

Fabrication of Objects from Fish and Sea Animals in Ancient Israel

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The purpose of this paper is to apply the available references in the Mishnah and in the Talmud concerning the use of bone and skin of fish and fishlike sea animals to the background of ancient Israel (Early and Middle Iron Age) and to that of the ancient Near East. Though our direct evidence is of late date, it reflects practices and usages of earlier times, some of which were probably known from the most remote antiquity.

The use of animal bones for the production of various tools, artifacts and common objects, though less common than the use of stone and wood, was already well known during the Old Stone Age (Paleolithic) in Palestine and in many parts of the Near East, as well as in areas far removed from there.¹ Objects made from bone included spear throwers, fish hooks, lance points, needles—some pierced with an eye for the stitching together of skins—and ritual ornaments. Many of the beautifully made implements, usually the smaller ones, were fashioned from bones. However, the available evidence indicates clearly that, with the exception of artifacts such as needles, which were commonly made of fish bones, they were usually produced from the bones of land animals. Similarly, the skins and hides which were the raw material for clothing and for a great many utilitarian objects, until the invention of weaving, were generally those of land animals. This has been demonstrated by archaeological discoveries interpreted through the labor and perception of many eminent ethnologists and historians. To the best of my knowledge, the Sumerian, Egyptian, and Babylonian literary sources now available are silent on the use of the bones and skins of aquatic animals as the raw material for any manufacturing process. Only some biblical texts and several ritual art decorations from Mesopotamia shed important light upon the use of skin of aquatic creatures for specific articles of clothing.

1 Kenneth P. Oakley, *Man the Tool-Maker* (London, 1956), 92 f., and idem, "Skill As a Human Possession," *A History of Technology*, eds. Charles Singer, E. J. Holmyard and A. R. Hall (Oxford, 1956), 1:31, 32-37; L. S. B. Leakey, "Working Stone, Bone, and Wood," *ibid.*, 140-41; S. M. Cole, "Differentiation in Non-Metallic Tools," *ibid.*, 514-17; Jacquetta Hawkes and Sir Leonard Woolley, *Prehistory and the Beginnings of Civilizations*, History of Mankind, vol. 1 (New York, 1963), 122, 130, n. 5; Stuart Piggot, *Ancient Europe* (Chicago, 1965), 24-25; Emmanuel Anati, *Palestine Before the Hebrews* (New York, 1963), 122, 156, 157, 158, 160, 269, 309.

The Sources

The sources which furnish our information comprise the following texts: (a) a reference in the Mishnah *Kelim* 10:1 concerning articles (*kēlîm*) made of fish bones and of fish skin and those made of "the bones and skin of sea animals"; (b) a note in *Negaim* 11:1 alluding to "hides of sea animals," which clearly implies their use; (c) a text in *Kelim* 24:11, which speaks of specific articles, like bottles and bags made of fish skin. Similarly the Tosefta *Kelim Baba Kamma* 7:11 speaks of a bag made of the skin of a fish and of a jug covered with fish skin and papyrus; (d) a reference in *Kelim* 16:1 to fish skins used as abrasives for the application of a final surface finish to beds and cots²; and (e) a text in the Talmud, *Shabbath* 108a, which discusses the writing of scriptural passages in the phylacteries "on the surface of the skin of ritually clean fish."

These Mishnaic sources belong to approximately the end of the second century A. D. , and the one from the Talmud probably to the fourth century A. D. However, their information reflects practices used extensively in much earlier times. It may be added here that Mishnah *Kelim* 17:13 concerns itself with "all (articles made of fish skin and that of animals) that live in in the sea" as well as with articles made "from what grows in the sea and is joined to a substance that grows on land, even if it is but a thread of cords" (cf. *Negaim* 11:1). This text describes articles made of some species of very tall marsh plants called reed (*'āgēm* [*'agmōn*]) or cane (*qāneḥb*) which grow "along margins of the Dead Sea, in the Jordan Valley, and elsewhere to form almost impenetrable thickets which may almost be compared to the bamboo jungles of India."³ These were used for a wide variety of purposes (Job 41:12; Jeremiah 51:32),⁴ but have no connection with the subject matter of our inquiry.

Kēlîm

The word *kēlîm* does not refer exclusively to utensils, vessels, and containers, even though it is frequently rendered by those terms in English and in European languages. In biblical Hebrew and in post-biblical Hebrew⁵ this is a general term for utensils of any kind not confined to receptacles for solids or liquids, though it certainly includes them. The word has no specific meaning, but a broad and extensive significance covering a wide range of tangible objects produced by manual skill. Thus the word *kēlîm* is applied to almost any personal article (Genesis

2 Cf. *Nedarim* 56b.

3 Harold N. and Alma L. Moldenke, *Plants of the Bible* (New York, 1952), 50. See also Michael Zohary, *Plant Life of Palestine* (New York, 1962), 69, and bibliography, 213; Immanuel Löw, *Die Flora der Juden* (Hildesheim, 1928), 1:664-73; Yehuda Feliks, *Plant World of the Bible* (Ramat Gan, 1968), 288-90, 292 [in Hebrew]; Uriah Feldman, *Plants of the Mishnah* (Tel Aviv, n.d.), 281-83 [in Hebrew]; idem, *Plants of the Bible* (Tel Aviv, 1956), 161-63 [in Hebrew]; H. B. Tristram, *The Natural History of the Bible* (London, 1889), 435-37.

