

UDC 551.542(41/42)
551.543.6

METEOROLOGICAL OFFICE

CLIMATOLOGICAL MEMORANDUM

No. 51 A

AVERAGES OF MEAN SEA LEVEL BAROMETRIC
PRESSURE AT 9h FOR THE UNITED KINGDOM

1941—1970

by

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Climatological Services (Met.O.3)

September 1973



Figure 1

AVERAGES OF MEAN SEA LEVEL BAROMETRIC PRESSURE AT 9h FOR THE UNITED KINGDOM

Introduction

This memorandum contains tables and maps of monthly and annual averages of barometric pressure at 9h G.M.T. reduced to mean sea level for the period 1941-70. The averages given in Table 1 refer exclusively to this period, small gaps in the observations for any particular place having been completed with estimates taken from monthly pressure maps prepared for publication in the Monthly Weather Report. Figure 1 shows the places for which averages are given.

The new 1941-70 averages are compared with previous 30-year averages for 6 widely-spaced stations and a table of the highest and lowest pressures recorded in the British Isles from 1870-1970 is also given.

Presentation

The 1941-70 averages given in Table 1 are listed under climatological districts and in the same station order as that used in Table 3 of the Monthly Weather Report. It should be noted that the revision of county administrative areas in April 1974 has necessitated some amendments to the climatological district boundaries (see Fig 1). Several new counties have been created and others have changed names. The revised county names are used in this memorandum. The National Grid Reference and height of the barometer cistern above mean sea level are given for each station.

The maps following Table 1 show the distribution of average mean sea level pressure at 9h G.M.T. for each calendar month and for the year as a whole during the period 1941-70. They may be compared with similar maps for the period 1931-60 given in Climatological Memorandum No 51.

The Observations

Mean pressure is expressed in millibars. One millibar = 10^3 dynes/cm 2 = 10^2 Newtons/m 2 and is the pressure due to 0.750062 mm of mercury at 0°C and standard gravity of 980.665 cm/sec 2 .* Corrections for index error, gravity, temperature and height are applied to the barometer readings at the time of observation to obtain pressure at mean sea level. For full details of these corrections see the Observers Handbook 1969 edition published by the Meteorological Office.

Before 1945 barometers at Meteorological Office stations were usually read at 7h G.M.T., but the morning hour of observation for climatological purposes was then changed to 9h and has remained so ever since. A correction factor, based on the mean diurnal variation of pressure (see below), has been applied to the readings from official stations taken before 1945 to make them comparable with readings taken at 9h. A large number of the stations for which averages are given took readings at 9h for the whole period 1941-70.

* Standard gravity of 980.62 cm/sec 2 was used by the Meteorological Office prior to January 1965.

Diurnal Variation

Superimposed on the changes of pressure associated with the movement and development of weather systems are regular small-amplitude oscillations having maxima at 10h and 22h local time and minima at 4h and 16h local time. These diurnal extremes occur at the same hour local time everywhere, the range being greatest at the equator and becoming insignificant north of 60°N . At 52°N the range is about 0.8 mb.

Comparison with previous averages

Figures 2 and 3 present graphically monthly averages of pressure reduced to mean sea level and corrected to 9h, at 6 widely spaced stations for various 30-year periods between 1901 and 1970.

It will be seen that the differences between one 30-year period and another 30-year period are relatively small with a few notable exceptions. In particular, during the early spring mean pressures at all stations for the periods 1901-30 and 1911-40 are very much lower than those for later periods, and in September the periods 1901-30 and 1911-40 give higher pressures than later periods.

Two maxima are clearly indicated in all the graphs, the first being in May (in the north) - June (in the south) and the second being in September. The first maximum is much more pronounced in the north whilst the maxima are about equal in the south.

Highest and Lowest Pressures

Table 2 gives the highest and lowest mean sea level pressures known to have been recorded at official meteorological stations in the British Isles. It is possible that pressures outside these limits have occurred at other times or in other places not recording pressures but the table gives a good indication of the range of values within which pressure may be expected to lie in any particular month.

It will be seen from the table that the extreme maximum and extreme minimum pressures both occur in January. The upper extreme value is lowest in August and the lower extreme value is highest in June. The absolute monthly range of pressure is highest in January and gradually decreases to a minimum of about half the January figure in June. Most of the extreme values are recorded in the northern half of the country and there is a greater range in the monthly minimum values than in the maximum values.

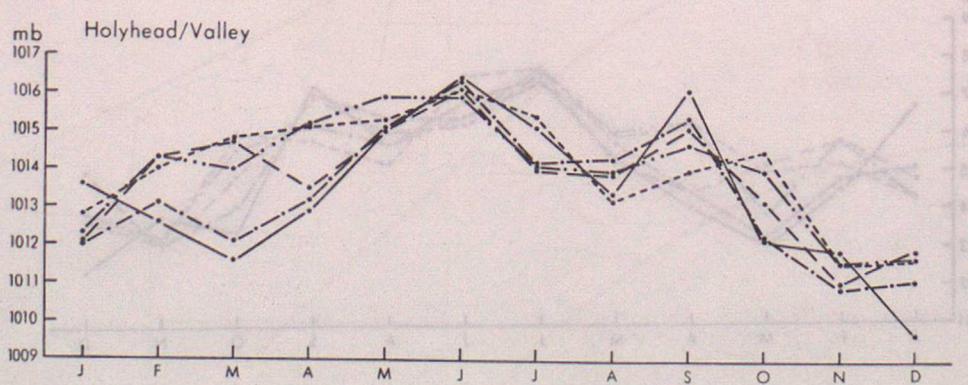
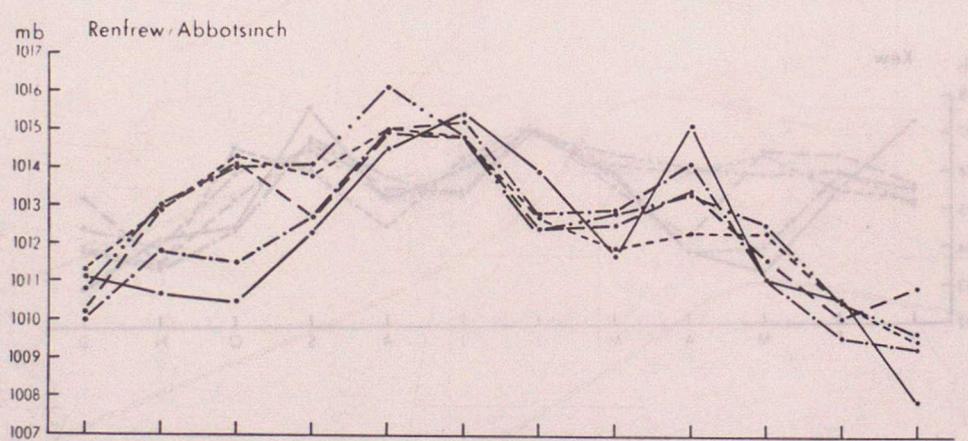
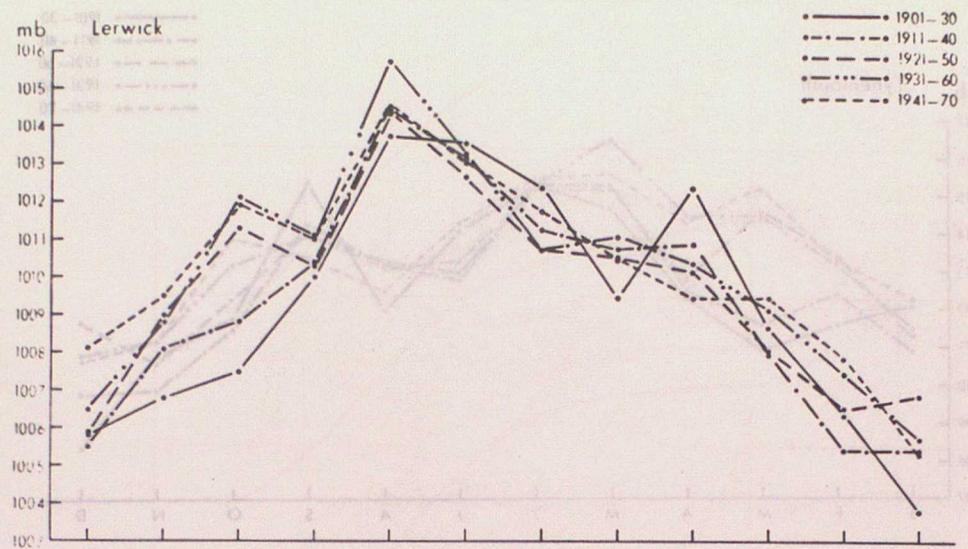


