the southwest is thought to be a normal fault with the limestone area
to the south dropped in relation to the pre-Cambrian belt. This fault,
too, may be vertical and the pre-Cambrian ridge be dominantly a nar-
row horst block. The displacement on the northwest side where gneiss
is in contact with Beekmantown limestone is much greater than on the
southeast side where the gneiss is in contact with the Tomstown.

The more normal east trend of the Camels Hump end of the ridge
in variance with the northeast trend of the remainder of the ridge to
the southwest, together with the presence of a valley between the two
parts, suggests the presence of a cross fault having a north trend at
this point. That a structural break does exist along this general line
is further indicated by the experience of the National Cement Com-
pany whose quarry is about a mile to the northeast. It was found
that in pumping the water from the quarry the springs between their
quarry and Camels Hump were affected much more than the springs
to the southwest.

RIDGE ONE MILE NORTH OF HELERTOWN

A small ridge extending from the roundhouse of the Reading Rail-
road near Hellertown eastward about one and one-quarter miles to a
point where it is separated from the higher pre-Cambrian hills by a
narrow valley is of special importance. A cut behind and on both sides
of the roundhouse shows good evidence of repeated thrust faulting.
At this place the ridge exhibits imbricate structure. The pre-Cam-
brian crystallines and the Cambrian limestone are the formations in-
volved in the repeated faulting. The limestone disappears to the
estward and Hardyston comes in toward the eastern end of the
ridge.

MORGAN HILL SHEAR ZONE

This small area is one of considerable interest not only because of
the faults but also because of the interesting relations between the
supposed Hardyston sediments near the eastern end and the alkalic-
silicic type of invasion of those sediments. This latter feature is dis-
cussed under the topic of igneous activity of Paleozoic age.

The most highly developed zone of shearing found in the pre-Cam-
brian rocks of Northampton County is exposed along the steep south-
eastern slope of Morgan Hill. The rocks involved are Byram gneiss
and pegmatitic members of this formation. A short distance to the
southwest the Moravian Heights formations, greatly invaded by the
Byram, is also broken by this shear zone. The total thickness of mate-
rial involved is on the order of a quarter of a mile. Within this belt
the crystalline rocks have in many places been reduced to mylonite
and everywhere show evidence of granulation and stretching as a re-