"METEOROLOGICAL MAGAZINE"

November 1944 - January 1945.

TRACING SOUND WAVES.

By A.H.R.Goldie

(reprinted from The Times of August 31st, 1944.)

The letters from Mr.U.V. Bogaerde and Captain Cave in The Times of August 10 and 14 under the heading "A Solar Phenomenon" have called forth a number of letters on optical phenomena seen recently in the sky. These letters relate in the main to mock suns, sun-rings or halos, produced in some cases in the remains of condensation trails formed by aircraft; and though some of the phenomena described are of types only rarely seen, the physical explanations of such phenomena are to be found in optical and meteorological textbooks.

One or two of the readers of The Times have, however, notified a new kind of phenomenon for the explanation of which the text-books will probably be searched in vain. Mrs. Charles Martin, writing from Boars Hill, Oxford, quotes an account of such an occurrence as given by her son an R.A.F. Officer stationed at an aerodrome in the south of England. It will be noted that the date is the same as that to which Mr. Bogaerde's observations relate and as it happens the date to which some recent correspondence related. He writes:- "Did you see the mysterious waves on Wednesday morning (August 9) ? It was a clear morning with a lot of very high "mare's tails", and in the north-west sky there was a bright band across the clouds from reflected sunlight. At intervals extraordinary ripples travelling at very high speed could be seen as they passed against the white cloud They were exactly the same as the waves made by bunging a stone in water and were similarly curved. The effect was as though one was standing under water and looking up at the surface into which pebbles were being thrown. The business went on for about an hour and was thoroughly intriguing".

Accounts from a number of meteorological observers, mostly near artillery ranges, make it fairly certain that phenomena of this type are connected with the sound waves from explosions, even though the sounds are not necessarily audible at ground level at the same time;

/and

and it now seems that the phenomenon is one which was observed on a few occasions in France during the last war, including one occasion by the present writer. There are two possible ways in which sound waves might influence optical phenomena.

Sound waves passing through the air involve alternate increases and decreased of pressure. The alternate compressions and expansions of the air produce alternate adiabatic rises and falls of temperature. If the ranges of the temperature changes were sufficient and if they did not take place too quickly the rises of temperature could evaporate cloud droplets already present in the air, and the falls of temperature could condense additional water from the air. In the ordinary way, however, no such evaporation or condensation effects could be seen, partly because of the speed with which the temperature changes take place, partly because the amplitude of the sound waves is, as a rule, much too small. It happens, however, that if the water-droplets are very small, as in thin newly forming clouds, they can increase or decrease appreciably by additional condensation or by evaporation during the short time of passage of a sound wave.

INTERFERENCE COLOURS

Now if solar or lunar optical phenomena depending on diffraction of light in water-droplets happen to be visible when a big explosion occurs, the sudden changes in size of the water-drops would cause corresponding changes in the interference colours to take place. In practice the eye could probably not detect colour changes taking place with the frequency of sound waves, but the observer would see rather a ripple of successive ripples of light and shade streak across the cloud. Some observers have, in fact, seen these ripples in clouds showing irridescent patches caused by diffraction of light in the minute water-droplets.

The other possible way in which sound waves could be rendered visible is in the class of optical phenomena depending on reflection or refraction of light rays through ice crystals floating in the air with their axes in the same direction, usually either horizontal or vertical, as in halos, horizontal sun-rings, mock suns, &c. Several observers have recently reported ripples as passing rapidly over such optical appearances.

The present writer also recalls a striking occasion in France during the last war when a lunar halo of 22 deg., a horizontal mock moonring, and a halo of 90 deg. were all visible. On the same evening

/enemy

enemy bombing set fire to an ammunition dump and the flames from this, as viewed by observers some 10 miles away, appeared - in consequence of the ice crystals in the upper air - as a tall pillar of light. The sound waves caused by the accompanying explosions were similarly rendered visible as dark waves sweeping up the column of light. The spectacle was truly amazing, and a staff officer of the British Fourth Army described it as the "Angel Gabriel crossing swords with the powers of darkness". Since in the ice crystal phenomena the optical effects depend on the exact direction of the axes of the crystals, it is probable that the ripples observed in such cases are the result of the momentary displacements caused in the lie of the crystal axes of the passage of the sound waves.

So even if the skies seem to tremble, they will not fall, nor is the trouble in the vision of the observer, it is only that the bangs of modern warfare have imposed an audio-frequency modulation on the waves of light in their passage through minute waterdroplets or ice crystals in the high atmosphere.

Sequences of Months with greatest mean Deviation.

In Prof. Notes No.77, Miss L.F.Lewis gives the periods of 1, 2... months with the greatest positive and negative mean deviations of temperature at Oxford during a period of 120 years. She also gives the standard deviations of the mean temperatures of the individual months. It occurred to me to compare the series of actual deviations with the maxima to be expected by chance, supposing that the frequency distribution in each month were normal and there was no persistence from one month to another.

The standard deviation of all 12 months taken singly is 2.67°F. The standard deviation of all possible combinations of n successive months is given by $2.67/\sqrt{n}$. The total number of possible combinations of n. months is 1441-n, but this can be taken with sufficient accuracy as 1440 throughout. Then the greatest positive and negative deviations to be expected by chance on the assumptions made are each 2·885 times the standard deviation of the series of n months.

The calculated and observed figures are as follows:-

/Number

Number of months.		1	2	3	4	5	6	7	8
Calculated max deviation	± °F.	7.71	5.47	4.45	3.85	3.45	3.16	2.87	2.73
Observed max deviation	+ °F	7.4	6.35	5.23	4.57	4.48	4.03	4.04	3.85
	-° F	11.0	8.4	6.27	5.05	4.54	4.40	4.24	4.04

		9	10	11	12	13	14	15
Calculated max deviation	± °F.	2.57	2.44	2.32	2.22	2.14	2.06	1.99
Observed max deviation	+ °F.	3.78	3.81	3.69	3.38	3.17	-	-
	- °F.	4.08	3.87	3.58	3.40	3.66	3.81	3.83

