completed by stream piracy and dismemberment of old streams. The presence of shale and limestone valleys between the resistant rock ridges has especially favored such processes. The changes which affect the streams of Lehigh County only can be considered here.

Williams offered an explanation of the change of course of the Lehigh River at Allentown. He believed that originally the Lehigh from Lehigh Gap flowed south or southeast until the vicinity of Allentown where it turned to the southwest, passed through Leibert’s Gap near Emmaus and continued to the Perkiomen Valley. He thought that a westward-flowing tributary existed along the north side of South Mountain from Freemansburg or beyond and joined the Lehigh in the Allentown region. Monocacy Creek is thought to have been a tributary of this stream and instead of its present course, it turned to the southwest in the north part of Bethlehem and crossed the present highest portion of West Bethlehem. This filled valley has been partially located by well borings. He supposed that a tributary of the Delaware River flowing past Glendon pushed its head westward until eventually it captured the Lehigh River at Allentown. This theory is worthy of examination, although it has not generally been accepted.

A deep deposit of sand and gravel a short distance east of the Lehigh & New England Railroad in East Allentown and a similar deposit along Prospect Avenue in West Bethlehem that is known to be 138 feet in depth, give some indication of a filled valley that may have been cut by the Lehigh River before the ice sheet invaded the region. Instead of the present course south of the East Allentown hill the river may have flowed on the north side in an almost east course from a short distance south of the present site of Fullerton to about the present mouth of Monocacy Creek.

In several other places in Lehigh County there are evidences of changes in some of the minor streams. It is a fascinating subject for investigation and should receive further consideration. Well borings and perhaps geophysical data may furnish additional information.

**Water Gaps and Wind Gaps**

A water gap is a short, narrow, steep-sided pass or gorge by which a stream cuts through a hard, resistant rock ridge. A wind gap is an abandoned water gap or notch in a ridge cut by a stream that was later diverted or captured. Examples of wind and water gaps are numerous throughout the folded Appalachians of Pennsylvania.

In Lehigh County the most prominent are the Lehigh water gap (pl. 11), through which Lehigh River flows, and the Lehigh Furnace wind gap, both cut in the resistant sandstones and conglomerates of Kittatinny (Blue) Mountain. In the south part of the county Leibert’s (Leipert) Creek cuts through South Mountain north of Vera Cruz, and Indian Creek through another ridge of crystalline rocks, to form two minor water gaps. Several notches in South Mountain might appropriately be designated as wind gaps. Different explanations, some highly fantastic, have been proposed to account for these phenomena.

---