull & Wet	20
21	30·252	65	30·168	67	66	56			62	59	60	59	~~·40~~ ·10	W.	1	—	—			3		10						52·5	Dry fine - " "	21
22	30·140	66	30·138	69	68	50			62	60	61	59	~~·10~~	W.	1	—	—			10		8						52·5	" " fine	22
23	29·988	67	29·806	70	68	53			63	60	62	60	·31	E.	·5	—	—			10		6						53	" " Dull & Wet	23
24	29·808	69	29·882	66	67	51			61	59	52	49	·09	S.W.	·5	W.	·5			10		10						53	fine Rn. Earlier - fine Very Wet Earlier	24
25	29·842	64	29·792	65	62	44			55	53	55	54	~~·09~~	S.W.	1	—	—			10		10						53	Showery - Dull & Wet	25
26	29·748	63	29·704	65	64	44			62	56	55	52	·01	W.S.W.	1	W.	2			3		8						53	Dry fine - Dry Cold	26
27	29·716	64	29·810	64	62	51			55	52	54	51	·04	W.	·5	W.	1·5			8		8						53	Showery - Dry fine	27
28	29·866	63	29·960	62	62	50			55	52	54	50	·03	N.W.	·5	N.E.	·5			8		9						53	Dull fine - " "	28
29	30·112	59	30·100	62	58	47			53	48	49	44	—	—	—	N.W.	2			5		1						53·5	" " Dry Cold	29
30	30·084	59	30·078	63	59	45			53	48	49	48	·05	W.	2	W.	1			8		3						53·5	Dry Cold " "	30
31																															31
Sums.	N 15	16	10 12 10	14	13	11			11	12	13	12	1·87		6		6			6		9						157		
	3966	143	3836	169	1819	95			274	147	147	66			20·5		20·5			133		147						325		
Means.	30·120	64·8	30·128	65·3	66·0	48·3			59·1	54·9	54·9	52·2			0·7		0·7			4·4		4·9						51·1		
Corrections for Instrumental Errors.																															
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. = ...—.98.. = 30·022

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ...—.99.. = 30·029

Mean at Station, corrected, and at 32°, ... = 30·026

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

Mean, reduced to 32°, and Sea-level, ... = 30·108

Highest Reading, corrected for Index error, on the 4 th, ... = ~~30·384~~

Lowest Do. Do., on the 1 th, ... = 29·456

Difference, or **Monthly Range,** ..... = 0·932

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 11 th, ... = 76·0

Lowest in Month, corrected for Index errors, on the 4 th, ... = 37·0

Difference, or **Monthly Range,** ..... = 39·0

Mean of all the Highest, ... = 66·0

Mean of all the Lowest, ... = 48·3

Difference, or **Mean Daily Range,** ..... = 17·7

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), ... +2·2 = 57·2

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, ... = 57·0

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

Computed **Temperature of Dew-Point,** ..... = 50·4

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

Do. **Relative Humidity** (Saturation = 100), = 79

RAIN fell on 12 Days; Amount in Inches, ... = 1·87

WIND. SUMMARY.

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

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.	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.

Rothesay
June 1906

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 July 1906.

