

ABORIGINAL SKIN-DRESSING—A STUDY BASED ON MATERIAL IN THE
U. S. NATIONAL MUSEUM.

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INTRODUCTION.

Consider for a moment all the industries included within the word "leather." It involves everything done to the hides of animals from the moment they are taken off by the butcher until they are manufactured and ready to be sold to the consumer. It is important to enter somewhat into detail at this point before describing the skin-working apparatus of the American aborigines, so as to bring into a congenial relationship the earliest and the latest manifestation of a great series of industries.

The hides of cattle, sheep, goats, horses, dogs, and indeed of all domestic animals, the peltries of all wild animals that are of any use whatever to man, are gathered up in a kind of civilized or wild harvest, as the case may be, by butchers, trappers, hunters, etc., and sent to the tannery or to the manipulators answering to this trade.

Here commences a diversity of treatment, ending in the preparation of the hide with the hair remaining, by the furrier; in the production of a soft leather by a process called tawing; or in the manufacture of true leather by the use of tannin in some form. We have done now with the secondary industries.

The products of the leather factories are taken up and prepared for consumption by harness-makers, shoe-makers, glove-makers, satchel-makers, embossers, book-binders, carriage-makers, armorers, machinists, musical-instrument-makers, taxidermists, and the like, and passed on through the great Bazaar of commerce to those who will destroy them in use.

After fully realizing this immense body of industries, we are in a position to appreciate one or two facts respecting savagery, to wit, how largely the products of the skins of animals entered into the activity of primitive men; how necessary it is, in order to reconstruct that civilization, to know what modern savages do with these same substances, and finally to collect the tools and observe the processes of aboriginal

peoples working at this series of trades in order to know the life-history of a great human occupation.

The first artisans of this craft were, for the most part, women, who, indeed, were the inventors and fostering patrons of all these simple arts which lay at the foundation of most of our modern peaceful industries.

Let us follow the savage woman through her daily cares in order that we may comprehend the significance of her part in the play. The slain deer lying before her cave or brush shelter, or wigwam, shall be the point of departure in the inquiry. She strikes off a sharp flint flake for a knife. By that act she becomes the first cutler, the real founder of Sheffield. With this knife she carefully removes the skin, little dreaming that she is thereby making herself the patron saint of all subsequent butchers. She rolls up the hide, then dresses it with brains, smokes it, curries it, breaks it with implements of stone and bone, with much toil and sweat, until she establishes her reputation as the first currier and tanner. With fingers weary and worn, with needle of bone and thread of sinew, and scissors of flint, she cuts and makes the clothing for her lord and her family; no sign is over the door, but within dwells the first tailor and dress-maker. From leather especially prepared she manufactures moccasins for her husband, which to his speed adds wings. Compared with the tardy progress of her barefooted man in the chase, they are indeed the winged sandals of Hermes, and she is the aboriginal St. Crispin. Out of little scraps of fur and feathers, supplemented with bits of colored shell or stone or seeds, she dresses dolls for her children, makes head-dresses and toggery for the coming dance, adorns the walls of her squalid dwelling, creating at a single pass half a dozen modern industries—at once, toy-maker, milliner, modiste, hatter, upholsterer, and wall-decker.

In order to comprehend the steps in the processes of the aboriginal tanner it may be serviceable to take a hurried glance through a modern tannery. The methods of procedure are somewhat as follows:

(1) Salted or dried hides are soaked to make them pliable, washed, and the extraneous flesh taken off with a flesher, an instrument like a drawing knife, sharp on one edge and dull and smooth on the other. Market hides are soaked in fresh water to remove blood and dirt.

(2) The cleaned hides are then placed for a few days in a vat of lime water, which opens the pores, loosens the hair and combines with the oily matter in the hide to form a soap. Putrefaction softening is also resorted to for removal of the hair.

(3) The hides are then rubbed down with the smooth side of the flesher, the hair removed, and the skin made as pure and clean as it can be. They are at the same time rendered porous for the reception of the tannin.

(4) They are then hung in a series of tan-pits, in which the water is more and more charged with tannic acid until the hide is converted into leather.

(5) After rinsing, the hides are subjected to scouring in a machine by which one man can go over a hundred a day. But the interesting part remains that Turkey-stone is still the only substance that will do the work. The whole operation at this point is no more than a savage process, except that machinery is used to move the stone.

(6) The subsequent processes of drying, oiling, sweating, and pressing are varied with the uses of the leather. The genius of the inventor has been invoked to substitute machinery for these simple hand processes. After all the problems are the same, to remove the hair without impairing the hide, to introduce some antiseptic substance within the texture, to break up the fibrous tissue, and to render it pliable as possible. The subsequent processes of dyeing and preparing for special uses involve all the accretions of civilization, and produce the complexity of the more highly organized processes.

ANIMALS WHOSE SKINS ARE UTILIZED BY AMERICAN ABORIGINES.

It will help us in getting an adequate conception of the amount of work on peltries by our aborigines to consider for a moment the great number and variety of animals whose skins were necessary to their happiness. The mention of savage skin-working usually recalls the seal, elk, reindeer, musk-ox, buffalo, bear, deer, beaver, and fox, but a moment spent in examining the species of mammals which the fastidious taste of an Esquimo woman demands before her wardrobe is completed will enlarge one's knowledge.

In order to properly estimate the industry under consideration, a list of the animals whose skins are known to have been used by our aborigines is appended.

M A M M A L S .

Felidæ.

- Lynx rufus* (Güldenstädt). Bay lynx or wild cat. North America.
Lynx baileyi Merriam. Plateau wild cat. Colorado, Utah, and Arizona.
Lynx canadensis (Geoff. and Desm.). Canada lynx. Northern North America.
Felis yaguarundi Desm. Yaguarundi cat. North America, south of the United States.
Felis concolor Linn. Puma or cougar. America generally.
Felis pardalis Linn. Ocelot or tiger cat. Southwestern North America.

Canidæ.

- Canis lupus* Linn., var. *griseo-albus*. Gray wolf. North America generally.
Vulpes macrotis Merriam. Big-eared fox. Southern California.
Vulpes fulvus (Desm.), var. *decussatus*. Cross fox. Northern North America.
Vulpes fulvus (Desm.), var. *fulvus*. Red fox. Northern North America.
Vulpes fulvus (Desm.), var. *argentatus*. Silver fox; black fox. Northern North America.
Vulpes macrurus Baird. Prairie fox. Western States.
Vulpes velox (Say). Kit fox or swift fox. Western States.
Vulpes lagopus (Linn.). Arctic fox. Alaska.

- Urocyon virginianus* (Schreber). Gray fox. United States generally.
Urocyon virginianus (Schreber), var. *littoralis*. Coast gray fox. Islands of the California coast.

Mustelidæ.

- Mustela pennanti* Erxl. Fisher. Northern North America.
Mustela americana Turton. Pine martin or American sable. Northern United States.
Mustela caurina Merriam. Washington Terr.
Putorius erminea (Linn.). White weasel; ermine. Northern United States.
Putorius longicauda Bonaparte. Long-tailed weasel. Western United States.
Putorius vison Rich. Mink. North America generally.
Putorius nigripes And. and Bach. Black-footed ferret. Western States (in holes of prairie dogs).
Gulo luscus Sabine. Wolverine or glutton. Northern North America.
Taxidea americana Waterh. American badger. Western United States and Pacific slope.
Mephitis mephitis (Shaw). Common skunk. Eastern United States.
Mephitis estor Merriam. Arizona.
Spilogale putorius (Linn.). Little striped skunk. Florida.
Spilogale interrupta (Rafin.). Little striped skunk. Kansas.
Spilogale ringens Merriam. Little striped skunk. Alabama.
Spilogale indianola Merriam. Little striped skunk. Texas.
Spilogale lucasana Merriam. Little striped skunk. Lower California.
Spilogale leucoparia Merriam. Little striped skunk. Texas.
Spilogale gracilis Merriam. Little striped skunk. Arizona.
Spilogale saxatilis Merriam. Little striped skunk. Utah.
Spilogale phenax Merriam. Little striped skunk. California and Oregon.
Conepatus mapurito (Gmelin). White-backed skunk. Southwestern United States.
Lutra canadensis Sab. American otter. North America generally.
Enhydra marina Fleming. Sea otter. Pacific coast of the United States.

Ursidæ.

- Ursus horribilis* Ord. Grizzly bear. Western United States and Pacific slope.
Ursus richardsoni Reid. Barren ground bear. Arctic America.
Ursus americanus Pallas. Black bear. United States generally.
Thalartos maritimus (Linn.). White or polar bear. Northern America, Europe, and Asia.

Procyonidæ.

- Procyon lotor* (Linn.). Raccoon. United States generally.

Otariidæ.

- Callorhinus ursinus* (Linn.). Fur seal. North Pacific Ocean and Bering Sea.
Eumetopias stelleri (Lesson). Steller's sea lion. Pacific coast.

Phocidæ.

- Phoca vitulina* Linn. The common seal; harbor seal. North Atlantic and Pacific oceans.
Phoca groenlandica (Fabr.). Harp seal. Arctic seas.
Phoca fasciata Zimm. Banded or ribbon seal. Pacific coast, Arctic seas.
Erignathus barbatus (O. Fabricius). Square-flipper seal. Arctic seas.
Halichoerus gryphus (O. Fabricius). Gray seal. North Atlantic ocean.
Cystophora cristata (Erxl.). Hooded seal. North Atlantic ocean.
Macrorhinus angustirostris Gill. Sea elephant; elephant seal. Pacific coast.

Odobænidæ.

- Odobæmus rosmarus* (Linn.). Atlantic walrus. North Atlantic.
Odobæmus obesus (Illig.). Pacific walrus. North Pacific.

Bovidæ.

- Bison americanus* (Gmelin). Bison, or American buffalo. The great prairie region (nearly extinct).
Oribos moschatus Blainville. Barren grounds of Arctic America.
Mazama montana (Ord). Rocky Mountain goat. Northern Rocky Mountains of the United States and British America.
Ovis canadensis Shaw. Bighorn; Rocky mountain sheep. Rocky Mountain region.

Antilocapridæ.

- Antilocapra americana* Ord. Proughorn antelope or cabree. Plains west of the Missouri from lower Rio Grande to the Saskatchewan.

Cervidæ.

- Alces machlis* (Linn.). Moose. Northwestern United States to Alaska.
Rangifer tarandus (Linn.), subspecies *caribou*. Woodland caribou. Arctic and sub-arctic America.
Rangifer tarandus (Linn.), subsp. *groenlandicus*. Barren-ground caribou. Arctic America.
Cervus canadensis Erxl. American elk; wapiti. Northern North America.
Cariacus virginianus (Boddaert). Virginia deer. United States east of the Missouri.
Cariacus macrotis (Say). Mule deer. Central North America.
Cariacus columbianus (Rich.). Columbia black-tailed deer. Pacific slope.

Dicotylidæ.

- Dicotyles tajacu* (Linn.). Peccary. Red River, Arkansas, and southward.

Delphinidæ.

- Delphinapterus catodon* (Linn.). White fish or white whale. Arctic and subarctic seas (ascending large rivers).
Monodon monoceros Linn. Narwhal. Arctic seas.
Phocæna communis Lesson. Harbor porpoise; herring hog. North Atlantic and Pacific oceans.
Phocæna dallii True. Dall's porpoise. Coast of Alaska.
Globicephalus scammoni Cope. Blackfish. Pacific coast.
Grampus griscus (Cuv.). Grampus; cow-fish. North Atlantic.
Orca gladiator (Lacépède). Killer whale. Pelagic.

Physeteridæ.

- Physeter macrocephalus* Linn. Sperm whale. Tropical and temperate seas.

Talpidæ.

- Scalops aquaticus* (Linn.). Common mole. United States generally.

Sciuridæ.

- Sciurus niger* Linn.* Fox squirrel. Eastern United States, westward to the plains.
Sciurus carolinensis Gmelin.* Gray squirrel. United States.
Sciurus fessor Peale. California gray squirrel. Pacific slope.
Sciurus aberti Woodhouse. Tuft-eared squirrel. Southern Colorado, New Mexico, and Arizona.
Sciurus hudsonius Pallas.* Red squirrel; Chickaree. North America generally.
Tamias striatus (Linn.). Chipmunk. Eastern United States.
Tamias quadrivittatus (Say)*. Missouri striped squirrel. Pacific slope, eastward to Michigan.
Tamias lateralis (Say)*. Say's striped squirrel. Rocky Mountain region, from Mexico northward.
Spermophilus grammurus (Say)*. California ground squirrel. Pacific coast to Western Texas and New Mexico.
Spermophilus harrisi Aud. and Bach. Harris's ground squirrel. The Great Basin.
Spermophilus leucurus Merriam. Lower California.
Spermophilus franklini (Sabine). Gray gopher. Northern Illinois, northward to the Saskatchewan.
Spermophilus mohavensis Merriam. Mohave Desert.
Spermophilus mollis Kennicott. Short-tailed spermophile. Utah and Nevada, northward.
Spermophilus neglectus Merriam. Arizona.
Spermophilus tereticaudus Aud. and Bach. Round-tailed ground squirrel. Arizona.
Spermophilus tridecemlineatus (Mitchell)*. Striped gopher; prairie squirrel. The prairies of the United States.
Spermophilus mexicanus (Erxleben). Mexican ground squirrel. Southwestern Texas and southern New Mexico, southeastward into Mexico.
Spermophilus parryi Rich.* Parry's marmot. Northern parts of the continent, from the northern States to Hudson Bay and Bering Strait.
Spermophilus pilosoma Bennett.* Sonora ground squirrel. Eastern base of the Rocky Mountains north to western Wyoming.
Spermophilus cryptopilotus Merriam. Desert spermophile. Arizona.
Spermophilus canescens Merriam. Arizona.
Spermophilus richardsoni (Sabine). Yellow gopher. Plains of the Saskatchewan southward to the upper Missouri.
Spermophilus townsendi Bach. Townsend's ground squirrel. Plains of the Columbia.
Cynomys ludovicianus (Ord). Prairie dog. Great plains east of the Rocky Mountains.
Cynomys gunnisoni Baird. Short-tailed prairie dog. Sonoran region.
Cynomys leucurus Merriam. Wyoming.
Arctomys monax Linn. Woodchuck. Eastern North America.
Arctomys caligatus Eschscholtz. Hoary marmot. Rocky and Cascade Mountains from Washington northward.
Arctomys flaviventer Aud. and Bach. Yellow-bellied marmot. Rocky Mountains and westward to the Pacific coast.
Arctomys dacota Merriam. Dakota woodchuck. Black Hills, Dakota.

Haplodontidæ.

- Haplodon leporina* Rich. Sewellel; Showtl. Pacific slope (especially about Puget Sound).
Haplodon major Merriam. Sierra Nevada Showtl. Sierra Nevada Mountains.

* The species of rodents marked with an asterisk run into numerous geographical races. Descriptions of most of these will be found in the works of Drs. Cones and J. A. Allen, especially in *Monographs U. S. Geological Survey*, Vol. XI; also among the writings of Dr. C. H. Merriam, in *North American Fauna*, published by the U. S. Department of Agriculture.

Castoridae.

Castor canadensis Kuhl. American beaver. North America generally.

Geomyidae.

Geomys bursarius Rich. Pouched or pocket gopher. Missouri to Minnesota and Nebraska.

Geomys tuza (Ord). Florida salamander. Southeastern States.

Geomys castanops Baird. Texas pouched gopher. Texas and New Mexico.

Thomomys talpoides (Rich.). California gopher. Northern and western North America.

Thomomys clusius Cones. Small-footed pouched gopher. Rocky Mountains.

Muridae.

Cunicuculus torquatus (Pallas). White Lemming. Arctic America.

Myodes obensis Brants. Lemming. Arctic America.

Fiber zibethicus Cuv. Musk-rat. United States, except the southwestern portion and southern Florida.

Hystriidae.

Erethizon dorsatus (Linn.) var. *dorsatus*. White-haired porcupine. Northern United States.

Erethizon dorsatus (Linn.) var. *epixanthus*. Yellow-haired porcupine. Pacific slope and upper Missouri regions.

Leporidae.

*Lepus timidus** Fab., var. *arcticus*. Polar hare. Arctic and subarctic America.

Lepus americanus, Erxl. American hare; varying hare. Central United States to Alaska.

Lepus campestris, Bach. Prairie hare. Central plains of North America.

Lepus callotis Wagler. Jackass hare; jack rabbit. Southwestern United States.

Lepus texianus Waterh. Jack rabbit. Arizona.

Lepus californicus Gray. California hare. California.

Lepus sylvaticus Baeb.* Gray rabbit; cotton-tail. United States generally.

Lepus arizonae J. A. Allen. Arizona jack cotton-tail.

Lepus bachmani Waterhouse. Bachman's hare. Texas.

Lepus trowbridgii Baird. Trowbridge's hare. California.

Lepus palustris Bach. Marsh hare. Southeastern United States.

Lepus aquaticus Bach. Water hare. Southern States.

Lagomyidae.

Lagomys princeps Rich. Little chief hare or Pika. Rocky Mountain region from Colorado and Utah northward to Alaska.

Lagomys schisticeps Merriam. Sierra Nevada Pika. Sierra Nevada Mountains.

Dasypodidae.

Tatusia noveboracensis (Linn.). Armadillo. Southwestern United States and Southward.

Didelphidae.

Didelphys marsupialis Linn. Opossum. United States generally.

* The species of rodents marked with an asterisk run into numerous geographical races. Descriptions of most of these will be found in the works of Drs. Cones and J. A. Allen, especially in *Monographs U. S. Geological Survey*, Vol. XI; also among the writings of Dr. C. H. Merriam, in *North American Fauna*, published by the U. S. Department of Agriculture.

REPTILES.

Crocodilidæ.

Crocodylus americanus Seba. Florida crocodile. Southern Florida.

Alligator mississippiensis Daudin. Alligator. Southeastern North America.

Testudinidæ.

Testudo carolina Linn. Florida gopher tortoise. Southeastern North America.

Emydiæ.

Malacoclemmys palustris (Gmelin). Diamond-back terrapin. Coast from New York to Texas.

Pseudemys rugosa (Shaw). Red-bellied terrapin. New Jersey to Virginia.

Pseudemys concinna (Leconte). Florida terrapin. Southeastern United States.

SKIN-DRESSING AMONG THE ESKIMO.

For the purpose of approaching this industry in its earliest and least complex state a few quotations from early travelers and explorers are introduced. Crantz, in the history of Greenland (p. 167), speaks as follows:

“For their ‘kapitek,’ or hairy seal-skin clothes, they scrape the seal-skin thin, lay it twenty-four hours in the ‘korkik,’ or urine tub, to extract the fat or oil, and then distend it for drying with pegs on a green place. Afterwards, when they work the skin, it is sprinkled with urine, rubbed with pumice-stone, and suppled by rubbing between the hands.

“(2) The sole leather is soaked two or three days in a urine tub; then they pull off the loosened hair with a knife or with their teeth, lay it three days in fresh water, and so stretch it for drying.

“(3) In the same manner they prepare the ‘eresak’ leather that they use for the legs of boots and the overleather of shoes, only that it is scraped very thin to make it pliable. Of this leather they also make the sea-coats which the men draw over their other clothes to keep out the wet when they go to sea. It is true it grows as soft and wet as a dish-cloth by the salt water and rain, but it keeps the wet from the undergarments.

“(4) In the same manner they dress the ‘erogak,’ of which they make their smooth black pelts to wear on shore, only in working it they rub it between their hands; therefore it is not so stiff as the foregoing, but loses the property of holding out water and is not fit for boots and sea-coats.