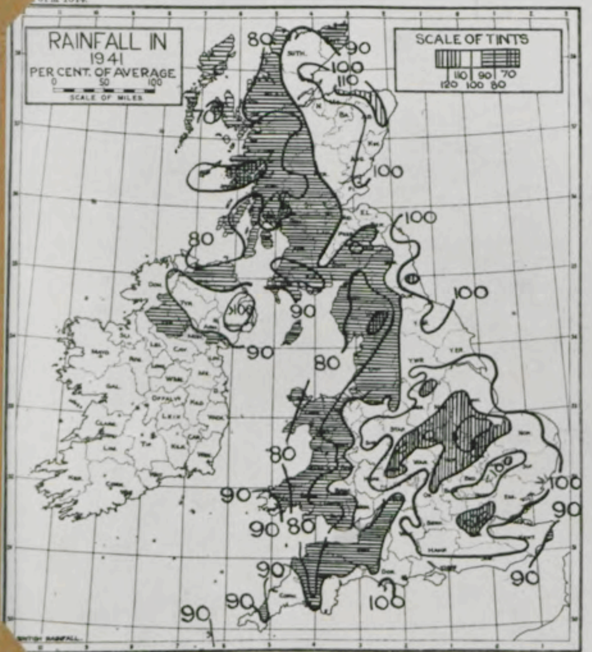
For one month the observed greatest positive deviation is slightly less than the calculated figure, but the greatest negative deviation is much greater. This is due to the skewness of the winter frequency distributions. For periods of 2 months upwards, both positive and negative maxima exceed expectations, obviously because a tendency for abnormal hot or cold weather to persist through several months.

The effect of the greater standard deviation and greater skewness of winter is shown in the increase of the maximum negative deviation for periods of more than 12 successive months, which include two winters.

The standard deviation of the mean of 12 months would be expected, from the monthly figures, to be .077°F. Actually it is 1·11°F. again showing that successive months and seasons are not independent. Adopting the figure of 1·11°F. we should expect the greatest positive and negative deviations in any one of 120 calender years to be ± 2.37°F. Those actually found were +2.44°F.(1921) and -3.38°F.(1879). On the other hand we should expect the greatest positive and negative deviations in any 12 successive months to be ± 3.12°F; those actually found were ± 3·38 (Aug.1821-July 1822) and -3·40 (Nov.1878-Oct.1879 and Dec.1878-Nov.1879).

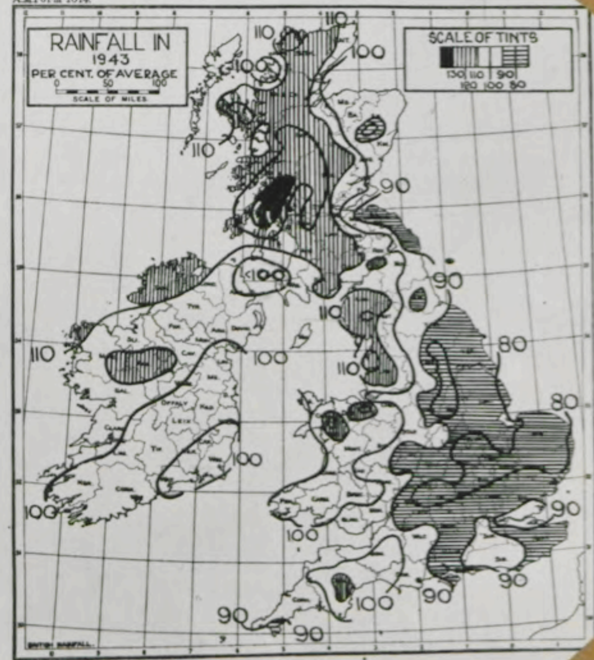
C.E.P.B.

orm 1014.



MINISTRY, METEOROLOGICAL OFFICE.

A.M.Form 1014.



AIR MINISTRY, METEOROLOGICAL OFFICE.

ANNUAL RAINFALL DISTRIBUTION OVER THE BRITISH ISLES AND PRESSURE GRADIENT (NORTH TO SOUTH).

In considering annual maps of rainfall 1868 to 1922 the extremes quoted by Salter and Glasspoole (1923) of (a) well developed orographical type (and steep pressure gradient) and of (b) subnormal orographical rains (and weak pressure gradients) were 1874 and 1919. It is of interest to note that the recent years 1943 and 1941 provide even better examples of these extremes. In 1943 the rainfall was above average in the west of Great Britain and below in the east. The distribution in 1941 is a complete contrast, with deficiencies in the west and excesses in the east.

In 1943 the deviations of pressure from normal at 7h varied from +0.3mb. at Stornoway to +3.1 mb. at Plymouth. The gradient for westerly winds was thus increased. In 1941 the deviations varied from -0.4mb. at Kew to +2.8 mb. at Stornoway. The mean pressure gradient was weak, winds from west were less frequent and those from north and east more frequent than usual. The percentage rainfall maps for 1941 and 1943 are reproduced separately for comparison.

J.Glasspoole.

Salter, C. and Glasspoole, J. 1923. The Fluctuations of annual rainfall in the British Isles considered cartographically. Q.J.R.Meteor.S., 49, 207.

The Effect of the Hours of Setting and Reading the minimum thermometer on the number of screen frosts.

The hourly readings of the dry bulb at Kew for the 10 years 1928 to 1937 were examined to find the numbers of screen frosts (273.0 A or less) which would have been counted had the "day" been taken over various intervals. The results were as follows(10 - year totals):-

1928-37	Jan.	Feb.	Mar.	Apr.	May	Oct.	Nov.	Dec.	Year
0-24h.	83	92	63	10	2	11	31	63	355
18-18h.	74	81	60	9	2	9	28	60	323
21-21h.	75	88	60	9	2	9	28	61	332
7-7h.	95	104	85	11	2	17	40	72	426
9-9h.	86	94	65	9	2	10	32	72	370
Night Frosts									
18-7h.	69	77	59	9	2	9	28	56	309
21-9h.	70	79	59	9	2	9	27	56	311

It is obvious from this table that reading and setting the minimum thermometer at 7h. gives an erroneous impression of the number of screen frosts. On several occasions in the 10 years 7h. was the only reading of 273.0 or less, yet this gave two days of frost. The remaining 24 hour periods are not violently discrepant. As would be expected, the "night frosts" give appreciably lower totals than the 24 hour totals.