Figure 2 Comparison of 30 year averages

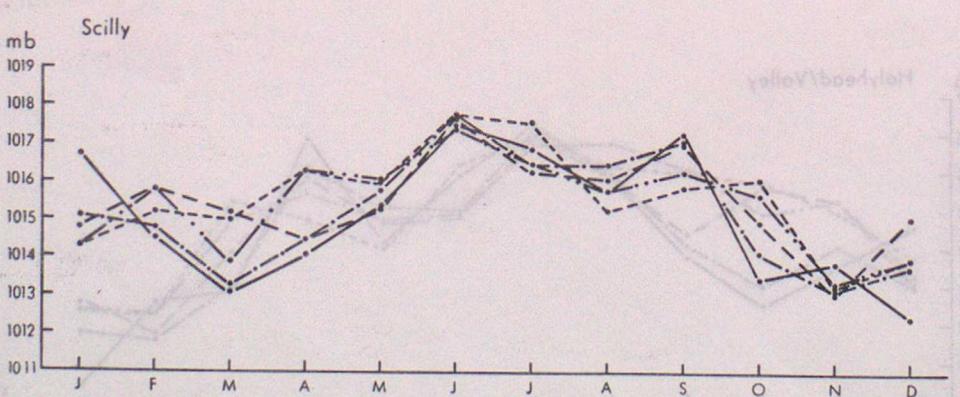
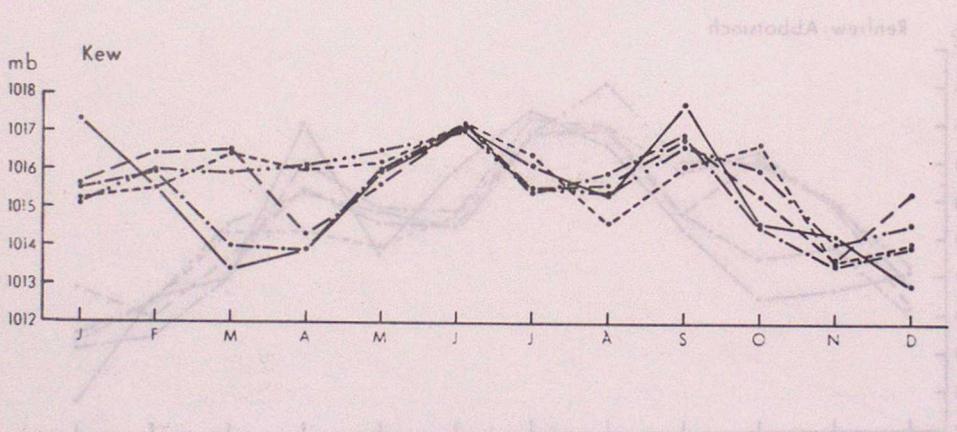
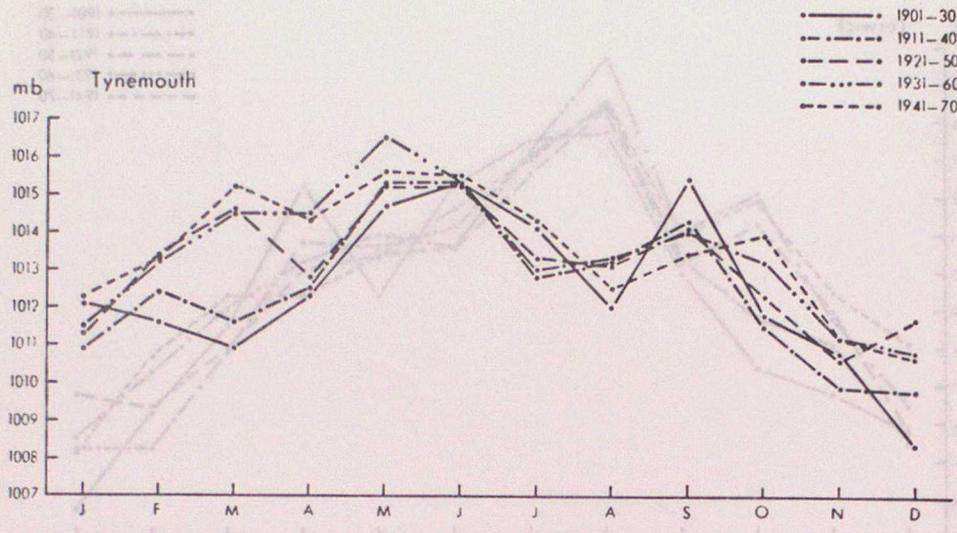


Figure 3 Comparison of 30 year averages

TABLE I

TABLE 1

DISTRICT PLACE AND COUNTY	NAT. GRID REFERENCE	HEIGHT (METRES)	AVERAGE PRESSURES									YEAR (MB)	
			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	
DISTRICT 2 - ENGLAND EAST & NORTHEAST													
ACKLINGTON	46/225007	46	11.8	12.8	14.7	14.0	15.2	15.1	13.8	12.2	12.9	13.4	10.6
CRANWELL	53/003494	64	14.0	14.5	15.9	15.4	15.8	16.4	15.4	13.6	15.0	15.6	12.6
HARROGATE	44/303579	65	13.1	13.8	15.3	14.5	15.4	15.7	14.6	12.8	14.0	14.5	11.9
KILNSEA	54/417161	16	13.3	13.9	15.5	15.0	15.7	16.2	15.1	13.3	14.5	15.1	12.0
LECONFIELD	54/026438	9	13.2	13.9	15.5	14.9	15.7	15.9	14.8	13.0	14.3	14.9	12.0
LEEMING	44/305690	33	13.0	13.8	15.4	14.8	15.5	15.8	14.6	12.9	14.0	14.6	11.8
MALHAM TARN	34/893672	400	13.1	13.9	15.4	14.9	15.4	15.7	14.6	12.9	14.0	14.8	11.8
SCARBOROUGH	54/044884	36	12.7	13.5	15.2	14.6	15.5	15.7	14.4	12.7	13.8	14.5	11.5
TYNE & WEAR	45/347695	40	12.3	13.3	15.0	14.3	15.6	15.5	14.3	12.5	13.4	13.9	11.2
WADDINGTON	43/988653	69	13.9	14.5	15.9	15.3	15.8	16.4	15.4	13.6	14.9	15.4	12.6
DISTRICT 3 - EAST ANGLIA													
CAMBRIDGE	52/453572	12	14.6	15.0	16.2	15.8	16.0	16.9	15.9	14.2	15.6	16.1	13.6
CARDINGTON	52/081464	29	14.8	15.3	16.3	15.8	16.1	17.0	16.1	14.3	15.8	16.3	13.4
CROMER	63/208422	24	14.1	14.3	16.0	15.4	15.9	16.5	15.3	13.5	15.1	15.7	12.6
FELIXSTOWE	62/286328	5	14.8	15.1	16.3	15.9	16.2	17.0	16.0	14.3	15.8	16.5	13.3
GORLETON	63/534037	8	14.3	14.7	16.1	15.5	16.0	16.6	15.6	13.9	15.3	15.9	12.8
MARSHALL	53/726094	24	14.3	14.8	16.1	15.5	15.9	16.6	15.6	13.9	15.4	16.0	12.9
SUFFOLK	52/683779	12	14.5	14.9	16.1	15.6	15.9	16.7	15.7	14.0	15.5	16.1	13.0
HERTFORD	52/132134	121	14.8	15.1	16.1	15.6	15.8	16.8	15.9	14.3	15.6	16.3	13.3
ESSEX	51/948857	5	15.2	15.4	16.5	16.0	16.4	17.2	16.4	14.7	16.2	16.7	14.1
STANSTED	52/531226	102	15.0	15.3	16.4	15.9	16.1	17.0	16.1	14.4	15.8	16.5	13.4
NORFOLK	53/847245	80	14.1	14.5	15.9	15.3	15.7	16.4	15.4	13.7	15.2	15.8	12.7
CAMBRIDGE	53/043026	76	14.3	14.8	16.1	15.6	15.9	16.7	15.7	13.9	15.3	15.9	13.1

