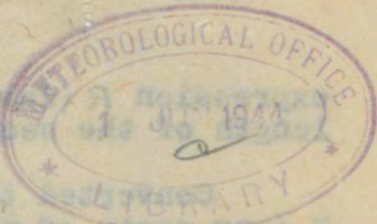


VIB 2

"METEOROLOGICAL MAGAZINE"



March - April 1944.

A note on the maximum falls in a day at Camden Square.

Dr. Glasspoole lent me a record of the maximum fall in a rainfall day at Camden Square in each year from 1860 to 1942, and a study of this brought out a few curious points.

The mean of the whole series is ^{1.31}~~1.26~~ inches, the distribution being as follows:-

.61-.77	.71-.8	.81-.9	.91-1.0
2	4	7	9
1.01-1.1	1.11-1.2	1.21-1.3	1.31-1.4
14	4	4	10
1.41-1.5	1.51-1.6	1.61-1.7	1.71-1.8
12	5	21	44
1.81-2.0	2.01-2.5	2.51-3.0	3.01-3.5
13	2	2	1

There is thus a double mode, at about 1.02 and 1.41. It appears as if the frequency curve is made up of two quite separate sets of maxima, one from the minimum of 0.67 to 1.3 and the other from about 1.2 upwards to the maximum of 3.26. This may be due to the selectiveness of the data; if all falls exceeding 0.6 inch in the 83 years had been included, there would probably have been a smoother decline in frequency from the lower to the higher values of rainfall.

The record was also used to determine the last of increase of daily maxima as the record lengthens. The first 80 years were divided into sections of 1, 5, 10, 20, 40 and 80 years and the mean maxima in each section were found to be as follows:-

Length of section. yrs.	1	5	10	20	40	80
mean maximum ins.	1.22 1.31	1.89	2.25	2.50	3.07	3.28

These can be represented approximately by the

FGS St 27

/expression

expression $R(\text{ins}) = 1.12 + 1.07 \log Y$ where Y is the length of the section in years.

Converted to percentages, this gives 53 47
 R (per cent. of maximum once in 10 years) + ~~53~~ + ~~47~~
 $\log Y$. Corresponding expressions for other countries are:

Holland $R = 56 + 44 \log Y$
 N.Germany $R = 46 + 54 \log Y$
 Ceylon $R = 58 + 42 \log Y$

As an approximate guide, it seems that we can take with some confidence, for any part of the world, the rule that the maximum rainfall to be expected in a day once in Y years is equal to half the maximum once in 10 years plus half the logarithm of Y.

4.1-10.1	8.1-12.1	12.1-16.1	16.1-20.1
10	10	10	10
8.1-10.1	10.1-12.1	12.1-14.1	14.1-16.1
10	10	10	10
10.1-12.1	12.1-14.1	14.1-16.1	16.1-18.1
10	10	10	10
12.1-14.1	14.1-16.1	16.1-18.1	18.1-20.1
10	10	10	10

C.E.P.B.

There is then a double mode, at about 1.4 and 1.6. It appears as if the frequency curve is made up of two quite separate sets of maxima, and from the minimum of 0.57 to 1.5 and the other from about 1.5 upwards to the maximum of 2.0. This may be due to the selection of the data; if all falls exceeding 0.6 inch in the 25 years had been included, there would probably have been a separate section in frequency from the lower to the higher values of rainfall.

The record was also used to determine the least of intervals of daily maxima as the record length. The first 50 years were divided into sections of 1, 5, 10, 20, 40 and 50 years and the mean maxima in each section were found to be as follows:-

Length of section, yrs.	1	5	10	20	40	50
Mean maxima ins.	1.31	1.33	1.35	1.36	1.37	1.38

These can be represented approximately by the

55 12 1207

SOME DETAILS OF THE RECENT DROUGHT OVER

ENGLAND AND WALES

- 1) It is apparent from the table given below (in which the general monthly rainfall over England and Wales is expressed as a percentage of the average), that dry months predominated during the period of 37 months commencing with April 1941.

On the 37 months as many as 22 gave less than the average.

Monthly percentage values of rainfall over England and Wales January 1941 - April, 1944.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1941	125	161	138	75	108	57	94	147	36	82	98	53	96
1942	147	50	101	77	177	30	100	104	107	100	55	107	94
1943	209	70	38	68	142	94	79	97	133	86	80	54	94
1944	104	71	105 101	105									

- * 2) The most striking feature of the rainfall of recent years, with far-reaching effect on water supply, is the change over from wet to dry winters. In the second table values are given for the winter and summer half years separately. Whereas the mean of the rainfall for the last three winters was 85 per cent, the previous seven winters gave 118 per cent.

