Three-Dimensional and Attribute Debitage Analyses of Stone Chips

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It is a common practice among Paleolithic archaeologists to record all the stone materials, large or small, throughout excavations, but we still scarcely see the case in which such recorded data have been fully analyzed. In order to see how much of information on small flakes or chips commonly encountered during excavations of Paleolithic sites can be used for deriving clues as to human activities and site use patterns, we carried out a three-dimensional and attribute analysis of about 1,600 small flakes, using a micro-computer (NEC 9801), a device now easily accessible by any archaeologists in Japan.

Our data consist of stone assemblage from Locality A of the Gerstle River Quarry site (XMH-246) in interior Alaska. All the materials, including stone tools and small debitage, were recorded three dimensionally during 1985 field season and their attributes were later added through laboratory examinations.

The following attributes constitute our database: 3-dimensional locations, length, width, thickness, presence/absence of striking point, form of striking platform, presence/absence of bulb of percussion, number of scars on dorsal surface, and stone quality. And ranges of variations of each attribute are statistically calculated and shown in the accompanying figures.

We also carried out, for comparison, an experiment in making stone tools such as bifacial points, wedge-shaped microblades, and end-scrapers and recorded all the flakes and debitage on the laboraroty floor two-dimensionally.

Results of the analyses as well tool making experiments indicate that small flakes tend to be concentrated in several spots or clusters and that those flakes in particular clusters are rather homogeneous in stone quality, suggesting that only a few occasions of tool making probably took place here. Morphological characteristics of small flakes also suggest that the debitages from XMH-246 are similar to those from later stages of stone tool making experiment, possibly secondary or final stage of shaping of tools.

Based on the analyses, it is possible to infer how the site locality was util-
ized by American Paleoarctic tradition people and what kinds of activities were carried out here. One possible explanation is that American Paleoarctic tradition people used the locality as a look-out point for moving herds of animals, such as caribou, and that they added final touches to unfinished stone tools while waiting for those animals.

We find the three-dimensional debitage distribution analysis as well as debitage attribute analysis is worthy of trial, since most of the raw data necessary for such an analysis are almost always ready at hand when each excavation of a Paleolithic site is over.