

The curious distribution and present position of the Upper Magnesian Limestones in Durham is noticed, and an explanation offered.

The Permian succession is shown to be more complete in the southern than in the northern area of the county.

Various sections in the Upper and Upper Middle Limestones in the Hartlepool area are described, among them the recent sinking for Blackhall Colliery, where all the series were pierced, including the full thickness of the Shell Limestone.

CORRESPONDENCE.

SEA-WATER AND CRITICAL TEMPERATURES.

SIR,—I have been very much interested in Professor Bonney's contribution to "The People's Books" in his *Structure of the Earth*. From repeated inquiries for such a clear and lucid introduction to geology, I know by experience how much such a work has been wanted.

It is, of course, a great pleasure to myself to note the stress that Professor Bonney lays on Professor Arrhenius' view of the penetration of the rocks by sea-water, both under pressure and by means of capillary attraction; but, in justice to the fathers of geological science, I should like to point out that Sir Henry de la Beche taught the doctrine of the entrance of sea-water into the earth's crust by pressure; that Professor Daubrée proved by experiment the power of capillary attraction to overcome the opposing resistance of steam as published in 1879 in his *Géologie Expérimentale*, ch. iii; and that Professor Judd, in 1881, endorsed and popularized this doctrine in his *Volcanoes, what they are and what they teach*, pp. 358, 359, besides pointing out the importance of the critical temperatures of liquids in the same work, p. 63.

Daubrée supposed that granite would ordinarily be very impermeable to water, and suggested the possible access of water through dykes of porous rocks ("par des injections de roches éruptives," loc. cit., p. 242). I, however, in 1890 showed that "under extreme changes of temperature granite cracks throughout", and that "a minutely cracked granite would suck in salt water like a sponge, either under pressure or by capillary attraction".¹ The experiment is simple, viz., to heat a piece of granite in an ordinary fire, and to soak it when cool in coloured water. I respectfully submit that the important question of the penetration of rocks by water was, long before 1880, promoted from the rank of a mere 'view', even of so distinguished a chemist as is Professor Arrhenius.

I have often wondered why the convincing experimental demonstrations of Professor Daubrée were so completely ignored in the closing decades of the last century, and venture to suggest the following as a possible explanation. In mid-Victorian times all educated people were expected to know something of the French language, but they rarely knew German. About 1870 German

¹ Rep. Brit. Assoc. 1890, p. 815.

became the language desirable for scientists, and French was allowed to lapse. Being a pre-Darwinian myself I can read Daubrée with pleasure, but German is to me a sealed book scientifically.

The French writers on physical geology, such as Daubrée, Delesse, Fouqué, and Lévy, appeal greatly to the followers of the old-fashioned English methods of experiment and demonstration, with the avoidance of 'views', and when possible of 'theories'.

As readers of the GEOLOGICAL MAGAZINE are, perhaps, too well aware, I pressed the two subjects of the permeation of rocks by fluids and of the critical temperature of liquids on them at every possible opportunity between the years 1892 and 1903, having in the year 1892 entirely renounced further original work, as being quite futile so long as the main principles were denied, and retiring entirely in 1904 when tacit opposition became too pronounced. I remain more and more convinced that since the waters first covered the earth no single agent has been more active in the processes of rock-metamorphism than the oceanic waters, charged as they are with soda, potash, magnesia, and lime.

A. R. HUNT.

TORQUAY.

December 31, 1912.

OBITUARY.

ELLEN SOPHIA WOODWARD.

BORN AUGUST 7, 1836.

DIED JANUARY 10, 1913.

THE beloved wife of the Editor of this journal, and the compiler of a *Forty Years Index to the Geological Magazine, 1864-1903* (Dulau & Co.), passed peacefully away, after fifty-five years of happy married life, on January 10, 1913, at 13 Arundel Gardens, Notting Hill, W.

She took a keen and active interest in science, and greatly assisted Dr. Woodward in his geological and literary work, both in the British Museum and at home. She also accompanied him, for many years, to the meetings of the British Association and on visits to the Continent.

MISCELLANEOUS.

RETIREMENT OF MR. CLEMENT REID, F.R.S., F.L.S., of the Geological Survey of England and Wales.

Mr. Clement Reid, District Geologist on the Geological Survey, retired from the public service on January 6, 1913. He joined the staff of the Survey in 1874, under Sir A. C. Ramsay, and has been actively engaged in field-work for more than thirty-eight years.

Mr. Clement Reid is distinguished for his knowledge of the Tertiary floras, and is the author of many papers and Survey memoirs, including the *Origin of the British Flora*, 1899. He was awarded the "Biggsby Medal" in 1897, and was elected a Fellow of the Royal Society in 1899.