



XXV. Notes and observations on the remaining part of the seventh chapter of Mr. Robert Bakewell's "Introduction to Geology;"—embracing incidentally, several new points of Geological investigation and theory

Mr. John Farey Sen.

To cite this article: Mr. John Farey Sen. (1814) XXV. Notes and observations on the remaining part of the seventh chapter of Mr. Robert Bakewell's "Introduction to Geology;"—embracing incidentally, several new points of Geological investigation and theory , Philosophical Magazine Series 1, 43:190, 119-127, DOI: [10.1080/14786441408637984](https://doi.org/10.1080/14786441408637984)

To link to this article: <http://dx.doi.org/10.1080/14786441408637984>



Published online: 27 Jul 2009.



Submit your article to this journal [↗](#)



Article views: 3



View related articles [↗](#)

clearly appear that the doctrine of Messrs. Higgins and Dalton with regard to atoms is truly hypothetical, and cannot with propriety be at present admitted: objections to this theory have also been pointed out by Dr. Bostock in Nicholson's Journal. The views I am most inclined to adopt are those of Sir H. Davy, as in these we are guided by the result of experiment and fact. The more accurately our researches are made, the more forcibly is the doctrine of definite proportions demonstrated. The researches of Mr. J. Davy on the combinations of different metals and chlorine, published in the Philosophical Transactions for 1812, and the late interesting publication of Berzelius, sufficiently prove the truth of what is above stated: although not standing the test of a rigorous mathematical examination, they are sufficiently near, considering that chemical analysis is still imperfect, to point out this grand law. Objections may undoubtedly still be urged against it, and that of solution has been considered by some as the most forcible; since, in this, bodies within certain limits appear to unite in any proportion. But surely there is some difference between dissolution and combination: in the former we find merely the cohesion of the compound aggregates amongst each other disunited, and the particles of the compound diffused throughout the fluid: in the latter, a decomposition takes place amongst the elements of which a compound is formed, it assumes entirely new properties; and it is here we are to look for the determinate action of affinity. If it were not guided by such a law, our results would always be showing different productions, and compounds consisting of the some proportion of elements would scarcely ever be obtained.

XXV. *Notes and Observations on the remaining part of the Seventh Chapter of Mr. ROBERT BAKEWELL'S "Introduction to Geology;"—embracing incidentally, several new Points of Geological Investigation and Theory. By Mr. JOHN FAREY Sen., Mineral Surveyor.*

[Continued from p. 34.]

Notes, &c.

P. 182, l. 6, from the ocean†.—† The great south-eastern Denudation of England ¶, probably includes the Basin of Paris in its upper eastern edge, P. M. xxxv. p. 130 and 134, notes; but

¶ The acknowledgement of this characteristic phenomenon of the counties of Kent, Sussex, Surrey, and the eastern part of Hampshire (the first Denudated tract that was well ascertained probably) seems with difficulty or reluctance made, by the Wernerian School: a learned Doctor, when lately

[P. 182] but when the actual elevations of the different parts of the edges of the *Chalk* around this great denudation, are considered, it will be seen, that a *Lake*, in any great degree

reviewing the progress in 1813, of his favourite *Geognosy* (Ann. of Phil. iii. 29), ascribes to Mr. Thomas Webster (but perhaps rather erroneously?) the assertion, that the Parisian "new series of *flatz Rocks*, which appear to lie over the *Chalk*," "constitute almost the whole of the south-east corner of England." Notwithstanding, that all the south-eastern coast between Folkestone and Eastborne (a direct distance of 45 Miles or more) shows Strata that lie under the *Chalk*, and that the same thing occurs thence inland, as far as Farnham and Petersfield, (distances of 85 and 55 miles respectively), within which large denudated tract, it is impracticable to find any of the Parisian or London Strata, or even the *Chalk* on which they should lie: but a quite different series of strata appear, dipping every where towards and passing under the nearest *Chalk* ranges.

