

Nearest the oceans the inverted anticlinals alone are found ; but gradually becoming less inclined, till the normal, and finally the symmetrical flexures are reached. Fig. 19 shows a natural section of the rocks across the Alleghany range in the eastern part of the United States, exhibiting this succession of flexures. In Pennsylvania the folded and normal curves appear ; west of which are the symmetrical flexures of the Upper Palæozoic rocks of Ohio. For the discovery of this beautiful series of curves the world is indebted to Professors H. D. and W. B. Rogers.

As the strata are elevated to form these curves, igneous matters would fill the vacancies beneath the arches, and thus assist in the process both by sustaining the strata and by increasing their pliability through the transmission of heat. The Professors Rogers, in accounting for these flexures, admit a degree of lateral action, but argue that this action proceeded from the propelling force or thrust of moving waves of igneous matter, or the natural undulations of the liquid interior.

3. FISSURES AND DISPLACEMENTS OF THE CRUST.

Fissures in the crust of the earth are produced by the unequal contraction of its different parts—the weight of one portion being too great to be sustained by other portions of the crust ; hence there will be a forcible rupture of the strata, and the layers, once continuous, may be displaced, sometimes hundreds of feet. The direction of the fissures may coincide with the tendency of the rocks to cleave in a general northeasterly or northwesterly direction, or be modified by the size and relative positions of large areas contracting unequally.

Many of the fissures thus produced may be arranged in systems of uninterrupted or parallel lines instead of single lines of great length. Sometimes these lines, or systems of lines, are curved. Fissures often occur along anticlinal or synclinal lines, as in Fig. 40, because the rocks are weakest along these axes.

4. ESCAPE OF HEAT AND MELTED MATTER THROUGH FISSURES.

Dykes are eruptions of melted matter filling up fissures ; their injection is an *effect*, not a cause of displacement.

Like the fissures, dykes are arranged in systems, either linear or curved. It is an interesting fact that these systems correspond