4 See A. Lucas, *Ancient Egyptian Materials and Industries* (London, 1962), 48, 131, 133, 149, 346, 364-65.

5 For references, see Lazarus Goldschmidt, *Subject Concordance to the Babylonian Talmud* (Copenhagen, 1959), 249-50.

24:53); to household property (Genesis 31:37; Exodus 22:6; Leviticus 15:26, etc.); to objects made of leather (Leviticus 13:49, 52, 54, 57, 58, 59; Numbers 31:20), and of wood (Leviticus 11:32, 15:12; Numbers 31:20); to articles of men's wear (Deuteronomy 22:5); to iron tools (1 Kings 6:7); to various types of utensils for holding any solid or liquid substance (Genesis 42:11; Ruth 2:9; Jeremiah 40:10); to basins or vessels (Isaiah 22:24); to earthenware vessels (Leviticus 11:33; Numbers 5:17); to pitchers (1 Kings 17:10); to little pots (Isaiah 22:24); to cups (Esther 1:7); to objects of gold and silver (Genesis 24:53; 2 Kings 12:14; Job 28:17); to sacred furnishings (1 Kings 8:4; 2 Chronicles 4:18, 25:14), etc. Hence the use of the word *kēlīm* in the Mishnaic texts under discussion—as well as in all biblical texts—refers to utilitarian objects or artifacts which are often quite different from one another in function and appearance.

Hebrew *dāg*, Egyptian *rm* and Babylonian *nūnu*

It is well known that the Egyptians, in addition to the generic term for fish, namely *rm* (pl. *rmw*) had a large number of distinct names for various species of fish and fishlike sea animals.⁶ Such was also the case with the Babylonians.⁷ The Assyrian and Babylonian scribes interested in the identification of the species and genera of fish drew up long lists of synonyms and vocabularies of rare terms, even adding the corresponding words in other languages. In contrast, the biblical and post-biblical Hebrew *dāg* refers to any animal living in fresh or salt water without distinguishing its species. Hence the term includes whales, frogs, crustaceans and molluscs, as well as fish in the true sense. Some of them have little in common with true fish except their life in an aquatic environment. Yet they are all classified as *dāg*. The following are the only exceptions known in the Bible.⁸

(a) The distinction between ritually "clean" and "unclean" aquatic beasts (Leviticus 11:9-12) depends upon external signs (fins and scales). The "unclean" animals belong to two categories, *šerēš bammayîm* and *nepeš hayyāb* ^a*šer bammayîm*, but unlike the land animals, they are not distinguished by species.

(b) The phrase *nepeš hayyāb* ^a*šer bammayîm*, 'living creatures that are in the water' (Leviticus 11:10) is evidently the general term for fish, marine mammals or fishlike animals, because *nepeš hayyāb* is usually used collectively to refer to all sorts of animals (Genesis 1:20, 9:10; Ezekiel 47:9). When the expression is qualified by the words ^a*šer bammayîm* it would seem to designate the same category as the Mishnaic *hayyāb šebayyām* and therefore the phrase should be rendered as 'sea animals'. In fact, the opposition in Leviticus 11:10 between *nepeš*

6 Ingrid Gamer-Wallert, *Fische und Fischkulte im alten Ägypten* (Wiesbaden, 1970), 16-43 (see also bibliography cited by her on 138-39); Oric Bates, "Ancient Egyptian Fishing," *Harvard African Studies* 1 (1917), 199-271.

7 Armas Salonen, *Die Fischerei im alten Mesopotamien* (Helsinki, 1970), 145-242.

8 For Mishnaic and Talmudic terms of specific kinds of fish, see Immanuel Löw, "Aramäische Fis'hnahnamen," *Festschrift, Theodor Nöldeke* (Gieszen, 1906), 549-70 (reprinted in Löw's *Fauna und Mineralien der Juden*, Alexander Schreiber, ed. [Hildesheim, 1969], 137-70); Mendel Nun, *Fisbery in Ancient Israel* (Merchavyah, 1964), 121 f. [in Hebrew].

baḥayyāb ^{ʿaššer} *bammayîm* and *šerqš* *bammayîm*, 'insects (or reptiles) of the water', suggests that the former refers to the larger sea animals which do not have fins and scales, which is to say, the sharks and sea mammals. This is probably the more precise meaning of the Mishnaic phrase under discussion.

(c) The common names for enormous sea beasts are *tannîn* (*tannînîm*, *tannîm*) and *liwyātān*. The identity of both remains unresolved to date. Because some descriptions of the *liwyātān* contain mythical elements, they have led to the unjustifiable conclusion that the *liwyātān* was not a real animal.⁹

(d) The name *taḥaš* which is employed in the Bible was often understood as a kind of leather or skin of dark red (Septuagint), black (Saadia) or violet color (Jerome), or as a name of a sea animal yielding it, suggesting 'dolphin', 'sea dog', 'sea cow', 'porpoise', or shark species generally. It was even prudently admitted to be of "uncertain meaning." At present the *taḥaš* is justifiably thought to denote an aquatic herbivorous mammal belonging to the order of sirenia, the *Dugong dugong* (*Holicore tabernaculi*),¹⁰ which is peculiar to the coasts of the Red Sea.