To obtain a measure of the significance of the variations, the totals for the individual years are given below as differences from 0-24h. as a standard:-

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
0-24h.	24	64	26	43	31	44	36	21	32	34
18-18h.	-1	-4	-2	-6	-5	-4	-3	-3	-1	-3
21-21h.	0	-2	-2	-3	-5	-2	-2	-2	-1	-4
7-7h.	+2	+12	+9	+4	+6	+8	+11	+4	+7	+8
9-9h.	0	+3	+5	-4	+1	+4	+1	+3	+2	0
18-7h.	-1	-9	-3	-7	-5	-7	-3	-4	-3	-4
21-9h.	-1	-8	-3	-7	-5	-5	-3	-4	-3	-5

The means and standard deviations of the differences and the ratios of the means to the S.D.S. are as follows:-

	18-18	21-21	7-7	9-9	18-7	21-9
Mean	-3.2	-2.3	+7.1	+1.5	-4.6	-4.4
Standard deviations	1.54	1.35	3.01	2.42	2.29	1.96
Mean/S.D.	2.1	1.7	2.4	0.6	2.0	2.2

/If

If we adopt the Civil Day, 0-24h. as the standard to be aimed at we find that the best approach is given by 9-9h. which has the smallest mean difference but a relatively large "Scatter". This difference is barely significant. The next best approximation is given by 21-21h. which also shows the smallest "Scatter", in this case the difference is definitely significant, i.e. it is practically certain that in any other period of 10 years the number of frosts given by the combination 21-21h. would be less than that given by 0-24h.

The "night frosts", 18-7h. and 21-9h. are both significantly lower than the 0-24h. frosts, but it is reassuring to find that the difference between 18-7h. and 21-9h. is negligible, so that no discontinuity will be introduced by the projected change from the former to the latter.

An additional source of discrepancies is caused by the practice of reading minimum thermometers to whole degrees only. Then 32°F. comprises anything from 31.6 to 32.4°F. and includes readings which are definitely not "frosts". In such a case the best way to describe the readings is "32°F. or less", and not "frosts".

C.E.P.B.

RAIN FALLING FROM A CLEAR SKY.

With reference to the note on page 23 of this Magazine for August - October 1944, we have received the following correspondence:-

"The note by the Editor following Mr. Ashmore's letter dated 12th October, 1944, seems to need correction. The raindrops are assumed to fall from a height of 3 km. at the rate of 1m/sec, giving a time of fall of 3,000 seconds or 50 minutes. The wind speed is taken as being 50 m./sec. so that the horizontal distance travelled by the drops in falling would be 150 km, and the note goes on to say, "It is quite possible under these conditions for rain to fall at a place from which the clouds would not be visible". The distance travelled by the cloud while the raindrop is falling, is not however considered. If the wind speed and direction were the same all the way up from the ground to cloud level, the raindrop would remain vertically under the cloud during the fall, no matter what the cloud height or the wind velocity. If, as is usually the case, the wind at cloud level is not the same as the mean wind between the cloud level and the

/ground

ground, there will be a horizontal displacement of the drop relative to the cloud. This displacement will be proportional to the time of fall, and to the vector difference between the wind at cloud level and the mean wind in the layer of air traversed by the drop.

On the occasion in question the surface wind was of the order of 20 m./sec, and wind at the 700 mb. level (approximately 3 km) was about 30 m/sec. (not 50 m/sec. as assumed by the Editor). The vector difference of the winds affecting the cloud and the raindrops was thus of the order of 5m/sec. and the horizontal displacement of the drops relative to the cloud would be 15 kilometres, which is only one-tenth of the value given in the Editorial note. From that distance cloud at a height of 3 km. would subtend an angle of about 12 degrees and should thus have been visible. Moreover, until the very moment of cessation of rain at ground level, clouds from which the rain would reach the observer later would be visible at a higher angle of elevation. All that can be said is that under the conditions assumed there would be a lag of about 5 minutes between the time the rear edge of the precipitating cloud sheet passed overhead and the time of cessation of rain at the surface. Mr. Ashmore's observation of rain apparently falling from a clear sky for 15 minutes after all cloud had disappeared cannot therefore be accounted for in the manner proposed.

It is difficult, however, to suggest a reasonable alternative explanation. Has Mr. Ashmore any ideas of his own? "

E.G. Bilham.

The Editor misquotes Mr. Ashmore with regard to the rate of rainfall - it should be .01 in. per hour, not 0.1 in. per hour. It is doubtful whether his extrapolation of Lenard's table (Met. Glossary) into the region of such small rates is correct, since it seems from the table that the value of the most frequent drop size with slight rainfall is asymptotic to about 0.5 mm. diameter. The terminal velocity of such droplets is about 3 m/sec. and therefore the time taken to reach the ground from 3 km. would be about 17 minutes.

Mr. Bilham's point that the cloud as well as the rain is carried forward with the wind is, of course, correct; and with the wind values obtaining on this occasion the cloud producing the rain should certainly have been seen <u>if it had persisted</u>. The explanation of the effect must therefore be that the cloud, after it had produced the rain, dispersed. It has ample time to do so - on the Editor's assumption of drop size the time would be 50 minutes, and even the modified time suggested above, 17 minutes is still appreciable."

W.C.Swinbank.

*

"Yesterday, November 8th, rain actually did fall from a clear sky under conditions not covered by the explanation of the former occurrence. During the afternoon instability became evident, and cu. and some false ci. were observed, and from scattered patches of these clouds, light showers fell. At 1542 G.M.T. a similar light shower (not heavy enough to prevent people from remaining at work in the open) occurred from a completely cloudless sky except for small pieces of sc. around the horizon in most directions, of a maximum altitude of 10 degrees.

The wind was W. to WNW, and of force 2, although it became higher later, and squally conditions, with frequent hail, occurred all the evening".

S.E.Ashmore.

Mr. Bilham assumes that the rain-producing cloud travels with the speed of the air in which it is formed, and maintains its existance. This may have been so in the particular instance quoted by Mr. Ashmore but it is not necessarily true. In hilly country it often happens that clouds form at a particular point and either remain stationary with the wind blowing through them, or drift down wind dissolving rapidly. (It would be interesting to know the greatest distance for which a detached low cloud has been followed). The main point is that there is an appreciable interval between a raindrop leaving the cloud and striking the ground. Probably Mr. Swinbank's suggestion that during this interval the cloud dissipated is the correct explanation of most cases of rain from a clear sky.

The term serein is sometimes used for this phenomenon; the definition in the Meteorological Glossary is "Serein - Fine rain falling from an apparently clear sky. It is very rare".

It may be interesting to repeat a note from the Meteorological Magazine April 1923 which follows an account by Mr. H.L.Pace of rain from a clear sky.

"There is some doubt as to whether rain can be produced without

/the

the previous existence of clouds. Hellmann * believes that many if not all apparent cases are falls from clouds that have passed out of sight. Some books, e.g., Marriott's Hints, and the Meteorological Glossary state that the term "serein" is to be used for rain without clouds.≠ Hellmann makes it clear, however, that this is to perpetuate the misapprehension amongst French meteorologists of the older school as to the nature of dew. Serein (derived from the Latin "serum" - late in the day) was the old name for evening dew in contrast to rosée, morning dew.

