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Mr George Redpath
43 Lochend Road
Leith

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of January 1907.

Lat. 55° 59′ N, Long. 3° 10′ W, Distance from Sea half miles. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

43 Lochend Road.

Diameter of Rain Gauge ____ inches. Height of Rim of Gauge above Ground ____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. and red. to 32° + sea-level. 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			28·967																										Cloudy; freq. li. r. shs. after 11 am.; evening const. rain.	1
2			28·814																										Changeable; fresh ags. with shs. early morng.; fine, sunny at times till 3 pm.; sl. sn. + r. shs at Cantv. after 3. 10 pm; very squally.	2
3			29·760																										Fine; frequent sunshine.	3
4			30·195																										Fine; hazy; evening overcast; drizz. r. after 7 pm.	4
5			29·845																										Cloudy; a few sl. shs. during day, + thick shs. bet. 6·30 + 8·30 pm.; sq. at times.	5
6			30·357																										Fine; mostly sunny; rather hazy.	6
7			30·330																										Cloudy; damp at times.	7
8			30·766																										Fine; cloudy, with occas. sunshine.	8
9			30·121																										Fine; mostly cloudy.	9
10			30·713																										Cloudy; showery during afternoon.	10
11			30·424																										Fine; mostly cloudy; evening sq. at times.	11
12			30·199																										Cloudy, with shs. at 10 am.; sunny intvs. dur. afternoon; sq. at times.	12
13			30·346																										Fine; freq. sunshine dur. forenoon; occas. sl. shs. after 2. 40 pm.	13
14			30·176																										Mostly cloudy; a few sl. shs. after 4. 15 pm.; sq. at times.	14
15			30·312																										Fine; occas. sunshine.	15
16			30·536																										Fine; sunny at times; a few sl. shs.	16
17			30·696																										Cloudy; rather hazy.	17
18			30·580																										Cloudy; fine.	18
19			30·535																										Fog, with thick h.-fr.	19
20			30·495																										Cloudy; li. shs. after 3. 20 pm.; hazy.	20
21			30·360																										Fine; mostly sunny; hazy.	21
22			30·989																										Fine; frequent sunshine.	22
23			30·935																										Fine; sunny. Clo. ha. at 5. 50 pm.	23
24			30·371																										Fine, sunny dur. forenoon; cloudy after 2 pm.; sn. at 9 pm. – Faint	24
25			30·356																										Fine; sunny at times.	25
26			30·427																										Cloudy; fine.	26
27			29·800																										Cloudy; a few sl. shs. dur. day; evening sq. showers.	27
28			29·231																										Changeable; freq. r. shs. acp. by sunny intvs.; Tr. L. with r. + d. at 0. 54 pm.; sn. after 0.7 pm. very squally.	28
29			29·210																										Snd. frost. night; day fine, sunny at times; a few sl. sn. shs.	29
30			30·087																										Fine; sunny; sl. sn. at 9. 15 am.	30
31			30·361																										Fine; cloudy during forenoon	31
Sums.			14512 / 196																												
Means.																														
Corrections for Instrumental Errors.																														
Corrections for Diurnal Range.																														
Corrected Means																														

Jany 2. 6 am. 28·743 in.
" 22. 6 pm. 30·942 "
" " 7 " 30·959 "
" " 8 " 30·969 "
" " 10 " 31·001 "
" 23. 6 am. 31·037 "
" " 7 " 31·043 "
" " Noon 31·036 "

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. = ____ = ____

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

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

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

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

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

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

Difference, or **Monthly Range,** ____ = ____

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

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

Difference, or **Monthly Range,** ____ = ____

Mean of all the Highest, ____ = ____

Mean of all the Lowest, ____ = ____

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

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

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, ____ = ____

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

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

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

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

RAIN fell on **Days; Amount in Inches,** ____ = ____

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of February 1907.

Lat. 55° 59′ N., Long. 3° 10′ W., Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 56 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. + red. to 32° + sea-level. 9 A.M. Barometer. No. ____ inches.	9 A.M. Attached Thermometer. °	9 P.M. Barometer. No. ____ inches.	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. inches.	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.
1			30·409																												For fog. with thick h. fr.	1
2			30·422																												Cloudy; hazy.	2
3			30·210																												Fine, mostly sunny; hazy. [at 6.15 a.m.	3
4			30·433																												Cloudy; const. sn. bet. 9.20 a.m. and noon; evening clear. - Faint Lu. sha.	4
5			30·560																												Fine, sunny; cloudless; morng. + evening low fog.	5
6			30·005																												Cloudless; hazy; sun's disk visible.	6
7			29·684																												Fine; mostly cloudy.	7
8			29·734																												Fine; frequent sunshine.	8
9			29·486																												Squally, showery early morning; day fine, sunny.	9
10			29·401																												Fine; sunny after 10.15 a.m.; evening cloudy, with sho. at 7.45 p.m.	10
11			29·451																												Fine; mostly sunny; sn. thl. sho. bet. 4.15 and 5 p.m.	11
12			29·335																												Overcast; freq. sn., sl. and r. after 9.20 a.m.	12
13			30·096																												Fine, clear, sunny; evening hazy.	13
14			29·819																												Cloudy; hazy.	14
15			29·670																												Mostly cloudy; sho. after 7.45 p.m.; squally at times.	15
16			29·564																												Fine, sunny till abt. 1.30 p.m. then cloudy; const. r. after 4.30 p.m.	16
17			29·946																												Strg. sqs. early morn., with brisk sho. bet. 5 + 7.30 a.m.; day clear, sunny; sq. at times.	17
18			29·456																												Cloudy, with occas. sunshine; sho. aft. 11.40 a.m., + freq. brisk r. sn. dur. afternoon + evening.	18
19			28·530																												Cloudy; showery dur. forenoon; nearly const. r. after noon; brisk r. sqs. bet. 6 + 8 p.m.	19
20			29·151																												Sq. early morng., with brisk sn. sho. bet. 4.6 a.m., + r. sho. at + abt. noon; freq. sunshine, sq. at times.	20
21			29·679																												Fine, sunny; sli. sn. sho. at 11.15 a.m. and hl. sho. at 8 p.m.	21
22			29·896																												Fine; sunny; clear.	22
23			30·106																												Fine; sunny. - Lu. ha. at 9 p.m.	23
24			30·045																												Cloudy; a few li. sho. after 6 p.m.	24
25			30·225																												Fine; frequent sunshine.	25
26			30·328																												Fine; cloudy, with bright sunshine at times.	26
27			30·508																												Fine; sunny at times - rather hazy.	27
28			30·433																												Fine, sunny; thick h. morning + fog evening.	28
29																																29
30																																30
31																																31
Sums.			12 11 12 24 582																													
Means.			29·878																													
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. = ... = _____