Lat. 55° 49' 50" N, Long. 5° 4' 5" W, Distance from Sea 132 ~~miles~~ 3de. 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	30·044	59	30·080	63	64	40	+	+	57	51	52	49	·10	–	–	–	–	+	+	5	+	–							53·5	fine	–	fine	1
2	30·094	61	30·100	62	63	47			53	52	54	52	–	N.E.	3	S.W.	5			10		9							53·5	Dull & Wet	–	Dry fine	2
3	30·158	59	30·210	62	67	48			61	55	54	51	–	N.W.	1	W.	5			–		–							53·5	fine	–	fine	3
4	30·166	60	30·084	68	71	45			61	55	60	56	–	–	–	S.E.	5			–		8							53·5	"	–	Hazy fine	4
5	29·982	62	29·910	68	72	51			60	55	58	55	·10	E.	1	S.W.	5			–		8							53·5	Hazy fine	–	fine	5
6	29·886	66	29·942	66	63	53			59	58	53	56	–	–	–	–	–			10		–							53·5	Dull & wet	–	"	6
7	29·924	65	29·958	65	64	45			60	57	55	54	·09	S	3	–	–			9		10							53·5	fine	–	Dull Showery	7
8	30·104	66	30·244	63	64	50			58	53	52	50	–	W.S.W.	1	S.W.	5			9		5							53·5	Dull fine	–	Dry Cold	8
9	30·254	62	30·210	64	65	50			59	53	56	54	–	W.	1	–	–			9		10							53·5	"	"	Dull fine	9
10	30·192	61	30·228	61	63	49			56	51	51	48	–	W.	1	N.W.	5			6		–							53·5		"	"	10
11	30·252	60	30·282	61	63	43			53	50	50	49	–	W.N.W.	5	N.	5			–		–							53·5		"	"	11
12	30·246	60	30·184	64	61	49			60	54	57	54	·25	N.	5	W.	5			2		–							54		"	"	12
13	29·946	65	29·994	60	63	50			54	52	52	49	·03	N.W.	5	N.W.	2			10		–							54	Dull & Wet		"	13
14	29·932	62	29·804	63	63	48			55	53	55	54	·54	W.	1·5	S.W.	1			10		10							54	" fine	–	Dull & Wet	14
15	29·786	61	29·880	62	60	51			58	54	52	48	·16	W.N.W.	1	N.W.	3·5			6		2							54	" "	–	Dry Cold	15
16	29·700	63	29·740	62	59	49			53	53	54	53	·27	–	–	W.N.W.	2			10		10							54	Dull & Wet	–	Dull & Wet	16
17	29·840	62	29·788	66	63	50			58	57	60	58	·01	W.	1·5	S.W.	1			10		9							54	Showery	–	fine	17
18	29·674	66	29·482	66	64	53			62	59	54	52	·56	S.W.	2	S.W.	1			10		10							54	fine	–	Dull & very Wet	18
19	29·592	62	29·730	59	58	47			52	49	50	46	·20	W.	3	N.W.	4			3		–							54	Showery Cold	–	Dry Cold & Stormy	19
20	29·700	61	29·814	57	60	44			54	49	52	42	·02	W.	4	W	2·5			–		9							54	Showery & stormy	–	Dry Cold	20
21	29·876	59	29·854	65	65	45			56	51	58	57	·12	W.N.W.	1	S	5			1		10							54	Dry fine	–	Dull & Wet	21
22	29·830	64	29·954	65	65	55			63	62	56	50	·01	S.W.	1	N.W.	5			10		5							54	Dull & Wet	–	fine	22
23	29·870	63	29·858	61	61	46			55	54	53	51	·09	E.	5	–	–			10		4							54	" "		Dull & damp	23
24	29·914	60	30·010	63	62	49			55	52	54	52	·01	W.	1	W.	5			9		8							54	Showery	–	fine	24
25	30·100	61	30·040	65	67	47			58	54	55	53	–	W.	5	–	–			9		–							54	Dull fine	–	"	25
26	29·982	62	29·796	69	73	52			66	59	61	57	·03	E.S.E.	1	–	–			–		8							54	Dry Hazy	–	"	26
27	29·898	66	29·910	66	64	54			57	55	57	56	·08	E.	5	E.	5			10		–							54	Dull & damp	–	"	27
28	29·754	65	29·886	66	63	49			59	56	55	53	·35	S.	5	–	–			8		8							54	fine	–	Dull & Wet	28
29	29·912	63	29·972	66	68	48			57	50	54	51	–	–	–	–	–			5		–							54	"		fine	29
30	29·946	66	29·872	68	62	49			59	56	61	60	·22	E.	2	E.	2			–		10							54·5	Hazy Dry	–	wet. Thunder & Lightning 10.P.M. at a distance	30
31	29·822	67	29·876	67	67	56			64	61	57	56	–	E.	1	S.	5			–		4							54·5	fine	–	Dull & Wet	31
Sums.	19·510	10	18·359	14	11	15			15	13	11	13	7		5		7			8		8							11 6				
	29376	78	29692	123	127	274			242	130	152	78	3·24		245		356			181		157							1195				
Means.	29·948	62·5	29·958	64·0	64·1	48·6			57·8	54·2	54·9	52·5			1·0		0·8			6·0		5·1							53·9				
Corrections for Instrumental Errors.																																	
Corrections for Diurnal Range.																																	
Corrected Means																																	

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.							

NOTATION USED IN GENERAL REMARKS.

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 = 29·857

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —95 = 29·863

Mean at Station, corrected, and at 32°, = 29·860

Correction for height, feet above Mean Sea-level, = + ~~82~~ 92

Mean, reduced to 32°, and Sea-level, = 29·952

Highest Reading, corrected for Index error, on the 11 th, = 30·282

Lowest Do. Do., on the 16 th, = 29·482

Difference, or **Monthly Range,** = 0·800

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 26 th, = 73·0

Lowest in Month, corrected for Index errors, on the 1 th, = 40·0

Difference, or **Monthly Range,** = 33·0

Mean of all the Highest, = 64·1

Mean of all the Lowest, = 48·8

Difference, or **Mean Daily Range,** = 15·3

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 56·4

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, = 56·4

Wet Bulb, Mean of A.M. and P.M. Readings, = 53·4

Computed **Temperature of Dew-Point,** = 50·6

Do. **Elastic Force of Vapour,** = ·369

Do. **Relative Humidity** (Saturation = 100), = 81

RAIN fell on 20 **Days; Amount in Inches,** = 3·24

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	1	1	6	–	2	3	10	3	5	1·0
P.M.	1	–	2	1	2	6	5	5	9	0·8
Sum.	2	1	8	1	4	9	15	8	14	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.

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.

Rothesay
July 1906

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 August 1906.

