Review: Weather

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detailed regional description; we are referred for this to the regional treatment of temperature, rainfall, etc., given in earlier chapters, a treatment which is indeed much more geographical than that often found, but which, after all, is analytical and can hardly do duty for the synthesis on which Hettner himself justly lays stress.

His claim for a more adequate treatment of that most important factor, moisture, is timely; we have been too long content with a barren statement of amount of precipitation, often only the yearly total, without any attempt at a description of the kind of rain, its diurnal and seasonal period, number of rainy days, etc. The downpour of a tropical thunderstorm, the slower but more persistent contribution of a North Atlantic cyclone, the drizzle of a Scotch mist,—all is “rain,” so many inches in the year, the time of day, season of year, and the qualities and causes of the phenomenon all ignored, as also the amount of evaporation, a factor of almost equal importance with rainfall. Hettner is certain of sympathy in his plea for a more scientific as well as a more artistic—in a word, a more geographical—treatment of this element of climate.

W. G. K.

WEATHER.

‘Forecasting Weather.’ By W. N. Shaw, F.R.S., SC.D. London: Constable & Co. 1911. *Maps, Charts, and Diagrams.*

In this volume Dr. Shaw sets forth the results of his eleven years’ experience as Director of the Meteorological Office, and there is enough in it to show that, although forecasting is still in its empirical stage, great strides have been made in the prescience of the weather since the time when daily weather conditions first came to be carefully watched and studied by means of synoptic charts. The system of forecasting in vogue to-day is based mainly upon the principles established by the late Hon. Ralph Abercromby in his ‘Principles of Weather Forecasting by means of Synoptic Charts,’ but the rules of forecasting have naturally, in the light of years of continuous experience, now become far more finely elaborated. In one important feature Dr. Shaw’s book is unique of its kind: it is a masterly exposition of the physical processes concerned in the very phenomena of weather changes which it is the great problem of meteorology to solve. Any one indeed sufficiently acquainted with the fundamental laws of thermodynamics to view the Earth’s atmosphere as a great physical laboratory, must needs peruse this work with enjoyment and advantage, and with a full sense of the grandeur of the science of meteorology.

Emphasis is laid on the newly discovered relationship between wind and pressure gradient, and the interpretation of this relationship. When the method of synoptic charts first revealed the existence of the closed isobaric systems of low and high pressure, known as cyclones and anticyclones, the wind was theoretically supposed to flow radially out of the high pressure system, and into the low, the air currents being thus in a certain sense secondary to, and dependent upon, these systems. But Dr. Shaw clearly explains (what is so far in accordance with old ideas) that it is the currents which are the important things, and that the cyclonic and anticyclonic centres connected with the general circulation of the atmosphere may be regarded quite as truly as being maintained by the wind as maintaining the latter. The anti-cyclone, in fact, is often merely an inert mass of air taking little part in the neighbouring circulation, but steering long-distance air currents round its flanks. In the cyclonic system the forces producing its pressure-gradient are balanced by an appropriate velocity of the wind.

We are not sure that the paradoxical phrase “cooling by warming,” which

the author uses on p. 149 in connection with the process by which air heated at the surface becomes cooled by expansion when it rises to higher levels of the atmosphere, is altogether good, as it may tend to confuse the ordinary reader by concealing the fact of the expansion.

A full and candid statement is given of the efficiency and utility of weather-forecasts both general and special, such as storm warnings to the coasts, and special forecasts for agriculturists and for aeronauts.

Perhaps the most disappointing chapter in the book from the point of view of practical meteorology is that on colliery warnings. It is clear from this that a very close and elaborate investigation remains to be made as to the precise atmospheric conditions favourable to colliery explosions. In the ordinary course of events life is grim enough in the great colliery districts of England, and it is surely high time that science were able to do more to avert the doom that from time to time hangs unsuspected over a mining village. Facilities are needed to conduct an important piece of research, and these granted, the skill to do so would not be found lacking.

The foremost justification for the pursuit of any branch of physical science is the service to which it may lead in the improvement of the conditions of human life upon the globe and the incidental contribution to national honour, greatness and prosperity; and we believe that the present time heralds the brighter dawn of that epoch when meteorology, firstly through the obvious channel of successful weather forecasting for longer periods than is now possible, and secondly through the manifold potential applications of meteorological knowledge to the sciences of engineering and medicine, will be able to afford one of the greatest careers which this or any other country can offer a young man.

L. C. W. B.

ANTHROPOGEOGRAPHY AND HISTORICAL GEOGRAPHY.

THE ERYTHREAN PERIPLUS.

'The Periplus of the Erythrean Sea.' Translated and annotated by W. H. Schoff. *Illustrated*. New York: Longmans. 1912. 7s. 6d. net.

Readers of this *Journal* will remember that their attention was called last May, by Mr. J. W. Crowfoot, to some problems in the ancient topography of the Red sea coast. That writer was concerned in the main with Ptolemy, but he had also to take account of the anonymous Greek "Red Sea Pilot," whose text has been preserved for us by two manuscripts; one in Heidelberg, and the other in London. Both the text and a translation into our own tongue have been published in well-known English books, those of Dean Vincent and of Mr. McCrindle, and a critical edition with German translation, issued in 1883, by B. Fabricius, still supplies all the needs of scholars. But there is, undoubtedly, a large public, ready from curiosity or commercial interest, to read the Periplus in English and study a commentary upon it, could it easily obtain access to it, which has never heard of, or cannot lay its hands on, the publications just mentioned; and it is with a view to this public that the secretary of the Commercial Museum in Philadelphia, Pa., has translated the Greek text afresh, and issued it with full notes on subject-matter in pursuance of the museum's plan of "making a graphic history of commerce from the earliest dawn of trade and barter down to the present time." This being the end in view, the book is certainly well justified of its appearance, and its very good and full index will make it useful even to the scholars and specialists, for which avowedly it is not intended. It badly wants a map, however. We would gladly have given for this all its