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

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

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

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

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

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

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

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

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

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

Mean of all the Highest, ... = _____

Mean of all the Lowest, ... = _____

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

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

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, ... = _____

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

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

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

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

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

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

Observations made and Return verified by _____

(*Signed*) _____

Febry. 19. 6 p.m. 28·568 inches (corrected.
" 6.30 " ·512 " "
" 7·0 " ·458 " "
" 7·30 " ·482 " "
" 8·0 " ·488 " "
" 8·30 " 28·514 " "
Febry 20. 6 a.m. 28·419 " "
" 7 " 28·449 " "

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.

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

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

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

BAROMETER.

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

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

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

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

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

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

STEVENSON SCREEN.

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

MAXIMUM AND MINIMUM THERMOMETERS.

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

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

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

DRY AND WET BULB THERMOMETERS.

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

RAIN GAUGE.

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

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

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

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of March 1907.

Lat. 55°59′N, Long. 3°10′W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge ____ inches. Height of Rim of Gauge above Ground ____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. & red. to 32° & sea-level. 9 A.M. Barometer. No. ____	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ____	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. *Mention the hour at which Storms, including Thunder and Lightning, began and ended.*	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1			30·231																										Cloudy; hazy; li. sho. abt. 5.30pm, and const. r. after 5.50pm	1
2			30·325																										Fine. cloudy; hazy.	2
3			30·232																										F. with thick h.-fr. in the morning; day fine, mostly sunny.	3
4			30·078 10pm.																										Fine, sunny.	4
5			29·913																										Changeable; fog early morning; freq. sho. bet. 5.45 am & 1.45pm; sunny at times.	5
6			30·161																										Fine; mostly sunny; evening cloudy.	6
7			29·566																										Cloudy; li. sho. duv. forenoon, & brisk shs. after 3pm.; fog at times.	7
8			29·935																										Changeable; r. sn. whl. sho. at intervals. sunny at times.	8
9			30·080																										Fine, mostly sunny till noon, then cloudy; li. sn. after 4.30pm & brisk sn. at 9pm	9
10			29·873																										Frequent sn. till 7.45 am, then fine; bright sunshine at times.	10
11			30·476																										Fine, sunny.	11
12			29·929																										Cloudy; showery after 3.15 pm. Cloudy sho. after	12
13			29·597																										Fine, sunny till abt. 2pm.; r. sho. after 2.45 pm. & brisk sh. & sn. sho. at times after 3pm.;	13
14			29·854																										Fine, sunny till abt. 2.45 pm, then cloudy; evening showers.	14
15			29·517																										Morning cloudy, showery; occas. sunshine. equally.	15
16			28·963																										Mostly cloudy, brisk sho. bet. 5 & 7 am, & li. sho. after 4.15pm & const. r. after 5pm.	16
17			29·309																										R. prev. night & freq. brisk sho., separated by sunny intvs.; very changeable.	17
18			29·500																										Squally; sho. early morning; bright sunshine duv. afternoon.	18
19			29·493																										Hazy sn. sho. at 6.30 am & heavy whl. & sn. at 7.15 am.; sunny at times; r. sho. after 6 pm.	19
20			30·356																										Squally, showery early morning; day fine, sunny.	20
21			30·095																										Mostly squally; sunny at times; freq. sho. after 5.15 pm.	21
22			30·356																										Fine, sunny.	22
23			30·371																										Morning, thick h.-fr.; day fine, sunny.	23
24			30·276																										Fine; freq. sunshine after 11.45 am.	24
25			30·311																										Fine, cloudy; rather hazy.	25
26			30·392																										Fine; sunny at times.	26
27			30·322																										Fine; bright sunshine	27
28			30·132																										Fine; mostly sunny; hazy.	28
29			29·832																										Morning, thick h.-fr.; day fine, sunny.	29
30			29·944																										Fine; frequent sunshine.	30
31			29·866																										Fine; mostly sunny.	31
Sums.			15 15 12 30 235																												
Means.			29·975																												
Corrections for Instrumental Errors.																															
Corrections for Diurnal Range.																															
Corrected Means																															

March 18. 6.45 am. 28.833
" " 7 am. 28.869

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. = ____ = ____

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

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

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

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

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

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

Difference, or **Monthly Range,** ____ = ____

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

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

Difference, or **Monthly Range,** ____ = ____

Mean of all the Highest, ____ = ____

Mean of all the Lowest, ____ = ____

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

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

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, ____ = ____

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

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

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

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

RAIN fell on ____ **Days; Amount in Inches,** ____ = ____

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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.