Lat. 55°49'50" N. Long. 5°4'5" W. Distance from Sea 132 3ds ~~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. 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	29·950	65	29·880	66	65	54	+	+	60	59	60	59	·56	S.	1	SSW	1	+		5		10	+	+	+	+	+	545	Dry fine – Dull & Wet	1
2	29·712	66	29·534	68	64	58			64	60	59	59	·57	S.	1	S.	2			10		10						545	Dull & Wet – Dull & very wet	2
3	29·522	67	29·532	66	65	55			61	59	56	55	·05	WSW.	1	SW.	1			5		6						55	fine – Dull Showery	3
4	29·778	64	29·978	65	62	54			59	55	55	53	·13	SW.	1	W.	1·5			10		9						55	" – fine Rr Earlier	4
5	30·088	64	30·200	65	62	52			57	52	54	52	—	NW.	3	WNW.	1			10		—						55	" – fine	5
6	30·208	62	30·174	66	70	48			61	57	62	60	·07	W.	1	—	—			—		10						55	" – Wet & Foggy	6
7	30·084	66	30·056	68	68	55			58	56	59	58	—	E.	1	—	—			10		4						55	Foggy & damp – fine	7
8	29·996	66	29·900	67	71	54			64	62	58	55	·12	SW.	1	—	—			5		10						53	fine – "	8
9	29·804	65	29·880	67	64	52			57	56	54	52	·08	NW.	1	WNW.	·5			10		—						55	Dull & Wet – Clear fine	9
10	29·700	64	29·662	66	62	46			57	55	55	54	·17	E	1	—	—			10		10						55	fine-Foggy – Dull & Wet	10
11	29·768	64	29·776	64	64	52			56	54	58	56	·21	NE.	·5	—	—			9		10						55	" " – fine	11
12	29·662	66	29·600	65	61	54			55	53	58	57	·61	ESE.	·5	E.	1			10		10						55	Dull & very Wet – Dull & Wet	12
13	29·478	61	29·478	66	65	57			60	59	57	56	·04	S.	·5	—	—			9		3						55	" & damp – Dry fine	13
14	29·464	65	29·464	65	67	53			59	57	58	56	·13	SSE	1	S.	1			9		10						55	Showery – Dull fine	14
15	29·572	65	29·664	64	65	54			57	55	56	54	·43	W.	1	W.	1			6		5						55	" – Dry fine	15
16	29·612	63	29·710	64	64	51			55	54	55	53	·10	—	—	WNW.	1·5			5		6						55	Dull Showery – " "	16
17	29·722	59	29·868	60	60	51			53	51	55	51	—	NW.	2	NW.	1·5			10		1						55	Dull & Wet – fine	17
18	30·022	59	30·122	61	64	50			57	53	51	47	—	NW.	2·5	NW.	2			8		—						55	fine, Breezy – "	18
19	30·122	59	30·034	62	63	47			55	52	56	54	·20	W.	·5	—	—			10		10						55	fine – "	19
20	29·776	64	29·958	65	63	52			61	61	54	53	·12	W.	2	W.	1·5			10		—						55	Dull & Wet – "	20
21	29·978	64	29·964	64	64	52			61	60	56	55	·59	W.	·5	—	—			2		10						55	fine – Dull & Wet	21
22	29·882	64	29·924	65	64	52			61	60	60	59	·33	W.	·5	—	—			10		10						55	Wet Hazy – " "	22
23	30·014	63	29·950	65	60	50			53	50	55	53	·32	E.	3	E.	1·5			10		10						55	Hazy Strong Breez – fine	23
24	29·874	65	29·742	66	65	51			56	54	56	55	·48	E.	1	—	—			6		10						55	Hazy – Hazy & Wet	24
25	29·612	62	29·952	65	62	51			55	54	52	50	·11	NW.	2	—	—			9		—						55	Dull & Showery – Clear fine	25
26	29·952	61	30·084	65	61	47			55	54	56	55	·11	S	1	W.	1			10		—						55	" & Wet – Dull Showery	26
27	30·242	62	30·360	64	64	50			58	55	57	56	·01	W.	·5	—	—			10		10						55	fine – fine, Lightning	27
28	30·350	64	30·264	64	68	51			59	58	59	58	—	—	—	—	—			9		10						55	Hazy – Dull fine	28
29	30·212	65	30·144	66	70	51			60	59	53	52	—	—	—	E.	·5			10		—						55	damp & foggy – Hazy fine	29
30	30·094	64	30·054	68	72	47			60	58	52	51	—	—	—	SW.	1			—		—						55	Hazy fine – Clear fine	30
31	30·064	63	30·036	66	76	47			60	57	56	55	—	—	—	SW.	1			—		—						55	Foggy heavy dew – " "	31
Sums.	16 14 11	13	16 14 10	15	10	10			13	14	16	14	4		3		3			8		3						15 1		
	27244	109	27764	156	154	45			253	191	192	143	5·56		305		215			231		183						1540		
Means.	29·879	63·5	29·896	65·1	65·0	51·5			58·2	56·2	56·2	54·6			1·0		0·7			7·8		6·0						55·0		
Corrections for Instrumental Errors.																																
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. = —9.3 = 29.786

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —9.7 = 29.799

Mean at Station, corrected, and at 32°, = 29.792

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

Mean, reduced to 32°, and Sea-level, = 29.874

Highest Reading, corrected for Index error, on the 27 th, = 30.360

Lowest Do. Do., on the 14 th, = 29.464

Difference, or **Monthly Range,** = 0.896

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 31 th, = 75.0

Lowest in Month, corrected for Index errors, on the 6 th, = 45.0

Difference, or **Monthly Range,** = 30.0

Mean of all the Highest, = 65.0

Mean of all the Lowest, = 51.5

Difference, or **Mean Daily Range,** = 13.5

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 58.2

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, = 57.2

Wet Bulb, Mean of A.M. and P.M. Readings, = 55.4

Computed **Temperature of Dew-Point,** = 53.8

Do. **Elastic Force of Vapour,** = ·415

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

RAIN fell on 23 **Days; Amount in Inches,** = 5.56

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	—	1	4	1	5	3	7	5	5	1·0
P.M.	—	—	3	—	2	4	7	2	13	0·7
Sum.	0	1	7	1	7	7	14	7	18	0·9

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.

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.

Rothesay
August 1902

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 September 1906.

