

section, Part iv., is entitled "Graphic Statics," and is devoted to the graphical determination of the stresses in the bars of framed structures, and to the theory on which these graphical constructions depend. The examples selected are comprehensive, and include most of the ordinary roof and bridge trusses; cranes, sheer legs, &c., are also studied. Bending moment and shear diagrams, which come very much better in Part v., are rather out of place in Lecture xxviii.; it would certainly have been far better, and less confusing to the reader, to have taken them up in the section on strength of materials, which forms Part v. of the book. This section is by no means as complete as the others preceding it. The lectures dealing with the stresses and strains in beams and shafts are full, and well worked out; but tension is treated in a very half-hearted way, while struts and their strains and stresses are simply entirely ignored: this is most unsatisfactory. It is to be hoped that in a new edition Prof. Jamieson will look to this. The omission detracts greatly from the practical value of Part v.

The last Section (vi.) is hardly entitled to the name of hydraulics, and it would have been far better to have omitted it altogether. There are only two chapters: one deals with the hydraulic plant in a modern gas-works; it is, however, almost exclusively descriptive, quite unlike all the rest of the book.

The last chapter is given up to refrigerating machinery; though what this has to do with hydraulics the author does not condescend to explain: it is, in fact, good matter in the wrong place. We confidently recommend the book to engineering students, who will find it of much use in their study of the various branches of practical mechanics touched upon by the author.

H. B.

*Twenty-first Annual Report (1896) of the Department of Geology and Natural Resources, Indiana.* By W. S. Blatchley, State Geologist. Pp. viii + 718. (Indianapolis, 1897.)

THE contents of this volume refer very largely to the economic natural resources of the State of Indiana, and embrace the results of the work accomplished by the different divisions of the Department under Mr. Blatchley's administration during the year 1896. The papers deal with the petroleum industry in the State, composition of Indiana coals, Indiana caves and their fauna, the geology of the middle and upper Silurian rocks of Clark, Jefferson, Ripley, Jennings and Southern Decatur Counties, the oolitic limestone of Indiana, the natural gas of the State, the geology of Vigo County, and the uncultivated ferns and fern allies and the flowering plants of the same county. Several excellent plates illustrate the report, and the whole volume shows that the State, which twenty years ago was noted mainly for her agricultural products, possesses great natural resources, and is rapidly assuming high rank as a mineral producing and manufacturing centre.

*The Mines of New South Wales, 1897.* Compiled and edited by C. W. Carpenter. Pp. 552 + lxxviii. (Sydney, London, &c.: George Robertson & Co.)

THE vast mineral resources of New South Wales may be judged by reference to this handy volume. The mines—which range from the mines of the Broken Hill Proprietary Company, with 6,512,000*l.* of dividends, to a coal mine worked by its proprietor in his spare time—are in the first place arranged geographically, and, in the case of each, particulars are given—as the proprietors, development, yields, area, &c. In the geological section of the book the mines are arranged under the names of the minerals obtained from them. The remainder of the volume is taken up with descriptions of batteries and ore-reducing works, and lists of directors of mining companies, New South Wales mining patents, and an alphabetical list of mines.

## LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

### The Submerged River-Valleys and Escarpments off the British Coast.

IN connection with the observations of American geologists—especially those of Prof. J. W. Spencer and Mr. Warren Upham—on the "drowned" terraces and cañons of the American coast, the eastern borders of the North Atlantic afford some interesting results when examined with the aid of the Admiralty charts. It has long been known from the researches of the late Mr. Godwin-Austen, Prof. T. Rupert Jones, and others, that the British Isles are planted on a platform, of about 100 fathoms near its margin, and known under the name of "the 100-fathom platform." I am now engaged on a careful study of this physical feature, and the results, though as yet incomplete, are of such interest that I may be permitted to place them briefly before your readers. By tracing the contours, which may be drawn on the chart of the British Isles from the neighbourhood of Rockall as far south as the entrance to the Bay of Biscay by the aid of the very numerous soundings, two well-marked features may be recognised. The margin of the platform is very nearly defined by the 100-fathom line off the coast of Scotland, where it terminates along "the Vidal Bank"; but from this level it gradually falls away southwards, till at the entrance to the Bay of Biscay it reaches the 200-fathom contour; from this margin the floor of the ocean gradually slopes upwards to the coast, so as to constitute a shelving plain with little interruption. West of the coast of Ireland the platform is as broad as Ireland itself; that is, about 200 miles at its greatest breadth; and here it breaks off in a magnificent escarpment of no less than about 1300 fathoms (7800 feet) in height, its base giving place to a second gently sloping plain from 1500 to 2000 fathoms; or 9000 to 12,000 feet in depth, leading down to abyssal regions. This grand escarpment of about 7000 feet in height is continuous with the Vidal Bank, and opposite the English Channel bends sharply round to the eastward; in some degree conforming to the outline of the land. That this escarpment was once an emergent physical feature, corresponding to those of Eastern America, now submerged, or of the now unsubmerged terraces of Colorado, is a deduction of which I am now absolutely convinced, notwithstanding the stupendous physical changes which the deduction involves. We will now proceed to consider briefly some evidence of a corroborative kind, from which I cannot see any possibility of escape; I refer to the existence of river-valleys now traceable across the British platform, and opening out into gorges on approaching the edge of the escarpment. Some of the existing river-courses, like those of the Severn and the Kenmare rivers, are somewhat obscurely indicated by the soundings across the platform; but there are two distinctly traceable river-courses which are now altogether submerged: the first descending from the Irish Channel; the second through the English Channel. Assuming for a moment, what will scarcely be denied, that the platform down to a depth of 100 to 200 fathoms was formerly a land surface, it is clear that the streams entering from the existing lands must have had an outlet by means of rivers entering the Atlantic westwards. The examination of the soundings shows that this drainage was effected by means of two large rivers running near the centre of these channels, receiving the streams from either side. On tracing them across the platform, and on approaching the edge of the escarpment, we find the channels rapidly deepening, and within a mile or two of the edge taking the form of deep and narrow gorges, ultimately broadening out into "embayments," descending down to the very base of the escarpment itself; a condition corresponding to the "base levels of erosion" of the American geologists; and also represented by some of the Scandinavian fjords. Such physical features are altogether terrestrial. It is impossible (as it seems to me) that they could have been originated while the region referred to was in its present condition of ocean-bed. One portion of the river-valley which drained the English Channel is very clearly indicated on the chart under the name of the "Hard Deep." This gorge, about a quarter of a mile broad and seventy miles in length, occupies that narrow part of the channel between Cape de la Hague on the coast of France and the Bill of Portland. Throughout the