

METEOROLOGICAL OFFICE
London Road, Bracknell, Berkshire

CLIMATOLOGICAL MEMORANDUM

No. 72

**MAPS OF AVERAGE DURATION OF BRIGHT SUNSHINE
OVER THE UNITED KINGDOM
1941-1970**

Climatological Services (Met.O.3)

December 1974

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Maps of mean daily duration of bright sunshine for each month and the year are presented in this memorandum. These maps are based on 30 years (1941-1970) of records collected from a network of Campbell-Stokes sunshine recorders. Details of the instrumental and exposure errors, methods of data analysis and individual station's data may be found elsewhere⁽¹⁾.

Maps for 1931-1960 were published in Climatological Memorandum No 42A⁽²⁾.

Table 1 gives the mean duration of possible sunshine in each month between the latitudes of 50°N and 60°N. This is defined as the interval between the ascending and descending transits of the upper limb of the sun across the horizon, allowance being made for refraction.

Table 1. Daily mean duration of possible sunshine (hours).

Month	Latitude (north)					
	50°N	52°N	54°N	56°N	58°N	60°N
January	8.65	8.37	8.05	7.72	7.32	6.85
February	10.13	9.98	9.82	9.65	9.45	9.22
March	11.87	11.85	11.83	11.83	11.82	11.78
April	13.77	13.88	14.03	14.20	14.37	14.58
May	15.38	15.65	15.95	16.28	16.68	17.12
June	16.27	16.62	17.02	17.48	18.02	18.65
July	15.87	16.18	16.53	16.93	17.40	17.95
August	14.45	14.62	14.83	15.07	15.32	15.62
September	12.63	12.68	12.72	12.77	12.82	12.88
October	10.78	10.68	10.58	10.47	10.32	10.18
November	9.08	8.85	8.58	8.32	7.97	7.58
December	8.20	7.88	7.52	7.12	6.65	6.08

Table 2 shows the highest and lowest durations of bright sunshine recorded in each month during the period 1890-1970. It will be seen that the highest values are for coastal stations, mostly on the south coast of England. Stations with more than 5 per cent loss due to obstructions have not been included in this table.

Table 3 gives a comparison of averages for different periods since 1901.

Figure 1 shows the variation of sunshine duration over the 30-year period in January, April, July and October at a selection of places: Mount Batten (Plymouth), Edgbaston (Birmingham), Wick, (Caithness) and Aldergrove (Northern Ireland). The solid line indicates the average value; the pecked lines are the upper and lower 20 percentiles. Certain climatic trends such as the decrease of sunshine in April in the southern half of the country are discernible from these graphs. There have been increases in the amount of winter sunshine in urban areas since the Clean Air Act came into force in the 1950s⁽³⁾. This effect can be seen in the January graph of Edgbaston.

The variation in sunshine throughout the day is shown in Figure 2 where average hourly sunshine durations at Mount Batten (Plymouth), Rothamsted (Hertfordshire) and Lerwick (Shetland Islands) are presented. The times given in these diagrams are Local Apparent Time; to convert these to Greenwich Mean Time the Tables in the "Observer's Handbook"⁽⁴⁾ or "Nautical Almanac"⁽⁵⁾ should be consulted.

References

- (1) Averages of Bright Sunshine for the United Kingdom 1941-1970 H.M.S.O. London (to be published)
- (2) R E Booth, Climatological Memorandum No 42A, Meteorological Office, Bracknell. 1966.
- (3) I Jenkins, London Weather Centre Memorandum No 5. Increase in averages of sunshine in Central London.
- (4) "Observer's Handbook" H.M.S.O. London. 1969.
- (5) "Nautical Almanac" H.M.S.O. London. 1974.

Table 2. Extremes of Monthly Duration of Bright Sunshine

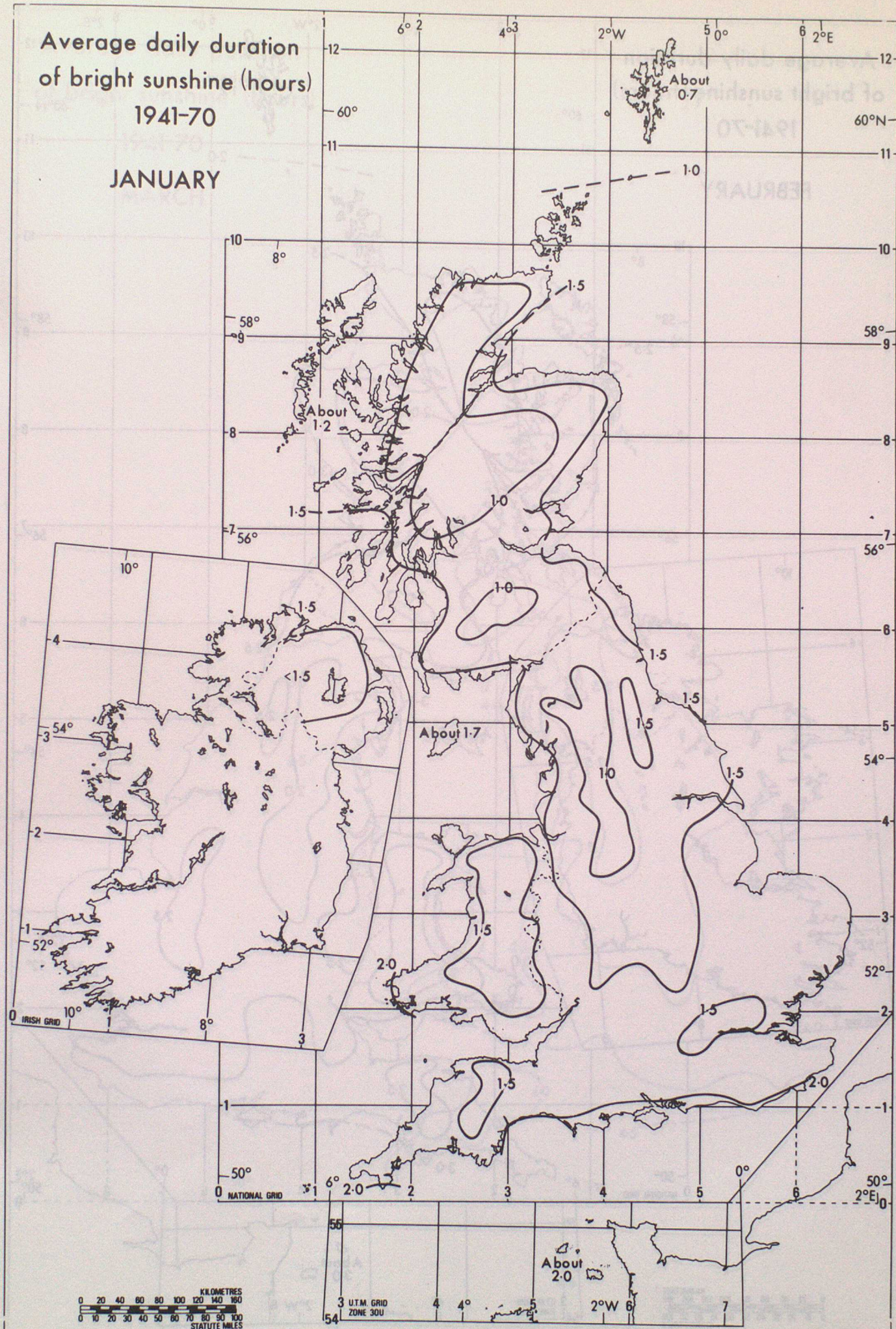
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Highest												
Total	115	167	253	302	353	382	384	325	281	207	145	117
Year	1959	1891	1929	1893	1909	1929	1911	1899	1959	1920	1923	1962
Place	Bournemouth	Jersey	Aberystwyth	Westbourne	Worthing	Pendennis Castle	Hastings	Guernsey	Jersey	Felix-stowe	Falmouth	East-bourne
	(Hampshire)	(C.I)	(Dyfed)	(W.Sussex)	(W.Sussex)	(Cornwall)	(E.Sussex)	(C.I)	(C.I)	(Suffolk)	(Cornwall)	(E.Sussex)
Lowest												
Total	3.6	4.3	25.0	35.9	59.6	60.9	50.1	43.9	34.3	8.0	4.9	0.0*
Year	1901	1966	1916	1920	1967	1912	1961	1912	1967	1968	1942	1890
Place	Morpeth	Gt Dun Fell	Whitworth Park	Whitworth Park	Gt Dun Fell	Crathes	Strathy	Eskdale-Muir	Balta-sound	Gt Dun Fell	Burnage	London
	(Northumberland)	(Cumbria)	(Manchester)	(Manchester)	(Cumbria)	(Grampian)	(Sutherland)	(Dumfries)	(Zetland)	(Cumbria)	(Manchester)	