“(5) The boat-skins are selected out of the stoutest seal hides, from which the fat is not quite taken off. They roll them up and sit on them and let them lie in the sun covered with grass several weeks till the hair will come off. Then they lay them in the salt water for some days to soften them again. They draw the borders of the skins tight with

their teeth, sew them together, and smear the seams and stitches with old seal blubber instead of pitch, that the water may not penetrate. But they must take care not to impair the grain, for if they do the corroding sea-water will easily eat through the leather.

“(6) The remnants of this and the other sorts they shave thin, lay them upon the snow or hang them in the air to bleach them white, and if they intend to dye it red chew the leather with some bark of the roots of pine, which they gather up out of the sea, working it in with their teeth.

(7) They soften the skin of the fowls about the head and then draw it off whole over the body. The processes of tanning, Hall says, are first to scrape the skin by an instrument called *Sek-koon* (by the Frobisher Bay Innuits, *Teg-se-koon*). (Plates LXX, LXXI.)

This instrument is about 6 inches long, including the handle, and is made of a peculiar kind of whet or oil stone, or else of musk-ox or reindeer bone or of sheet-iron. The second step is to dry the skins thoroughly; the third, to scrape again with the *sek-koon*, taking off every bit of the flesh; the fourth, to wet the flesh side and wrap it up for thirty minutes, and then again scrape with the *sek-koon*, which last operation is followed by chewing the skin all over, and again scraping and cross scraping with the instrument. These laborious processes Hall describes as resulting “in the breaking of the skin, making the stiff hide soft, finished like the chamois skin.” The whole work is often completed within an hour. (Narrative of the Second Expedition made by C. F. Hall, pp. 91, 92.)

“In Cumberland Sound,” says Kumlien, “when a seal skin is about to be prepared for drying the blubber is first removed somewhat roughly, the skin then laid on a board, and with the woman’s knife the membrane underneath the blubber is separated from the skin. The knife must be very sharp to do this successfully. The operators always push the knife from them. It takes considerable experience to do the job well. When all the blubber is removed, which will take three or four hours of faithful work, the skin is taken outside, and by means of the feet is rolled and rubbed around in the snow for some time, and by this process they succeed in removing every trace of grease from the hair. When thoroughly washed the skin is put upon the stretchers, if it be winter, to dry; these stretchers are merely four poles, which are lashed together at the corners, like a quilt-frame, the proper distance apart to suit the size of the skin. The skin is secured in place by seal-skin thongs passed through little slits along its edges and made fast to the poles.

When the skin is properly stretched upon the frame it is put above the lamps inside the snow-hut to dry. As the sun gets higher and begins to have some effect the skins are stretched, flesh side up, on the southern slopes of snow banks, and are secured by means of wooden or bone pegs about a foot in length.

As the season advances and the snow melts they begin to stretch the skins upon the ground by means of the before-mentioned pegs. The skins are not allowed to rest upon the ground, but are raised a few inches to allow the air to circulate underneath. Skins dry very fast when exposed in this manner.

The first days of spring are always a busy time with the Eskimo women. One thing is, they get more freshly-killed skins to prepare, and then they generally have a surplus stock of the winter's catch, which they could not take care of by the slow process of drying over the lamps in the huts during winter. The skins of the young in the white coats are dried in some considerable quantities, as it takes about fifteen to make a single suit of clothes, and many of them have double suits made from this material. They have no idea of any tan, and prepare the skins by merely rubbing them with their skin-scrapers.

We insert a sketch of a very old skin-scraper, such as are now found only in the old graves (Plate LXX, Fig. 3). It is made of stone, with a wooden handle, which is fastened to the stone by means of a strip of whalebone. Another and a later pattern is made from the scapula of the reindeer. A better idea of its manufacture can be got from the sketch than by a description. Such scrapers are still in use, but serve as a sort of auxiliary to one made from a tin can, resembling a little scoop in shape and having a wooden handle. This is the style of scraper made at the present day, and is by far the most effective instrument of the three. The manner of using these scrapers is to take the skin firmly in the left hand, to put the knee or foot upon the extreme part of it, holding it securely, while the scraper is worked with the right hand, pushing downward with some force. If the skins are very dry when they begin they are somewhat softened by rubbing with the hands, or even chewing the most stubborn parts. They continue using these tools upon a hide till it gains the desired pliability. All the work of stretching, drying, cleaning, washing, and softening the skins falls on the women.

“The skins of *Phoca barbata* are stretched on a frame like those of the netstick, but not until the hair has been removed. The cutting of the hair is one of the nastiest and most disgusting sights one can imagine. It generally falls to the lot of some old woman to do this. The skins are allowed to lie and become somewhat putrid, a portion of the blubber remaining on. The only tool used is the woman's knife before mentioned. When about to clean one of these skins the squaw takes off her boots, stockings, and pantaloons, and tucking her feet under her body, lays this dirty, bloody, greasy, stinking skin on her bare thigh, the flesh side down. She then pushes the knife against the hair, cutting or rather shaving it off. As her hand becomes too oily to hold on to the skin, she puts her fingers into her mouth and thus cleans them. When properly cleaned, it is dried in the manner already spoken of, except that the back and belly of the animal are dried separately, as the

skin is different on those portions of the body, and would cure unevenly. When finished it is almost as stiff and dry as a board. This skin is used mainly for the soles of boots; the pattern is cut from the hide and then chewed till it becomes sufficiently soft to sew. This last operation is also mainly performed by the old squaws. When they are too old to sew they become oojook chewers as the last resort, and when their teeth fail them they are better off in the grave." (Ludwig Kumlien. Bull. National Museum, No. 15.)

Amongst the Central Eskimo, says Dr. Franz Boas, the latest authority, the skin of the seal (*Phoca, fœtida*) is dressed in different ways according to the purpose for which it is intended. In skinning the animal a longitudinal cut is made across the belly with a common butcher's knife or one of ancient pattern (An. Rep. Bur. Ethnol VI., Fig. 460). The skin, with the blubber, is cut from the flesh with the same knife. The flippers are cut off at the points, and thus the whole skin is drawn off in a single piece. The woman's knife, ulo is used to clean and prepare the skins (*id.* Fig. 461), in which operation the women spread the skin over a piece of whalebone (*Asimautang*), a small board, or flat stone, and sit down before it, resting on their knees, the feet bent under the thighs. They hold the skin by the nearest edge, and pushing the ulo forward, remove the blubber and deposit it in a small tub, which stands near the board. As they proceed to the opposite end of the skin the finished part is rolled up and held in the left hand.

If the skin is to be used with the hair on it, the tough membrane (*mami*) which covers the inner side is removed in the same way as the blubber, and after it has been carefully patched and the holes have been cut all round the edge, it is stretched over a gravelly place or on snow by means of long pegs (*paukton*), which hold it a few inches above the ground, thus allowing the air to circulate underneath it. The skin itself is washed and rubbed with gravel, snow, or ice, and every hole made by the bullet or by the spear or in preparing it is sewed up. It very seldom happens that the women in preparing it damage the skin or even the thin mammae. It is particularly difficult to split the skin near a hole. First, they finish the work all around it and then carefully sever the membrane at its edge. The skin is dried in the same way as the membrane. In the early part of spring, though it may still be very cold, a few choice young seal skins are dried on snow walls which face the south. In order thoroughly to dry a seal skin, one fine warm spring day is needed. If the Eskimos are greatly in need of skins they dry them in winter over the lamps. A frame is made of four poles, lashed together, according to the size of the skin. A thong passes through the slits along its edge and around the frame, keeping the skin well stretched. Thus it is placed over the lamps or near the roof of the hut. However, it is disagreeable work to dry the skins inside the huts, and as they are much inferior to those which are dried on the ground, the Eskimos avoid it if they can. When so prepared the seal skins are only fit for

covering tents, making bags, etc.; they are too hard to be used for clothing, for which purpose the skin of yearlings is almost exclusively employed.

The young seals having shed for the first time have a very handsome coat, the hair being of a fine texture and much longer than in older animals. From the middle of May until late in summer their skins are most suitable for the manufacture of summer clothing, but it is necessary to protect the carcass of the killed animals from the burning rays of the sun as soon as possible, or the skin will be quickly spoiled.

After being dried they are cleaned with a sharp scraper (*teserqun*) (Boas, Figs. 465, 466). The skin is then soaked in salt water and washed again. As soon as it is dry it is softened with a straight scraper (*seligoung*) (Boas, An. Rep. Bur. Ethnol., VI, Fig. 468).

Skins of *Phoca fœtida*, *Cystophora cristata*, and *Phoca groenlandica* are prepared in the same way.

Those that are intended for kayak covers, boots, mittens, quivers, etc., are prepared in a different way. They are either put into hot water or laid in a brook for a few days until the hair begins to loosen. Then both sides are cleaned and worked with the ulo, in order to clean and shave them. When the hair has been removed they are dried and made pliable in the same way as has been described. If it is intended to make the skin as soft as possible, it is allowed to become putrid before it is cleaned. Then the hair and blubber are removed, and afterwards it is left to hang in the sun a few days until it acquires a light color.

The large ground seal *Erignathus barbatus* is skinned in a different manner. Its skin is very thick, even thicker than sole-leather, and is extremely durable, and suitable for all sorts of lines, particularly traces, lashing and harpoon lines, and for soles, drinking cups, and boat covers. The skin of the back and of the breast dries unequally, and therefore a piece covering the throat and breast is taken out and dried separately. If it is to be used for lines, it is cut by making girdles about 6 inches in width around the body. The hair and blubber are removed from these cylindrical rings, from which lines are made by cutting spirally, a string 70 or 80 feet long being thus obtained.

This line is stretched as taut as possible between two rocks, and while drying it undergoes an enormous tension. Before it is taken from the rocks the edges are rounded and cleaned with a knife.

Walrus hide is always cut up before being prepared. As soon as the walrus is killed it is cut into as many parts as there are partners in the hunt, every part being rolled up in a piece of skin and carried home in it. Sometimes the skin is used for making boats, but generally it is cut into lines. Both kinds of hide, that of the walrus and that of the ground seal, are as stiff as a board when dried and require much work before being fit for use. They are chewed by the natives until they become thin and pliable. The whole skin must be chewed in this way before it can be used for soles and boat covers. Afterwards it is scraped

with the tesirqun and softened with the straight scraper. The new thongs after being dried between the rocks must be also chewed until they become sufficiently pliable, after which they are straightened by a stretcher that is held with the feet (Boas, Fig. 469.) Frequently they are only pulled over the sole of the boot for this purpose, the man taking hold of the line at two points and pulling the intermediate part by turns to the right and to the left over the sole of the foot.

Another kind of line is cut from the hide of the white whale, which is skinned in the same way as the ground seal; but, as it must be slit on the spinal column, the single pieces of line are much shorter, and they can not be used to the same extent as seal lines. Some lines are cut from the skins of *Pagomys fœtidus*, but these are weak and greatly inferior to lines of ground-seal hide.

Deer skins are dried in summer and dressed after the ice has formed. Like all other kind of skins, they are not tanned, but curried. They are hung up on the rafters of the hut, and the workers in Oqo and Akudnirn, the women—in Hudson Bay the men—take off their jackets and begin preparing them with the sharp scraper. After being cleaned in this way they are thoroughly dried, either by hanging them near the roof of the hut, or according to Gilder, by wrapping them around the upper part of the body next to the skin, after which they are again scraped with the tesirqun. This done the flesh side is wetted, the skin is wrapped up for half a day or a day, and afterwards undergoes a new scraping. Then it is chewed, rubbed, and scraped all over, thus acquiring its pliability, softness, and light color. In the spring the skin of bears and of seals are sometimes dried on large frames which are exposed to the sun, the skins being tied to the frames with thongs. Smaller quadrupeds, as foxes and ermines, are skinned by stripping the entire animal through its mouth without making a single cut in the skin. Birds are opened at the breast, and the body is taken out through this small hole; the head, wings, and legs being cut off at the neck and the joints. Ducks are frequently skinned by cutting the skin around the head and the outer joints of the wings and legs, and stripping it off. The skins are cleaned by sucking out the fat and chewing them.

Skins of salmon are used for water-proof bags, intestines of seals, particularly those of ground seals, are carefully dried, and after being sewed together are used for sails, windows, and kyak jackets.

The Malemut Eskimo tan and soften the seal skin used for boot-soles in urine (Whimper, Tr. Ethnol. Soc. 1868). For making kyaks and umiaks seal skins are used. The skin is prepared in the first instance, while the hair is yet on it, by spreading fermented fish-spawn over it, and allowing it to remain until the hair rots off. It is then stretched on a frame and saturated with urine until it becomes translucent. The fat is removed with bone and stone knives, metal being considered likely to cut it. (Whimper, Alaska, 162.)

The hide scraper of the Chukchis is of stone or iron, and fastened to a wooden handle, and looks like a spokeshave. It is, indeed, the lineal descendant of the bone scraper. With this tool the moistened hide is cleaned very particularly, and is then rubbed, stretched, and kneaded so carefully, that several days go to the preparation of a single reindeer skin. That this is hard work is also shown by the woman who is employed at it in the tent dripping with perspiration. While thus employed she sits on a part of the skin and stretches out the other part with the united help of the hands and bare feet. When the skin has been sufficiently worked she fills a vessel with her own urine, mixes this with comminuted willow bark which has been dried over the lamp, and rubs the blood-warm liquid into the reindeer skin. In order to give this a red color on one side the bark of a species of *Pinus* (?) is mixed with the tanning liquid. The skins are made very soft by this process, and on the inner side almost resemble chamois leather. Sometimes, too, the reindeer skin is tanned to real chamois of very excellent quality.*

The Tuski understand the art of tanning and are able to produce very fair specimens, but practice it principally with seal skin, which is dressed in all colors. The white is very delicate and much prized. Deer skins are dressed with ammonia, red ocher and other materials. They are rendered very soft and pliable (W. H. Hooper, p. 183). This description answers perfectly to the work done on the reindeer hide, both with and without the hair, by the Indians and Eskimo of Ungava, Canada.

A large collection of those brought by Lucien Turner will be found in the National Museum. The softness of the texture is marvelous. Not one particle of rigid fiber seems to have been left in the skin. In order to effect this perfect flexibility the statement of Nordenskjöld is not overrated. Indeed, those who have seen some of the best of the wigwams made of buffalo hide depilated will recall the softness and pliability effected in this refractory material by the application of human muscle, which after all is the chief ingredient in aboriginal tanning.

CHAPTER III.

SKIN DRESSING AMONG THE INDIANS.

The skin-working apparatus of the Naskopi Indians is described by Lucien Turner.

This instrument is one of the few really labor-saving tools of the poorly equipped Naskopi; and is particularly effective in removing the hair from the hides of various mammals or the fat from the flesh side of the skins. The skin is removed from the beast and laid aside until a convenient time arrives for preparing it for its intended uses. The

* Nordenskjöld, *Voyage of the Vega*, New York, 1882, Macmillan, 486, Fig. 1.

time depends on the season of the year; for if it be in the height of the deer-killing the poor squaw has her hands full of labor, since she must not only remove the skins from the carcasses, but prepare the flesh for drying, smoking, or other manner of preserving it for the future. To these labors are to be added the other domestic duties which fully occupy the shortening days of the year, and often cause her to express a wish that the deer were less plentiful for the time being. When a number of reindeer skins have been collected they are wetted and thrown into a pile, where they are allowed to decompose or ferment until the hair is loosened in its follicle. The process may be inspected from time to time, and when advanced to a proper state a skin is taken from the heap to undergo the act of depilation, which is effected in the following manner. (Plate LXVII, Fig. 1.)

The radius or large bone of the fore-leg of the reindeer is cleaned of its flesh and one side of the shaft or central portion of the bone is removed, leaving two sharp edges. One edge is dull or rounded for reasons which will appear clear in the manner of using the scraper. The other or outer side (for the instrument is to be held in a certain way) is rendered sharp, so as to form an edge, but not so keen as to cut the pelt. The skin is now placed upon a short beam of wood about 3 or 4 inches in diameter and long enough to reach obliquely from the abdomen of the standing person to the ground at a convenient distance, say 4 feet in length. Over this beam the skin is laid with the hinder part of the skin towards the person, so as to allow the edge of the scraper to work against the layer of hair. The scraper is now seized with one end in each hand and applied to the portion of the skin lying in contact with the beam. A skilful push dislodges the hair, and the skin appears clean and free from hair wherever the edge of the bone has scraped its surface. The process continues until each part of the skin is brought under the edge of the scraper and the work is complete. This instrument is also employed to remove the excess of water from a skin that has been wetted to bring it into the degree of pliability desired. It is employed in the same manner to remove the scurf from the skins of the white whales (*Delphinapterus calodon*), captured in goodly numbers each year near Fort Chimo. (I must here add that the Whale River (Fort George) Indians perform this labor, as the Naskopis consider the whale too oily a creature for them to work. It only proves that the employment of this instrument is not confined to the Naskopi Indians.)

It should be understood that this form of aboriginal beaming-knife is employed for removing the hair from reindeer skins that are to be converted into parchment (raw hide) or into buckskin. It is to be remarked that the scraper is used only after the flesh side of the skin has received attention. The flesh side requires another form of instrument to effect the removal of the skin-muscles, ligaments, and adherent fat. An instrument is especially made for removing that part. The heel bone of the reindeer is cut very obliquely at the lower end, so that the flat edge

may form a blade, which is ground sharp and then finely serrated. A strap-like loop is tied around the bone, and when the tool, which is adze and chisel combined, is grasped, the hand is prevented from slipping along the bone by the loop passing under the wrist and supporting the hand. The adherent muscle is quickly separated from the skin and forms a sort of vellum, which may be dried and serve as wrappers for bundles of furs or dry meat. The fleshy side of the skin is rubbed with a mixture of decomposed brains and liver and laid away for several hours. The process of rubbing is next resorted to, resembling the act of rubbing linen in the laundry between the hands. When the desired pliability is gained, the superabundant fat and moisture are removed by calcareous earths, bone dust, or flour, to act as absorbents. The skins are now ready for any purpose. (Plate LXVIII, Figs. 1, 2, 3.)

Lieut. G. T. Emmons, U. S. Navy, says that the Chilkat women procure the hair of the Rocky Mountain goat for their sacred blankets by rolling up the hide until it sweats and the pores are opened. A woman then sits on the ground, lays the skin on her lap, and with her hands scrapes off the hair in great flakes, without the use of a beaming-knife of any kind. This, of course, is the simplest form of depilation. The next is that practiced by the Indians of northern California, who employ a rib of the elk, without any modification whatever.

The manner of preparing buckskin by the Nisqually and Columbia River Indians is as follows: Immediately after the animal is killed the skin, having all the hair scraped off, is stretched tight on a frame. It is there left until it becomes as dry as parchment, then it is rubbed over with the brains of the animal, which impart oil to it. It is then steeped in warm water and dried in the smoke, two women stretching it all the time it is drying. It is then again wet and wound tightly around a tree, from which it is again taken, smoked, and drawn by the women as before. When nearly dry it is rubbed with the hands, as in washing, until it is soft and pliable, and then it is ready for use.

Mr. Forest stated to me that he had put on a suit twenty-four hours after the animal had been running in the forest. (Wilkes.)

The Crows, like the Blackfeet, are beautifully costumed, and perhaps with somewhat more of taste and elegance, inasmuch as the skins of which their dresses are made are more delicately and whitely dressed. The art of dressing skins belongs to the Indians in all countries; and the Crows surpass the civilized world in the beauty of their skin-dressing. The art of tanning is unknown to them, when civilized habits and arts have not been taught them; yet the art of dressing skins, as we have it in the civilized world, has been (like hundreds of other ornamental and useful customs which we are practicing) borrowed from the savage without our ever stopping to inquire whence they come or by whom invented.