Fish and Fishlike Mammals

The Mishnaic texts cited above speak of articles made of fish skin, and others of articles made from the skin or the bones of "sea animals." There is no doubt that all of them refer to products made of bones and skin of sharks (which are true fish) and of various sea mammals such as whales, dolphins and porpoises, and particularly of the sirenia, the order of aquatic mammals which includes the dugongs. It is exceedingly difficult to ascertain which of these animals were the main source of the products under discussion, since they exhibit an extraordinary range of form, size, habits, and yield a diversity of by-products.¹¹

The late F. S. Bodenheimer lists the following species of marine mammals which were known in the eastern Mediterranean and at Elath:

The monk seal (*Monachus monachus*; *Phocidae*, *Pinnipedia*); among the dolphins (*Cetacea*, *Delphinidae*) the most common are the common dolphin (*Delphinus Delphis*) so often figuring on pottery, mosaics and figurines, and less common the bottle-nosed dolphin (*Tursiops truncatus*). To the same family belongs the sword whale (*Orcinus orca*—*Orca gladiator*), the orca of the ancients. Among the pot whales (*Cetacea*, *Physeteridae*) the sperm whale (*Physeter catodon*) is apparently by far the most common—if that term can be used for such rarely occurring animals—on the shores of Palestine; among the finn whales (*Cetacea*, *Balaenopteridae*)

9 T. H. Gaster, "Cosmogony," *The Interpreter's Dictionary of the Bible*, 1:706 and bibliography § 9. As to Job 40:15, following the description of Job 40:15-24, see Martin Pope, *Job*, The Anchor Bible (New York, 1965), 268-70, 276-78; Mitchell Dahood, *Psalms III*, The Anchor Bible (New York, 1970), 45. (On mythical legends of dolphins and of many of the cetaceans family, *Delphinidae*, among the Nabataeans, see Nelson Glueck, *Deities and Dolphins* [New York, 1965], 316 f.

10 In fact, this is, I am told, also the opinion of the Israeli zoologist, M. Dor, the author of the Hebrew *Lexicon of Zoology*, and accepted by the Israeli Academy for the Hebrew Language. However, see Aharoni, *Tarbiz* 8 (1936), 319 f. See also F. S. Bodenheimer, *Animal Life in Biblical Lands* (Jerusalem, 1949), 1:83, and [Jerusalem 1956], 2:251 [in Hebrew].

11 Donald K. Tressler, *Marine Products of Commerce* (New York, 1923).

the common *Balaenoptera physalis* is found; among the sirenes (*Ungulata, Sirenia, Dugongidae*) the Red Sea dugong (*Dugong dugong*) is still found in the Gulf of Akaba, where it has, however, grown rare as compared to 150 years ago, when most of the sandals of the eastern Sinai peninsula were made from its skin. The skin of the dugong with its definite mammae and the posterior body in fish shape, repeatedly gave rise to rumours and tales about mermaids.¹²

Several of the above species are now extinct, but others are still found in the Mediterranean and the Red Sea.¹³ They were certainly far more numerous in ancient times than at present. All of them were well known for their various by-products, and all were pursued wherever found with stones and weapons made of bone, flint and slate, probably since the so-called Mesolithic period.¹⁴ These species exploited all the available aquatic habitats: the oceans and the seas connected with them, as well as the estuaries and rivers. Whales and dolphins, and particularly the true fish such as the shark, though chiefly marine animals, often penetrate fresh and shallow waters to a considerable distance from the sea.¹⁵ In fact, some of the sharks live and breed in the comparatively shallow water of the continental shelf.

Such an array of cosmological and supernatural traditions, so many folk tales and fables, have arisen around the *liwyātān* and the *tannîn* that is not surprising how difficult it is to disengage fact from fiction. Various named aquatic animals and fish appear since early times in the myths and the magic symbolisms of many cultures. This was widespread and curiously persistent, far beyond the Semitic area of the ancient Near East.¹⁶ The name *liwyātān* is clearly used in Job 40:25 and in Psalm 104:25-26 without any mythological implications whatsoever. The first text alludes to the *liwyātān* as a great fishlike animal and the second speaks of the Mediterranean as "This great and wide sea, wherein are creeping things beyond number, both small and great animals. There go ships; and *liwyātān* whom Thou hast made Thy plaything."¹⁷ Unlike the mythical sea monster, the rager *rabab* (Psalm 40:5, 87:4, 89:11; Isaiah 30:7, 51:9; Job 26:12, 9:13; [*ōz'erê rabab = Akkadian: ilānu rīšūša ālikū idīša*]),¹⁸ the *liwyātān* and the *tannîn* do not always denote mythical marine animals.¹⁹ Neither name is a precise zoological classification but both are rather common

12 F. S. Bodenheimer, *Animal and Man in Bible Lands* (Leiden, 1960), 52, and idem, *Animal Life in Biblical Lands* (Jerusalem, 1949), 1:82 [in Hebrew].

13 Francis Harper, *Extinct and Vanishing Mammals of the Old World*, American Committee for International Wild Life Protection, Special Publication, no. 12 (New York, 1945).

14 E. A. Stackpole, *The Sea Hunters* (Philadelphia, 1953), 191 f.

15 V. M. Copleson, *Shark Attack* (Sidney, 1962), 134; Paul Budker, *The Life of Sharks* (New York, 1971), 136.

16 The available literature is too voluminous to be quoted.

17 As to suggestions that the *liwyātān* might be 'tunny' or 'dolphin', see G. R. Driver, "Mythical Monsters in the Old Testament," *Studi Orientalistici in onore di Giorgio Levi Della Vida* (Rome, 1956), 240-41.

18 G. R. Driver, *Mythical Monsters*, 248; Marvin H. Pope, *Job*, 70.

19 As to the *tannîn* see Exodus 10:12; Deuteronomy 32:3; Job 7:12; Isaiah 51:9; and as to the *liwyātān*, see Isaiah 27:1; Psalm 74:14; Job 3:8. See also Bodenheimer, *Animal Life in Biblical Lands*, 1:81-82; 2:202, 208; Tristram, *Natural History*, 151, 257; Ludwig Lewysohn, *Die Zoologie des Talmuds* (Frankfurt, a.M., 1858), 150, 155-58, 355; and Driver, *Mythical Monsters*, 234-49.

names used generally for any very large sea or river animal, including the cetacea.²⁰ These aquatic creatures are very ancient and, as mentioned, they were far more numerous in ancient times than at present.²¹

Israel's Control Over the Eastern Mediterranean Coast and the Northern End of the Red Sea

The prevailing opinion is that Israel was not acquainted with the sea and its cetacea as the result of the allegedly short and interrupted durations of its control over the southern part of the eastern seaboard of the Mediterranean as well as over the Gulf of Eylath at the northern end of the Red Sea. However, the available information does not confirm that opinion.