Lat. 55°49'50" N. Long. 5°2'5" W., Distance from Sea 1320 yds ~~miles~~. Height of Cistern of the Barometer above Mean Sea-Level 74 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	30·018	65	29·926	70	80	53	+	+	64	61	63	60	–	S.E.	·5	S.E.	1	1	1	–	+	–							55	Heavy dew. Hazy – Hazy fine	1
2	29·910	68	29·970	70	81	58			71	65	60	58	–	E.	1·5	–	–			–		–							55	do do	2
3	30·024	66	30·156	65	66	52			61	58	53	51	·06	N.W.	·5	–	–			8		–							55	Fine – Clear fine	3
4	30·182	63	30·130	65	65	48			56	55	63	51	·02	W.N.W.	·5	S.W.	·5			8		–							55	Showery – do	4
5	29·954	63	29·658	66	60	50			58	55	58	57	–	W.	1	N.W.	3·5			10		10							55·2	Hazy – very Wet. Squally	5
6	29·804	61	29·894	63	64	52			56	52	57	56	·35	N.W.	4	–	–			3		10							55·2	Stormy & Showery – Dull & very Wet	6
7	29·920	64	29·916	65	63	53			60	60	58	57	·53	W.	1·5	–	–			10		10							55·2	Foggy & Wet – Foggy & Wet	7
8	29·956	62	30·096	62	62	50			58	55	53	51	·08	W.	3	–	–			4		–							55·2	Squally & Showery – Dry fine	8
9	30·192	60	30·214	62	59	48			55	52	52	50	·03	W.N.W.	2	W.	1			2		–							55	Fine – Showery	9
10	30·328	59	30·306	60	64	43			56	52	46	45	–	–	–	S.	1			–		–							55	do – Clear fine	10
11	30·200	59	30·086	61	65	43			55	53	57	56	1·21	S.S.E.	1	S.W.	1			9		10							55	Dull fine – Very Wet	11
12	30·100	61	29·974	62	63	48			57	55	54	52	·74	W.	·5	S.	1			1		–							55	fine Heavy Rn Earlin – Clear fine	12
13	29·736	59	29·730	64	61	47			57	56	50	49	·49	S.	1	S.W.	·5			10		–							55	Very Wet – do	13
14	29·538	61	29·422	60	60	46			55	53	53	51	·29	W.	·5	S.W.	1			4		10							54·5	Showery Heavy Rn Earlin – Dull & Wet Thunder & Lightning 11 P.M.	14
15	29·334	59	29·526	62	57	47			51	49	49	48	·36	W.	2	W.	1			6		5							54·5	Raw Showery – Raw Showery	15
16	29·868	59	30·138	62	62	48			56	50	50	47	–	N.	3·5	N.W.	·5			1		–							54·5	Squally Showers at intervals – Clear fine	16
17	30·280	57	30·388	60	65	40			54	51	49	48	–	–	–	W.N.W.	·5			–		–							54·5	Heavy dew fine – do	17
18	30·444	60	30·382	60	63	47			56	53	55	53	–	E.	2	E.	1			–		–							54·5	Hazy fine – do	18
19	30·348	60	30·348	60	57	52			55	54	53	51	–	E.N.E.	1	–	–			10		10							54	Dull fine – Dull fine	19
20	30·360	60	30·388	61	63	50			54	52	51	50	–	E.	·5	E.	·5			9		–							53·5	Hazy fine – Clear fine	20
21	30·444	60	30·444	61	64	48			54	53	53	52	–	E.	·5	E.	·5			1		10							53·5	do – fine	21
22	30·444	61	30·490	63	63	50			54	53	53	51	–	–	–	E.	·5			8		–							53·5	very foggy fine – fine Hazy	22
23	30·558	61	30·572	63	59	47			54	51	50	47	–	E.	1	E.S.E.	1			8		–							53·5	Dry fine – Clear fine	23
24	30·548	59	30·500	61	58	47			50	47	46	46	–	E.	·5	E.	·5			–		10							53·5	Hazy fine – Dull fine	24
25	30·500	59	30·544	60	60	46			54	52	52	50	–	E.S.E.	·5	W.	·5			10		8							53·5	do – fine	25
26	30·560	59	30·550	61	62	46			51	50	50	49	–	W.S.W.	·5	W.	·5			9		8							53·5	Dull fine – do	26
27	30·560	60	30·568	60	63	45			55	54	46	46	–	S.S.W.	·5	W.	·5			10		–							53·4	do – Clear fine	27
28	30·512	58	30·420	60	62	41			52	51	45	44	–	–	–	S.W.	·5			10		–							53	Foggy heavy dew – Clear fine Colder	28
29	30·358	56	30·266	59	57	38			47	47	45	45	–	–	–	–	–			–		–							53	very foggy Heavy dew – Foggy	29
30	30·206	59	30·100	62	63	43			51	49	53	51	–	E.	1	S.W.	·5			–		10							52·5	do do – do	30
31																															31
Sums.	1911	13	1862	6	1	13			12	10	11	12	3·56		7		7			8		2							127		
	5176	18	5102	70	91	228			167	98	67	21			310		190			153		111							1287		
Means.	30·173	60·6	30·170	62·3	63·0	47·6			55·2	53·3	52·2	50·7			1·0		0·6			5·0		3·7							54·3		
Corrections for Instrumental Errors.																															
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. = —.86 = 30·087

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —.91 = 30·079

Mean at Station, corrected, and at 32°, = 30·083

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

Mean, reduced to 32°, and Sea-level, = 30·165

Highest Reading, corrected for Index error, on the 23rd, = 30·572

Lowest Do. Do., on the 15th, = 29·334

Difference, or **Monthly Range,** = 1·238

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 2nd, = 81·0

Lowest in Month, corrected for Index errors, on the 29th, = 38·0

Difference, or **Monthly Range,** = 43·0

Mean of all the Highest, = 63·0

Mean of all the Lowest, = 47·6

Difference, or **Mean Daily Range,** = 15·4

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), +1.6 = 55·3

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, = 53·7

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

Computed **Temperature of Dew-Point,** = 50·3

Do. **Elastic Force of Vapour,** = ·364

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

RAIN fell on 11 **Days; Amount in Inches,** = 3·56

WIND. SUMMARY.

