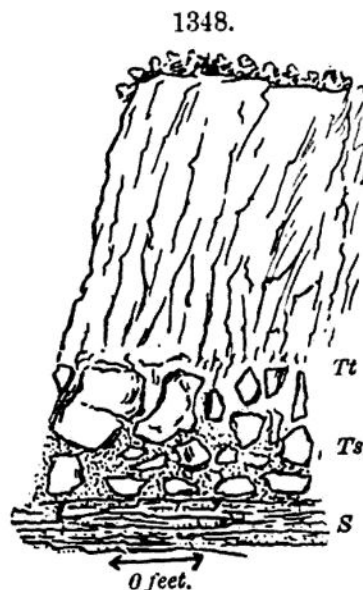


While the West Rock section, Fig. 1347, indicates, not only a great amount of abrasion, but also a shoving forward of the abraded material beyond or west of the place in view, that of the second trap belt east of the Saltonstall Ridge has the abraded material resting on the underlying sandstone in the form of rounded and angular stones of the trap and sandstone; the accumulation was evidently made, as Hovey states, by the friction between the liquid and solid rock.

B. K. Emerson reports that the trap sheet of northern Greenfield, Mass., where the bluff or trap faces westward (the dip being eastward), as shown in Fig. 1348, rests on a bed of coarse sandstone breccia, 12 to 16 feet thick, the upper part of which (*Tt*) is cemented by trap, which extends from above between the blocks, and the lower part, 6 or 8 feet thick (*Ts*), by red sand, which is continuous with the underlying sandstone. Moreover, the bed of trap breccia rests on unbaked sandstone. At a locality in the Mount Tom Ridge, in the town of Holyoke, the base of the trap, according to Emerson, is "kneaded full of dove-colored limestone," looking "as if the limestone and trap had been plastic at the same time"; and at one place, where the trap is about 300 feet thick, its "upper surface is filled in the same way with the same limestone to a depth of 8 or 10 feet." The limestone had been torn off from a layer not visible in the section; for, as he says, only sandstone is there in view, or was found in a boring carried down 3500 feet.

The large north-and-south belts of trap often have an attendant belt on the east or west side, or on both, which is generally made of hydrous and amygdaloidal trap, even when the trap of the large belt is of the normal anhydrous kind. Percival draws special attention to this feature. The Mount Tom Ridge is thus attended, as the map on page 801 shows, from the Meriden region northward; the line, which is low from denudation, is on the western side through the southern part of the Mount Tom Ridge, and on the eastern side for the more northern part. Saltonstall Ridge has a similar parallel belt to the east, and another to the west of it, only a few hundred yards distant, and each is perhaps of like relations to the "attendant" dike of the Mount Tom Ridge.

*The time of the eruptions and their relation to the upturning of the sandstone.*—The evidence is complete that eruptions of trap preceded, as held by Emerson and Davis, the deposition of part of the sandstone. The sandstone of East Haven, east of Saltonstall Ridge, contains stones of trap at many places, as described by E. O. Hovey, while none are known to occur



Trap bluff at Greenfield, Mass., with breccia of sandstone blocks (the part *Tt* cemented by trap, and *Ts* by sandstone) lying between it and the sandstone *S*. B. K. Emerson, '92.