

the greenstone which is intermixed with the soft sandstones and shales of the coal formation has hardened these beds at the surfaces of contact so as to convert them into a kind of jasper, which takes a good polish. Under Stirling Castle, in Teesdale, on the flanks of the Caradoc, by the Plas Newydd dykes on the Menai, and indeed generally where the rocks of igneous origin appear in great masses, this effect of consolidating the stratified rocks is conspicuous, and leads to important reflections concerning the changes which, on a greater scale, the whole series of stratified rocks may have undergone.

The induration of the strata is an effect quite distinct from their deposition, and appears to require the supposition of long continued application of heat. In surveying the different systems of strata in succession, we readily perceive that, independent of the local influence of particular masses of igneous rocks, whose influence extends only a few yards at most from their bounding surfaces, the formations of different ages are unequally indurated,—the oldest being by far the most consolidated, while the newest appear but little harder than the analogous deposits which at this day are known to be produced in freshwater lakes, at the mouths of rivers, on the sea coast, or on the bed of the ocean.

This may be satisfactorily proved by a short comparison of the three principal varieties of stratified rocks, viz. arenaceous, argillaceous, and calcareous beds. In the tertiary series loose sands not only occur, but, in fact, constitute a large part of the whole series in Europe; for the sandstones of Fontainbleau, and the “grey-weathered” of the Wiltshire downs, and the molasse of Switzerland, seem only exceptions to the general rule. Clays abound under London, in Hampshire, and the sub-Apennine hills; and even the limestones, as the stony crag of England, the Leitha kalk of Transylvania, and the calcaire grossier of Paris, have a softness and looseness of texture not common in strata below the chalk. (Some freshwater beds in the Cantal, and near Weimar, are hard.)