Fish Remains in Archaeology

Fish remains have the same role to play in archaeological analysis as any other class of faunal remains; ie. as an aid in the reconstruction of palaeoeconomies and palaeoecology (see for example in Casteel (1976) and Jones (1982:79)). It is toward this end that the identification of fish remains should be undertaken. It is not the aim of this manual to solve the problems of identification to species; in fact its scope is far too limited for such a purpose. However, one of the purposes of this manual is to encourage the complete identification of all fish osteological elements. A basic understanding of the morphological characteristics of all elements is necessary if fish remains are to be treated to the same standards as other classes of faunal remains. Among archaeologists generally, basic knowledge of the forms of disarticulated fish bones is not as well developed as it is for mammal bones. As a result, there is from the beginning a potential for fish remains to be under represented to an unknown extent. Methods for the reconstruction and interpretation of palaeoeconomy and palaeoecology from faunal remains assume that the material has been identified as completely as possible. An unknown element of bias is introduced if quantification and interpretation are attempted on the basis of incomplete identification.

Much zooarchaeological literature is entirely devoted to methods of quantifying faunal assemblages (eg. Casteel 1976; Grayson 1979), with an aim toward overcoming the biases introduced by archaeological preservation and recovery techniques, and providing as 'true' a picture as possible of the relative importance of species in the economy or environment of a region. However, all methods assume that basic standards of element identification have been attained. The truth of this assumption of course depends upon the knowledge and skills of the individual investigator. In regard to fish remains, the necessary knowledge is not readily available.

In the area of mammal bone identification, fairly comprehensive manuals have been published (Olsen 1964; Gilbert 1973; Glass 1973). Arguably, it is the dissemination of knowledge by manuals such as these that has done so much to bring the analysis of mammalian remains into archaeological prominence. In the identification of fish remains, standards are likely to be much more variable between investigators, and it is perhaps for this reason that fish remains have not attained a greater significance in archaeology, despite the efforts of Casteel (1976) and others to promote their use. Therefore it is important for a fish osteology

manual to depict all of the elements present in a fish skeleton if possible, regardless of whether such a range of elements has been previously identified in archaeological sites.

The fact that there are such a large number of fish elements, and the tendency for fish bone to break into tiny fragments has meant that identification and interpretation has come to focus mainly on the more substantial elements such as: vertebrae centra, otoliths, pre-maxillae, maxillae, dentaries, dermal structures, and head bones such as angulars and posttemporals (Rackham et al. 1984:40). The less familiar elements are sometimes mistaken for chips of mammal or bird bone and thus excluded from proper identification and quantification (Olsen 1968:ix). Without specialized knowledge, the best that can be done with such unfamiliar elements is to classify them as unidentified fish. As a result, a potentially incorrect or at least altered picture of palaeoeconomy or palaeoecology is likely to emerge.

There are a number of reasons for wanting to obtain as complete an identification of fish elements as possible; including cranial elements. Even though these may be less likely to survive archaeologically, they cannot be disregarded simply because they are not recognized, and they cannot be recognized unless their basic form is familiar to the investigator. The presence of cranial elements can help to answer questions concerning processing practices and help to establish a possible distinction between fishing/ processing sites and habitation sites. Cranial elements are also important because they are either median or paired and can therefore be used to aid in the calculation of the minimum number of individuals of different species. Because an individual fish has many different vertebrae. the number of these is often a less adequate representation of the number of individuals present.

One further reason for attaining as complete an identification of fish elements as possible concerns the importance of sampling in the analysis of faunal remains. Often, fish and other remains are present in such large numbers that it is only economically feasible to conduct their analysis on the basis of small samples of the originally recovered material. Such sampling severely restricts the number of elements of any one species available for potential identification. If the investigator's lack of knowledge further restricts identification to only a subset of available elements, then very serious distortion may arise, and even the presence of some species may be overlooked.

To whatever purpose the analysis of fish remains is applied, a basic knowledge of fish osteology is essential. As archaeologists are often forced to rely on their own efforts in the identification of fish or other remains which they recover, it is essential that they themselves develop the requisite level of knowledge and skill. It is for this reason that the drawing of each element of the species represented in this manual was undertaken.

Scope of Coverage

Four of the most common families of marine fish in the Northern Hemisphere are represented in this handbook; the Salmonidae, Gadidae, Scorpaenidae, and Pleuronectidae. They were chosen because they comprise species which are indigenous to both the North Atlantic and North Pacific Oceans, and were, according to a range of archaeological and ethnographic evidence, economically exploited in both regions in the past.

One species from each of the above families is illustrated.

Oncorhynchus keta (Pacific)

The first osteology constitutes a Pacific salmon (*O. keta*). Its Atlantic cousin, *Salmo salar*, belongs to a different genus, but both are of the sub-family Salmoninae, and the family Salmonidae. The external appearance of these species is distinct, but their skeletons, like those of all salmonids, are very characteristic. (see Tchernavin 1938 plates II,III, and V, for an illustrated comparison of the articulated skulls of *O. keta* and *S. salar*). In fact, it is difficult to identify bones of the Salmonidae to species, even with the aid of a comparative collection. There is also considerable variation introduced through breeding changes. As Tchernavin concludes in his study of the breeding changes in salmon:

> The skulls of adult migratory *Salmo* and *Oncorhynchus* are subject to striking changes throughout the whole life of the fish. These changes are so marked that the study of the salmon skull becomes in fact, a study of its changes. Many characteristics regarded as 'fortuitous variations' or 'taxonomic distinctions' are found to be features of particular phases of these regular changes. [Tchernavin 1938:165]

In this respect, the osteology of *Oncorhynchus keta* is typical of the salmons.