Percentage values for winter and summer half years and for seasonal years Oct. 1934-Mar. 1944.

Seasonal Year	Winter Oct.-Mar.	Summer Apr.-Sept.	Year Oct.-Sept.
1934-1935	102	113	107
1935-1936	131	111	122
1936-1937	128	93	112
1937-1938	81	91	86
1938-1939	130	98	115
1939-1940	119	76	99
1940-1941	134	89	113
1941-1942	87	99	92
1942-1943	97	102	99
1943-1944	70		

- 3) The winter of 1943-44 gave 13.81 in. or 5.80 in. less than the average and there have only been two drier winters in the series since 1869 viz., the winter of 1879-80 with 10.6 in. and that of 1890-91 with 13.0 in.

Over England and Wales as a whole, the rainfall for the winter of 1943-44 was deficient everywhere with the exception of a small region in North Wales, which recorded a little more than the average. Apart from this region and another over the valley of the Ribble in Lancashire, values were less than 90 per cent. The driest regions, with less than 60 per cent. of the normal occurred in south-west and south-east England and over a wide area from the Fen District and Essex. in the east to Carmarthenshire in the west, which included much of the valleys of the Thames and Great Ouse and part of the mountains of South Wales.

- 4) The 36 months from April 1941 to March 1944 gave a deficiency in all parts of England and Wales, especially in the south and north-east and over part of the east Midlands where considerable areas received less than 90 per cent. of the average amount for 36 months.

H.R.

Year	1941-42	1942-43	1943-44	1944-45
1941-42	107	112	108	107
1942-43	122	111	101	107
1943-44	112	88	101	107
1944-45	88	88	81	107
1945-46	107	88	101	107
1946-47	112	88	101	107
1947-48	107	88	101	107
1948-49	112	88	101	107
1949-50	107	88	101	107
1950-51	112	88	101	107
1951-52	107	88	101	107
1952-53	112	88	101	107
1953-54	107	88	101	107
1954-55	112	88	101	107
1955-56	107	88	101	107
1956-57	112	88	101	107
1957-58	107	88	101	107
1958-59	112	88	101	107
1959-60	107	88	101	107
1960-61	112	88	101	107
1961-62	107	88	101	107
1962-63	112	88	101	107
1963-64	107	88	101	107
1964-65	112	88	101	107
1965-66	107	88	101	107
1966-67	112	88	101	107
1967-68	107	88	101	107
1968-69	112	88	101	107
1969-70	107	88	101	107
1970-71	112	88	101	107
1971-72	107	88	101	107
1972-73	112	88	101	107
1973-74	107	88	101	107
1974-75	112	88	101	107
1975-76	107	88	101	107
1976-77	112	88	101	107
1977-78	107	88	101	107
1978-79	112	88	101	107
1979-80	107	88	101	107
1980-81	112	88	101	107
1981-82	107	88	101	107
1982-83	112	88	101	107
1983-84	107	88	101	107
1984-85	112	88	101	107
1985-86	107	88	101	107
1986-87	112	88	101	107
1987-88	107	88	101	107
1988-89	112	88	101	107
1989-90	107	88	101	107
1990-91	112	88	101	107
1991-92	107	88	101	107
1992-93	112	88	101	107
1993-94	107	88	101	107
1994-95	112	88	101	107
1995-96	107	88	101	107
1996-97	112	88	101	107
1997-98	107	88	101	107
1998-99	112	88	101	107
1999-00	107	88	101	107
2000-01	112	88	101	107
2001-02	107	88	101	107
2002-03	112	88	101	107
2003-04	107	88	101	107
2004-05	112	88	101	107
2005-06	107	88	101	107
2006-07	112	88	101	107
2007-08	107	88	101	107
2008-09	112	88	101	107
2009-10	107	88	101	107
2010-11	112	88	101	107
2011-12	107	88	101	107
2012-13	112	88	101	107
2013-14	107	88	101	107
2014-15	112	88	101	107
2015-16	107	88	101	107
2016-17	112	88	101	107
2017-18	107	88	101	107
2018-19	112	88	101	107
2019-20	107	88	101	107
2020-21	112	88	101	107
2021-22	107	88	101	107
2022-23	112	88	101	107
2023-24	107	88	101	107
2024-25	112	88	101	107
2025-26	107	88	101	107
2026-27	112	88	101	107
2027-28	107	88	101	107
2028-29	112	88	101	107
2029-30	107	88	101	107
2030-31	112	88	101	107
2031-32	107	88	101	107
2032-33	112	88	101	107
2033-34	107	88	101	107
2034-35	112	88	101	107
2035-36	107	88	101	107
2036-37	112	88	101	107
2037-38	107	88	101	107
2038-39	112	88	101	107
2039-40	107	88	101	107
2040-41	112	88	101	107
2041-42	107	88	101	107
2042-43	112	88	101	107
2043-44	107	88	101	107
2044-45	112	88	101	107
2045-46	107	88	101	107
2046-47	112	88	101	107
2047-48	107	88	101	107
2048-49	112	88	101	107
2049-50	107	88	101	107
2050-51	112	88	101	107
2051-52	107	88	101	107
2052-53	112	88	101	107
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2062-63	112	88	101	107
2063-64	107	88	101	107
2064-65	112	88	101	107
2065-66	107	88	101	107
2066-67	112	88	101	107
2067-68	107	88	101	107
2068-69	112	88	101	107
2069-70	107	88	101	107
2070-71	112	88	101	107
2071-72	107	88	101	107
2072-73	112	88	101	107
2073-74	107	88	101	107
2074-75	112	88	101	107
2075-76	107	88	101	107
2076-77	112	88	101	107
2077-78	107	88	101	107
2078-79	112	88	101	107
2079-80	107	88	101	107
2080-81	112	88	101	107
2081-82	107	88	101	107
2082-83	112	88	101	107
2083-84	107	88	101	107
2084-85	112	88	101	107
2085-86	107	88	101	107
2086-87	112	88	101	107
2087-88	107	88	101	107
2088-89	112	88	101	107
2089-90	107	88	101	107
2090-91	112	88	101	107
2091-92	107	88	101	107
2092-93	112	88	101	107
2093-94	107	88	101	107
2094-95	112	88	101	107
2095-96	107	88	101	107
2096-97	112	88	101	107
2097-98	107	88	101	107
2098-99	112	88	101	107
2099-00	107	88	101	107
2100-01	112	88	101	107