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

BAROMETER.

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

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

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

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

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

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

STEVENSON SCREEN.

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

MAXIMUM AND MINIMUM THERMOMETERS.

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

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

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

DRY AND WET BULB THERMOMETERS.

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

RAIN GAUGE.

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

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

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

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of April 1907.

Lat. 55° 59′ N, Long. 3° 10′ W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge ____ inches. Height of Rim of Gauge above Ground ____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. & red. to 32° & sea-level. 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			29.720																						Fine; fine morning; freq. bright sunshine after 9.30 a.m.	1
2			29.297																						Fine, sunny; li. sho. about 7 & 8 p.m.	2
3			29.347																						Frequent sunshine; li. sho. aft. 6.15 a.m.; mdte. to brisk & v. after 5.30 p.m.	3
4			29.579																						Cloudy; v. till 11.45 a.m., then fine.	4
5			29.321																						Fine; mostly sunny till 4 p.m., then cloudy.	5
6			29.180																						Fine; mostly sunny after 10.30 a.m.; cloudy aft. 4 p.m. & brisk sho. after 8 p.m.	6
7			29.345																						Cloudy; freq. v. sho. after 2.40 p.m. and large hl. at 2.50 p.m.	7
8			29.491																						Cloudy; hazy; sunny intvs. aft. 11.45 a.m.; brisk sho. after 5.45 p.m.	8
9			29.782																						Cloudy, with freq. sunshine; sho. at 11.40 a.m. and bet. 2 & 2.30 p.m.	9
10			30.013																						Cloudy; showery; occas. sunshine.	10
11			29.992																						Rain early morning; day fine, mostly cloudy.	11
12			29.895																						Fine; sunny at times.	12
13																															13
14																															14
15			29.671																						Fine, clear, sunny.						15
16			29.612																						Morning, low h. with thick h.-fr.; day fine, sunny; evening cloudy.						16
17			30.010																						Cloudy, with freq. bright sunshine; v. sho. till 9 a.m., & hl. sh. at 2.30 p.m.; clear.						17
18			30.009																						Fine, clear, sunny. So.-ha. at 11.40 a.m.						18
19			29.992																						Fine; freq. sunshine till noon, then mostly cloudy.						19
20			29.656																						Changeable; freq. sho. after 9 a.m.; sunny intvs.; squally at times.						20
21			29.870																						Cloudy; sunny intvs. abt. noon, and after 2.30 p.m.						21
22			29.918																						Freq. sunshine; squally after noon; sho. at 4.30 p.m. & 6.30 p.m.						22
23			30.089																						Fine; freq. sunshine dur. forenoon, wining overcast; sli. drizz. sho. after 7.30 p.m.						23
24			30.346																						Fine, sunny; evening cloudy.						24
25			30.218																						Fine; frequent sunshine. - So.-ha. at 9.45 p.m.						25
26			29.821																						Fine; sunny; evening overcast. - So.-ha. at 4 p.m.						26
27			29.936																						Changeable; freq. v. sho. aft. 7.15 a.m., with brisk hl. at 10.30 a.m. & 2.40 p.m.; sunny at times; very clear						27
28			29.683																						Cloudy; freq. li. sho. bet. 10.30 a.m. & 2.30 p.m.; mostly sunny after 3 p.m.						28
29			29.726																						Fine; sunny at times.						29
30			29.608																						Overcast; li. to mod. rain between 9 a.m. and 7.15 p.m.						30
31																															31
Sums.																															
Means.																															
Corrections for Instrumental Errors.																															
Corrections for Diurnal Range.																															
Corrected Means																															

See Mr. Bolam's Register

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. = ____ = ____

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

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

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

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

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

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

Difference, or **Monthly Range,** ____ = ____

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

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

Difference, or **Monthly Range,** ____ = ____

Mean of all the Highest, ____ = ____

Mean of all the Lowest, ____ = ____

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

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

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, ____ = ____

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

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

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

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

RAIN fell on ____ **Days; Amount in Inches,** ____ = ____

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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.

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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.

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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.

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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
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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.

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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.

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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.

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DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of May 1907.

