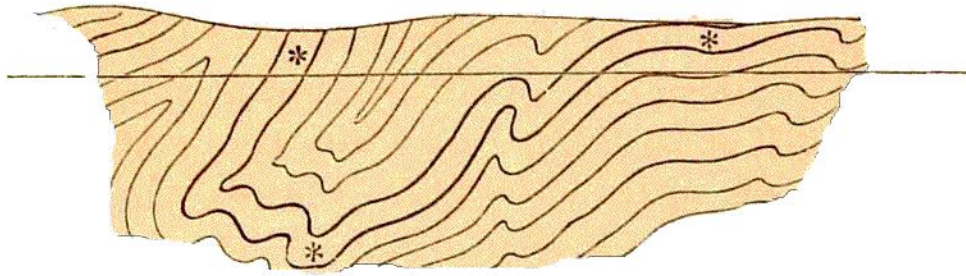


ently capriciously eats its way towards the surface by the hydrothermal fusion or alteration of parts of the earth's crust, in a manner not immediately connected with the more superficial phenomena of volcanic action

FIG. 12.



—and for this, among other reasons, it may happen that strata which are contorted, have in places been brought within the direct and powerful influence of great internal heat. Under some such circumstances, we can easily understand how stratified rocks may have been so highly heated that they were actually softened; and most rocks being moist (because water that falls upon the surface often percolates to unknown depths), chemical actions were set going, resulting in a re-arrangement of the substances which composed the sedimentary rock. Thus certain strata, essentially composed of silica and silicates of alumina, and alkalis such as soda and potash, may have become changed into crystalline gneiss.

This theory of re-arrangement leads me to another question—connected with, but not quite essential to my argument, as far as relates to physical geography—viz., What is the origin of granite, which in most manuals is only classed as an igneous rock? For my part, with some other geologists, I believe that in one sense it is an igneous rock—that is to say, much of it has often been completely fused. But in another sense