TABLE 1

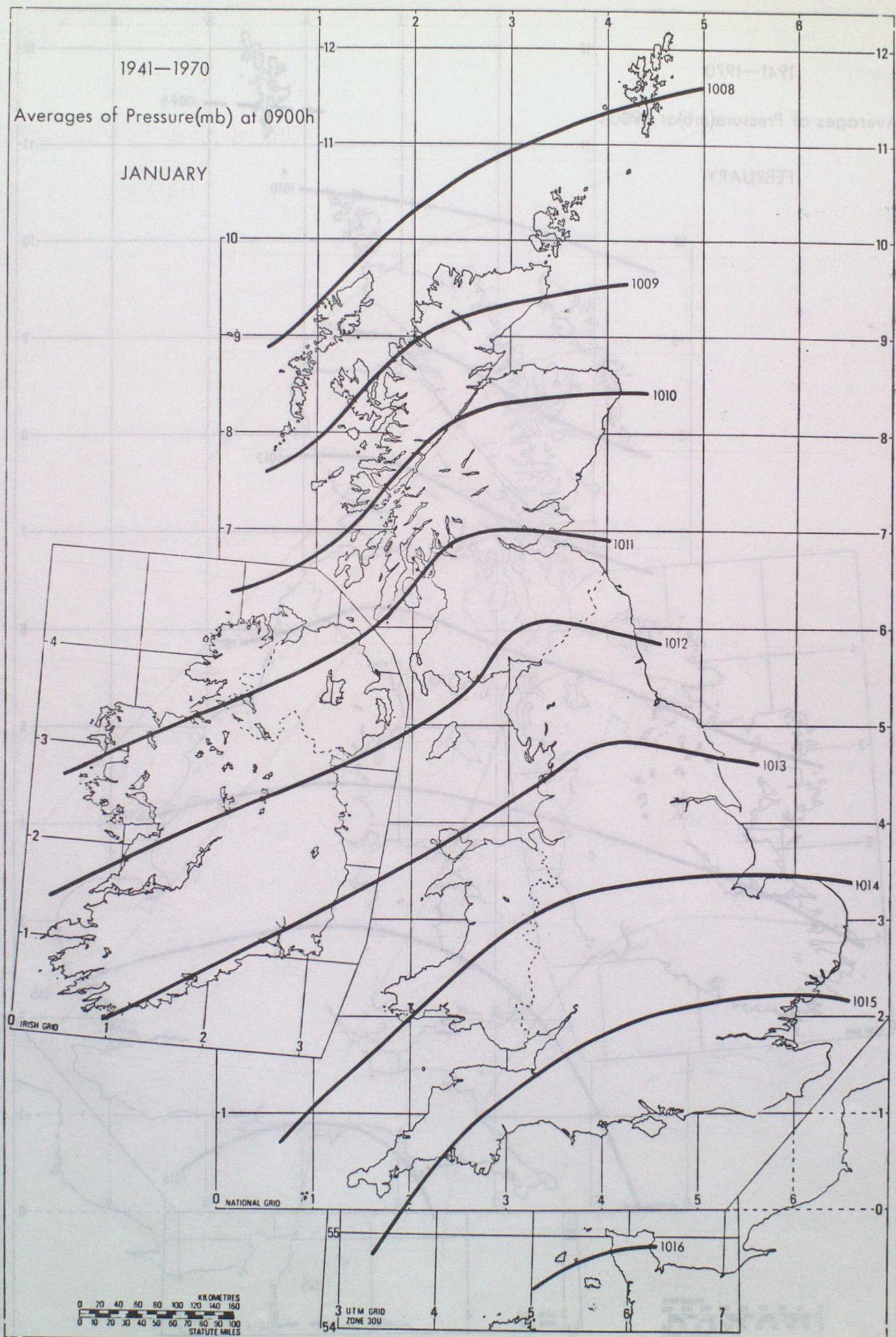
DISTRICT PLACE AND COUNTY	NAT. GRID REFERENCE	HEIGHT (METRES)	AVERAGE PRESSURES												
			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR (MB -1000)
DISTRICT 4 - MIDLAND COUNTIES															
ABINGDON	OXFORD	71	15.0	15.5	16.4	16.1	16.2	17.1	16.5	14.5	15.9	16.5	13.6	14.1	1015.6
EDGBASTON	WEST MIDLANDS	165	14.4	15.1	16.1	15.8	16.0	16.8	16.0	14.2	15.4	16.0	13.1	13.4	1015.2
ELMDON	WEST MIDLANDS	100	14.4	15.0	16.0	15.7	15.9	16.7	15.9	14.0	15.3	16.0	13.0	13.3	1015.1
FINNINGLEY	SOUTH YORKS.	14	13.5	14.4	15.7	15.2	15.7	16.2	15.1	13.4	14.6	15.2	12.2	12.3	1014.5
GLoucester	Gloucester	24	14.8	15.4	16.3	16.0	16.0	17.1	16.3	14.5	15.7	16.3	13.4	13.9	1015.5
LITTLE RISSINGTON	Gloucester	229	14.8	15.3	16.1	15.9	16.0	17.0	16.2	14.4	15.8	16.3	13.4	13.8	1015.4
ROSS-ON-WYE	HEREFORD & WORCS.	69	14.5	15.2	16.0	15.9	15.9	16.9	16.2	14.2	15.5	16.1	13.1	13.6	1015.3
SHAWBURY	Salop	75	14.0	14.8	15.8	15.5	15.7	16.5	15.6	13.7	15.2	15.5	12.7	12.9	1014.8
SHEFFIELD	SOUTH YORKS.	137	13.6	14.3	15.7	15.2	15.7	16.2	15.2	13.4	14.6	15.1	12.4	12.5	1014.5
WATNALL	NOTTINGHAM	119	13.9	14.5	15.8	15.3	15.6	16.3	15.3	13.5	14.8	15.4	12.5	12.7	1014.6
DISTRICT 5 - ENGLAND SOUTHEAST & CENTRAL SOUTHERN															
BOSCOMBE DOWN	WILTSHIRE	128	15.4	15.9	16.6	16.4	16.4	17.5	16.9	15.1	16.3	17.0	14.0	14.6	1016.0
EASTBOURNE	SUSSEX	7	15.5	15.8	16.6	16.2	16.3	17.6	16.8	15.1	16.4	16.9	13.9	14.5	1016.0
FOLKESTONE	KENT	67	15.4	15.5	16.6	16.1	16.1	17.1	16.4	14.8	16.1	16.7	13.6	14.4	1015.7
GATWICK	WEST SUSSEX	59	15.4	15.8	16.6	16.2	16.3	17.3	16.6	14.9	16.3	16.9	13.9	14.5	1015.9
KEW	GREATER LONDON	10	15.2	15.5	16.4	16.1	16.2	17.2	16.4	14.7	16.1	16.7	13.6	14.2	1015.7
LARKHILL	WILTSHIRE	133	15.1	15.5	16.2	15.9	15.9	17.0	16.4	14.6	15.3	16.5	13.6	14.2	1015.6
LONDON (HEATHROW) R.A.F.T	GREATER LONDON	26	15.2	15.5	16.4	16.1	16.2	17.2	16.4	14.6	16.0	16.0	13.6	14.1	1015.7
LYNEHAM	WILTSHIRE	149	15.1	15.6	16.4	16.2	16.3	17.4	16.6	14.7	16.0	16.6	13.7	14.2	1015.7
SOUTHAMPTON	HAMPSHIRE	10	15.4	15.7	16.4	16.1	16.2	17.4	16.8	15.0	16.2	16.8	13.8	14.5	1015.9
SOUTH FARNBOROUGH	HAMPSHIRE	70	15.4	15.8	16.6	16.3	16.3	17.3	16.6	14.8	16.2	16.9	13.9	14.5	1015.9
THORNEY ISLAND	SUSSEX	4	15.5	15.8	16.6	16.3	16.4	17.6	16.8	15.1	16.3	16.9	13.9	14.9	1016.0
TUNBRIDGE WELLS	KENT	118	15.6	15.7	16.5	16.1	16.2	17.2	16.5	14.8	16.3	16.8	13.8	14.6	1015.8
WEST MALLING	KENT	94	15.5	15.7	16.6	16.2	16.3	17.2	16.5	14.8	16.3	16.9	13.9	14.5	1015.9
WORTHING	SUSSEX	11	15.7	15.9	16.7	16.3	16.6	17.5	16.8	15.0	16.3	17.0	14.0	14.8	1016.0

TABLE I

DISTRICT	PLACE AND COUNTY	NAT. GRID REFERENCE	HEIGHT (METRES)	AVERAGE PRESSURES								YEAR (MB)
				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	
DISTRICT 7A - ENGLAND NORTHWEST & ISLE OF MAN												
BOSTON	MERSEYSIDE	33/287897	62	13.2	14.2	15.3	15.1	15.4	16.1	15.3	14.3	12.0
CARLISLE	CUMBRIA	35/384603	28	12.4	13.6	15.0	14.6	15.3	15.5	14.4	12.5	10.8
NELSON	LANCASHIRE	34/872384	166	13.1	14.0	15.3	14.8	15.3	15.7	14.7	13.3	11.4
POINT OF FYRE	ISLE OF MAN	25/467043	9	11.8	13.2	14.4	14.3	15.0	15.4	14.5	12.4	10.8
RINGWAY	GREATER MANCHESTER	33/818850	84	13.5	14.3	15.5	15.2	15.5	16.1	15.2	13.3	14.5
RONALDSWAY	ISLE OF MAN	24/279688	21	12.2	13.6	14.7	14.7	15.1	15.7	14.8	12.7	13.0
SPEKE	MERSEYSIDE	33/437820	26	13.5	14.5	15.5	15.3	15.5	16.2	15.4	13.3	14.4
SQUIRES GATE	LANCASHIRE	34/316317	11	13.0	14.1	15.2	15.0	15.4	16.0	15.1	13.1	14.0
DISTRICT 7B - WALES NORTH												
HAWARDEN	CLWYD	33/353655	5	13.5	14.4	15.5	15.3	15.5	16.2	15.4	13.3	14.4
LLANDUDNO	Gwynedd	23/778819	10	13.2	14.3	15.2	15.3	15.5	16.4	15.6	13.5	14.4
VALLEY	Gwynedd	23/310758	11	12.8	14.0	14.8	15.1	15.3	16.1	15.4	13.2	14.0
DISTRICT 8A - WALES SOUTH												
ABERPORT	DYFED	22/242521	134	13.7	15.1	15.2	15.6	15.5	16.2	16.1	13.9	14.8
LLANTRINDOD WELLS	POWYS	32/061605	221	14.6	15.3	16.0	16.0	16.1	17.1	16.3	14.3	15.7
MILFORD HAVEN	DYFED	12/892054	39	13.9	15.2	15.3	15.9	15.7	17.1	16.6	14.4	15.1
PORT TALBOT	WEST GLAMORGAN	21/789867	9	14.7	15.8	16.1	16.3	16.3	17.5	16.8	14.9	15.8
RHOOSSE	SOUTH GLAMORGAN	31/064679	70	14.9	15.6	16.1	16.2	16.1	17.3	16.7	14.7	15.8