* 0.0 at Westminster, 0.1 at Bunhill Row, 0.3 at Kew Observatory

Table 3 - Comparison of averages of bright sunshine for different periods

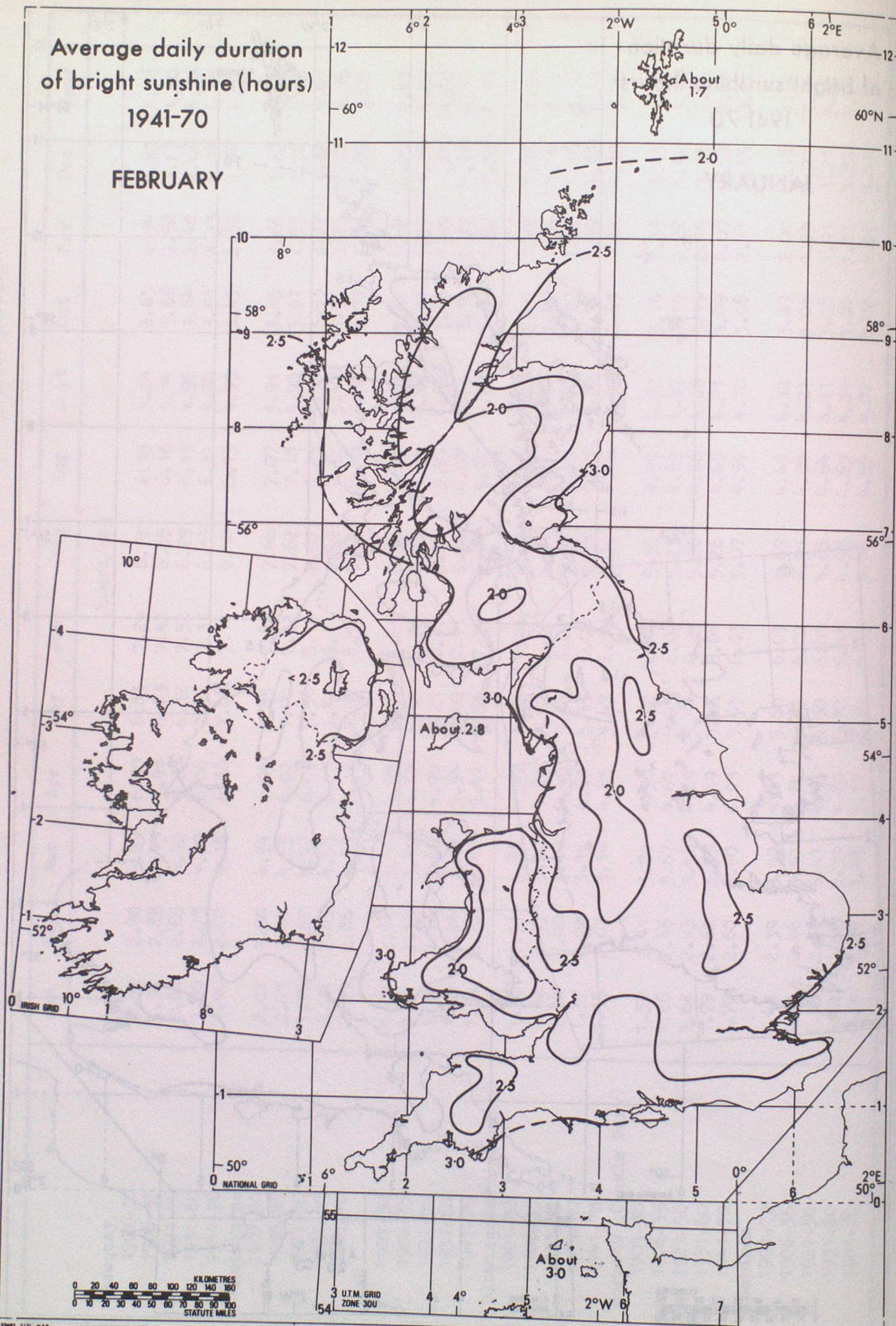
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
	hours/day												
Newquay													
1901-30	1.82	2.80	4.29	6.00	6.83	7.24	6.72	6.15	5.24	3.65	2.54	1.63	4.58
1906-35	1.91	2.88	4.45	5.96	6.63	7.42	6.65	6.16	5.14	3.68	2.50	1.67	4.60
1921-50	1.82	2.68	4.42	5.89	6.82	7.52	6.29	6.15	4.99	3.64	2.40	1.68	4.53
1931-60	1.90	2.75	4.29	6.08	7.02	7.33	6.33	6.31	5.00	3.51	2.33	1.73	4.55
1941-70	1.90	2.80	4.18	6.18	7.07	7.14	6.40	6.13	4.95	3.45	2.32	1.74	4.52
Eastbourne													
1901-30	2.01	3.00	4.34	6.04	7.85	7.82	7.66	7.07	5.91	3.85	2.66	1.67	5.00
1906-35	2.01	3.07	4.55	6.02	7.70	7.92	7.62	7.18	5.90	3.91	2.53	1.72	5.02
1921-50	1.99	2.87	4.72	6.03	7.56	8.16	7.67	7.23	5.55	3.93	2.37	1.87	5.01
1931-60	2.06	2.83	4.53	6.25	7.45	8.31	7.52	7.12	5.47	3.97	2.23	1.77	4.96
1941-70	2.05	2.86	4.45	6.35	7.57	8.51	7.62	7.00	5.60	4.17	2.36	1.82	5.03
Kew													
1901-30	1.43	2.14	3.31	4.98	6.54	6.65	6.29	5.90	4.83	3.02	1.78	1.20	4.01
1906-35	1.41	2.16	3.49	4.87	6.40	6.76	6.25	5.91	4.88	3.10	1.77	1.21	4.02
1921-50	1.36	2.13	3.60	4.90	6.21	6.87	6.28	5.93	4.58	3.05	1.69	1.27	4.00
1931-60	1.49	2.26	3.64	5.34	6.40	7.11	6.39	6.07	4.75	3.15	1.77	1.28	4.16
1941-70	1.54	2.28	3.62	5.41	6.56	7.14	6.34	5.90	4.77	3.29	1.92	1.38	4.18
Birmingham (Edgbaston)													
1901-30	1.38	1.91	2.88	4.37	5.66	5.94	5.52	5.21	4.10	2.81	1.75	1.08	3.56
1906-35	1.42	2.03	3.10	4.24	5.52	5.96	5.51	5.24	4.12	2.94	1.54	1.14	3.57
1921-50	1.34	2.00	3.19	4.40	5.38	6.07	5.38	5.23	4.00	2.90	1.63	1.16	3.56
1931-60	1.37	2.06	3.16	4.63	5.39	6.00	5.35	5.13	3.90	2.77	1.59	1.22	3.55
1941-70	1.38	2.03	3.14	4.55	5.47	6.15	5.29	4.86	3.92	2.81	1.61	1.35	3.55
Morpeth (Cockle Park)													
1901-30	1.52	2.41	3.74	4.90	5.62	6.15	5.30	4.99	4.52	3.14	2.35	1.45	3.84
1906-35	1.66	2.46	3.67	4.67	5.45	6.02	5.25	4.89	4.47	3.14	2.20	1.42	3.78
1921-50	1.62	2.43	3.48	4.69	5.52	6.23	5.26	4.66	4.20	3.19	2.19	1.53	3.75
1931-60	1.79	2.62	3.35	4.89	5.64	6.04	5.26	4.65	4.21	3.09	2.05	1.53	3.76
1941-70	1.70	2.60	3.40	4.93	5.63	6.03	5.07	4.59	4.10	3.08	2.11	1.85	3.74
Aberdeen													
1901-30	1.43	2.39	3.47	5.03	5.60	6.03	4.89	4.47	4.12	3.09	2.00	1.18	3.64
1906-35	1.50	2.46	3.51	4.81	5.49	6.02	4.91	4.50	4.21	3.04	1.95	1.21	3.64
1921-50	1.50	2.41	3.41	4.53	5.50	6.09	4.85	4.64	4.11	3.08	1.91	1.21	3.61
1931-60	1.64	2.66	3.31	4.80	5.72	5.98	4.98	4.65	4.24	3.00	1.81	1.32	3.71
1941-70	1.63	2.79	3.48	5.17	5.59	5.88	5.06	4.55	4.07	3.02	1.91	1.47	3.72

