

of these plains differed from the first or upland alluvium, by containing in it rounded fragments of various volcanic rocks, and often bones belonging to distinct groups of land animals which flourished in the country in succession.

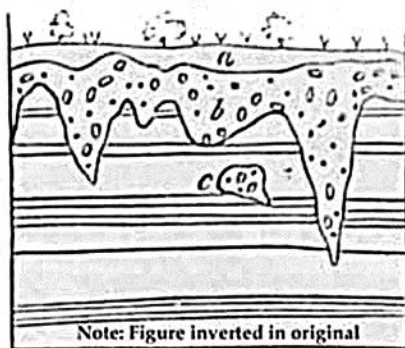
The annexed drawing will explain the different heights at which beds of lava and gravel, each distinct from the other in composition and age, are observed, some on the flat tops of hills, 700 or 800 feet high, others on the slope of the same hills, and the newest of all in the channel of the existing river where there is usually gravel alone, but in some cases a narrow stripe of solid lava sharing the bottom of the valley with the river. In all these accumulations of transported matter of different ages, the bones of extinct mammalia have been found belonging to assemblages of land quadrupeds which flourished in the country in succession, and which vary specifically, the one set from the other, in a greater or less degree, in proportion as the time which separated their entombment has been more or less protracted. The streams in the same district are still undermining their banks and grinding down into pebbles or sand, columns of basalt and fragments of granite and gneiss; but portions of the older alluviums, with the fossil remains belonging to them, are prevented from being mingled with the gravel of recent date by the cappings of lava before mentioned. But for the accidental interference, therefore, of this peculiar cause, all the alluviums might have passed so insensibly the one into the other, that those formed at the remotest era might have appeared of the same date as the newest, and the whole formation might have been regarded by some geologists as the result of one sudden and violent catastrophe.

In almost every country, the alluvium consists in its upper part of transported materials, but it often passes downwards into a mass of broken and angular fragments derived from the subjacent rock. To this mass the provincial name of "rubble," or "brash," is given in many parts of England. It may be referred to the weathering or disintegration of stone on the spot, the effects of air and water, sun, and frost, and chemical decomposition.

The inferior surface of alluvial deposits is often very irregular, conforming to all the inequalities of the fundamental rocks (fig. 100). Oc-

asionally, a small mass, as at *c*, appears detached, and as if included in the subjacent formation. Such isolated portions are usually sections of winding subterranean hollows filled up with alluvium. They may have been the courses of springs or subterranean streamlets, which have flowed through and enlarged natural rents; or, when on a small scale and in soft strata, they may be spaces which the roots of large trees have once occupied, gravel and sand having been introduced after their decay.

Fig. 100.



- a. Vegetable soil.      b. Alluvium.  
c. Mass of same, apparently detached.