

therefore a shallow-water deposit, while the columnar basalt is three thousand five hundred feet thick. High cliffs of basaltic columns, like those exposed on the Hudson and Columbia rivers are often called palisades.

In some cases the uprising lavas have not been able to find their way to the surface. Either the fissures in which they started, from some unknown depth, never extended to the surface, or the streams lost their way and found themselves pent in the strata, and crowded in every direction in search of relief. In such case the lavas have sometimes insinuated themselves laterally between the strata to such extent as to separate the strata by a considerable interval, without being able to escape to the surface. The result is, a dome-like elevation of the surface, forming a peculiar type of mountains called *laccolites*—named and first described by Mr. G. K. Gilbert. In many cases, the arched strata become much fissured, and the lava sheets communicate quite freely with each other. Such *laccolites* exposed to the processes of erosion reveal the constitution of the interior. This subject is fully illustrated by Mr. Gilbert in his memoir on the Henry Mountains in eastern Utah.

River erosions of vast lava-sheets have resulted in many striking forms. As the most extensive sheets are the result of late geological action, they generally rest on incoherent materials—gravel and sand, as in Oregon and California. When the erosions of the streams have cut through the lava, and for some distance into the gravel, the less coherent nature of the latter causes an undermining of the lava-sheet. It thus projects like a table-top, beyond the gravel. When the erosion cuts the lava-sheet along parallel lines, it gives rise to the forms known as “table mountains.” These are common in the volcanic region of central France; and especially so in eastern California. In Butte county, the ancient drainage wore channels stretching westward from the upland of the Sierra. These were subsequently filled by outflows of lava. Then in modern times, a change of levels established drainage from north to south. The modern streams, therefore, have