Steering as cautiously as possible, we may confidently assume that Israel's dominion over the eastern Mediterranean coast commenced with David's reign. That this coast, from a point near Joppa and northward, was fully under David's and Solomon's control is proved by the fact that one of Solomon's administrative districts was centered there. It is almost certain that this area passed on to the Northern Kingdom, and, possibly with some interruptions, continued to be part of its possessions until the fall of the Northern Kingdom in 722-721 B. C. The Hebrew ostraca discovered in 1960²² on the seashore in the neighborhood of Joppa probably imply that the region was part of Josiah's monarchy some time after the disintegration of the Assyrian empire. Concerning Eylath, which had been a bone of contention between Israel and Edom, it also came into Israel's possession during the days of David, who defeated the Edomites (2 Samuel 8:13-14; 1 Kings 11:15-17), and was controlled by Solomon and Jehoshaphat. Uzzia recaptured it from Edom after it had been lost, probably by Joram (Jehoram). The whole area remained under Israel's control until it was lost during the disastrous rule of Ahaz.²³ In relation to the historical existence of ancient Israel, this is most

20 The size range of cetaceans is between four and one hundred feet, with an adult weight range of about one hundred pounds to one hundred and fifty tons.

21 There is no doubt that they were feared, though most of them are harmless giants. In fact, even at present they are suspected of being hazardous to man, and in some countries beaches are provided with lookout towers, bells and sirens. The *tannîn* was regarded as the symbol of a dangerous enemy, representing the cruel Nebuchadnezzar (Jeremiah 51:34) or the mighty pharaoh (Ezekiel 29:3). Similarly designed is the mythical marine monster *rahab* (Psalms 87:4; Isaiah 30:7). See n. 47.

22 J. Naveh, "A Hebrew Letter from the Seventh Century B. C.," *IEJ* 10 (1960), 129-39. It should be noted that the dating of the ostraca does not seem to be beyond question. Naveh dates the ostraca by reference to the East Greek pottery, but see *IEJ* 12 (1962), 96-97. A Josiah date is probable, but not certain. For literature on this ostraca, see Otto Eissfeldt, *The Old Testament* (New York, 1965), 675, n. 18 and 780. See also Yohanan Aharoni, *The Land of the Bible* (Philadelphia, 1967), 349.

23 For a convenient summary of the history of Judah's control of the Negev and of Ezion-geber, see Yohanan Aharoni, "The Negev Archaeology and the Old Testament," *Archaeology and the Old Testament Study*, ed. D. Winton Thomas (Oxford, 1967), 385 f. See also Nelson Glueck, "The Civilization of the Edomites," *The Biblical Archaeologist Reader*, eds. David Noel Freedman and Edward F. Campbell, Jr. (New York, 1964), 2:51-58; and J. M. Meyers, "Edom and Judah in the Sixth-Fifth Centuries B. C.," *Near Eastern Studies in Honor of William Foxwell Albright*, ed. Hans Goedicke, (Baltimore and London, 1971), 377f. See also J. C. Bartlett, "The Rise and Fall of the Kingdom of Edom," *PEQ* 104 (1972), 26f.

certainly not a short period and the intermittence is neither frequent nor significant.

It is true that Israel was not a maritime power, but the Israelites were not necessarily ignorant of the sea, as is evident from Lamentations 4:3,²⁴ which refers very clearly to cetacea. As Tristram remarked, "the prophet here exhibits a knowledge of the habits of the whale tribe, which proves his familiarity with some species, at least, of these marine mammals."²⁵ The same applies to Job 40:25-26, 31. It may be added that the gift of the skins of dugongs to the Tabernacle in order to be fashioned into covers for the Tabernacle tent and altar, demonstrates that, aside from any mythological significance which may have adhered to the beast, the usefulness of its thick skin was much appreciated.²⁶ This is confirmed by a reference to its employ in the making of women's dress shoes (Ezekiel 16:10)²⁷ and, therefore, probably countless articles not mentioned in the Bible.

These references, as well as the names denoting the gigantic aquatic creatures and the several descriptions of the boundlessness of the sea, cannot have originated in "heresy," as G. R. Driver maintained.²⁸ They suggest a familiarity with the sea, with some of its creatures, and with the wealth of bone, flesh, and oil stored in their colossal bodies. Yet this does not imply that Israel was a maritime people with a tradition of whale hunting. The lack of species names among the "pure" and "impure" sea animals also argues against such an implication.

The Use of Bones of Fishlike Animals

As has already been mentioned, there is evidence of various artifacts made from bone dating from the Paleolithic period. With the exception of needles which were commonly made from fish bones, the broaches for holding heavy skins together, the combs, pins, spoons, tools and various decorative objects were all made out of the bones of land animals.²⁹ They are found from the earliest stages of human history right up to the dawn of Christianity.³⁰ However, very little has been written relating to the use of marine mammal bones as human artifacts, because until very recently archaeologists were not particularly interested in what kind

24 Hiller's rendering of the *tannîn* in Lamentations 4:3 into "jackle" and his note on p. 79 are unconvincing (Delbert R. Hillers, *Lamentations*, The Anchor Bible 7a [New York, 1972]).