Lat. 55° 59′ N., Long. 3° 10′ W., Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. & red. to 32° & sea-level. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. *Mention the hour at which Storms, including Thunder and Lightning, began and ended.*	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°	[after 7.30 pm.	
1			29.255																										Fine, mostly sunny bet. 10.30 am & 3.30 pm; evng. overcast; r. with brisk sqs.	1
2			28.729																										Changeable; freq. shs. separated by sunny mbts.; equally at times.	2
3			29.074																										Sq., thry. prev. night; day fine, mostly sunny; freq. shs. abt 4 pm.; gusty.	3
4			29.489																										Changeable; freq. brisk shs. after 10 am.; sunny intvs.	4
5			29.804																										Fine; mostly sunny; clear; evening cloudy.	5
6			29.829																										Cloudy; a few sli. shs; evening foul with drizz. - rain.	6
7			29.655																										Overcast; shs. dur. forenoon; thick h. at hills; damp.	7
8			29.628																										Shs. prev. night; freq. bright sunshine; T. & L. with shs. at 3.10 pm	8
9			29.640																										Fine; sunny at times; a few sli. shs.	9
10			29.670																										Mostly cloudy; fine till 2. to 5 pm, then showery.	10
11			29.833																										Shs. early morning; much cloud at times till 2 pm, then mostly sunny.	11
12			29.876																										Cloudy; freq. shs. after 5 am.	12
13			29.910																										Fine; bright sunshine after 10 am.	13
14			29.826																										Fine; mostly cloudy. - Faint So. ha. at 7.20 am.	14
15			29.856																										Fine; cloudy till abt. 3 pm, then sunny.	15
16			30.150																										Cloudy; fine.	16
17			30.333																										Fine; mostly sunny.	17
18			30.287																										Fine; morning sunny; day mostly cloudy; clear.	18
19			30.139																										Fine, cloudy; very clear.	19
20			30.096																										Cloudy; brisk shs. bet. 7.15 & 10.30 am.; bright sunshine dur. afternoon.	20
21			29.698																										Cloudy; sli. shs. dur. forenoon; overcast, const. r. after 3 pm.	21
22			29.755																										Cloudy; r. prev. night, & freq. shs. during day.	22
23			29.814																										Cloudy, with occas. sunshine dur. forenoon; const. sli. to mod. r. after 3 pm.	23
24			30.017																										Overcast; freq. r.; thick f. in the evening.	24
25			30.153																										Overcast; f. with drizz. r. till about 10 am.	25
26			30.040																										Fine; bright sunshine; very clear.	26
27			30.182																										Fine; sunny till abt. 4 pm, then cloudy; clear.	27
28			30.303																										Fine; freq. bright sunshine; clear.	28
29			30.233																										Fine; mostly sunny; evening cloudy. - Faint So. ha. at 5.50 pm	29
30			29.861																										Overcast; freq. r. bet. 6 & 11.30 am, & const. r. after 1.30 pm.	30
31			29.614																										Overcast; rain.	31
Sums.			15 14 5.3 25.749																													
Means.			29.881																													
Corrections for Instrumental Errors.																																
Corrections for Diurnal Range.																																
Corrected Means																																

May 2. 6 am. 29.010
" 2. 7.15 " 28.998
" 2. 8 pm. 28.731

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. = ... — ..... } = _____

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

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

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

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

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

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

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

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

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

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

Mean of all the Highest, ... = _____

Mean of all the Lowest, ... = _____

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

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

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, ... = _____

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

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

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

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

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

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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.

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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.

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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.

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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.

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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.

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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.

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DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of June 1907.

Lat. 55° 59′ N., Long. 3° 10′ W., Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr.ted to 32° + sea-level. 9 A.M. Barometer. No. ____	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ____	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. *Mention the hour at which Storms, including Thunder and Lightning, began and ended.*	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1			29.571																					Overcast; const. r. till 3 p.m., and sho. after 7.30 p.m.	1
2			29.462																					Cloudy; sho. p.m. night & a few sl. sho. dur. day; sunny after 4.15 p.m.	2
3			29.865																					Cloudy, with a few pass. sho.; sunny early morning and after 6 p.m.	3
4			29.762																					Mostly cloudy; freq. sho. after 1.15 p.m.	4
5			29.424																					Overcast; freq. brisk r.; thick h. at times.	5
6			29.596																					Fine; cloudy with occas. sunshine.	6
7			29.784																					Fine; freq. bright sunshine. — So. ha. at 4 p.m.	7
8			29.708																					Cloudy; const. r. bet. 6-9 a.m., and a few brisk sho. during day	8
9			29.482																					Fine; frequent sunshine; evening cloudy.	9
10																															10
11																															11
12																															12
13																								See Mr Bolues notes							13
14																															14
15																															15
16			30.044																					Fine; bright sunshine early morning; day mostly cloudy; clear.	16
17			29.991																					Fine; bright sunshine.	17
18			29.719																					Cloudy; showery after 8.30 a.m.; fine, sunny at times after 4 p.m.	18
19			29.713																					Changeable; showery; frequent sunshine.	19
20			29.479																					Cloudy; freq. sho. after 10.45 a.m.	20
21			29.731																					Fine; mostly sunny; wining cloudy. — So. ha. at 4.30 p.m.	21
22			29.607																					Frequent heavy sho. after 3.40 a.m.; sunny at times.	22
23			29.738																					Fine; mostly sunny.	23
24			29.426																					Cloudy; freq. brisk sho. bet. 6 a.m. & 1.30 p.m.; fine, sunny after 3 p.m.	24
25			29.529																					Fine; freq. sunshine after 11.30 a.m.	25
26			29.423																					Cloudy; showery.	26
27			29.649																					Cloudy, with sunny intrs.; squally; heavy r. bet. 5 & 5.30 p.m.	27
28			29.907																					Fine; mostly sunny.	28
29			30.000																					Fine, sunny till noon; heavy hl. sh. at 1.15 p.m., & brisk r. at times bet. 2.30 & 3 p.m.	29
30			30.003																					Mostly strongly cloudy; freq. sunshine after 10 a.m.; brisk sho. 6.15-6.30 p.m. & clear.	30
31																															31
Sums.																															
Means.																															
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. = ____ — ____ = ____

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

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

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

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

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

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

Difference, or **Monthly Range,** ____ = ____

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

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

Difference, or **Monthly Range,** ____ = ____

Mean of all the Highest, ____ = ____

Mean of all the Lowest, ____ = ____

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

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

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, ____ = ____

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

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

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

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

RAIN fell on **Days; Amount in Inches,** ____ = ____

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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

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

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

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Leith*, County of *Edinburgh*, During the MONTH of *July* 190*7*.