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

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.

Rothesay
Glenburn Hydro
September 1906

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Glenburn Hydro, ~~Bute~~, County of Bute, During the MONTH of October 1906.

Lat. 55°49'50" N, Long. 5°4'5" W., Distance from Sea 132 3rds ~~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.*	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.												°	°	°	°	°		
1	29·940	60	29·722	62	60	49	†	†	53	50	53	52	·41	N.E.	1	S.W.	·5	†	†	8	†	8	-1	-†	†	†	†	52·5	Foggy fine – Dull & damp R^n Earlier	1
2	29·600	59	29·624	64	62	48			55	54	49	48	–	E.S.E.	·5	E.	·5			3		–						52·5	damp R^n Earlier – Foggy dry.	2
3	29·800	59	29·930	61	58	46			53	52	54	52	–	–	–	E.	·5			10		10						52·5	foggy damp – foggy fine	3
4	29·882	60	29·594	60	57	51			54	52	53	53	·66	E.	1	E.	2			5		10						52	Hazy fine – Dull & Wet	4
5	29·538	60	29·760	62	59	52			58	58	53	51	–	–	–	NW	1·5			10		1						52	Dull & damp – Clear fine	5
6	29·816	58	29·730	61	60	44			52	51	58	58	·21	–	–	W.	1			–		10						52	Heavy dew, fine – Dull & Wet	6
7	29·632	61	29·670	64	60	51			59	57	53	52	·10	S.W.	2	S.W.	1·5			1		8						52	fine R^n earlier – Showery	7
8	29·514	61	29·624	63	59	51			53	51	53	52	·32	E.S.E.	1	S.S.E.	·5			10		10						52	Dull & Wet – Dull & Wet	8
9	29·778	60	29·900	61	59	49			53	52	52	51	·07	E.	1·5	–	–			10		–						52	Hazy damp – Clear fine	9
10	29·856	60	29·850	65	60	51			56	55	55	55	·21	E.	·5	–	–			10		10						52	Dull Showery – Dull & Wet	10
11	29·760	61	29·684	65	60	51			56	55	54	54	·94	N.E.	·5	–	–			10		10						52	" & damp – very Wet	11
12	29·632	58	29·614	57	56	45			50	48	46	44	·02	W.N.W.	2	W.N.W.	2			10		–						52	Showery – Clear fine	12
13	29·634	54	29·884	52	49	38			46	41	38	35	–	W.N.W.	4	N.W.	1			–		–						52	Dry Cold Squally – " Cold	13
14	29·884	51	29·674	58	54	32			42	40	53	52	·23	S.	1	W.N.W.	2·5			–		10						52	fine Air frosty – very Wet	14
15	29·482	55	29·464	57	55	45			51	48	46	44	·43	W.	3	–	–			4		–						52	Showery & Squally – Clear fine	15
16	29·380	54	29·424	56	55	43			47	45	45	43	·28	W.	3	W.	3·5			8		10						52	do do Squally Showery hail	16
17	29·480	52	29·682	55	52	39			44	42	45	43	·22	W.	3·5	W.	2			1		10						52	do do – bitter Showers R^n & Ha.	17
18	29·844	52	29·880	52	51	37			43	42	43	40	·01	E.	·5	E.	2			2		8						51·5	Raw – Showery Cold –	18
19	29·656	51	29·554	51	46	41			43	38	42	40	·07	N.N.W.	1	W.	6			10		10						51	Dull dry – very Stormy & Wet from 6–30 P.M.	19
20	29·674	51	29·754	53	50	42			47	44	47	43	·21	W.N.W.	2	E.S.E.	1			–		10						51		20
21	29·774	55	29·810	62	58	44			49	48	57	56	·59	E.	2·5	S.E.	1			8		10						50·5	Raw Breezy – Dull & wet	21
22	29·672	61	29·684	62	59	52			57	56	53	50	·14	S.	2	S.W.	1			10		–						50·5	damp Breezy – Mild & damp	22
23	29·782	61	29·842	64	59	48			54	52	49	48	·96	S.W.	1·5	S.W.	3			9		10						50·5	Dull & wet – Dry fine	23
24	29·992	58	30·192	60	55	40			48	46	42	40	·04	W.S.W.	1	S.W.	·5			4		3						50	" Dry – very Wet.	24
25	30·330	55	30·330	56	55	39			44	43	51	49	–	W.	·5	S.W.	1·5			–		10						50	fine – fine	25
26	29·862	57	29·830	61	54	43			53	50	44	43	–	S.	2·5	S.W.	·5			10		–						50	Dull & Wet – do	26
27	29·928	56	29·636	55	52	38			44	43	52	50	·17	W.	·5	W.S.W.	1·5			9		10						50	" fine – do	27
28	29·284	57	29·284	55	53	38			48	47	39	38	·72	W.	3	S.W.	2			10		10						50	Dull & wet – Cold R^n Ha. Lightning 19-13 P.M.	28
29	29·240	52	29·280	52	41	34			39	38	36	35	·77	W.	3	N.W.	1			10		8						50	Raw Showery – Slight Showers R^n Sn. & Sleet.	29
30	29·368	49	29·434	54	44	32			36	35	44	39	–	E.	2·5	S.E.	2·5			5		10						50	partly air foggy – Dry Cold	30
31	29·560	54	29·736	63	55	42			52	50	49	47	–	E.	3	S.E.	2·5			8		10						49·5	Hazy dry – do	31
Sums.	2016·9	11	2015·7	10	14	13			14	12	14	11	8		6		7			7		3								
	21564	202	22076	273	162	115			298	243	268	217	7·78		500		450			195		216								
Means.	29·696	56·5	29·712	58·9	55·2	43·7			49·6	47·8	48·6	47·0			1·6		1·5			6·3		7·0								
Corrections for Instrumental Errors.																														
Corrections for Diurnal Range.																														
Corrected Means																														

