ART. XXV.—*Note on a Calcite-Prehnite Cement Rock in the Tuff of the Holyoke Range*; by B. K. EMERSON.

AT Lyman's Crossing, now abandoned, a mile north of Smith's Ferry, and just south of the river notch through the Holyoke Range, is a large cutting through the posterior trap sheet, exposing the upper surface and the superjacent tuff beds. The cementing material which holds the tuff fragments together at the base of the bed is quite peculiar. It looks like a felsite or a compact sedimentary limestone. It is clear gray with faint shade of green.

The small angular fragments of trap enclosed in this cement are often one to three inches apart, showing that it cannot be a simple secondary interstitial cement produced by a later infiltration. It contains here and there rounded or pear-shaped cavities, filled with coarse calcite, which seem to be certainly steam holes. Minute scales of graphite just visible to the eye are quite generally distributed and are slightly larger and more abundant where the cement rock borders against the trap. The scales are graphite and not molybdenite, since they float in Thoulet's solution.

Under the microscope the trap fragments are seen to be normal and to preserve their usual characters up to their borders.

The cement rock has a confused crystalline texture and large stationary black crosses appear everywhere over the surface. It is made up in about equal parts of calcite in shapeless areas with very irregular boundaries, and a colorless prehnite in coarse rudely radiating prisms and wheel-shaped forms which plainly cause the black crosses. A few blades of a pale brown biotite are present but may be secondary. Distinctly secondary are the angular fragments of acid plagioclase and microcline, which have a granitic aspect. The rock has sp. gr. = 2.86, which indicates that a little more than half its mass is prehnite, and the study of the section confirms this. The small crumpled graphite scales are also secondary, and must have come from west of the axis of the Green Mountains, twenty-five miles west, or from the Brinefield rusty schist area fifteen miles east. The brightly shining scales resemble those from the western area. The same graphite is found extensively in the adjoining sandstone. There is also a small amount of a primary albite deposited by the same waters from which the prehnite crystallized and having the same undulose extinction which characterizes the albites deposited by heated waters in the cavities in the trap.

The outburst of the tuff followed immediately on the outflow of the trap sheet and many of the scoriaceous bombs which first fell sank quite deeply into the latter and can be seen enclosed in compact trap as at the western pavilion in Mountain Park.

The cement rock formed at the base of the tuff in waters which were slightly contaminated by the materials of the sandstone, the graphite scales being especially far travelled because of their indestructibility and lightness. It increased to very considerable thickness between the trap fragments and crystallized so rapidly and in such high temperature that it enclosed pear-shaped steam holes like a scoria. After the temperature had fallen below the solution point of prehnite, these cavities were filled by calcite.

Amherst College, Mass.