Snow Storms of February 26th - March 4th 1944
in Scotland.

The heaviest snowstorms of the 1943-44 winter occurred between February 26th and March 4th. Sleet or snow fell on every day during this week but the outstandingly heavy falls were on Saturday February 26th and Wednesday March 1st.

A trough of low pressure over the North of England and Southern Ireland on the morning of February 26th brought cold northerly winds and heavy falls of snow to most Scottish districts. Over Deeside there were 8 or 9 inches on the 26th and frequent snow showers all day on the 27th. There was a good deal of drifting in Skye and also in North Argyll where farmers and crofters had an anxious time on the hills rescuing sheep from deep drifts. Many lambs perished. Roads in Glencoe and Glenorchy were blocked.

The snow was even heavier in the north. Drifts were 6 to 12 feet deep in Caithness and for miles snow was level with the hedges. All roads in the county became blocked. It was one of the worst storms of recent years in Caithness. Heavy falls also occurred in the South of Scotland and, indeed, over most of England. There was a great deal of snow or sleet in Edinburgh, but it was just possible to clear the Murrayfield Rugby ground in time for the Services International on the afternoon of the 26th. Widely scattered showers occurred between the 27th and 29th but these added little to the accumulated snow depth, except in Sutherland where the fall on the 29th was considerable.

On March 1st, with low pressure to the northeast of the British Isles and high pressure to the southwest, very wintry conditions again spread over Scotland. In Shetland and on the western seaboard, Northwesterly winds rose to gale force. Snow fell in all districts but in varying amount. Thus in Shetland snow showers were frequent but not severe and this was also the case at Fort William. In Lanark and Ayrshire there were only slight or moderate falls and these caused little or no inconvenience. On the other hand, the fall in the neighbourhood of Lairg, Sutherland was so heavy that by evening on the 1st

snow wreaths were piled up to a depth of about 30 feet in some places. In Caithness 4 to 5 feet of snow were reported, and in places 7 feet. All roads were blocked and some districts in the centre of the county were cut off for a week. Telephonic communications were interrupted and the Lybster train was marooned. About 40 passengers spent a night in another snowed-up train on the Aberdeen-Macduff line. In the Glenmuick area of Aberdeenshire there was about 10 inches (undrifted) snow and the road over the Devil's Elbow from Braemar was blocked.

In most years comparatively little snow is seen in the low lying western Isles. The falls of March 1st and 2nd were exceptional for these islands, and in Barra were the heaviest for many years. The snow lay 2 or 3 inches deep and for several days roads were impassable. Tiree too had an unusually heavy fall, roads there being still blocked on the 4th. Drifting was the most severe remembered by an old man who had lived on Tiree for 79 years.

