

Although at a greater elevation than 120 feet, no evidences of the existence of ice have been found, there is a possibility of their having been removed from off the highest land, by the denuding influences of the atmosphere, or by the sea, before being covered by the Boulder-clay, but whether that be so or not, the most careful search has been made without finding the slightest evidence of ice anywhere to the east of Liverpool, notwithstanding the great advantages presented by the very frequent excavations made for building purposes. If the ice were a glacier confined to the valley of the Mersey, its thickness in the centre was about 300 feet, but there is a possibility that ice covered the whole of this part of the country, and in that case it must have been much thicker.

At the meeting of this Society, on November 13th, 1866, R. A. Eskridge, Esq., F.G.S., President, in the chair, the following papers were read:—

“On the Oscillation of Level during the Eocene Period on the Coast of Hampshire.” By Dr. Ricketts.

“Notes on the Geology of Leicestershire.” By G. H. Morton, F.G.S.

THE NORWICH GEOLOGICAL SOCIETY held its anniversary meeting on the 10th October, upon which occasion the Rev. John Gunn, F.G.S., President, and about thirty members, sat down to dinner. The President afterwards reviewed the various papers relating to East Anglian Geology which had occupied their attention during the past session. Among these was a paper on the Upper and Lower Crags by Mr. J. E. Taylor (one of the most energetic and able members of the Society); also an important paper by the President, on the “Anglo-Belgian Basin” (read also before the British Association at Nottingham).

The Trimmingham outlier of Chalk; the Norfolk Forest Bed; and many other interesting questions relating to Climatal changes, had been considered. Great diversity of opinion exists between Mr. B. Russell and Messrs. Gunn and Taylor as to the glacial theory. The former gentleman strongly protesting against a glacial epoch upon astronomical grounds, and the two latter defending it upon geological evidences. The result of these discussions is, that members consult “Lyell’s Principles of Geology” and other good books of authority, and, best of all, go and make observations for themselves in the field.

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CORRESPONDENCE.

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LITHOLOGICAL NOMENCLATURE.

*To the Editor of the GEOLOGICAL MAGAZINE.*

DEAR SIR,—Neither you, nor your subscribers, will need any recommendations of mine upon the duty of exactness in scientific nomenclature. I am not, either, going to discuss the delicate question of the value of applying to stones the scale of minute

specific distinctions. This attempt, made mostly by foreign geologists, has been rather hastily extended from classificatory sciences proper—Zoology, Botany, and Mineralogy—to rocks, although the ulterior scientific purpose to which that method is subservient and necessary in those sciences, namely, to ascertain how and to what extent such minute distinctions are fixed or derivative—can scarcely be said to exist in the philosophy of stones, our researches here having pretty well proven that the natural selection which pre-determines the composition of rocks is of the most fortuitous nature. The interest in rocks turns upon other and broader points. Thus, not seeing how the system alluded to is essential to the pursuit of chemical geology, or of mineralogy in rocks, and fully experiencing how great an obstruction it may prove in general geology, it is only upon the faith that no labour is altogether in vain that I can have any tolerance for this new fashion—it may lead to some new development of our glorious science.

What I would wish to bring to notice is a glaring inconsistency in the use of a familiar English rock-term. In my description of a portion of the N.W. Himalaya, in the Memoirs of the Geological Survey of India, wishing to avoid ambiguity, I defined the sense in which I should use the words schist, slate, and grit. The sanction to which I appealed was, the *practice* of English field-geologists. Some friendly critic at home took me to task on this point.<sup>1</sup> Schist, as implying crystalline foliation (and not argillaceous rocks in general), was allowed to pass. I will not haggle with my objector upon a point of degree in the application of the word slate (and slaty) to subfissile argillaceous rocks, in which that character is not traceable to original lamination; true cleavage is due to pressure; and so is the imperfect, though important character I would designate as slaty. Upon my use of the word *grit* I received no quarter. I was perfectly aware at the time that this term was frequently used in a totally different sense to that of my definition; but, having served my apprenticeship in Great Britain, I was also pretty sure of my ground when I appealed for sanction to the practice of English field-geologists. During a recent brief visit to England, I did not omit to verify my position. It will, I think, be granted that the classified collections of the Geological Survey of Great Britain and Ireland are a good exponent of the authority I quoted. They are, perhaps, the only named collections in the kingdom that are not based upon a 'Krantzian' foundation. And in those collections the word *grit* is frequently, I believe even exclusively, used in the sense I gave to it. I am writing from the Jungles, so cannot refer to the numbers I noted in the printed catalogues of the Museums in Jermyn-street and in Dublin, and which bear the *imprimatur* of Professors Ramsay and Jukes, but the specimens are easy to be found among the transition rocks. These grits are very fine-grained siliceous rocks; they appear abundantly associated with slates: their composition and texture is such that in the midst of highly cleaved

<sup>1</sup> See Review of "Memoirs of the Geological Survey of India," vol. iii., Part 2, GEOLOGICAL MAGAZINE, Vol. II. p. 310.

strata they present no trace of this structure; yet no one would think of calling them sandstones or quartzites. In their original state I can imagine them described as very light, friable clays. The literature of transition rocks (*e.g.* Professor Ramsay's recent Memoir on North Wales) may be consulted with the same effect as the Survey collections. In this field of observation practice seems unanimous upon the necessity of a class-name for the rock in question, and upon the appropriateness of the word *grit*.

