

Appendix to Paper on Holwell Cavern.

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Being desirous to try how far the transfer of carbonate of lime, from a piece of *limestone* upon a piece of *clay-slate*, under electric action, would succeed,—that is, whether the carbonate of lime so transferred, would appear in the form of *common* carbonate of lime upon the clay-slate, or of *arragonite*,—I made the following experiment. I placed a large glass funnel vertically in a wooden stand, filling it about one-fourth with a mixture of limestone and clay-slate coarsely powdered, and then pouring in water up to the brim. Underneath this I suspended a piece of clay-slate, some inches in length, on the middle of which the water from the funnel above was constantly dropping, keeping the greater portion of the suspended clay-slate continually wet. On one end of this wet slate I caused a piece of *limestone* to rest, connecting it by a platinum wire with the *positive* pole of a small and weak, but constant, voltaic battery. On the opposite end of the wet clay-slate, I caused another, but smaller piece of *clay-slate* to rest, connected by a platinum wire with the *negative* pole of the same battery. The electric action gradually drawing to the positive limestone a portion of the very minute quantity of mineral acid common to almost all waters not distilled, extracted slowly a part of the lime, which on well known principles was carried to the negative clay-slate, and is now depositing itself in the form of, *not*

common carbonate of lime, but of *groups of crystallized arragonite*, in starry concretions of prismatic needles, issuing from their respective centres. These crystals are formed upon the upper piece of negative slate in the greatest perfection, and are beginning to be formed upon the whole of the large piece of clay-slate which supports the limestone and slate that rest upon it ; and in the course of time, if the experiment be continued sufficiently long, will entirely cover it. This experiment was set in action August 14th, 1851, so that at present it has only continued for seven months and a half. I cannot explain *why arragonite* should make its appearance instead of some one of the numerous formations of common carbonate of lime ; but such is the fact, and it is perfectly explanatory of the growth of arragonite upon the clay-slate of Holwell Cavern. I should add that the droppings of the water from the funnel are caught by a pitcher standing underneath the suspended clay-slate, and daily returned into the funnel above.

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Broomfield, March, 1852.