

within.—Nothing more effectual could have been contrived with the same degree of simplicity.

The humid process of refining has however of late years been brought to such perfection, that it must finally drive the dry process off the field even in India, on account of its vastly superior economy. I have not space here to enter into any particulars of the new method of refining silver and gold by sulphuric acid, but I may remark that according to a recent publication on the subject by GAY LUSSAC, the refiners of Paris not only charge nothing for refining gold of low qualities, but actually pay a bonus to be allowed the job, returning to the proprietor all the silver contained in it, and paying themselves out of the copper alloy!

V.—*Notice of some Fossil Impressions occurring in the Transition Limestone of Kamaon. By Dr. J. McCLELLAND.*

The three accompanying figures, Pl. XXXV. figs. 1, 2, 3, are a representation of appearances observed in a schistose rock, which is composed of argillaceous clay and hornblende. They are interesting for two reasons; first, because they assist to determine the period at which the rock was formed which, but for the presence of these appearances, and a few indistinct traces of orthocera, would be referred to the primitive era; and secondly, because they appear to constitute a new species of fossil remains. I have only found them in the valley of the Ponar river, a small stream which rises in the mountains between Lohughat and Almorah. The bed of this stream is about 1500 feet above the sea, and is chiefly composed of the rock in which these remains are found. Lofty mountains ascend to the height of some two or three thousand feet on each side of the river: some of these are composed of primitive and others of transition rocks, and the latter are superimposed on the rock in which these fossils occur. During a hasty survey of the bed of this river, I found the impressions only in the smooth surface of water-worn masses, and from the great size and globular shape of the latter, I was unable to detach any of the fossils with the hammer, and am therefore deprived of the pleasure I should otherwise have had of transmitting a few specimens to the Society. The accompanying drawing was, however, sketched on the spot, and conveys a pretty accurate idea of the appearance of these fossils as they exist in the rock. They never occur straight, being always bent and distorted, and a great number are usually aggregated together in the same stone. The rings are detached and equidistant from each other, and are always about fourteen or fifteen in number,

Fossil Impressions in Transition Slate.

Fig. 1.

Fig. 2.

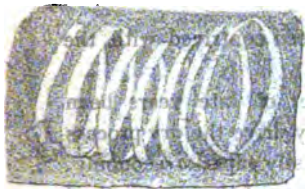
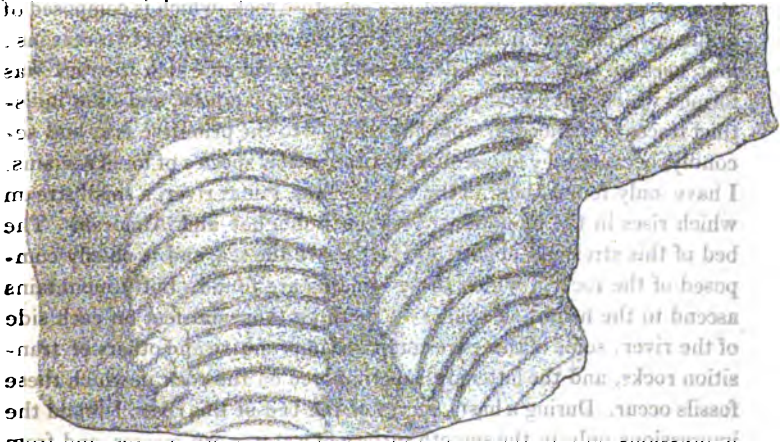


Fig. 3.



Fossil Impressions in Transition Limestone.

Fig. 4.



Fossil (?) Crawfish from Ramoo Island (see page 527)



Foot of a Land Tortoise, do.



Front

(full size)

Side



Native mode of refining Gold. (page 623)

except in such specimens as fig. 1 : these are probably only the remains of fragments, as they never consist of any fixed number of rings. We may refer these fossils perhaps to the Linnæan genus *Dentalium*, and the species may in that case be named *D. annulata*.

March, 1834.

The valley of the Ponar river, where the peculiar appearances represented in my notice of March are found, is so hot and unhealthy, that it is quite deserted at this season, and the path leading to it is so difficult that for eight or ten miles it must be travelled on foot ; a performance which an European could not accomplish with safety except in the cold weather.

This will account for my not being able to send you at present the specimens you require ; and whether I be permitted to remain in this neighbourhood long enough to be enabled to procure the specimens is somewhat uncertain.

These considerations induced me to make an effort to procure some of the fossils without delay ; and on receipt of yours of the 27th ultimo, I despatched a few natives to the spot, provided with such implements as I could procure for breaking rocks, and placed them under the direction of a person who was with me at the time I first observed the fossils.

The men have now returned unsuccessful in their attempts to break the rocks, containing the specimens for which they were sent.

