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Review: Surveying Instruments

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North America, in which it is shown how many features these ancient lands have in common, and the very perfect balance between the two sides of the Atlantic is gradually demonstrated. Incidentally the history of the older mountain chains of the world is sketched, as a sort of appendix to the story of the Alps and other mountains already described in the first volume. It is shown how the Atlantic is an ocean bounded mostly by broken fragments of continental masses. The long and intricate story of the Mediterranean must also be told in order to explain many exceptional features of the Atlantic shores. The Pacific, on the other hand, is surrounded everywhere by folded ranges which on the whole run parallel to the strand, and are accompanied in a more or less regular fashion by the volcanoes which constitute the great Pacific zone of fire.

We then pass to consider another question of the highest importance, with which the name of Suess will always be associated. The ridging up of the Earth's crust by the formation of mountain chains has hitherto been one of his principal themes. The question he now asks is this: Can we recognize another type of earth-movement by which the land is slowly upheaved or submerged over great areas without marked folding? The raised beaches, so well known to all geographers, have long been held to prove that such changes have gone on extensively in comparatively recent times. But after a review of all the evidence, which amazes the reader by the intimate knowledge shown of the geological literature of all countries, the conclusion is arrived at that there is no good proof that the land has experienced elevation and depression of this nature. The explanation hinted at is that the changes have been in the level of the sea. But the argument is destructive rather than constructive.

Whatever verdict posterity may bring in on this question, the surpassing interest of this volume cannot be gainsaid. Every chapter is full of geographical speculations which fire the student's imagination. The importance of the book must be measured rather by the influence it has exerted on geological thought than by the rigidity of its demonstrations and the ultimate triumph of its teaching. Those who know it well in its German and French editions will welcome the appearance of so good an English translation, while those who never read it before may be congratulated on having it prepared for their use in so acceptable a form.

J. S. F.

GENERAL.

SURVEYING INSTRUMENTS.

'Instrumentenkunde für Forschungs-Reisende.' Unter Mitwirkung von Ingenieur C. Seidel bearbeitet von W. Miller. Hanover: Jänecke. 1906.

Among the numerous works that have been published during the last few years on scientific observations for travellers and the necessary outfit, that entitled 'Instrumentenkunde für Forschungs-Reisende,' by Profs. C. Seidel and W. Miller, ought certainly to be classed with the most useful and practical. At the first glance it has somewhat the appearance of an ordinary catalogue of instruments by different makers, but it is in reality far more than this, for although it gives lists and illustrations of theodolites, sextants, barometers, photographic apparatus, instruments for marine surveying, for magnetic observations, and indeed the necessary outfit for almost every conceivable branch of scientific investigation that an explorer can undertake, with particulars as to price and weight, yet it is in no wise confined to a bare list, but contains valuable information as to principles of construction, variety of form, and many other subjects that cannot fail to make the work of considerable value and practical importance. One important subject dealt with is the customs tariffs for scientific instruments in different countries, a list of which is given, followed by useful information concerning frequency and dates of departure of steamships by which instruments may be sent from Hamburg to all parts of the world.

As might perhaps be expected, this is essentially a German work, and by far the greater number of the firms of instrument makers are German. Still, this is not entirely the case, and since makers in other countries are included, it is surprising that the list is not more complete in this respect. For instance, nearly all the more important makers in this country are omitted from the general list, although the names of some incidentally appear in the list of scientific outfit of the Japanese government surveying ships. Again, as to instruments, there are some important omissions, such as the Lloyd-Creak magnetic instrument, from the list of instruments for magnetic observations. No reference is made to the plane-table, of which many forms exist, and which instrument is admitted by the best authorities to be specially suitable for rapidly filling in topographical features between fixed points on a survey. Amongst the apparatus for photographic surveying, it is surprising that the Bridges-Lee photo-theodolite, certainly one of the best, is omitted.

HINTS TO TRAVELLERS.

‘Anleitung zu wissenschaftlichen Beobachtungen auf Reisen.’ Herausgegeben von Prof. Dr. G. von Neumayer. 2 vols. Third edition. Hanover: Jänecke. 1906. Price (vol. 1), 25m., (vol. 2), 24m.

If the geographical explorer of the present day fails to bring back valuable scientific results of his travels, or is at a loss to know how to preserve his health in the region he may visit, or what instruments he should take with him, it can hardly be due to the fact that no instructions have been published for his guidance; for apart from works dealing with special subjects, of which several have lately appeared, almost simultaneously with the new edition of this Society’s ‘Hints to Travellers,’ a third edition of Dr. G. von Neumayer’s ‘Anleitung zu wissenschaftlichen Beobachtungen auf Reisen’ has been published. Although both of these works are intended to furnish guidance for the intending travellers on scientific matters, the latter, since it now consists of two octavo volumes, each containing over eight hundred pages, is perhaps more fitted for previous careful perusal than to furnish practical hints in the field. Still, to many the bulk may not be a serious difficulty, and on important expeditions, the traveller acquainted with German would doubtless consider that the valuable information the ‘Anleitung’ contains far more than compensates for its weight and size.

The work is certainly most exhaustive and complete, and no less than thirty-two professors and experts have contributed articles on the particular branch of scientific inquiry which they have specially made their own. To give merely a brief notice of each of these would be impossible in these pages, and if any fault can be found it is that too much has been attempted for the purpose in view, and that the average traveller would have profited more if less had been given and the matter had been more condensed.

That the latest discoveries and results of the most recent investigations have been taken advantage of may be seen from a glance of such articles as that by Prof. S. Finsterwalder on “Photography as an Aid to Land Surveying;” Dr. G. von Neumayer and Dr. J. Edler’s on “Magnetic Observations on Land;” the important notes on “Magnetic Observations on Board Ship,” by Dr. Friedrich Bidlingmaier; the article by Dr. W. Köppen on the “Use of Kites in Meteorological Observations;” and many others. A special interest attaches itself to the article on geology, inasmuch as it was the last work of the kind undertaken by its illustrious author, the late Baron F. von Richthofen.

Very properly, the opening section of the work, written by Herr P. Vogel, is devoted to fixing positions by astronomical observations; but considering the importance of this subject, and the amount of detailed information contained in many