In East Lothian on March 1st there were 4 or 5 inches of snow at the coast and some 10 miles inland, and 6 to 8 inches over the Lammermuir Hills. A strong westerly wind caused drifts 2 to 3 feet deep which blocked roads in the hill districts but the storm was not exceptional for that part of the country. Following a beautiful sunny morning, Edinburgh had 4 or 5 inches of snow in about two hours on the afternoon of the 1st. The snow ceased as suddenly as it began and was followed by more sunshine. Depths were greater than 5 inches outside the city; at Glencorse, in the Pentlands, and also at Gladhouse, there was an accumulated level fall of about 12 inches. Though snow was not exceptionally heavy in the Border counties, roads were blocked between Langholm and Hawick. Eskdalmuir reported that snow ploughs were up from Lockerbie and Langholm to Nether Cassock, a mile beyond the Observatory.

Further snow showers occurred on the 2nd, 3rd and 4th but for the most part these were light. The districts chiefly affected by these later falls were in the east and extended from Orkney to the Borders.

H. E. Carter.

Night Sky Records.

With reference to the note by Dr. Glasspoole in the Meteorological Magazine for December 1943 - February 1944, entitled "Comparison of the night sky at Greenwich and Porton", we are informed that a full account of the night sky records obtained at Greenwich, Porton and Leafield has already been prepared and is awaiting publication by the Royal Meteorological Society.

BOSTON FLOOD, 1810.

* The Lincolnshire Standard of January 1st, 1944, gives some details of the great flood on November 10th, 1810 at Boston, Lincs. Knowledge of the rainfall of such early years is limited, but at South Kyme, some 10 miles W.N.W. of Boston the total for November 1810 was 5.94 in., which is not a very arresting figure. The graphic account describes how an extraordinarily strong east-north-east gale, accompanied by continuous rain, gathered up strength in the course of the day. It was the day before full moon and a high tide was expected in the evening, but by five in the afternoon the storm was at its height and it raged for two hours. "Vessels lying in the river Witham between the Bridge and Skirbeck Quarter rolled gunwhale under", - a circumstance never before witnessed there and all the more significant when one remembers that this part of the river is about four miles from the sea. Several vessels off the coast were lost with all hands, and the flood-tide brought havoc on land. For nearly an hour the flood-tide appeared to be stationary as the waters surged relentlessly forward up the river and over the sea-walls. Nothing like it within living memory had been seen before on that coast. About 8 p.m. it began to ebb. The force of the water broke down not only the ancient sea-banks, but also newly constructed sea-banks, inundating farm-lands and buildings and dwelling houses. Many people sought refuge in the rafters of their houses until rescuers came by boat.

Mr. H.W.Wheeler, C.E., in "History of the Fens", published in 1868, quotes a fuller account of this disaster, together with notes on earlier and subsequent floods. The

description adds that the whole extent of coastal country from Wainfleet to Spalding (some 10 miles to the north and to the south of Boston) suffered considerable damage, and attributes much of the blame to "an impetuous east-south-east wind that rose to a hurricane".

Catchment and Drainage Boards have done much since those days to ensure that vulnerable areas shall be free from such calamities. It is interesting to note that the tidal floods of this particular area have found their way into English Literature through the pen of a poetess who was born in Boston in 1820. "The High Tide on the Coast of Lincolnshire", by Jean Ingelow, tells dramatically the story of the flood of 1571, recorded in Holinshed's "Chronicles of England, etc." London, 1577, and it seems reasonable to suppose that her imagination was coloured by first-hand accounts of the 1810 visitation.

M. Shirley.

Mr. H. W. Wheeler, G.E., in "History of the Fens", published in 1888, quotes a earlier account of this disaster together with notes on earlier and subsequent floods. The

Dates of occurrence of maximum temperatures of 85°F. or
above at Kew Observatory 1934-43.
(extension of table I - Met.Mag., 1934, vol.69, p.112).

* Date	Maximum °F.	Wet Bulb °F.	Rel. Hum	Water Content gram./m ³
			<u>1935</u>	
July 14	85.1	64.4	27	8.2
			<u>1936</u>	
June 20	85.5	73.2	53	16.0
			<u>1937</u>	
Aug. 6	84.9	69.2	42	12.5
			<u>1939</u>	
June 7	85.3	68.9	40	12.0
			<u>1940</u>	
June 8	85.6	65.0	28	8.5
			<u>1941</u>	
June 21	85.6	71.1	46	14.0
June 22	87.1	74.0	52	16.3
July 8	88.0	72.9	46	15.0
" 10	84.6	70.0	45	13.3
" 11	88.7	71.5	40	13.4
" 12	85.6	71.1	46	14.0
			<u>1942</u>	
June 6	85.8	70.1	43	12.9
Aug. 28	87.1	69.4	38	11.9
			<u>1943</u>	
July 30	86.5	68.5	36	11.3
" 31	90.5	71.1	35	12.3

No maximum temperatures of 85°F. or above were recorded
at Kew Observatory in the years 1934 and 1938.