Another learned Doctor, who claims, I believe, to be still "better educated," in the Wernerian subtilties, thinking perhaps (with an Edinburgh Professor, and Mr. B. P. M. xlii. p. 167) that the Section previously made across this district, formed principally on "Stage-coach observations," was utterly beneath the dignity of his *Geognosy*, and unworthy even of having its most obvious facts as above mentioned, attended to, or examined; when he returned two or three years ago from a southern *Geognostic Tour*, presented an account (as Mr. Webster is stated by Dr. T. to have done) representing, as I was informed, the strata in this denudated tract, whose places are really far below the *Chalk Strata* of its edges, as lying above the *Chalk*!! It was however then thought proper to strike this part of the Doctor's discoveries from his paper, before it was inserted in the *Geo. Tran.* vol. i.

A very striking feature of the south-eastern Denudation of England, and which my manuscript Section made in 1806, mentioned P. M. xlii. p. 167, was in a principal degree intended to show, is the rise of the strata from the vale of the Thames at London, southward, to a strata-ridge line, ranging nearly E and W, which crosses the London and Brighton Road at Hand-cross 35 Miles from London, and the contrary dip of the strata from this place to the Sea at Brighton; and also, that from the Thames the strata begin to rise again through Islington, from a strata-trough line, ranging along the vale of the Thames. In your xxxixth vol. p. 271 Note, I have mentioned, that some distance beyond Brighton, the strata rise again southward, from another strata-trough line, which ranges thence between the Isle of Wight and Portsmouth, and proceeds westward into Dorsetshire. Which last Trough in the English strata, I investigated to a certain degree, near Portsmouth, and made a Section, of which I circulated several manuscript copies in the spring of 1812; which showed, that the notion so often published, of the Isle of Wight having been forcibly rent off from Hampshire, and the channel between them occasioned by the fissure or chasm thereby opened, was entirely without foundation, and that the Isle of Wight, was on the contrary, a hummock or part remaining, of the ridge in the strata, south of the trough above mentioned; and that instead of a chasm the highest of the known British strata, in unbroken continuity, occupies the bed of the Channel and adjoining coasts of the Isle of Wight and Hampshire, as my other Section mentioned, had done with respect to the Thames Trough at London. In your last volume, p. 393, Mr. Webster appears to have given the names of "Isle of Wight Basin," and "London Basin," to these two Troughs in the strata, that I had previously ascertained, as above mentioned.

larger

[P. 182] larger than that part of the channel of the Sea which now occupies the denudation, (and rests partly on *under-strata to the Chalk*) is a very improbable supposition (see my Note on p. 185); and Mr. B. must not avail himself, in this case, of the existence of a vast series of strata *on the Chalk*, which supplied edges; (since "broken down" by the Channel) to retain the waters of his Lake, since *these upper strata*, are the very things *to be accounted for*, and for the formation of which alone, were the *Lakes* of the Paris Gentlemen and himself, invented; although "the assumption of imaginary facts in Geology, has a tendency to retard the progress of the science, more than any other cause." Mr. B. P. M. xl. p. 47.

183, l. 19, subsidence of mud*.—* Mud will not form *strata*, except perhaps of alluvial Clay or loam, but more probably, "*les marnes argillenses noires*," p. 336.

184, l. 16, osseous remains*.—* The fossil Bones of Gibraltar are found in *Caves* or fissures, partly filled with calcareous *Tufa*, near to the Tarfes, at the S end of the Gibraltar Rock, as I have been informed, see page 18, and M. Cuvier has stated.

185, l. 9 and 10, waters in the Baltic*.—* Here Mr. B. seems supposing, the northern edge of the Chalk, from Flamborough-head to Jutland, Zealand and Gothland, (P. M. xxxv. p. 131), to be entire, and to act as a partial or an entire dam, to a greater *Lake*, than that which I have objected to in my 2nd Note on p. 182, and here my objections will apply with greater force.

