

author finds the Bargate Beds with pebbles (at Park Hill, Reigate) separated from the Folkestone Sands only by a thin bed of Fuller's Earth and a layer of sandy chert. The section is now first described; the dip has been observed and proved, and by measurement this pebble-bed is shown to lie at approximately the same horizon above the Atherfield Clay as when it was last seen west of the Mole. From Reigate eastwards to Tilburstow Hill the same beds are seen in the numerous hollow lanes and pit-sections. The pebble-beds are found approximately on a definite horizon; but whilst they become of less importance eastward, the overlying cherts, first seen at Reigate, become of greater importance in that direction. The thin bed of Fuller's Earth, also first seen at Reigate, thickens to the east likewise.

2. "On the Eastern Limits of the Yorkshire and Derbyshire or Midland Coalfield."<sup>1</sup> By W. S. Gresley, Esq., F.G.S.

The author attempts to throw light on the question of the easterly extension of the Yorkshire, Derbyshire, and Nottinghamshire coalfield beneath the newer rocks. He notices the general trend of the strata, the sizes of other British coalfields, the question of the origin of mountains, stratigraphical considerations, and the faults of the North of England. His object is rather to suggest what he believes to be novel ways of treating the subject than of reaching conclusions or locating limits.

3. "On some Phases of the Structure and Peculiarities of the Iron Ores of the Lake Superior Region." By W. S. Gresley, Esq., F.G.S.

The author has been studying heaps of ore brought from the region lying south-west of Lake Superior since 1890. He describes certain structural features of the ore-fragments, and discusses the evidences of mechanical movements and chemical alteration exhibited by these fragments.

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## CORRESPONDENCE.

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### THE GEOLOGICAL AGE OF THE ROCKS OF CHARNWOOD FOREST.

SIR,—As some uncertainty seems to hang about the origin of the name "Cambrian" as applied to the rocks of Charnwood Forest, will you allow me to make a short statement on the subject.

Having had occasion recently to refer to the Survey Memoir "On the Geology of the Leicestershire Coalfield," published in 1860, for another purpose, I turned to the passage dealing with the Charnwood Forest rocks; and as regards the origin of the name "Cambrian" as applied to them by the Survey, I thus wrote (p. 11): "In the absence of organic remains, these rocks have been referred by Professor Sedgwick and Mr. Jukes to the Cambrian period; amongst other reasons, from their resemblance to the rocks of this age in Wales. They have been described in detail by Mr. Jukes,<sup>2</sup>

<sup>1</sup> See also a paper on the same subject by Mr. Arnold Lupton, entitled "On the Geology of the West Yorkshire Coalfield" (Trans. Federated Inst. Mining Engineers, vol. vii. pt. 1, p. 137).

<sup>2</sup> Geology of Charnwood Forest, appended to Mr. Porter's History of Charnwood Forest.

and the Geological Survey of the range has been executed by my colleague Mr. H. H. Howell."

From this it will be seen that the age of these rocks was determined by no less an authority than Professor Sedgwick, the founder of the Cambrian system in Wales, supported by his friend and pupil Professor Jukes, and the ground of this determination is the resemblance of the Forest beds to the Cambrian beds of North Wales. Who amongst men should have been better able to recognize this resemblance than the distinguished founder of the Cambrian system? Nor was the opinion of Professor Jukes less entitled to weight, as Jukes spent several years of his Survey life amongst the old rocks of North Wales. For six months of my own Survey life I was his companion and pupil in the same region; and when a few years afterwards I had opportunities of examining the rocks of Charnwood Forest I was able to recognize the similarity of physical character, upon which Sedgwick and Jukes to a great degree relied in determining the geological age of the rocks; nor, notwithstanding what has been written by more recent authors, am I able to see good reason to alter the opinion I then held.

On reading over again the brief description of these rocks (as far as regards their non-plutonic masses), written at a time when their characters were vividly impressed on my mind, and when there was no dispute regarding their age, I see how similar is the description to one which might be applied to the Lower Cambrian beds of Merionethshire. "Crossing the axis we find the beds as far as Upper Black Brook, consisting of bluish-purple and green slates, of a coarse character, alternating with fine grits." The eruptive masses are then described, and their resemblance to the contemporaneous and intrusive masses of North Wales is pointed out (p. 12). Since these words were written much new light has been thrown on the composition and structure of the igneous masses by Professor Bonney and other petrologists. In 1860, the application of the microscope to thin sections of rock was scarcely begun; but the determination of the geological age of the whole series of the Charnwood rocks is not affected by microscopic definitions of the eruptive beds.

I have still much hope that fossils may yet be discovered in these old rocks. After the discovery of a Trilobite in the slates of Llanberis no one need despair; and any young geologist who desires to break fresh ground and win his spurs would do well to turn his attention to the slates of Charnwood Forest.

EDWARD HULL.

#### THE MAKING OF MOUNTAINS—A REPLY TO MR. MELLARD READE.

SIR,—May I ask you to allow me space to answer, as briefly as possible, a letter, in the GEOLOGICAL MAGAZINE for December, 1894, in which Mr. Reade attacks my theory on the making of mountains.

I must in the first place object to a statement implying that I have, to a certain extent, changed front. Mr. Reade remarks: "Mr. Vaughan *now* says, that he does not rely upon decrease of