Lat. *55°59′N*, Long. *3°10′W*, Distance from Sea *half* miles. Height of Cistern of the Barometer above Mean Sea-Level *55* feet, above Ground *3* feet.

Diameter of Rain Gauge ______ inches. Height of Rim of Gauge above Ground ______

The Hours of Observation are of Greenwich Time.

Days of Month	Barometer (*corr. & red. to 32° and sea-level*) 9 A.M. Barometer No. __ (inches)	9 A.M. Attached Thermometer (°)	9 P.M. Barometer No. __ (inches)	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. (inches)	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
1			29·965																										Cloudy, with sunny intvs.; freq. brisk shs. bet. 8 am. & 1.15 pm.	1
2			29·813																										Fine; cloudy, with occas. sunshine.	2
3			29·588																										Mostly cloudy; drizz. shs. after 3.45 pm.	3
4			29·506																										Overcast; nearly const. rain.	4
5			29·637																										Fine; freq. sunshine dur. afternoon; pass. sh. at 11.30 am.	5
6			29·812																										Changeable; freq. rain; occas. sunshine.	6
7			29·784																										Fine; sunny at times; clear.	7
8			29·639																										Freq. brisk r. till 7 am.; fine, sunny at times forenoon; gloomy at 4 pm. with r.² of 20 min. duration and brisk shs. later.	8
9			29·865																										Cloudy; brisk shs. after 4 pm.	9
10			30·353																										Mostly cloudy; brisk shs. at 3.15 & 11.40 am.; sunny intvs. dur. afternoon; very clear.	10
11			30·330																										Fine; cloudy, with occas. sunshine.	11
12			30·216																										Fine; mostly cloudy; sunny intvs. forenoon; li. shs. after 6 pm.	12
13			30·133																										Overcast; freq. shs.	13
14			30·332																										Fine; frequent bright sunshine.	14
15			30·521																										Fine, cloudy; sunny at times after 3 pm.; clear.	15
16			30·434																										Fine; bright sunshine; mostly cloudless dur. day.	16
17			30·289																										Fine, sunny; evening hazy.	17
18			30·158																										Fog till abt. 10 am., then sunny; evening cloudy.	18
19			30·144																										Fine; mostly cloudy; sunny intvs. dur. afternoon.	19
20			30·188																										Fine, sunny.	20
21			30·070																										Cloudy; li. shs. abt. 11 am.	21
22			29·976																										Fine; bright sunshine dur. afternoon; clear.	22
23			29·965																										Fine; bright sunshine at times; clear.	23
24			30·002																										Fine; sunny at times; clear.	24
25			29·876																										Fine; freq. sunshine; clear; morning & evening cloudy.	25
26			29·715																										Cloudy; hazy; shs. after 8 pm.	26
27			29·849																										R. prev. night; day fine; cloudy, with occas. sunshine.	27
28																													Cloudy, with occas. sunshine; a few li. shs. after 10.30 am.	28
29			29·602																										Cloudy; thick h. morning, with shs. aft. 9.30 am.; T. & L. bet. 0.50 & 1.5 pm. foll. by h. r.; freq. brisk r. later.	29
30			29·844																										Cloudy; showery; evening fine.	30
31			29·843																										Fine; mostly sunny after 10 am.	31
Sums.			17 1313 30·349																											
Means.			29·979																											
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. = ...—........ =

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

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

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

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

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

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

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

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

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

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

Mean of all the Highest, ... =

Mean of all the Lowest, ... =

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

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

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, ... =

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

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

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

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

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

WIND. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

Observations made and Return verified by { ______

(*Signed*) ______

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

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

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

STEVENSON SCREEN.

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

MAXIMUM AND MINIMUM THERMOMETERS.

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

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

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

DRY AND WET BULB THERMOMETERS.

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

RAIN GAUGE.

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

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

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

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of August 1907.