TABLE 1

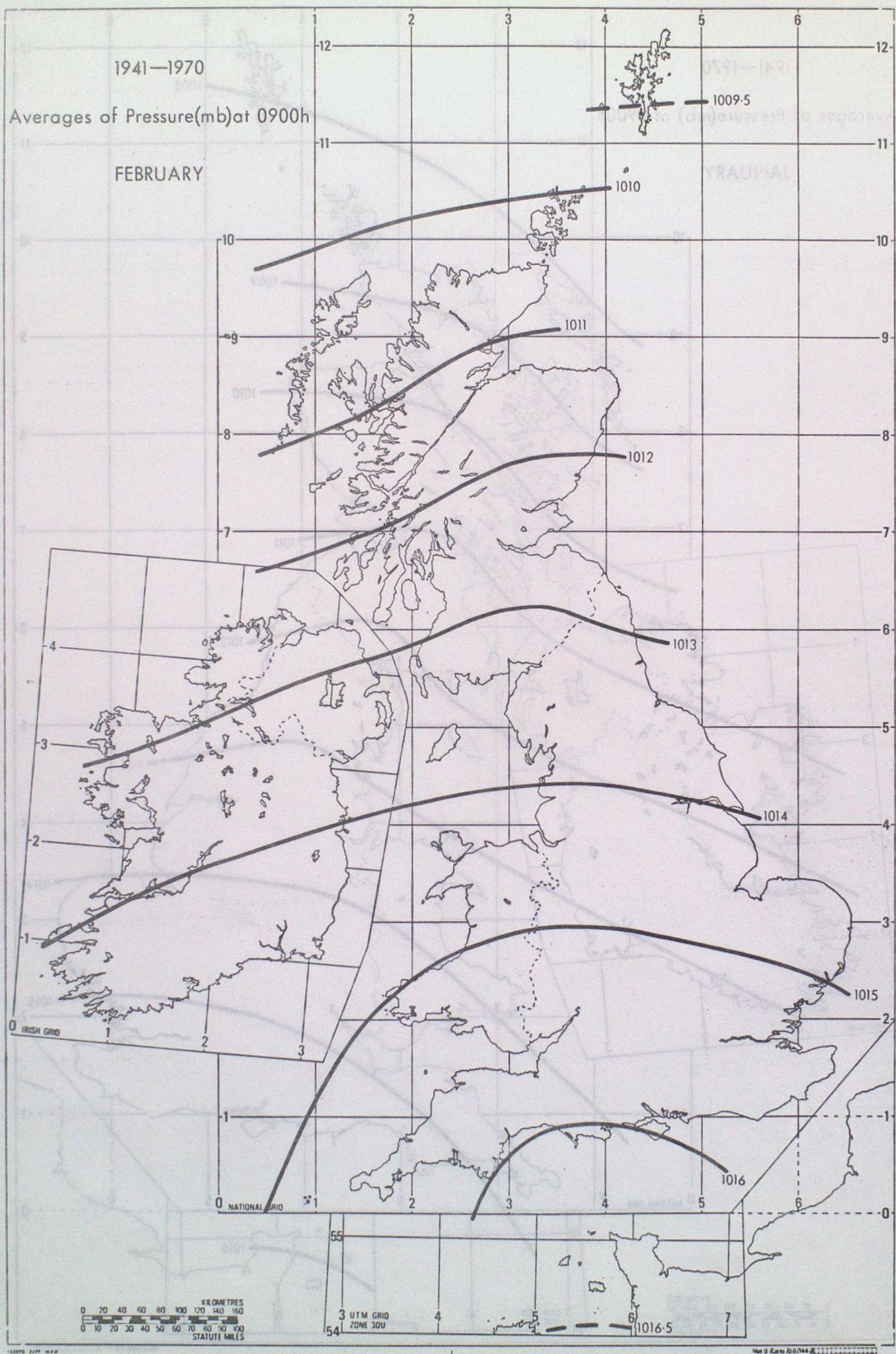
DISTRICT PLACE AND COUNTY	NAT. GRID REFERENCE	HEIGHT (METRES)	AVERAGE PRESSURES												YEAR (MB)	
			JAN	FEB	MAR	APR	MAY	JUN (MB - 1000)	JUL	AUG	SEP	OCT	NOV	DEC		
DISTRICT 88 - ENGLAND SOUTHWEST																
BATH	AVON	134	14.9	15.4	16.1	15.9	17.1	16.5	14.6	15.7	16.4	13.4	14.0	1015.5		
BOURNEMOUTH	DORSET	20	15.7	16.0	16.7	16.6	16.5	18.0	17.3	15.4	16.6	17.2	14.1	14.8	1016.2	
BRISTOL(FILTON)APT	AVON	60	14.9	15.6	16.3	16.3	16.1	17.3	16.5	14.5	15.9	16.4	13.5	14.0	1015.6	
CHIVENOR	DEVON	21/494347	7	14.8	15.6	15.8	16.3	16.1	17.5	17.1	14.9	15.8	16.3	13.4	14.0	1015.6
EXETER	DEVON	30/001933	38	15.2	15.9	16.2	16.4	16.2	17.6	17.1	15.1	16.2	16.6	13.8	14.5	1015.9
LIZARD	CORNWAL	10/701119	73	14.8	15.5	15.5	16.3	16.1	17.8	17.6	15.4	16.0	16.3	13.6	14.3	1015.8
MOUNT BATTEN	DEVON	20/492529	30	15.2	15.8	16.0	16.4	16.1	17.8	17.4	15.3	16.2	16.6	13.8	14.5	1015.9
ST MANGAN	CORNWAL	10/871642	107	14.6	15.5	15.4	16.1	15.8	17.6	17.2	15.0	15.8	16.2	13.4	14.2	1015.6
SCILLY (ST MARY'S)	CORNWAL	00/913121	61	14.3	15.2	15.0	16.3	16.0	17.8	17.6	15.3	15.9	16.1	13.3	14.0	1015.6
NORTHERN IRELAND																
ALDERGROVE	ANTRIM	33/147798#	73	10.7	12.6	13.5	13.7	14.5	14.8	14.2	11.9	12.1	12.0	10.3	9.4	1012.5
BALLYKELLY	LONDONDERRY	24/624235#	3	11.6	13.3	14.2	14.3	15.0	15.3	14.6	12.4	12.9	13.3	11.0	10.4	1013.2
CHANNEL ISLANDS																
JERSEY (ST.HELIER)		554/652493\$	11	16.2	16.3	16.5	16.9	16.6	18.5	18.1	16.1	17.1	17.4	14.4	15.5	1016.6