JANUARY

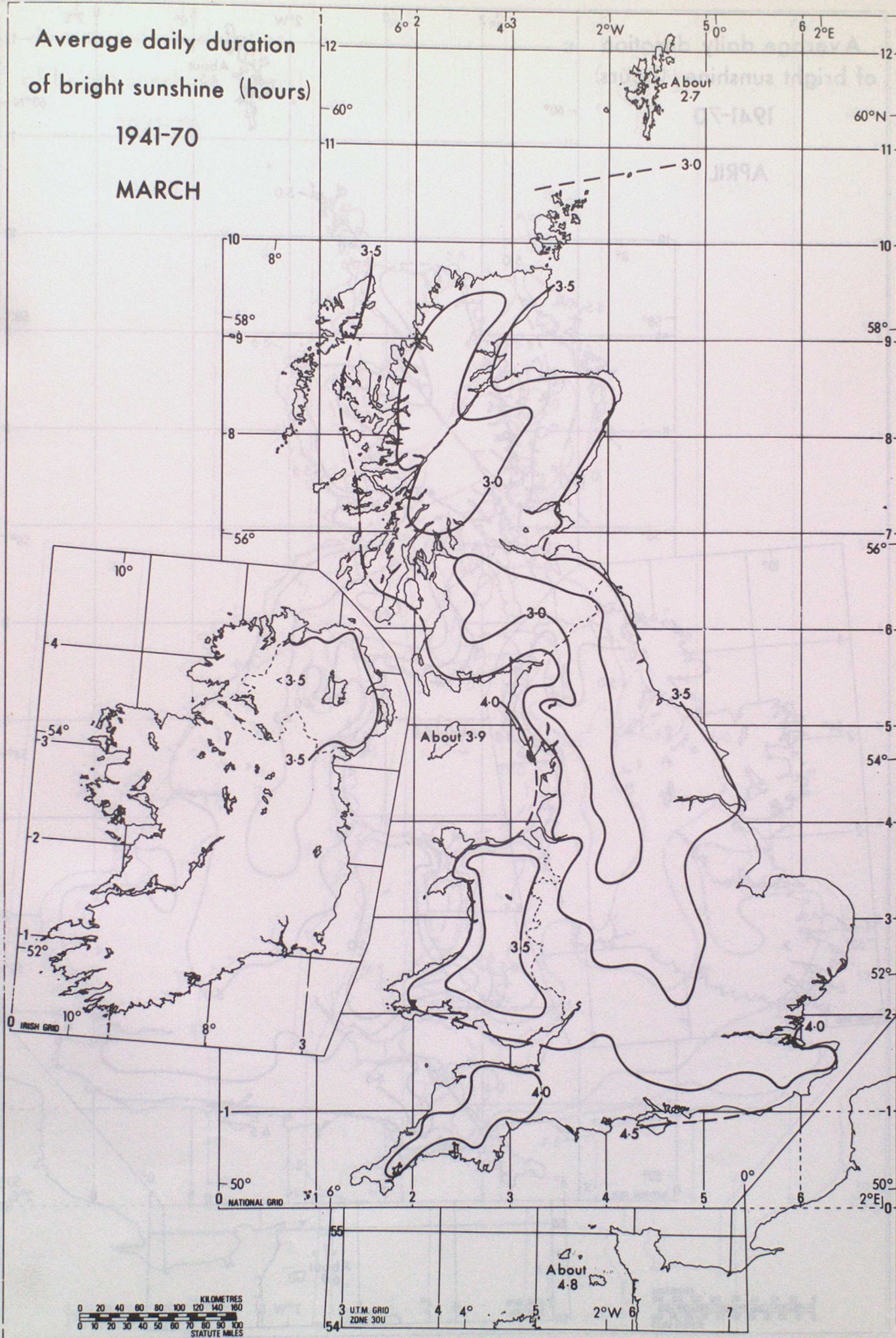


Average daily duration of bright sunshine (hours) 1941-70

FEBRUARY

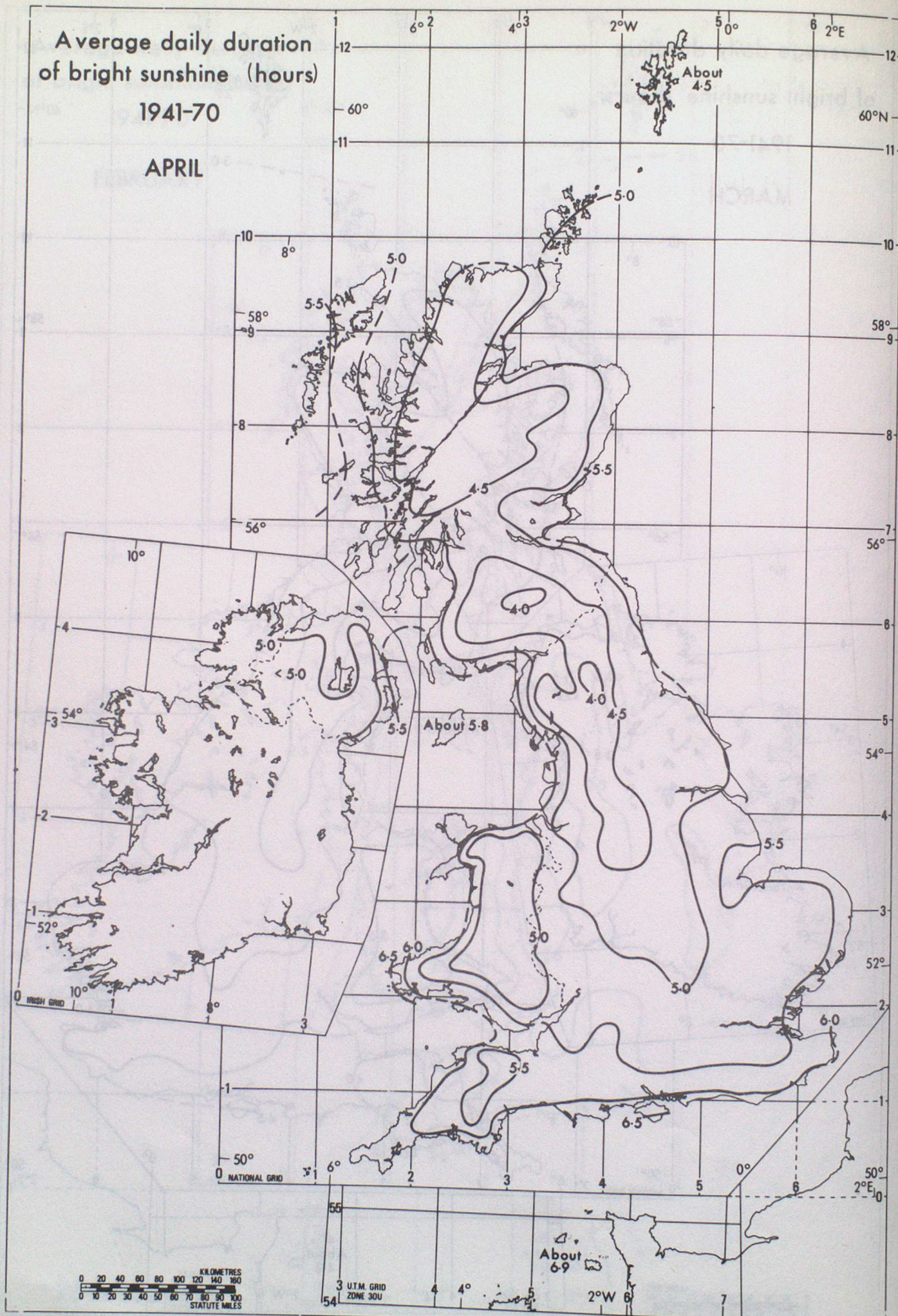


Average daily duration
of bright sunshine (hours)
1941-70
MARCH



Average daily duration
of bright sunshine (hours)
1941-70

