range; (3) the axis is usually nearly straight, but sometimes bends around through a large arc; (4) instead of one flexure for the range, or parallel flexures of like length, there is generally a succession along the mountain region, one rising near where another ends, making overlapping series. There is *no crumpling* of the beds, and no long intervals of horizontal beds alternating with the flexed. Some single flexures are 80 to 100 miles long; and they vary in span from one mile or so to 20 or more. In the finer kinds of rocks flexures occur of a few inches or less, which are like wrinkles on the great rock-sheets.

(5) The flexures have rarely the ridge line horizontal; and, in adjoining flexures it often inclines in opposite directions, this being a mechanical effect in the process of warping.

Further (6), the axial plane of a flexure is seldom vertical, the opposite slopes, in a transverse section, being unlike; hence the flexures are mostly *unsymmetrical*, even when not overthrust flexures (page 103). Again (7), the flexures have the steeper side generally facing *northwest, away* from the Atlantic Ocean; at the same time they are by far the most numerous and close-pressed, and most generally overthrust, in the *eastern* part of the range, or the side *toward* the ocean. The mountains have consequently a *front-and-rear structure*, the front side facing the ocean.

This flexing of rocks to such depths appears less incredible when it is noted (*a*) that the strata so treated were generally those of sedimentary formations; (*b*) that they were, for the most part, only partially consolidated, the limestones excepted; (*c*) that all the rocks contained much moisture, and had their cohesion diminished thereby; (*d*) that as the movement proceeded, heat was being generated by friction, which, if low in degree, made siliceous solutions that would diminish friction by the dissolving action, and, if high, produced superheated vapor and a general softening of the flexing masses.

Again (8), great upthrust *faults*, with displacements 10,000 to 20,000 feet or more, exist in the region of flexed rocks, and especially where the flexures are overthrust and close pressed; and they are sometimes, if not generally, flexure-faults, with the thrust westward along the flank plane of the overthrust flexure. Professors W. B. and H. D. Rogers, in their admirable paper on the Appalachians, observe that "the passage of an inverted fold into a fault is of common occurrence," and that some flexure-faults have, "in southwestern Virginia, a length of about 100 miles." They always occur on the northwest side of the flexure, as in the following figures taken from two of their sections; and they begin, say these authors, with the thinning, or "disappearance of one or more of the groups of softened strata lying immediately to the northwest of the more massive beds." "The dislocation increases as it is followed along, until finally the lower beds (II) of the Lower Silurian are found resting directly on rocks of the Carboniferous series (X, XI)." These two sections are from the same fault, the first near its place of beginning, and the second, where the