WILEY

Review: German South-West Africa

Source: *The Geographical Journal*, Vol. 21, No. 6 (Jun., 1903), pp. 661-662

Published by: geographicalj

Stable URL: <http://www.jstor.org/stable/1775662>

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the unbiased standpoint of the author—Professor at the ‘École supérieure des Mines’—who treats of the questions under consideration from the point of view of sober science, and is fully conscious of the reserve with which current statements as to African mineral wealth must be received. From a practical point of view, the book supplies a useful summary of our present knowledge respecting African minerals, each of which, from gold to coal and petroleum, is dealt with in turn, while the final chapters discuss the various regions in Africa from the point of view of the collective mineral deposits. The book has, however, a further, more theoretical, interest. The author has previously, in various writings, put forward his views as to the importance of the notion of *depth* in dealing with metalliferous deposits, and he now uses the facts observable in Africa as object lessons, illustrating the principles which he considers involved. He holds that the variation in the character of mineral veins according to the depth below the surface is of two distinct kinds, which have hitherto been too much confused. In the first place, there are differences due to the variations of temperature, pressure, etc., at different depths at the time of the original formation of the veins; and in the second, subsequent metamorphism will have operated in the neighbourhood of the surface, which will then be, in the majority of cases, totally different from the original surface which existed at the time when the veins were formed. It is generally impossible to study such variations as we proceed downwards in any one locality, but the writer points out that, as the amount of erosion has differed enormously in different areas, we can arrive at certain conclusions by comparing the character of the mineral deposits in two regions, in one of which a vastly greater amount of material has been removed from the surface than in the other. The African continent supplies an excellent field for such studies, by reason of the strong contrast displayed between the ancient mass which occupies its main bulk and the Tertiary zone of the north, while the subject has more than a theoretic interest, by reason of its obvious practical bearing. The introductory chapter contains also a useful general sketch of African geology as we now know it.

GERMAN SOUTH-WEST AFRICA.

‘Deutsch-Südwest Afrika.’ Von Prof. Dr. Karl Dove. Berlin: Süsserott. 1903.

This little handbook, which forms vol. v. of Süsserott’s ‘Kolonialbibliothek,’ gives, for its size, the most lucid and systematic description of German South-West Africa that has yet appeared, the author being, both by his personal acquaintance with the country and by his careful study of the existing literature, particularly well qualified to write such a work. After a preliminary sketch of the history of the territory, Dr. Dove treats in turn of the broad physical features, the mineral resources, the climate, flora and fauna, and inhabitants, both native and European. In describing the surface features he divides the area into four natural regions, each of which has a distinct individuality. The first of these, the coast strip, though generally bare and arid, and showing but small variations of relief, differs considerably in its surface, sand being by no means universally present; it is, however, still but imperfectly known, especially in the south. The second, in the north and north-east (Ambo Land, etc.), is a remarkably uniform plateau with an average altitude of 3000 to 3300 feet, extending from the Kunene to the Okavango. This altitude is not great enough to admit of European settlement, but the district may serve for plantation purposes. The third region—Herero Land—the most important from the point of view of European enterprise, comprises three orographic subdivisions, the terrace lands of the north-west, the plains of the north-east, and the southern districts with the best-developed relief of the whole territory. The

fourth region is the more arid Nama Land in the south. From the point of view of vegetation, the coast strip is sharply contrasted with the other three regions. Dr. Dove considers that Swakopmund, in spite of the absence of shelter, is a far more valuable position than Walfish bay, owing to the much greater facilities it presents for penetration into the interior.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

VOLCANIC STUDIES.

'Volcanic Studies in Many Lands.' By Tempest Anderson, M.D., B.Sc., F.G.S., etc.
London: John Murray. 1903.

The special feature of this book is the number and excellence of its photographic illustrations. Dr. Tempest Anderson has been for many years a well-known student of volcanic phenomena, and in the course of his visits to the active and extinct volcanoes of Europe and North America, has formed a large collection of photographic views illustrative of this branch of geological research. Many of the most interesting of these are included in this work, by the publication of which the author has made a valuable contribution to the literature of vulcanology. A word of praise is due also to Mr. Murray for the admirable manner in which the volume is got up.

For scientific purposes, a well-taken photograph excels all other kinds of illustration in truthfulness and accuracy; and the study of land-forms lends itself especially to this method of elucidation. The stay-at-home geologist, who examines carefully the plates contained in this book, cannot fail to obtain clearer ideas of the actual appearance of active volcanoes, and of the stages of their growth and decay. The author has not entered into the consideration of the more recondite and theoretical questions involved in the study of volcanic action, but has contented himself with depicting and explaining the principal types of volcanic structures. He furnishes, in fact, a series of object lessons, beautifully clear and often very striking, of the scenery of volcanoes, with explanations of the manner in which the topographic features have been produced.

The familiar landscapes of Vesuvius, Auvergne, the north of Ireland, and the Inner Hebrides are represented by a number of carefully selected examples, but the Icelandic views, which were obtained during two visits to that island, possess more novelty and interest to the geologist and geographer. The enormous lava-fields, studded with little cones, are shown in the photographs, and several beautiful plates are given of the row of craters which stands upon the Skaptar fissure. Many of the great lava-streams are cut by fissures of another sort, due to the escape of the still liquid interior at a time when the surface of the mass had already solidified. The unsupported crust has then subsided along great rectilinear cracks, leaving cliffs many feet in height, which often show a striated face owing to the friction to which it was subjected as the broken mass sank to a lower level. The most celebrated instance of this is the Almannagjá, where the deep valley of the Oxerà had been filled with a gigantic *coulée* of lava, and after the surface had cooled the deeper part of the lava-flow escaped. The crust collapsed, unable to support its own weight, and left a vertical wall over 100 feet in height, separated by a chasm from the remainder of the consolidated surface with which it had at one time been continuous. One of these outflow tunnels is shown in Plate LXXII. from the neighbourhood of Lake Myvatn, and in this case the stream of molten rock entered the lake, and, on coming in contact with the water, gave rise to steam explosions, which covered the surface of the lava with small secondary craters and spiracles.

Some of the most successful views given in the book are from the remote crater-lake of Oregon, and there are beautiful illustrations of the geysers of the