



LXVII. Dr. Gilby in reply to Mr. Farey on the stratification of Great Britain

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of the light is, besides, reflected perpendicularly by the second surface, and emerges at the place where it entered; but the portion of light reflected irregularly at this second surface radiates in all directions from the point of reflection. The luminous molecules, therefore, of which it consists, traverse the glass a second time, but in a different direction; and thus the length of their fits changes both from the different extent of their paths, and from the obliquity of their directions to the reflecting surfaces. Hence it follows that, in returning to the first surface of the mirror, some of these particles are in fits of transmission, and others in fits of reflection. Knowing therefore the length of their primitive paths, and also that which they describe in their return, and the ratio in which the fits of the particles are enveloped by obliquity, it is easy to calculate in what points each colour ought to emerge, and in what points the other colours ought to be reflected anew. By following the light emerging into the air according to the ordinary law of refraction, one can calculate the diameter of the rings which ought to be formed upon a white surface at any distance from the mirror. This is what Newton has done, for plates which had a thickness of nearly a quarter of an inch; and the results were exactly conformable to the calculations even when the particles in first traversing the plate had suffered more than 34386 fits.

In the experiments of M. Brewster, however, the equal thickness of the two plates and the small inclination of their surfaces appear to me to act the part of the equal curvature of the two reflecting surfaces in Newton's experiments, the inclination of the plates having the same influence as the sphericity in changing the length of their paths. It therefore appears to me probable that the two results may be calculated by the same formulæ, and I propose in a short time to verify this supposition. But, whatever be the result, I have thought that natural philosophers would peruse with pleasure these details relative to experiments which will probably lead to a thorough knowledge of the manner in which the coloured rings are produced.

LXVII. *Dr. GILBY in Reply to Mr. FAREY on the Stratification of Great Britain.*

To Mr. Tilloch.

SIR,—YOUR readers will (I doubt not) be heartily tired of a controversy which is neither productive of interest or instruction, and which consists of little else than recrimination bandied from one side to the other. I foresaw that a few expressions
in

in my last paper could not fail to excite the irritability of so pugnacious a polemic as Mr. Farey, and in that case I resolved to forbear from any reply; and, to use a childish phrase, to allow him the last blow. But upon reading this reply, I find it so full of misrepresentation, and to contain so many perversions of my meaning, that I cannot forbear noticing them.

First, then, I have not made any use in my *last* paper of Professor Jameson's name, in order to appropriate to myself the discovery of the unconformable position of the red ground, as Mr. F. has falsely asserted top of p. 279.—My words are, “But any thing I can say will be of far less consequence than the opinion of Professor Jameson, who allows me to state, that as far as he can judge from the description I have given, and the specimens I have shown him, he considers the red sandstone and mountain limestone as members of the first floetz formation.”

I do not unhandsomely charge Mr. Farey with wishing to introduce confusion as to the geology of England; for I say nothing more than is warrantable from the flagrant geological errors which Mr. F. has committed. One of the most preposterous is that of referring the sienite of Leicestershire to that *omnigenous* formation, the red ground,—contrary, I venture to say, to the opinion of every sensible geologist in Britain; and contrary to the facts so beautifully displayed by the stratification on the western side of the Malvern range. This range, I need not repeat, consists in great measure of a sienite, which even Mr. Farey, as he wishes to imbed it in the red ground, cannot but allow to have been formed at the same time with the sienite of Leicestershire. The fact to which I allude I have mentioned p. 186 and 188 of my paper, but I beg leave once more to press them upon Mr. Farey's notice. Upon the west side of the range there rests a formation of limestone, which Dr. Prichard in the *Annals of Philosophy* assures us is seen dipping under the red sandstone of Herefordshire. This red sandstone, as I have myself ascertained in company with Dr. Prichard, lies below the mountain limestone; so that we have these rocks formed, besides a world of coal beds and coal measures, before the red ground, which is supposed to be a twin production with the sienite, was deposited. All these facts, however, will, I dare say, be of little avail in altering Mr. Farey's opinion; and I unfortunate

“Non profecturis littora bobus aro.”

Another of these extravagancies, by which Mr. Farey outrages every thing like system, is to be found at p. 280 of his Report, where he gives it as his opinion, without the shadow of a proof in support of that opinion, “that the *4th limestone of Derbyshire* is the *lowest* which is any where seen in England, not excepting

cepting the rocks of Devonshire and Cornwall, which probably (says he) will appear to rank with the *red marl* in the British series; and so, perhaps, will those of the great part of Wales."

