

1 foot long, 5 inches square, and 2 inches thick, and appears to have almost entirely filled up the pipe, retaining its square form throughout: the whole was deposited in the short space of from six to nine months.

The chemical composition, which is rather remarkable, is as follows:—

(Sp. gr. at 15·5 C., 3·646.)

	(1)	(2)
Sulphate of Baryta . . . . .	83·91	83·6
Ferric Oxide . . . . .	3·77	5·5
Carbonate of Lime . . . . .	9·46	8·2
Alumina . . . . .	traces	1·0
Water . . . . .	2·02	2·0
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	99·16	100·3

No. 1 was from the centre of the deposit, No. 2 from the outside. This analysis was made by a friend.

The only reference which I have been able to find with regard to the occurrence of sulphate of baryta in coal-pits is in a paper by Messrs. R. C. Clapham and T. Daghish, read before the British Association at Newcastle in 1863. It is there stated that Mr. Foster had found quite a large mass: Dr. Richardson also had observed it in the waters of Walker Colliery.—Yours truly,

J. WALLACE YOUNG.

GLASGOW.

#### DENUATION, UNCONFORMABILITY, AND THE VALE OF CLWYD.

*To the Editor of the GEOLOGICAL MAGAZINE.*

SIR,—Geological notions, like all others, occasionally swing pendulum-like from one extreme to the other. The old controversy between the respective importance of Fire and Water has not ceased; though, judging from the number of important results which are now attributed to its denuding power, Water is evidently in the ascendant. Believing myself that these results are rather over-estimated, I am induced to offer to your readers the following remarks.

A gap in the order of strata—as, for example, Carboniferous Limestone resting upon Lower Silurian rocks, or the Trias, as in the Vale of Clwyd, supposed to rest upon the Carboniferous Limestone—does not *necessarily* imply the denudation of the strata missing from between them; for it is possible to conceive that towards the close of the deposition (or indeed at any period during its deposition) of any group of strata, the deposit might, in any portion, or the whole of it, be raised above the sea-level, and so remain, while newer deposits were being formed around it; and so a *hiatus* in the order of the strata would be caused, which would be greater or less in proportion to the time the relative positions of sea and land remained unchanged.

Thus, suppose in any particular district the sea-bottom to have been elevated towards the close of the Lower Silurian period, and to have remained above the sea-level until the Old Red Sandstone was deposited, and then be again submerged, we should in that

district miss the whole of the Upper Silurian rocks; and the Old Red Sandstone and the Carboniferous Limestone would rest directly upon the Lower Silurian strata, just as it is seen to do on the west of Oswestry. Of course, the land so raised would become subject to the influence of the atmosphere and rain, and its outlines would become modified in proportion to the power of these agents and the extent of surface so exposed.

The thinness, too, of a 'Formation' at a given point does not *necessarily imply* a previous 'erosion' or denudation of the strata at that point. For it is but reasonable, and in accordance with what we know, to suppose that while the deposition of matter may be the same in character over an extended area, it may yet differ greatly at various points in the *rate* at which it is deposited, liable as the deposition is to be affected by currents, by the nature of the solids supplying the materials, by the presence and intensity, or otherwise, of sub-marine springs, &c. Thus, whilst over the large area supposed we should find beds similar in their general character, and occupying the same stratigraphical position, we should also find local variation as to colour, texture, and thickness.

It appears to me also, that Unconformability of strata does not *necessarily imply* a lengthened lapse of time, or a change in the mineral or organic constituents of the deposit. It is easy and reasonable, as it appears to me, to conceive that, during the formation of any deposit, the sea-bottom in any portion of it may be tilted up from a nearly horizontal to a highly inclined position, and the work of deposition go on again with scarcely any interruption; and thus we should have strata of the same age (geologically speaking) resting unconformably on each other, while, on the other hand, a much older 'formation' which had been elevated, as I have before supposed, and remained so, whilst newer deposits were forming about it, may again be depressed, and in such a position as that the new matter shall be deposited conformably to it.

It appears to me that no theory of Denudation or Unconformability is universally applicable, but both are liable to be affected by local and particular causes: hence the need of great and constant discrimination in all geological theorizing. To some of your readers these remarks may appear mere truisms; nevertheless I do think that they are too often forgotten. Thus, in the August Number of this Magazine, Mr. Maw argues from the supposed aggregate thinness of the Carboniferous Limestone near the head of the Vale of Clwyd, in favour of a great erosion of that formation prior to the deposition of the Trias; whereas, if the foregoing remarks are true, the supposed erosion is not necessarily consequent upon the thinness of the Limestone. And then we find no less an authority than Mr. Jukes, in his lecture at Birmingham before the British Association, assuming it as an axiom that where the Carboniferous Limestone is present, it was once covered by the Coal-measures. Here, again, your readers will see that while this might have been the case, and probably in some instances was so, it does not follow logically that any group of strata now exposed on the surface was once overlain by the group next in geological order. Though, singularly enough,

in the Vale of Clwyd, which has been singled out as an illustration of former denuding power, the edges of the Coal-measures (supposed to have been washed away) were observed cropping up on the western side of the vale, between the Limestone and Sandstone, when the Rhyl and Denbigh Railway was in course of construction; and then the *uppermost* beds of the Carboniferous Limestone, as developed in North Wales, are seen in the immediate vicinity of Mr. Maw's section; so that the supposed erosion could not have taken place. From the great similarity of the beds described by Mr. Maw as Permian, and those of the Millstone-grit near this town, I should not be surprised if the 'Purple Shales and Sandstones' of his section should be found to belong to that member of the Carboniferous series; though, from one or more causes, but not necessarily by Denudation or Erosion, they do not assume the massive proportions to which in other places they have attained.

Apologising for the length of this communication, I am, yours truly,

D. C. DAVIES.

OSWESTRY: *Sept.* 13, 1865.

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#### MISCELLANEOUS.

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SILVER PEAK is believed to be as pre-eminent over all silver-mountains, as the Iron Mountain of Missouri is superior to all other iron-deposits. It is situated east of San Francisco, on the eastern side of the Sierra Nevada, and nearly one degree south of the city of Austin. It is some two miles from Castle Mount, an old extinct crater, about 5,000 ft. above sea-level. Near Silver Peak is an extensive deposit of salt, and not far distant a hill of pure sulphur. The whole country has a naked appearance, being quite destitute of vegetation, and bristles with mountains scattered over a plain of great extent. The dreaded 'Valley of Death,' upon the plains of which, along the 'old Spanish trail,' travellers have suffered so much, lies but a short distance to the south-east of the crater of Silver Peak. Little Salt Lake, in Southern Utah, lies directly east of Silver Peak. At first the searchers after deposits of the precious metals confined themselves to the Pacific side of the Sierra Nevada; but discoveries in New Mexico, Arizona, and Virginia city induced a thorough examination of the east side of that range. This proved a great success, the most brilliant result of which is found in the neighbourhood of Austin, on the line of the great overland mail, where a city has sprung up within three years which, Senator Nye says, contains a population of 10,000. From along this line of exploration the miners are rapidly extending their operations, both north and south. Recently (within six months) they came upon this immense deposit near Castle Mount. Twelve exceedingly rich lodes, or 'ledges' as the miners call them, were discovered on that single mountain. This is believed to be the most valuable discovery yet developed. The specimens—a great number of which have been brought to New York by Colonel Catherwood—are certainly very remarkable, and are well worthy of attention. If there is no