AURORAL NOTES, MAY TO DECEMBER 1943.

Auroral glows were observed in early May at Stornoway (1st, 2nd 7th), Benbecula (7th), Dyce (1st, 10th) and Montrose (7th, 9th). No reports were received after May 10th until August 8th when aurora was seen from Sumburgh (Shetland), Montrose and Leuchars. It was observed in Shetland again on the 12th and more widely on August 28th and 30th. Lossiemouth reported a faint aurora on August 23rd.

In September there was exceptional auroral activity, the phenomenon being seen on 20 nights. This is more than in any month since March 1941 and appreciably more than in any other September during the last ten years. A display at Lerwick on the 2nd lasted from 21.15h. to 23.15h. Except at the beginning of this period there was little cloud to interfere with observation. Rays and draperies of moderate intensity were noted fluctuating in position between NW. and NE. Faint diffuse surfaces with isolated rays reaching to 50 degrees of altitude appeared in the NNE. at 22.25h. This display, and one of shorter duration on the 3rd, were seen all over the north of Scotland and as far south as Montrose and Leuchars. Aurora was reported every night from September 5th to 10th at the more northerly stations but on most nights clouds made observation difficult. Isolated observations were reported from Sumburgh on the 12th and from Lerwick on the 17th and 20th. At Lerwick on the 21st faint diffuse surfaces were seen through breaks in the clouds at about 20h. Kettins also reported aurora on that evening. The phenomenon occurred every night from September 23rd to 30th. The most widely observed display was during the evening of the 26th. At Lerwick observations were made continuously from 20.23h. to 23.00h, the principal features being rays up to an elevation of 45 degrees and a diffuse arc which at times extended across the sky from WNW. to ENE. This rather fine display was seen by many observers in north and east Scotland and as far south as Greenock, Rothesay and Kilmarnock.

Aurora was seen on 15 nights in October. On the 1st it was observed at Stornoway and at Paisley. Shetlanders noted its appearance on October 2nd, 4th, 7th, 18th, 20th-22nd and 24th-27th inclusive. In the northern islands the display on the 24th was marred by cloud but it was clearly seen over large areas on the mainland, over the Western Isles, and from

Edinburgh, Stirling, Chryston (Lanarkshire) and Galloway. Isolated reports of aurora were received from Stornoway (8th) and Paisley (28th). Both Stornoway and Benbecula reported its appearance on October 23rd.

During November aurora was seen by Shetland observers on the 5th, 6th, 22nd-25th and 28th-30th. A single report of its appearance on the 17th came from Buddonness. The most widely observed display of the month was that of the 25th which was reported as far south as Edinburgh, Paisley, Eskdalemuir and Galloway. The aurora of the 26th also was seen from Edinburgh. A display on the 26th, though not observed in Shetland, was seen at many places on the mainland including Nairn, Lossiemouth, Gordon Castle, Aberdeen, Montrose and Abbotsinch.

