NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

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were cleared, it was discovered that the bottom of the hole took the form of a smooth oval depression in the clay, measuring about 19 ins x 17 ins along its axes and 6ins deep. On one side of this depression, 9 pieces of wood protruded from the clay and formed an irregular arc on the inside of its edge. Some showed what appeared to be adze marks.

It was unfortunate that this interesting discovery was made on the last day of the excavation, when there was little time for its examination. It is tentatively suggested that it is the seating or 'ghost-hole' for a large post which was subsequently removed, but detailed examination must await re-excavation, and a more extensive study of the area surrounding it, to be carried out in January 1962.

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A Note on Problems of Identification of Fish Remains

K. DUNCAN

At most sites a large amount of bone material is found, which has to accurately recorded and identified if one is to reconstruct the everyday life of the former inhabitants. The study of bones will show which animals were being caught and how the food was processed by them. In addition it may show if there was any change in the intensity of exploitation of the animal populations and to what extent the composition of these populations was affected by human intervention (this may have led to dietary changes of cultural significance.)

Much therefore depends on primary identification in the field, which will enable sufficient typical and well localised material to be retained from the total excavated, and some of this can be sent to the specialist later. The latter may be sent so much material, however, that a serious bottleneck will arise from the necessarily slow process of detailed identification. This means that much depends on the ability of the excavator to carry out provisional identification and sorting of the material found, and ensure that this is representative of the excavation as a whole. But what are to be our criteria for selection, bearing in mind our present state of knowledge?

Many of these points were discussed at the Association's Wellington Conference last year. Without reiterating the points made there, I would like to suggest, as one who is sent fish bones for identification, that present excavators adopt the following procedure for fish remains:-

1. Retain everything excavated, cleaning it sufficiently (usually brushing is adequate) to enable a primary sorting to be made.
2. Separate out the head bones (the most diagnostic bones of the fish); bag them with the usual context data in numerical series, but link the bag numbers if the bones are

closely associated together; keep splintered and broken bones separately.
3. Later clean, mark and sort the material again, arranging it in order of priority according to the archaeological significance of the layers in which it has been found. This will enable the specialist to decide in what order to approach his material and to appreciate why the archaeologist is especially interested in a particular section of the material.

The importance of retaining everything found, even if some of it appears to be of little significance, cannot be overstressed at present. Obviously, not all of it will require the same specialist attention at this stage, but it may do so later on.

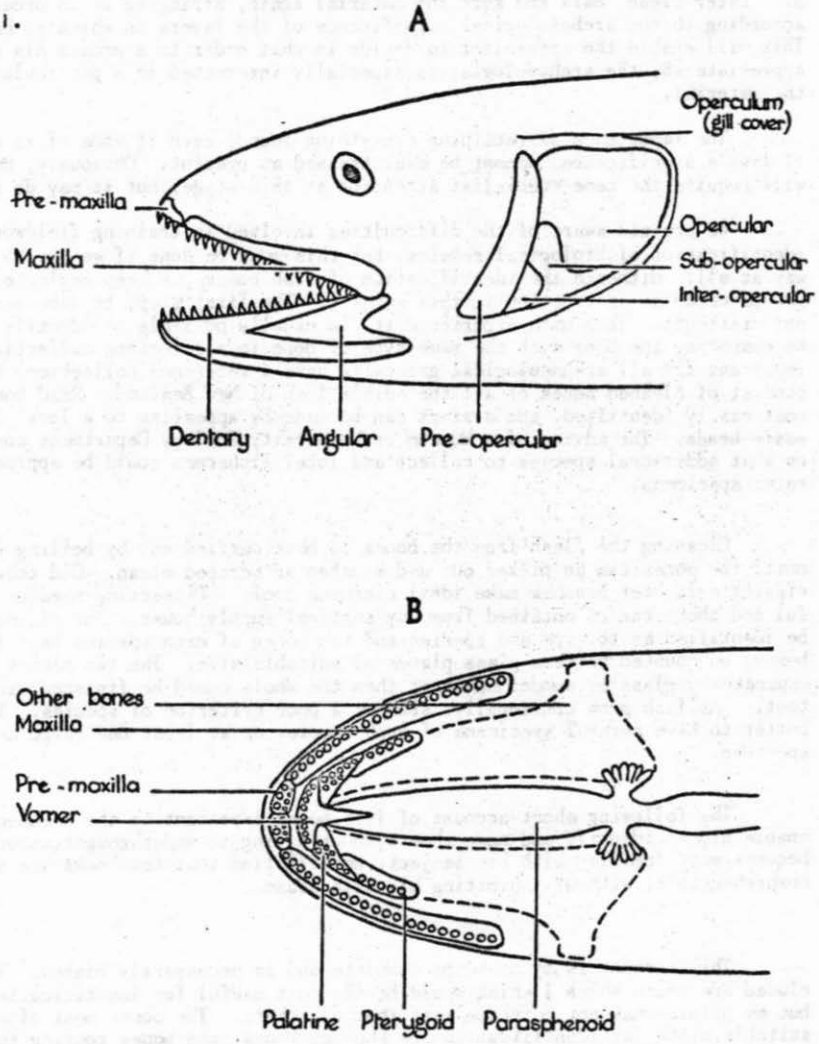
We are all aware of the difficulties involved in training fieldworkers in the identification of biological remains, but this must be done if we are to make any headway at all. Hitherto the identification of fish bones has been neglected but now many groups organise instruction in this subject. The first step, to name each bone, is not difficult. Then with experience it is usually possible to identify the species by comparing the bone with the same type of bone in a reference collection. It is important for all archaeological groups to have a reference collection, which should consist of cleaned bones of all the edible fish of New Zealand. Head bones are the most easily identified, and a start can be made by appealing to a local fishmonger for waste heads. The advice of a Museum or University Zoology Department could be obtained on what additional species to collect and local fishermen could be approached for the rarer specimens.