The usual mode of dressing the buffalo and other skins is by immersing them for a few days under a lye from ashes and water until

the hair can be removed, when they are stretched upon a frame or upon the ground with stakes or pins driven through the edges into the earth, where they remain for several days, with the brains of the buffalo or elk spread upon and over them, and at last finished by "graining," as it is termed by the squaws, who use a sharpened bone, the shoulder-blade, or other large bone of the animal, sharpened at the edge somewhat like an adze, with the edge of which they scrape the fleshy side of the skin, bearing on it with the weight of their bodies, thereby drying and softening the skin and fitting it for use. (Plate XCI.)

The greater part of these skins, however, go through still another operation afterwards, which gives them a greater value and renders them much more serviceable—that is, the process of smoking. For this a small hole is dug in the ground, and a fire is built in it with rotten wood, which will produce a great quantity of smoke without much blaze, and several small poles of the proper length stuck in the ground around it, drawn and fastened together at the top, around which a skin is wrapped in form of a tent, generally sewed together at the edges to secure the smoke within it. In this the skins to be smoked are placed, and in this condition the tent will stand a day or two inclosing the heated smoke, and by some chemical process or other which I do not understand the skins acquire a quality which enables them, after being wet many times, to dry soft and pliant as they were before, which secret I have never yet seen practiced in my own country, and for the lack of which all of our dressed skins, when once wet, are, I think, chiefly ruined.

An Indian's dress of deer skins, which is wet a hundred times upon his back, dries soft; and his lodge also, which stands in the rains and even through the severity of winter, is taken down as soft and as clean as when it was first put up.

A Crow is known wherever he is met by his beautiful white dress and his tall and elegant figure, the greater part of the men being 6 feet high. The Blackfeet, on the other hand, are more of the herculean make, about middling stature, with broad shoulders and great expansion of chest, and the skins of which their dresses are made are chiefly dressed black or of a dark-brown color, from which circumstance, in all probability they—having black leggins or moccasins—have got the name of Blackfeet. (Catlin's *Eight Years*, pp. 46–47, vol. 1.)

Among the Sioux the hides were stretched and dried as soon as possible after they were taken from the animals. When a hide was stretched on the ground pins were driven through holes along the borders of the hide. These holes had been cut with a knife. While the hide was still green the women scraped it on the under side by pushing a webajabe over its surface, thus removing the superfluous flesh, etc. The webajabe was formed from the lower bone of an elk's leg, which had been made thin by scraping or striking. The lower end was sharpened by striking, having several teeth-like projections, as in the accompanying figure. A withe was tied to the upper end, and this was secured to the arm of

the woman just above the wrist. When the hide was dry the woman stretched it again upon the ground, and proceeded to make it thinner and lighter by using another implement called the wenbaja, which she moved towards her after the manner of an adze. This instrument was formed from an elk horn, to the lower end of which was fastened a piece of iron (in recent times) called the wen-hi. (Plates XC and XCI.)

When the hide was needed for a summer tent, leggins, or summer clothing of any sort, the weubaja was applied to the hairy side. When the hide was sufficiently smooth grease was rubbed on it, and it was laid out-of-doors to dry in the sun. This act of greasing the hide was called wawexigxi, because they sometimes used the brains of the elk or buffalo for that purpose.

Dougherty stated that in his day they used to spread over the hide the brains or liver of the animal, which had been carefully retained for that purpose, and the warm broth of the meat was also poured over it. Some persons made two-thirds of the brain of an animal suffice for dressing its skin. But Frank La Fleche says that the liver was not used for tanning purposes, though the broth was so used when it was brackish.

When the hide had been dried in the sun it was soaked by sinking it beneath the surface of any adjacent stream. This act lasted about two days. Then the hide was dried again and subjected to the final operation, which was intended to make it sufficiently soft and pliant. A twisted sinew about as thick as one's finger, called the "wexikiude," was fastened at each end to a post or a tree about 5 feet from the ground. The hide was put through this and pulled back and forth. This act was called waxikinde. On the commencement of this process, called ta"pě, the hides were almost invariably divided longitudinally into two parts each, for the convenience of the operator. When finished they were again sewed together with awls and sinews. When the hides were small they were not so divided before they were tanned.

The skins of elk, deer, and antelopes were dressed in a similar manner. (J. O. Dorsey, *An. Rept. Bur. Ethnol.* 1881-'82, p. 310.)

Dressing skins by the Sioux Indians is thus described by a noted traveler: "They had killed a large elk, the skin of which the women were employed in dressing. They had stretched it out by means of leather straps on the ground near the tent, and the women were scraping off the particles of flesh and fat with a well-contrived instrument made of bone, sharpened at one end, and furnished with little teeth like a saw, and at the other end a strap, which is fastened around the waist. The skin is scraped with the sharp edge of this instrument until it is perfectly clean. Several Indians have iron teeth fixed to this bone." (Maximilian's Travels.)

Again: "We looked at the women as they worked; for the shoes they made they had softened the leather in a tub of water and stretched it in the breadth and length with their teeth. In another,

tent the women were dressing skins, either with a pumice-stone or with the toothed instrument described before. They then pulled the skin over a line in all directions to make it pliable." (Maximilian, p. 158.)

Among the Kiowa Indians those skins taken are mostly dressed for lodges. They are first staked on a smooth spot of ground and water put upon them, when they are ready for fleshing. This consists in removing the flesh with an instrument made of a straight bar of iron, about a foot in length, flattened at one end and filed to the edge. This being grasped in the hand, and a succession of quick blows given, the work slowly proceeds. The skin is then dried, after which the hair is removed in a dry state, and the skin reduced to the proper thickness by dressing down on the hair side. This is done with an instrument made by firmly tying a flat piece of steel, filed to a beveled edge at one end and with the corners rounded, to a large prong of a deer's horn. This is so trimmed, in connection with the body of the horn, as to form an elbow, and is used a little as a carpenter uses his adze. This work is usually done in the cool of the morning. The brains of the animal, having been properly taken care of for the purpose, are now soaked and squeezed by the hand until reduced to a paste and applied to both sides of the skin, which is afterwards worked and rubbed until flexible.

The preparation of robes is from winter skins, and differs from the foregoing only in being dressed down on the flesh side, so as to leave the wool and hair upon the robe, and is more thoroughly worked and scoured by means of a sharp gritted stone. (Thomas C. Battey. *A Quarter of a Century among the Indians*, 1875, pp. 187-188.)

The Pitt River Indians and the Modocs tan their leather by nearly the same process. When an Indian wants buckskin for clothes, immediately after skinning a deer he cuts its head open, procures the brains, spreads the skin on a smooth log with the bark off. The flesh side of the skin being up, he rubs the brains over it and allows it to dry. This makes the hide not only grain easier, but half tans it. The skin is then thrown into the stream, where it is allowed to remain three or four days. This raises the grain. It is then thrown across a slick smooth piece of log about 10 or 12 inches in diameter. One end of this stick is usually about 3 feet off of the ground and the other end resting on the ground. The neck of the skin is now pulled 6 or 8 inches over the elevated end of the graining log, and the stomach of the grainer pressed tightly against it. A flat stick is usually placed between the stomach and the skin. This enables the workman to hold the skin from slipping. He has what is known as a graining-knife. This knife is now made of iron, but was not long since made of hard yew wood. It is from one-fourth to three-eighths of an inch thick, by 2 to 3 inches wide. It is curved edgewise to fit the round surface of the graining-log. The edge is perfectly square. There is a handle at each end, and the knife is taken by each handle and pushed vigorously down the skin. This is rather slow work; still, an Indian will

grain twelve or fifteen skins in a day. After a skin is grained it is thrown into a basket of water. This water has a lot of roots cut up in it that causes the water to lather like soap. In fact it is called soap-root, and is used not only for tanning, but for washing clothes, etc. The hide is allowed to remain in this soapy water from three to four days. It is then taken out and rubbed and pulled dry. This completes the tanning of a skin. If, though, it be a very large one, the same process is gone through with, except the graining, the second time, which invariably leaves the skin soft and nice. This rule is slightly varied by some of the tribes. For example, the brains will be taken from the deer's head and cooked about half. This keeps it from spoiling. The skin is soaked longer to raise the grain, sometimes a little ashes being sprinkled on the skin, which makes the grain slip. After graining the skin is thrown into brain-water and soaked, instead of using the soap-root water. It is then worked as before described until soft. We now have buckskin. To prevent this from becoming stiff and hard when wet it is thoroughly smoked. This smoking process is also practiced by the settlers here, but I think the idea originated with the Indians. A ditch is cut in the ground about 2 feet deep and 20 or 25 feet long. At one end of this ditch a rough fire-place is made, being usually walled up with rock. Over the other end of the ditch is a large hollow log, something like a bee-gum, only larger and taller. In this the buckskins are hung, and the top of the gum pretty well closed. Sticks are laid cross-wise close together from one end of the ditch to the other and covered completely over with dirt. This makes a blind ditch from fire-place to the gum. A fire is now built in this fire-place, and the smoke naturally follows the ditch, there being an escape for the smoke in the top of the gum. The idea of having the ditch long is a good one; the smoke becomes cool in its passage through the ground, and there is no danger of burning the buckskin. A buckskin is smoked two or three days. After this it can be washed like a piece of cloth, and when dry is equally as soft.

The tribes belonging to the Shoshonian stock inhabiting the Great Interior Basin were formerly most expert manufacturers of buckskin leather. Clothing, tents, and much of their paraphernalia were made of three kinds—the white, the yellow, and the brown. The processes of preparing were identical in the main with those described. However, the hair was removed in many cases by rolling up the hide in ashes wet with warm water for a few days. The hair was then removed by means of a wooden knife, a rib, or in later times with an old case-knife or bit of hoop-iron. The yellow and the brown skins received their tint by drying them over a smoldering fire of dry willow for the former and green willow for the latter color. The skins were vigorously pulled and stretched in every direction while the drying and smoking were going on. (Compare Plates XCI, XCII, XCIII.)

Tanning among the Pawnees is thus effected: The hide is extended

upon the ground and with an instrument resembling an adz, used in the manner of our carpenters, the adherent portions of dried flesh are removed and the skin rendered much thinner and lighter than before. The surface is then plastered over with the brains or liver of the animal, which have been carefully retained for the purpose, and the warm broth of meat is also poured over it. The whole is then dried after which it is again subjected to the action of the brains or broth, then stretched in a frame and while still wet scraped with pumice-stone, sharp stones, or hoes until perfectly dry. Should it not be sufficiently soft it is subjected to friction by pulling it backward and forward over a twisted sinew.

This generally terminated the process. On the commencement of it the hides are almost invariably divided each longitudinally into two parts for the convenience of manipulations and when finished they are again united by sewing with sinew. This seam is almost always present in the bison robe, but one of the largest we have seen is used for covering on one of our beds, and has been dressed entire, being destitute of a seam. When the process of tanning and dressing is completed and the inner surface of the skin dry, figures are traced upon it with vermilion and other showy colors. These are designed as ornaments, but are sometimes the record of important facts. (Long's Ex., Vol. I, pp. 221, 440.)

The Senecas used to tan green hides. If a hide was dry it was soaked in the water of a running stream, after which it was stretched on a smooth log the size of a man's leg. With a knife-blade, placed in a curved stick, all the hair and outside skin was scraped off. After that the flesh was scraped off and the skin thoroughly dried. It was then soaked in a suds made of deer's brains and warm water, one or two Indians rubbing with stones, much like those called axes plowed up in the fields, and often pulling the skin. A hole 18 inches in diameter was then made in the ground and the skin suspended above it on upright sticks and smoked, until the desired color is produced, by burning rotten wood beneath. The skin was then ready for use.

Skin-dressing among the Eastern Indians is thus described :

These skins they convert into very good leather making the same plume and soft. Some of these skinnes they dress with haire on and some with the haire off. The hairy side in winter they weare next their bodies and in warme weather they weare the haire outwards. They make likewise some coates of the Feathers of Turkeys which they weave together with twine of their owne makinge very prettily ; these garments they weare like mantels knit over their their shoulders and put under their armes. They have likewise another sort of mantels made of Mose skinnes, which beast is a great large Deere so bigge as a horse. These skinnes they commonly dresse bare and make them wonderous white and stripe them with size round about the borders, in form like lace set on by a taylor and some they stripe with size in works of severall fashions very curious, according to severall fantasies of the workmen wherein they strive to excell one another. And mantels made of Beares skinnes is an usuall wearinge among the natives that live where the beares doe haunt. They make skinnes of Mose skinnes, which is the principal lether used to that purpose and for

want of such lether which is the strongest, they make shoes of deeres skiunes very handsomely and commodious, and of such deeres skiunes as they dresse bare they make stockings that comes within their shoes, like a stirrup stockinge and is fastened above at their belt which is about their middell. A good well growne deere skin is of great account with them and it must have the tale on, or else they account it defaced. The tale being three times as long as the tales of our English Deere, yea foure times so longe. This when they travell is raped round about their body and with a girdle of their making bound round about their middles to which girdle is fastened a bagg in which his instruments be with which hee can strike fire upon any occasion.

Of their several arts and employments; as first in dressing all manner of skiunes, which they do by scraping and rubbing, afterwards painting them with antique embroyderings in unchangeable colors, sometimes they take off the haire especially if it bee not killed in season. (Wood's N. England Prospect. Prince Pub. Soc. I. Page 101.)

DETAILS OF SKIN-DRESSING AMONG THE NAVAJOS.

When the author at first contemplated this paper he found that the accounts of the most careful observers were not quite up to his requirements. He therefore wrote to his friend Dr. R. W. Shufeldt, U. S. Army, begging him to define the process as minutely as possible. The result was most satisfactory and was published in the Proceedings of the Museum for 1888. As much of Dr. Shufeldt's paper as is necessary to complete this narrative is here reproduced, together with the illustrations. The reader should note especially the similarity of the hair scraper to those from Point Barrow, Labrador, the Interior Basin, and the graves of Madisonville, Ohio. (Plates LXI to LXVII.)

Dr. Shufeldt employed a Navajo to do the work for him. In a day or two this Indian returned with a fine doe, an adult specimen of *Cariacus macrotis*. He had skinned the legs of the animal from the hoofs up as far as the ankles, which he disarticulated partially, so the limbs could be tied more compactly together, and thus be less liable to either frighten his horse or catch in the low timber as he returned home with his game.

"The deer which had been captured for me had already been eviscerated and the skin divided from its chin to its tail, the entire length of the under side of the animal. In a moment with a sharp hunting-knife he divided the skin on the inside of the thighs, from the ankles to the abdominal division, making similar incisions on the inside of the forelimbs. The legs were quickly skinned, the small tail split up on its under side and the vertebræ removed, while with his knife the hide was started on both sides from the abdominal and throat incision and quickly removed in the direction of the animal's back. Thus it was that the skin was removed from the entire body and up to the ears first; then as he arrived at the latter, their cartilages were cut through close to the skull, leaving the great ears of this species of deer attached to the hide. When he arrived at the eyes, these were skinned round, much in the same way as a skilful taxidermist manages the eyes in any vertebrate specimen he may be preparing. Upon arriving at the muzzle

he simply divided the skin all around, posterior to the external nostrils, and the operation of removing the hide was completed. (Pl. LXI.) He next proceeded to dig a hole in the ground about as big as a bushel. The bottom of this excavation was tramped hard with his feet and the hide placed therein, hair side up, and immediately covered with cold water. On top of the hide he placed a camp-kettle bottom side up, and braced it down with the spade. This was to prevent the skin from drying and to keep the dogs from eating it during the night.

“In the morning he left the camp with an axe to soon return with the trunk of a small pine tree. At its thickest end it was about 6 inches through, and about 4 inches at the smaller extremity. From one side of the larger half he removed the bark, completely exposing the smooth surface of the wood beneath it. He next cut a deep notch in the big end of this stick, so as to assist in bracing it against the limb of a small cedar tree near by, with the smooth surface facing him and the small end of the stick resting firmly upon the ground some two feet from the base of the cedar tree. Around about was plentifully bestrewn some clean short hay, to prevent the hide from being soiled upon the ground beneath. He now returned to the hole where the skin had remained over night, and it was taken out to be washed in clean water, when he proceeded with a sharp knife to remove all superfluous tissue from its raw side, skinned the ears carefully by removing completely the cartilaginous parts, then cleared away the muscles which had remained attached about their bases, trimmed off the remains of the panniculus muscle, and indeed left nothing but a thoroughly clean hide which received its final dip in clear water.

“It was now ready to have the hair shaved from it. The tanner obtained his scrapers from the bones of the fore limb of the deer he had killed, and the ulna and radius of this limb are wonderfully well fitted to perform the work of this natural spoke-shave. These bones, as we well know, are, in a deer, as in many other hoofed animals, quite firmly united together, having a form well known to the comparative osteologist. The shaft of the ulna, which is closely approximated to the shaft of the radius, has its posterior edge thin and sharp, which is still further improved by the tanner scraping it with his knife. The olecranon process, with the deep sigmoid notch, forms an excellent handle at one end, while the enlarged distal end of the radius, with the carpal bones, which are usually left attached, forms a good one at the other. Moreover, the curvature of the shafts of this consolidated bone is favorable for the use of our Indian tanner, who, in using this primitive instrument, slings it at either end in his hands, and works with it in shaving off the hair much in the same manner as one of our carpenters uses a spoke-shave, only here the sharp edge of the ulna bone takes the place of the knife-edge in doing its special work. (Plate LXII.)

“Before proceeding further I should mention that, after removing the hide, on the first day he placed the skinned head of the deer, without

the lower jaw, in the low ashes of a camp-fire, where the brains were able to become semi-baked during the first night, as these parts too are utilized in the tanning process.

“Next to shaving off the hair, the hide is thrown over a small log he had arranged against the tree in the morning, being held in place by catching the skin of the head between the notch and the limb, the skin of the hinder parts being always nearer the ground, and as the work proceeds it is deftly shifted about by the tanner.

“Now all the hair, except on the lower parts of the legs and the tail, is rapidly scraped off with these bone scrapers, including the black epidermis. Some tanners use a deer's rib, or that of the beef, and others a dull hunting-knife, but the bones of the deer's fore-arm is the usual instrument, and it is quite remarkable to observe how skilfully it is managed, and how rarely a hole is cut in the skin. The shaving is carried to the very edges of the hide all around, and even the backs of the ears are carefully scraped, the entire operation lasting from two to four hours, depending upon the size of the deer.

“In appearance the hide now has the same form as when removed from the animal, the hair side is clean and white, the body side devoid of all superfluous tissue, the back of the ears still showing the black epidermal layer of the skin, as it is only from these parts where it is not scraped off with the hair; the hair also is left on the skin of the lower halves of the four limbs.

“A thorough washing is now given it in several changes of clear, cold water, though sometimes in the last wash the water may be made slightly tepid, and in this it is allowed to stand while the tanner prepares the brains of the animal soon to be used in another stage of his work. Picking up the deer's skull from the ashes where he had left it the night before, he took an ax and split it along the bifrontal suture, cleaving the skull partly in two, then chipping off the parietal bones he was enabled to lift out the brains nearly entire. They were at once transferred to a basin of tepid water, where by gentle manipulation the little slivers of the bone (which had gotten into it while splitting the cranium), the blood, etc., were effectually removed. Next they were placed in a small quantity of tepid water in another basin and put upon a low fire, where they were allowed to simmer for over an hour. At the end of this time the water, then being not so hot but that one could comfortably hold his hand in it, had come to be of a muddy color, and our tanner, using the fingers of one hand as a sieve, lifted out from the water the little particles of brain in a small pile upon the palm of his opposite hand; then, by rubbing this together between the palms of his hands, it was soon reduced to a pasty mass. This process was continued until all the brains were thus reduced and dissolved, and then the water in which they were had about three times its quantity of tepid water added to it, nearly filling the small basin.