	5	1
h.	3	
	2	
	13	
r.	2	
g.	1	

			54
			400
			51·3

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. = —.74 = 29·622

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —.80 = 29·632

Mean at Station, corrected, and at 32°, = 29·627

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

Mean, reduced to 32°, and Sea-level, = 30·710

Highest Reading, corrected for Index error, on the 7th, = 30·330

Lowest Do. Do., on the 29th, = 29·240

Difference, or **Monthly Range,** = 1·090

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 2th, = 62·0

Lowest in Month, corrected for Index errors, on the 14th, 30 = 32·0

Difference, or **Monthly Range,** = 30·0

Mean of all the Highest, = 55·2

Mean of all the Lowest, = 43·7

Difference, or **Mean Daily Range,** = 11·5

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 49·4

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, = 49·1

Wet Bulb, Mean of A.M. and P.M. Readings, = 47·4

Computed **Temperature of Dew-Point,** = 45·5

Do. **Elastic Force of Vapour,** = 307

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

RAIN fell on 23 **Days; Amount in Inches,** = 778

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

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.

Rothesay
October 1906

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 November 1906.

Lat. 55°49'50"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 3 feet. 6 in

Diameter of Rain Gauge 6 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	29·580	57	29·340	62	51	47	+	+	49	48	50	49	·22	E.	2	N.W.	1·5	+	+	10	+	10	+	+	+	+	+	49·5	Dull fine – Wet, Mild	1
2	29·300	58	29·002	65	60	48			49	48	59	58	·44	E.	·5	E.	1·5			10		10						49·5	" Showery – Dull & Wet	2
3	29·234	57	29·284	55	51	43			45	43	47	46	·02	S.E.	1·5	E.	2			3		8						49	Clear fine – " Dry	3
4	29·504	56	29·420	57	57	36			44	42	47	45	·06	E.	3	E.	3			10		8						48·5	Dull & raw – " & damp	4
5	29·540	56	29·592	59	52	35			46	44	36	35	–	E.	·5	–	–			5		–						48·5	Dry fine – Clear frosty Air	5
6	29·698	53	29·776	56	46	33			39	38	42	41	–	–	–	E.	·5			9		1						48·5	Raw Hazy – fine	6
7	29·742	52	29·744	61	54	40			47	43	50	44	·02	N.E.	·5	–	–			6		10						48·5	fine – Dull fine	7
8	29·784	53	29·904	60	53	45			50	45	46	41	–	N.E.	1	N.E.	1			4		–						48·5	Dry fine – Clear fine	8
9	30·086	54	30·276	56	47	37			44	39	40	36	–	N.E.	2	N.E.	1			3		–						48·5	" " – " "	9
10	30·432	50	30·474	54	43	30			33	32	39	36	–	–	–	–	–			–		9						48	Clear frosty – Dull fine	10
11	30·460	53	30·460	58	48	38			43	42	46	44	–	S.W.	·5	S.W.	·5			9		10						48	Dull fine – " "	11
12	30·432	54	30·446	57	50	37			46	44	38	37	–	S.W.	1	–	–			10		–						48	" " – Clear frosty Air	12
13	30·396	53	30·300	60	48	37			42	41	45	42	–	–	–	S.S.E.	·5			6		5						47·5	fine – Foggy fine	13
14	30·086	56	29·916	62	51	42			49	44	46	45	·74	S.W.	1	W.	1			5		8						47·5	" – Dull & Wet	14
15	29·624	55	29·768	55	48	38			44	43	39	37	·36	S.	·5	S.W.	·5			10		–						47·5	Dull & Wet – Clear fine	15
16	29·596	52	29·286	54	43	38			42	41	40	39	·58	S.W.	·5	E.	2			10		10						47	" " Cold & Wet. Breezy.	16
17	28·966	52	29·010	59	46	38			46	44	38	36	·37	W.S.W.	2	W.	2·5			9		–						47	Dull raw – Clear cold; Rn Earlier	17
18	28·986	51	28·988	53	42	34			39	37	40	39	·05	W.S.W.	1	N.W.	·5			2		5						47	clear Cold Ground – Raw Showery	18
19	29·048	47	29·208	52	44	37			43	40	43	39	·08	N.W.	3·5	N.N.W.	6			8		–						47	Partly covered Snow * –	19
20	29·384	46	29·532	52	46	37			41	38	39	36	·03	N.N.W.	3	S.S.E.	·5			2		–						46·5	cold dry Squally – Stormy Cold. dry.	20
21	29·568	50	29·626	58	52	36			39	37	57	57	·57	E.N.E.	2	S.	1			10		10						46·5	Cold & damp – Clear fine	21
22	29·888	58	30·082	64	58	50			56	54	56	53	·02	S	2	S.	2			9		10						46·5	Dull & damp – Dull & very Wet	22
23	30·166	60	30·264	62	58	53			56	54	56	53	–	S.W.	3	S	2·5			8		10						46·5	" fine, Mild – Dull Mild Slight Showers [warm soft Wind from South	23
24	30·242	59	30·350	61	57	49			51	49	52	51	·15	S	3	S.W.	1			5		10						46	Breezy fine – fine very Mild	24
25	30·338	60	30·426	61	54	49			52	51	51	50	·12	–	–	S.W.	·5			10		10						46·5	" " – Dull & Wet	25
26	30·238	56	30·018	62	54	48			54	52	49	48	·59	W.	2	W.	·5			9		10						46·5	Dull & damp – " & damp	26
27	29·936	53	30·066	58	51	45			48	46	48	46	·10	W.	3	W.N.W.	·5			9		5						46·5	" Mild – " & Wet	27
28	29·874	67	29·852	53	54	47			52	51	50	49	·25	W.	5	W.	·5			10		10						47	" Breezy – fine dry.	28
29	29·882	56	29·420	61	55	47			49	47	54	53	·69	W.	10	N.W.	6			9		10						47	Dull & Wet Stormy – Dull & Wet.	29
30	29·644	50	29·668	54	50	38			43	39	39	38	·28	N.N.W.	4	N.W.	8			1		10						47	Dull fine – very Wet & Stormy	30
31																													Rn & Ha. Stormy – very Wet Stormy a Gale. Thunder 9 a.m.	31
Sums.	1517·13	12	1563·11	11	12	17			15	13	14	15	9		4		7			12		4						1·9		
	23644	139	23673	239	11	32			181	115	174	117	5·68		145		470			211		189						226		
Means.	29·188	54·6	29·383	58·0	50·4	41·1			46·0	43·8	45·8	43·9			1·6		1·6			7·0		6·3						47·5		
Corrections for Instrumental Errors.																															
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.
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. = ——.72 = 29·718