Other accounts of the phenomenon are given in the Meteor.Mag. for September 1925 and December 1933.

---

* Classification of the Hydrometeors; trans. in U.S. Monthly Weather Review, July 1916 and Jan. 1917.
≠ The New English Dictionary quotes from Tyndall's Heat, 1870. § 495. "Reference to the original shows that in opposition to authors quoted by Melloni as attributing the "fine rain which sometimes falls in a clear sky after sunset" to radiation of the air, Tyndall attributes it to radiation from "the body itself, whose condensation produces the serein", i.e., presumably from water-vapour or incipient drops".

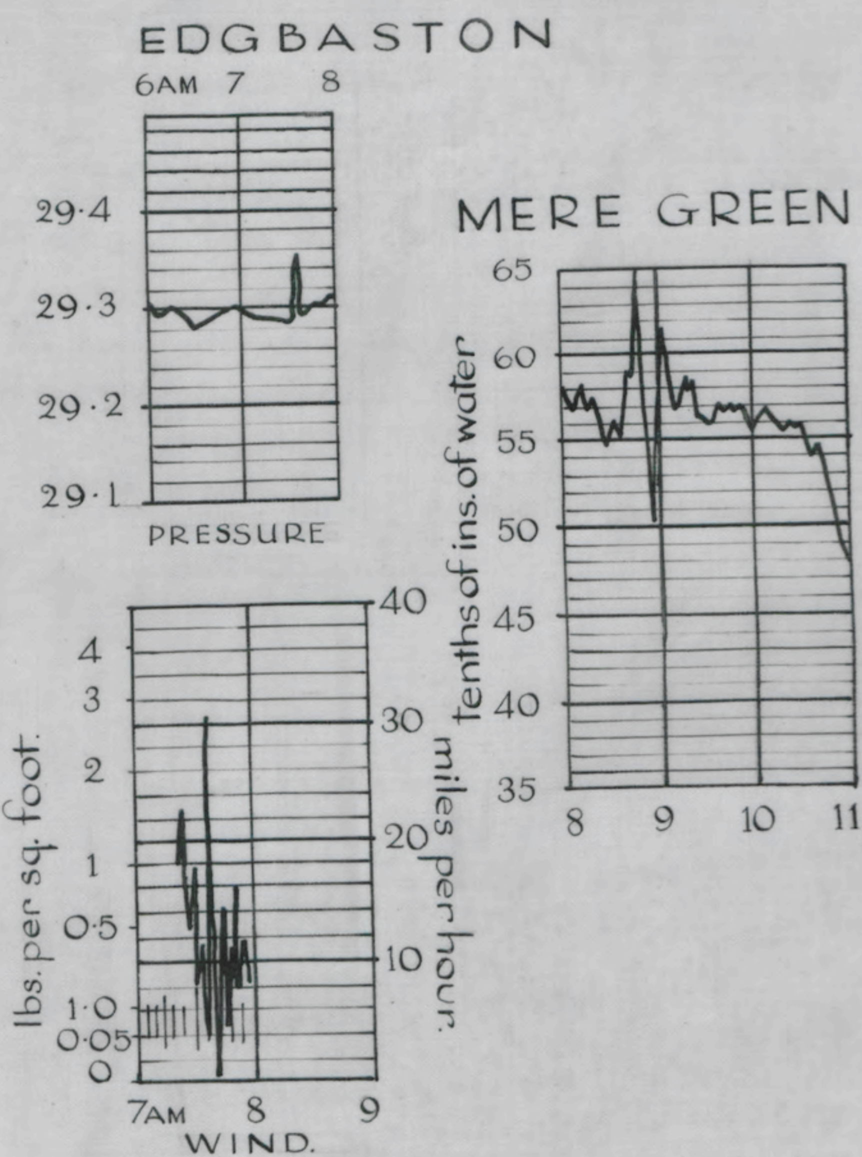
EVAPORATION FROST.

I should like to introduce a new term into Meteorology. It is "Evaporation Frost". This frost arises, or a frost, formed during the previous night, persists during the day in the shade, in dry windy weather when the temperature of the air is above 32°F. but the wet bulb temperature is at or below 32°F. This phenomenon occurred here today. At 1500 G.M.T. the wind was NNW. force 2 to 3, weather bc and the dry and wet bulb temperatures, as given by an Assmann Psychrometer held at about 2 feet above the ground, 35.5°F. and 32.0 °F. respectively, giving a relative humidity of 67.5 per cent.

J.E. Belasco.

Stowhouse.

4.1.45



EDGBASTON
6AM 7 8
29·4
29·3
29·2
29·1
PRESSURE
MERE GREEN
65
60
55
50
45
40
35
tenths of ins. of water
8 9 10 11
40
30
20
10
miles per hour.
lbs. per sq. foot.
4
3
2
1
0·5
1·0
0·05
0
7AM 8 9
WIND.

A NOTE ON THE PRESSURE IRREGULARITY AT BIRMINGHAM ON AUGUST 23rd, 1944.

The pressure irregularity was due to a fast moving disturbance aloft, but owing to its local character the upper air information is insufficient for any complete understanding of its character. The pressure and wind discontinuity passed London at 0635h., Dunstable at 0700h., Cardington at 0730h., and Birmingham at 0740h. At Birmingham there was a squall of 30 m.p.h. from S.W. and the front had evidently advanced faster at its western end, near the area of heavy rain and of strongest upper winds. The average speed of the front for two hours was about 35-40 m.p.h. in the east and 40-45 m.p.h. in the west.

It is not clear why the Birmingham barograph had so sharp a fall immediately after the rise. A thunder shower quite frequently causes a very temporary rise of pressure, sometimes over a millibar, with a return to the original pressure as soon as the shower has past. The other abnormal feature of the trace at Edgbaston is the brevity of the passage of the whole disturbance, which was due to its high speed. As there was a squall of 30 m.p.h. from S.W. at Edgbaston the shear between 3,000 and 1,200 ft. was probably less than further south, allowing a narrow wall of air cooled by the shower to persist for long enough to give a trace of the type recorded. The air pressure curve on the lower right hand side of the Birmingham Gas Department's set of curves is quite different from the Edgbaston curve, and the curves of gas pressure show great diversity. (See accompanying illustration).

* There ~~was~~ were also remarkable pressure fluctuations in East Anglia the following night and again in East Anglia and the Midlands in the next afternoon August 24th. The pressure irregularities on both days were associated with instability high up in the S.S.E. current. The sudden rise may be attributed mainly to cooling by evaporation below the clouds, possibly assisted by melting of snow at about 10,000 to 12,000ft. The falls on the 24th must have been due to small high-level depressions formed as the result of the release of latent heat in conditions of instability for saturated air. The detailed features of the Birmingham barograph trace were purely local and there is no direct evidence as to the precise atmospheric structure which produced them.