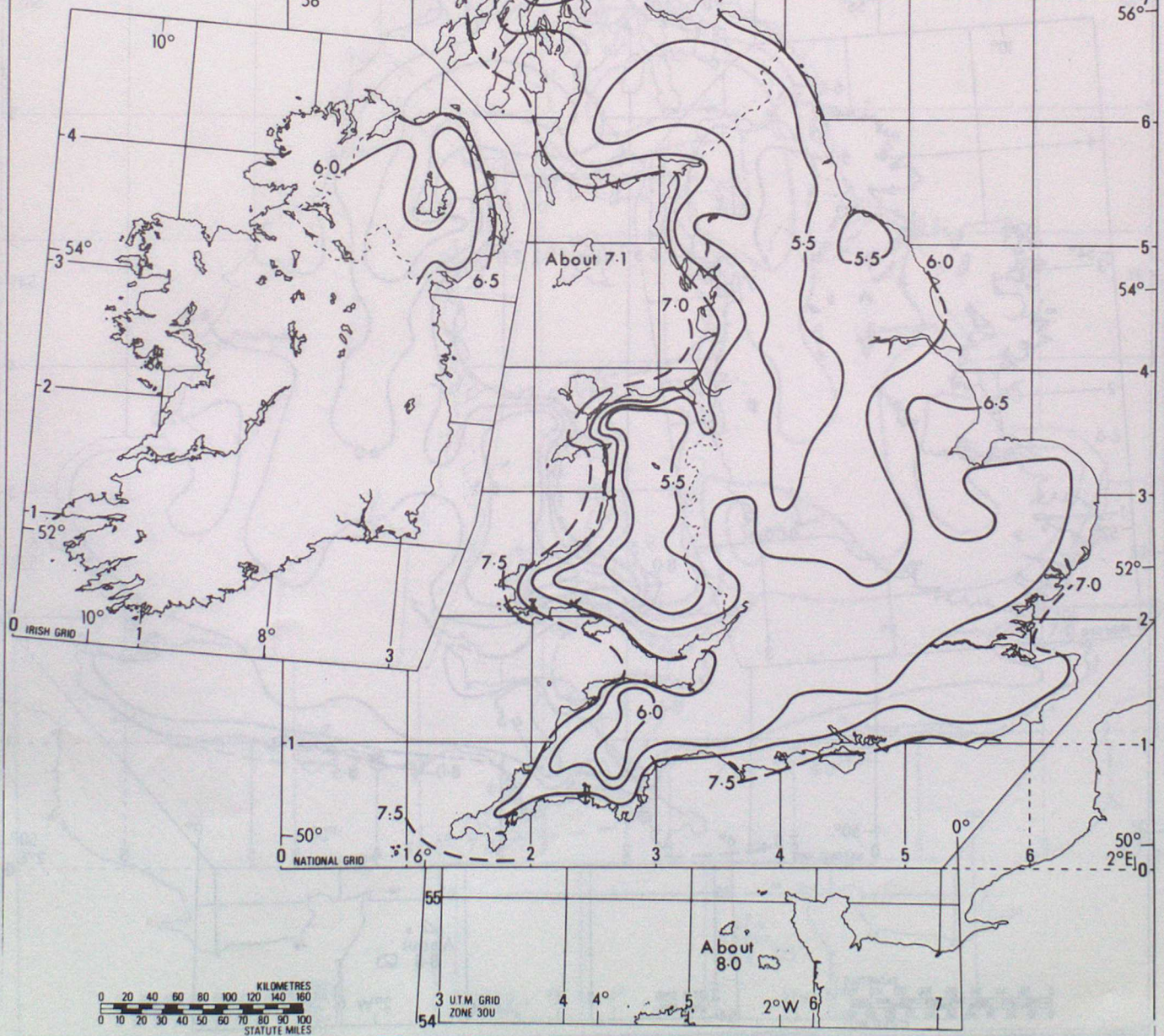
APRIL



Average daily duration of bright sunshine (hours)

1941-70

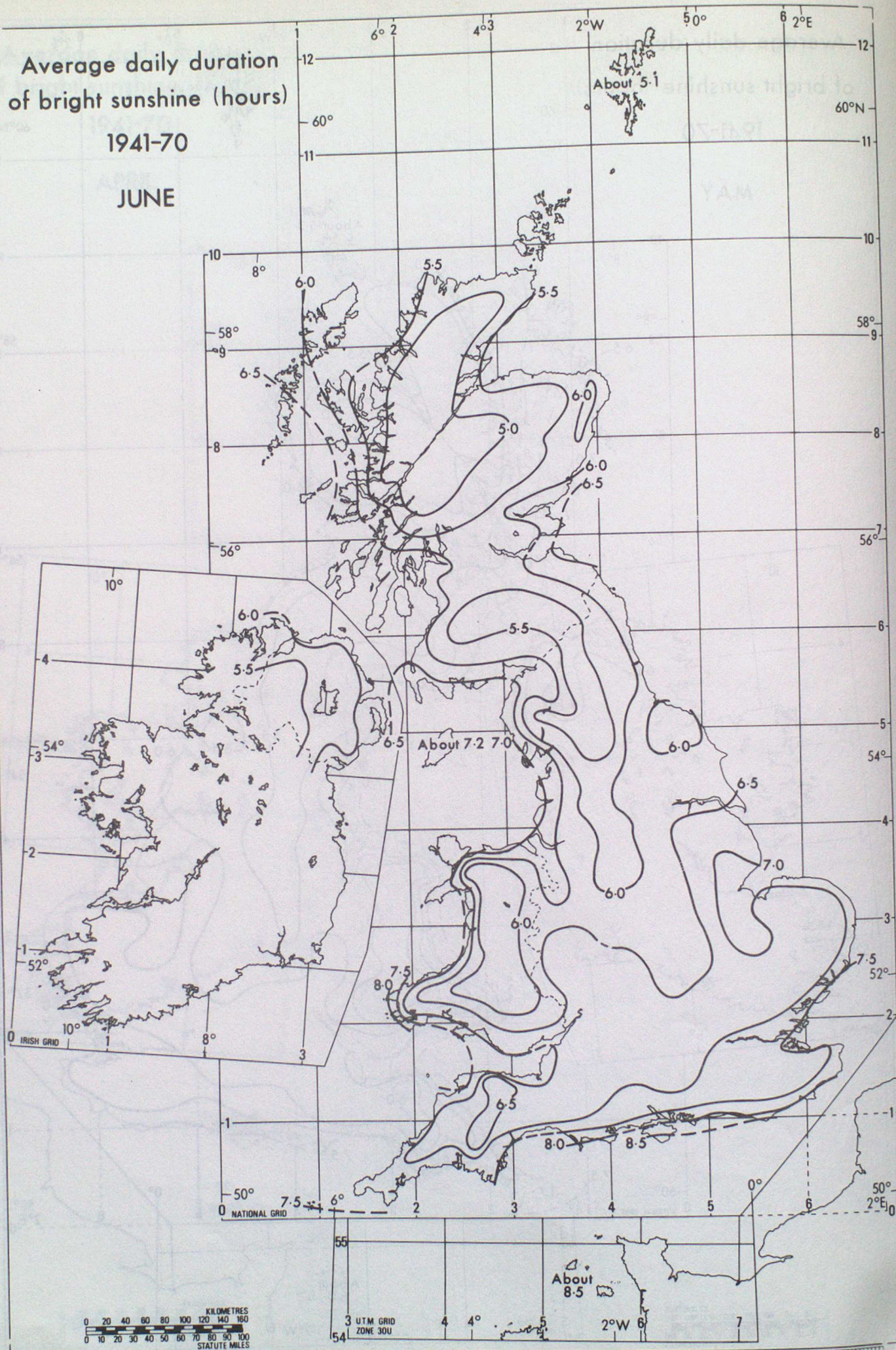
MAY



Average daily duration of bright sunshine (hours)

1941-70

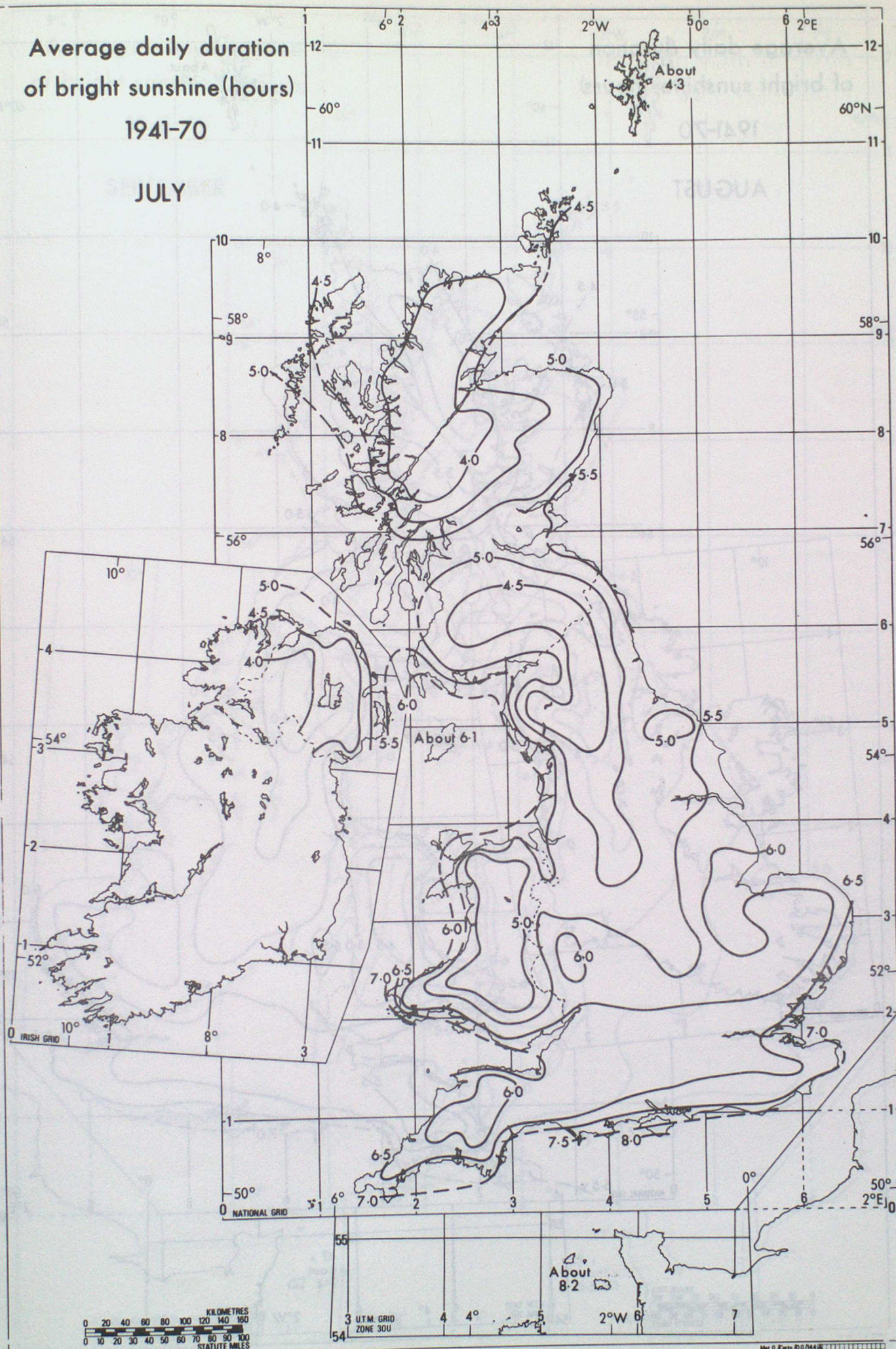
JUNE



Average daily duration of bright sunshine (hours)

