

OUR BOOK SHELF.

Die Meteorologie, ihrem neuesten Standpunkte gemäß, und mit besonderer Berücksichtigung geographischer Fragen dargestellt. Von Dr. Sigmund Günther. With 71 Illustrations. 304 pp. (Munich: Ackermann.)

DR. SIGMUND GÜNTHER is already known by his "Lehrbuch der Geophysik," in two volumes, which appeared in 1884 and 1885, and runs up to nearly 1200 pages. The title of the present work is ambitious, and the endeavour to produce a text-book of the whole of meteorology in the space of 300 pages is a bold one. The work is a digest of existing text-books, such as Van Bebbber's "Handbuch der ausübenden Witterungskunde," and Sprung's "Lehrbuch der Meteorologie." It is therefore excessively condensed, and to such an extent that it can only be used as a sort of index, for on all the subjects discussed, the reader is referred to other sources of information. The conception of the treatise is good enough, and the subdivisions are: (1) the general properties of the atmosphere, and observations thereon; (2) the movements of the atmosphere; (3) general climatology; and (4) the special climatology of the different zones. These are followed by two appendixes which might well have formed separate chapters; their subjects are, respectively, practical weather knowledge, and optical meteorology.

As might be expected, the sources of Dr. Günther's information are almost exclusively German, so that his *résumé* is slightly one-sided. This is especially the case when he is dealing with marine meteorology, as he almost ignores all work and all methods except those of the Deutsche Seewarte. In his notice of the marine barometer (p. 45), he entirely omits any mention of the principle by which the necessity for a capacity correction is dispensed with by the employment of a modified scale of inches. In speaking of the origin of weather telegraphy, Dr. Günther does scant justice to FitzRoy, who is merely casually mentioned as a former head of the English office. At p. 39 he gives the reader to understand that Kew, Pawlowsk, and Zikawei are the only stations in the world employing photographic self-recording instruments. A more serious slip, for a German, is at p. 243, where he speaks of two international Congresses at Leipzig and Rome, forgetting that the private meeting at Leipzig in 1872 was only preliminary to the Congress of Vienna in the following year. The correction of the press has not been carefully done: not only are letters dropped out in the printing of Latin and English words, but even in the German we have noticed several slips.

However, Dr. Günther's work is undoubtedly useful as indicating to geographers the main outlines of existing knowledge in the most important branches of science with which they come in contact at every turn, and also the lines in which further investigation is desirable.

Haunts of Nature. By H. W. S. Worsley-Benison. (London: Elliot Stock, 1889.)

SOME time ago we had the pleasure of recommending an excellent little book by Mr. Worsley-Benison, called "Nature's Fairy-land," consisting of a series of simple, pleasantly-written papers on some of those aspects of Nature which are most likely to excite the interest of children. The present volume has been planned on exactly the same lines, and is in every way worthy of its predecessor. In the opening essay the author describes the proceedings of two house-martins who did him the honour to select as the site for their nest a small wooden projection under the eaves of his roof. This paper has all the freshness and charm that spring from direct observation, and young people will read it with genuine pleasure. Among the subjects dealt with in other papers are wild roses, water scavengers, the dragon-fly's haunt, protective mimicry in insects, "fast asleep for months," and the ministry of leaves.

LETTERS TO THE EDITOR.

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The Structure and Distribution of Coral Reefs.

I AM somewhat disappointed that my criticism of Prof. Bonney's appendix in the last edition of Mr. Darwin's work on "Coral Reefs" has resulted only in an affair of outposts on the part of my opponents, since the main body of my arguments remains to be assailed. It would have been interesting, for instance, to obtain some further information concerning the evidence establishing the existence of the "90-fathom" reef of Rodriguez; and I should have welcomed the opinion of some zoologist as to the degree of our acquaintance with the fauna of the greater depths, say between 30 and 100 fathoms, around the shores of tropical islands in the Indian and Pacific Oceans. If this acquaintance is as scanty as I contend it is, then it is premature to fix the absolute limit of depth of the reef-coral zone.

At present, however, I shall be content with the establishment of the fact that corals occasionally grow in greater depths than 20 or 30 fathoms; and it was with this intention that I purposely singled out Commander Moore's observation in his Report on the Tizard and Macclesfield Banks. It is just this occasional greater depth of reef-coral growth that is the *crux* of the whole matter as far as the necessity for a theory of subsidence is concerned. Prof. Bonney admits in his last letter that "reef-building corals occasionally grow at depths considerably greater than 25 fathoms," and thus practically abandons the scanty foundation on which the surviving portion of the theory of subsidence now rests. My critic in this manner dispenses with the necessity of a movement of subsidence to explain the circumstance that lagoons are occasionally deeper than the usual limit of depth of the reef-coral zone, and to account for the occasional considerable thickness of upraised coral reefs. The supporters of Mr. Murray's anti-subsidence views will welcome this admission. It removes, in the first case, one of the chief points in favour of subsidence brought into prominence by Agassiz and Geikie in their hostile criticisms of the theory of Mr. Darwin—I refer to the abnormal depths of some atolls. In the second case, it shows that some of the evidence ranged in Prof. Bonney's appendix on the side of Darwin—I allude to that concerning the thickness of the upraised reefs of Cuba and the depth of limestone penetrated by the artesian borings at Oahu—should at least be placed in a neutral position. This is especially necessary in the instance of the artesian borings at Oahu, since Prof. Agassiz in his recent extensive memoir on the Hawaiian reefs,¹ which has not hitherto been quoted in this discussion, regards the borings from a point of view very different from the standpoint of Prof. Dana.

In this and in my previous letters I have shown to the best of my ability that nearly all the evidence ranged by Prof. Bonney on the side of Darwin should be placed at least in a neutral position. It almost all hinges on inferences that have not been established, or else on assumptions that cannot yet be proved. Surely the "90-fathom" reef of Rodriguez, if there has been no mistake in the matter, can be explained without subsidence by those who admit that "reef-building corals occasionally grow at depths considerably greater than 25 fathoms." The upraised reefs of Cuba must be placed on neutral ground. Masamarhu Island I have claimed for Mr. Murray. Lastly, there remain the artesian borings at Oahu; and, accepting Prof. Agassiz as our authority, we do not at present receive them as in favour of subsidence.

H. B. GUPPY.

June 11.

P. S.—After writing the above, I received a letter from Mr. John Murray, relating to the "90-fathom" reef of Rodriguez; he has kindly allowed me to quote from it the following remarks:—"I have examined all the charts and other available information, and have consulted some of the surveyors of the island. The result is that I don't think Prof. Balfour had sufficient grounds for stating with regard to Rodriguez that 'an older reef exists now quite submerged in some places to a depth of over 90 fathoms. Upon it the present reef rests, and it extends westward nearly fifteen miles from the present coast, while on the east it stretches

¹ Bulletin of the Museum of Comparative Zoology at Harvard College, vol. xvii., No. 3, April 1889.