Cleaning the flesh from the bones is best carried out by boiling the whole head until the bones can be picked out and brushed or scraped clean. Old toothbrushes and cigarette-lighter brushes make ideal cleaning tools. Dissecting needles are also useful and these can be obtained from any surgical supply house. The cleaned bones should be identified as to type and species and the bones of each species kept in separate boxes, or mounted between glass plates of suitable size. The two plates should be separatedby glass or wooden spacers; then the whole could be finished with passe partout. As fish grow continually, size is a poor criterion of species. It is therefore better to have several specimens of each species or at least one large and one small specimen.

The following short account of fish bones important to the archaeologist, is to enable him to identify and name them without having to wadethroughtextbooks. As he becomes more familiar with his subject, he will find that textbooks are useful and comprehensible, without inhibiting his enthusiasm.

This account is by no means complete and is necessarily biased. The bones included are those which I think would be the most useful for identification purposes - but my opinion may not coincide with that of others. The bones most often found in a suitable state for identification are the jaw bones, the bones roofing the mouth, those supporting the gill cover (operculum) and the vertebrae. Apart from the vertebrae, the bones mentioned above lie underneath the skin, are hard and often well preserved. The deeper bones are small and are often partly made of cartilage - this is a white material, softer than bone with the consistency of plastic. We find it in our own skeleton covering the joint ends of long bones, in the ear and nose and elsewhere. As cartilage rots quickly the deeper bones are not often well preserved. Sharks and their relatives have completely cartilaginous skeletons so no remains other than the hard teeth are found.

FIG.1.

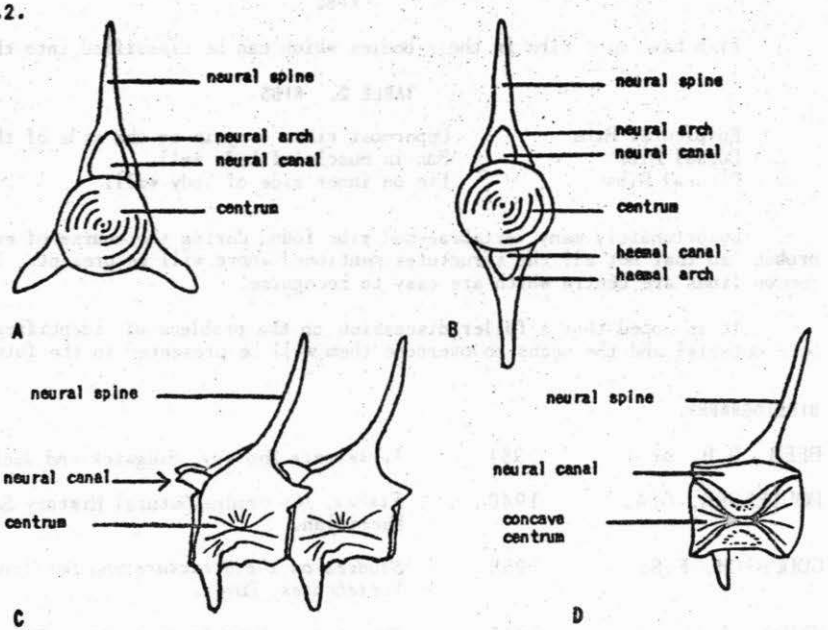


The bones mentioned above are included in the following table, also in fig.1. Paired bones are present on both sides of the body, and when examining the specimens from a site, bone pairs should be matched if possible to avoid a false count of individuals. Under the heading'Function', there is a list showing whether the bones referred to carry teeth or not. This is an important feature of fish classification, so it is essential to know which bones carry teeth for each species likely to be found during the course of field work.