“Returning to the skin, it was now removed from the water where it had been left, carefully rinsed, and wrung out with the hands much as

we see washing women wring clothes, and carried over to the tree where the scraping process had been done. Here the tanner selected a small limb about 5 or 6 feet from the ground and passed the head and neck of the hide under and over it, and then carefully folded this latter part lengthwise along the middle of the body surface of the hide, and twisted the whole over and over again until he came to the fore legs. It will be seen that the limb was firmly folded within a loop of the hide, and by pulling heavily upon it I saw that there was no such thing as its slipping. In a similar manner the skin of the fore legs was folded lengthwise inside the hide; then the borders of the abdominal incision were likewise folded in, and in turn the skin of the hind legs, but this latter had, of course, to be thrown in, in the direction of the tree, so as to include them. The borders of the hinder parts were thrown over in such a way as to form a loop like the one around the limb of the tree. During all of this operation the hide was being twisted from left to right, and at its completion looked like a wet hide rope, fast, as we have described, to the tree at one end and looped over a stick about two feet long at its middle at the other. This latter was used as a twister by the tanner, for now he proceeded to wring the hide thoroughly by twisting it over in one direction, causing the water to be rapidly squeezed out of it. (Pl. LXIII.) By continuance of this twisting the skin was finally brought up close to the limb of the tree in a hard coil, where by hooking the turning stick under the limb it was held in that position and allowed to drip for nearly an hour. At the end of the above-mentioned time the Indian unhooked the stick, untwisted the hide, and took it down. It had apparently shrunk two-thirds of its size, and looked like a damp, semi-tanned dog-skin. The tanner immediately set to work to pull it into shape as he walked in the direction of his camp-fire.

“Spreading out a small buffalo robe, he sat down on it (Plate LXIV) and proceeded to pull the hide vigorously with his hands in every direction. Catching hold of the extreme edges, he tugged away at it until it was nearly its original size. I noticed, however, that he only employed his hands in this part of the operation, and never once resorted to his feet for assistance in the stretching.

“After he was satisfied that the entire surface of the hide was opened and exposed again, he carefully spread it out perfectly flat, with the hair side up, upon the buffalo robe on which he had been sitting; then, taking his basinful of dissolved deer brains, he commenced applying it with his hand to the surface from which the hair had been removed. It is never put on the opposite side of the skin. In doing this he frequently rubbed the solution well in, using his open hand for the purpose, and as he came to the head, ears, and legs he worked the stuff in with his fingers, and occasionally kneaded it with his knuckles, going over the entire skin on the side referred to until his basin of brains was expended and the whole had been worked in as described. (Plate LXV,

“Upon asking him why he put it only on the hair side, he gave me to understand that the pores were on that side, and consequently the brains could get into the skin more effectually, and upon inquiring why he put them on at all, he said, ‘To make it soft.’ Buckskin that is tanned without using brains is harsh and stiff afterwards, and still worse in these particulars if it happens to get wet at any time.

“The Navajoes often use beef brains for this purpose, especially when their game is taken far from camp and they do not care to pack the deer skulls home on their ponies. In early days they employed deer brains as a rule, but in some cases the brains of the buffalo, when that animal existed in their country.

“Finally, as the last step of the process, he commenced, by folding in the edges of the skin all round continuously, to make it up into an ellipsoidal ball, quite firm, though not tightly rolled. He then wrapped it up in the buffalo robe and allowed it to remain out in the sun for about fifteen minutes for the purpose, he said, ‘of letting the brains go well into him.’

“Once more in its wet and limp condition it is thoroughly opened, and this time spread out over the top of a sage bush near by with the outer surface exposed to the sun and sufficiently from the ground to prevent the dogs from getting at it, or its being soiled through accident. It was now about 3 o’clock in the afternoon, and very warm, and the skin at once commenced to show the effects of it as the first stages of drying set in. Nevertheless, I was informed that the hide would now be allowed to remain there and dry until dark, when it would be placed up on top of the “hogan” for the night, or in the event it rained, to be taken in and hung up on the inside. Next morning I was on the ground at 9 o’clock, and was thoroughly surprised at the appearance of the hide when it was brought out and shown me. Although I was familiar with the making of buckskin, not only as practiced by the Navajoes, but by the Sioux and other North American Indians, I never happened to have seen it in this particular stage, that is, right after the drying on the second day.

“I found that it had again shrunken so as to be not more than one-third of its original size, or just after it had been removed from the animal. It was hard and appeared almost brittle, as though it might be broken in two; moreover it was semi-transparent, and easily transmitted the light through it, or even prominent objects might be outlined through it in favorable lights. In color it was of a deep, muddy amber, or a semi-translucent Roman ocher, and one would never have suspected in the world that it was either a deer hide, or that in a few short hours it be converted into the softest and most durable fabric in the country—a tanned buckskin.

By the exercise of considerable ingenuity and careful bending he now forced the skin into a large camp-kettle containing water from which the chill had been taken off by the addition of a little warm water, and

in this it was allowed to soak well for the next three hours, standing all this time out in the morning sun.

Some of the Indians insist that this soaking should be done in cold water (spring water), and a new Mexican guide who has been among the Navajoes for many years, being an excellent tanner himself, claims that it is almost the universal practice to soak it in cold water on the morning of the third day instead of in tepid water. However, there was but little difference, for on the present occasion the water was almost cold from the start, and quite so after the skin had been in twenty minutes. This washing, the Indians tell me, was to remove all traces of the brains which were rubbed into the skin on the day before. He next gives it three or four thorough rinsings in clear cold water, and takes it over to the tree to wring it. This is done precisely in the manner already described above and shown in the plates.

“Likewise it is curled once more, made into a coil, twisted and re-twisted upon itself, and allowed to drip in this condition for nearly half an hour. It is then once more undone and drawn out into shape, as on a previous occasion after wringing.

“He is very careful now in exposing the entire surface; pulling the edges, stretching the skin of the ears, flattening out the skin that covered the legs, and paying similar attention to the little tail.

“In the mean time he had brought a large square piece of canvas and spread it out upon the ground near where he was at work. It is upon this that the last stages of the operation will be performed. Bringing next a sharp knife, it takes him but a moment to whittle out from a soft piece of pine an instrument that resembled a large wooden awl. This, with the knife, he threw upon the canvas sheet, where they may be distinctly seen in Plate LXVI. To return to our hide, how different it looks after this second wringing; but he persists in pulling away at the edges all around, over and over again, until the whole is manipulated into a shape to suit him. Even this primary handling now has its effect, and in some places the skin begins to grow like buckskin. At last he sits down on the middle of the canvas sheet, having first thrown aside his hat and removed his moccasins. He wears nothing but his thin Navajo shirt and trousers, while beside him is his wooden awl and sharp knife. (Plate LXVI.)

“He threw the now limp skin lengthwise over his naked feet and pulled it with both hands in the direction of his body. Rapidly repeating this operation, he turned it and tugged at it the other way. But it was most often thrown over his feet and vigorously pulled towards him. Then he stretched it out with his hands, pulled it this way and then pulled it that, worked at the edges to get them limp and pliant, manipulated the ears and the skin of the legs. But during all this an interesting change was coming over it, the heat of an August sun was rapidly drying it, it was fast coming to a velvet-like softness throughout, and attaining its original size, it was changing to a uni-

form pale clay color. The hair side was smooth, while the inside was roughish. Indeed, in a few moments more it was buckskin.

“Picking up next his wooden awl, he commenced far forward on the extreme edge of the skin on the right side of the neck, and by successively stretching it over the handle of the awl, cut upon this edge some dozen or thirteen holes with his knife. Then beginning in front, he put the awl in every hole, and by holding on to the edge of the opposite side with his left hand he was enabled to powerfully stretch the skin of the neck transversely. This operation is shown in Plate LXVI. His mark must go on next, so turning the skin of head over, he cut on either side just below the ear on the body or inner surface of the skin a leaf-like figure, with the apex pointing forward and outward.

“This was the last touch of all, and the now finished fabric, if we may call it a fabric, so pliant, so soft, and withal so useful, was spread out on the canvas for an hour in the sun to receive its final drying, after which it passed into the possession of the National Museum. One of these finished skins retains much the same form as the hide had when first removed, though it may be rather longer from the stretching. The backs of the ears are always black; the edges all around are uneven and harder than the rest of the skin; the hair remains upon the distal moieties of the skin of the legs; bullet-holes of exit and entrance will be usually seen, and there may be an accidental rent or two of small size.

“The Navajoes value these hides at a price varying from \$1.50 to \$2, depending upon the size and the need they have of the money. Squaws, I am told, never engage in manufacturing them, while the Indian boys learn the art at a very early age.”

SKIN-DRESSING AMONG ABORIGINES OF OTHER PARTS OF THE WORLD.

In Patagonia the skin of the guanaco is dried with the hair on in such a manner that when wet it retains its pliability and softness. This process of preserving skins seems to be peculiar to the Indian tribes, and is not unlike that by which buffalo robes, bear skins, and other articles of luxury and even necessity among us are prepared by the North American Indians. Guanaco skins are cut into pieces of all sizes and sewed into a thousand fanciful patterns, every workman originating a style to suit himself. (Bourne, “Captive in Patagonia,” p. 53.)

The following is the method among the Fors in Darfur, Central Africa: As soon as the animal has been skinned the skins are scraped and put into water in which okun (the bark of a tree) has been mixed. After several days they are taken out, scraped again with iron knives, and afterwards pegged out under the shade of a tree or under a shed made for the purpose. They are then rubbed and beaten with flat stones. At times they are also rubbed with butter. (Proc. Roy. Soc. of Edinburgh, 1884-'85, p. 262.)

The Wagandas are good tanners and manage to get their skins as

soft as the best kid leather. In some cases the hair is removed, but generally it is left on. They first dry the skins in the sun, then stretch them on a frame, and the inner surface is carefully scraped with a sharp knife. They are then rubbed for a long time with flat heavy stones until quite smooth. This produces a fine grain. Butter or oil is then applied in considerable quantities and the skin once more placed in the sun. This latter process is repeated several times. Both men and women are employed in tanning. Some skins are dyed after the hair has been removed, others have patterns printed on them, and the thick buffalo hide, from which sandals are made, is ornamented by either a knife or a red-hot nail. Leather rope is sometimes used in house-building, if so, it is without tanning. Straps, traps, and nets are first tanned. (Proceedings Royal Soc., Edinburgh, 1881-'86, p. 730.)

Friendly Islanders remove the hair and entrails of the hog with knives of split bamboo, also used in carving cooked pig. Nutka Sound, iron, knife, chisel, mallet, polisher. (Cook.)

In making an opossum rug the Yarra tribe employ some skill and knowledge. In the first place, it is necessary to select good, sound, well-clothed skins. These, as they are obtained, are stretched on a piece of bark and fastened down by wooden or bone pegs, and kept there until they are dry. They are then well scraped with mussel-shell or a chip of basalt, dressed into proper shape, and sewn together. (H. B. Smyth, *Aborigines of Victoria*, I, 1878, p. 271.)

THE SCRAPER.

Whenever the savage has come in contact with the whites he has been quick to substitute iron for stone in his arrow-heads, knives, etc. Not so with his scraper. Indeed the white man keeps up the use of stone, glass, etc., in his modern tannery. In some respects these implements are the most interesting example of the history of the civilization of man. They may not actually be the earliest implement made or used, but they have been the longest in use. We might despair of explaining their extreme antiquity.

They commence to appear with the earliest age of man and have continued in use to the present day, and are essentially the same instrument now as at the beginning. Their use was all but universal among the prehistoric peoples of North America, but they were equally universal in the paleolithic era. They were the principal implement of the early cave dwellers in western Europe and so continued through all the other prehistoric ages. They extend through all time among all peoples and have figured in all civilizations. Neither in form nor substance did it change perceptibly during the prehistoric ages. It is the one enduring implement that was also used by prehistoric man. It is therefore of the utmost importance for the archæologist who wishes to rehabilitate a certain ancient culture to consider carefully all the elements of that culture which crystallize around this little implement. He may have in

his cabinet a few pieces of stone which he labels "scrapers." At once in looking at them there springs upon the imagination of the philosophic student visions of clothing, houses, beds, furnitures, boats, lines for all conceivable purposes, the paraphernalia of state, ceremony and religion, the garniture of the dead.

We may now pay attention to particular examples. Laying aside for the moment flaying, sharpening, cutting, and sewing tools, the reader is invited to look especially at the collection of scrapers in the U. S. National Museum. (Plates LXVII-XCIII.)

Under this general table have been grouped together all of those aboriginal implements which belong to the tanner's craft. They are found in all the countries where man has used the depilated skins of animals for any purpose whatever. In the American Continent this region is bounded on the north, only by the line of uninhabited territory. It extends southward through Greenland, Alaska, Canada, and the United States. The warm climate of middle America requires the substitution of vegetable clothing, so that the scraper is no longer a necessity. The essential elements of a scraper are its grip or handle and its working portion or blade. In the first scrapers the blade and grip were one. Indeed the Little Lake, Concow, and Redwood Indians used formerly the dried rib of a large mammal, and now think there is nothing better than the rib of a steer without any change of form. (Plates LXXXIV, fig. 3.) This implement is caused to vary in structure by the following conditions: (1) The natural supply of material. (2) The skins to be manipulated. (3) The tribal technique. (4) The culture grade of the people.

Even among the Eskimo one can see how in the change of location slate, chert, and jade replace one another. This is a universal law of industries.

Again, to prepare a seal-skin for the Bidarka demands a different treatment and tool from those required in producing the soft product of the antelope hide by the Navajo.

Not so well as in language, nevertheless, in a marvelous degree, the history of a people is written in their implements and industries. Tribes have their own ways of doing things. A museum curator has reason to be thankful for this every day, owing to the careless manner in which many of his acquisitions are labeled.

Again, the nicety of the tool is a sure guarantee of the status of a people. The cylindrical scrapers are variously made. A segment from the hollow base of a walrus tusk, a strip of antler bent into the form of a hoop and properly lashed, or a strip of the same material strained to the form of a horseshoe, has a cable of raw-hide stretched between the calks of the shoe. In all of these, one edge of the cylinder is sharpened to a chisel edge to increase its efficiency. The cup-shaped scraper made of walrus ivory is often labeled in collections as a vessel, but a slight inspection will show that it is a veritable tool. The shape is that of a low oblong pan, not over 3 inches long, 2 inches wide, and 1 inch high.

This is grasped in the hand, bottom up, and drawn across the hide until a quantity of fat is secured, which is deftly conveyed to the stone lamp or some convenient receptacle. (Plates LXXX-LXXXI.)

In connection with the making of moccasin is the art of tanning deer-skins. It is done with the brain of the deer, the tanning properties of which, according to tradition, were discovered by accident. The brain is mingled with moss, to make it adhere sufficiently to be formed into a cake, which is afterwards hung by the fire to dry. It is thus preserved for years. When the deer-skin is fresh, the hair, and also the grain of the skin are taken off, over a cylindrical beam, with a wooden blade or stone scraper. A solution is then made by boiling a cake of the brain in water, and the moss, which is of no use, being removed, the skin is soaked in it for a few hours. It is then wrung out and stretched, until it becomes dry and pliable. Should it be a thick one, it would be necessary to repeat the process until it becomes thoroughly penetrated by the solution. The skin is still porous and easily torn. To correct both, a smoke is made, and the skin placed over it in such a manner as to inclose it entirely. Each side is smoked in this way until the pores are closed, and the skin has become thoroughly toughened, with its color changed from white to a kind of brown. They also use the brain of other animals, and sometimes the backbone of the eel, which, pounded up and boiled, possesses nearly the same properties for tanning. Bear-skins were never tanned. They were scraped and softened, after which they were dried, and used without removing the hair, either as an article of apparel or as a mattress to sleep upon. (Lewis H. Morgan, *League of the Iroquois*, 1851, pp. 361, 362.)

After flaying the seal, the Eskimo often finds the inner surface of the skin coated with fat, and the first operation is to remove this by means of a special tool, which we may call the fat-scraper. By means of this the fat is scraped clean from the hide and placed in the soap-stone lamp, for which purpose some of the forms are specially adapted. These implements occur in the Eskimo area all the way from Ungava to Kodiak and are of three forms, the spoon-shaped, the cylindrical, and the cup-shaped scraper. The simplest form is a segment of reindeer scapula (*Rangifer tarandus*), so cut as to have the inferior border at the back of the knife and the thin part between this border and the spine for the blade. This implement is also used for scaling and opening salmon and is a most efficient tool. Almost as simple as the foregoing, is a fat-scraper made of the split antler of the reindeer. The spongy part is scraped out and the borders brought to the proper edge. Some specimens of this type are ingeniously worked out, so as to have one of the small prongs for a handle, while the spoon or scraping portion is from the split portion of the antler. Bits of walrus-tusks are also carved into the shape of a long-bladed spoon. From the long spoon-shaped scraper, branches off, in the region between Behrings Strait and Norton Sound, a very dainty ladle-shaped implement with projections on the

hinder margin to fit the fingers. This is a very effective tool, both in its grip and the handiness with which its contents may be conveyed to the lamp. (Plate LXIX.)

There is not so great a variety of apparatus in the hand of the aboriginal leather worker as will be found at present in possession of the civilized craftsmen, yet there are several classes of tools worthy of attention.

The pre-Columbian butcher's or flaying knife has not been sufficiently studied. This will form the subject of a subsequent chapter.

The leather cutting knife is also worthy of careful study. Among the Eskimo collections it goes by the name of woman's knife or ulu. Among our modern industries this peculiar Eskimo form has a curious history. When women ceased to be leather workers and went into the kitchen they carried the ulu with them, but transferred it to another function, that of meat chopping. On the other hand, when men became leather workers, they borrowed this same implement from the women, and it may be seen any day in the saddler's shop. All of these woman's knives have crescent-shaped or plano-convex blades set in handles of wood, musk-ox horn, antler, walrus ivory, and other substances peculiar to each region. The blades are of slate, jade, or metal and are kept sharp by rubbing with the incisor tooth of a beaver. Now there is no tool more common in our collections than this same knife. It is safe to say that no Eskimo girl or woman is without one or more.

As we come further south the chipped thin blade takes the place of the smooth blade of the Eskimo, but only in very restricted areas has any observer reported the Indians as using stone blades for cutting leather.

Seeing the great numbers of this particular tool among modern savages, it is incumbent upon the archæologist to look out among his specimens, the scissors, the shoemaker's knife, and the saddler's knife of pre-historic peoples. He will probably find them among the boxes he has been labeling spear-heads.

The north Alaskan Eskimo type of scrapers consists of a grip more or less fitted to the hand and a chipped blade, with a varying length of shaft between them. In the handle the different type-forms grow out of the provisions made for accommodating the thumb, the first two fingers, the last two fingers, and the palm of the workman.

In the front end of this handle the blade is inserted in a rude socket; the rear of the handle slopes down like a Derby hat to form the palm rest. On the left side is the thumb groove, on the upper side are the first finger grooves, on the right side and bottom is a great sweeping excavation which may be called the finger pocket. On grasping one of these implements one is struck with the ingenuity with which every part of the hand is brought into its maximum activity and every necessity of the operation provided for. (Plates LXXII to LXXIX.)

The palm is provided with a nicely rounded surface for pushing, the

first fingers with the best facility for bearing down, the thumb for guiding, and the last two fingers for pulling the tool back, and at the same time they are protected from injury by the hide beneath.

The student of technology is at every moment astonished to see how the Eskimo, wherever he sets out to invent, leaves nothing to be desired as regards facility. Remember, also, that as we go southward and get away from the walrus, the scraper handle is made of wood, and losing the graceful proportions of its northern relative, grows more and more like the tool of the southern Indians.

