of 15 feet, seemed to settle the question. It was an oven regularly built
of blocks of jasper and contained a mass of charcoal and ashes (see PI. 1).
The fact that the sides of the blocks were reddened, and several had already
split through the middle, while the interstices were filled with fine splinters,
offered conclusive evidence that the quarrymen had built the fire to fracture
the blocks, which measured 2 feet, 1½ feet, 6 and 7 inches, respectively,
in diameter.

My experiments proved (a) that if a large block of 2 feet in diameter
is thoroughly heated on a wood fire it breaks into numerous pieces at a
moderate blow; (b) that only the fragments near the fire are reddened;
(c) that the fragments lose their original gloss by the process. The luster,
however, seemed to be regained by long burial in damp clay, as was indi-
cated by the high-polished fracture of some of the reddened chips found
on the fire-places. Moreover, many of the worked forms gathered on the
surface had been probably fire-reddened, and it is not unlikely that the
Indian could have so heated the blocks as to reach their purer parts without
spoilng the whole, while many of the large and coarse blocks might have
been fire-fractured to get them out of the way.

The Transport of Jasper from the Quarry

Lastly, what was done to the jasper after excavation? This brings
us to the chips and refuse found in the shafts and on the surface. (1) In the
large shaft 2, two leaf-shaped forms of jasper ("turtlebacks") were found
at the eleventh and two were found at the sixteenth foot, none of them
showing signs of use on their cutting edges. In shaft 5 and 7 I found
hammerstones at the first foot, in shaft 12 another at the fourteenth foot,
and in the fields close to the pits 233 leaf-shaped forms and 55 hammer-
stones. Certainly 70 per cent of the hammer-stones were broken, a very
few were made of sandstone, about 10 per cent were of jasper, but most
consisted of quartzite, or its equivalent, metamorphosed Potsdam sand-
stone, pebbles no doubt found in the beds of neighboring streams or where
on hillydes marine forces had rolled them since Laurentian times. Many
of them were well battered and many so reduced by successive blows
following one plane of their circumference as to have the characteristic
appearance of heavy discs, while it is important to note that none of them,
with two or three doubtful exceptions, are pitted on the sides.

The refuse may be divided into four classes:
(a.) Chips and fragments of no inferable design.
(b.) Rough leaf-shaped forms not betraying their artificiality in their
fractures, but only in their comparatively great numbers. Had the Indian
been pounding on argillite pebbles, the blows would have left their mark in
a series of conchoidal fractures, and, as in the quartzite specimens from
Piney branch, the marred pebble surface would have told the tale. But
here the cross-grained jagged edges often explain little, and it is only
after we have visited other jasper outcrops where no such fragments as
these exist and convinced ourselves that frost does not even account for
the chips, much less for the hammer-stones, in a word, after we have
gathered these specimens by the dozen, thrown them away and picked them
up again, that we are finally convinced, in spite of the criticisms of friends,
that nearly as many blows have been expended upon them as upon the
ordinary "turtleback," and that it is only the coarseness of the material
that hides from us in these ruder instances the handiwork of man.
(c.) The "turtlebacks." About these there is no doubt. We need no
context to settle their artificiality; each, big or little, vouches for itself,
as do the similar forms in argillite and sandstone from the Delaware or
Susquehanna beaches. Standing in a ratio of about 1 to 15 of the former
class, they are not nearly as common as at Flint ridge and Piney branch.
To gather the 153 that we found on six or seven occasions, varying from
1 to 5 inches in length, required careful, painstaking search; still they were
there, and it is the question of their purpose that concerns us most. The
Indian made them, either as finished or unfinished implements, for they