Lat. 55° 59′ N., Long. 3° 10′ W., Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. & red. to 32° + sea-level. 9 A.M. Barometer. No. ____	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ____	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No. ____	Min. No. ____	Black Bulb Max. in Sun. No. ____	Min. on Grass. No. ____	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. *Mention the hour at which Storms, including Thunder and Lightning, began and ended.*	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.										°	°	°	°	°		
1			29.989																									Fine; mostly cloudy.	1
2			29.910																									Fine; mostly sunny till noon; cloudy, hazy aft. 1 pm.; thick drizz. r. bet. 4 & 5.30 pm.	2
3			29.817																									Cloudy; dry till 1.15 pm, then fine; ocsnl. brief sunshine after 2 pm.	3
4	29.627		29.664																									Cloudy, with sunny intvs.; showery; sunny especially at times; clear.	4
5			29.672																									Fine; cloudy, with frequent sunshine.	5
6			29.532																									Fine, sunny at times; brisk shs. at 1.15 and 3.55 pm.	6
7			29.736																									Cloudy, with sunny intvs.; protracted shs. after 5 pm.	7
8			29.702																									Cloudy, with occas. sunshine; very oily early morning & quicky dur. day.	8
9			29.560																									Fine, mostly cloudy; shs. at and about 6 pm.	9
10			29.620																									Frequent bright shs. till 6 am, then fine; mostly sunny dur. afternoon.	10
11	29.730		29.784																									Freq. sunshine; sq. bet. 2 & 4 pm.; heavy shr. at 4.15 pm.	11
12			29.913																									Freq. r.² bet. 2 am & noon, then shry.; sunny intvs. bet. 2.30 & 6 pm.; brisk shs. at 8.30 pm.	12
13			29.636																									Changeable; shry. till 2.30 pm; mostly sunny after 3.10 pm.; evening squally.	13
14			29.634																									Squally till 6 am.; day fine; cloudy, with frequent sunshine.	14
15			29.686																									Overcast; const. r. (heavy at times) till 1.45 pm; evening showery.	15
16			29.576																									Changeable; r. prev. night; mostly sunny dur. forenoon; li. to mod. r. after 4 pm.	16
17			29.725																									Mostly overcast with f. drizz. r. at times; fine, mostly sunny after 10.30 am.	17
18	29.658		29.568																									Fine, except shs. bet. 8 & 9 am and r.² bet. 6 & 6.30 pm; frequent sunshine	18
19			29.779																									Fine; frequent sunshine; squally at times.	19
20			30.129																									Cloudy, with occas. sunshine; r.² at bkt. 1.30 pm. and about 4 pm.	20
21			30.226																									Fine; frequent sunshine.	21
22			29.895																									Fine, except shs. bet. 5.30 & 7.30 am.; mostly cloudy.	22
23			30.079																									Cloudy; drizz. r. chiefly bet. 6.40 & 10 am.; freq. sunshine dur. afternoon.	23
24			29.980																									Fine; sunny at times.	24
25	29.744		29.938																									Cloudy; shs. early morn, & bet. 10.50 am. & 3 pm.; mostly sunny bet. 2.30 & 4.30 pm.	25
26			29.954																									Fine; mostly sunny; hazy.	26
27			30.012																									Fine, sunny; heavy pass. clouds about noon.	27
28			29.639																									Overcast; nearly const. r. bet. 6.30 am. & 1 pm.; pass. shs. later; sq. after 3.30 pm.	28
29			30.026																									Cloudy; fine; hazy; sunny after 5.30 pm.	29
30			29.969																									Fine, sunny; heavy dew in morning.	30
31			29.921																									Changeable; fresh sunshine; a few brisk shs.	31
Sums.																																
Means.																																
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. = ... = _____

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

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

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

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

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

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

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

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

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

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

Mean of all the Highest, ... = _____

Mean of all the Lowest, ... = _____

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

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

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, ... = _____

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

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

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

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

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

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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.

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

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

BAROMETER.

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

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

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

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

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

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

STEVENSON SCREEN.

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

MAXIMUM AND MINIMUM THERMOMETERS.

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

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

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

DRY AND WET BULB THERMOMETERS.

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

RAIN GAUGE.

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

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

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

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of September 1907.

Lat. 55°59'N, Long. 3°10'W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge ______ inches. Height of Rim of Gauge above Ground ______

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. red. to 32° + sea level. 9 A.M. Barometer. (inches)	9 P.M. Barometer. (inches)		GENERAL REMARKS.	Days of Month.
1	30·045	29·894		Fine, sunny; evening cloudy.	1
2		29·463		Cloudy; r. prev. night + shs. dur. day; freq. r² after 4 p.m.	2
3		29·779		Fine, sunny.	3
4		29·795		Fine; sunny at times; evening cloudy.	4
5		29·639		R. prev. night; day changeable, shs. aft. 1 p.m. / sunny intervals.	5
6		29·819		Fine; sunny at times.	6
7		30·249		Fine, sunny.	7
8		30·480		Fine, sunny; evening cloudy.	8
9		30·350		Haze chiefly; sunny at times dur. afternoon.	9
10		30·193		Fine, sunny; morning and evening hazy.	10
11		30·168		Cloudy; hazy; freq. brisk shs. after 1 p.m.	11
12		30·121		Cloudy, with f. early morning; occas. sunshine about noon.	12
13		29·959		Cloudy; fine; hazy early morning.	13
14		30·194		Fine; mostly sunny.	14
15		30·293		Fine; sunny till about 4 p.m., then cloudy.	15
16		30·219		Frequent sunshine; squally.	16
17		30·349		Cloudy; fine.	17
18		30·414		Fine, sunny.	18
19		30·409		Fine; mostly sunny; evening cloudy.	19
20		30·383		Fine, sunny; mostly cloudless during day; evening cloudy.	20
21		30·549		Overcast; drizz. r. bet. 10.50 a.m. and 3 p.m.	21
22		30·299		Cloudy; hazy.	22
23		30·017		Cloudy, with occas. sunshine; hazy.	23
24		29·837		Fine; mostly cloudy.	24
25		29·718	S.H.	Fine; sunny at times; thick h. in morning. – so. ha. at 10 a.m.	25
26		29·702		Morning thick h.; freq. sunshine dur. forenoon; showery after 3 p.m.	26
27		29·943		F. till 1 p.m.; sunny intvls. later; f. again after 7 p.m.	27
28		29·971		Thick f. chiefly.	28
29		29·889		Cloudy; hazy.	29
30		29·699		Dull; hazy.	30
31					31
Sums.					
Means.					
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. 0 Calm. 1 Light Air. 2 Light Breeze. 3 Gentle Breeze. 4 Moderate Breeze. 5 Fresh Breeze. 6 Strong Breeze. 7 Moderate Gale. 8 Fresh Gale. 9 Strong Gale. 10 Whole Gale. 11 Storm. 12 Hurricane.