Typical Eskimo scraper handles seem to be divided into two classes, even in the same locality, for which no reason is assigned.

One class is characterized by an under-cut extending quite symmetrically across the under side, and the material has some uniformity of thickness, as in a ladle. In most of these the grip descends to its base in the rear almost vertically, and in none of them is there any considerable tail-piece. The finger grooves, except in a few aberrant forms, are extremely shallow, and the outline above much curved.

The other class is characterized by an under-cut which primarily does not extend across the under side. The impression on a soft surface is quite similar to that of a human foot without toes. In some specimens the thumb side of the bottom is notched out somewhat, but this has no functional connection with the real under-cut.

Now, in all the specimens of this type the tail-piece is more or less pronounced. The finger grooves run the whole gamut of profundity, from a shallow groove to deep pockets in which half of each finger is buried. In outline this class is more parallel-sided.

No literature is at hand upon the subject, but from the manner in which these implements are poised it would seem that they go in pairs, as the jack-plane and smoothing-plane, the spoon shaped tool serving for the rough or first process, the flat-bottomed class for finer work in finishing. But this is only guessing.

Every one who has handled a series of these implements has been astonished at the diminutive hands of the workwomen who have wielded them. To dress the hide is woman's work, but the men also have small hands. Again, while I have found three left-handed throwing-sticks in a hundred; in more than a hundred scrapers I have never seen one left-handed.

Scraper blades among the northwestern Eskimo are made from a plano-convex spall of black chert, jasper, etc., kept flat on the under face and chipped into shape on the upper face. The cutting edge is rounded and chisel-shaped, and is usually the broadest part of the blade. The general outline varies from circular, or even a flattened ellipse through infinite varieties, to an oblong parallelogram rounded at either end. Indeed, one and the same blade may be all of these forms at various periods of its existence by a process now to be explained.

One of the commonest tools in ethnotechnic cabinets is the stone

chipper of bone used in forming the edges of arrow-heads, spear-heads, scrapers, etc. The writer has only recently learned the indispensable character of this tool. In the first place every chipped implement after being separated from the parent block is made out and out with one of them. But this is only the beginning. The writer has lately learned that the hunter and the leather-worker are never without one, and they bring it into requisition with a frequency which reminds one of the old plantation slave sharpening his scythe every few minutes, to get a rest.

Lieutenant Stoney, speaking of his experience at Kotzebue Sound, says that the leather-worker is incessantly touching up his scraper edge with the chipper, and that in time he wears it out to a mere stub. This constant sharpening also accounts for the fact that few specimens show signs of great wear. It is important to repeat this, that the constant use of the edging tool rapidly wears down the scraper blade and keeps the edge sharp. This accounts for the great difference in the length of the blades in our cabinets and for the fact that they show so little sign of use.

A very old skin-scraper, such as are now found only in the old graves, is made of stone, with a wooden handle, which is fastened to the stone by means of a strip of whalebone. Another and a later pattern is made from the scapula of the reindeer. A better idea of its manufacture can be got from the sketch than by a description. Such scrapers are still in use, but serve as a sort of auxiliary to a scraper made from a tin can, resembling a little scoop in shape and having a wooden handle. This is the style of scraper made at the present day and is by far the most effective instrument of the three. (Boas, VI An. Rep. Bur. Ethnol., Figs. 465, 466, 468.)

The manner of using these scrapers is to take the skin firmly in the left hand and putting the knee or foot upon the lower part of it, hold it securely while the scraper is worked with the right hand, pushing downward with some force. If the skins are very dry they are somewhat softened by rubbing with the hands, or even chewing the most stubborn parts. They continue using these tools upon a hide till it gains the desired pliability.

After removing the fat with a musle shell, the skins are tendered to the men, and especially to the guests, as a piece of civility to chew or gnaw betwixt meals. This is esteemed a delicacy. Then the skins are macerated or steeped in the urine tub. After that they are dried in the air a little and finally milled to perfection by their teeth. They make their thin light under-garments of the backs of the sea-fowl skins; their warm winter garments of the bellies, and their fine holiday dress of the necks, and these they commonly turn feathers outward.

List of specimens in the U. S. National Museum on which this paper is based, showing the catalogue number, the material and shape of the implement, the place or tribe from which it was procured, the length, and the collector.

FAT-SCRAPERS.

Number.	Material.	Shape.	Place.	Length.	Collector.
				<i>Inches.</i>	
36501	Antler.....	Spoon	Kushinuk	6½	Nelson.
37967	...do .....	...do	Chalitmut	7	Do.
44771	...do	Bow	Sledge Island.....	3½	Do.
44987	Ivory	Ring .....	...do	2½	Do.
44988	Antler.....	Bow .....	...do	3	Do.
44989	Ivory	Ring .....	...do	2½	Do.
44990	...do .....	...do ....	...do	2¾	Do.
55911	Antler.....	Hoop	Bristol Bay	3½	McKay.
56603a	Ivory	Dish.....	Point Barrow.....	4½	Ray.
56603b	...do .....	...do ....	...do	3½	Do.
63351	...do .....	...do	St. Lawrence Island.....	3¼	Nelson.
63352	...do .....	...do ....	...do	3	Do.
53353	...do .....	...do ....	...do	2½	Do.
63354	...do .....	...do ....	...do	3½	Do.
63355	...do .....	...do ....	...do	3	Do.
63356	...do .....	...do ....	...do	4½	Do.
63642	Antler.....	Bow	Cape Wankarem.....	2½	Do.
63666	Ivory	Ring.....	Diomedé Island.....	2½	Do.
63667	...do .....	...do ....	...do	1½	Do.
63800	Antler.....	Spoon.....	Point Hope.....	3	Do.
63833	Ivory	Dish.....	...do	4	Do.
63900	Antler.....	Spoon	Diomedé Island.....	3	Do.
89251	Ivory	Dish.....	Point Barrow.....	3½	Ray.
89253	...do .....	...do ....	...do	3½	Do.
89255	...do .....	...do ....	...do	3½	Do.
89258	...do .....	...do ....	...do	3½	Do.
127508	Antler.....	Spoon	Togiak River.....	7¼	Applegate.
127652	...do	Hoop .....	...do	2¾	Johnson.
127791	...do .....	...do	Kushinuk	3¼	Do.
127892	...do .....	...do	Nakneek	4	Fisher.
127896	...do	Spoon	Kotzebue Sound	3¼	Stoney.

HIDE-SCRAPERS.

[Used for cutting flesh and hair from a dried skin. The handle, blade and lashing indicate environment, skill, and amount of contact with the white race.]

Num-ber.	Material.	Place.	Length.	Collector.
			<i>Inches.</i>	
10398	Wood, bone, sinew	Igloolik	6¾	Hall.
24350	Wood, slate, spruce root	Norton Sound	6½	Nelson.
24359	...do	St. Michael's Island.....	9½	Turner.
24361	Wood, slate	Norton Sound	4½	Do.
24689	Wood, slate, rawhide.....	...do	11¼	Do.
33084	...do .....	...do	7¼	Nelson.
33086	...do .....	...do	12½	Do.
33090	...do	Kegiktoiwik	9¾	Do.
33093	Ivory, flint	Norton Sound	3¼	Do.
33094	Wood.....	Kegiktoiwik	6¼	Do.
34083	Wood, stone, twine	Cumberland Gulf.....	4¾	Kumlein.
34084	...do .....	...do	4	Do.

HIDE-SCRAPERS—Continued

Number.	Material.	Place.	Length.	Collector.
			<i>Inches.</i>	
34085	Wood, stone inserted	Cumberland Gulf	$3\frac{7}{8}$	Kunlein.
37613	Ivory, no blade	Nubviak	$4\frac{1}{2}$	Nelson.
37614	do	Kotzebue Sound	$2\frac{1}{4}$	Do.
38252	Wood, flint, spruce root	Lake Yukton	$6\frac{1}{8}$	Do.
38253	Wood, slate, spruce root	do	$6\frac{1}{2}$	Do.
38288	Ivory, no blade	do	$3\frac{3}{10}$	Do.
38485	Wood, slate, spruce root	do	10	Do.
38602	Wood, slate, sinew twine	Cape Vancouver	$18\frac{5}{8}$	Do.
38603	Wood, slate, rawhide	do	$17\frac{1}{4}$	Do.
38868	Wood, slate, spruce root	Kuskokvim	19	Do.
38828	Wood, celt, rawhide	Big Lake	$12\frac{1}{2}$	Do.
38838	Crutch of wood, slate, spruce root	do	17	Do.
39062	Wood, flint, rawhide	Norton Sound	6	Do.
43228	Ivory, flint	Oonalakloet	$5\frac{1}{8}$	Do.
43405	Wood, slate	Cape Prince Wales	7	Do.
43408	Wood, slate, rawhide	do	$4\frac{3}{4}$	Do.
43886	Crutch of wood, slate, rawhide	Mission Alaska	$16\frac{5}{8}$	Do.
43927	Wood, slate, spruce root	Nubviak	$11\frac{3}{4}$	Do.
44086	Wood, slate	Koyuk River	$6\frac{1}{2}$	Do.
44140	Wood, no blade	Norton Bay	$5\frac{1}{2}$	Do.
44180	Ivory, no blade	Cape Darby	$5\frac{1}{2}$	Do.
44357	Wood, no blade	Norton Bay	$4\frac{1}{4}$	Do.
44085	Wood, flint inserted	Koyuk River	$4\frac{3}{4}$	Do.
44084	Ivory, no blade	do	4	Do.
44982	Wood, slate, rawhide	Sledge Island	$7\frac{5}{8}$	Do.
44983	do	do	$7\frac{1}{2}$	Do.
44984	do	do	7	Do.
48623	Ivory, no blade	Kotzebue Sound	$2\frac{3}{8}$	Do.
48624	do	do	$3\frac{1}{2}$	Do.
48625	Ivory, flint inserted	do	$4\frac{7}{8}$	Do.
48626	Ivory, no blade	do	$3\frac{3}{4}$	Do.
48627	do	do	$5\frac{1}{4}$	Do.
48882	Wood, slate, spruce root	Lake Yukon	$7\frac{3}{4}$	Do.
48941	do	Sabotnisky	$11\frac{3}{4}$	Do.
55910a	do	Bristol Bay	$15\frac{1}{2}$	McKay.
55910b	do	do	$13\frac{1}{8}$	Do.
55910c	do	do	$12\frac{3}{8}$	Do.
55910d	do	do	$15\frac{1}{2}$	Do.
55910e	Wood, slate, rattan root	do	16	Do.
55910f	Wood, slate, spruce root	do	$15\frac{7}{8}$	Do.
55910g	do	do	$16\frac{1}{2}$	Do.
55910h	Crutch of wood, slate, rawhide	do	$13\frac{1}{2}$	Do.
55910i	do	do	14	Do.
55910k	do	do	$14\frac{7}{8}$	Do.
55910l	do	do	$16\frac{1}{4}$	Do.
56548	Ivory, no blade	Point Barrow	$3\frac{1}{2}$	Ray.
56549	do	do	$4\frac{1}{2}$	Do.
63559	do	Point Hope	$3\frac{5}{8}$	Nelson.
63655	do	do	4	Do.
63851	Ivory, flint inserted	do	$3\frac{3}{4}$	Do.
63852	do	do	$2\frac{3}{4}$	Do.
63853	do	do	$4\frac{5}{8}$	Do.
63854	Ivory, no blade	do	$3\frac{7}{8}$	Do.
63856	do	do	$3\frac{7}{8}$	Do.

GRAINING TOOL, WITH FINE TEETH AT THE END.

Number.	Material.	Tribe.	Length.	Collector.
			<i>Inches.</i>	
14196	Iron	Sioux	15	Palmer.
19894	Bone	Utes	7½	Powell.
31316	do	Pueblos	11½	Yarrow,
89924	do	Ungavas	12¼	Turner.
89925	Bone and iron	do	14¾	Do.
89927	Wood and iron	do	13	Do.
90246	Bone	do	13	Do.

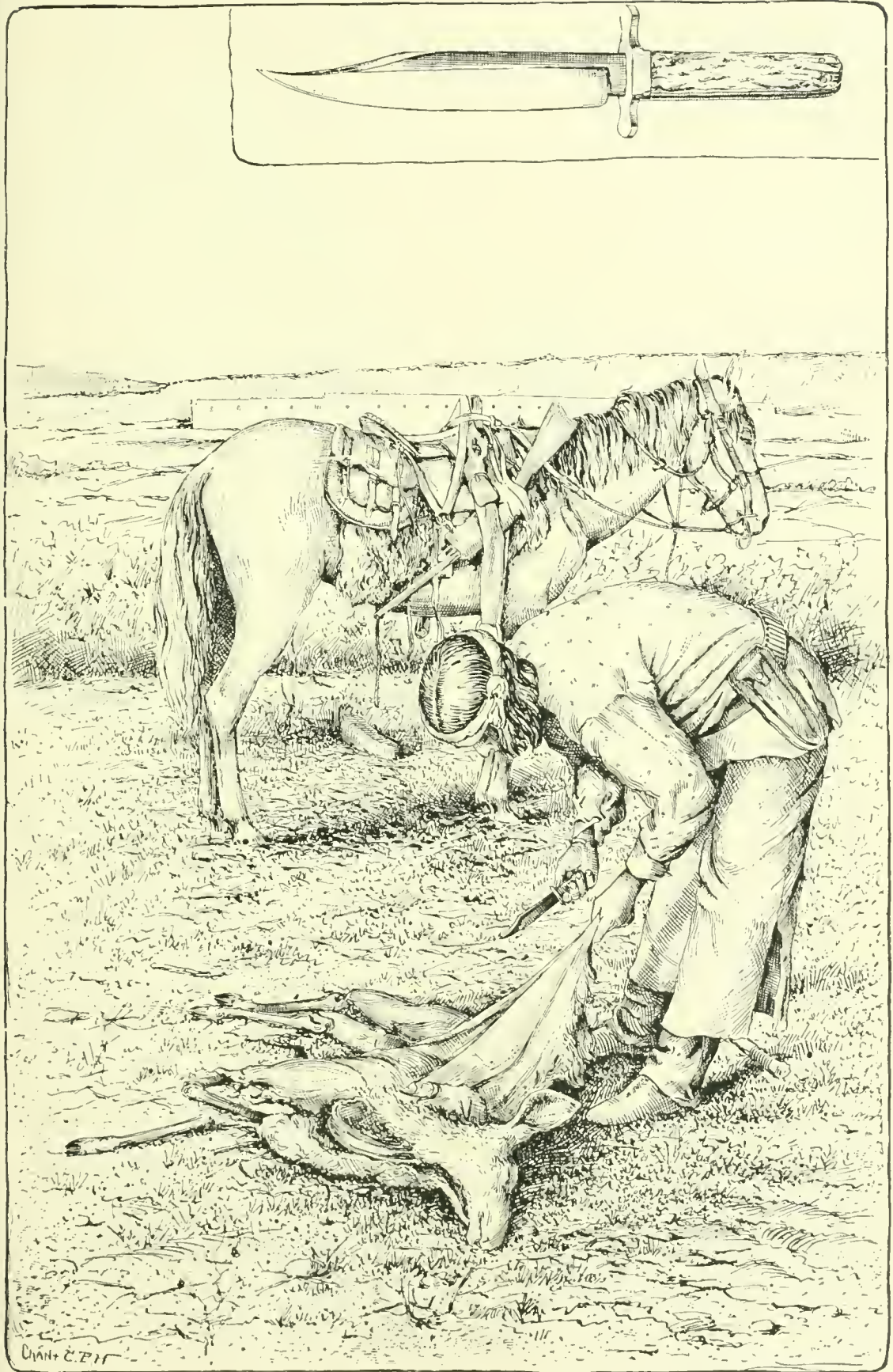
BEAMING TOOLS OF BONE, FOR REMOVING HAIR

Number.	Material.	Place or people.	Length.	Collector.
			<i>Inches.</i>	
11891	Bone	Pai Utes	10¾	Powell.
19881	do	do	14½	Do.
38244	do	Madisonville		Metz.
38490	do	Kuskovim	9½	Nelson
55912	Wood and iron	Bristol Bay	14½	McKay.
89928	Bone	Ungavas	13¼	Turner.
89930	do	do	14	Do.
90248	do	do	12¾	Do.
90248	do	do	11¾	Do.

ADZE-SHAPED SCRAPERS WITH IRON BLADES.

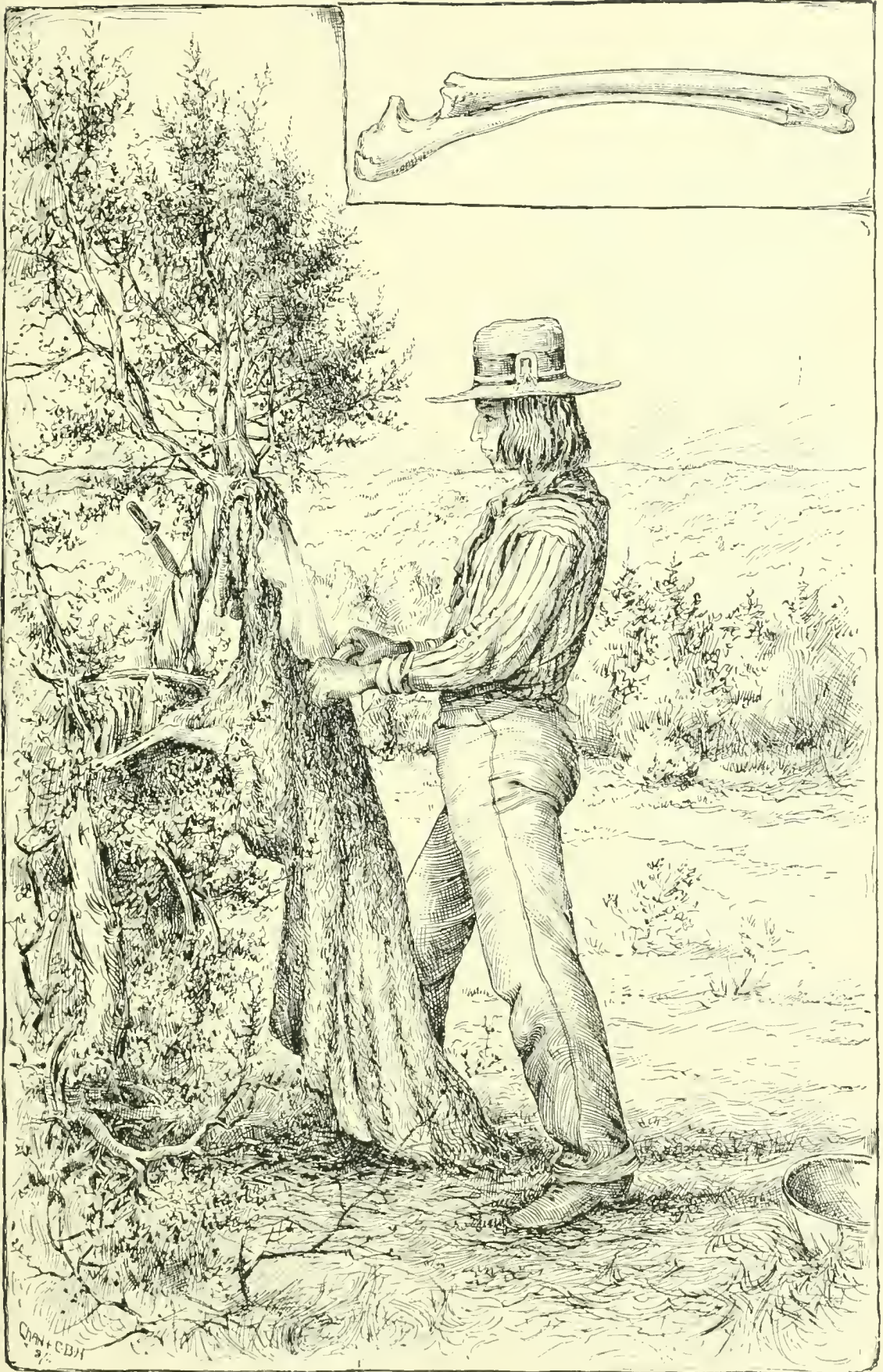
Number.	Handle.	Tribe.	Length.	Collector.
			<i>Inches.</i>	
.....	Antler	Sioux	14½	Blackmore.
1462	do	Comanches	11	Berlandier.
6336	do	Gros Ventres	11	Matthews.
6337	do	do	13¾	Gray and Matthews.
6896	Wood	Comanches	12	Palmer.
6897	do	do	11	Do.
9064	Antler	Sioux	12	Gardner.
9852	do	Utes	11½	Lyon.
11100	do	Crows	13½	Stevenson.
11226	do	Pai Utes	11½	Powell.
19882	do	Utes	9	Do.
19883	do	do	11¾	Do.
31317	Wood	Pueblos	11	Wheeler.
130622	Antler	Crows	14¾	Allen.



