These consolidated gravel beds are called conglomerates, breccias, or pudding-stones; we find them among the transition rocks, in the old red sandstone, in the millstone-grit and coal-grits, in the lower members of the new red sandstone, in the sand strata beneath the chalk, and in the gravel beds associated with the plastic clay, and interposed between the chalk and great London clay.

§ 7. From the occurrence of the marine remains lately noticed, occupying, as they do, rocks spread over two-thirds of the surface of every part of our continents which have been explored, and rising to the highest situations, even to the loftiest summits of the Pyrenees and still more elevated points on the Andes, it is an inevitable inference that the greater part of those continents have not only been covered by, but have been formed of materials collected beneath the bosom of the ocean; that we inhabit countries which we may truly call factas ex æquore terras. The great and fundamental problem, therefore, of theoretical geology is obviously to assign adequate causes for the change of level in this ocean which has permitted these masses which once formed the bottom of its channel to rise in hills and mountains above its waves. The causes which it is possible to imagine are reducible to two general classes; first, the decrease of the absolute quantity of water; this must have resulted from causes entirely chemical, namely, the decomposition of some portion of the water, its constituents entering into new forms of combination, and its fixation in the rocks formed beneath it; it is probable that these causes have operated to some degree, but it seems impossible to ascribe to them the very great difference of level for which we have to account. The second class of possible causes is entirely mechanical; those, namely, which may have produced a change of relative level without any diminution of absolute quantity in the waters. The causes of this kind which have been proposed, are, first, the absorption of the waters into a supposed central cavity, but the now ascertained density of the earth (being greater than that which would result from an entirely solid sphere of equal magnitude of the most compact known rock) renders the existence of any such cavity very doubtful; secondly, a writer in the Journal of the Royal Institution, vol. 2. has proposed the very ingenious hypothesis that a change of temperature of a few degrees will, from the unequal expansibility of the materials of land and water sufficiently account for this change of level; thirdly, it has been ascribed to violent convulsions which have either heaved up the present continents, or, which amounts to the same thing (as the same relative change must have taken place in either view), depressed the present channel of the