confused, and the articulated bones could be compared with the drawings in biological studies.

Once separated, the bones were hand cleaned under tepid water. Care was taken to work over a fine-meshed screen. Finally, the bones could be laid out to dry and later labelled.

The process used here was painstaking and time consuming. This was necessary in order to identify elements in comparison with the articulated drawings and descriptions of zoological osteologies. It is hoped that with the aid of the present manual, much quicker and more effective maceration techniques could be used (see Casteel 1976:7-16). During the maceration process, it should not be necessary to maintain articulations, or separate left from right, as these precise element identifications can be made later with reference to the drawings in this manual. However, it is important to stress again that for the recognition of morphological differences between various species, and their precise archaeological identification, a comparative osteological collection is essential. This manual is only intended as a useful adjunct to such a collection. It can be used in field situations in which the fragility of comparative fish collections makes their use impractical, and can also help prevent the deterioration of a collection by reducing the amount of handling required in laboratory analysis.

References: for the identification of whole specimens- Hart (1973) for Pacific species; Wheeler (1969) for Atlantic species.

Additional Notes

Although an attempt has been made to produce osteologies as complete as possible, some bones have been omitted. The otoliths of the salmon (*Oncorhynchus keta*) are so small as to make a to-scale drawing useless. Included is a detailed series of enlarged drawings of salmonid otoliths redrawn after Norden (1961). In addition, the following bones are absent: the extrascapulars of the salmon, suborbitals 4 and 5 of the rockfish, and the supratemporals, and orbitals of the halibut. Drawings of the extrascapulars and supratemporals were not attempted because they are merely a thin line of tubular bones enclosing a sensory canal. The orbitals of the halibut and supraorbitals 4 and 5 of the rockfish were omitted for the same reason. These bones are all extremely small or fragile, and therefore are not considered of essential importance. Their recovery is unlikely in archaeological sites.

The salmon bones are those of a spawning male, and therefore show the characteristic increase in the size of jaws and teeth, etc. (see Tchernavin 1938 for a description of breeding changes in the skull). It is interesting to note that in all species of sea-run *Oncorhynchus*, with the possible exception of *O. kisutch*, the teeth of half-grown and adult fish of both sexes are not fastened to the various teeth bearing bones. It is only close to the time of spawning that the teeth become fused to their respective bones (Vladykov 1962:50-52). In addition, unlike *Salmo*, the breeding teeth of *Oncorhynchus* are not set in sockets (Tchernavin 1938:164). Instead, they have large ossified bases which are easily recognized in archaeological specimens.

The cod otolith that was drawn came from a smaller specimen of the same species, while all of the other cod elements came from a single larger specimen. The branchial arches of the rockfish are from a Pacific species of rockfish (*Sebastes* sp.). The frontals, sphenotic and supraoccipital of the halibut were drawn from a larger specimen of the same species (*H. stenolepis*).