



dish shale, containing peculiar organic remains. A glance at the section will show that each of the formations 2, 3, 4, are repeated thrice at the surface, twice with a southerly, and once with a northerly inclination or *dip*, and the beds in No. 1, which are nearly horizontal, are still brought up twice by a slight curvature to the surface, once on each side of A. Beginning at the northwest extremity, the tile-stones and conglomerates No. 4 and No. 3 are vertical, and they generally form a ridge parallel to the southern skirts of the Grampians. The superior strata Nos. 2 and 1 become less and less inclined on descending to the valley of Strathmore, where the strata, having a concave bend, are said by geologists to lie in a "trough" or "basin." Through the centre of this valley runs an imaginary line A, called technically a "synclinal line," where the beds, which are tilted in opposite directions, may be supposed to meet. It is most important for the observer to mark such lines, for he will perceive by the diagram, that in travelling from the north to the centre of the basin, he is always passing from older to newer beds; whereas, after crossing the line A, and pursuing his course in the same southerly direction, he is continually leaving the newer, and advancing upon older strata. All the deposits which he had before examined begin then to recur in reversed order, until he arrives at the central axis of the Sidlaw hills, where the strata are seen to form an arch or *saddle*, having

an *anticlinal* line B, in the centre. On passing this line, and continuing towards the S. E., the formations 4, 3, and 2, are again repeated, in the same relative order of superposition, but with a southerly dip. At Whitness (see diagram) it will be seen that the inclined strata are covered by a newer deposit, *a*, in horizontal beds. These are composed of red conglomerate and sand, and are newer than any of the groups, 1, 2, 3, 4, before described, and rest *unconformably* upon strata of the sandstone group, No. 2.

An example of curved strata, in which the bends or convolutions of the rock are sharper and far more numerous within an equal space, has been well described by Sir James Hall.* It occurs near St. Abb's Head,

* Edin. Trans. vol. vii. pl. 3.