

The Met. Office

Observer's
Handbook

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OBSERVER'S HANDBOOK

INTRODUCTION

Meteorological observations are made for a variety of reasons. Those observations made primarily for the purpose of providing information for weather forecasts are termed 'synoptic'. These synoptic observations are not by themselves sufficient to meet all the needs of, for example, agricultural meteorology, hydrology and industry. Hence, in the United Kingdom there is a further network of voluntary co-operating stations maintained by private individuals, schools and colleges, industrial concerns, local authorities, etc. whose records supplement those from the synoptic reporting stations. In addition there is a much larger number of 'rainfall stations' where the only records regularly maintained are those of rainfall.

The aim of all these observations is essentially to provide data. The differences between them arise mainly from the use to which the data are initially put. Synoptic observations are more frequent and more detailed, and are encoded for immediate transmission to forecasting centres. The other stations report in a manner suited to their particular function and ability, and are detailed below. All types of station should aim at high standards of accuracy, punctuality and instrument care. From this generalized classification there emerge five categories of station in the United Kingdom to which this handbook is addressed:

- (a) Synoptic stations whose primary function is to provide data for the forecasting service and for aviation purposes.
- (b) Auxiliary reporting stations also make observations which supplement the main network of synoptic stations. The number of observations made, and the type, vary according to a particular station's circumstances. The contributions may range from an observation every hour to one every three hours for a limited period.
- (c) Climatological stations are manned by voluntary co-operating observers who make a daily observation at 0900 GMT. These observations are not reported at the time but they make a significant contribution to the long-term climatological data for the British Isles.
- (d) Health Resort stations at which, in addition to the normal procedure of a climatological station, the observers make special reports at 6 p.m. clock time for inclusion in bulletins to the Press by the Meteorological Office.
- (e) Agricultural meteorological (agrometeorological) stations which are maintained for research and operational decisions on field-work (mostly by the Ministry of Agriculture, Fisheries and Food). These stations also make an 0900 GMT climatological observation.

The majority of the stations described above make an additional contribution in the form of climatological summaries which are completed monthly and, in some cases in an abbreviated form, weekly. The Meteorological

Office maintains a number of stations undertaking specialized functions which are outside the scope of this handbook; these include the Observatories and upper-air stations. The former have a multi-purpose role, making additional reports such as solar radiation, atmospheric pollution, evaporation, atmospheric electricity, etc. The upper-air stations make measurements of temperature, humidity and wind in the upper air, and some of these stations are involved in the location of thunderstorms, in solar radiation measurements and in surface observations.

This handbook has been based largely on guidance provided by the World Meteorological Organization (WMO). In particular, much use has been made of the WMO *Guide to meteorological instrument and observing practices*, 1971, and the WMO *International cloud atlas*, Volume I, 1975.

It is assumed throughout this book that the observer is at a station which has been properly sited and equipped, on the scale appropriate to its type, and that the station is in full working order. Chapter 1 accordingly begins with a brief summary of the observing procedure at each type of station and gives some general notes on observing. The chapters which follow are devoted to the details of each type of observation. Reference is made to the use and maintenance of instruments where necessary in describing observational techniques. Since the previous (3rd) edition of this handbook was published some new instruments have been brought into routine use. These are described in general terms, but for more complete advice on instruments the reader is referred to the *Handbook of meteorological instruments* and either to the special maintenance instructions or the installation/operator instructions which are published by the Operational Instrumentation Branch of the Meteorological Office. The main text is followed by three Appendices, one of which gives directions for the selection of the site and for those other matters which must receive attention when the station is being set up; thus it is only occasionally necessary to refer to questions of exposure in the body of this book.

The metric (SI) system of units is becoming increasingly accepted in this country and is used throughout this edition. For a time Imperial units are likely to remain in use for some purposes, notably for reporting wind speed and cloud height. In these cases the Imperial units are added where these are considered important and informative.

Except where otherwise indicated, all times refer to Greenwich Mean Time (GMT) and are specified in the 24-hour system beginning at 0000. To emphasize the distinction between GMT and time by public clocks, the a.m. and p.m. system is used when reference is made to clock time. Adequate explanations accompany the few references made to other time standards, namely Local Zone Time and Local Apparent Time.

Details of the books mentioned throughout this handbook are given in the Bibliography on page 213.

Observers who still have a requirement for correction tables applicable to mercury barometers will need to retain the previous (3rd) edition of this handbook (see the introductory text in Appendix III, page 204).