1941-70

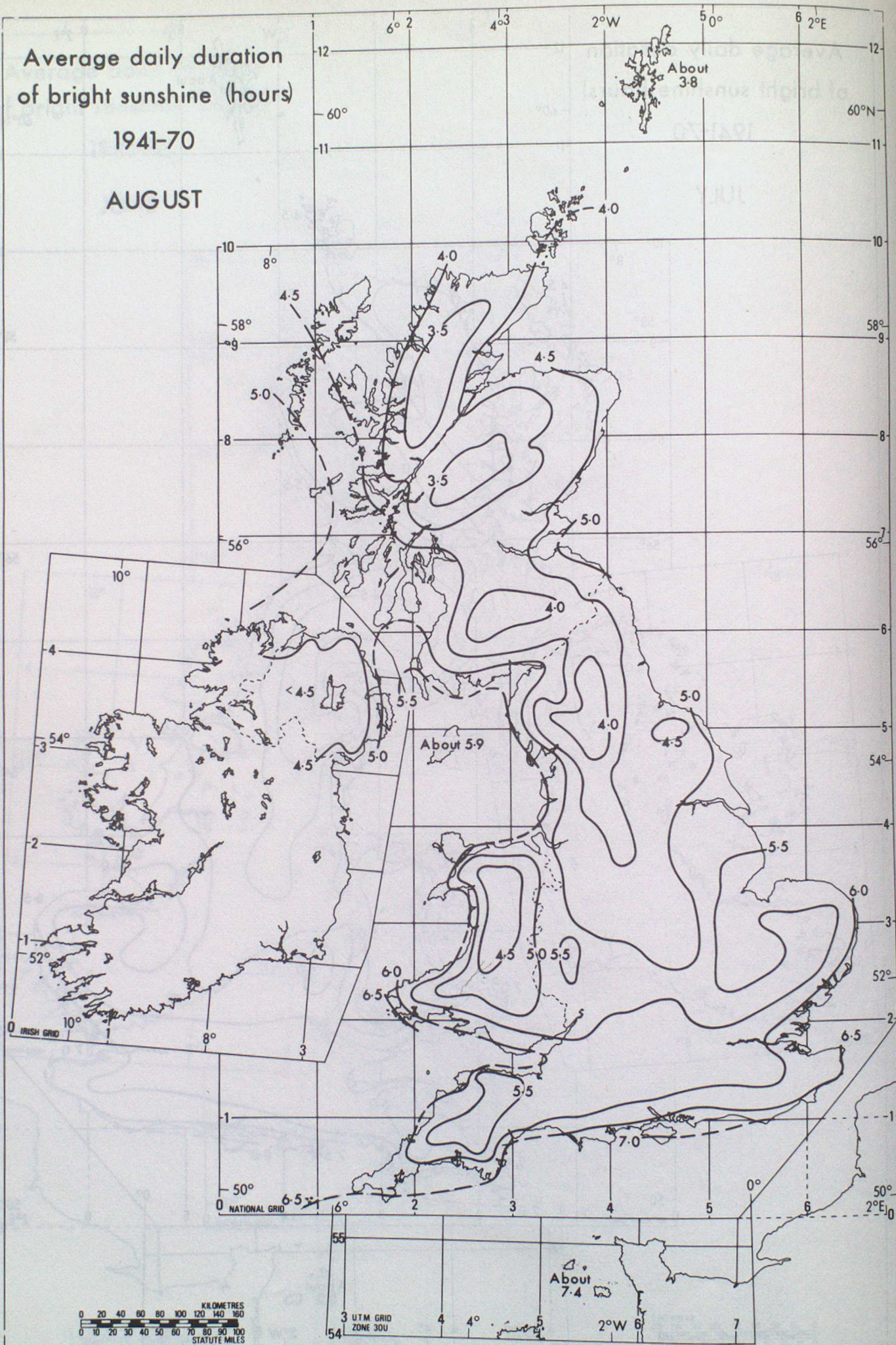
JULY



Average daily duration of bright sunshine (hours)