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for Temp. = ...—........ =
Corrected Mean at 9 P.M., *minus* Correction for Temp. = ...—........ =
Mean at Station, corrected, and at 32°, ... =
Correction for height, feet above Mean Sea-level, ... = +
Mean, reduced to 32°, and Sea-level, ... =
Highest Reading, corrected for Index error, on the th, ... =
Lowest Do. Do., on the th, ... =
Difference, or **Monthly Range,** .... =

S.-R. THERMOMETER, (in shade) **Highest in Month,** corrected for Index Errors, on the th, ... =
Lowest in Month, corrected for Index errors, on the th, ... =
Difference, or **Monthly Range,** .... =
Mean of all the Highest, ... =
Mean of all the Lowest, ... =
Difference, or **Mean Daily Range,** .... =
Mean Temperature of Month, ½ (Mean Max. + Mean Min.), ... =
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, ... =
Wet Bulb, Mean of A.M. and P.M. Readings, ... =
Computed **Temperature of Dew-Point,** ...... =
Do. **Elastic Force of Vapour,** ...... =
Do. **Relative Humidity** (Saturation = 100), =
RAIN fell on Days; **Amount in Inches,** ...... =

WIND. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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.

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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.

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RADIATION THERMOMETERS.

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of October 1907.

Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge ____ inches. Height of Rim of Gauge above Ground ____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. + red. to 32° and sea-level. 9 A.M. Barometer. No. ____ inches.	9 A.M. Attached Thermometer °	9 P.M. Barometer. No. ____ inches.	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. inches.	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.
1			29.374																												Cloudy; sunny at times after 2 pm.	1
2			29.215																												Fine; freq. sunshine.	2
3			29.686																												Sho. early morning; day fine, sunny at times.	3
4			29.995																												Fine; freq. sunshine; hazy.	4
5			29.788																												Fine, except sho. bet. 7 and 8 a.m.; sunny at times.	5
6																															Cloudy; sho. early morn. and after 2 pm.; const. brisk v. aft. 4 pm.	6
7																																7
8																																8
9																															See Mr Bolam's Register	9
10																																10
11																																11
12			29.717																													12
13			29.464																												Fine, except brisk sho. bet. 10.45 a.m. and noon; sunny at times.	13
14			29.241																												R. bet. 5 and 9.30 a.m., then fine; sunny at times; evening cloudy.	14
15			29.101																												Changeable; morng. fine, hazy; const. r.[2] aft. 11.30 a.m.; T. L. bet. 4.5 & 5.15 pm. with heavy r.[2]	15
16			29.586																												Cloudy; r. till 9.30 a.m., then fine; occas. brief sunshine.	16
17			29.211																												Overcast; nearly const. r. after 8.30 a.m.; equally.	17
18			29.004																												Fine, sunny at times during forenoon; showery after 3.30 pm.	18
19			29.479																												Changeable; freq. sho. till 3 pm.; sunny at times.	19
20			29.472																												Mostly Cloudy; freq. showers after 1.30 pm.	20
21			29.804																												Overcast; r. chiefly; fine after 7 pm.	21
22			29.788																												Cloudy; hazy; freq. r. till about 11 a.m.	22
23			29.855																												Overcast; hazy; freq. drizz. rain.	23
24			29.797																												Cloudy; showery; occas. sunshine dur. afternoon.	24
25			29.782																												Fine; sunny at times.	25
26			29.881																												Cloudy; freq. r. till 9 a.m., and a few li. sho. dur. day.	26
27			29.752																												Fine, sunny; hazy; evening cloudy.	27
28			29.573																												Cloudy; showery; hazy; sunny intvs. dur. afternoon.	28
29			29.446																												Cloudy; freq. brisk sho. after 4.45 pm.	29
30			29.601																												Cloudy; showery; gusty.	30
31			30.115																												Rain prev. night; day fine, cloudy.	31
Sums.																																
Means.																															15th. 7 pm. 29.043 inches. 8 pm. 29.079 "	
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. = ... — ..... = ____

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

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

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

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

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

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

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

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

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

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

Mean of all the Highest, ... = ____

Mean of all the Lowest, ... = ____

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

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

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, ... = ____

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

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

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

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

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

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

Observations made and Return verified by ____

(*Signed*) ____

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

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

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

STEVENSON SCREEN.

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

MAXIMUM AND MINIMUM THERMOMETERS.

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

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

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

DRY AND WET BULB THERMOMETERS.

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

RAIN GAUGE.

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

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

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

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of November 1907.

Lat. 55°59′ N, Long. 3° 10′ W, Distance from Sea half miles. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr: and red. to 32° and sea-level. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. *Mention the hour at which Storms, including Thunder and Lightning, began and ended.*	Days of Month.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1			30·055																					Cloudy, with occas sunshine; brisk shs. bet. 9.45 & 11.30 a.m.	1
2			29·804																					Fine, except brisk shs. bet. 6 & 7 a.m.; frequent sunshine.	2
3			29·775																					Cloudy; fine.	3
4			30·000																					Fine, sunny.	4
5			30·243																					Cloudy; thick h. at times; shs. early morng. and freq. shs. after 2.15 p.m.	5
6			30·319																					Fine, sunny; hazy.	6
7			30·042																					Cloudy; hazy; occ. shs. about 8 p.m.	7
8			29·748																					Cloudy; thick h. in morning; r. after 4.45 p.m.	8
9			29·845																				f	Overcast; freq. shs.; fog at times.	9
10			29·975																					Fine, sunny; wearing cloudy.	10
11			29·699																					Cloudy; a few slight shs.	11
12			29·255																					Fine, sunny at times; clg. showery after 4 p.m. & brisk N. sqls. bet. 6.30 & 8.30 p.m.	12
13			29·943																					Fine, sunny.	13
14			30·009																					Cloudy; mostly fine; a few slight shs.	14
15			30·271																					Fine, sunny; hazy.	15
16			29·907																					Cloudy; freq. shs. after 9 a.m.	16
17			30·061																				LH	Fine; freq. sunshine dur. forenoon. – Su.-ha. at 7.45 p.m.	17
18			30·407 at 10 p.m.																					Fine, sunny; hazy.	18
19			29·986																					Cloudy; hazy; showers after 7 p.m.	19
20			30·204																					Fine, sunny; cloudless during day; hazy.	20
21			30·185																					Cloudy; fine.	21
22			29·687																					Cloudy; squally; shs. after 10.15 a.m. and brisk shs. after 6 p.m.	22
23			29·580																					Cloudy; hazy early morning; a few li. shs. after 10.30 a.m.	23
24			29·501																					Morning, thick h.-fr.; day sunny, mostly cloudless; hazy.	24
25			29·488																					Hazy; thick h. frost.	25
26			28·948																				LH	Cloudy; const. r. bet. 11.40 a.m. & 7 p.m. – Su.-ha. (well-marked at 6 a.m.)	26
27			29·365																					Cloudy; thick h. at times; drizz. shs. at and about noon.	27
28			30·016																					Cloudy; showery; const. r. bet. 1 p.m. and 4.45 p.m.	28
29			30·398																					Fine, sunny.	29
30			30·456																				f	Mostly foggy, with thick h.-fr.	30
31																									31
Sums.																								26th. 10 p.m. 28·976.	
Means.																									
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. = ... — ..... = _____

