

The descriptions of world climates occupy seventeen chapters and 530 pages and cover all the solid surface of the globe. Each climatic region is discussed at considerable length, with emphasis on its relation to the general pattern of the atmospheric circulation and with details of its climate, terrain and vegetation. Characteristic plants are identified by both their common and scientific names. Vegetation and relief occupy a large part of the text, as may be exemplified by the typical juxtaposition in the index of red rain and redwood; névé and neutrosphere; multiple tropopause and muskeg; cuesta and cumulonimbus.

The climatic part of the descriptions includes details of the characteristic weather elements and sequences and of more abnormal occurrences. Lists of mean monthly temperatures and rainfall, for more than 600 stations, provide ample scope for comparative climatology. In addition, each regional chapter has numerous diagrams and a set or two of climatic graphs of mean monthly readings. These lucid graphs, uniform in scale and style, form a striking and highly praiseworthy feature of the volume. The other illustrations are usually successful except those which show areal distributions on the misleading Mercator projection. Each chapter is followed by a list of further references which seem in parts over-weighted on the ecological and the American side.

The text is reasonably free of errors apart from an occasional indifference to the spelling of European place-names. The whole volume is nicely produced. It can be warmly recommended as a broad reference for general readers and as a stimulating introduction to world climatology for the student who is also interested in plant geography and is happily free of financial concern.

ROBERT P. BECKINSALE

## SURVEY OF BRITAIN

### The History of the Retriangulation of Great Britain 1946-1962

Written and compiled by Officers of the Department under the Authority of the Director-General of the Ordnance Survey. Pp. xix + 395 + 24 plates + 20 diagrams. (HM Stationery Office: London, 1967.) 315s.

A GEODETIC survey of a country is a rare event; often a unique event. It is therefore of considerable interest to geodesists to receive from the Ordnance Survey this *History of the Retriangulation of Great Britain 1946-1962*, a little more than a century after the publication of the *Account of the Principal Triangulation* in 1858. The production of such volumes is bound to be expensive and their circulation limited. Can it be justified? And is the present volume justified? The rarity and infrequency of a major triangulation—Great Britain is one of the very few countries in which such work has been repeated—ensures that when, if ever, conditions require a repetition, there will be no one alive with any knowledge of what was done and how it was done on the previous occasion. This is certainly an insurance against conservatism but, on balance, it is a hindrance; and, however inadequate, a printed record is the best way in which this knowledge can be put down with some hope of survival. Moreover, surveys based on a main triangulation continue long after its completion (these days it is chiefly what a main triangulation is for) and demand a familiarity with it in the area under consideration: how the data were obtained; how the calculations were carried out; and what errors were disclosed. A printed record is therefore an essential concomitant of a major triangulation and, however lavish the production may be, and the *History* is lavish, the cost is an essential but a very minor item in the total bill.

The *History* gives us information on three main points: the work in the field, comprising reconnaissance,

station construction and acquisition of data; methods of calculation; and final numerical results with discussions of the errors. Although the title mentions only Great Britain, the text describes connexions with Ireland, France and, surprisingly perhaps to some, Norway and Iceland. While the greater part of the work was carried out by traditional methods—theodolite and catenary base measurement, albeit with modern refinements—three electromagnetic methods had reached a sufficiently practical stage early enough for their use as independent checks and for making the longer international connexions. This volume therefore becomes one of the first to describe practical electromagnetic distance measurement on such a scale, enabling valuable comparisons to be made with the results of the traditional methods.

It is the primary object of a short review to advise the public whether to buy the book or not. There is no doubt that the *History* should be bought, but by whom? It was said above that the circulation would be limited; but it should not be as limited as all that. Those who have cause to make serious use of Ordnance Survey data should have the book by their side and they certainly include all National Coal Board surveyors, all British Railway surveyors, engineers to local authorities and consulting engineers and contractors engaged in large works. But it should not be thought that the *History* is a dry publication to be used only by specialists for reference. It is admirably illustrated with photographs and is written in an easy and witty way that makes it intriguing reading for all those who like maps and are affected by the glamour of a major survey. Among the latter was Wordsworth, who was sufficiently moved to compose a poem to an Ordnance surveyor he met by chance, working at the summit of Black Combe in 1813 on the first triangulation, and which is now reprinted.

This review cannot be concluded without at least a short reference to the architect of the retriangulation. Brigadier Martin Hotine initiated the survey with inadequate finances; he organized the field work and the computations in a masterly way; and he introduced several technical innovations, among which was the recognition that the accuracy of a triangulation could, in the end, be increased only by the proliferation of redundant rays: a procedure completely at variance with the then accepted practice of observing chains of simple figures. He took in his stride the considerably increased computation that this involved. His practical sense made him realize that, however good a triangulation might be, it is useless unless the stations are conspicuously marked so that they can be seen and, not least, so that they can be seen to disappear. The pillars on hill tops up and down the country are the result of Hotine's foresight. *Si monumenta requiris circumspice.*

E. H. THOMPSON

## POLDERS OF EUROPE

### Polderlands

By Paul Wagret. Pp. xvi + 288. (Methuen: London, 1968.) 63s.

AT a time when schemes are being prepared to reclaim bays and coastal marshes in many parts of the British Isles, this book, recently translated from the French, will serve as a useful guide to the problems and pitfalls, physical, social and economic, which have been presented by the polder lands of Europe through historic times. It is written in non-technical language and, although in places one suspects that the translation is at fault, it is most readable. The author has a feeling for the low coastal landscapes acquired through many years of field work and analysis of archaeological and historical material. It is well illustrated with photographs and diagrams. It can be thoroughly recommended as an introduction to a fascinating story of man/environment relationships in