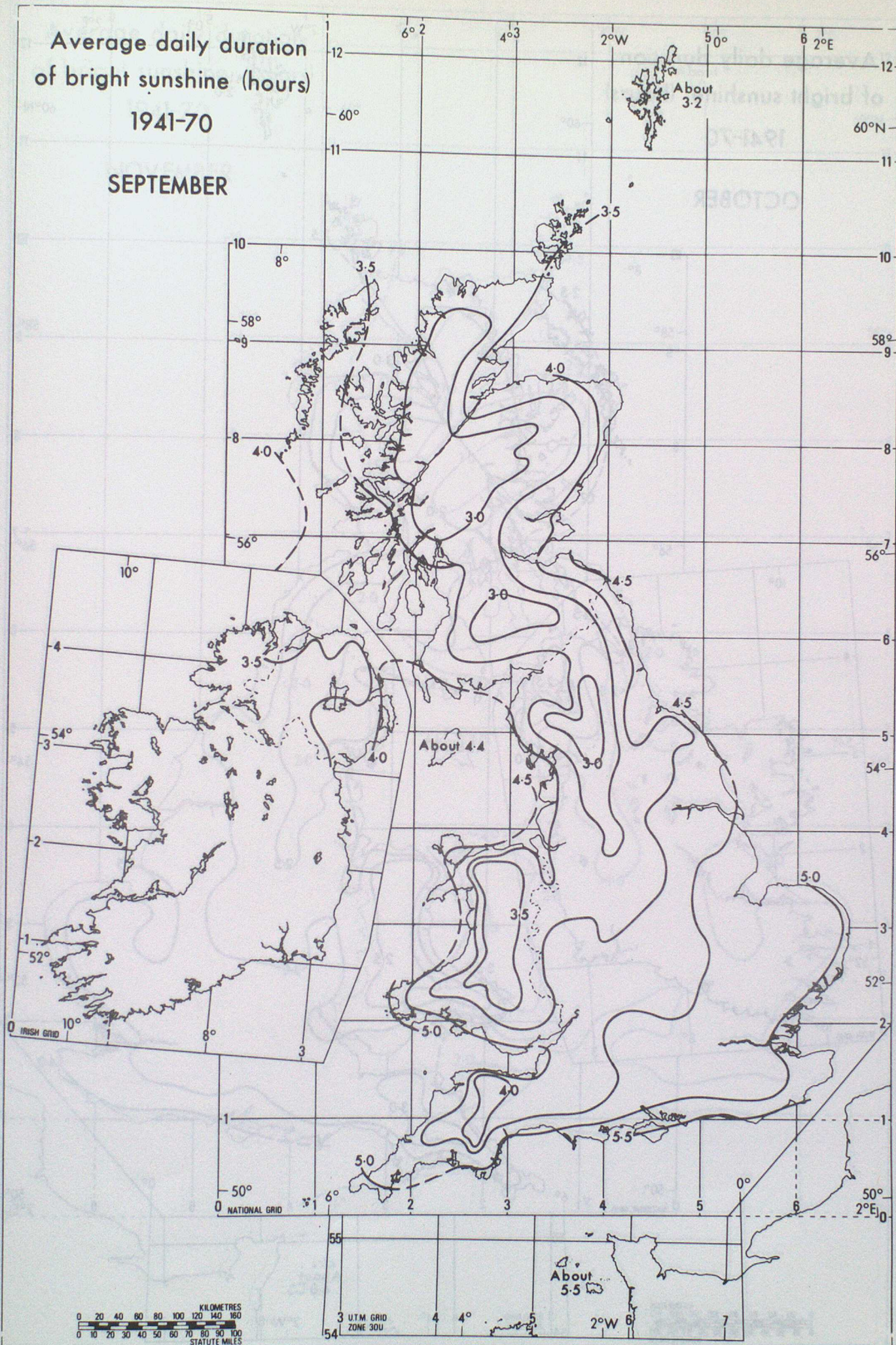
1941-70

AUGUST



Average daily duration
of bright sunshine (hours)
1941-70

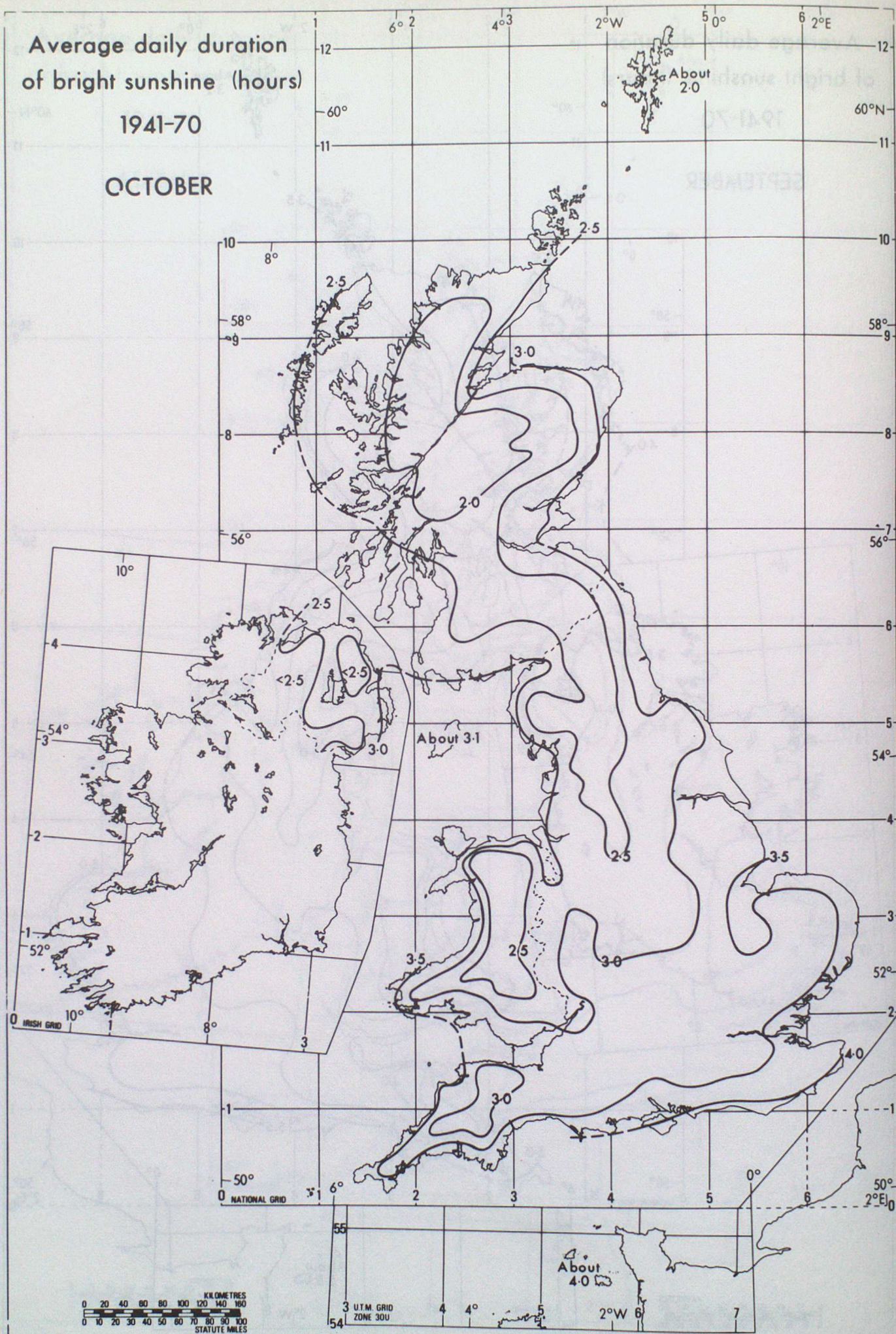
SEPTEMBER



Average daily duration of bright sunshine (hours)

