A Topographic Result of the Alluvial Cone.

By A. H. Purdue.

An alluvial cone that is composed mainly of more or less finely comminuted material would not last long enough after the area covered by it ceases to be one of deposition to produce an enduring topographic feature. It would soon succumb to the agents of erosion and transportation. Even if composed of coarse material, its life might be short if the lithological character and climatic conditions were such as to bring rapid disintegration. But if the cone be composed mainly of coarse material that can withstand the weathering agencies, there is every reason to believe that it would have lasting topographic results.

In transverse section, alluvial cones are higher in the middle than on the borders next the escarpment, as shown in Fig. 1, so that the tendency

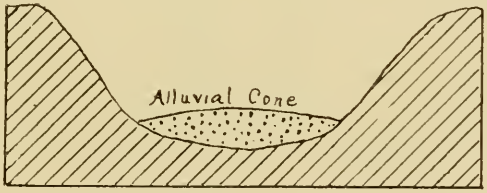

Fig. 1.

is for the streams which form them to shift either to the right or to the left, running along the base of the escarpment. If such a stream is not overloaded at this point, it becomes a cutting stream, and the profile, that

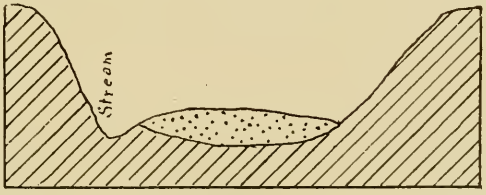

Fig. 2

shown in Fig. 2. Should the cone be formed immediately below the junction of two streams, as in Fig 3, both streams might shift, one to either

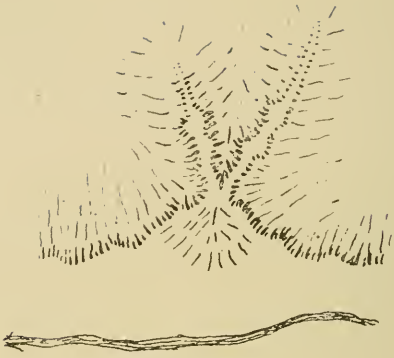

Fig. 3

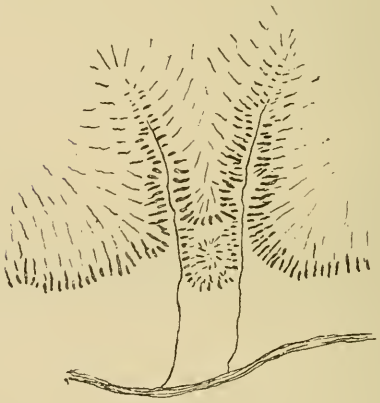

Fig. 4.

side, leaving the cone between them, as in Fig. 4, and with the profile as shown in Fig. 5. The writer has in mind a case of this kind, where the shifting has recently taken place.

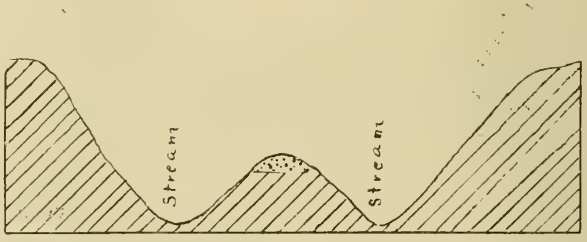

Fig. 5.

In the Boone chert region of northern Arkansas, there are many alluvial cones, composed almost entirely of fragmentary chert. This chert withstands weathering to a remarkable degree. It readily permits the rainfall to pass through it, thus preventing erosion, and forming an ideal protection for the underlying rocks.

Also, over this region, there are numerous knobs of the character shown in Fig. 6. These knobs are capped with fragmentary chert, resting upon the magnesian limestone that underlies the Boone chert. The sur-

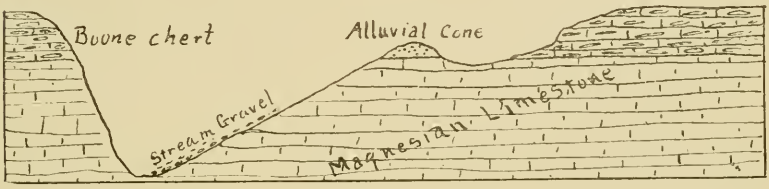

Fig. 6

rounding geography is that shown in Fig. 4. Nearly all the capping material is angular, but close search will often reveal water-worn pebbles.

The writer is of the opinion that the capping material is that of alluvial cones, and that the preservation of the rock beneath from erosion, is due to the protection afforded by the cones. Such knobs are sometimes 500 feet above the valleys beneath. The small number of water-worn pebbles is accounted for in the fact that the débris of the cones was transported but short distances, and there was not time for much rounding. Besides, the material is hard, and would wear slowly.

The material of these old cones must not be confounded with the gravel that is common in this region, and which occurs on the hill sides (see Fig. 6) often extending up to the height of 200 feet or more above the present stream level. This material, unlike that capping the knobs, is all water-worn, and was left on the inside curve of the streams as they shifted laterally.