no surprise in the Arctic Regions, provided a suitable temperature were provided for them.[1]

I cannot give here all the details explained in my paper, but I claim to have surrounded the North Pole with such a network of Lombardic plants, requiring Lombardic heat, but not Lombardic light, as to render the escape of the Pole from its present position as difficult as that of a "rat in a trap surrounded by terriers."

If the Lombardic light as well as heat were present in these Tertiary times, it would be difficult to explain the *absence* of a multitude of evergreen plants which require light to develope chlorophyll grains. Such evergreen plants ought to have migrated from North America and Europe into Greenland as easily and as rapidly as the peculiar groups of evergreens found there in Tertiary times.

In my opinion, the natural selection in the Tertiary Flora of Greenland of such evergreens only as require Lombardic heat, but can dispense with Lombardic light, is a fact which my opponents in the Geological Section not only did not answer, but entirely failed even to see the force of.

S. HAUGHTON.

TRINITY COLLEGE, DUBLIN, 17*th January*, 1879.

## FACTA NON VERBA.

SIR,—The Devonian question being already hampered with so much theory, I venture to hope that you will insert the following facts, arrived at after a series of traverses by almost all the river-courses in North Devon. Prof. Hull's description of the rocks of this county and West Somerset contains serious errors, into which I am sure he would not have fallen had he been acquainted with the area.

Firstly. The Pilton beds consist of bluish grey and grey schistose and slaty rocks, with local developments of grey and brownish grit. The calcareous element is represented by thin, trivial, and impersistent beds of limestone.

Secondly. The Baggy Sandstones are buff-grey and brown, apparently confined to a definite horizon, but by no means equally developed thereon; they rest upon olive slates. For stratigraphical survey lines these may be included in the Pilton beds, from which they cannot, in disturbed districts, be readily distinguished.

Thirdly. The Pickwell Down beds are strangely mixed up with the Morthoe Slates in Prof. Hull's table, which would be fatal to the supposition of unconformity between them (vide GEOL. MAG., 1878, p. 531, lines 18 and 19). The Pickwell Down series is distinguishable through North Devon by its characteristic interstratification of slates, not shales; these are almost invariably lilac or purple, and toward the base of the division seem to pass into the Morte group by intercalation with buff and greenish slates, especially on Exmoor.

Fourthly. The Mortehoe slates are simply an unfossiliferous upper portion of the Ilfracombe group; the former being greenish and glossy; the latter grey, bluish, steel grey, and silvery, with local

[1] So far as I can understand, it would be difficult, if not impossible, to distinguish between evergreen magnolias and those with deciduous leaves, in fossil remains.

developments of limestone bands near Ilfracombe and in West Somerset. It is impossible to fix any definite boundary between them.

Fifthly. The upper beds of the Hangman group are very coarse and siliceous, silvery red-stained shales being sometimes intercalated; the lower beds are generally flaggy and of a grey colour.

Sixthly. The Lynton zone is represented by grits, generally breaking in even tabular layers, schists, schistose grits, and slates, of a uniform warm grey tint.

Seventhly. The Foreland grits are generally fine, flaggy, cream-coloured, dull-grey, brown, reddish or greenish grits, with beds of red grit, sometimes massive; they very seldom contain slates.

Throughout the series conglomerate is conspicuous by its absence. The Drayton and Slade group, if not another name for the olive slates which form the base of the Pilton beds, below the *Cucullæa* zone, has no existence; and if the *Cucullæa* and olive slates are to be regarded as a separate division, the term Marwood used by Prof. Hull is much the most suitable, owing to the presence of the Hangman lower down.

W. A. E. Ussher.

Bear Street, Barnstaple, *Dec.* 1878.

## THE NORTH DEVON SECTION.

Sir,—Professor Hull, having depended on the writings of others for his knowledge of the North Devon rocks, has obtained the result which usually follows this method of inquiry. His proposed classification looks, no doubt, very well in print, but there are two or three points to which any one knowing the locality must take exception.

At page 531 it is suggested that "it will probably be found on a careful re-survey of North Devon, that the Pickwell Down Sandstones are somewhat unconformable to the underlying beds." Now, as a matter of fact, so far from this being the case, there is a gradual passage from the slates to the sandstones; first slates alone, then slates with layers of sandstone; next, sandstones with layers of slate, and finally the Pickwell Down Sandstone itself. With regard to a *re*-survey of this district, it must be remembered that the present map was constructed, not by the Geological Survey, but by De la Beche, working as an amateur; and the only boundary-line shown on it is that separating the Devonian and the Carboniferous. In 1865 I laid down for the first time, on the one-inch scale, the various subdivisions of the North Devon series from personal observations made during the preceding three years. The nomenclature I then published I had occasion to alter shortly afterwards by the substitution of *Cucullæa* zone for Marwood zone,[1] and the adoption of "Pickwell Down Sandstone" for the upper portion of the Morthoe group. Mr. W. A. E. Ussher, F.G.S., of the Geological Survey, who has now been engaged for some months in mapping the river valleys, informs me that, after going carefully over the ground, he has not only adopted these subdivisions, but also the general horizons as shown on my map.

As far as the Drayton and Slade beds are concerned, they have been placed by Professor Hull in a most convenient position in his

[1] For reasons see Quart. Journ. Geol. Soc., vol. xxiii. p. 374.