primary rocks, in immense masses below all other rocks, have in some situations, reproduced them in smaller masses, covering rocks belonging to the transition or secondary classes.

Granite, for instance, which has been regarded as the most ancient of all known rocks, has been sometimes found covering secondary rocks, and sometimes obtruded between them. Facts of this kind are rare, and can be explained only by admitting that granite, like volcanic rocks, has once been in a state of fusion, and was protruded in this state through the upper rocks. Similar facts are observed with respect to other primary rocks, which are believed to be of igneous formation.

Indeed, if the science were sufficiently advanced to enable us to pronounce, with absolute certainty, on the agents by which rocks were formed, a more intelligible arrangement might be substituted, than one founded on their relative ages; it might be comprised in three great divisions.

CLASS I. *Rocks of igneous Formation.*
CLASS II. *Rocks of aqueous Formation.*
CLASS III. *Conglomerates, and mechanical Formations.*

These would admit of distinct subdivisions :—

CLASS I. *a.* Rocks that have been fused and consolidated without ever having flowed as lavas.
b. Rocks that have been fused and protruded through the solid covering of the globe.
c. Rocks that have been greatly modified by heat, but which were originally aqueous depositions.
CLASS II. *a.* Marine formations.
b. Freshwater formations.
CLASS III. *a.* Ancient conglomerates.
b. Recent conglomerates.

Each of these divisions would comprise rocks of different relative ages; that of rocks of the first class would be determined by their position; those of the second and third classes by their order of succession, and the organic remains in each.*

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* Such an arrangement might be objected to, as resting too much on theory; and the fate of the Wernerian system ought to caution us against founding systems of classification on theoretical views respecting the formation of rocks. The following rocks, according to the evidence at present obtained, might be referred to the different divisions of the first class; and it may be useful to bear this in mind, without yielding implicit assent to the theory that they are all igneous formations; yet it must be allowed, that such a mode of formation will satisfactorily account for many positions in which these rocks occur, that appear inexplicable by any other theory.

Supposed igneous Rocks.—All varieties of granite, gneiss, and mica slate;—all varieties of porphyry and felspar rocks;—all varieties of hornblende rocks and serpentine;—all basaltic or trap rocks;—all ancient and recent lavas.

In subdivision *c*, slate rocks, clay-slate, and crystalline limestone, imbedded in igneous rocks.