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P 9008

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LONG RANGE FORECASTS

Forecasting by Pressure Anomalies and Trends

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For some years experiments were made in forecasting the general character of the weather of the coming month by means of charts of the deviation of pressure from normal for the preceding month. For this purpose charts of pressure deviations were drawn for each month for the period 1873 - 1939 classified into types and indexed. In most cases however the month proved to be too long a unit and recently experimental 10-day forecasts were substituted, with a further outlook for a longer period when conditions were favourable.

The method is briefly as follows:

1. A chart of the mean deviations of pressure from normal is drawn for the 28-31 days ending on the 10th, 20th or last day of the month. With the aid of the index similar distributions in the same month (1) are picked out, together with the charts for the following months. Sometimes the latter are diverse but at other times they present sufficient similarity to give some indication of the lines on which the pressure distribution is likely to develop. The general trend shown by the last few charts is used to confirm or modify this indication.

2. Charts of the mean actual pressure distribution are drawn for successive periods of 10 days up to the day of forecasting and the movements of the areas of high and low pressure shown on these charts are examined for persistent tendencies.

The procedure is shown by the following example of a trial forecast for April 11 - 20, 1937.

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P 9016

1. Distributions similar to that for March 11 - April 10 1937 occurred in March 1909 1916 and 1931 and April 1877 and 1920. The distributions in the following months were as follows:

Month	Excess	mb.	Deficit	mb
May 1877	E. of Greenland	+5	Newfoundland	-5
April 1909	Central Europe	+2.5	E. of Greenland	-5
April 1916	Greenland	+5	Iceland - Lerwick	-5
May 1920	Central - S. Europe	+5	Iceland	-5
April 1931	N.E. Europe	+5	S. Iceland	-5

There appears to be a good tendency for pressure to be 5 mb below normal near Iceland. Comparing the charts for March and for March 11 - April 10 it is seen that pressure was falling in Iceland and rising in central and eastern Europe. The probable distribution for April 1937 is therefore an excess of 5 mb over central and eastern Europe and a deficit of 5 mb near Iceland.

2. The main feature of the 10-day charts is a low pressure area which moves south from Iceland on Feb 11 - 20 to Ireland on March 11 - 20 and then returns towards Iceland. In the north an anticyclone moves from west to east and is greatly intensified over Finland and N.W. Russia on April 1 - 10, while in the south a wedge of high pressure also moves eastwards. These tendencies suggest that in April 11 - 20 the low pressure area will cover Iceland and the sea to the east while the two anticyclones will unite over central Europe.

Actually the low pressure area covered Iceland as predicted but the anticyclone lay further north over Finland and northern Russia.

This method only predicts the average pressure distribution during the 10 days, not the detailed changes. Attempts to introduce the latter by studying the details of similar cases mostly failed, and recent statistical tests have shown that detailed forecasts made in this way are unlikely to succeed. It should also be emphasised that any other relevant information, such as pressure waves, should be taken into account. In fact, in the trial example quoted the prediction of the position of the anticyclone was improved by taking into account waves of 18 - 72 days.