

FORECASTING THE WEATHER

Neue Methoden der Wetteranalyse und Wetterprognose

Von Dr. Richard Scherhag. Pp. xii+424. (Berlin, Göttingen und Heidelberg: Springer-Verlag, 1948.) 78 D. marks.

WITHIN the past twenty years the forecasting of to-morrow's weather has become a much more formidable task than it was in earlier years. This comes about not so much because more precision is expected, but because the forecaster is now required to analyse so many more reports and to apply so much recently acquired knowledge of the atmosphere before he can make a satisfactory assessment of the probabilities. Even then he can seldom do justice to his forecast, because of limitations of newspaper space and broadcasting time; but that is another matter.

Until the 1930's, the surface weather chart with its sea-level isobars was the forecaster's main tool; with it he achieved a measure of success which in retrospect is surprising. He always knew that there must be close links between the behaviour of the low- and high-pressure patterns on his surface charts and what was going on in the free atmosphere; but he had not enough information to study the mechanism. Then the application of radio and radar to the measurement of the meteorological elements in the atmosphere and improvement in the means of collecting reports from wide areas provided the forecaster with what he needed; but the new flood of information also brought new problems, not the least of which was the devising of practical and speedy means of analysing and assessing the great mass of surface and upper-air observations which poured on to his bench from the greater part of the hemisphere several times a day.

It is mainly with this problem, and with the summarizing of his long experience in applying upper-air analysis to day-to-day forecasting in Germany, that Dr. R. Scherhag's treatise is concerned, and its importance lies in the fact that it is written from the point of view of the practising forecaster. So many books have been written on meteorological theory and so few by experienced forecasters for forecasters. Dr. Scherhag has divided his book into five major parts dealing respectively with (1) the bases of synoptic meteorology, (2) the climatology of the upper atmosphere and its relation with weather, (3) three-dimensional analyses of weather situations, (4) forecasting procedure in Germany, and (5) long-period forecasting. The second, third and fourth parts are particularly valuable, not for any novel ideas they contain—the techniques described have already been adopted or developed and extended independently in other weather services—but for the emphasis on daily forecasting practice.

In Germany the procedure is to prepare contour charts for isobaric surfaces at five levels up to 41 millibars (70,000 ft.) for the standard times of observation each day. After assessing the changes in thickness of the layers between these surfaces which are likely to be brought about by horizontal and vertical movement and by radiation, the future deformations and positions of the upper isobaric surfaces are estimated, taking into account the probable disposition of the pressure patterns on the surface chart in order to keep the whole system mutually consistent. This is the framework which

has then to be filled in with considerations of the changing characteristics, history, and movement of the air masses taking part, and of the regions of interaction between these masses, so leading finally to a forecast of the weather over a particular region at a particular time.

Most modern weather services now follow a similar procedure; but as the physics of no single stage is completely understood, either in Germany or elsewhere, varying degrees of empirical treatment necessarily enter, with emphasis on factors which differ from one country to another. To Dr. Scherhag the day-to-day changes in the stratosphere have important interrelations with weather: in some circumstances he may even select the regime at the 41-millibar level as giving the best guide to the future movements of the pressure field lower down. Without denying that the stratosphere may play an important part, forecasters in other services look to lower levels for the dominating factors, and instead of extending their analysis ever higher, as Germany's recent isolation seems to have driven Dr. Scherhag and his colleagues to do, they pay more attention to the hemispherical circulation pattern in the lower half of the atmosphere.

Almost all Dr. Scherhag's 400-page treatise is concerned with forecasting for periods up to 40 hours ahead, and the brief section of 15 pages on long-range forecasting is not encouraging. The author sees little prospect of extending modern synoptic procedures beyond three days, and though other methods, such as the study of weather singularities and periodicities and pressure waves, and the effects of sunspots and volcanic dust, may have their applications, Dr. Scherhag cannot yet foresee any technique for making useful forecasts for longer periods as a regular procedure.

The book is excellently illustrated with more than two hundred diagrams, and has a bibliography of nine hundred items. Dr. Scherhag and his publishers are to be congratulated on making a contribution of first class importance to the literature of weather forecasting.

J. M. STAGG

UNITY AMID COMPLEXITY

Aspects of Form

A Symposium on Form in Nature and Art. Edited by Lancelot Law Whyte. Pp. ix+249 (32 plates). (London: Percy Lund, Humphries and Co., Ltd., 1951.) 21s. net.

THIS is one of the most intriguing books of recent times. It is also one of the most symptomatic. A stage has clearly been reached when thinkers of several kinds, namely, physicists, biologists, psychologists and art-historians, have cast professional discretion aside, and asked what form is, and what—if anything—we know about it. The result is a symposium at once original and, in the best sense, speculative. The discussion hinges upon "the unity of spatial form in relation to complex processes". This cardinal concept is allowed to develop in an almost classical environment, while the details emerge in the modern synthetic manner. (It is as if, writing *S* for spatial form and *C* for complex process, one was invited to put *SRC* and to let the whole subject take shape within the calculus of relations.)