tically nothing within thirty feet. Other beds have been noted in which great variations in thickness as well as lithologic characteristics of the beds take place in short distances. Sections of exposures mean little for this reason and exact correlation of strata is impossible except where the exposures are in close proximity. No key bed or horizon marker has been found in the entire formation. Black flint such as occurs in the Tomstown is well developed in certain localities.

**Mineralogical composition.**—The microscopic examination of the Allentown reveals little other than calcite, dolomite, quartz, sericite and carbonaceous matter with occasional crystals of pyrite. In a microscopic study of the insoluble residues made by B. Frank Buie and described in an unpublished thesis, other minerals were noted. He examined carefully the insoluble residues of eleven specimens of Allentown limestone from the Chapman quarry of the Bethlehem Steel Co. east of Bethlehem. Quartz was almost the only mineral recognized in those grains that failed to pass through a 200-mesh screen, but in the finer material he identified feldspar, zircon, tourmaline, rutile, cyanite, corundum, garnet, topaz, pyrite, galena and possibly fluorite. He regards the pyrite and galena as authigenic and the others as detrital. The following descriptions are quoted from Buie’s thesis.

**Quartz.** Quartz is the predominant species in the residues of all the samples of limestone studied. All the quartz observed was detrital, the grains varying from subangular to sub-rounded forms. The degree of rounding varies with the size of the grains, the larger grains being more rounded and the finer ones more angular. The size of the quartz grains commonly ranges from less than 0.02 mm. to about 0.5 mm. in diameter, though in some samples there is a very minor proportion of grains which are from 1 to 2 mm. in diameter. The grains exhibit a minutely pitted or “frosted” appearance, which is one of their outstanding characteristics when viewed with a microscope. This “frosting” is particularly well developed on the larger grains.

**Feldspar.** At least two varieties of feldspar are found in these residues, one being microcline and the other a calcic variety of plagioclase. Some of the microcline can be recognized by the characteristic twinning, and the index of refraction and extinction angles are helpful in deciding the variety of plagioclase present, but frequently the grains are decomposed to such an extent that definite determinations cannot be made. Accordingly, it is advisable to use the group term “feldspar” without attempt to differentiate into specific minerals.

Feldspar is the only mineral which has been found in any of the residues in a quantity comparable to that of quartz. A mount made of the light portion of the silt-size of one sample is composed almost entirely of feldspar. In that portion of the residue coarser than 200-mesh, however, quartz is practically the sole constituent, and for the whole residue, the quartz is several times more abundant than all other minerals combined. This particular sample of limestone was from a 3½-inch bed of dark, very finely crystalline stone, of which the insoluble residue constituted less than one per cent.

Some feldspar was found in the silt grade of all the residues studied. The grains are sub-rounded to sub-angular or irregular in shape. There