

up and driven over younger rocks. The "grande faille du Midi," in the north of France and Belgium, by which the Devonian rocks have been pushed over the Carboniferous, is a well-known and remarkable example of this structure. In some cases so intense have been the mechanical movements, that extensive metamorphism has been induced by them. Along the thrust-planes in the northwest of Scotland, and for a long way above them, the rocks that have been pushed forward have undergone enormous shearing, new divisional planes have been developed in them, and they have become more or less schistose, the new minerals crystallizing along the shearing-surfaces approximately parallel to the thrust-planes.

Throw of Faults.—That normal faults are vertical displacements of parts of the earth's crust is most clearly shown when they traverse stratified rocks, for the regular lines of bedding and the originally flat position of these rocks afford a measure of the disturbance. In Fig. 264, the same series of strata occurs, on either side of each of the two faults, so that measurement of the amount of displacement is here obviously simple. The measurement is made from the truncated end of any given stratum vertically to the level of the opposite end of the same stratum on the other side of the fault. Where the fault is vertical, like that to the right in Fig. 264, the mere distance of the fractured ends from each other is the amount of displacement. In the case of an inclined fault, the level of the selected stratum is protracted across the fissure until a vertical from it will reach the level of the same bed, as shown by the dotted lines. The length of this vertical is the amount of vertical displacement, or the *throw* of the fault. The throw of faults varies from less than an inch to several thousand feet.