

THURSDAY, AUGUST 15, 1907.

CORNISH GEOLOGY.

The Geology of Falmouth and Truro, and of the Mining District of Camborne and Redruth. By J. B. Hill and D. A. MacAlister, with Petrographical Notes by J. S. Flett. *Memoirs of the Geological Survey.* Pp. x+335; with 65 illustrations and 24 plates. (London: Wyman and Sons, Ltd., 1906.) Price 7s. 6d.

OF the new series one-inch map of England and Wales, few sheets are of greater interest than No. 352 (colour-printed, price 1s. 6d.), which represents that portion of western Cornwall that contains the oldest and richest mines in the county; and the value of the map is greatly enhanced by the admirable explanatory memoir, which contains a description of the older slaty rocks, the granites, elvans, and greenstones of this area, together with particulars of the metalliferous veins. Attention is given to the genesis of the ores, and to their mode of occurrence, to the methods of dressing the tin ore, and to the mineral output. In short, the description is much more detailed than is usual in a Geological Survey sheet explanation.

The original geological survey was carried out by De la Beche, whose results were published in 1839. New editions of the maps were published in 1866, with additional lodes inserted by Sir Warington Smyth. A comparison of the new map with the older one shows that the additions that have been made are of great importance. The area formerly represented as Devonian has been subdivided into Lower Devonian and three subdivisions, based on lithological characters, designated by the terms Portscatho, Falmouth, and Mylor. These three subdivisions, together with the Veryan beds, formerly classed as Lower Silurian, are shown to be Lower Palæozoic. The grits of Gram-pound and Probus, representing the base of the Devonian rocks, are taken as the equivalents of the conglomerate on the Helford River (one-inch map, 359).

The igneous rocks are divided by Mr. Hill into four groups: (1) the greenstones, the oldest, which are epidiorites derived from dolerites and basalts; (2) the granite, the dominant representative, with which the mineral products of the area are intimately associated; (3) the elvans, which represent the dyke phase of granite, and were intruded after its consolidation; and (4) the mica traps, the age of which is uncertain. Chapters are devoted to a description of the contact metamorphism effected by the granite and of the faults. The fractures are the product of the later Carboniferous period, and have a trend of about E.N.E. Many of them occur in the mineral areas, where they form the home of the lodes. They are traversed by a second set of faults, of early Tertiary age, which are known to the miner as cross-courses. The Pliocene deposits receive careful attention, the Polcrebo gravels appearing to represent a patch of the Pliocene deposits which formerly spread over the killas platform of this area, and are represented at St. Erth, St. Agnes, and Crousa Downs in adjacent districts. With the ex-

ception of these gravels, this area affords no evidence of stratified deposits from the Palæozoic period until the Pleistocene, which is represented by the raised beaches underlying the Head, that is probably a product of the Glacial age.

The second part of the work, which is written by Mr. MacAlister, deals with the mining industry of the district. Modern theories of the genesis of ore deposits are applied to the Cornish tin and copper ores, and detailed descriptions of the mines are given, illustrated by more than fifty sketches. Statistics of production since 1845 are set forth in detail, and ten pages are devoted to a description of the tin-ore dressing processes employed in the Camborne area. Products from the various operations have been subjected to microscopic examination, the results showing that grains of cassiterite which are less than the average size of the grains in the concentrates tend to be lost in the tailings of subsequent operations. The dressing operations are elucidated by means of excellent reproductions of photographs.

On the whole, the work is a very creditable production. It forms an excellent introduction to the geology of Cornwall; and it is satisfactory to note that the price at which it is published is not such as to preclude its use by students of economic geology.

MODERN INTRODUCTIONS TO PHYSICAL THEORIES.

- (1) *Elektromagnetische Schwingungen und Wellen.* By Dr. Josef Ritter von Geitler. Pp. viii+154. (Brunswick: Fried. Vieweg und Sohn, 1905.) Price 4.50 marks.
- (2) *Theorie der Elektrizität.* By Dr. A. Foppl and Dr. M. Abraham. Vol. i., pp. xviii+443; vol. ii., pp. x+404. (Leipzig: G. Teubner, 1904 and 1905.)
- (3) *Ueber den gegenwärtigen Stand der Frage nach einer mechanischen Erklärung der elektrischen Erscheinungen.* By Dr. Hans Witte. Pp. xii+232. (Berlin: E. Ebering, 1906.) Price 7.50 marks.
- (4) *Die Fortschritte der kinetischen Gastheorie.* By Dr. G. Jäger. Pp. ix+119. (Brunswick: F. Vieweg und Sohn, 1906.) Price 3.50 marks.
- (5) *An Elementary Treatise on Theoretical Mechanics.* By J. H. Jeans, F.R.S. Pp. viii+364. (Boston and London: Ginn and Co., n.d.) Price 10s. 6d.

A COMPARISON of text-books of the last year or two with those published, say, a quarter of a century ago affords a clear and definite measure of the great changes which have occurred during the interval in our commonly accepted physical theories. All the books now before us reflect these changes in a greater or less degree, but we take Dr. von Geitler's manual as our first example because the author has closely followed the historic order of development in leading his readers from the simple early notions of action at a distance to the modern theories of electrical oscillations and their applications to wireless telegraphy.

Starting with Newton's discovery of the law of gravitation, the reader is led up to Faraday's researches on the electromagnetic field, and he first