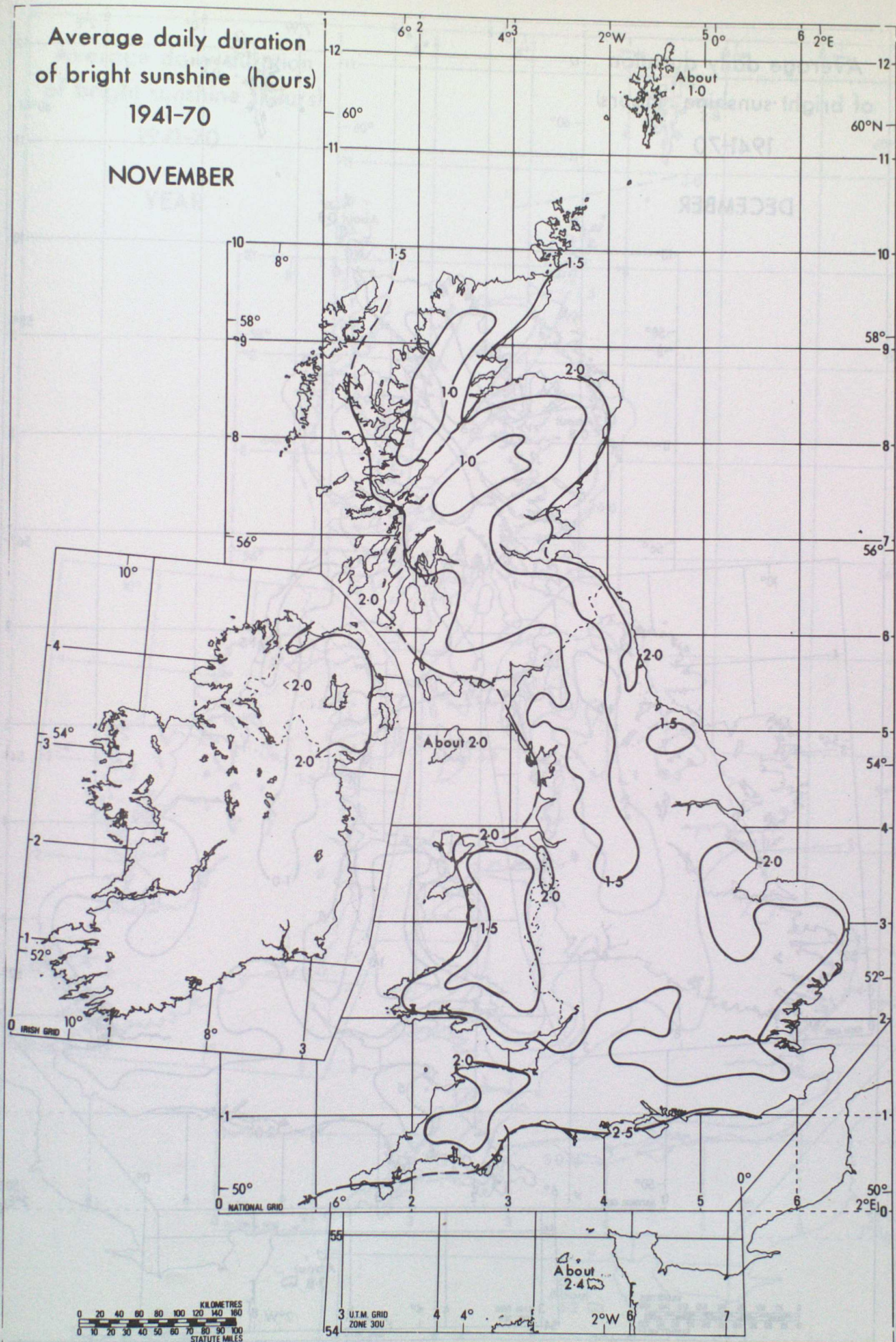
1941-70

OCTOBER



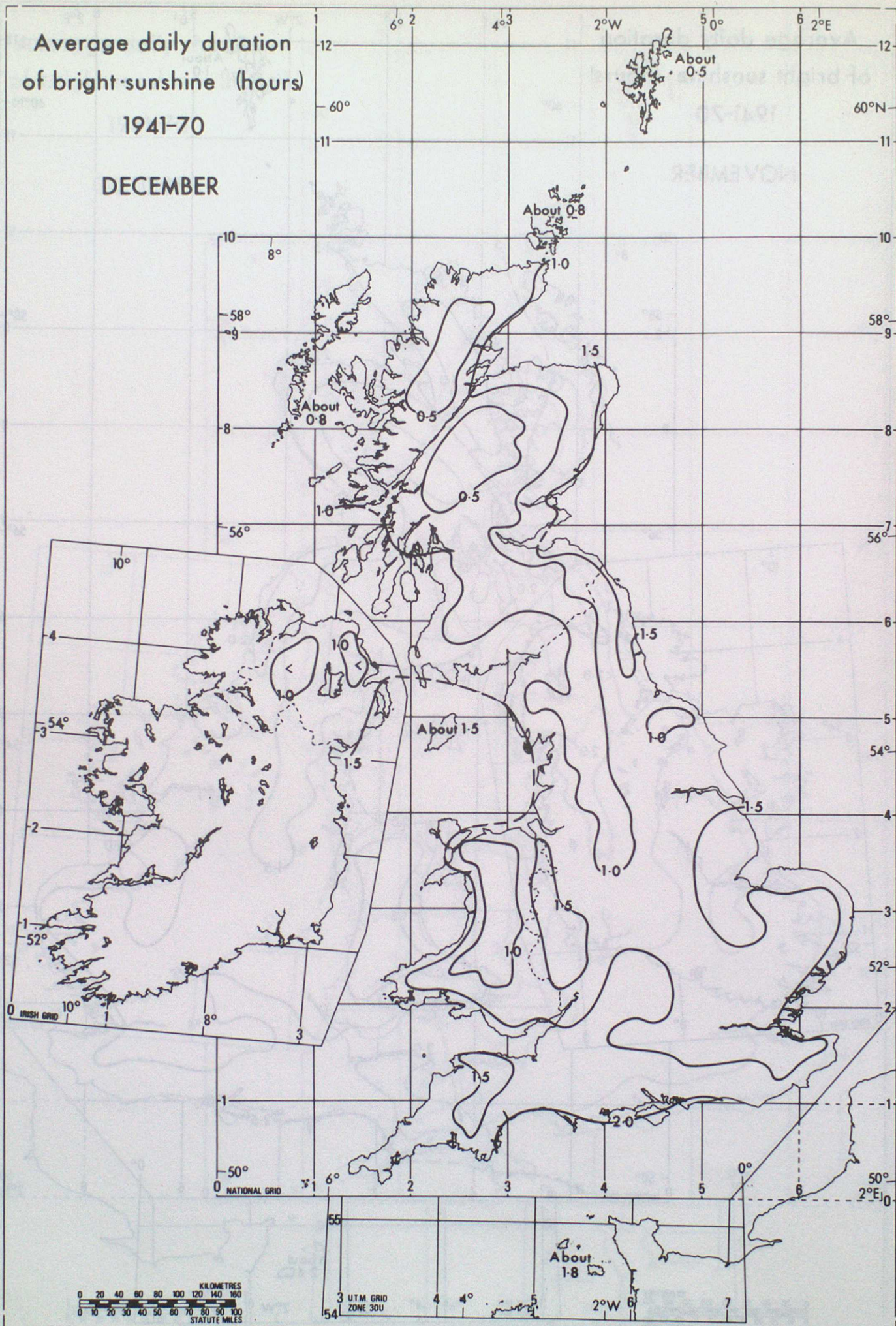
Average daily duration
of bright sunshine (hours)
1941-70

NOVEMBER



Average daily duration
of bright sunshine (hours)
1941-70

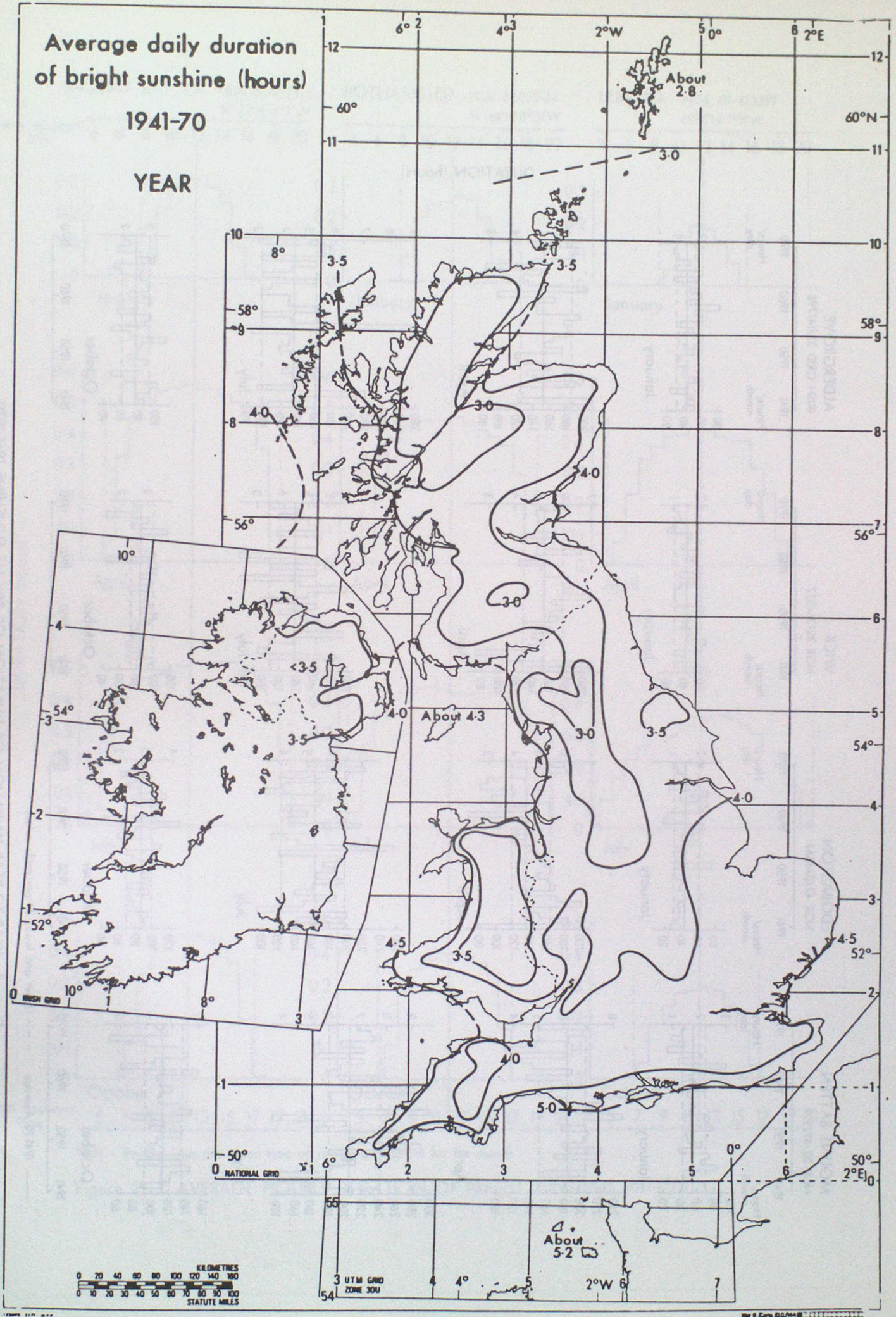
DECEMBER



Average daily duration of bright sunshine (hours)