Corrected Mean at 9 P.M., *minus* Correction for Temp. = ——.79 = 29·704

Mean at Station, corrected, and at 32°, = 29·710

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

Mean, reduced to 32°, and Sea-level, = 29·794

Highest Reading, corrected for Index error, on the 10 th, = 30·474

Lowest Do. Do., on the 17th, = 28·966

Difference, or **Monthly Range,** = 1·508

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 22 th, 23 = 58·0

Lowest in Month, corrected for Index errors, on the 10 th, = 30·0

Difference, or **Monthly Range,** = 28·0

Mean of all the Highest, = 50·4

Mean of all the Lowest, = 41·1

Difference, or **Mean Daily Range,** = 9·3 [+2·6] ✓

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 45·8

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, = 45·9

Wet Bulb, Mean of A.M. and P.M. Readings, = 43·8

Computed **Temperature of Dew-Point,** = 41·4

Do. **Elastic Force of Vapour,** = ·263

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

RAIN fell on 21 Days; Amount in Inches, = 5·68

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	1	3	5	1	3	6	6	1	4	1·6
P.M.	1	2	5	1	4	4	5	4	4	1·6
Sum.	2	5	10	2	7	10	11	5	8	1·6

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.

Rothesay
November 1908

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 December 1906.

Lat. 55°49'50"N, Long. 5°41'57"W, Distance from Sea 132 ~~miles~~ yds. 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	30·068	47	30·116	45	44	38	†	†	40	37	43	40	·38	NW.	1·5	SW.	·5	†	†	2	†	10	†	†	†	†	†	47	Clear Cold – fine		1
2	29·822	48	29·800	62	54	41			52	51	52	51	·37	W.	5	W.	5			10		10						47	Stormy & Wet – Stormy & Wet		2
3	29·620	57	29·880	59	53	45			47	44	48	44	·14	W.	7	WNW.	5			6		10						47	very Stormy Rn & Ha. – Stormy & Wet very Stormy Ear		3
4	29·446	56	29·670	59	53	45			46	45	48	44	·26	WSW.	·5	W.	7			10		2						47	Foggy very Wet – Dry very Stormy.		4
5	29·246	50	29·478	57	49	38			42	38	45	40	·36	W.	3	N.	2·5			9		–						47	Thunder & Lightning 2 a.m. – Dry Cold Rn earlier very Stormy Earlier Rn & Ha		5
6	30·192	50	30·386	55	46	31			43	37	34	33	–	NNE.	2	E.	·5			–		–						46·5	Dry cold – Clear frosty air		6
7	30·278	52	30·014	61	49	33			45	43	48	47	·07	WSW.	1	W.	3			9		–						46	Dull & Wet – Dull & damp breezy		7
8	29·774	52	29·564	54	50	37			45	43	38	36	·50	W.	3	NW.	6			8		10						45·5	Dull & damp Breezy – very Wet & Stormy Cold.		8
9	29·732	48	29·874	53	40	35			36	32	36	32	*	WNW.	1·5	NW.	2		S	–		–						45	Dry Cold, Hills Coated with Sn. Ha. Rn & Snow earlier – Clear Cold frosty		9
10	29·940	48	29·862	53	38	31			35	32	33	31	·10	NW.	·5	–	–			9		10						44	Full raw – Dull raw		10
11	29·654	52	29·530	54	42	32			39	30	39	38	·45	E.	1	–	–		f	10		–							Wet & foggy – Raw very foggy		11
12	29·194	52	29·480	54	44	35			35	34	39	35	·16	–	–	W.	3			10		–							Dull & Wet – Clear Cold		12
13	29·296	50	29·336	56	40	31			38	36	33	32	·23	SW.	2	W.	1		sl	10		10							Rn & Sl. – Rn, Ha, Sl, Hills around But coated with Snow		13
14	29·578	47	29·828	52	38	30			36	34	31	30	–	W.	3	SW.	·5			2		–							Dry freezing on grass – freezing hard on grass		14
15	29·926	49	29·892	55	40	29			31	31	37	37	1·14	NW.	·2	E.	·5			4		10							Hazy thawing – Dull & very Wet		15
16	29·922	52	30·114	60	52	35			39	39	50	48	·12	–	–	W.	·5			10		–							Dull & very wet – fine very Mild		16
17	30·178	54	30·186	58	54	48			50	49	50	50	·03	SW.	5	SW.	·5			9		10							" fine – " " "		17
18	30·286	60	30·544	62	52	41			51	50	47	46	·04	W	1	W.	1			10		9							very Mild – Dull & damp very Mild		18
19	30·346	57	30·418	61	49	46			47	46	48	46	–	SW.	1	SW.	1			10		9							Dull fine – " " "		19
20	30·476	57	30·560	59	50	43			48	45	46	43	–	SW.	1	SW.	·5			9		9							Dry Mild – " " "		20