M. Meicrotto long preceded Mr. B. in the assumption of large *Lakes* in the north of Europe, see M. De Luc's Geo. Trav. in France, &c. i. 420.

l. 20 and 21, in Chalk differ †.—† The organic Remains, in a large proportion of nearly *all the strata* which contain them, *differ most obviously from each other*, Rep. i. 109; and I entertain no doubt, that when sufficiently minute and extended examinations and descriptions of the Reliquia are made (Mont. Mag. xxxiii. p. 514), that the *species* thereof will characterize the different *strata*, and even the different beds, in many strata, in a very satisfactory manner. Mr. Sowerby's work called "Mineral Conchology," of which five numbers are published (9 now), is deserving of every encouragement, towards this end, by those who have it in their power, to send him ample and perfect specimens of *fossil shells*, with their *exact localities*; and when it can be done, their *places in the strata also*: and when several sorts of shells are sent, to distinguish those which are found uppermost, and how far above each other in the strata, &c.

P. 186, l. 2 and 3, partial formations*.—* There seem no grounds for stating Chalk to be a *partial* formation, and very little, except the modern whims respecting *fresh-water Lakes* and Shells, for saying the same of any of its superincumbent *strata*, if the *imbedded masses* belonging to them, are properly distinguished, see my Notes on pages 168, 177, 182, &c.: *Gravel*, Mr. B. will remember, is always partial in its formation or distribution, and always uppermost.

187, l. 15, which protect them*.—* If vegetable *soil* was less liable to be acted on, and displaced by the elements than hard *rocks*, we might be more disposed to admit, that “the loftiest eminences” are by this means protected from being levelled;—where ever did a *whole mountain* suddenly fall down?, such are common-place, yet very unphilosophical assertions.

188, l. 5, deep ravines*.—* These and gullies, formed “in the sides” of mountains, are no proof that *their tops are lowering* or degrading, sensibly, by the action of the elements, any more than large blocks found at the foot of a mountain, prove the same thing; since such blocks will in general be found, on examination, either to have fallen from some cliff or steep place, near at hand, or to have been moved from some distant stratum; or, if much *rounded*, perhaps from the antipodes, as likely so, as from *the top* of any adjoining mountain, (as seems here assumed), and often, far more likely I think, when the completely different nature of the rounded blocks and the adjacent strata, is taken into the account.

l. 19 and 20, blocks of white quartz *lie*†.—† If the violence of the waves of the Atlantic ocean, acting on the rocks and shores of the west of Scotland, is unable to *throw down* the veins of Basalt, which there stand up like “immense walls of stone,” when the surrounding rocks are decomposed and *torn away*, p. 210; how has it happened, that harder and more compact veins, of white quartz, intersecting slate, on Beacon and other hills, in Charnwood Forest, are found levelled, and that blocks of it “*lie upon their summits?*” and how, if quartz veins were in any degree as numerous in these Rocks, as for a moment to be supposed, to have furnished the millions of rounded “white quartz pebbles spread over the midland counties,” has it happened, that dykes of quartz, nowhere appear *above the surface* in all this forest?; but on the contrary, that a smooth surface of Red Marl prevails, over all except a comparatively small part, occupied by Slate or Sienite peaks, or
cliffs

[P.188] cliffs of such, Rep. i. 182: and the quartz veins observable in the cliffs, are but very few, see p. 287. In short, *theory* seems here, and at top of page 191, wildly let loose, in search of "imaginary" causes, and effects also: see my Note on p. 285.

Mr. Allan, I observe, p. 192, of your last volume, considers the white Quartz masses on the surface of some parts of Cornwall, as derived from the decomposition of Veins, in Killas strata, which once existed on these spots. I beg to invite your Readers who may have the opportunity, to investigate the validity of this inference.