1941-70

YEAR



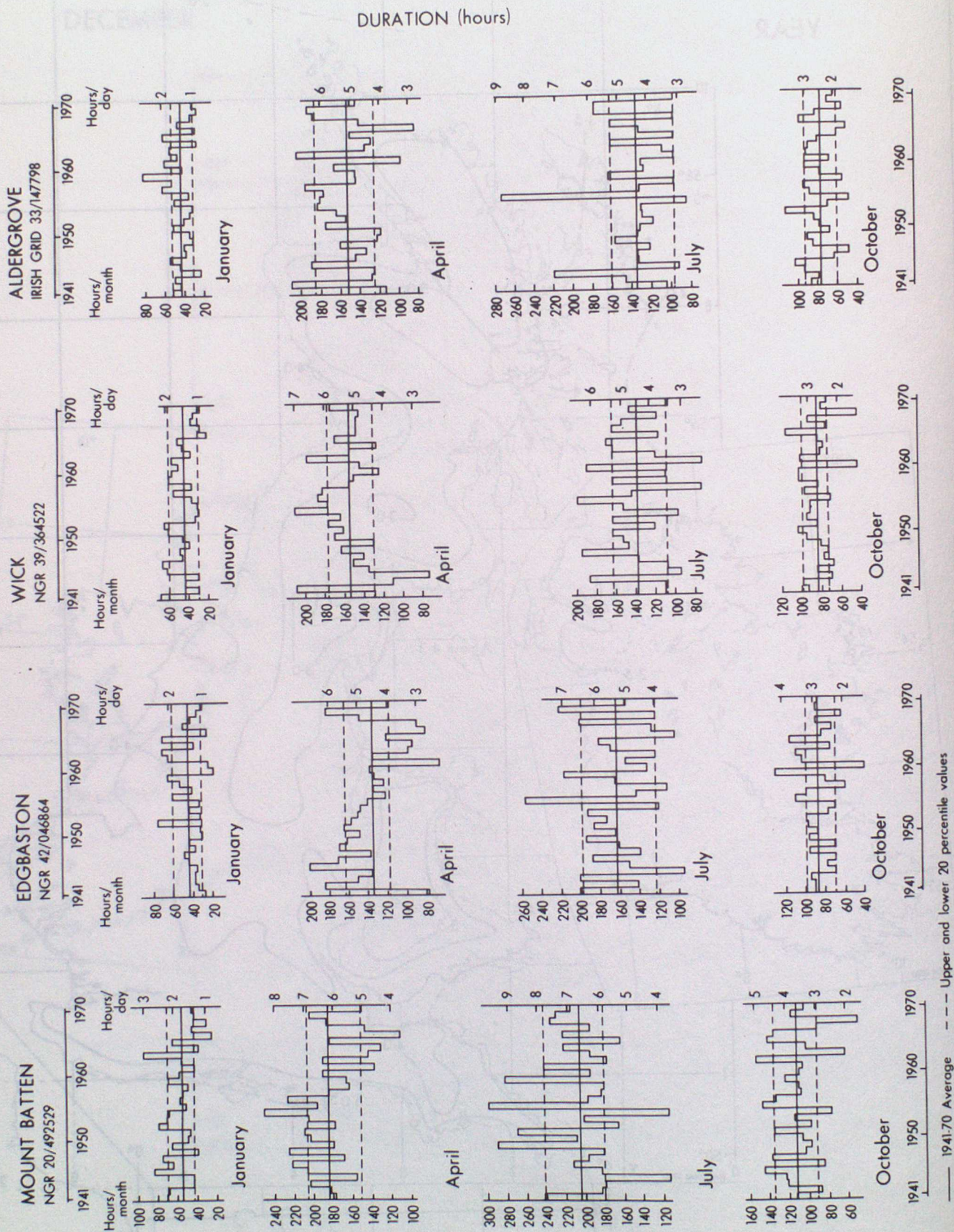
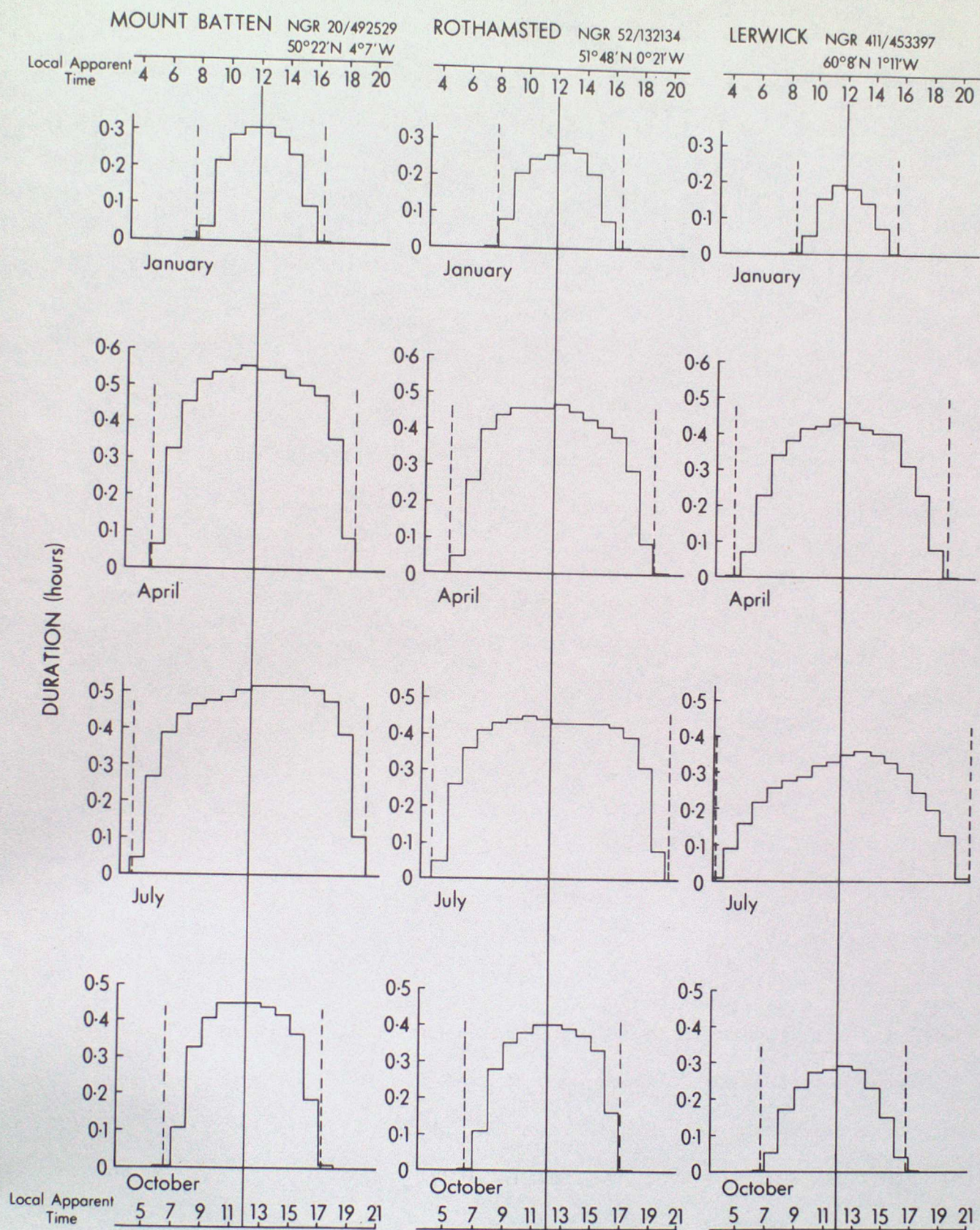


Figure 1. YEAR TO YEAR VARIATION OF DURATION OF BRIGHT SUNSHINE 1941-1970



Note : Pecked lines are mean time of sunrise and sunset for the month

Figure 2. AVERAGE HOURLY DURATION OF BRIGHT SUNSHINE 1941-1970

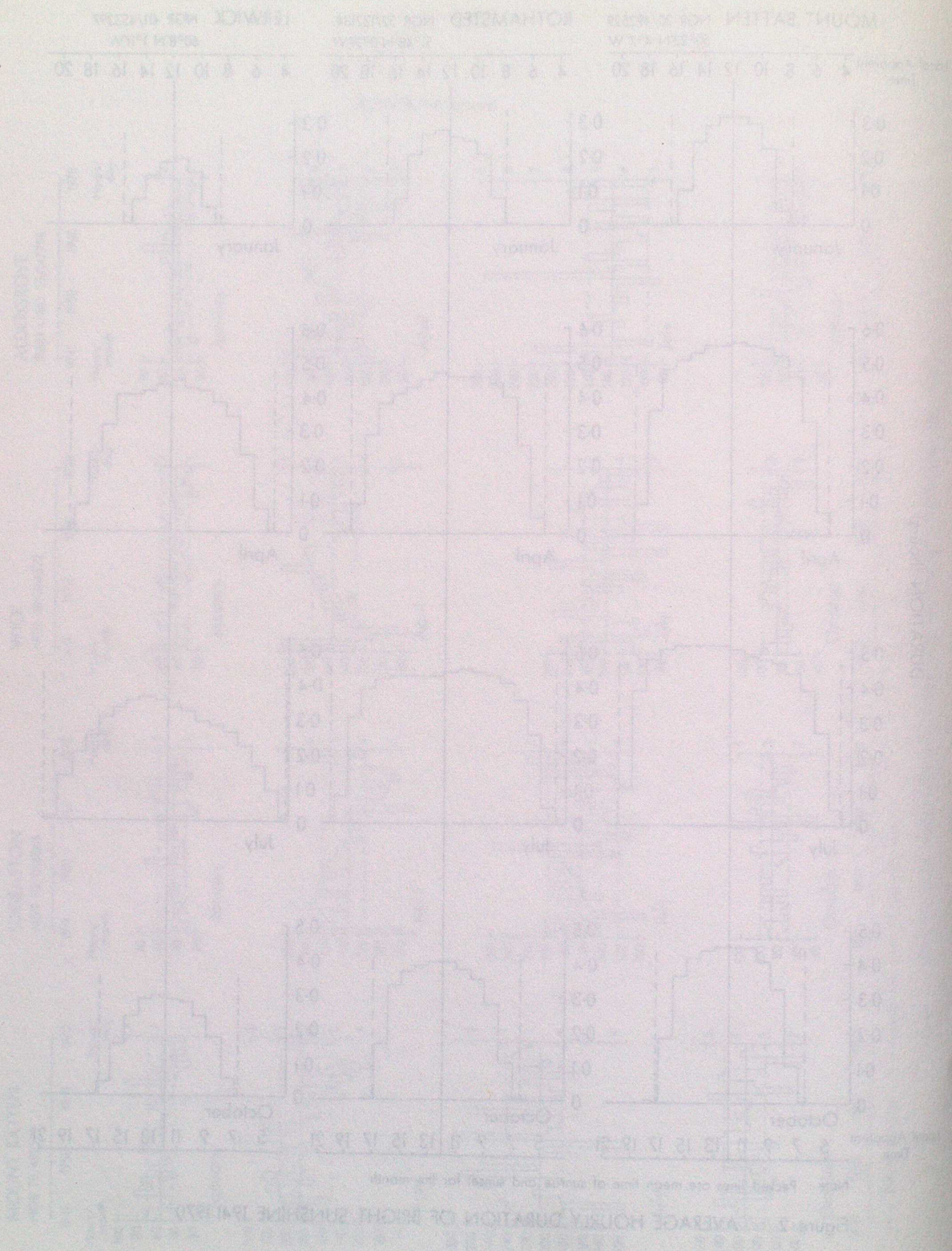


Figure 2. AVERAGE HOURLY DURATION OF BRIGHT SUNSHINE 1941-1950. The figures are the mean of the hourly sunshine duration for the month.