

mingled, instead of being, as he would have them, arranged in separate zones ?

I have said in my lecture that the first ocean waters would hold in solution salts of alumina and the heavy metals, all of which would be precipitated before the separation of carbonate of lime commenced. In such event, says Mr. Forbes "*geologists, though as yet unsuccessful in doing so, might still hope to find beds of alumina or of the metallic oxyds or carbonates alluded to, in the older strata. As no beds of such character are known to occur in nature,*" he regards my view with distrust. *Known* to Mr. Forbes ! Has he never heard of beds of emery, which are chiefly crystalline alumina, and which occur in the crystalline limestones of Asia Minor, and in the old crystalline schists of New England ? Is he ignorant that the beds of bauxite, so abundant in the Mediterranean basin, and used in the manufacture of aluminium, consist chiefly of hydrated alumina ? To console Mr. Forbes however, I will say that I believe these beds of emery and of bauxite to have been formed by secondary and subsequent reactions, and that we have nowhere exposed to view the first, deposited beds, which are everywhere destroyed or buried under more recent strata. When he remembers that the oldest known series of rocks, the Laurentian, consists of quartzites, limestones, and gneiss, evidently of sedimentary origin, and derived from still older sedimentary rocks, he will understand why he cannot hope to discover the first deposits of alumina or metallic oxyds. These, however, in most cases, have doubtless, by mechanical subdivision, or by solution, been subsequently diffused, and enter into the composition of later rocks.

In a note to this paragraph, Mr. Forbes inquires what became of the sulphurous acid of the early atmosphere ; as I have already told him, it doubtless became changed into sulphuric acid and passed into the sea. He then says "it may safely be asserted that there is fully as much (if not more) sulphur than chlorine" in nature, and that according to my hypothesis, the sea would become a solution of sulphate of soda. *Very safely asserted* indeed, since Mr. Forbes takes care to tell us that the sulphur in the form of dense metallic sulphids went to the centre of the earth, which I have shown, I think, good reasons for not believing. As it is, we have only to consider the quantities of sulphids and sulphates in the rocks and waters to see the absurdity of his remarks.

He next proceeds to discuss the theory of the origin of carbonate of lime. I have said that with the exception of that derived from the subærial decomposition of primitive calcareous silicates,