

bearing. The angle at which the stratum rises above the horizontal line or level is called the *Inclination*. Suppose the western edge of the pasteboard plane is raised above the table, forming with it an angle of thirty degrees; then, we say the direction of the stratum is north and south, its dip east, its rise of course west, and its angle of inclination thirty degrees. Simple as this appears, geologists of considerable eminence have made the most palpable mistakes, in defining stratification. It has been said correctly, that, the line of dip being, always, at right angles to the direction or line of bearing, when the dip is given, the direction is known: but when it is further said, that, if the direction is given, the line of dip is given also, the assertion is erroneous; for let the above plane of pasteboard be again laid flat upon the table in the same direction, due north and south; and instead of tilting up the western edge, if we tilt up the eastern we shall then have the same line of bearing as in the first instance, but the dip will be west instead of east.

It sometimes happens that a stratum, without varying its direction, may be so bent as to dip two ways in the same mountain, like the sloping sides of the roof of a church, or the letter V reversed (A). (See Plate I. fig. 2. stratum 4. and 5.) Place the two planes of pasteboard in a north and south direction, and raise them so as to make the upper edges meet; we shall then have the line of bearing north and south as before and the dip east on one side and west on the other. The limestone strata at Dudley Castle Hill dip on each side of the hill as above described. (See Plate III. fig. 4. B.) When strata are bent on each side of a mountain, without being broken at the top, they are called saddle-shaped. A line traced on the surface of a country, to designate where the strata dip in opposite directions, has been called the *anticlinal* line, and should be introduced in all geological maps, when it can be conveniently ascertained.

Whatever may be the inclination of a stratum, its true thickness is measured by a line perpendicular to the upper and under surface.

If we take a number of similar planes of pasteboard of different colours, and lay the undermost a little inclined, and place another plane upon it, with the upper edge about an inch or more distant from that of the under stratum, and again lay the others in succession in the same manner; the uncovered ends of the planes will rise from under each other, like a number of slices of bread laid on a plate. These uncovered edges will represent the outcrop or crop of the strata, and it will be perceived how we may obtain a knowledge of an under stratum without sinking or boring, merely by crossing a country in the line of the rise or dip of the strata. When strata are arranged in this manner, they are said to be in a conformable position. (Plate I. fig. 1.) It will naturally be enquired whether the strata absolutely terminate where we find their outcrop. In some instances this is the case; but frequently the strata are bent or