An Individual Identification Analysis of Animal Remains:
Pairing the Dolphin Humeri from the Mawaki Site

HIRAGUCHI Tetsuo

GOALS AND METHOD OF RESEARCH

Individual identification analysis of animal remains can be used to verify the continuity of layers, contempor of remains, and the precision of excavation; and to examine cultural aspects, such as the method of butchering, was of sharing and technology of tool making. Joining and articulation are the surest methods of individual identification, followed by pairing of symmetrical bones. This paper analyses dolphin remains (from the Mawaki Site on the coast of the Noto Peninsula) mainly by pairing the humeri, and hopes to serve as a basic work in terms of an approach to the problems of group relations.

PAIRING THE DOLPHIN HUMERI FROM THE MAWAKI SITE

The objects of analysis are restricted to specimens from the 6 m × 15 m excavation grids, divided into half meter square units, at stratum XI (the later Early/early Middle Jomon period) of District I. The humeri from the grids totalled 132 pieces including two joined pieces and three broken pieces indistinguishable as left or right. The humeri analyzed thus totaled 128 pieces, 61 left and 67 right.

The main measurements of the humeri are the greatest length (GL), the greatest breadth of the distal end (BD) and the greatest depth of the proximal end (DP). The dimensions of modern specimens (two individuals of *L. obliquidens* and one individual of *T. truncatus*), show little difference (one millimeter or less) between the left and right humeri. Their externals closely resemble each other except a large nutrient foramen of the dorsal corpus. The archaeological specimens, for which any of the three measurements are possible, totalled 116 pieces, 56 left and 60 right. By selecting left and right humeri with one millimeter or less difference in dimensions, and by comparing the overall shape of pieces, it has been concluded that only two pairs belong to the same individuals. This means that the minimum number of individuals is 114, whih is a little more than the 105 calculated based on the craniums and 111 on the atlases.

Cut marks on the dolphin bones from the Mawaki Site are often recognized on *Ramus mandibulae*, *Collum scapulae* and vertebrae, but rarely or not at all on *Condylus*
*Occipitalis*, atlases and pectoral fin bones. Because the pectoral fins are of no utility value, they must have been cut off from the scapulae and discarded as they were. Actually, they are often found in an articulated state. If humeri were of no utility, we should expect that many would be to found in pairs. The analysis of pairing, however, shows that paired humeri are rare, which is contrary to my expectation.

An explanation for this first needs to examine the premise mentioned above. If only the hides of pectoral fins were utilized, the left and right fins must have been separated from each other in the process of division, and the pectoral bones, which were only skinned and discarded, must have remained in a state articulation unless something unusual happened. I do not, however, know of any ethnological example of such use pattern. Even if the pairing research were done more precisely, results would probably be almost the same. As the bones found in a state of articulation attest to the stability of the layers containing the remains, there is little possibility of shifting by a stream.

Some unexamined humeri were included in the remains which were excavated from the area overlapping the grids at Stratum XI of District I. These were either collected before setting up the grids or their location within the grid was not recorded. Though the final conclusion must await examination of these bones, the number of paired humeri should not increase because there are little or no pairs in any of the clusters of dolphin bones collected with soil, covered with urethan resin. There is also the possibility of scavengers. Carnivore bite marks were found on two of 140 radii, but not on any of the humeri or ulnae. It thus remains unclear why there were only two pairs among the 116 pieces of humeri from the grids.

**HORIZONTAL DISTRIBUTION OF THE HUMERI**

The clusters of craniums, atlases and humeri, apart from other bones in the horizontal distribution, are classified into three patterns: the first consists mostly of one type of bone, the second of two, and the third almost equal numbers of all three. In the explanation of this phenomenon it is important, to determine if the craniums were cut off from the atlases in butchering.

The cut marks were not recognized at all on *Condylus occipitalis* or the atlases of the dolphins from the Mawaki Site, but they were on five pieces of twenty-three atlases from the Asahi Shell Mound. It is difficult to cut off an atlas from *Condylus occipitalis* because they are tied by strong ligaments and dolphins have no constrictions
between the head and the body. Skillful butchers, however, are able to separate the head from the body between an atlas and Condylus occipitalis with almost no damage to the bones.

METHODOLOGICAL PROBLEMS

The problem of butchering requires individual identification analysis between the craniums and the atlases. This is very difficult, however, because few Condylus occipitalis, which are often found broken into left and right fragments, can be restored to their original state. Individual identification analyses other than joining, articulation and pairing require storage of measurement data on various bones of a skeleton, and the result of analyses must be explained from the viewpoint of taphonomy with consideration of both artificial and natural factors.

The dolphin crania themselves are fairly large and often excavated in a state dis- jointed or broken pieces, and thus are open to several possible methods of individual identification. If these analyses are conducted thoroughly, they may produce more certain evidence about how craniums were dealt with at that time. A large amount of work remains unfinished; including horizontal distribution of each bone for each skeleton, examination of bone composition; compiling figures for individual identification for each cluster, and examination of the interrelation between clusters by means of specimens belonging to the same individual. Moreover, it is necessary to examine the distribution of other remains (other animal remains, botanical remains, pottery, stone tools and so on); and one barrier to the solution of the problems is that the precision in recording at the excavation varies with the sort of remains.

After the excavation report of the Mawaki Site, I have pointed out the possibility that the difference in age composition between L. obliquidens and D. delphis, as determined by the fusion degree of the atlases with the axes, results from factors involving animal behavior and the method of catching. The humeri pairing described here distinctly shows that preservation factors of animal remains are fairly complicated and cannot be simply explained. Future work in individual identification analyses will give us more certain insight into the problems involved in catching dolphins.