1941—1970

Averages of Pressure(mb) at 0900h

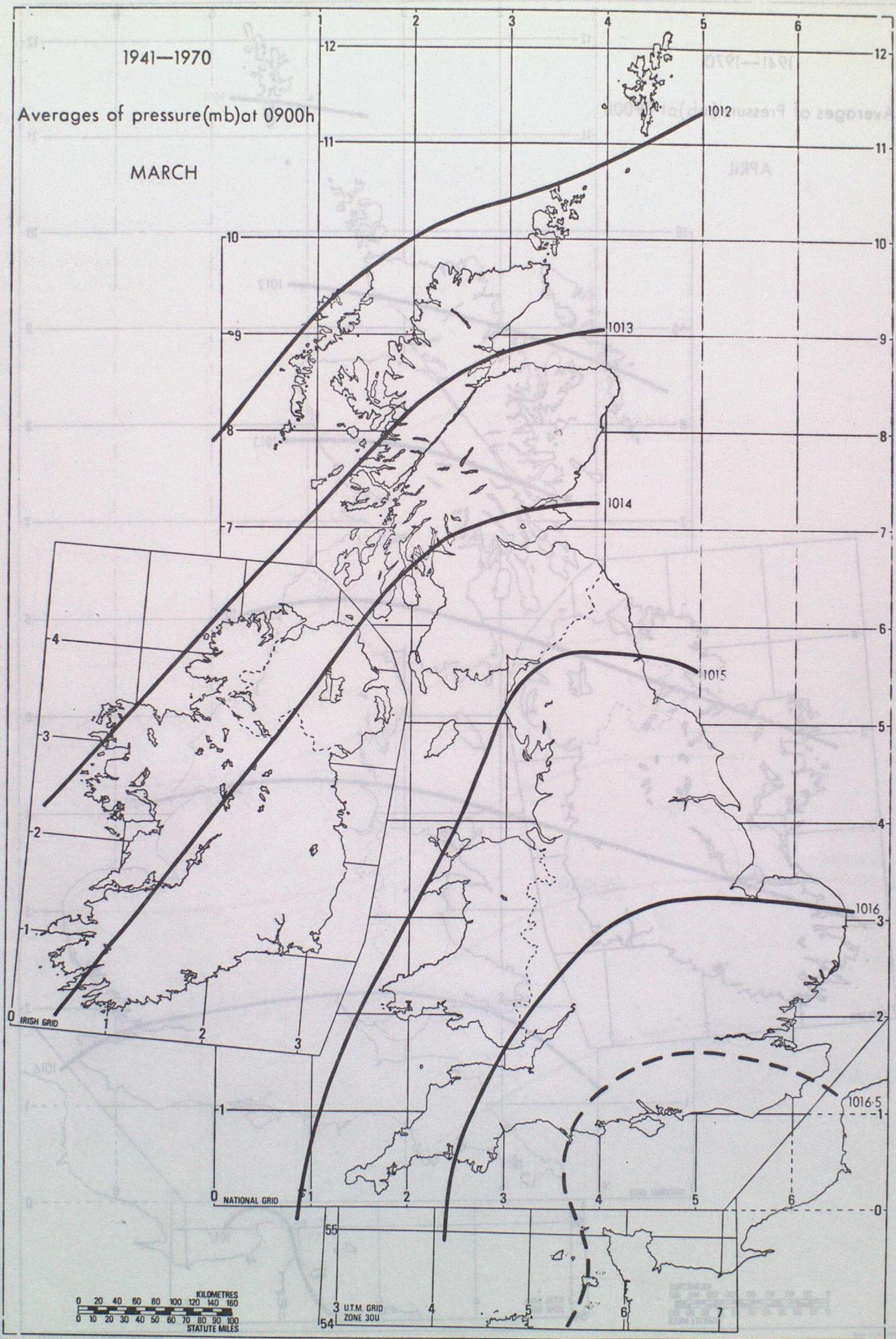
FEBRUARY



1941—1970

Averages of pressure(mb)at 0900h

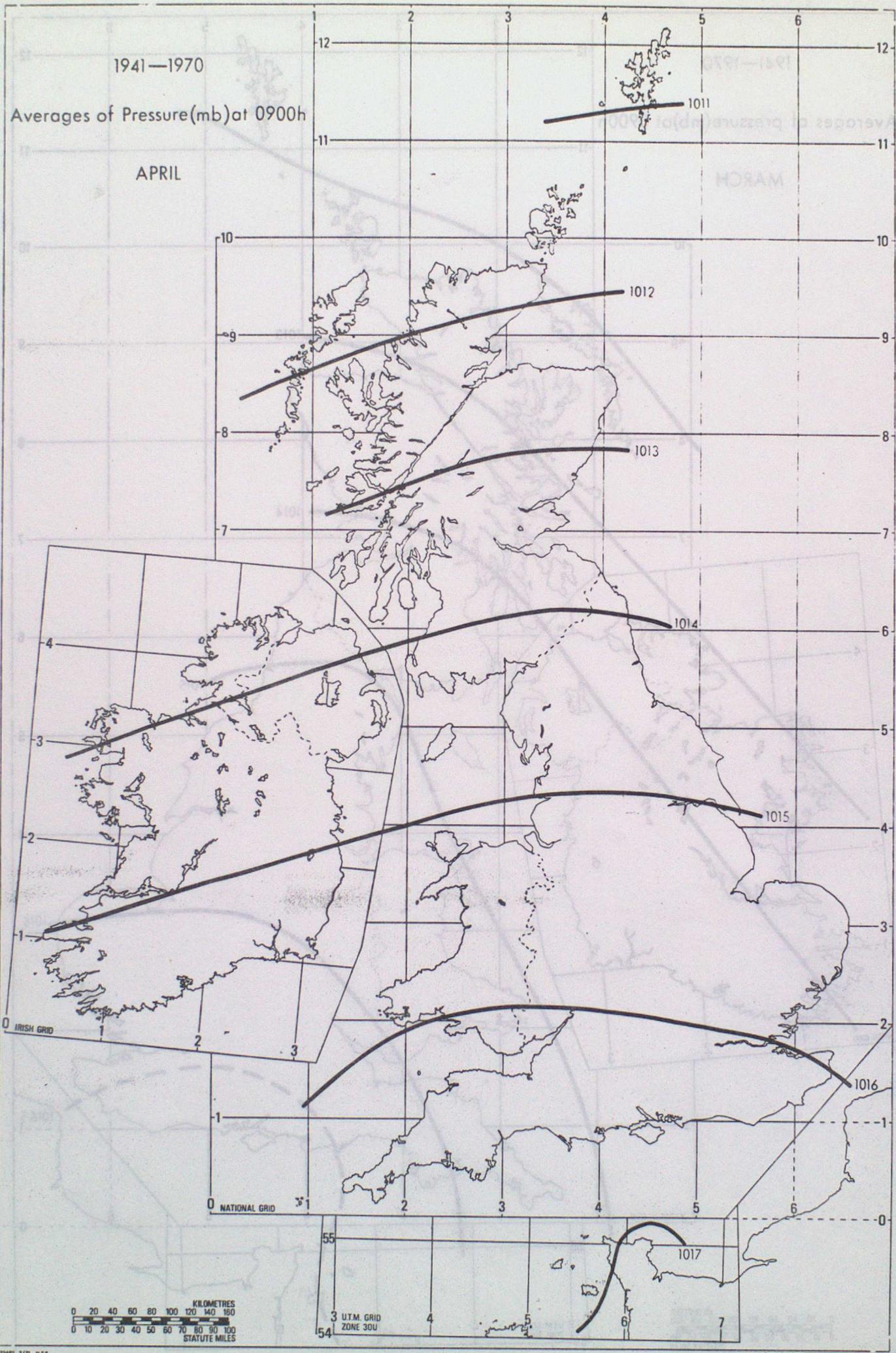
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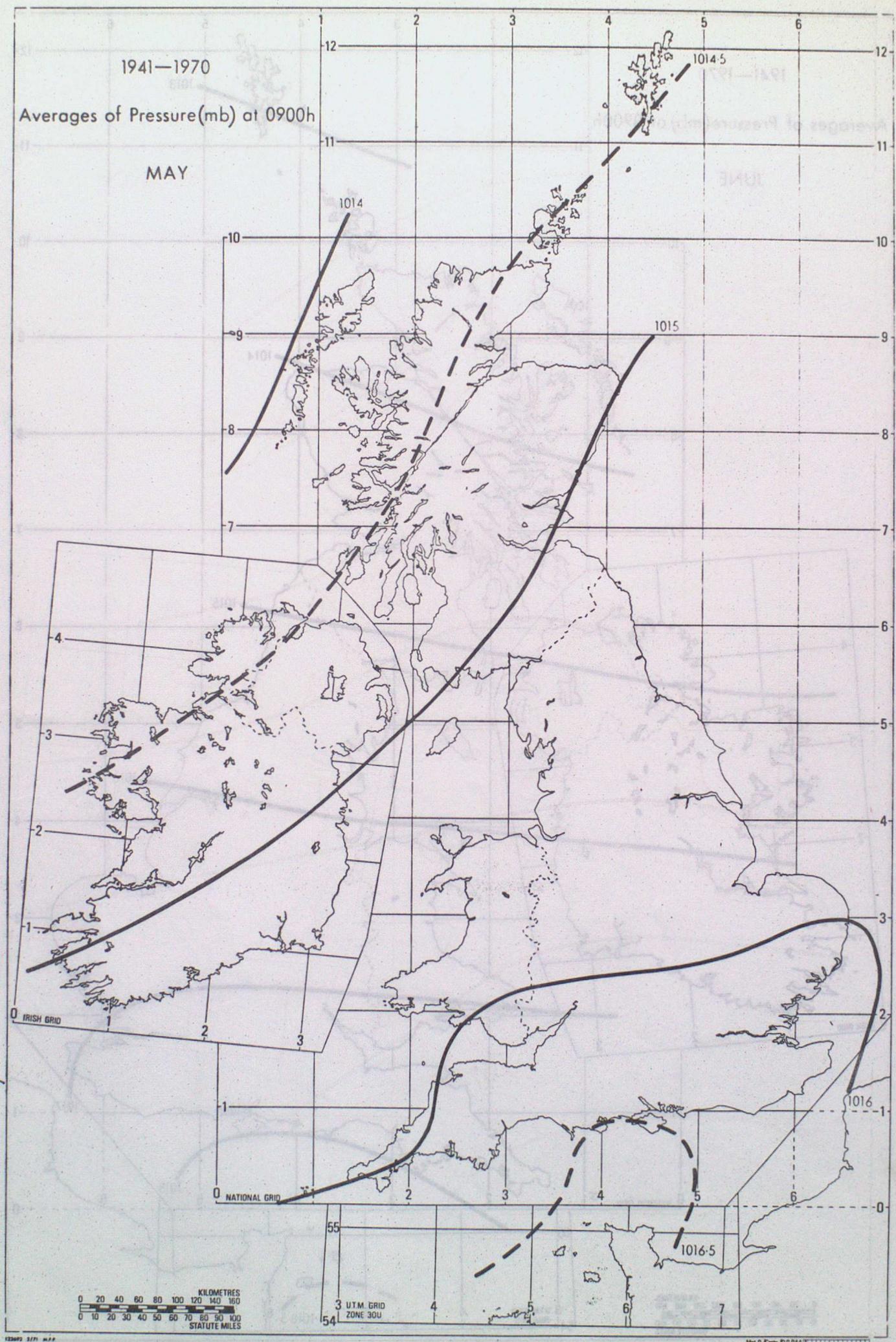