190. l. 15, an easy explanation †.—† The irregular sand pipes from Drigg in Cumberland, P. M. xl. p. 390, seem more evidently referable to *Lightning*, than any other Geological phenomenon that I have seen, and are no where noticed in Mr. B's volume, I believe:—when they first came into notice here, I was shown one of these Pipes (at No. 3, on the north side of Lincoln's-Inn fields) as an organized remain, petrified *Wood*, some said:—but I was not for an instant deceived. What relation is there between these Sand Pipes, and the *Osteocolla*, mentioned under that article in Dr. Rees's Cyclopædia?, from No. 39, of the Phil. Trans. &c.

192, l. 9, new mountains*.—* It in no degree appears, that the fanciful, rather than the *grand* "revolutions of the Globe," here contended for, are more necessary "in the œconomy of nature," than they are real;—Mountains more than Continents, do not grow old, and become less fit for the uses for which their bountiful Creator intended them, but the reverse of this: and though all the *living organized Beings*, which, in such myriads, people its surface, and have their different, but very limited periods of existence, and then their visible and material parts quickly loose their bond of connexion, and are fitted to form parts of other living Beings, in most cases, yet the *Mass of the Earth*, seems wisely fitted, to continue the theatre of these grand organic revolutions, with increasing happiness to the ever changing individuals (of the Human race in particular) to the most indefinite periods of time, if it should so please its almighty Author; and as we may perhaps reasonably conclude will be the case, from the recently demonstrated *facts of Astronomy*, from whence similar whims, regarding inherent causes of destruction and end, have been banished.

Although we can see no necessary cause of *end* to the duration of the *Earth*, we can plainly, by means of its imbedded organic remains in particular, perceive that it had a *beginning*, and reached its present state, by progressive and very

[P.192] very slow steps; patient investigation of the facts, and just reasonings upon them, such as the physical astronomers have persevering applied, in a century which is past, will certainly be rewarded with results in this science, of no ordinary interest to our Race, I venture to think, see my note on p. 328.

199, l. 6, unfavourable to vegetation*.—*Rep. ii. 185; and 447.

l. 25, the same purpose†.—†Rep. ii. 107, 409, and 412.

200, l. 19, worn by attrition*.—*Between the high mountains at the eastern end of the Caledonian Canal in Invernessshire, the largest quantity of alluvial Clay seems lodged, interspersed with a few huge Bolders, which I have perhaps any where seen¶ (see my Note on page 52): to me it seems probable, after conversing with Mr. Thomas Telford on the subject, as to the facts of these and other parts that I had not seen, that the immensely deep *Lakes* in the line of this Canal, may be parts of a valley or chasm, as deep as these *Lakes*, which once opened into the German Ocean, and that enough of this alluvium has since been lodged, not only to fill up the eastern end of this valley, to its present level, but even 100 or 150 feet higher, until a *subsequent excavation* therein, took place, and left a tablet of this Clay, skirting the mountains, to nearly the same level, for great distances, as monuments of its state at one period. The vast

¶ The alluvial *chalky* Clays of England, which I have mentioned, in Bedfordshire and other places, see my Note on p. 52, appear very liable to be mistaken by, and to mislead observers, who have not accurately studied the circumstances attending *stratification*, in the same school with the practical *sinkers* or the superintendants of Coal Pits, and other deep excavations (see my Note on p. 44); to which classes of Men the distinction is perfectly known, and evident (however difficult it may be to define the same, so as to instruct or even to draw the attention of *learned Geognosts*, to those distinctions): and the *alluvium of the surface*, whatever its thickness, or the technical or local Name by which it is distinguished (as Alluvium, Bareing, Callow, Clay [mixed], Clearing, Corn-soil, Cover, Corn-clay, Earth-cover, Gravel, Gingle, Keale, Loose-earth or soil, Ratchel, Ridding, Rock-cover, Rubbish, Rubble, Rommel, Sammel, Saud [mixed], Scale, Skerry, Soil, Ter, Till, Top-earth, &c. &c.) is perfectly known by them from the regular *strata* beneath these disturbed matters, of whatever kinds, or whatever Names such undisturbed matters may be known by, in the district (as Fast-country, earth, rock or soil, Measures, Metals, Mine, Regular-measures, Rock, Shelf, Strata, Undisturbed-ground, whole-ground, &c. &c.) And among these Men, the merest novice would be ashamed of making such blunders on this essential head, as have gravely been published to the world, as to red *Marl with Shells* in it, on Chellaston Hill, (see my Note on p. 176), *Chalk strata* in Huntingdonshire and Rutlandshire (note on p. 259), &c.