Under these circumstances, it may be the most prudent way, before introducing a new, real, or supposed species, to inquire if the figures in question be really organic remains, or mere delineations formed by a peculiar arrangement of the distinct concretions of the rocks in which they are found. The consideration of this point is suggested partly by the remarks contained in your letter, and partly by a fragment of transition limestone, which has been brought to me containing ring-shaped delineations on its surface, which, if not quite similar to those represented in my former notice, are at least nearly allied to them. The accompanying drawing (fig. 4) is a faithful representation of the appearance on the limestone ; the stone from which it was taken is much at your service : it was brought from the spot in which the other specimens are found. They occur in great quantity, and pass progressively into those represented in my first notice, and both appear to be but the two extremes of the same thing*. They occur only in rocks of

* Since the above was written I have met with an extremely interesting paper on Belemnites in the Phil. Transactions, 1754, by Mr. BRANDER, to which a plate is attached, containing various figures. No. 16 bears a strong resemblance

the same age, whether these be slate or limestone. On the other hand, we know that mere delineations on the surface of particular rocks, differ with the constitution of the rock in which they occur, are uncertain as to size, and are without any fixed regularity in the proportion of the different parts to each other; proving them to be either the result of mechanical increment or of chemical attraction. Respecting organic fossils, CRONSTEDT says, "They are distinguished by an organic structure more or less imperfect, of which as long as they bear any marks we are to reckon them as fossils of a foreign* species." With respect to your remarks on the rings, I can only account for the part of the lower and upper portions being both visible, by supposing the bodies to which they belonged to have been soft enough to yield to lateral pressure, and to have been thus converted into superficial substances. Others again, as fig. 1, may have been exposed to compression, which acted longitudinally, so as to destroy their length, but preserve the lateral dimensions.

It is unnecessary to remark that this explanation would not apply to any univalve shell with a regular spire; and that of univalve shells without regular spires, *Dentalium* is the only genus to which these appearances can be referred. The generic character of *Dentalium* is, "shell awl-shaped, open at both ends." The rings are sufficiently characteristic to distinguish the species; but until we can procure good specimens, it is premature to be positive as to the place these fossils should occupy. I know the danger of touching fossil drawings without the specimens before one's eyes, and what shakes my confidence in the drawing attached to the former notice now is, that though it was accurately sketched from the specimens, yet it was finished from recollection only.

With respect to the drawing here attached, it is calculated to mislead as to the true nature of the fossils; were the figures complete, they would be found to be awl-shaped, the ends nearly equal in size, to fig. 3, except that the Ponar fossil appears to have been perforated in the centre, while Mr. B.'s figure is merely grooved by external striae, but in this respect, Mr. B. remarks, there is great variety—may not the Ponar fossil be a *Belleminite*, so worn and changed by the lapse of ages, as only to present the marks of former cells: the outer crusts being destroyed, and the traces of septa and appendix only remaining—but taking the aggregated form of the rings, and admitting them to have been a shell; it certainly would have agreed with the modern *Dentalium*; but if by that we imply also the nature of the animal which formerly occupied it, we then go too far in attempting to define so imperfect a trace of the organisation of a former world. In a chronological arrangement this fossil must take its place amongst the remains of the earliest created beings.

* "Foreign species," as here used, means foreign substance.

and apparently open; there is also an appearance something like a detached spire, but this I take to be nothing but the fore-shortening of the rings, such as is represented in fig. 1, but less perfect. I may add, that I have not seen the trace of a spire or a whorl in all these appearances. Orthocera are long, straight, tapering shells, characters not one of which answer to these remains. One of the figures in the accompanying drawing resembles a fragment of an orthoceratite, but were it more complete, it would be awl-shaped. Now as to the mineral composition of the fossil in transition slate, I found the rings to be composed of a fine siliceous sandstone. In the limestone they are incorporated with, and similarly constituted, as the rock itself, so that they would elude the character of fossils, were it not for their more perfect existence in the transition slate. Having pointed out these appearances to your notice, as well as the locality in which they occur, their nature may be further inquired into by others, should the term of my residence in this quarter deprive me of the opportunity.

May, 1834.

[Being rather sceptical as to the appearance of the under-surface of the rings represented in Dr. McCLELLAND's first notice, we mentioned our doubts to him, and were favored with the further explanation, dated in May, which by some accident was mislaid; and we were forced to repeat our request for a duplicate. The great distance will account for the delay which has unfortunately occurred in its appearance. We are not yet satisfied, however, that the impressions are truly of a fossil nature, and we doubt whether any geologist would venture from such indistinct traces to pronounce an opinion of the genus of the fossil.—ED.]

VI.—*Further notice of Influence of the Moon on Atmospheric Phenomena.* By the Rev. R. EVEREST, M. G. S. &c.

In my last paper, I urged the probability of the dew-points varying with the declination of the moon, and from that was naturally led to the conclusion that the rain-falls would vary in a similar manner. Having, therefore, obtained the Nautical Almanack for the year 1823, and having by me the register of rain-fall for the two months of August and September in that year, I made out a table for comparison, placing the rain-fall in one column, and the declination of the moon in an adjoining one beside it, and her semi-diameter in the next to that; on the other side, the days of the month in succession, and on the other side of them again, the declination of the sun. If we recollect that the latitude of Calcutta is about $22^{\circ} 23'$ N., we may see by this table that a greater proportion of rain falls when the declination of the moon (either north or south) is near about the same as the latitude of the place, and that the proportion lessens as