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

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

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

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

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

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

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

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

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

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

Mean of all the Highest, ... = _____

Mean of all the Lowest, ... = _____

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

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

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, ... = _____

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

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

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

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

RAIN fell on _____ Days; Amount in Inches, ... = _____

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

Observations made and Return verified by _____

(*Signed*) _____

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

See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

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

STEVENSON SCREEN.

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

MAXIMUM AND MINIMUM THERMOMETERS.

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

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

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

DRY AND WET BULB THERMOMETERS.

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

RAIN GAUGE.

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

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

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

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

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

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of December 1907.

Lat. 55° 59' N., Long. 3° 10' W., Distance from Sea half miles. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. corr. & red. to 32° at sea-level. 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.									Hours.	°	°	°	°	°		
1			29.941																									Cloudy; with thick f. in morning; occas. sunshine abt. 1 p.m.	1
2			29.321																									Sunny at times; hazy; very gloomy about 3 p.m.	2
3			29.209																									Fine; mostly sunny.	3
4			28.657																									Cloudy; freq. shs. after 0.15 p.m.; occas. sunshine later; sq. after 9 p.m.	4
5			29.036																									Sq., showery prev. night; day fine, sunny at times; a few sli. past shs.	5
6			29.488																									Fine; sunny.	6
7			29.322																									Rain prev. night; day fine, mostly cloudy.	7
8			28.692																									Cloudy; brisk s. with thick doom bet. 2 & 5 p.m.; showery later.	8
9			29.041																									Cloudy; brisk shs. at and about noon; squally at times.	9
10			29.031																									Changeable; a few brisk shs.; occas. sunshine.	10
11			29.322																									Fine; sunny at times; rather hazy.	11
12			29.414																									Cloudy, with sunny intvs. dur. afternoon; thick h. at times.	12
13			28.631																									Mostly thick h.-fr.; freq. sunshine till 1 p.m.; shs. aft. 3 p.m. & const. r. after 5 p.m.	13
14			29.574																									Mostly cloudy, freq. h. r. early morning; showery later; evening fair; very changeable	14
15			30.047																									Sov. h., with thick h.-fr.; mostly cloudless dur. day. - Sn. ha. at 6.30 p.m.	15
16			30.031																									Cloudy; shs. after 10.30 p.m.	16
17			30.079																									Cloudy; shs. after 6.40 p.m.	17
18			29.844																									Cloudy; a few shs.; occas. sunshine.	18
19			29.846																									Cloudy; freq. li. rain; hazy.	19
20			29.597																									Overcast; constant rain.	20
21			29.658																									Overcast; freq. drizz. to mod. r.; fog at times.	21
22			29.907																									Cloudy; shs. hld. abt. 11 a.m.; sunny intvs. dur. afternoon.	22
23			30.235																									Mostly showery; day fine, sunny at times; evening cloudy, hazy.	23
24			30.323																									Mostly cloudy; drizzly at times dur. day; evening clearer.	24
25			30.228																									Fine, sunny at times; sli. shs. about 3.45 p.m.	25
26			30.019																									Cloudy, with occas. sunshine; a few sli. shs.	26
27			29.845																									Cloudy; freq. li. shs. of sn., with sl. and soft hl. at times.	27
28			30.019																									Cloudy; freq. li. shs. of sn. and soft hl.	28
29			30.167																									Cloudy; occas. sli. shs.; sleety r. after 6 p.m.	29
30			30.192																									Cloudy; brisk sl. & sn. shs. at 11.15 a.m. and 2.30 p.m.; r. after 7 p.m.	30
31			30.126																									Cloudy, with occas. sunshine; shs. at 11.20 a.m. and 1.30 p.m.	31
Sums.																															
Means.																															
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. = ... — ..... = _____

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

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

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

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

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

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

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

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

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

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

Mean of all the Highest, ... = _____

Mean of all the Lowest, ... = _____

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

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

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, ... = _____

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

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

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

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

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

WIND. SUMMARY. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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 re[illegible] at 9 P.M.

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

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

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

ADDITIONAL REMARKS.

BOOK POST.

Leith
1907

THE SECRETARY,
Scottish Meteorological Society,
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EDINBURGH.