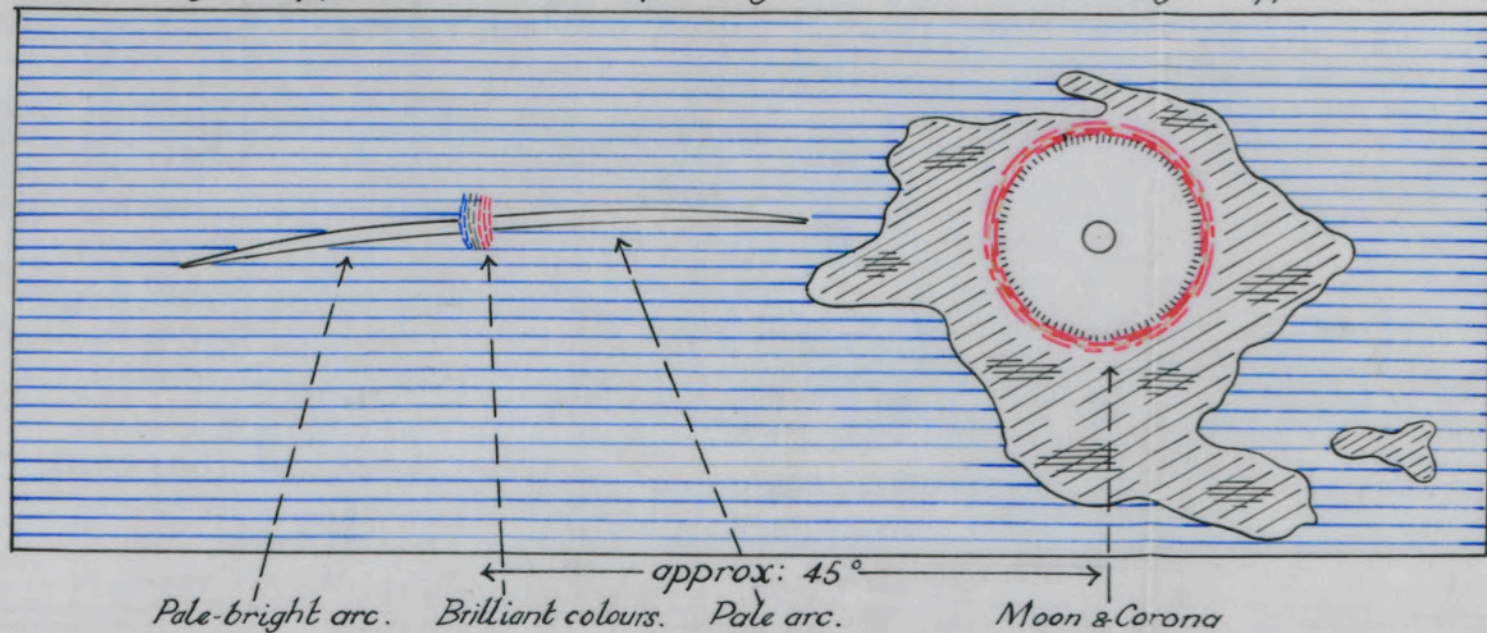
Auroral reports in December were confined to nine nights. Paradoxically it was more often seen at Nairn than in Shetland. It is presumed that this was due to the prevalence of cloud in the far north. The former station reported aurora on the 1st, 16th, 19th and 22nd while in Shetland it was observed on the 18th, 19th and 20th. Lossiemouth reported an auroral arc of 45 degrees elevation to the NNW. on the 18th. A display on the 21st was seen in Skye and Edinburgh. Benbecula and Stornoway reported aurora on the 2nd and 17th respectively.

A BRILLIANT HALO.

On April 22nd, 1944, 1735 G.M.T., I observed the following halo phenomena at North Harrow, Middlesex.

A brilliantly coloured arc to the 46° halo (T.H.S. in diagram in the Observers' Handbook), together with the mock sun of the 22½° halo were visible for about ten minutes, but no other phenomena could be seen. The arc, which was about one-fifth of the complete circle, was coloured from red near the sun through green, blue and indigo to violet, and was as brilliant as the normal rainbow, by far the brightest colours I have ever seen in any halo phenomena.

*Paraselene ring visible at Coopersale, Epping, 2045 G.M.T. 10/1/44, facing East.
Ring disappeared with the passing of the A.C.u. travelling E (ie. upper winds from W)*



A brilliant halo - contd.

The only clouds were the few patches of fairly dense cirro-stratus, drifting from the north west.

On the following day, April 23rd, the 22 $\frac{1}{2}$ ° halo was visible all afternoon through a continuous layer of very thin cirro-stratus.

R. Pilsbury.

Lunar halo phenomena observed on
January 10th, 1944.

The accompanying sketch is of a paraselene ring visible from my home in Coopersale, Epping, Essex, at 2045 G.M.T. on January 10th, 1944. The general conditions were - Surface wind northerly, light; visibility moderate; no low cloud; A.Cn. 2/10; There were also some filmy patches of very thin Ci.St; Wind at A.Cu. level Westerly.

The angle from the moon to the part halo was measured with a pocket compass as approximately 45° as I presumed that the halo was in fact the 46° usually associated with this phenomena.

The peculiarities were as follows:-

1. The vividness of the Red, Green and Blue of what could be seen of the halo and of the White of the arc from the outside of the halo.
2. A 22 $\frac{1}{2}$ ° halo (or part of one) was not visible but a coron was visible.
3. The brilliance of the light reflected by the moon.
4. The fact that when the A.Cu. had ceased to obscure the moon the part halo and mock moon ring disappeared.
5. When searchlights were set on that part of the sky occupied by the paraselence ring the arc and halo seemed to "shine".

Further Notes. *James - of Jan 1943*

A severe frost formed during the night of the 10th and the morning of the 11th, and was followed by medium and low stratus clouds which persisted until this morning (13th).

The halo phenomena seemed to me to be lower than cirrus level and I had the impression that they were really formed by reflection of light from the upper side of the A.Cu. This impression was strengthened by their fading with the apparant movement of the moon from the centre to the edge of the cloud and their disappearance when the moon was clear of the cloud.