1941—1970

Averages of Pressure(mb) at 0900h

APRIL

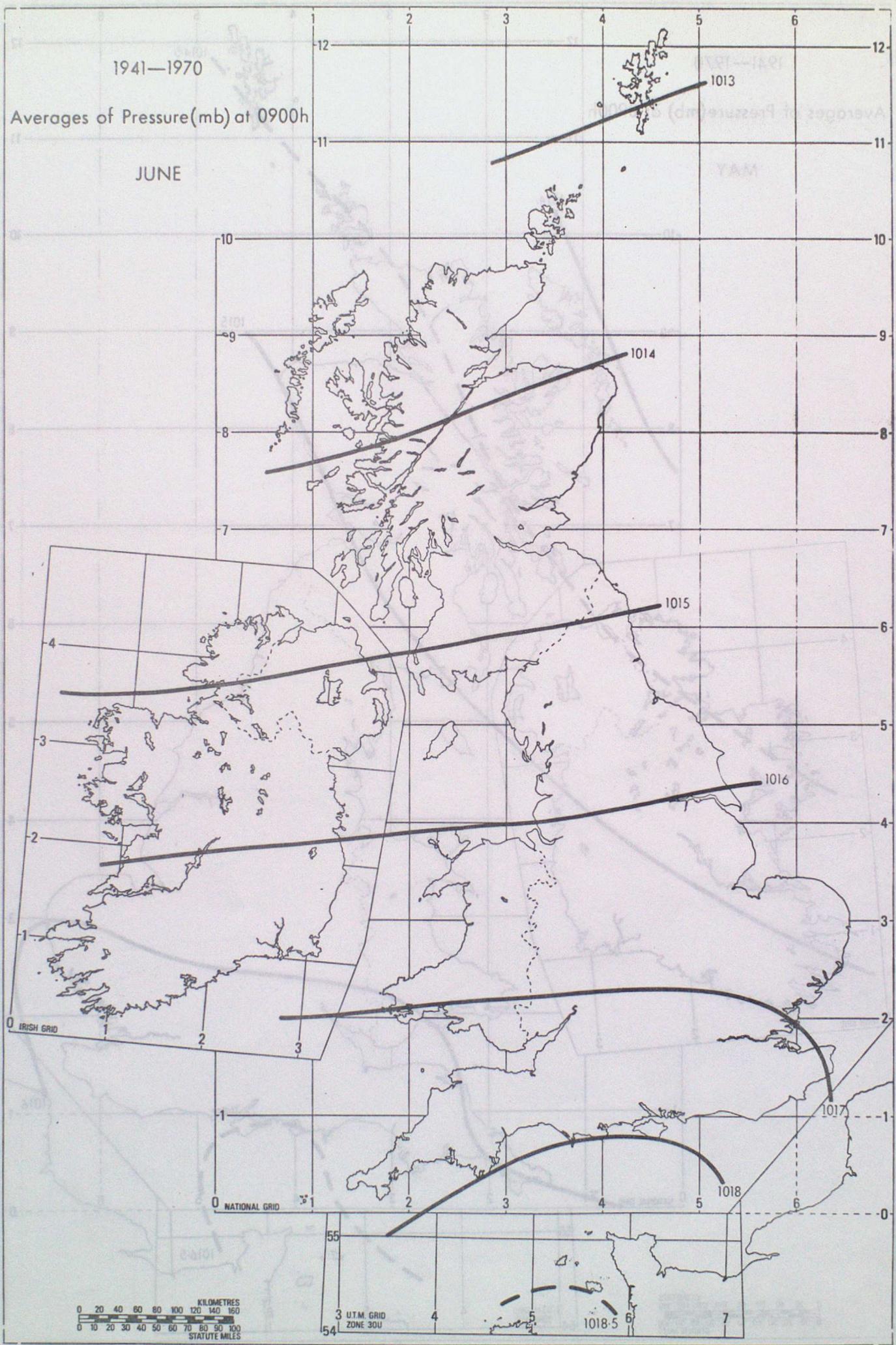


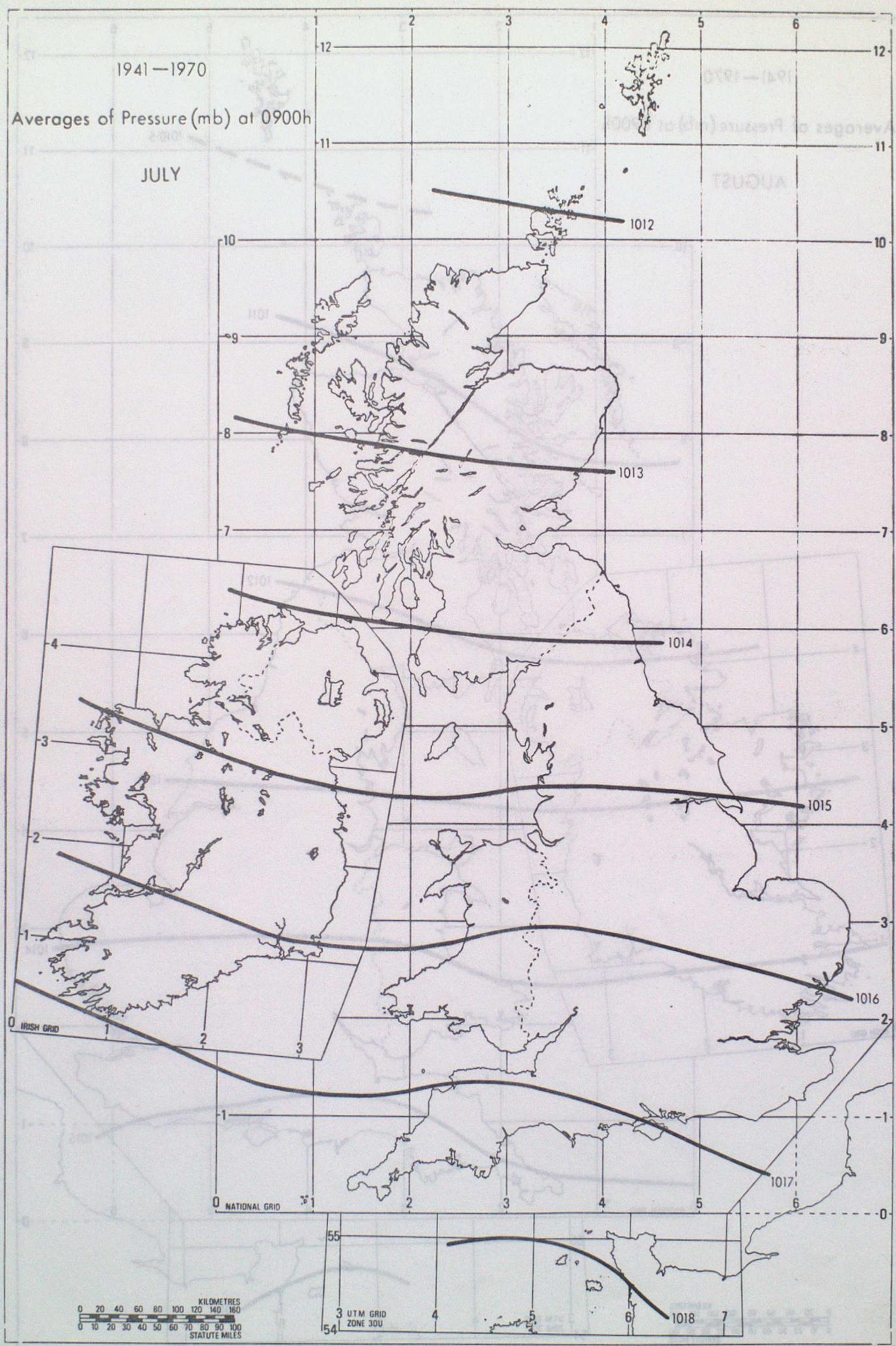


1941-1970

Averages of Pressure(mb) at 0900h

JUNE

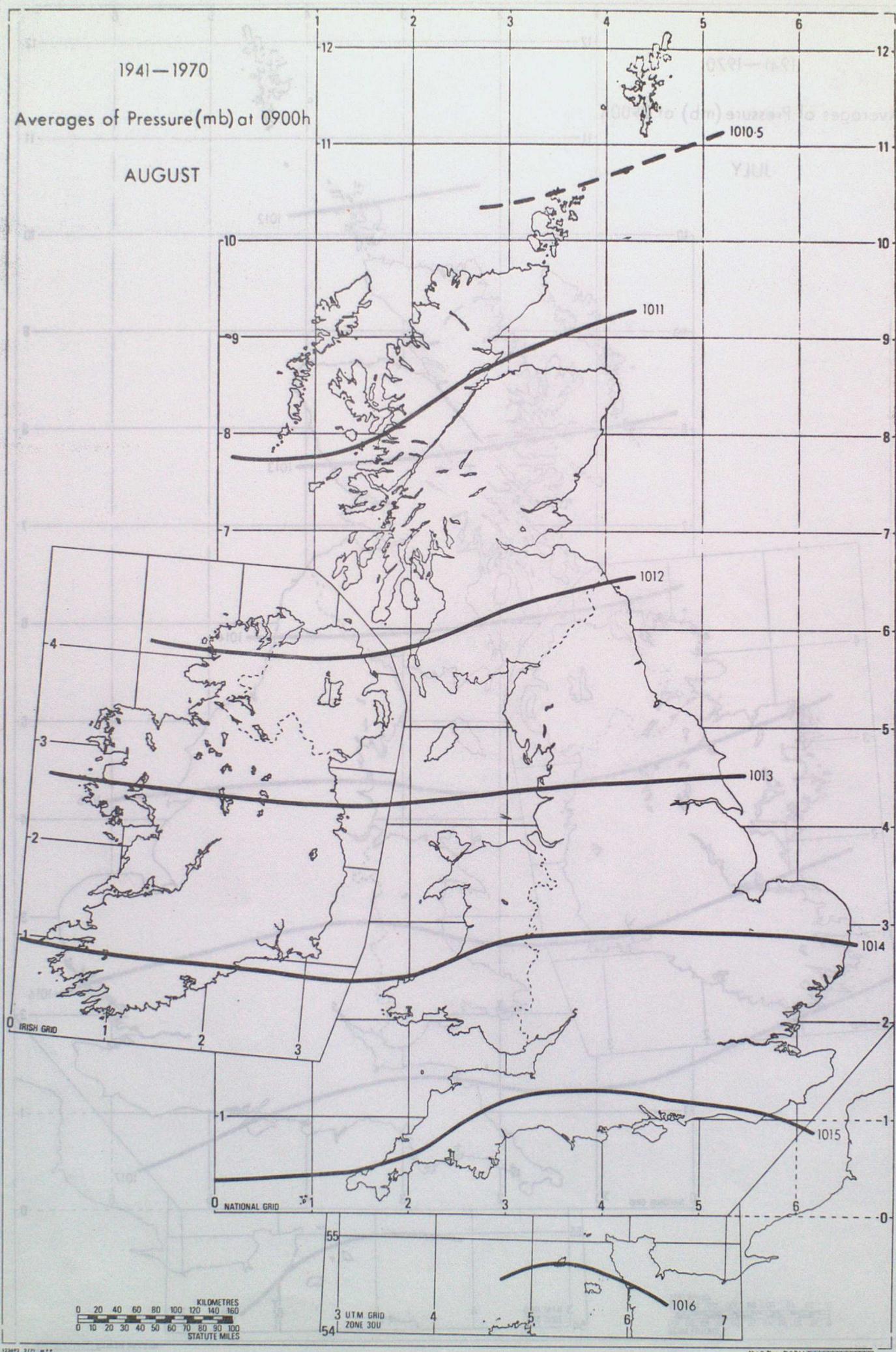


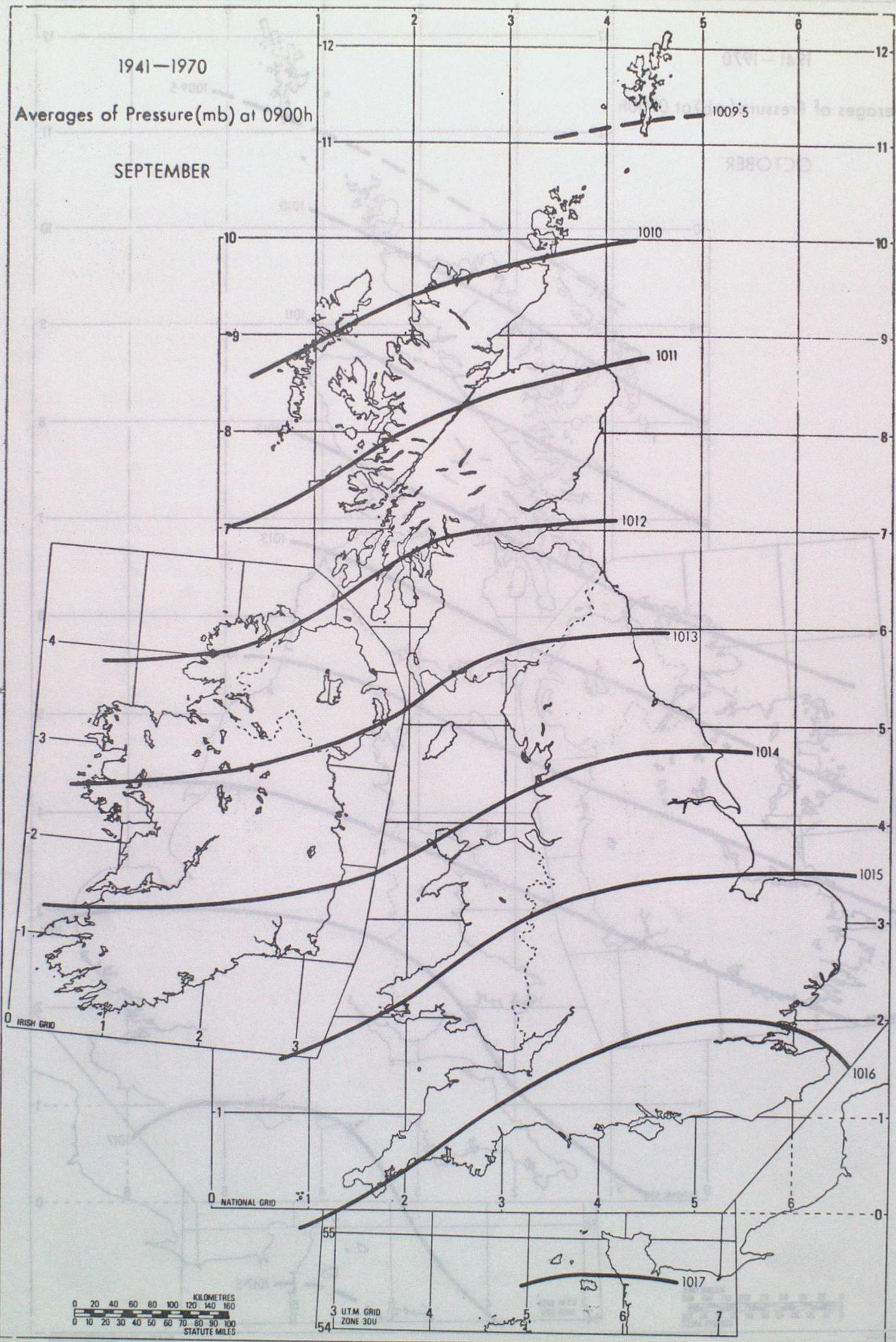


1941—1970

Averages of Pressure(mb) at 0900h

AUGUST

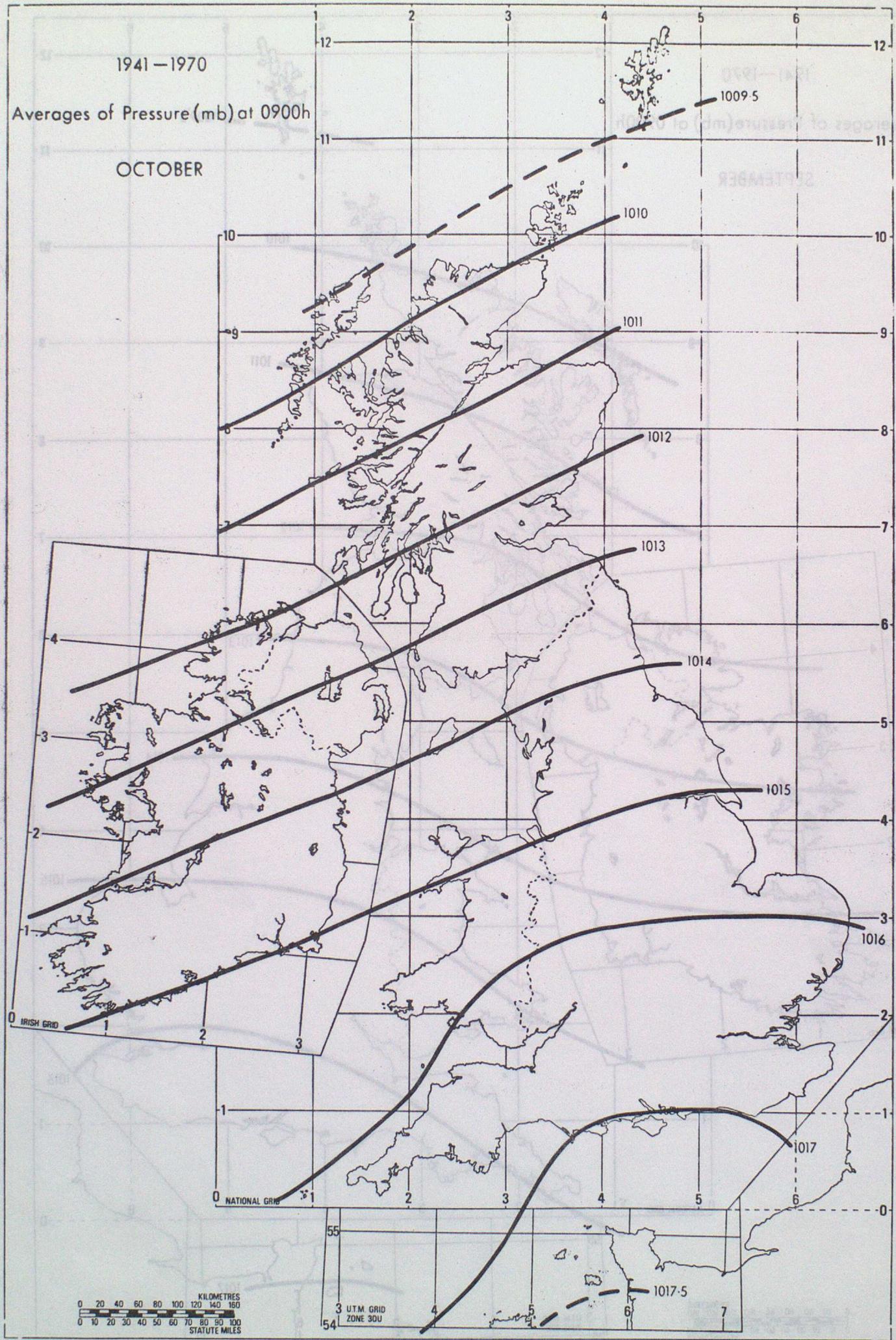


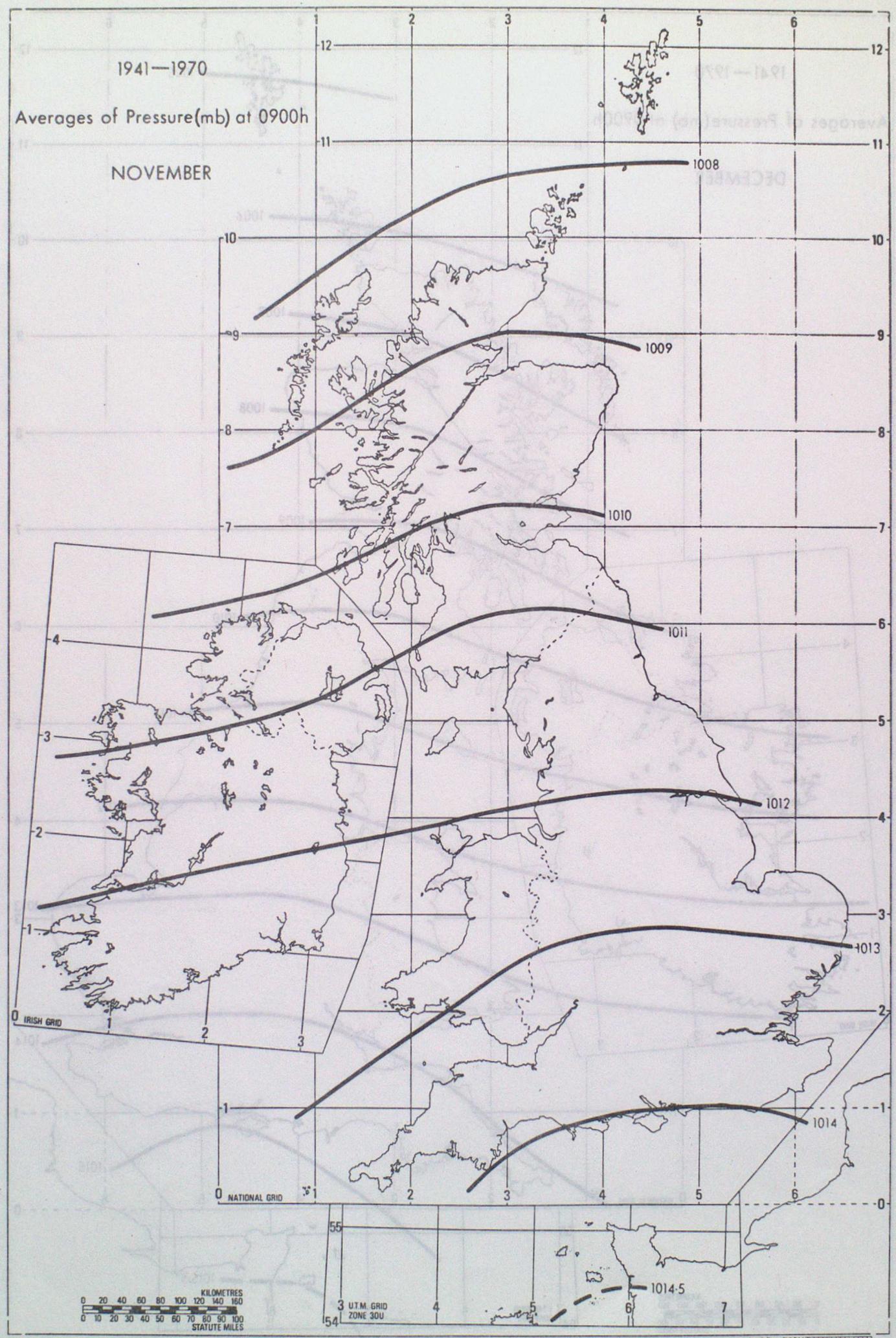


1941-1970

Averages of Pressure (mb) at 0900h

OCTOBER

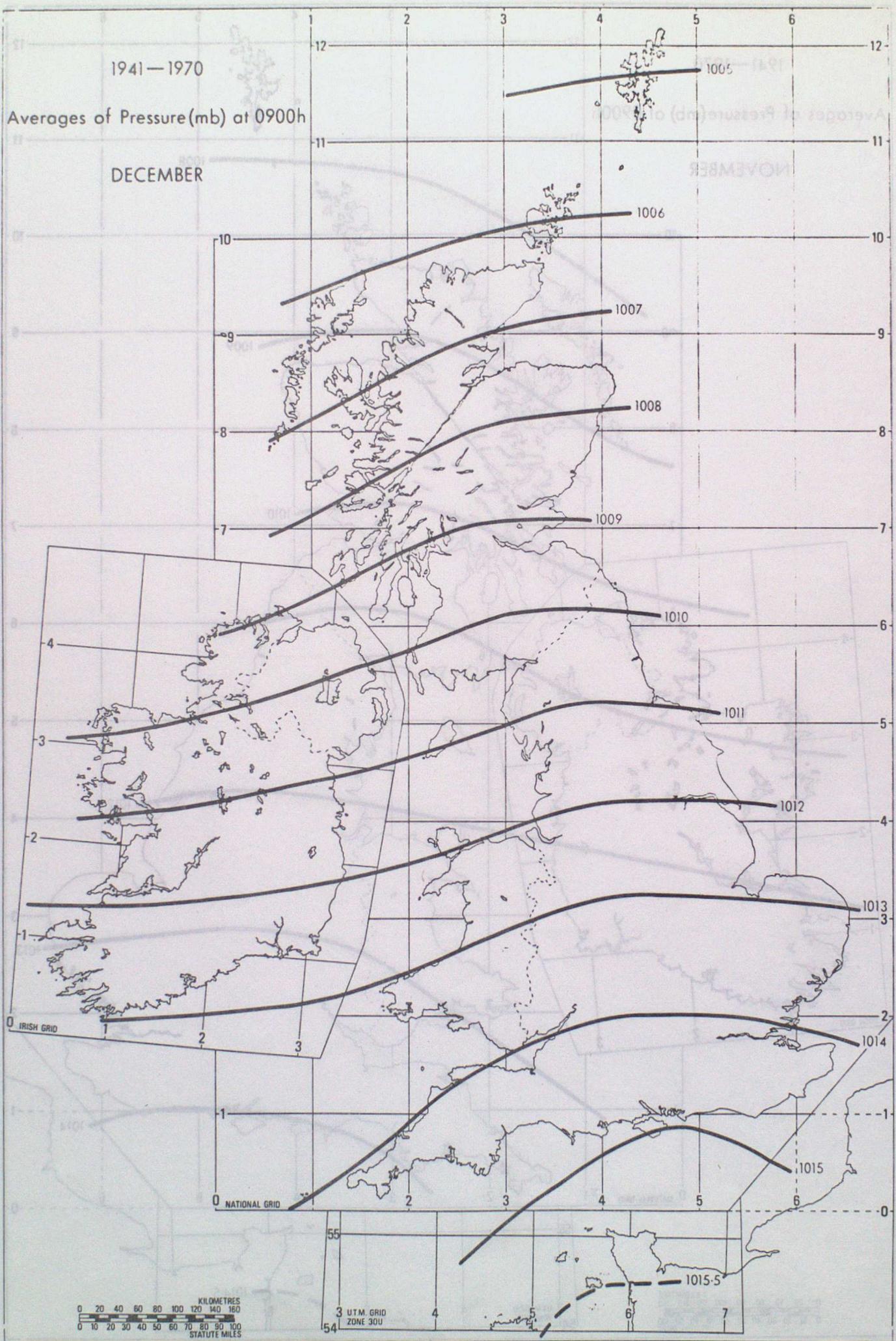