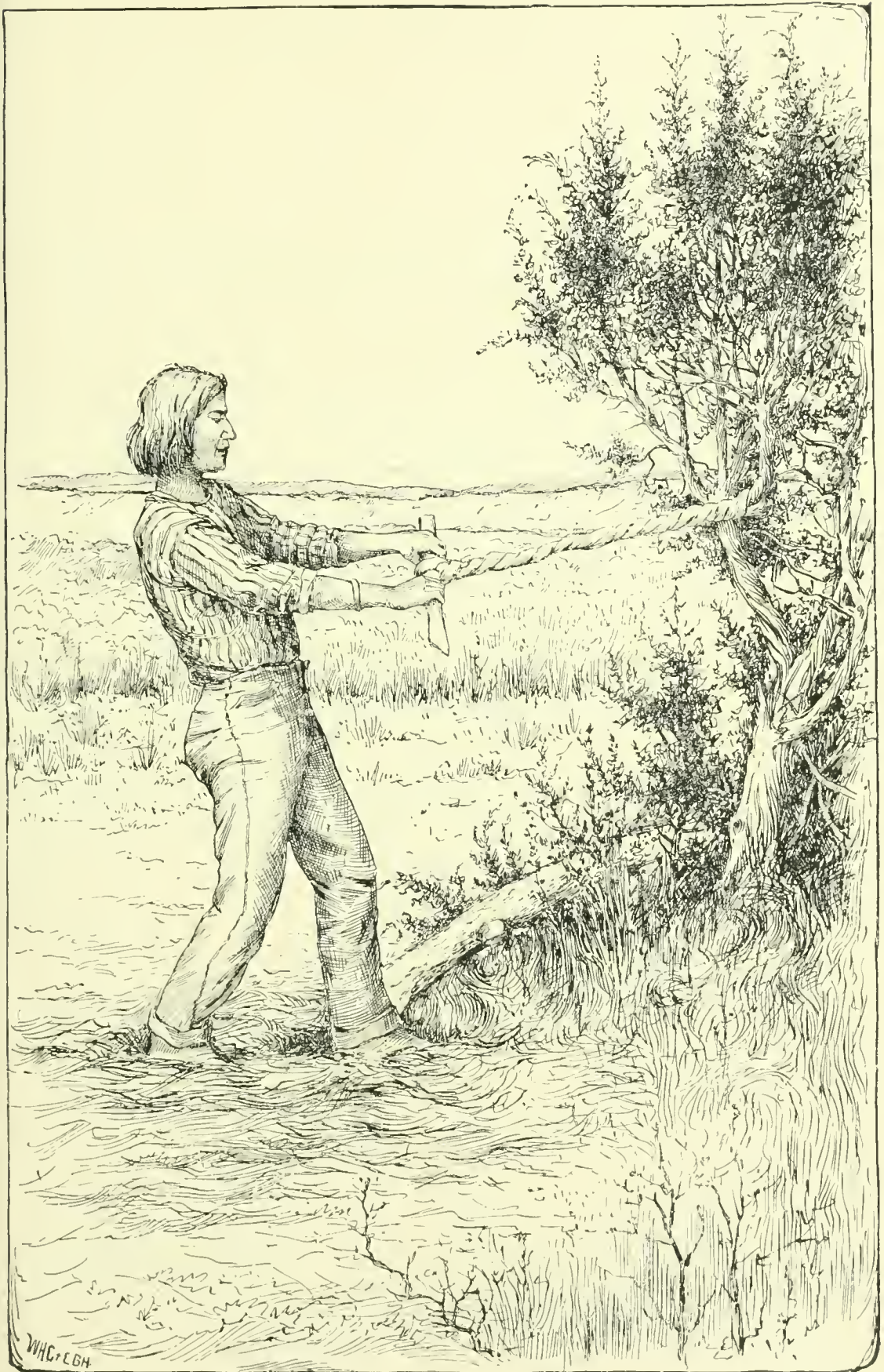


NAVAJO INDIAN SKINNING DEER. (After Shufeldt.)





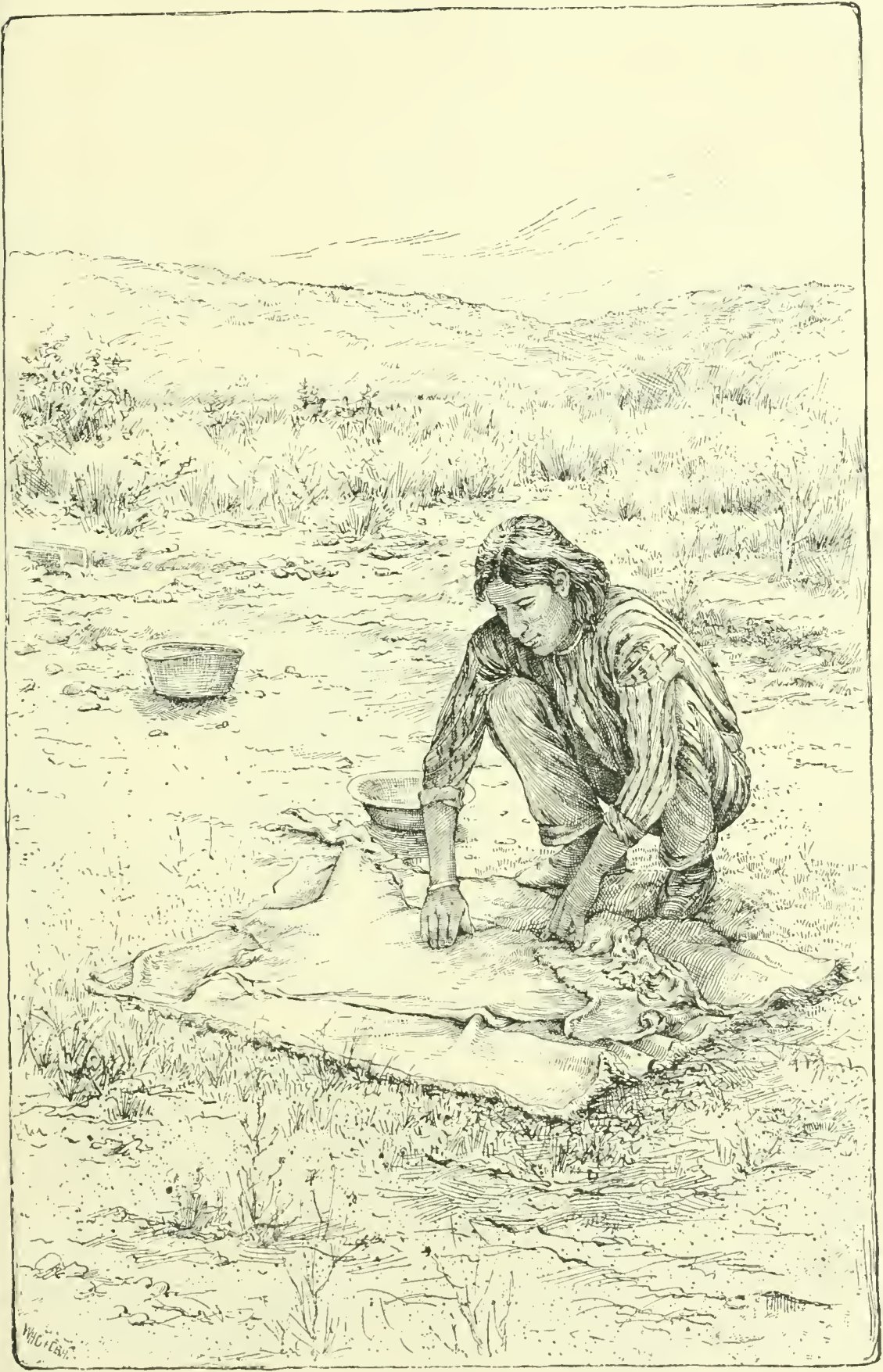
NAVAJO INDIAN REMOVING HAIR FROM DEER-SKIN. (After Shufeldt.)



NAVAJO INDIAN WRINGING WATER FROM A DEER-SKIN. (After Shufeldt.)



NAVAJO INDIAN PULLING DEER-SKIN INTO SHAPE AFTER WRINGING. (After Shufeldt.)



NAVAJO INDIAN APPLYING BRAINS TO DEER-SKIN TO MAKE IT SOFT. (After Shufeldt.)



NAVAJO INDIAN FINISHING DEER-SKIN BY STRETCHING IT. (After Shufeldt.)

EXPLANATION OF PLATE LXVII.

Fig. 1. BEAMING TOOL. Made of the tibia of a musk-ox. The bone has been hacked in so as to have the broad inner part of the posterior wing for a rest and the middle of the front portion for an edge. The natural form of the bone lends itself splendidly to this method of treatment. Compare this with Fig. 3, Pl. LXVII, and Fig. 1, Pl. LXXXIV.

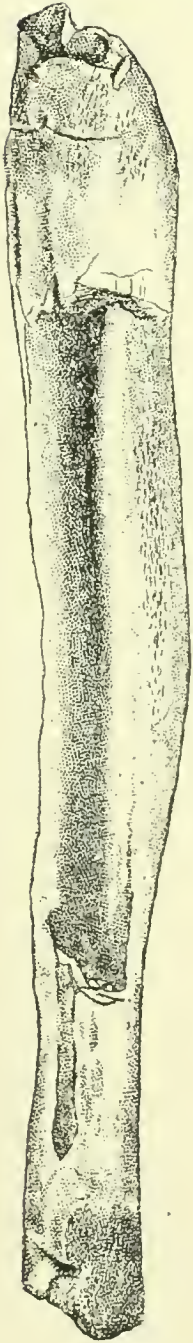
Cat. No. 90248, U. S. N. M. Indians of Ungava, Canada. Collected by Lucien M. Turner.

Fig. 2. BEAMING TOOL. Made from the leg bone of the reindeer. Only half of the specimen is given, but enough remains to show the absolute similarity between this and the great number of broken implements of the same sort found in the Madisonville cemetery, Ohio. See next figure. The perforation on the lower side is common in many Eskimo tools.

Cat. No. 89488, U. S. N. M. Eskimo of Point Barrow. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 3. BEAMING TOOL. Made from the leg bone of a deer. The bone has been cut away so as to afford two edges for removing the hair in skin working. This specimen comes from the celebrated cemetery at Madisonville, Ohio, and is here reproduced to show the great similarity of form in various parts of the country.

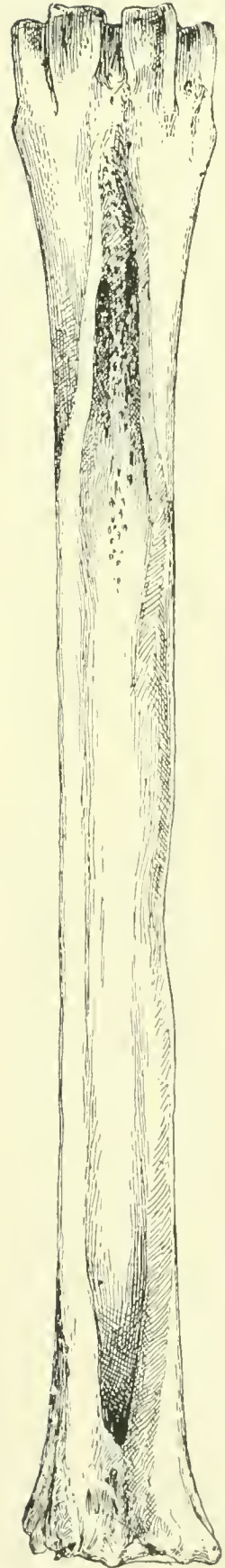
Cat. No. 43076, U. S. N. M. Graves of Madisonville, Ohio. Collected by Dr. C. L. Metz.



1



2



3

BEAMING TOOLS.

EXPLANATION OF PLATE LXVIII.

Fig. 1. GRAINER. Of the humerus of the musk-ox. The upper joint furnishes the handle and the hard portion of the bone cut diagonally forms the edge. Fine serrations on the edge furnish the graining surface.

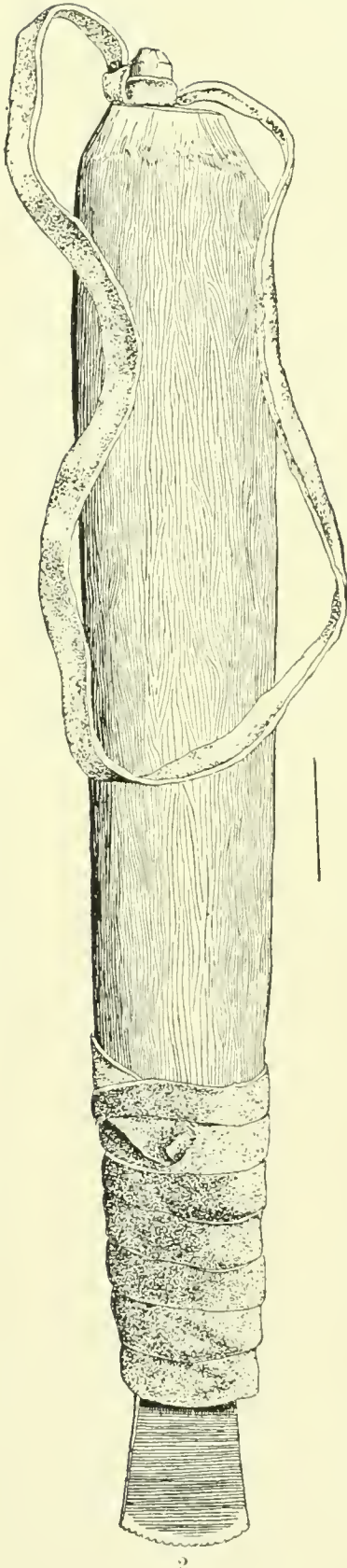
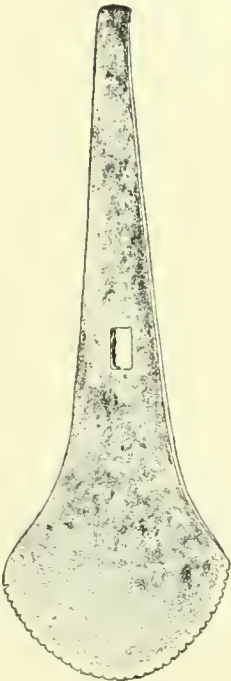
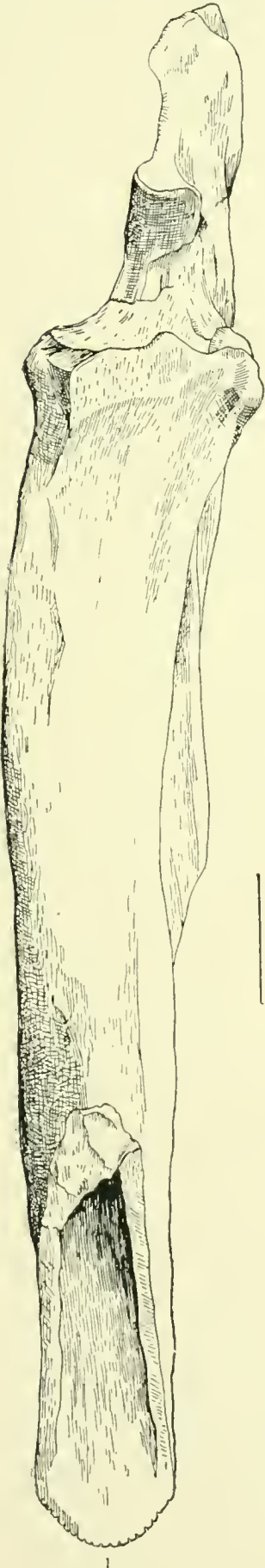
Cat. No. 90246, U. S. N. M. Eskimo and Indians of Ungava, Canada. Collected by Lucien M. Turner.

Fig. 2. GRAINING TOOL. Handle of pine. Blade of iron, finely toothed and lashed to the shaft with a buckskin strip. A thong fastened to the top of the handle passes around the wrist and catches the force of the blow. This is an excellent device for giving emphasis to the work of the tool.

Cat. No. 89927, U. S. N. M. Eskimo and Indians of Ungava, Canada. Collected by Lucien M. Turner.

Fig. 3. GRAINER. Made from the "bit" of a plane and finely serrated. In use this is placed on the primitive bone grainer and lashed with buckskin.

Cat. No. 90260, U. S. N. M. Eskimo and Indians of Ungava, Canada. Collected by Lucien M. Turner.



GRAINING TOOLS.

EXPLANATION OF PLATE LXIX.

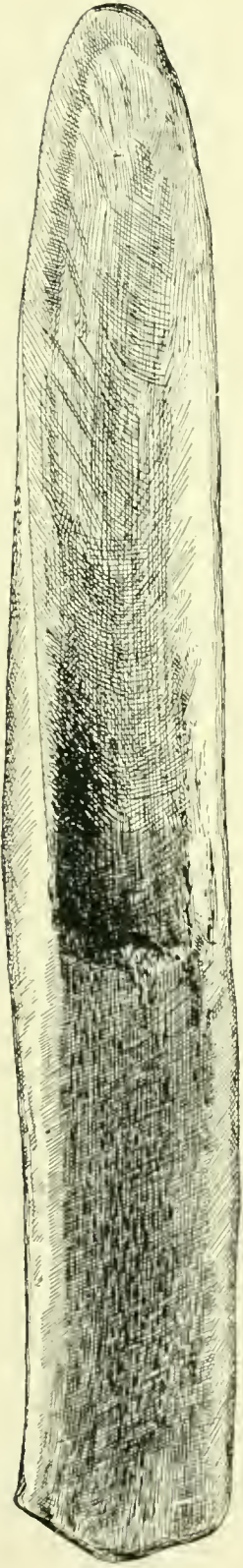
Fig. 1. FAT-SCRAPER. Of antler. Much larger than the examples from the west. The antler is first split. About one-third of the piece retains the core to form a grip, and from the remainder the core is scraped away and the edge of the hard portions sharpened.