AN UNUSUAL CLOUD FORMATION.

The accompanying photograph is contributed by the Meteorological Officer, Millom, Cumberland.

The cloud is the eddy type known as "Contessa del vento" frequently formed to the lee side of isolated mountains. It is often observed over Mt.Etna with a westerly wind. This cloud type was observed at Millom on the evenings of June 19th and 20th, 1944; the photograph was taken on June 20th. The synoptic situation on the day was as follows:-

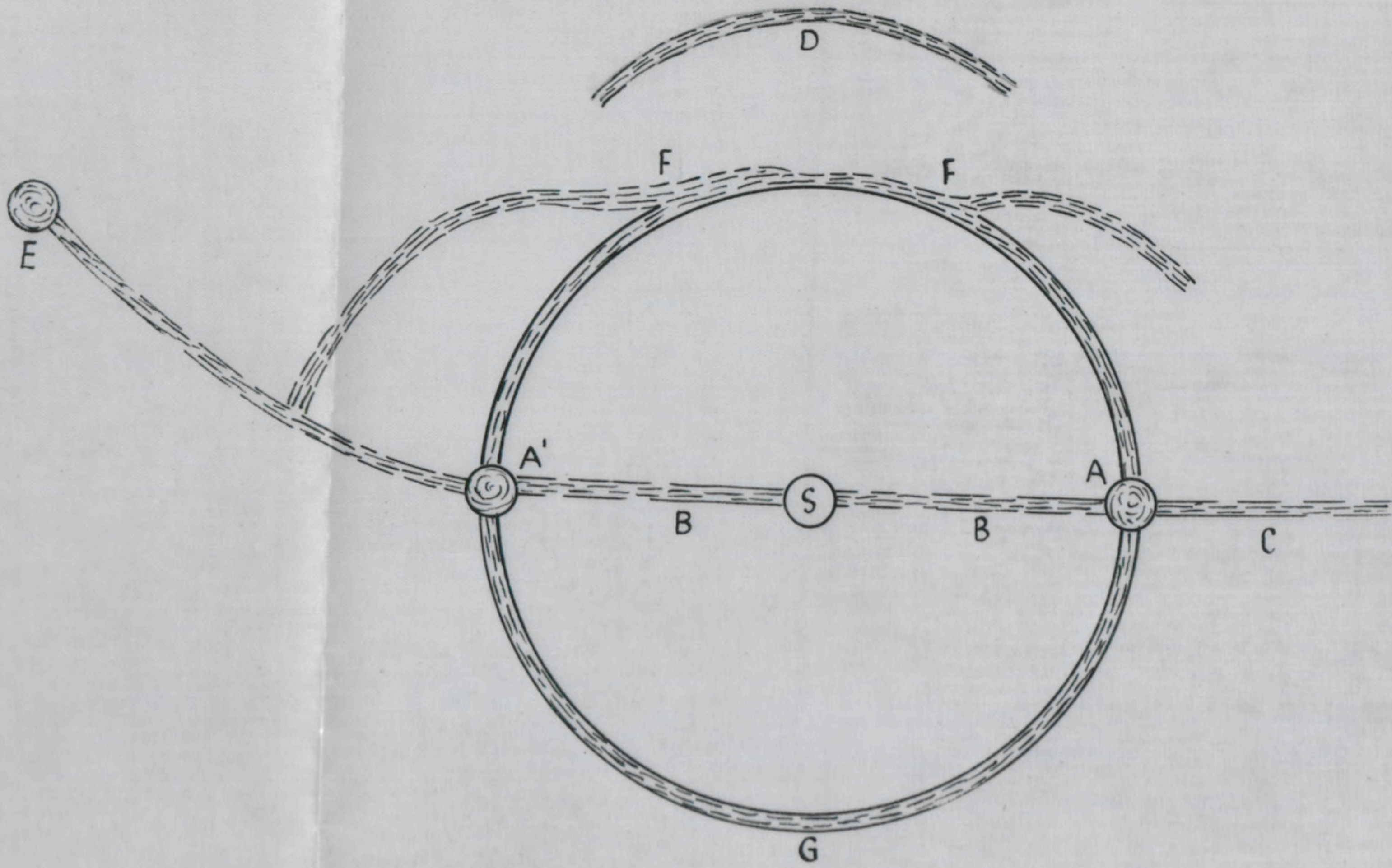
"Anticyclone centred W. and later NW. of the B.Isles. Feeble frontal system moving SE. across N.Scotland and N.Sea. Gradient at Millom ENE with air of relatively low humidity and potentially unstable above 700 mbs."

"By 1900 hrs, the easterly gradient having increased the sea breeze dropped and a land wind resumed with a marked drop in humidity from 72% to 55%. Cumulus dispersed within an hour leaving altocumulus and later the formation illustrated."

Con~~d~~tessa del Vento Cloud

Millom, Cumberland

June 20th 1944



Halo Complex observed at Heacham, March 7, 1940

AN INTERESTING HALO COMPLEX.

At 11.15 a.m. on March 7th, 1940, I was sitting on the beach at Heacham, on the north-west coast of Norfolk when I noticed that a halo had formed round the sun. It was a bright sunny morning, and there was little cloud, but a thin mist partially shaded the sun. Two mock suns appeared in a straight line to right and left of the sun, at A.A.' Very soon afterwards a straight band of light extended across the centre of the halo B.B. extending on the right of the halo to C. A little later a secondary portion of a circle appeared above the halo D. Then to the left of the halo the band of light across the sun extended an arm in a slightly upward curve from A' to E where another mock sun appeared. This was at about the same distance which divided the two mock suns at A.A'. Shortly afterwards at the top of the halo and extending to right and left, horns F.F. appeared. That on the right extended slightly beyond the halo. The horn on the left had, by 11.20, contacted with the band of light curving upwards to E. A little later a bright glow of light began to appear at a point directly beneath the sun G. but though it seemed that yet another mock sun might develop here, this did not materialise.

The whole phenomenon lasted brightly until 1.30 when it gradually faded out. Unfortunately the sun was at all times too bright to enable me to secure a photograph.

B.C. Tillett.

Mr. E.W.Cooper identified the elements as follows:

AA Parhelia of 22° halo.
FF Upper arc of contact
C Parhelic circle
D Parry's arc
E Parhelion of 46° halo.