25 Tristram, *Natural History*, 152.

26 Exodus 25:5; 35:7; 23; 36:19; 39:34; 26:14. Cf. Numbers 4:6, 8, 10, 11, 12; 14:25.

27 See n. 48.

28 Driver, *Mythical Monsters*, 240, 249.

29 Found in Jarmo (R. J. Braidwood and B. Howe, *Prehistoric Investigations in Iraqi Kurdistan* [Chicago, 1960], pl. 21, 8.) Incidentally, it may be mentioned that the Mishnah refers to spoons made of human bones (*Yadaim* 4:6). The discovery by Dorothy Garrod of a fine carving on a handle of a bone sickle haft at Mount Carmel dating from the early Mesolithic period (D. A. E. Garrod and D. M. A. Bate, *The Stone Age of Mount Carmel* [Oxford, 1937], 1:38) close to a skeleton of a child is insufficient to assume that it was made of a human bone. So far there is a total lack of evidence about the artifactual use of human skeletal material.

30 M. L. Ryder, "Remains of Fishes and Other Aquatic Animals," *Science in Archaeology*, eds. Don Brothwell and Eric Higgs (London, 1963), 294-311. The same applies to inscriptions on bones (simple pictograms) excavated in China, some of which are on the mottled horny plates of the carapace of some sea-turtles, belonging to the eighteenth-thirteenth centuries B. C., Li Chi, *The Beginnings of Chinese Civilization* (Seattle, 1957), 23, 36-37, 40-41.

of bone or ivory was used, but mainly in its use. It now becomes more and more evident that cetacean and seal bone was used on a large scale in coastal settlements in many countries. It may be confidently assumed that the techniques for shaping and mounting bones for their various uses were also transmitted through the millennia. The information of the Mishnah is generally very reliable and its text has been preserved with remarkable purity. Except for a few passages, one can confidently trace back its references to utensils of all sorts manufactured out of sea animals without restrictive qualifications, to an ancient and general use of fish or fishlike mammal bones. This deduction is supported by a private written communication (January 4, 1973) from Dr. Jeffrey H. Schwartz.

During the summer of 1971, while based at the excavations at Tel Hesi, Israel, as Director of Osteology, I was invited by Dr. Robert Bull (Drew University) to analyze the osteological remains from his site Caesaria Maritima, Israel. These remains came from the Roman deposits which had been excavated that season. Amongst the fauna were vertebrae of both marine and fresh-water fish. A few of the vertebrae of medium-large marine fish were lacking the vertebral spines. The appearance of these vertebrae indicated that the spines had been lost, not due to the damage of food preparation or archaeological deposition, but, rather, because of conscious directed human activity. I would not say that these vertebrae had been used in the strict sense of an 'artifact', (e.g. as a tool), but suggest that they could have had ornamental or 'toy?' usage. (Toy usage referring to a category which would include shaped astragali, interpreted to have been used as tops or die.) These findings clearly indicate that workings with the bony segments of which the spine or backbone consist, of both sea animals and fresh-water fish was not alien to the ancients.

Dr. Schwartz's assumption is further corroborated by a reference in *Prehistoric Britain* by Jacquetta and Christopher Hawkes, to conditions of the villagers of a settlement at Jarlshof, Shetland (Zetland) during the British Late Bronze Age (1,000 B. C.). Accordingly, "one ingenious householder tethered his cattle to a stall-ring fashioned from a whale vertebra."³¹ It is doubtful whether this practice illustrates the work of an "ingenious householder." It seems rather to prove that the use of cetacean and seal bone was widespread in various areas of the ancient world.

Turning now to *Kelim* 10:1, we postulate the following: if the bones referred to are those of true fishes, then the objects alluded to must be small artifacts or somewhat larger objects hollowed out from large shark vertebrae.³² However, if the *dāg* alludes to the larger marine mammals, which seems much more likely, then the article in question would probably be receptacles. The text may even refer to tent poles made of whale bones which are very hard, firm, and massive, or of baleen plates, which are not true bones,³³ but a horny elastic substance occurring in thin, narrow strips, sometimes as long as eight feet, found in the palate of

31 Jacquetta and Christopher Hawkes, *Prehistoric Britain* (Cambridge, Mass., 1953), 94.

32 As to the shark vertebrae, see Paul Budker, *The Life of Sharks* (New York, 1971), 41-42 and bibliography quoted.

33 Francis Charles Fraser, "Whale," *Encyclopedia Britannica* 23, 554B. (As to the use of bones of whales for all sorts of articles, see E. J. Slijper, *Whales* [Amsterdam, 1962], 17-22, 38, 42-45.)

certain whales.³⁴ In this connection it is appropriate to cite the remarkable tale of a Babylonian *Amora*, Rabbah bar bar Ḥannah, who spent much time in Palestine and who was famous for his aphorisms and his tales. During one of his journeys to Palestine he saw the body of a *dāg* providing much food, three hundred jars of oil, and many bones for the construction of a temporary shelter.³⁵ For a long time this story was regarded as imaginary, but this is not necessary. Because the description of the *dāg* agrees with our knowledge of the anatomy of the cetacea, and because the quantities of food and oil which he mentions are on the order of those for which the whale and whalelike creatures are still hunted, Rabbah bar bar Ḥannah's tale ought to be considered supporting evidence for our suggestions regarding the large scope of the word *dāg*, that is, that it includes the marine mammals, and as evidence for the Mishnah's testimony regarding the many uses and utensils that had been made from the bone and tissue of the great aquatic creatures. From the literary nature of the story, the tale of a great marvel, we can deduce that the exploitation of stranded whales was not an "industry" peculiar to Rabbah bar bar Ḥannah's time and hence, possibly, a relatively recent advance, but rather an improvisatory response to a happy accident. Actually tales such as this would probably have perpetuated the memory of such fortunate occasions and preserved the tradition of what to do should they recur. As an improvisatory application or exploitation of the ancient skills of fashioning the flesh and bone of land animals into food and artifacts to use on sea mammals, we can read Rabbah bar bar Ḥannah's tale in conjunction with our anterior Mishnaic passages in order to achieve a remarkable insight into much more ancient times.