21	30·610	57	30·586	60	49	42			46	44	43	42	–	SSW.	·5	S.	·5		f.	10		10							Dull fine – fine foggy		21
22	30·638	56	30·384	56	44	37			39	38	39	37	–	S.	1	E.	·5		f	10		10							" " Cold – " " Colder		22
23	30·250	53	30·164	53	43	37			40	38	39	38	·16	WSW.	·5	SW.	1			10		5							Dull raw – Dull raw		23
24	29·980	52	29·908	54	46	36			43	40	36	31	·14	W.	1·5	N.	2			10		6							" " Rn earlier – Dry Cold		24
25	29·954	44	29·551	53	37	27			32	32	27	26	·08	WNW.	1	E.	1		S	–		10							Dry frosty – 1½ inches Sn. began 3 P.M. Lasted to 11 P.M.		25
26	29·336	46	29·250	49	36	24			25	28	34	32	·03	NNW.	·5	NW.	3			9		9							fair – See over		26
27	29·326	43	29·542	50	35	30			32	32	34	32	–	NW.	4	NW.	1			–		8							freezing very Cold – freezing Cold Wind from NW.		27
28	29·698	43	29·880	51	38	26			32	32	27	32	–	N.	1	NW.	·5			9		2							fair " " – " Cloudy fair		28
29	29·862	46	29·750	51	33	25			25 ~~32~~	27 ~~32~~	28	27 ~~32~~	·03	–	–	E.	·5		S	7		5							freezing Cloudy – More Sn. 1 inch falling between 2-15 & 4-30		29
30	29·568	47	29·476	52	34	25			32	31 ~~32~~	31	30 ~~32~~	·15	SSE.	1	E.	2		S	10		10							Snowing a little P.T.O See over		30
31	29·380	46	29·230	55	42	31			33	32	42	40	·30	E.	1	W.	2·5		S	10		2							More Sn earlier – thawing from 10 a.m. Rn, Ha, & Sl.		31
Sums.	16·713	14	16·16·10	12	13	13			13	12	16	11	4·99	4			6			9		6									
	26916	30	27223	173	131	153			294	295	294	240	5·24	401			345			232		186									
Means.	29·868	51·0	29·878	55·6	44·2	35·0			39·5	37·6	39·5	37·8		1·6			1·8			7·5		6·0									
Corrections for Instrumental Errors.																															
Corrections for Diurnal Range.																															
Corrected Means																															

S 6 — 6 3 — 0 12 — 1 3 — 9 2

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. = —.60 = 29·808

Corrected Mean at 9 P.M., *minus* Correction for Temp. = —.73 = 29·805

Mean at Station, corrected, and at 32°, = 29·806

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

Mean, reduced to 32°, and Sea-level, = 29·891

Highest Reading, corrected for Index error, on the 21 th, = 30·610

Lowest Do. Do., on the 12 th, = 29·194

Difference, or **Monthly Range,** = 1·416

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the 2 th, 17 = 54·0

Lowest in Month, corrected for Index errors, on the 26 th, = 24·0

Difference, or **Monthly Range,** = 30·0

Mean of all the Highest, = 44·2

Mean of all the Lowest, = 35·0

Difference, or **Mean Daily Range,** = 9·2

Mean Temperature of Month, ½ (Mean Max. + Mean Min.), = 39·6

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, = 39·5

Wet Bulb, Mean of A.M. and P.M. Readings, = 37·7

Computed **Temperature of Dew-Point,** = 35·3

Do. **Elastic Force of Vapour,** = ·207

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

RAIN fell on 23 **Days; Amount in Inches,** = 5·24

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.	3	–	2	–	3	4	12	4	3	1·6
P.M.	2	–	6	–	1	6	9	5	2	1·8
Sum.	5	–	8	–	4	10	21	9	5	1·7

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

See instructions on back of Schedule.

Observations made and Return verified by _____

(*Signed*) _____

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.

Dec 26th 9.P.M. quite a blizzard of wind & snow raged here from 2 P.M. till 4·30 P.M. the Wind reaching about 30 miles an hour, debth of Snow ½ in with what had fallen the previous day & still on the ground make 2 in and in many places where drifting occured 2 to 3 ft. deep. fair after but a bitter cold Wind from the N.W. freezing.

Dec 30th 9. P.M. Snow falling more or less all day debth 2½ inches. Cold Wind.

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

Pothesay December 1906

BOOK POST.