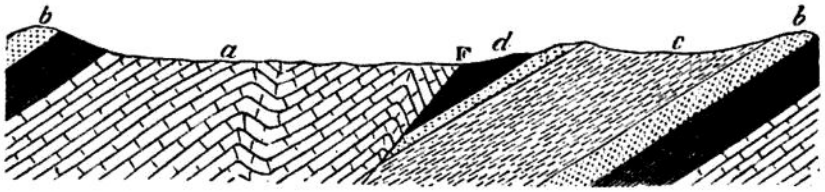
the fault F are coal-beds, on the other, one of the lower limestones of the geological series, which, by upthrust action, has been put on a level with the coal-formation. By the same forced movements, downward displacements or faults are sometimes made, and these have been distinguished

111.



Section of the Paleozoic formations of the Appalachians, in southern Virginia, between Walkers Mountain and the Peak Hills (near Peak Creek Valley): F, fault; *a*, Lower Silurian limestone; *b*, Upper Silurian; *c*, Devonian; *d*, Subcarboniferous with coal-beds. Lesley.

from the gravity-made downthrow faults by using the term *downthrust* fault (E. A. Smith).

The following figures show that after erosion the same surface features may result from a downthrow (Fig. 112) along a vertical fracture and from

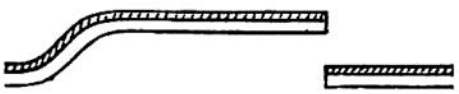
112. 113.

an upthrust (Fig. 113) along an oblique fracture; the dip of the fracture-plane is here about 25°.

Not unfrequently a flexure changes, in one direction or the other, into a fault, showing that the force causing the break first produced, as is natural, a bend. Many examples of such *flexure-faults* have been described by Major Powell, and later by others, from the plateaus of Colorado, where the absence of vegetation and soil affords unusual opportunities for observation on the positions and inside condition of strata. A bend (Fig. 114, from Powell) represents, ideally, the upper layer of a region of a low anticline in the eastern part of the Uinta Mountains. The bend in the part to the right shows that a fracture is begun; and in Fig. 115, which represents the same line of faulting, the actual displacement amounts to thousands of feet.

114.

115.



Flexure-fault. Powell, '76.

A succession of monoclines along faults produces, in the region of the Colorado plateaus, the features shown in Fig. 116, from Powell; and Fig. 117, from the same region, illustrates a section across a large fault having two branches.