be older than the oldest formations which overlie them. If in one region of the globe they appear from under Cretaceous, in another below Carboniferous, in a third below Silurian strata, their chronology is not more accurately definable from this relation than by saying they are respectively pre-Cretaceous, pre-Carboniferous, and pre-Silurian. They may all of course belong to the same period; but where they occur in detached and distant areas, there is as yet no method whereby their synchronism can be proved. To assert it is an assumption which, though in many cases irresistible, ought not to be received with the confidence of an established truth in geology.

In the investigation of the problem of the crystalline schists, much assistance may be derived from a study of the localities where a crystalline and foliated structure has been superinduced upon ordinary sedimentary and eruptive rocks —where, in fact, these rocks have actually been changed into schists, and where the gradation between their unaltered and their altered condition can be clearly traced. In recent years so much attention has been given to these transformations that our knowledge of metamorphic processes has been greatly extended, and the problem of regional metamorphism, though by no means entirely solved, is at least much more clearly understood than it has ever been before.

There is now a general agreement among geologists that a fundamental condition for the production of extensive mineralogical alteration of rocks has been disturbance of the terrestrial crust, involving the intense compression, crushing, fracturing, and stretching of masses of rock. Compression, as we have seen, may give rise to slaty cleavage (p. 532). But the same kind of force has re-