At frequent intervals until approximately 2230 G.M.T. I made observations of the moon in the hope that A.Cu. would again obscure it, but the moon remained clear of cloud. It did seem rather significant that some of the filmy patches of Ci.St. passed within the required distances and alignments for the further display of haloes and rings but such phenomena did not appear.

Orographical Cloud.

The accompanying photograph of orographical cloud over Fitful Head has been selected for reproduction from a number recently added to the Library collection by M.O.6

Cloud Photographs.

With reference to the note on page 6 of the October-November 1943 issue of this Magazine, Mr. Robin Biddulph of Blandford recently lent a further set of twenty-three negatives to the Office. One set of prints has been added to the Library collection.

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Orographical Cloud over Fitful Head, Sumburgh. Oct. 9th. 1943.



Unusual hailstones on March 14th, 1944.

Mr. S.E.Ashmore reports that on March 14th at Wrexham, there was considerable snow or sleet in the morning; the weather cleared in the afternoon but became unsettled again in the evening. At 18h.22m. there was a heavy shower of soft hail. The stones were the normal small opaque cones; scattered among there were a number of large hailstones of conical shape, "the size and shape of a large raspberry". The lengths of the base and height were each about half an inch. These large stones were soft and "did not hurt" but remained whole on the ground. The hail remained on the ground all night, melting in the strong sun on the morning of the 15th. It finally disappeared about 11h.

Dr. R.G.Hatton, Director of the Fruit Research Station, East Malling, has been elected to the Fellowship of the Royal Society.

Mr. William Boulton Smith, M.Sc., M.Inst.C.E., F.S.I., Borough Engineer and Surveyor, and Water Engineer at Dover, who has been responsible for the climatological station since 1921 retired at the end of 1943. He was also responsible for the rainfall stations of the Water Works. He is succeeded by Mr. P.V.Marchant, C.E.

REVIEWS.

Publications in the "Bulletin of the American Meteorological Society".

December 1942:

The Winds over New England in relation to topography.

by R.E. Enotis, Jr.

The aim of this paper is hidden in a confusion of observation details. One item of interest emerges however the dependence upon season as well as upon height of the ratio of mountain top to free-air wind speeds. In summer this ratio is approximately 1.2 at 1 km. and 1.35 at 2 km., and in winter 1.5 and 1.75., the greater increase with height in winter being due to the greater stability of the air in this season than in summer.

January 1943:

Gustiness under various weather conditions.

by S.P. Fergusson.

This is essentially the description of a highly sensitive recording anemometer in use at Blue Hill Observatory (Mass.). The transmitter is a 3-bladed wind mill of balsa wood, a very fragile material which, however, on account of its lightness was found to be unimpaired by heavy winds. Comparisons of gustiness with other phenomena show (a) greater uniformity of velocity during night and early morning than during the day (b) greater gustiness in clear than in cloudy weather and under conditions of high than of low pressure.

H.C.

G.R.HAY

OBITUARY.

Mr. G.R.Hay, who died suddenly at Moor Park on 2nd April, 1944, was born on 1st August 1892, educated at Aberdeen Central School and Aberdeen University where he obtained Honours degree in Mathematics and Physics.

He joined the Gordon Highlanders in September, 1914, and went with them to France in 1915. In July, 1915, he became one of the meteorological observers who were being posted in different places in forward areas, in preparation for the Battle of Loos. He was posted to St. Venant, where a Dines pressure tube anemometer had been erected, the first of its kind in France, with the vane at a height of about twelve feet. Like other observers, he maintained observations at six hour intervals day and night single-handed, and in trials before the Battle of Loos and during the 24 hours which covered its initial phase he, in common with others, made hourly observations without a break, and with a cheerfulness which was his outstanding characteristic.

During this period he was billeted in St. Venant. The respect and affection with which he was regarded by the two elderly ladies in whose house he was billeted was so outstanding as to be one of the never-to-be-forgotten memories of one who visited him there in the winter of 1915.

He took advantage of the opportunity which was presented to improve his French, which stood him in good stead later in the war, when he was liaison officer with the French Meteorological Service at Paris.

During 1917, he was at Hazebrouck as Assistant to the Meteorological Officer, 2nd Army, Captain F. Entwistle, and rapidly achieved a good working knowledge of synoptic meteorology.

After Hay was commissioned, in 1917, he was selected to be meteorological adviser on a project for sending a man over the German lines to be dropped at pre-selected spot in the Saar from a balloon launched near Nancy. With Hay's assistance, the operation was carried out with success, and with an accuracy, fortunately, appreciably greater than the most competent synoptic meteorologist could have been expected to achieve.