TABLE I. BONES OF THE HEAD

Series	Name		Function
Upper Jaw	Pre-maxilla	Paired	Carries teeth
	Maxilla	Paired	Commonly carries teeth
Lower Jaw	Dentary	Paired	Carries teeth
	Angular	Paired	Rest of lower jaw-
	etc.		does not carry teeth
Bones roofing mouth	Vomer	Not paired	Often carries teeth
	Palatine	Paired	Sometimes carries teeth
	Pterygoid	Paired	Sometimes carries teeth
	Parasphenoid	Not paired	Never carries teeth
Bones in Gill Cover	Pre-opercular	Paired	Supports gill cover
	Sub-opercular	Paired	Supports gill cover
	Inter-opercular	Paired	Supports gill cover
	Opercular	Paired	Supports gill cover

FIG.2.



VERTEBRAE

A - Trunk or pre-caudal vertebra - anterior view.
B - Tail or caudal vertebra - anterior view.
C - Two trunk vertebrae in side view; the neural spines point towards the posterior end.
D - Trunk vertebra cut in half to show the concavities in the centrum.

THE VERTEBRAL COLUMN

The vertebral column is made up of many individual vertebrae arranged in the form of a rod. Each vertebra is derived from a number of parts that are more or less fused. The main function of the vertebral column is to support the main axis of the body, and this is carried out by the centra of the vertebrae (see fig.2). Each centrum is a short cylinder, concave at both ends, and in life the centra of the vertebrae are joined to each other forming a continuous rod which is strong but flexible. The second function of the vertebral column is to protect the nerve cord; this runs in the neural canal formed by the neural arch situated above the centrum. Lastly the vertebrae provide surfaces where muscles and bones are attached. The most conspicuous of these processes for muscle attachment is the neural spine which arises from the neural arch.

Basically there are two types of vertebrae, those at the anterior end called the trunk or pre-caudal vertebrae and those at the posterior, called the tail or caudal vertebrae. These two types can easily be distinguished in intact specimens as the tail vertebrae have a canal below the centrum wich is called the haemal canal. A blood vessel runs in this haemal canal which is surrounded by the haemal arch. There is no haemal canal in trunk vertebrae. Trunk and tail vertebrae vary in size and also show other minor structural differences along the length of the cord.

RIBS

Fish have many ribs in their bodies which can be classified into three types.

TABLE 2. RIBS

Epipleural Ribs	Uppermost ribs - join to the side of the centra.
Dorsal Ribs	Run in muscle of body wall.
Pleural Ribs	Lie on inner side of body wall.

Unfortunately many vertebrae and ribs found during the course of excavation are broken, so that not all the structures mentioned above will be present. The most common finds are centra which are easy to recognise.

It is hoped that a fuller discussion on the problems of identification of fish bone material and the means to overcome them will be presented in the future.

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More on Preservation

G.D.G. BAILEY

In the last issue of the Newsletter, Mr H.J.R. Brown drew attention to the grave problem of the despoliation of Auckland's archaeological sites. As he pointed out, this problem, though perhaps more acute in Auckland than elsewhere, is nation-wide. Mr Brown advocated amendments to the Historic Places Act, and an increase in the powers and duties of the National Historic Places Trust. In the writer's opinion, these recommendations were good and timely, but he feels that legislation should go further, and introduce to our Statute Books something akin to the Ancient Monuments Acts in force in the United Kingdom.

Before discussing the British legislation, however, the writer would like to draw attention to certain other statutes existing in New Zealand, which enable some action to be taken with regard to the preservation of sites - although it is important to note that in no case is there sufficient statutory provision for the prevention of the despoliation now occuring. As will be seen, the powers they give are limited, though these could well be used in appropriate situations.

The Reserves and Domains Act of 1953 empowers the government to gazette as an Historic Reserve a place already set aside as a Public Reserve. Maori pa sites are listed as one type of place which can so be dealt with. This Act further empowers the government to creat Private Historic Reserves where land owners apply to the Minister of Lands to have their land so declared. Subject to the consent of the owner in the latter case, the Minister is empowered to promote, supervise or authorise excavations, etc. on the reserve. It should be noted, however, that there is nothing to prevent an owner himself, whose land has been declared a Private Historic Reserve from excavating and generally carrying out private investigations on his own behalf. The Minister may also control the management and preservation of reserves, and apart from the owner, in the case of Private Historic Reserves, no outside party can excavate without Ministerial consent.

Next, the Town and Country Planning Act of 1953 might be relevant in certain situations. Under its terms, any person or group of persons may apply to a Local Authority formulating a District Scheme to have provision made for the setting aside of land for certain purposes - which could include sites of archaeological importance meriting preservation. If such provision is not made, the Act gives right of appeal to the Town and Country Planning Appeal Board.

Finally, the Historic Places Act empowers the National Historic Places Trust to enter into agreements with authorities for the management, maintenance and preservation of sites. The Trust also has the power to acquire land where such sites are found, in order to carry out these functions, as well as any finds from them. It can promote or supervise excavation by approved organisations. Where private land is involved, the owner's consent must be obtained before this takes place.

It is clear that although these acts provide some means of preserving sites, they are all very limited in scope. The procedure under the Town and Country Planning