The Use of Fish Skin or Fishlike Mammals

The use of hides or skins preceded that of metals, and probably even that of pottery. It goes back to Paleolithic times and possibly its origin is related to magic.³⁶ Precisely the same applies to the skill of tanning, for which there is an abundance of evidence.³⁷ Once the skin is cured it can be made into all sorts of artifacts. Hence the use of skins to make garments, water bottles, thongs for tools, harnesses, saddles, wind screens, sandals, straps and countless other objects, constituted one of the oldest industries. By the time of the Bronze Age the

34 In Anglo-Saxon and Medieval times, whalebone was widely used for making triptyches and reliquaries. During the seventeenth and eighteenth centuries A. D., whales were chiefly hunted for their oil and whalebone. See T. K. Derry and Trevor I. Williams, *A Short History of Technology* (Oxford, 1961), 108, 687-88.

35 *Baba Batbra* 73b.

36 "Skins have, it is true, been worn in warm countries; but the original motive seems to have been mainly magical. They were thought to confer upon the wearer the qualities of the animals to which they once belonged, just as did necklaces and bracelets of teeth and claws. It seems to have been for this reason that a leopard skin came to be an emblem of rank and power among the Egyptian Pharaohs. The lion's skin which distinguished Hercules, doubtless originated in a similar idea when lions still existed in the lands about the eastern Mediterranean." Bishop, Abbot, and Hrdlička, *Man from the Farthest Past* (Washington, D. C., 1930), 102. See also J. W. Waterer, "Leather," *A History of Technology*, eds. Charles Singer, E. J. Holmyard, and A. R. Hall (Oxford, 1956), 2:147-86; M. Ebert, *Reallexikon der Vorgeschichte* (Berlin, 1920), 3:204; 7:264; Hawkes and Wooley, *Prehistory*, 162-63; A. Gansser, "Vor-und Frühzeit der Gerberei," *Civis Rundschau* 85 (1949), 3156-86.

37 For bibliography, see R. J. Forbes, *Studies in Ancient Technology* (Amsterdam, 1966), 5:22 f.

production and use of leather was already widespread almost everywhere in the Near East. Ancient Israel, too, had leather industries and its artisans made numerous leather products. This is asserted despite the generally prevailing opinion that tanning is never mentioned in the Bible, though the phrase *m^el^ek^et 'ôr* (Leviticus 13:48; cf. 13:51, 11:32) means simply 'processed skin', hence tanning.³⁸ Our information outside the Mishnah shows that leather was made from the skins of large and small land animals. This includes the available Sumerian evidence,³⁹ many Babylonian and Assyrian cuneiform tablets dealing with animal skins,⁴⁰ the leather discovered in Egyptian tombs and elsewhere,⁴¹ as well as the microscopic analysis of remains of skins found at various archaeological sites.⁴² The Eskimos and other northern peoples are the only exceptions to the rule. They are experienced in making water-proof clothing and kayaks out of the skins of fish, seals, and walrus. Some Caribbean tribes use shark skins extensively for sanding wood ("chafine gear") and as Norman states:

In certain of the Islands of the South Seas the natives made use of the dried and spiny skins of the Globe-fishes or Porcupine fishes for war helmets, and in Japan it is a common practice to make lanterns out of the inflated and dried skins of Puffers, by cutting out the back and suspending the fish by a wire. A candle being placed inside, the light shines as brightly through the stretched skin of the fish as through a piece of oiled paper.⁴³

Ritual Objects

As mentioned already, biblical texts refer to hides of a sea mammal called *tapaš* (dugong) as a donation to the Tabernacle and their use for decorative ritual purposes. The use of skins of large fish-like sharks or those of some sea mammals for ritual objects is proved by a Baby-

38 For a good survey of tanning in the Mishnaic and Talmudic literatures and for the reasons behind the low status of tanners, see J. P. Poole and R. Reed, "The Preparation of Leather and Parchment by the Dead Sea Scrolls Community," *Technology and Culture Anthology*, Melvin Kranzberg and William H. Davenport, eds. (New York, 1972), 156 f. (reprinted in a slightly condensed form from *Technology and Culture*, 3, 1. 1-26).

39 T. Jacobsen, "On the Textile Industry at Ur under Ibbi-Sîn," *Studia Orientalia Ioanni Pedersen dedicata* (Copenhagen, 1953), 172-87. Vaughn E. Crawford, *Sumerian Economic Texts from the First Dynasty of Isin* (New Haven, 1954). See also Armas Salonen, *Die Fussbekleidung der alten Mesopotamier* (Helsinki, 1969).

40 Considerable bibliography is to be found in Forbes, *Studies*, 5:73; and in Martin Levey, *Chemistry and Chemical Technology in Ancient Mesopotamia* (Amsterdam, 1959), 64-73.

41 Lucas, *Ancient Egyptian Materials*, 33-37. Note that among the Egyptians, references to skin are often made as "ox hides," "cow hides," and "panther skin." See James Henry Breasted, *Ancient Records of Egypt* (New York, 1962), 6:582; 4:379, 395; 2:265, 275, 321; 3:475. Nowhere do we encounter allusions to "fish skin" or that of sea mammals.