OBITUARY - Contd.

As a liaison officer at Paris, Hay was a marked success in maintaining effective co-ordination with the French meteorological service through its changing vicissitudes when Angot was Director of the Bureau Central Météorologique and (Naval) Captain Rouch and Col. Delcambre were alternately Heads of the military meteorological service.

Hay found the personality of the sailor (Rouch) the more attractive, but he had no hesitation about expressing his preference for the ordinary efficiency of the soldier (Delcambre).

After the armistice of 1918 and the transfer, in the spring of 1919, of the meteorological section from France to occupied Germany, Hay continued his service there until the end of the year.

His civilian service with the office commenced in January, 1920 when he acted for a short time as Meteorological Officer at Hounslow, which station was transferred to Croydon. Hay remained at Croydon for 9½ years, and was most successful in meeting the exacting demands of the civil aviation authorities. The arrangements for the supply of information to pilots were described in a lecture he gave to the Royal Meteorological Society in 1922.

In 1929 he was transferred to Cranwell, and after 18 months service there was appointed Superintendent of the Meteorological Office at Malta, where he remained for over 6 years. Later he saw service in the overseas Division at Headquarters, at Mildenhall and at Newcastle, until he was appointed Principal Technical Officer in Charge of M.O.2(b).

Hay was a good "mixer". He was a very popular figure at Croydon with all those connected with civil aviation, and with the naval and R.A.F. authorities at Malta. His work was characterized by attention to detail - a field in which he found good scope in the last appointment he held.

He leaves a wife and daughter to whom the sympathy of the office is extended in their very sudden bereavement.

A.G. McAdie.

We record with regret the death of Professor Alexander George McAdie which took place at his home in Hampton, Va. on November 1st, of last year. McAdie joined the scientific staff of the Weather Bureau, or rather of the U.S. Signal Corps as it was in those days, as far back as 1883 and remained in its service for close on 30 years. As he worked his way up he held various appointments of growing importance, the last of which was the charge of the Forecast Center at San Francisco, but it is not for his work in the state service that McAdie's name become a familiar one to meteorologists the world over.

As a young man he formed a close friendship with Abbott Lawrence Rotch who was possessed of a burning enthusiasm for meteorology and of considerable means. The latter enabled him to found the famous Blue Hill Observatory near Boston, Mass. Here, as Rotch's guest, McAdie had the opportunity of carrying out a number of investigations, mostly in the field of atmospheric electricity, ancillary to his official work for the Weather Bureau which were recognised by Harvard University by the conferment of the honorary degree of A.M. Rotch's untimely death in 1912 was a great loss to meteorology but he had bequeathed Blue Hill to the University and made some provision for carrying on its work, and his widow founded the Abbott Lawrence Rotch Professorship of Meteorology in his memory.

After the death of his friend, McAdie severed his connection with the Weather Bureau to become first Rotch Professor at Harvard and Director of Blue Hill, a post which he held up to the time of his retirement. He had scarcely entered upon his new duties when the war of 1914-18 broke out. Blue Hill became, for the time being, a school of instruction for officers of the U.S. Naval Air Service and later McAdie was commissioned Lieutenant Commander in the Navy and came to this country with the Meteorological Section of the U.S. naval forces.

McAdie's scientific writings were voluminous and ranged over a wide field and did a great deal to popularise, in the best sense, meteorological knowledge both in America and in this country. Perhaps the best known of his larger works was The Principles of Aerography (1917) which was later summarised as the Manual of Aerography for the U.S. Navy

(1918). It has been extensively used by meteorologists in Europe as well as in America.

McAdie was much interested in questions of symbolism and units. He viewed with some alarm the tendency of authors to use symbols of their own choosing and endeavoured to correct it by publishing in the Annals of the Astronomical Observatory of Harvard College (1920) a list of standard symbols for use in aerological work. On the subject of units he was somewhat of a crusader. He put forward, presumably for general adoption, a scale of temperature which he used in much of his own work, in which the zero was the absolute zero and the freezing point of water was marked 1000. He had a number of thermometers graduated on this "Kilograd" scale and presented them to his meteorological friends.

R.O.K.L.

J.F. Haseldine. It is with much regret that we learn from a recent announcement of the death on April 11th of Mr. John Francis Haseldine, M.C., a past president of the Institution of Water Engineers and for the last twenty years the Engineer and General Manager of the Barnet District Gas & Water Co.

He was born in December 1886, was educated at the Nottingham High School and was afterwards articled to a firm of Consulting Engineers.

During the last war he served in the Royal Engineers attaining the rank of major.

At the time of his death he was Chairman of the Post-war Planning Committee of the British Waterworks Association.

C.F.M.