Cat. No. 90250, U. S. N. M. Indians and Eskimo of Ungava, Canada. Collected by Lucien M. Turner

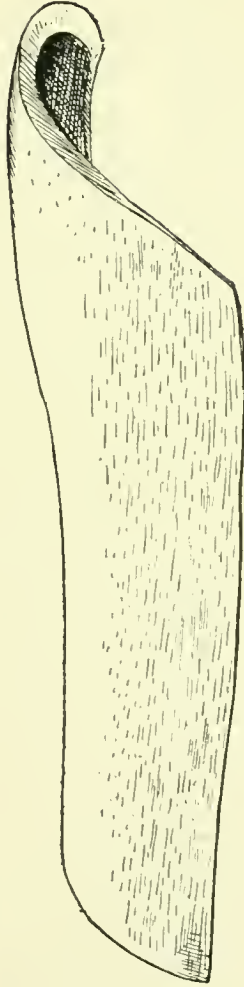
Fig. 2. SCRAPER. Probably for removing fat. Reproduced here from Captain Holm's celebrated work on East Greenland.

Fig. 3. FAT-SCRAPER. Of antler. A strip of the horn split off and the lower part scraped to an edge.

Cat. No. 90397, U. S. N. M. Eskimo of Igloodik. Collected by Capt. C. F. Hall.



1



2



3

FAT-SCRAPERS.

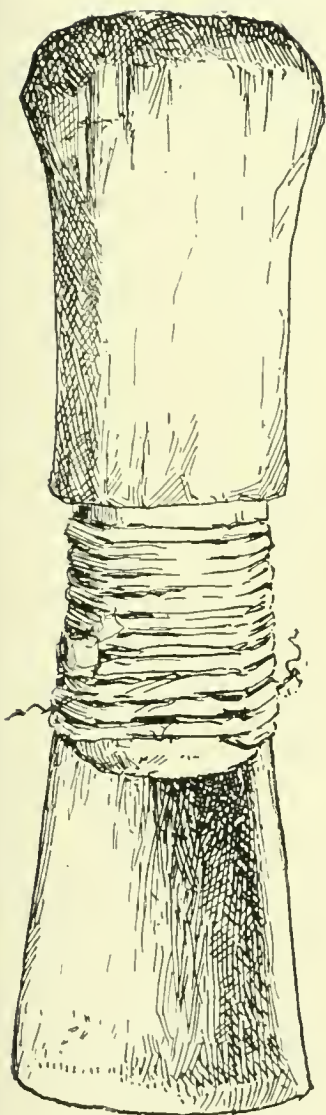
EXPLANATION OF PLATE LXX.

Fig. 1. SCRAPER. Blade of bone, with edge resembling that of a gouge, fastened to a pine handle by a seizing of sinew. The edge is very smooth and worn, and the specimen must have been used more as a beaming tool. The drawing marked (2) is a precisely similar form dug from the ash-pit graves of Madisonville. The attention of archaeologists is here called to the fact that all the specimens from that celebrated cemetery are allied to modern northern implements.

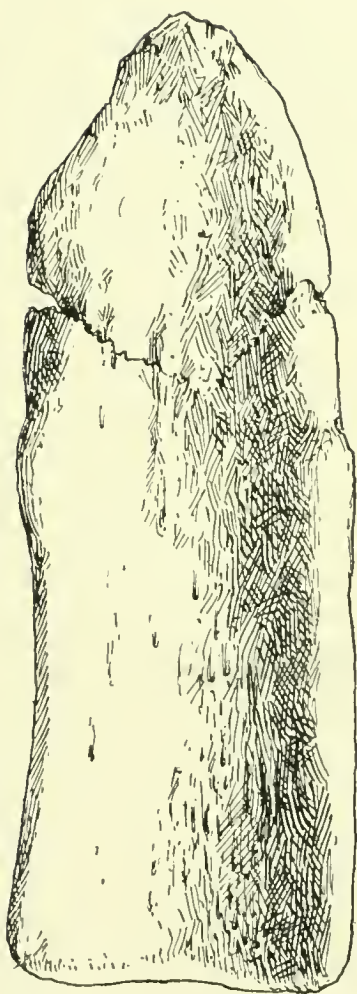
Cat. No. 10397, U. S. N. M. Eskimo of Iglulik. Collected by Capt. C. F. Hall.

Fig. 3. SCRAPER. Handle of soft wood, faintly and rudely cut in and grooved like the beautiful ivory specimens from Alaska. Thumb groove, fore and middle finger grooves atop; ring finger groove and underneath large; notch for finger, small. The blade is a dull celt of sandstone let half its length into a socket in the end of the handle. Length, 4 inches.

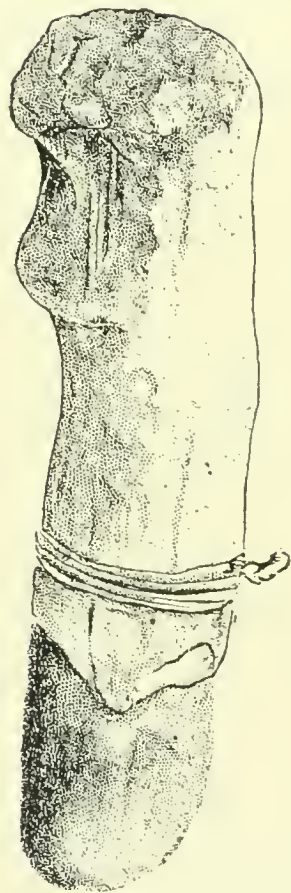
Cat. No. 34084, U. S. N. M. Eskimo of Cumberland Gulf. Collected by L. Kunlien. There are three examples of this type in the National Museum.



1



2



3

SCRAPERS.

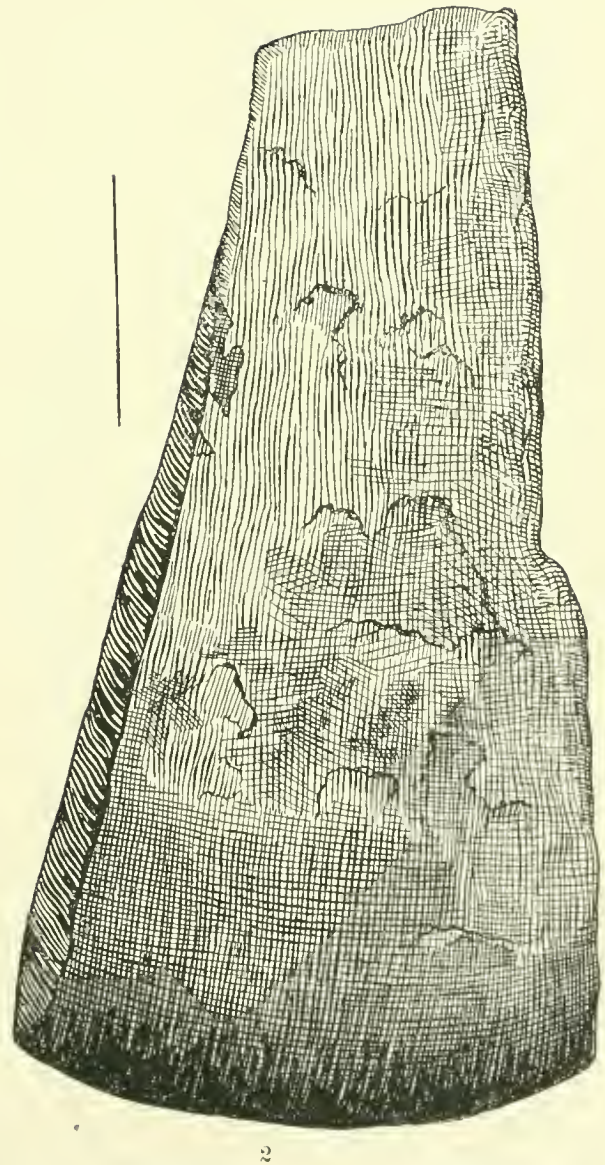
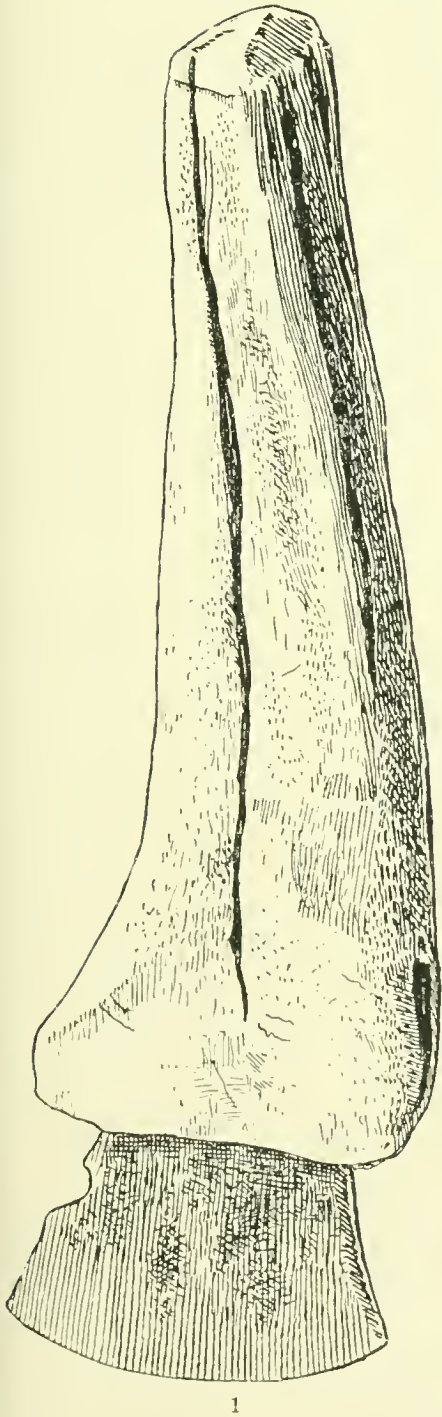
EXPLANATION OF PLATE LXXI.

Fig. 1. SCRAPER. Handle of antler. Blade of iron driven into the end of the handle.
The antler shows longitudinally the marks of the sand-saw.

Cat. No. 2020, U. S. N. M. Eskimo of Anderson River, Canada. Collected by B. R.
Ross.

Fig. 2. SCRAPER BLADE. Of dark chert.

Cat. No. 36290, U. S. N. M. Eskimo of Cape Vancouver. Collected by E. W. Nelson.

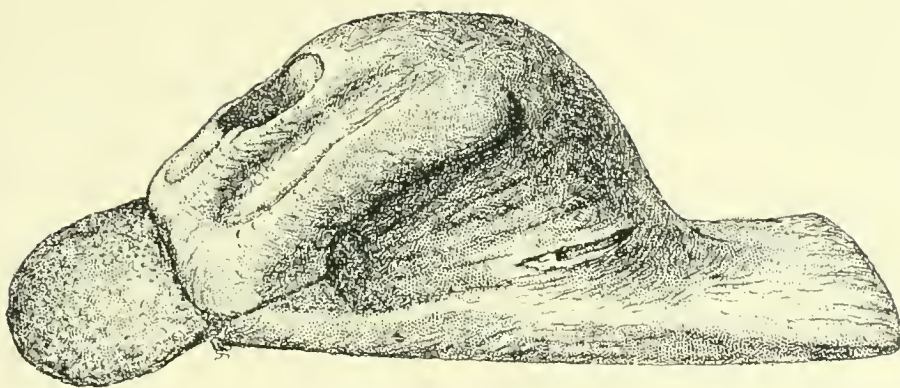


SCRAPERS.

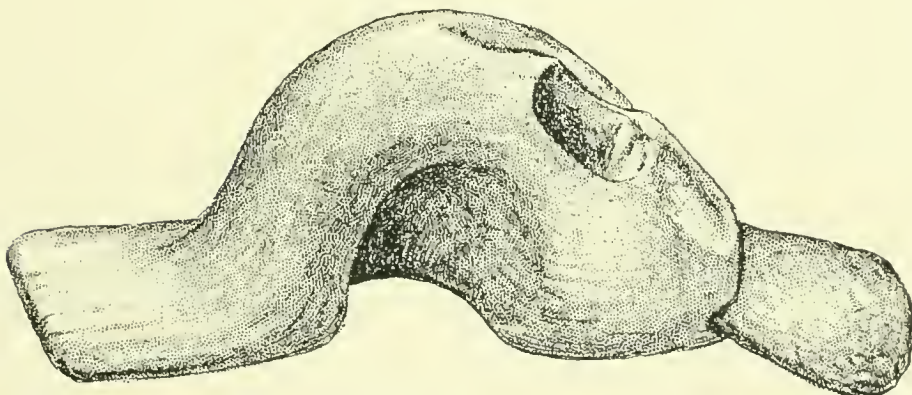
EXPLANATION OF PLATE LXXII.

Fig. 1 (*a*, *b*, and *c*). SCRAPER. Long, large-sized handle of spruce. Thumb groove for a large digit, deep and wide. Groove for forefinger, pocket for middle finger, undercut nearly across the bottom. Tailpiece rectangular, thin, and nearly flat. Unlike most other implements of this class the specimen has for a blade a thin scale of sandy shale.

Cat. No. 89309, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.



a



b



c

SCRAPER.

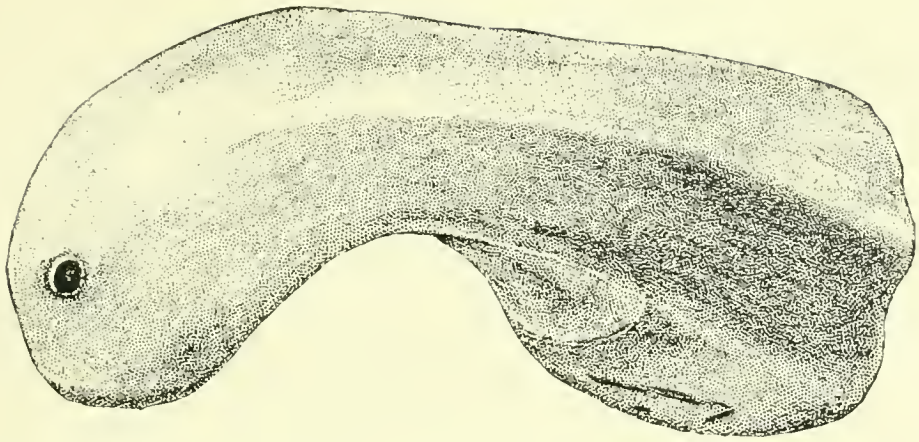
EXPLANATION OF PLATE LXXIII.

Fig. 1 (*a* and *b*). SCRAPER. Of walrus ivory. Thumb groove slight. Fingers separated by a ridge three and three-quarters inches in length. Undercut quite across and extending into a spoon-shape cavity of the palm rest, which is pierced for a suspending cord. This is a broad, heavy, and effective implement.

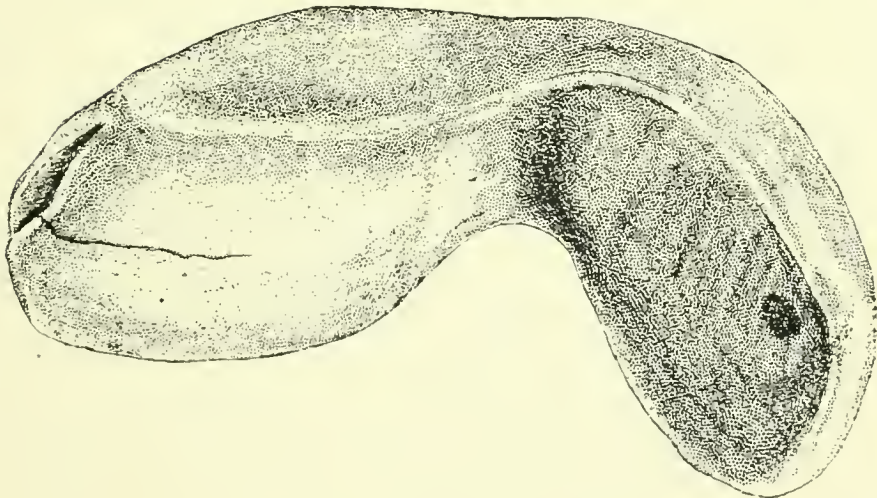
Cat. No. 89321, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 2. SCRAPER. Of walrus ivory. There are no grooves for digits. The undercut extends quite across and the implement rests on its front and rear edge. The palm rest declines at an angle of 90 degrees and terminates abruptly without horizontal appendix. The blade, of reddish-brown jasper, is held in its socket by a washer of rawhide.

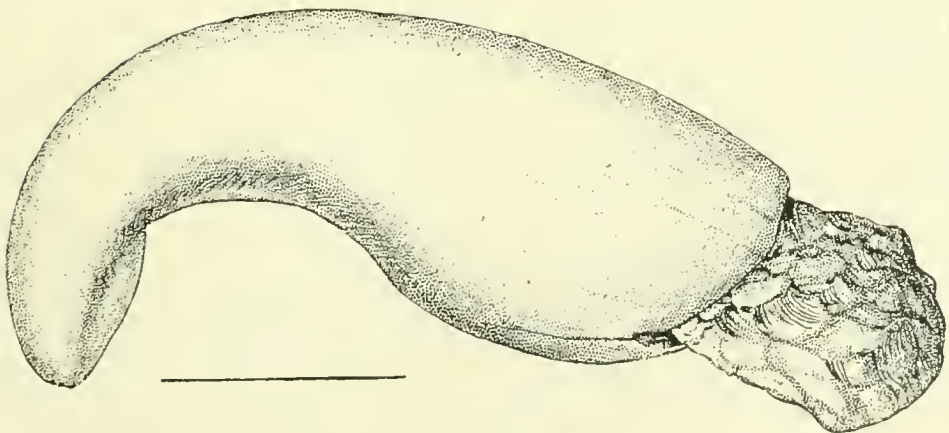
Cat. No. 89313, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.



1a



1b



2

SCRAPERS.

EXPLANATION OF PLATE LXXIV.

Fig. 1. SCRAPER. Of walrus ivory. A delicate, mottled specimen, shaped in front like the incisor of a horse. Thumb groove very slightly and delicately hollowed. There is an undercut on this side, but it serves no earthly purpose. In this and many other specimens this cut seems to be a fashion without an aim. The finger grooves are continuous to the margin next the stone blade and are models of graceful carving. The undercuts on both sides are nearly alike, causing the implement to rest on the front and rear. This is one of the most beautiful pieces in the Museum.

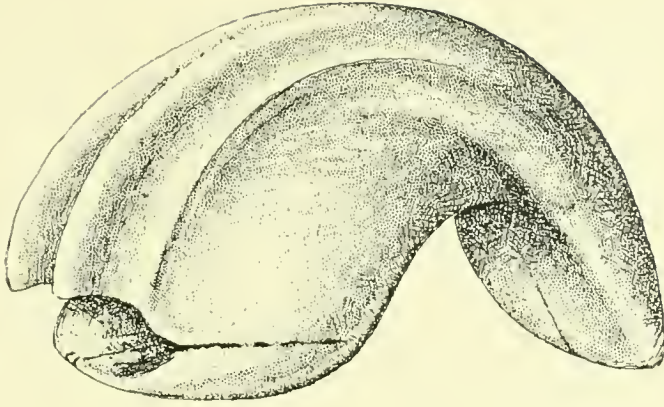
Cat. No. 89317, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 2. SCRAPER. Of walrus ivory, resting upon the front and tailpiece. The thumb groove a shallow pit. Front finger grooves slight hollows. Undercut extending entirely across, but much smaller on the thumb side. Blade of black chert, held in place by a packing of cord much broader than the handle.