This is Mr. Farey's English Geology: and it is quite of a piece with his English Mineralogy; for, upon finding some rock resting upon the sienite of Leicestershire, he with the utmost simplicity tells us that he had "rather call it coarse slate, than *risk* any of the German names greenstone, hornstone, schistus, trap formation,"—substances as different from one another, and from coarse slate, which I suppose should be read clay slate, as can well be imagined, and which it is hard to conceive how one who pretends to be a mineralogist, and who even styles himself a *mineral surveyor*, should not know how to distinguish. After having thus strangely perverted the order of succession as determined by the united labours of the ablest men in every country, will it be believed that Mr. Farey should think himself of sufficient authority to venture to assure us, that it is a vain attempt to reconcile the facts of British stratification to the Wernerian system? This however is the *ipse dixit* of our English Werner, and it becomes us to bow in humble submission to this oracle of geological knowledge.

I have not anywhere said that Mr. Jameson considers the limestone of Derbyshire to be *flötz*, and nothing but a determination to misrepresent my meaning could have induced Mr. Farey so far to misquote me:—for, after mentioning Professor Jameson's opinion that the mountain limestone, and the old red sandstone usually associated with it, belong to the first *flötz* formation; I immediately add, "it is a point yet to be ascertained, whether the limestone associated with the coal-field of Derbyshire is to be considered as belonging to the *flötz* or transition series"—thereby implying that Mr. Jameson's opinion does not extend to the limestone of Derbyshire, which is altogether different in its geological relations from the limestone associated with the coal fields in other parts of England.

But of all the misrepresentations which Mr. F. has made, the most vexatious is that where he says that I seem to have taken it for granted that the old red sandstone occurs universally between the Derbyshire-peak limestone and the coarse slate. I have nowhere mentioned during the course of my paper either of these rocks, and hardly know what they mean. But if Mr. F. means by the Derbyshire-peak limestone the 4th limestone; I have been so far from having taken it for granted that the red sandstone is found under this rock, that in a separate paragraph I have mentioned the absence of the red sandstone as one of the circumstances which distinguish the Derbyshire limestone from the mountain limestone in other parts of England. This paragraph,

paragraph, p. 185, Mr. F. has read and quoted from it: and although I wrote it for the express purpose of stating that the stratification of Derbyshire forms a striking exception to every thing I had been saying respecting the mountain limestone in other parts of England; yet Mr. Farey has several times in the most unhandsome manner applied to the limestone of Derbyshire, what I had said of the mountain limestone so commonly associated with the red sandstone. But the strangest thing of all is, that after Mr. F. had understood me in the way above mentioned, he should cite the passage where I had asserted the absence of the red sandstone, and upbraid me for having spoken in too unqualified a manner on the subject, as the under strata of the 4th limestone are still unknown, so that the red sandstone may still be found under the limestone.

After having quoted authorities to show that a red sandstone occurs under the mountain limestone in Somersetshire, Gloucestershire, Herefordshire, Monmouthshire, Brecknockshire, Shropshire, in the north of England, and in Anglesea (as Mr. Farey now mentions), are not these facts sufficient to show that it is not merely an accidental association, but that it will be found still more general, particularly if it be true that the red sandstone commonly occupies the low part of the country?

I have not charged Mr. Farey (towards the bottom of p. 187) with the inaccuracy and confusion of not knowing the relative age and situation of the red marl to be more recent or above the coal-measures, as he has most falsely asserted. The latter part of the sentence, "that not only members of the floetz but even of the transition series have been referred to this formation," is plainly the inaccuracy with which in part only I have charged Mr. Farey.

I have little doubt that this letter will be followed by another reply from Mr. Farey: but as I have sufficiently attained my purpose by correcting the mis-statements which Mr. Farey has made, and as I can employ my time much more to my inclination than by carrying on a controversy of this nature, I beg leave to say that I shall on no account take any further part in it.

I am, sir,

Very respectfully yours,

York Crescent, Clifton, Bristol,
Nov. 11, 1815.

W. H. GILBY, M.D.

P. S.—Is it not probable that the 4th limestone of Derbyshire may hereafter be found to rest on the sienite?

The word *Ness* has been misprinted for *Ross* in Herefordshire.