If the identification of D is correct the record is of great interest as Parry's arcs are very rare. Unfortunately some doubt exists. With the sun at 30° altitude, the upper arc of contact intersects the parhelic circle at about 40° from the sun, i.e., much nearer the 46° mock sun than is shown. If the point of intersection is correctly shown, D on the same scale would be about 40° from the sun which is incorrect for Parry's upper arc. I think it more probable that D is the ordinary 46o halo. Nevertheless the complex is worth putting on record.

C.E.P.B.

AN AMUSING PARALLEL.

The following passage might have been extracted from the work of any philosophical climatologist. "Now, just as the climatologist in his study of the.... classification of types is aiming at the discovery of homogeneous climates, so in his geographical work he tries to discover the extent in space of each climate, its frontiers and its points of contact with other climates... He is concerned with climates immobile, mobile and impinging. When considering the immobile aspects of a climate, he is concerned with the area occupied, the geographical influences of environment which determine the selection and frontiers of that area, and the shifting 'centres of gravity' during different epochs. To discover the area occupied by the climate he must select something which would not as a rule vary greatly...On the other hand there is a danger in applying rigid mathematical tests for they may fail to include obvious examples, and may include others which do not belong".

Actually this was copied almost verbatim from "Man and his past" by O.G. . Crawford. Crawford is writing of the necessity for mapping the distribution of prehistoric cultures; all that has been done is to substitute "climate" for "culture" wherever it occurs. Other words, such as "periodicity" could equally well have been substituted.

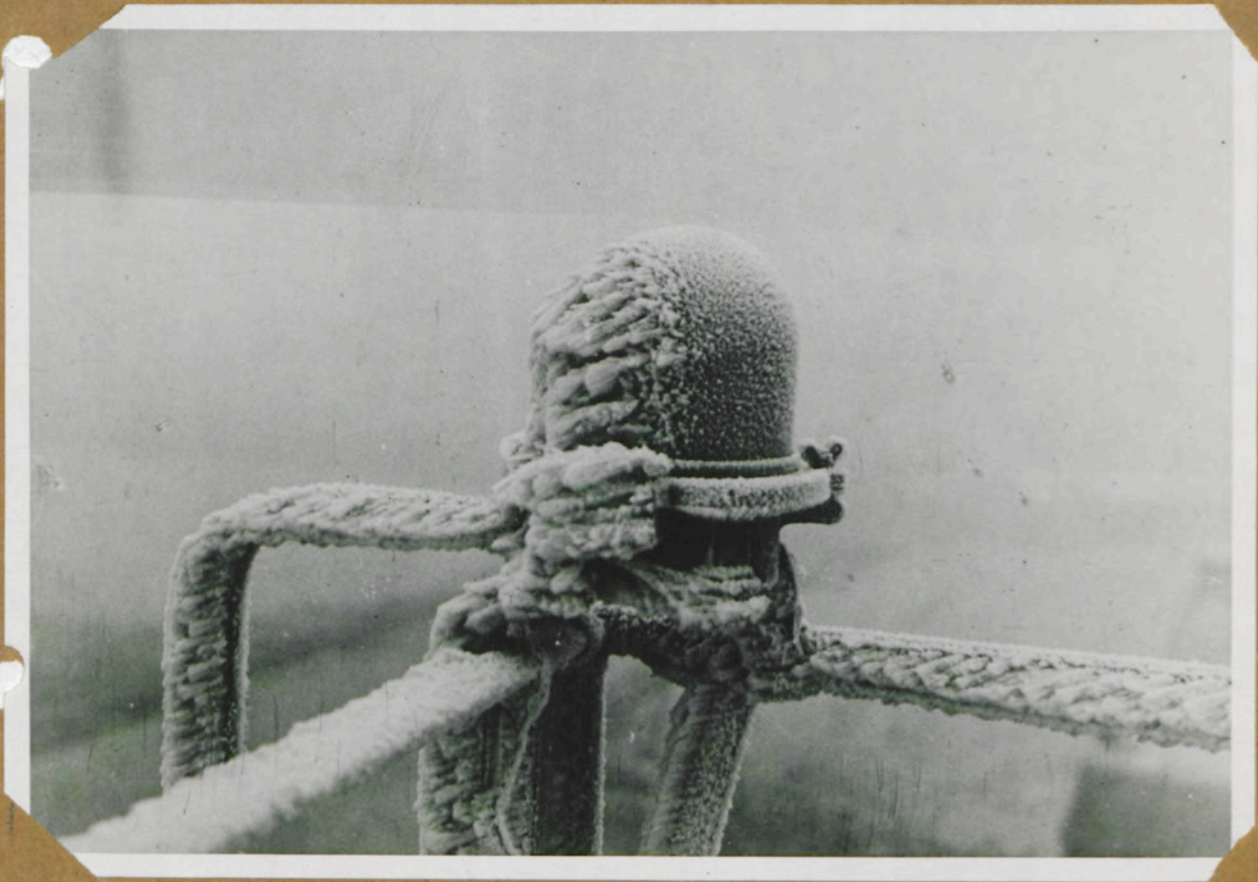
DEPOSIT OF RIME AT THE END OF DECEMBER, 1944.

The accompanying photographs were forwarded by the Meteorological Officer, Lasham, Hants; the photographs, which show the deposit on pieces of equipment on the roof, were taken between 1030 and 1100 hrs. on December 26th.

