

most remarkable instance of this metamorphism is the Carrara marble, a non-fossiliferous limestone of the Oolite series, which has been altered and the fossils destroyed; so that the marble of these celebrated quarries, once supposed to have been formed before the creation of organic beings, is now shown to be an altered limestone of the Oolitic period, and the underlying crystalline schists are sandstones and shales of secondary age modified by plutonic action.

The action of basalt upon limestone is observable at Villeneuve de Berg, in Auvergne; but still more in the neighbourhood of Belfast, where we may see the Chalk changed into saccharoid limestone near to its contact with the Trap. Sometimes the metamorphism extends many feet from the point of contact; nay, more than that, some zeolites and other minerals seem to be developed in the crystallised limestone.

When sandstone is found in contact with trappean rock, it presents unequivocal traces of metamorphism; it loses its reddish colour and becomes white, grey, green, or black; parallel veins may be detected which give it a jaspideous structure; it separates into prisms perpendicular to the walls of the injected veins, when it assumes a brilliant and vitreous lustre. Sometimes it is even also found penetrated by zeolites, a family of minerals which melt before the blowpipe with considerable ebullition. The mottled sandstones of Germany, which are traversed by veins of basalt, often exhibit metamorphism, particularly at Wildenstern, in Würtemberg.

Argillaceous rocks, like all others, are subject to metamorphism when they come in contact with eruptive trappean rocks. In these circumstances they change colour and assume a varied or prismatic structure; at the same time their hardness increases, and they become lithoidal or stony in structure. They may also become cellular—form zeolites in their cavities with foliated carbonate of lime, as well as minerals which commonly occur in amygdaloid. Sometimes even the fissures are coated by the metallic minerals, and the other minerals which accompany them in their metalliferous beds. Generally they lose a part of their water and of their carbonic acid. In other circumstances they combine with oxide of iron and the alkalies. This has been asserted, for example, at Essey, in the department of the Meurthe, where a very argillaceous sandstone is found, charged with jasper porcellanite, near to the junction of the rock with a vein of basalt.

Hitherto we have spoken only of the metamorphosis the result of volcanic action. A few words will suffice to acquaint the reader with the metamorphism exercised by the porphyries and granites. By contact with granite, we find coal changed into anthracite or graphite.