42 M. L. Ryder, "Remains Derived from Skin," *Science in Archaeology*, eds. Don Brothwell and Eric Higgs (New York, 1963), 530-43; and H. M. Appleyard and A. B. Wildman, "Fibres of Archaeological Interest: Their Examination and Identification," *ibid.*, 545-54.

43 J. R. Norman, *A History of Fishes* (London, 1963), 346-47. (As to the application of aquatic leathers, particularly those of sharks, rays and dog-fish, at the beginning of this century in the U.S., see Charles H. Stevenson, "Utilization of the Skins of Aquatic Animals," *U. S. Commission of Fish and Fisheries, Report of the Commissioner, Part 23*, [for 1902] [Washington, D. C., 1904], 281-352.)

Ionian decoration on a bronze bell showing an exorcist wearing a priestly robe made from the skin of a large fish or fish-like mammal;⁴⁴ by an Assyrian seal impression showing a worshiper facing a sacred tree flanked on both sides by two fish-skin garbed priest;⁴⁵ and by a bronze plaque of a scene of two fish-skin dressed priests officiating at the side of a bed-ridden man.⁴⁶ They are all obviously related to the myths in which fish and gigantic aquatic mammals have appeared. Some of these myths are very early.⁴⁷

Utilitarian Objects

The skins of the marine syrenia, particularly of the dugongs, are well known for their thickness and durability. They are similar to terrestrial animal hides. At present some wallets, belts and golf bags are manufactured from these skins. Their use for women's dress shoes (Ezekiel 16:10) was continued for centuries in the Near East,⁴⁸ and other luxury leather goods can be assumed to have been manufactured even if we have no literary evidence.

In many ways the same applies to the skins of some species of sharks which appear in the waters of Israel and also to those of various rays. Shark skin is well known for its strength, roughness and durability: it is covered with hard papillae and can be used for polishing. The spiky scales embedded in the skin of sharks are quite unlike the flattened scales of higher fishes; they provide the evolutionary origin of our own teeth. Paul Budker, referring to some species of sharks living in deep water in the Mediterranean and neighboring parts of the Atlantic, says that "between the wars, excellent results were obtained from the hide of this species (*Centrophorus Granulosus*), which was found to be amenable not only to the manufacture of luxury leather goods, but also to shoes."⁴⁹ This kind of skin can be used directly without tanning, and thus it was useable by the ancients when and where tanning was still unknown.

There is no doubt that whenever these skins were available, they were employed in the fabrication of various objects and commodities. The bags and flexible receptacles, like bottles for storing or transporting liquids, which are mentioned in *Kelim* 23:11, were only a few of the innumerable articles made from the skins of sharks and sea mammals.

Abrasives

The removal of splinters, the smoothing of irregularities, as well as the application of a fine finish upon the surface of high quality woodwork was achieved by the use of various abrasive substances. In Egypt the following were regarded as the common examples of abrasives: sand-

44 James B. Pritchard, *The Ancient Near East in Pictures* (Princeton, 1969), no. 665 (p. 216).

45 *Ibid.*, no. 706 (p. 223).

46 *Ibid.*, no. 658 (p. 215). See now Trudy S. Kawami, "A Possible Source for the Sculptures of the Audience Hall, Pasargadae," *Iran* 10 (1972), 146-48.

47 David Flusser, "Gods, Personification and Sea Monsters," *Senufim* (Bulletin published by the National Maritime Museum, Haifa, 1969-71), 3:22-50.

48 See Bodenheimer, *Animal Life in Biblical Lands*, 2:251. For earlier bibliography, see Julius Fuerst, *A Hebrew and Chaldee Lexicon* (London, 1867), 1469.

49 Budker, *The Life of Sharks*, 189.

stone, powdered abrasives, smooth pebbles, and, possibly, emery cloth.⁵⁰ However, from *Kelim* 16:1 we learn that beds and cots were "rubbed" over with "fish skin," the obvious purpose being to remove the splinters and make a smooth glossy surface. There is no doubt that the text refers here to the use of skins of sharks because of their abrasive quality. They were extensively applied for sanding wood of fine furniture, similar to the sandpaper in our days.⁵¹ Many primitive peoples of the Pacific Ocean basin still use shark skin as an abrasive. Incidentally, it may be added that in Egypt and in Babylonia, where fishing and marine culture were highly developed, the use of those skins as abrasives must also have been practiced.

Writing Material

Various materials were used as a writing surface. They included stone coated with plaster (Deuteronomy 27:2-3), wood tablets provided with a thin layer of beeswax, clay tablets, parchment, and the very expensive vellum (the latter two made of the skin of land animals), papyrus "and some kind of papyrus-like writing material."⁵² Bone, ivory, gold, silver, copper and bronze, as well as pieces of broken and discarded pottery, lead (Job 19:24), and even cloth were used as surfaces for inscription.⁵³ In none of the available archaeological evidence nor literature dealing with paleography do we find any references or even allusions to the use of the skins of fish or that of sea mammals for writing purposes.

As mentioned earlier, the text of *Shabbath* 108a speaks distinctly of writing passages in the phylacteries "on the surface of the skin of ritually clean fish." Although the text might contemplate writing upon the skins of true fish, it cannot have been common because fish skin is not suitable for this purpose. My attention is drawn to the fact that "The skin of bony fishes (teleostei) would not be a good bet for tanning or for other kinds of fixation because it lacks elastin and becomes very brittle when dry. This elastin is present in the skin of marine animals, such as the whale, dolphin, etc., and could be used for the preparation of some type of leather." However, making "paper" need not have necessitated tanning. It seems that drying after treatment with some preservative would make sheets that could be written upon.

