along the south side of South Mountain a few miles southeast of Seidersville in Lehigh County, previously mentioned, is sufficiently great to account for the valley. With these facts it seems best to explain the structure as a syncline which has been profoundly faulted along the northern side of the valley.

The gap in South Mountain through which Saucon Creek leaves the valley and enters the Lehigh River is floored with limestones. The presence of Hardyston in its normal position overlying crystalline rocks at the eastern nose of the mountain at Northampton Heights suggests downward folding, whereas its absence at the western nose of the mountain south of Freemansburg indicates downward faulting. A recent boring just south of the gap along the Bethlehem-Hellertown road passed through Tomstown limestone to a depth of 659 feet without encountering the Hardyston. This break in South Mountain therefore appears to be due partly to a synclinal fold and partly to downward faulting.

The fairly flat-bottomed irregularly-shaped valley in which the hamlet of Lower Saucon is situated has long been a structural problem. The hardness of the water in some of the wells indicates that part of the valley is underlain by limestone, presumably Tomstown. The presence of the Hardyston on the lower slopes of the gneiss hills in places suggests a synclinal fold but its absence in other places must be explained by faulting. At no place are the sedimentary rocks found in place, so no dips and strikes are obtainable. It therefore appears that the valley is the result of a downward fold that has been complicated by several normal faults of different trend.

The minor structures in the Saucon Valley are varied and complex. One of these near the Lehigh Valley R. R. roundhouse, involving crystalline rocks and Tomstown limestone in a series of small thrusts, has been described on an earlier page.

PORTLAND SECTION

The area of Allentown, Beekmantown and Jacksonburg limestones in the vicinity of Portland is of considerable structural interest. It forms a wedge block bounded by faults on both sides. The fault on the north side bringing the Martinsburg in contact with the Allentown represents a greater displacement than the one on the south side that, near the river, cuts out only the upper part of the Jacksonburg, but becomes progressively greater to the west, where it likewise brings the Allentown and Martinsburg in contact.