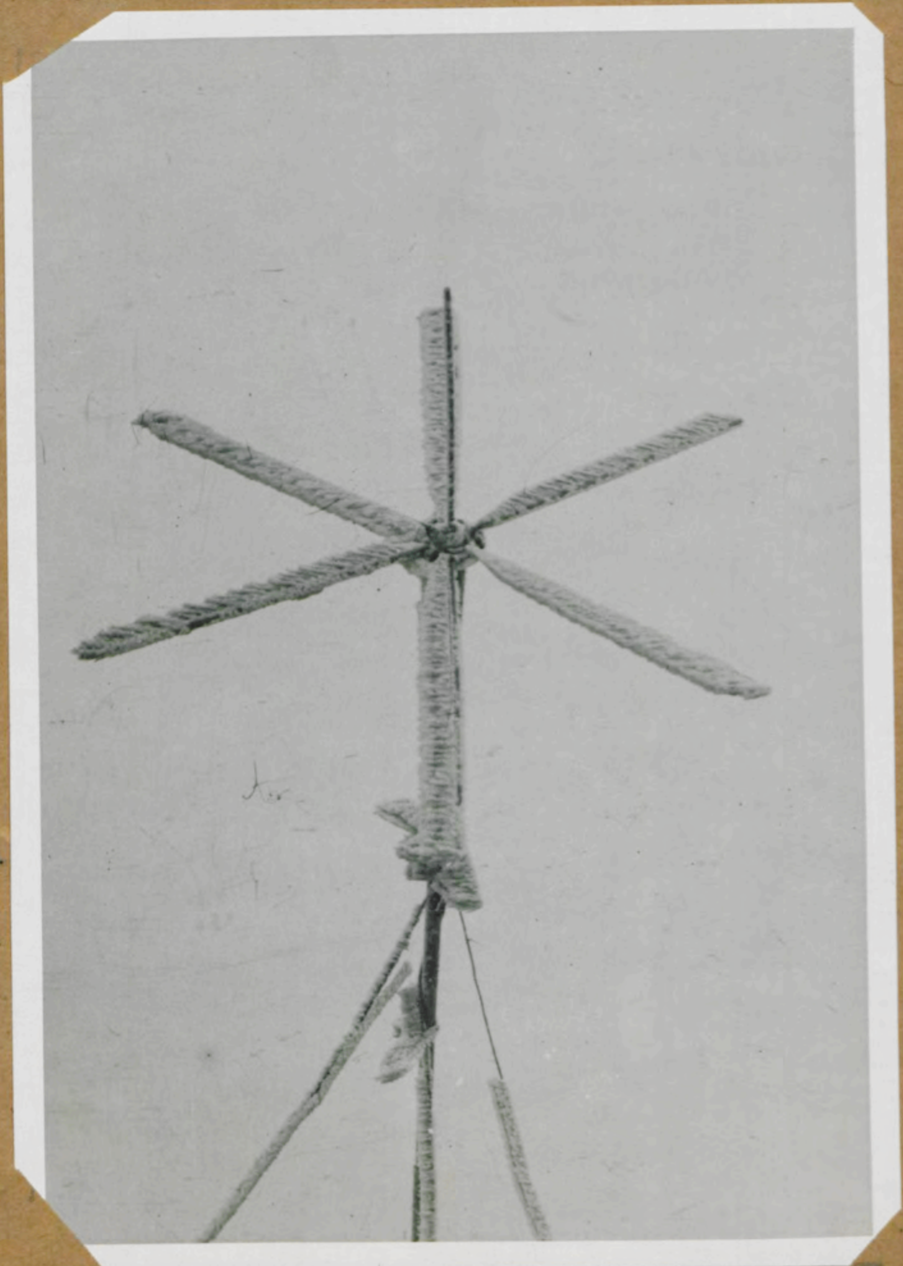
"Conditions at the time were, - Fog, (visibility less than 50 yds) - obscuring the sky; wind, light NE-E'ly. Conditions during the night 25/26th had been, - fog, with no cloud above a minimum air temperature of 19 deg.F. was recorded at the nearest neighbouring station; wind throughout the night was light NE.-E'ly. not exceeding 12 m.p.h.

All natural objects, - trees, hedges, grass, etc. - were similarly heavily coated. Individual blades of grass took on a circular sectioned deposit of ½ inch diameter. The deposit measured on a 1-inch iron rail round the roof was 2½ inches thick.

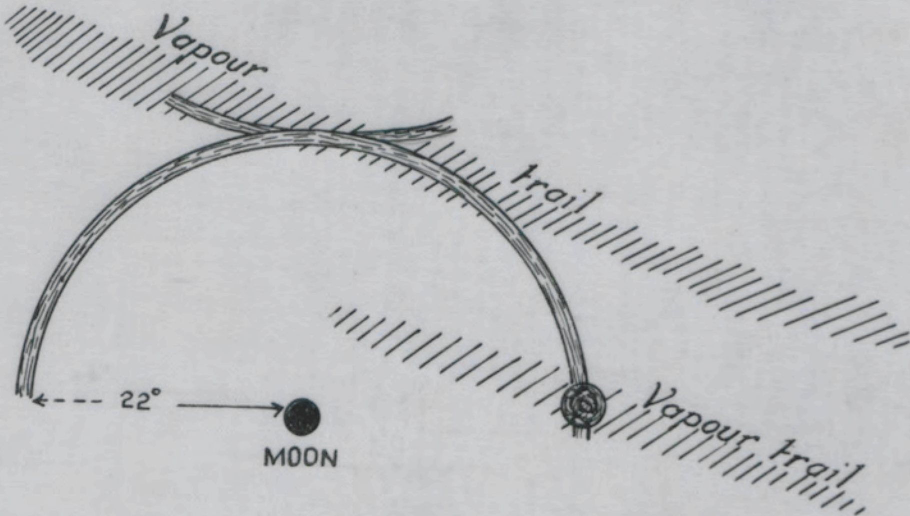
/There



Lasham (Hants) 26.12.44.



Lasham (Hants) 26.12.44.



Lunar Halo observed at Earls Colne Nov. 29th 1944

There have been lesser deposits on subsequent nights, and the deposit as a whole persists to-day 29/12/44, especially on the ground, where it resembles frozen snow to a depth of approx. 1 inch. There has definitely been no snow, sleet or hail during the period".

PARASELENAE

PARASELENAE

Very bright paraselenae were observed at Henllan, a village west of Denbigh, on December 28, 1944. They were first noticed at 18h. 29m. G.M.T. when the writer came out of a house, and they remained visible for 40 minutes. The moon was very bright, a day before being full: it was dead calm, and the air temperature at 4 feet was about 25°. The cloud responsible for the display was quite invisible. The clarity of the parhelia was variable, and for brief intervals, one or the other would be nearly invisible. The only accompanying phenomenon was a part of the paraselenic circle extending a few degrees on either side of the moon.

S.E.Ashmore.

LUNAR HALO ON NOVEMBER 29th, 1944.

The accompanying sketch of a lunar halo in slight stratus and vapour trails is contributed by Mr. H.V.Sims of Earls Colne, Essex.

HALO PHENOMENA OBSERVED NEAR HOLYHEAD ON AUGUST 7th, 1944.

I have received a report of unusual optical phenomena from Mr. Jack Williams, 14 Jarman Avenue, Wrexham. He was at Trearddur Bay, near Holyhead on August 7th, and observed what is depicted roughly on the accompanying sketch. Unfortunately the data are scanty: to begin with he had no means of taking notes, and the time of day, and whether the arcs were coloured, is not known.

A is the ordinary 22° halo with both parhelia. B and C, as far as I gather, appear to be in such a position that they may be the supralateral and infralateral areas of contact of 46° respectively. The shaded portion D, curiously enough, was an aircraft trail which joined exactly on to the end of the arc C.

