

The geologist may also gather some information concerning the circumstances under which a deposit was formed from the mineralogical structure of the bed itself. Gravel must be the effect of an impetuous motion of water; it consists of fragments broken from rocks *in situ*: some of these are rounded, which could only be occasioned by the rolling motion given to them by the fluid, and we may therefore always connect an aqueous cause with the existence of a pebble. In these gravel beds we find the fossils which characterize sedimentary rocks blended together, and hence we know that the force which produced them must have acted upon an extensive tract of country. When beds of clay and limestone are found, the observer has evidence of a more gentle, though, in all probability, a more continued action of water, whether of rivers or of springs.

4. Some geologists have imagined that they could deduce, from the character of the animal and vegetable remains found in rocks, a change of superficial temperature. The plants that are found in the coal measures, even in those of our own country, are of a tropical character, and must have grown in countries that possessed a temperature nothing inferior to that of the equatorial regions. There are two hypotheses by which their presence in cold northern climes may be accounted for; either they were drifted by the sea to their present places, which might happen without destroying their texture, supposing them to have been under the pressure of a considerable body of water; or they grew in the countries where they are now found. In the same manner we may suppose the animals, whose remains are found in rocks, to have lived near the places where their remains are imbedded, or to have been transported by causes posterior to that which destroyed life. There is one objection that stands in the way of the former supposition; for if we acknowledge that animals and vegetables lived near to those spots in which their remains have been discovered, it is scarcely possible to avoid the conclusion, that at some former period there must have been an equality of temperature over a large portion of the earth, a supposition that is not consistent with physical principles.

5. From the presence of marine animals in stratified rocks, we may deduce that the dry land must at some former period have been covered by the sea, and that the bed of the ocean must have been more than once elevated by some great con-