

shown, that so far as aqueous action is concerned, the gain by fresh deposits, and the loss by denudation, must at each period have been equal (see above, p. 68): and in like manner, in the inferior portion of the earth's crust, the acquisition of new crystalline rocks, at each successive era, may merely have counterbalanced the loss sustained by the melting of materials previously consolidated. As to the relative antiquity of the crystalline foundations of the earth's crust, when compared to the fossiliferous and volcanic rocks which they support, I have already stated, in the first chapter, that to pronounce an opinion on this matter is as difficult as at once to decide which of the two, whether the foundations or superstructure of an ancient city built on wooden piles, may be the oldest. We have seen that, to answer this question, we must first be prepared to say whether the work of decay and restoration had gone on most rapidly above or below, whether the average duration of the piles has exceeded that of the stone buildings, or the contrary. So also in regard to the relative age of the superior and inferior portions of the earth's crust; we cannot hazard even a conjecture on this point, until we know whether, upon an average, the power of water above, or that of heat below, is most efficacious in giving new forms to solid matter.

After the observations which have now been made, the reader will perceive that the term primary must either be entirely renounced, or, if retained, must be differently defined, and not made to designate a set of crystalline rocks, some of which are already ascertained to be newer than all the secondary formations. In this work I shall follow most nearly the method proposed by Mr. Boué, who has called all *fossiliferous rocks* older than the secondary by the name of primary. To prevent confusion, I shall sometimes speak of these last as the *primary fossiliferous* formations, because the word primary has hitherto been most generally connected with the idea of a non-fossiliferous rock. Some geologists, to avoid misapprehension, have introduced the term Paleozoic for primary; from *παλαιον*, "ancient," and *ζωον*, "an organic being," still retaining the terms secondary and tertiary; Mr. Phillips, for the sake of uniformity, has proposed Mesozoic, for secondary, from *μεσος*, "middle," &c.; and Cainozoic, for tertiary, from *καινος*, "recent," &c.; but the terms primary, secondary, and tertiary are synonymous, and have the claim of priority in their favor.

If we can prove any plutonic, volcanic, or metamorphic rocks to be older than the secondary formations, such rocks will also be primary, according to this system. Mr. Boué, having with propriety excluded the metamorphic rocks, *as a class*, from the primary formations, proposed to call them all "crystalline schists."

As there are secondary fossiliferous strata, so we shall find that there are plutonic, volcanic, and metamorphic rocks of contemporaneous origin, which I shall also term secondary.

In the next chapter it will be shown that the strata above the chalk have been called tertiary. If, therefore, we discover any volcanic, plutonic, or metamorphic rocks, which have originated since the deposition of the chalk, these also will rank as tertiary formations.