

is supposed, that the area now occupied by the Hastings sand (No. 6) was once covered by the Weald clay (No. 5), and this again by the Greensand (No. 4), and this by the Gault (No. 3); and, lastly, that the Chalk (No. 2) extended originally over the whole space between the North and the South Downs. This theory will be better understood by consulting the annexed diagram (fig. 321), where the dark lines represent what now remains, and the fainter ones those portions of rock which are believed to have been carried away.

At each end of the diagram the tertiary strata (No. 1) are exhibited reposing on the chalk. In the middle are seen the Hastings sands (No. 6.) forming an anticlinal axis, on each side of which the other formations are arranged with an opposite dip. It has been necessary, however, in order to give a clear view of the different formations, to exaggerate the proportional height of each in comparison to its horizontal extent: and a true scale is therefore subjoined in another diagram (fig. 322), in order to correct the erroneous impression which might otherwise be made on the reader's mind. In this section the distance between the North and South Downs is represented to exceed forty miles; for the Valley of the Weald is here intersected in its longest diameter, in the direction of a line between Lewes and Maidstone.

Through the central portion, then, of the district supposed to be denuded runs a great anticlinal line, having a direction nearly east and west, on both sides of which the beds 5, 4, 3, and 2, crop out in succession. But, although, for the sake of rendering the physical structure of this region more intelligible, the central line of elevation has alone been introduced, as in the diagrams of Smith, Mantell, Conybeare, and others, geologists have always been well aware that numerous minor lines of dislocation and flexure run parallel to the great central axis.

In the central area of the Hastings sand the strata have undergone the greatest displacement; one fault being known, where the vertical shift of a bed of calcareous grit is no less than 60 fathoms.* Much of the picturesque scenery of this district arises from the depth of the narrow valleys and ridges to which the sharp bends and fractures of the strata have given rise; but it is also in part to be attributed to the excavating power exerted by water, especially on the interstratified argillaceous beds.

Besides the series of longitudinal valleys and ridges in the Weald, there are valleys which run in a transverse direction, passing through the chalk to the basin of the Thames on the one side, and to the English Channel on the other. In this manner the chain of the North Downs is broken by the rivers Wey, Mole, Darent, Medway, and Stour; the South Downs by the Arun, Adur, Ouse, and Cuckmere.† If these transverse hollows could be filled up, all the rivers, observes Dr. Conybeare, would be forced to take an easterly course, and to empty themselves into the sea by Romney Marsh and Pevensey Levels.‡

* Fitton, *Geol. of Hastings*, p. 55.

† Conybeare, *Outlines of Geol.* p. 81.