1941—1970

Averages of Pressure(mb) at 0900h

DECEMBER



KILOMETRES
0 20 40 60 80 100 120 140 160
STATUTE MILES
0 10 20 30 40 50 60 70 80 90 100

3 UTM GRID
ZONE 30U
54 4 5 6 7

Met O Carto R001442

TABLE 2

HIGHEST AND LOWEST M.S.L. PRESSURES RECORDED IN THE BRITISH ISLES (1870-1970)

	HIGHEST PRESSURE MB	DATE	PLACE	LOWEST PRESSURE MB	DATE	PLACE	RANGE MB
JAN.	1054.7	1902	ABERDEEN	925.5	1884	OCHTERTYRE	129.2
FEB.	1051.1	1902	NAIRN	942.3	1951	CORK	108.8
MAR.	1047.1	1900	VALENTIA	946.2	1876	WICK	100.9
APR.	1044.5	1938	ESKDALEMUIR	952.9	1948	MALIN HEAD	91.6
MAY	1042.2	1943	DUBLIN	968.0	1943	SEALAND	74.2
JUNE	1043.1	1959	CLONES	976.8	1944	WICK	66.3
JULY	1038.3	1911	NORTH SHIELDS	976.0	1922	TYNEMOUTH	62.3
AUG.	1036.7	1949	PEMBROKE	967.8	1957	SULLE SKERRY	68.9
SEP.	1038.6	1906	KEW	957.1	1953	CLAREMORRIS	81.5
OCT.	1045.6	1956	DYCE	946.8	1891	CARDOR CASTLE	98.8
NOV.	1044.5	1956	BENBECULA	939.7	1877	MONACH LIGHTHOUSE	104.8
DEC.	1051.9	1926	WICK	927.2	1886	BELFAST	124.7

