often more clear and trenchant—so much so that those fathers of British geology who made a separation between the Palæozoic and Mesozoic groups exercised a wise discretion in making the division at the junction of the two formations. This physical break is represented by the remarkable change in the fauna and flora of the formations on either side of the boundary, a fact which I fear neither of your correspondents has sufficiently considered.

EDWARD HULL.

THE AGE OF THE PENNINE CHAIN.

SIR,—Having given some attention during the past few years to the Permian Formation in the North-east of England, I should feel obliged if you would allow me to say a word or two on the above subject. I can corroborate all that Mr. E. Wilson has said with respect to the physical break which exists on the north-east side of Pennine Chain between the Permian and Carboniferous formations; for at some of the new collieries which have recently been put down through the Permians in the Nottingham and Derbyshire Coal-field, the difference in dip nearly amounted to twenty degrees, whilst in every case the unconformability between the two formations was most marked.

The westerly attenuation of not only the Marl Slates but of the Permian Formation as a whole, and the sedimentary materials with which on the west it is intermingled, point to the existence of high ground in that direction during Permian times; whilst the great differences which undoubtedly exist in the character and thickness of the same formation on both sides of the existing anticlinal are facts altogether in favour of its existence at the time these deposits were laid down. I remember the surprise quite well which Professor Hull expressed when the Scarle boring proved the Permians to attain such a vast thickness in that locality, and the difficulty he experienced in recognizing the Marl Slates (about 150 feet in thickness), which he afterwards placed in the Carboniferous system.

Under these circumstances, I fail to see how Professor Hull and Mr. Teall can object to the existence of the Pennine Chain during the deposition of the Permian formation, when such reliable facts in support of such an existence can be produced.

MEXBOROUGH, near ROTHERHAM. ROWLAND GASCOIGNE, F.G.S.

CRETACEOUS GASTEROPODA.

SIR,—Mr. Wm. Gault, of Belfast, now engaged in compiling a list of the Irish Cretaceous fossils, has kindly forwarded to me for examination those which appeared to be Limpets and Dentalia. The result has proved that the Irish species, hitherto known as *Dentalium septangulare* of Fleming, is really an Annelid. Mr. Etheridge and Prof. Morris agree with me in this opinion, but it is especially to Dr. Gwyn Jeffreys that I am indebted for a most critical examination. He states regarding them—"They differ from the Solenoconchia and agree with the Testaceous Annelida in the following particulars. They are much more solid and more curved, and the mouth or aperture is decidedly constricted. The microscopic structure showing the lines of periodical

growth or accretion is such as occurs in Annulose and not in Molluscous shells. One of the specimens contains a *Ditrupa* and a *Spirorbis* both of which exhibit precisely the same kind of microscopic structure."[1]

While some of the supposed patelliform shells cannot be placed among the Mollusca, one form, of which there are two specimens, is very well preserved and distinct. It is referred by Gwyn Jeffreys to the genus *Hipponyx*, of which no upper valves were known previously from any strata below the Maestricht Limestone, although the lower valves or shelly bases had been met with in both the Chalk and Greensand in England.

They are from the Glauconitic Marls of the Black Mountain, Belfast, from the zone of *Pecten asper* of Barrois.

I have also received within the past week a new *Emarginula* from the Grey Chalk near Folkestone, which differs markedly from the only form hitherto known, *E. Gresslyi*, from that locality. I hope to illustrate both these in a future number of the GEOLOGICAL MAGAZINE.

J. STARKIE GARDNER.

COMPARATIVE PHYTOLOGY.

SIR,—Some very indistinct impressions, or rather remains of leaves, were forwarded to me from the well-known hazel-nut bed of Brook in the Isle of Wight, under the supposition that they might prove to be leaves of the beech. It is interesting to record that Baron von Ettingshausen found himself able to at once pronounce them to be leaves of *Corylus*, although he was quite unaware that they had been found associated with the nuts, and therefore recognized them entirely from what could be traced of their venation, for the outline and margin were almost wholly obliterated. J. STARKIE GARDNER.

THE TERM "SCHIST."

SIR,—I feel rather perplexed by some observations on the term "schist" made by Mr. Allport in the GEOL. MAG. for this month. A great deal of confusion at present prevails as to the exact meaning of the word, and the progress of our knowledge, as I know by experience, is impeded by the want of a fixed meaning. Following Jukes, I have usually confined the terms "schist" and "schistose" to a rock possessing true foliation, as defined by Darwin, and approved by Mr. Allport. But when I have come to study certain "schists" in the field, I have found them to be simply laminated or cleaved, and therefore not schists, but shales or slates. It has appeared to me that we could not do better than adhere to Jukes's summary of the different kinds of fissile structure: "the *foliation* of *schist*, the *cleavage* of *slate*, and the *lamination* of *shale*." I was accordingly cast in doubt on finding that so high an authority as Mr. Allport used "schistose" as equivalent to "fissile," and affirmed that "the term schist certainly ought not to imply or include foliation." I confess I do not see why the word "fissile" could not be used for rocks which do not come into Jukes's triad, leaving as "schistose" undecomposed and unmetamor-

[1] See Dr. Gwyn Jeffreys's report of the *Valorous* Expedition, Proc. R.S. 1876.