On the other side of the argument are to be found all text-books, glossaries, and lectures. It is indeed probable, that if an impromptu show of hands could be called for, the geologists of England would agree that a *grit* is a coarse, sharp sandstone—an essentially different rock in all its characters and associations from that before described. It is not difficult to explain such an anomaly—nine-tenths of our geologists have done little or no work upon transition rocks; so that the occasion for the ambiguous use of the term has never occurred to them; the remaining minority could not, all of a sudden, revoke a familiar expression. I have yearly to fight this battle of the grits with new assistants joining the Indian Survey, and seldom with any good result. Naturally enough, with all the enthusiasm of youth for the respected teachers of the schools, they prefer the recent lessons of those high authorities to the representations of an obscure Indian; and, to my great discomfiture, the oral and printed instructions of those to whose field-practice I vainly appeal, are most frequently quoted against me. The unfortunate result is, that this broad discrepancy in our vocabulary is perpetuated in the annals of our work: those who are set to map and describe the Coal-deposits find this *grit* a very handy term, and use it triumphantly. It is with the conviction that my respected old masters, who know both sides of the question, will be more reasonable than their more recent pupils, and will at least drop one or other signification, that I venture to send home this appeal to them and to their judges, the geological public.

To aid in the decision I call for, I will add my own notions on the point at issue. The word *grit* was, I believe, introduced to us through the Millstone-grit, from a technological vocabulary in which we should find it applied as appropriately to a cellular trachyte as to a sandstone. By a true process of natural solution, it seems to have been applied to the rock I first described—to fill a real gap in our geological vocabulary. If this latter application of the word be abandoned, some new word must be coined or borrowed to take its place; whereas no such plea can be urged for the continual use of the word as applied to sandstone—there could be no difficulty in describing our Indian Coal-measures without a special name for one of the many varieties of sandstone that occur. Convenience should not be the umpire in such matters. Such a practice is unsystematic and confusing. What would a naturalist say to the phrase—a collection of dogs and quadrupeds? To me, the words “a series of grits and sandstones” sounds just as barbarous, when I know that the first word only means a common sandstone. If, in geology, we can as

yet dispense with a voluminous categorical list of stones—as conveying no sense at all commensurate with the labour and the inevitable indistinctness attending such niceties of specific distinctions—it is all the more essential that our type-names and the terminology we apply to important characteristics should be well understood and carefully used. We are often told to practise what we preach: in matters of science, at least, we may adopt the easier and safer maxim to teach what we practise.

Yours truly,

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CHOTA, NAGPORE, December 1, 1866.

### INUNDATIONS AND THEIR PREVENTION.

*To the Editor of the GEOLOGICAL MAGAZINE.*

SIR,—Under this heading a writer in the *Pall Mall Gazette*, who signs himself X, recommends the construction of “artificial lakes” or “huge reservoirs” on each side of the Pennine chain, “which would have the effect of preventing inundations like those of last month in Leeds, York, Salford, etc.” X gives this idea as an origination of his own. It is, however, Ellet’s idea, and it was published for him by the United States Government, in a book of some 400 pages, in 1853. The book is entitled, “The Mississippi and the Ohio rivers, containing plans for the protection of the delta from inundation.” The principles of this book are discussed in the last chapter of “Rain and Rivers,” which is entitled “Ellet on the Mississippi.” In reference to the late floods in France, X says, “In 1856 the Emperor addressed a letter to the Minister of the Interior on this subject, in which he pointed out that the first object was to ascertain the cause of these sudden floods, and suggested that they came from the rainfall among the mountains.” And again, “Our experience in England seems to confirm the Emperor’s theory that certain floods are chiefly caused by rain in mountainous districts.” The Emperor’s theory is as certainly true, and one would have thought as self-evident as that two and two, make four. And posterity will find it difficult to believe that in the 19th century such a truism could have been enunciated as a *discovery*! This so-thought *discovery*, however, is a most important step taken in advance when we consider the profound ignorance which prevails on the subject. And it will be of advantage to the entire world that the most enlightened, clear-headed, and energetic of its sovereigns has learned the first great A in the Hornbook of Rain and Rivers. Nor is it of slight importance that the *Pall Mall megatherium* has changed the tone of his roaring, and has taken to steal, and to promulgate as his own, doctrines, which he only yesterday attempted to controvert. He at least has the power to *publish* those stolen doctrines. His *own* idea on alluviums was that they were hatched out of *igneous* “nest-eggs,” (*sic*) and it is really quite “a nice change” when X finds that *aqueous* causes *now* can “cover the productive soil several feet deep by stones, etc.,” and proves that aqueous