I strongly suspect, that what Mr. Webster in your last volume, page 325, calls the *Chalk Marl* (notwithstanding, that this name was already appropriated

[P.200] vast beds of Till, S of the Ochills (Wernerian Trans. i. 481) appear also, other instances to show, that the skirts of Mountains and mountainous countries, are less commonly, strewed with the worn fragments of *their own Rocks*, than seems here by Mr. B. and is very generally, assumed, by Geological writers.

201, l. 18, by other processes*.—* Why may not there be vast *regular strata of Sand*? I have met with nothing to contradict such a conclusion; but much to confirm it, see my Note on p. 60.

202, l. 10, classed with *alluvial* products*.—* Very few Breccias or Conglomerates, will perhaps, come into this Class, see my Notes on pages 44 and 50. In Anglesea, I have lately had the opportunity, rather unexpectedly, of seeing a conglomerate Mass or Rock, such as I had not previously noticed, in examining, what I conceive to be the same series of Strata, in the Great Forest of Brecon, and other parts of the edges of the great South-Wales Coal-basin or *Trough*, and of those of the Forest of Dean and of the Clee-Hills.

This Anglesea conglomerate I first observed, at the SW corner of a very poor common, called Rhos-mirch, $\frac{1}{4}$ m. NE of Llangefni Town, from which a new Road is about to be made, under Mr. Maughan, the Commissioner for the Inclosure, across this common. There is a quarry open in this Rock, from whence a Cottage has lately been built, just by it, and this stone is used also in several other Buildings SW.

priated to a stratum *below* the Chalk, Rep. i. 112), immediately *incumbent upon* Chalk, will turn out to be *alluvial Chalky Clay*, and *not any stratum*, underlying the red mottled Clay, as is stated, at the top of page 396.

In p. 482, the description is given, of a patch of alluvial chalky clay, resting on a detached hummock of hard Chalk and green Sand, in the Chalk-marl district, near Foxton, in Cambridgeshire, "situated to the west of the great range of Chalk;" and yet the writer would persuade us, that the numerous pieces of worn Chalk and Flints in this Clay patch were lodged there, by "an ancient current, the course of which was *from West to East*!"

It may perhaps be doubted, whether this Gentleman is possessed of the means of knowing certainly, the organic remains *older than the Chalk*, from other reliquia? or, that he can show, that no such shelly Limestone Strata, and Rocks of Greenstone, as he alludes to, occur in Europe, to the South-east of Cambridgeshire?—on failing in which showings, Mr. Smith's and my multiplied observations, as to the *removal of known alluvia from SE to NW*, will stand unaffected, by this pretended case to the contrary. This is a subject, which I believe Mr. Bakewell has overlooked, see my Note on page 52,

The

[P. 202] The principal masses in this conglomerate are quartz grains of very various sizes, variously intermixed with masses of white Chert, of Jasper, of Slate, &c. &c. It forms regular beds, dipping easily SE, and passing under the very regular black Marble Rock (in which there is a considerable Quarry and Lime-Kilns called Cwaise-bangor, about $\frac{1}{4}m.$ NNE) constituting the lower part of the Limestone floor or trough to the Coal-measures, mentioned in my note on p. 108. In general, where I had opportunities of examining this gritstone below the black Limestone Rock, it consisted of very variable coarse Grit-stone, but in other places, the same had a few masses of Jasper in it (as I had noticed in South-Wales), masses of Chert in others, and on the W side of Nant-heorva Quarry, $\frac{1}{2}m.$ SW of Llangefni, the masses of Chert are large, resting on coarse Slate, and seem to graduate or pass into Jasper, as they do also on the SW side of Graig-fawr Rock ENE of the Town. I much wish to call the attention of Geological observers, to the careful examination of this and other variable Rocks, as presenting matter of important consideration, on the formation of strata: Mr. Jameson's late opinions and mine, seem very nearly to coincide, as to their cotemporary formation.

l. 18 and 19, more properly to the vegetable†.—† Rep. i. 311, Mont. Mag. xxxiii. p. 515.

