

sometimes to originate indirectly from anhydrite by absorption of water. Here we must remember, as Von Cotta says, that "the supposed origin of gypsum from anhydrite leaves the greater difficulty unsolved of the original deposit of anhydrous sulphate of lime"*; and this rock we have here containing imbedded in it hydrated minerals, namely selenite and silicoborocalcite. The latter being in rounded nodules, may have been reduced to that form before being included; but the angular, lustrous, and transparent crystals of selenite cannot have been subject to action capable of so affecting a body originally angular as to render it a pebble. The nodules of hard silicoborocalcite are imbedded (so far as I observed—and I examined the accessible parts of some 300 tons of quarried rock piled in a low heap for shipment, and also saw the mineral *in situ*) exclusively in anhydrite, the soft exclusively in gypsum; there is an intermediate degree of hardness in the mineral found in a matrix composed of both these rocks. We might hence conclude that the soft results from the hard borate in consequence of physical changes accompanying the passage of anhydrite into gypsum: this is not impossible in some cases; but the gypsum holding the soft borate most abundantly is not only so much less pure a rock than the anhydrite holding the hard nodules that it could not have arisen by mere absorption of water, but there are frequently imbedded in it separate nodules of natroborocalcite, which I have never seen in anhydrite. As regards the passing of anhydrite into gypsum, what proofs are there of its ever occurring? Here we see alterations of these rocks below the surface: at Windsor, for example, large lenticular masses of anhydrite, from 2 to 10 feet thick in the centre and some 50 feet long, lie in the midst of gypsum brought to view by quarrying. In other places there are lofty cliffs composed largely of anhydrite on their surface: at Cape Canseau, for instance, I am told by Professor Lawson, the bluff, exposed to the wash of the ocean as well as the action of the atmosphere, is anhydrite, not gypsum. From a consideration of these circumstances, it appears to me that in sedimentary rocks even, where gypsum might be derived from anhydrite, but the converse is not probable, these minerals must sometimes have an independent origin. In the present case I think it must be so, because of the exclusive occurrence of the hard nodules of silicoborocalcite in anhydrite, and from the absence of natroborocalcite from this rock, while it occurs abundantly in the impure gypsum holding the soft silicoborocalcite with selenite. However these rocks and their borates may have originated, it is clear that as deposits they were contemporaneous.

* Rocks Classified, p. 292.