Applying to our text the Talmudic rule of inference that specification is exclusion, we may conclude that one may not write the passages of the phylacteries upon the skin of "impure" marine animals, which is to say that some of them had skins which, when suitably processed, could be written upon. The skin that the text in *Shabbath* has in mind is most probably that of a whale. Its hide is opaque when fresh but it becomes yellowish and translucent when

50 Lucas, *Ancient Egyptian Materials*, 42-43, 66-67, 71-74.

51 Budker (*The Life of Sharks*, 188) mentions that "in Europe, oriental polished sharkskin-covered objects began to appear in the seventeenth century, and by the eighteenth century, European craftsmen had begun to practice this art."

52 A. Leo Oppenheim, *Ancient Mesopotamia* (Chicago, 1970), 60. As to parchment, see Michael L. Ryder, "Parchment—Its History, Manufacture and Composition," *Journal of Society of Archivists* 2 (1964), 391-9.

53 G. R. Driver, *Semitic Writing* (London, 1948), 98-103; Lucas, *Ancient Egyptian Materials*, 364; Forbes, *Studies*, 5:63-66. For a brief but excellent survey, see Kurt Galling, "Tafel, Buch und Blatt," *Near Eastern Studies in Honor of William Foxwell Albright*, 207-23.

dried, a poor but possible writing material. We must remember, however, that with the exception of clay and the expensive super-fine parchment called vellum, all the writing materials of ancient times were of coarse and poor quality. This judgment includes also the leather skins upon which the Isaiah text of the Dead Sea Scrolls was written, but at least processing whale skin cannot have been too difficult.

Professor Irving Rehman kindly informs me (January 16, 1973) that:

I had occasion to study the skin of these animals from the point of view of the histologic structure and configuration with regard to their swimming ability. I did find that the skin of the whales and dolphins was peculiar in that the outer layer or epidermal layer of the skin of the whales and dolphins rests upon a thick carpeting of very small blood vessels. This makes possible the removal of this outer thin layer quite readily. Furthermore, this layer is very smooth and should lend itself well to conversion to writing material such as the equivalent of papyrus. In the whale one finds beneath this outer thin layer resting upon the vascular network, a thin layer of fat and muscle. It is quite conceivable, therefore, that this could have been used as a form of writing material. The skin of the shark, on the other hand, is quite rough and directly in contact with the underlying musculature, so that its removal would be considerably more difficult than that of the whale or dolphin.

Professor Rehman's opinion on the possibility of using whale and dolphin skins for writing supports our inference from *Shabbath* 108a that they were indeed used for writing when they were available. What was testified to for ancient Israel in the uses of materials and technology, was surely known much earlier in Egypt, in this case, and in Babylonia.

Résumé

Not having recovered a single artifact or even a nonartifactual specimen of skin of a sea mammal, we have relied upon inference and considerable speculation. Hence, we suggest the following. Populations whose zones of distribution extended to the sea coasts made tools and numerous artifacts from the bones and skin of large fish and sometimes from those of the larger sea animals. This, we venture to suggest, applies to all populations including those of the ancient Near East. However, it may be taken for granted that those articles were never common, nor were they produced regularly. They were made incidentally, as opportunity arose, when odd whales, dolphins or sharks were washed ashore, dead or alive, or when they entered shallow waters and were caught by sandbanks or cliffs. It has to be stressed that there were no technical means of hunting sharks or any of the larger sea mammals. Slijper correctly states that "It seems that the ancients never hunted the bigger species."⁵⁴ Even in our day, steamships engaged in whaling are equipped with powerful engines. They carry a gun in the bows that fires a harpoon, weighing more than a hundredweight, fitted with hinged barbs that open inside the body of the whale. The head of the harpoon also contains an explosive charge that is fired upon contact with the animal. The frequent reports, based on the findings of bones of whales among the original inhabitants of Alaska of the fifteenth century B. C., that

54 Slijper, *Whales*, 13.

the Eskimos and North American Indians whaled from ancient times, are incorrect. That evidence indicates, rather, that they chased stranded animals ashore and succeeded in killing them. It was by such accidents that the bones and skins of sea mammals were utilized in ancient Israel as well as among other ancient near eastern sea populations. Their use in the ancient Near East is evident from the above quoted textual references in the Bible and from the Babylonian and Assyrian decorations. However, because of the sporadic availability of these animals, their by-products were not common but probably very rare and did not therefore warrant more frequent mention in the ancient texts.



Assyrian impression seal, carnelian, the central part representing a scene of a worshiper facing a sacred tree, on either side of which are two priests performing a ritual wearing robes of fish-skin or of skin of fish-like mammals. Photograph courtesy Pierpont Morgan Library, New York.



A Babylonian or Assyrian bell made of bronze decorated on one side with the figure of an exorcist wearing a priestly robe of skin of a large fish or fish-like mammal, and looking remarkably similar to a fish. Photograph from James B. Pritchard, *The Ancient Near East In Pictures* (Princeton, 1969), no. 665.

The face of an Assyrian bronze bell depicting an exorcist wearing a fish-like robe, looking remarkably similar to a fish. Photograph from James B. Pritchard, *The Ancient Near East In Pictures* (Princeton, 1969), no. 665.



The face of an Assyrian bronze plaque depicting among others a scene of an exorcism of a demon from a bed-ridden man by two priests clothed in fish-skin or skin of fish-like mammals, one (at left) distinctly resembling a fish. Photograph from Collection de Clercq, *Catalogue*.