205, l. 16, on this coast*.—* Without doubt the ground has sunk, comparatively at least, on all the British Coasts, see *Encroachment* of the Sea in Dr. Rees's Cyclopædia, my 1st Letter, vol. xlii. p. 58, and Note on p. 11.

206, l. 3, than the Geologist*.—* No true theory of the Earth or system of Geology will ever be produced, which does not embrace a knowledge of "alluvial ground," so universally spread, equally or more intimate, than with all the "primitive and transition" countries in the World; because alluvium, besides being vastly more spread, indicates *later operations* on our Planet, and more within the reach of our investigations, than the *formation* of Mountains; the force of this remark Mr. B. may comprehend, from my Notes on pages 16, 175, 200, &c.

l. 12 and 13, and explained the principles†.—† In 1784, Dr. James Anderson clearly explained the general principles of draining Land (in his Essays, i. 150), more of these principles, indeed, than Mr. Joseph Elkington knew, in 1794 (Rep. ii. 363, and P. M. xli. p. 215)? Years before either of which periods, they were *practically known* to Mr. William Hart (Rep. ii. 371) and others, engaged extensively in draining, for Proprietors and Occupiers of Land in various

[P. 206] various parts of England. At length, after repeated attempts with Mr. E., had proved, that he could neither sufficiently explain, the already well known principles of Draining, or add any *new* one, as the too sanguine zeal of the President of the Board of Agriculture had imagined (see Communications to the Board, vol. i. pages lxi. and lxxvi.) and so persuaded the Legislature: in order to satisfy the condition annexed by the latter, to the *public Reward*, thus prematurely voted to Mr. E., the measure was adopted, of employing two or more young Men, to travel through the various districts in which Mr. E. had effected or attempted to make drainages, and from their own observations and study of the subject, and what they could draw from Mr. E. to furnish, in a degree at least, such a work on the subject, as the Legislature expected, as the result of the national liberality. Mr. *John Johnstone*, one of these young Men, very ably executed his task, and explained more fully than had previously been done, the principles and practices of this important art, in a Work prepared by him, but which is on almost all occasions (as in the present one by Mr. B. apparently) improperly ascribed to Mr. *Elkington*, Rep. ii. 372 Note.

[To be continued.]

XXVI. *Remarks on the geological Theory supported by JAMES SMITHSON, Esq. in his Paper on a saline Substance from Mount Vesuvius.* By J. A. DE LUC, Esq. F.R.S. &c. &c.

Windsor, January 1814.

SIRS,—IN the number of your Magazine for last December, which contains my paper addressed to you, “On a Phenomenon of Mount St. Michael in Cornwall,” I have found a paper under the title: “On a saline Substance from Mount Vesuvius, by James Smithson, Esq.” intended to support a new geological system, thus introduced at the beginning of the paper. “It has long appeared to me, that when the *earth* is considered with attention, *innumerable circumstances* are perceived, which cannot but lead to the conclusion, that it has been once in a state of *general conflagration*. The existence in the skies of planetary bodies, which seem actually *burning*, and the appearance of *original fire* on our globe, I have conceived to be mutually corroborative of each other; and at the same time when *no answer* could be given to the most essential objections to the hypothesis, the *mass of facts* in favour of it fully justified, I thought, the inference that our *habitation* is *an extinct comet or sun.*”

Such is the system: and we must now consider what is that