tain needles; but much of the granite of the world easily crumbles under atmospheric influences, and makes the tamest of scenery. Slates standing on end often bristle slopes with projecting ledges, and rise into lofty needles that defy the elements, like the Matterhorn in the Alps; but other slates are fragile, and wear down into hills of gentle earth-covered slopes.

8. *Climatal effects.* — Climatal causes also have great effect on the work of rivers. A wet climate produces abundant vegetation, which is more or less a protection from wear; and in tropical regions it covers even precipices with ferns and other foliage. It also occasions rapid decay by the chemical and other weathering methods. Moreover, it sometimes makes deep, hard-working rivers, torrents that sweep away roughly, degrade rapidly and persistently and leave behind massive peaks, broad mountains, earth-covered slopes ribbed or belted by the more enduring beds, with gently swelling outlines over the lower slopes, and foliage almost everywhere.

A dry climate, on the contrary, as in the Colorado region, and that of Yellowstone Park, makes small streams or streamlets in the mountain valleys, many of which through much of the year are only threads of water, if not wholly dried up. They hence finish off with sharp and delicate outlines. All the variations of the beds in hardness are expressed in series of projecting edges beneath the broader shelves and entablatures. The jointed structure of the thick, durable beds adds much to the diversity of surface, instead of insuring the removal of the beds. The winds also aid with lighter finger.

In such regions, color from foliage may fail. But the dripping waters of the occasional rains, or the oozings through the steep mountain-sides, transfer to the surface the results of oxidations and deoxidations, and paint the walls with various delicate tints.

Even alternations of half-hardened clay-beds and sand-beds, under such conditions, as Colorado scenery illustrates, may be cut into groups of pinnacles, turrets, and columns finished with capitals and bases which will last indefinitely; for whatever the occasional supply of waters to the channels, it ends in reproducing the same features in the soft beds. Appalachian rains, as Powell says in his work on the Colorado Cañon (1875), would soon obliterate much of Colorado scenery. The excavation of the Colorado Cañon has been chiefly due to great floods; but the finishing work carried on within it has been of the gentler kind.

Transportation and Deposition.

Amount of material transported and deposited by rivers. — The *materials transported* by running waters are (1) stones, pebbles, sand, and clay or earth; (2) logs and leaves from the forests, and sometimes trees that have been torn up or dislodged by the current; (3) Mollusks and their dead shells, Worms, Insects, etc., attached to the logs or leaves; (4) occasionally larger