I am told that the display was evident enough to attract the notice of people on the beach. Trearddur is very near to Holyhead Observatory, and you may like to compare this note with any report which may come from the Observatory.

S.E.Ashmore.

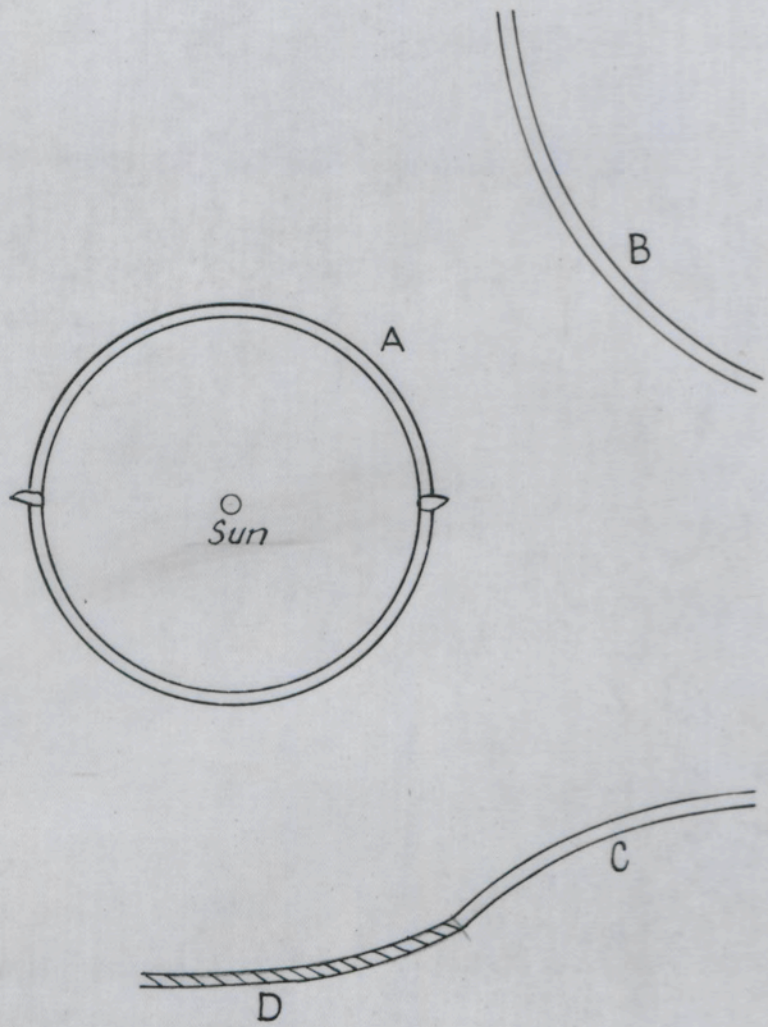
NOTE: The halo was not observed at Holyhead or Valley and the Meteorological Officer suggests that it was possibly ~~observed~~ obscured by medium cloud.

METEOROLOGICAL STATIONS.

With reference to the note on page 8 of this Magazine for October-November 1943, the number of new stations ~~allowed~~ approved for inclusion in the Monthly Weather Report for 1945 is not large, but the numerous inquiries from Public bodies and from private observers about the installation of climatological stations shows that the general interest in meteorology is growing. Correspondence shows also that a large number of rainfall observers maintain small climatological stations and that a number of people are taking observations regularly and systematically although the equipment is not always of the approved type. In some cases well equipped stations are maintained in ~~arrears~~ areas already well represented.

A new crop-weather station at Aylesbury (Bucks W.A.E.C.) has been officially approved and a new climatological station at Wilmington, ~~Glenchome~~ Glasshouse Demonstration Station (Kent Education Committee).

/The



Halo phenomena observed near Holyhead on August 7th 1944

The health resort stations at Tintagel and Perranporth have been closed owing to difficulties in finding observers; the climatological station at Tottenham has been closed as the site has been requisitioned; it is hoped that all these stations will re-open after the war.

Miss Purch

The climatological station at Castleton has ceased as ~~this Parish~~ is unable to secure the services of an observer; it is hoped that the instruments, which are the property of the Royal Meteorological Society, will be utilised at another station.

The climatological station at Hankham has ceased as the site has been requisitioned; Mr. A.E.Moon hopes to set up the station elsewhere in Sussex in the near future.

Mr. G.B.Hamlin, who has maintained a series of stations for some 40 years, was unable to continue the climatological station at Patcham; but after a short break he resumed daily observations at 13h. G.M.T. and continues to take a keen interest in meteorology.

The climatological station at Horsham has ceased temporarily as the observer Mr. John L.Bennett is in training; the rainfall record is being maintained by Miss Bennett.

The sunshine recorder at Hastings, and the building on which it was situated were destroyed by enemy action in July 1944, five minutes after the observer had changed the card. A new recorder has been obtained but is not yet installed.*

Stonyhurst College, which has contributed one of the longest series of meteorological records, celebrated the 150th anniversary on August 29th, 1944 and the Director, Father J.P.Rowland celebrated on September 9th his golden jubilee as a Jesuit and his Silver Jubilee as a member of the Stonyhurst Observatory Staff.

---

* Records resumed 1.1.45.

OBITUARY.

J.Edmund Clark.

It is with much regret that we learn of the death in December 1944 of Mr. J.Edmund Clark at the age of 94. Mr. Clark forwarded rainfall records to this office from Croydon (1900-1904), Purley (1905-1929) and from Street, Somerset, (1929 to 1943).

He was responsible for the Phenological Reports of the Royal Meteorological Society for several years, contributed papers on the climate and rainfall of York and numerous notes to this magazine on a wide range of subjects.

Mr. Clark's brother, the late Mr. W.G.Clark, commenced rainfall records at Street in 1857 and maintained a record of 69 years which must surely be unique.

Major General Sir Edward Broadbent.

It is with much regret that we learn of the death of Major-Gen. Sir Edward Broadbent, K.B.E., C.B., C.M.G., D.S.O., which occurred suddenly at his home, Beaufort House, Winchester, on June ~~21st~~ 18th, 1944. Sir Edward first became associated with this Office in 1939, when he took over the work of recording rainfall from an observer who had maintained a station for many years at Winchester. In addition to observing rainfall, he took other meteorological observations and was a regular contributor to the "Hampshire Chronicle" on this subject.

The meteorological equipment has now been taken over by Mr. F.E.Box, who formerly had a rainfall station at Guildford and now resides at Winchester.

J. Edmund Clark

1935