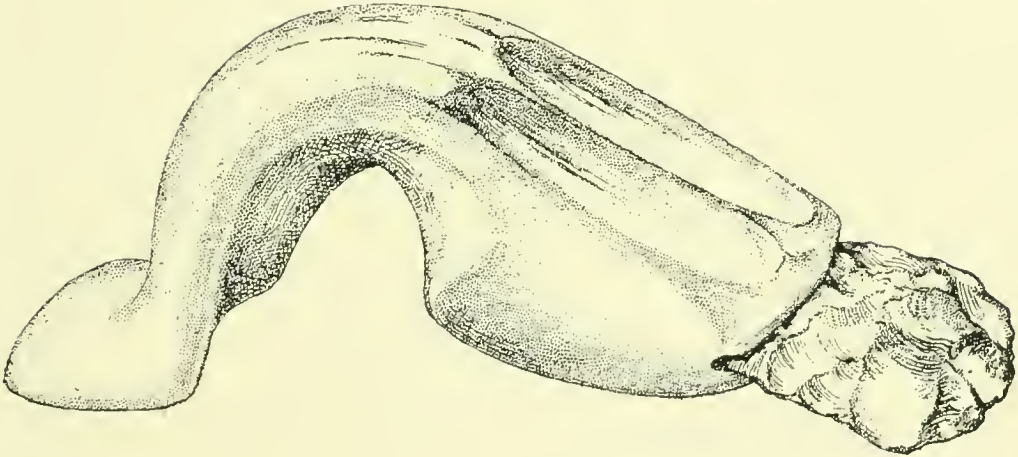
Cat. No. 89315, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 3. SCRAPER. Of walrus ivory. Heavy and high arched. The specimen is new and is ornamented with incised lines coarsely fringed. This specimen has never been used and is the only one in the National Museum with the slightest ornamentation. It rests upon the front margin of the blade socket and the edge of the declined tailpiece and is singularly lifted up. Thumb groove deep, bordered above by a long ear-shaped piece in high relief. The finger grooves are long, narrow, and deep. The undercut is peculiar, that portion in which the fingers fit being separated from the more shallow portion on the left by a sharp offset. The ear-shaped projection will be noticed faintly on several other specimens.

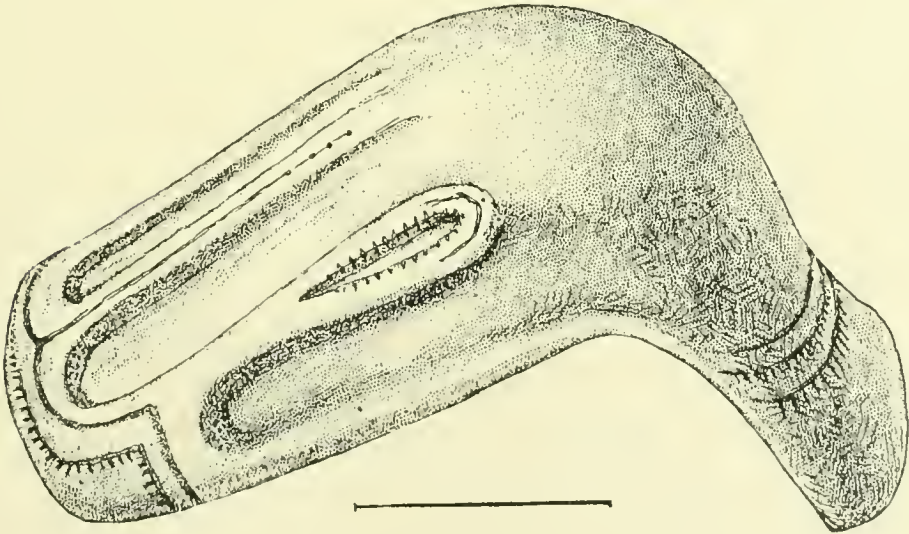
Cat. No. 89314, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.



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SCRAPERS.

EXPLANATION OF PLATE LXXV.

Fig. 1. SCRAPER. Of walrus ivory. The specimen lies flat, touching a horizontal surface all around its underside. The last two specimens, on the contrary, touch only at the front and rear. Thumb groove a deep furrow, almost concealing the digit. Finger grooves two slight cup cuttings for the tips. Undercut not extending all the way across, so that the lower margin under the thumb touches the ground all the way from front to rear.

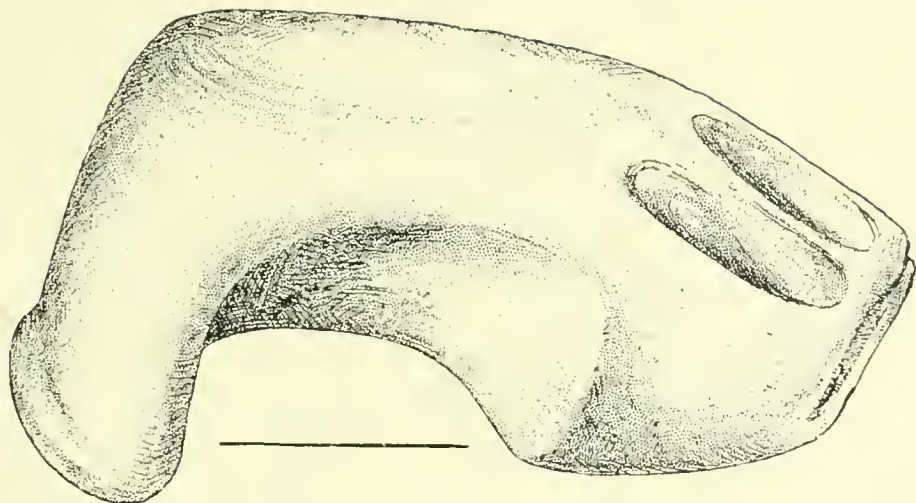
Cat. No. 89316, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 2. SCRAPER. Handle of wood. Flat bottomed. The material is so much cut away that the thumb pocket, the upper and the side finger pockets all communicate, and the thumb groove at the end opens into the blade socket.

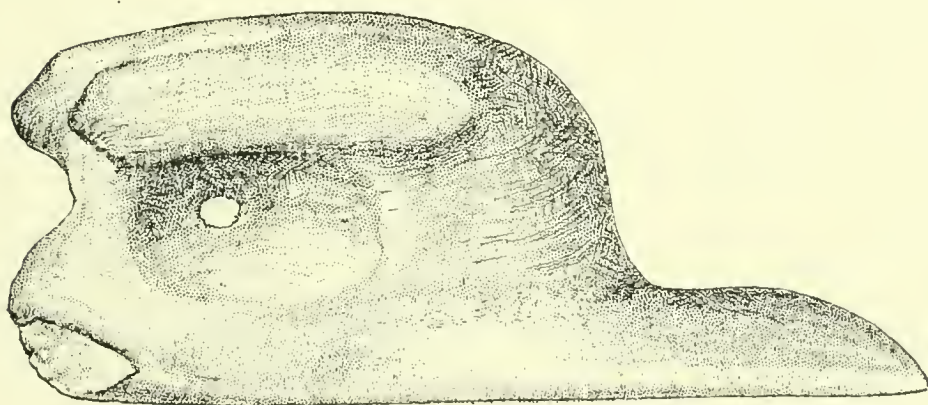
Cat. No. 89310, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 3. SCRAPER. A clumsy specimen of spruce wood resting upon a flat base, scarcely affected by the undercut. The thumb groove wide and for the first joint a deep pocket. Upper finger groove only for the forefinger. For the middle finger there is a separate undercut pocket and for the last two fingers the undercut is deeply pocketed. The front is precipitate, 2 inches high: the rear prolonged into a flat tailpiece, broader than the rest of the implement. There are a few specimens of this class made of wood, unique in form, but there are no others with precipitate front.

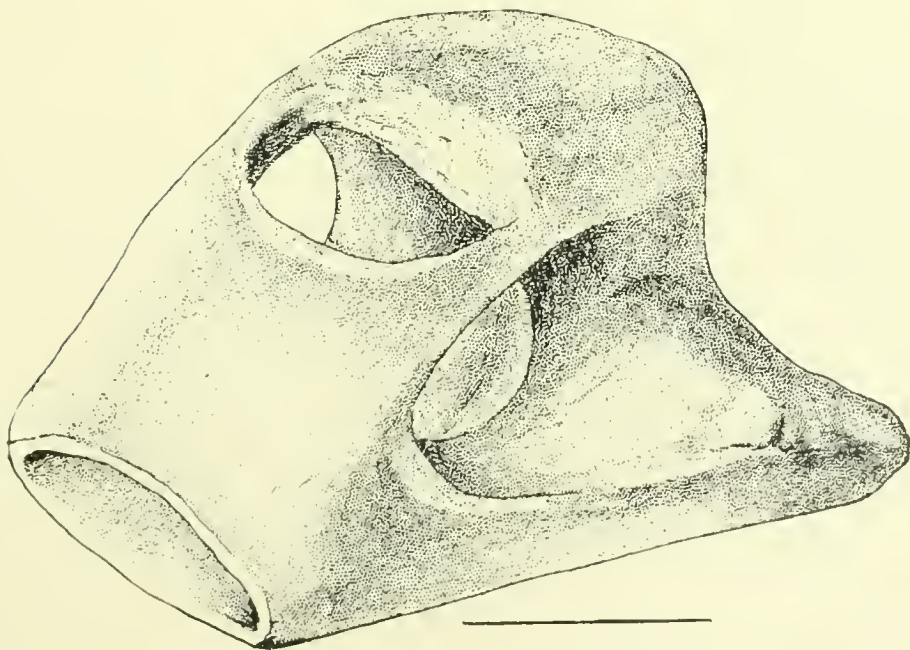
Cat. No. 89311, U. S. N. M. Eskimo of Point Barrow, Alaska. Collected by Capt. P. H. Ray, U. S. Army.



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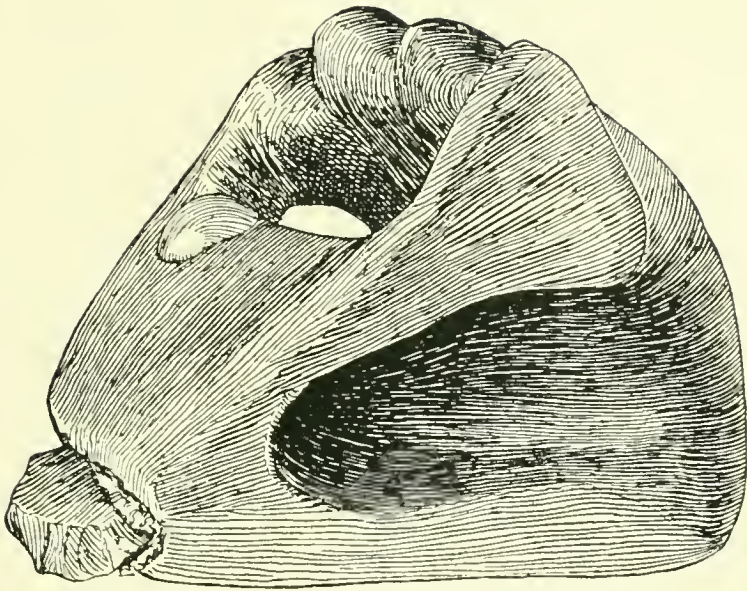
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SCRAPERS.

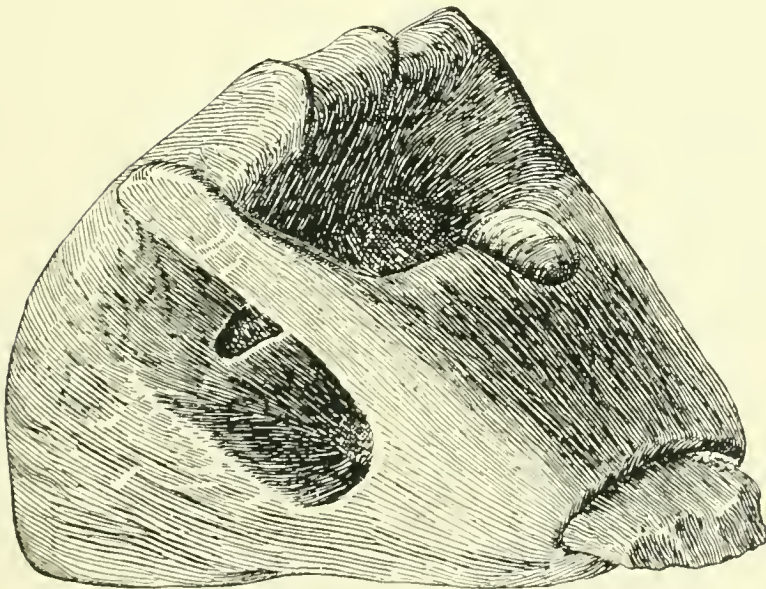
EXPLANATION OF PLATE LXXVI.

Fig. 1 (*a* and *b*). SCRAPER. Handle or grip of wood, with deep pocket grooves for the digits. The thumb is almost hidden in its cavity. On top there are three grooves for the fore, the middle, and the ring finger, respectively, and a very deep pocket into which the ends of all three are concealed. The little finger fits into a deep pocket on the right side and there is not the slightest shadow of undercut, the lower surface resembling exactly that of a carpenter's plane. The blade, of drab flint, is neatly inserted into the front and packed with canvas. A blue bead inserted on top in front of the finger pocket is the only ornament.

Cat. No. 63848, U. S. N. M. Eskimo of Point Hope, Alaska. Collected by E. W. Nelson.



a



b

SCRAPER.



EXPLANATION OF PLATE LXXVII.

Fig. 1. SCRAPER. Handle of spruce. Thumb groove fitted to both phalanges of the thumb. Finger grooves slight. Undercut only two-thirds across the bottom, giving the implement a rest along the entire left side. The top is arched high up and there is a slight bell-shaped tailpiece. Blade of black chert, secured with a leather washer into a grooved socket—that is, half the depth of the mortise is cut out on the sides. This would fit a blade of any width.

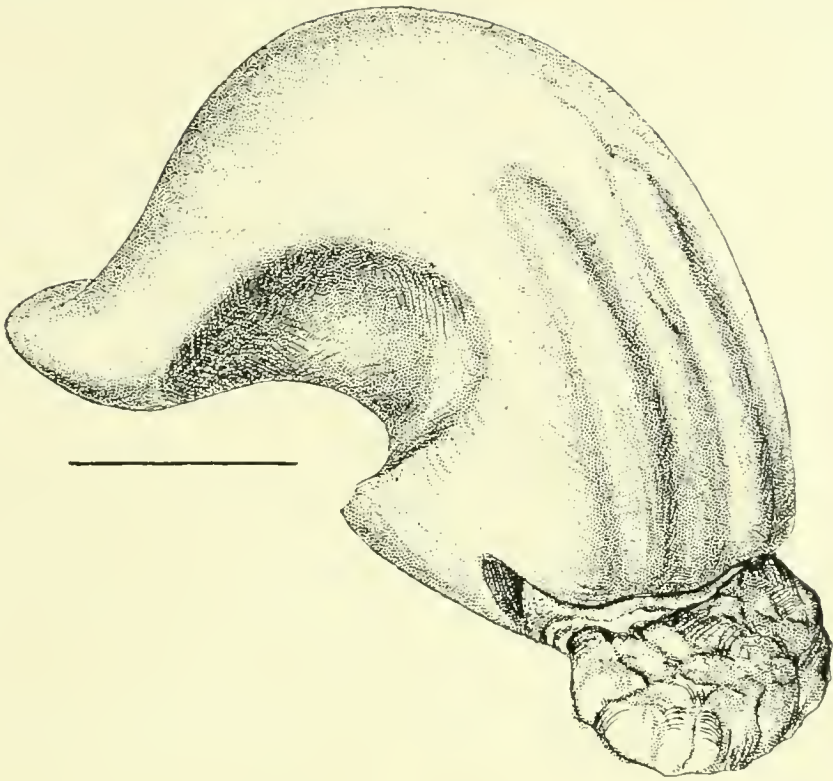
Cat. No. 63847, U. S. N. M. Eskimo of Point Hope, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 2. SCRAPER. Handle of hard wood. Thumb groove deep and long, over which an ear-shaped projection is carved, as in Plate LXXIV, Fig. 3, from Point Barrow. Finger groove rounded out to give the appearance of a skull and terminating 1 inch behind the stone blade. Undercut not wide and hook-shaped in base outline. The tailpiece is gouged out like the rim of a belt. This form is quite an oddity and leads to the conclusion that each implement was made to fit the hand of the workman. This being the case they reveal as great a diversity in the size of Eskimo hands as exists among the white race.

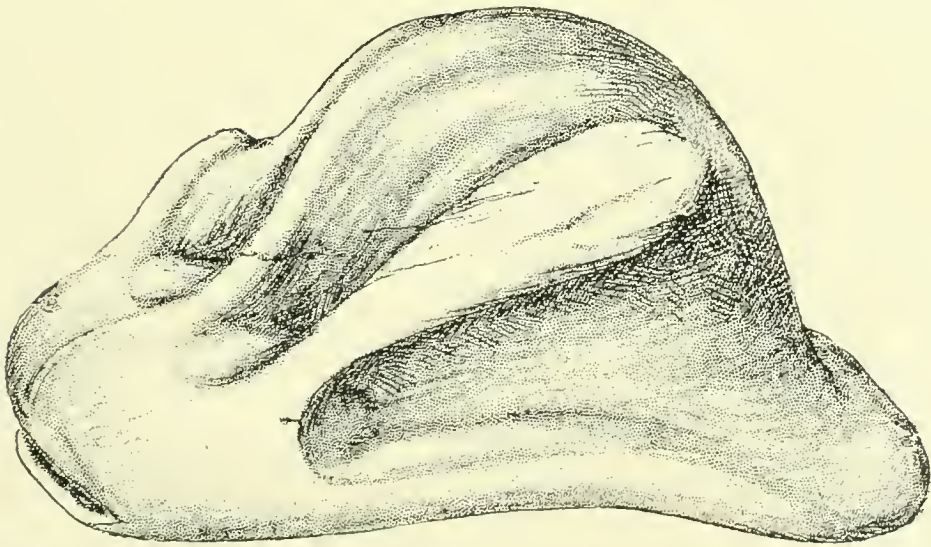
Cat. No. 63849, U. S. N. M. Eskimo of Point Hope, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 3. SCRAPER. Of walrus ivory. A very graceful old handle, much discolored, resting on the front or haft and the broad flattened tailpiece. Thumb groove shallow, but exactly fitting and bounded above by the ear-shaped ridge so prominent in Plate LXXIV, Fig. 3, from Point Barrow. Finger grooves extending to the stone blade. Undercut consists of two distinct parts, that for the last two fingers and a smaller one under the thumb, a common characteristic, but serving only to remove useless material. The tailpiece is long, broad, and gracefully curved into the grip.

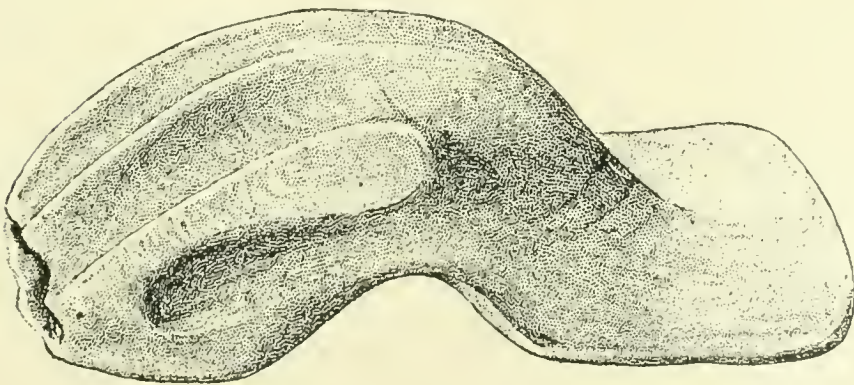
Cat. No. 63855, U. S. N. M. Eskimo of Point Hope, Alaska. Collected by Capt. P. H. Ray, U. S. Army.



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SCRAPERS.



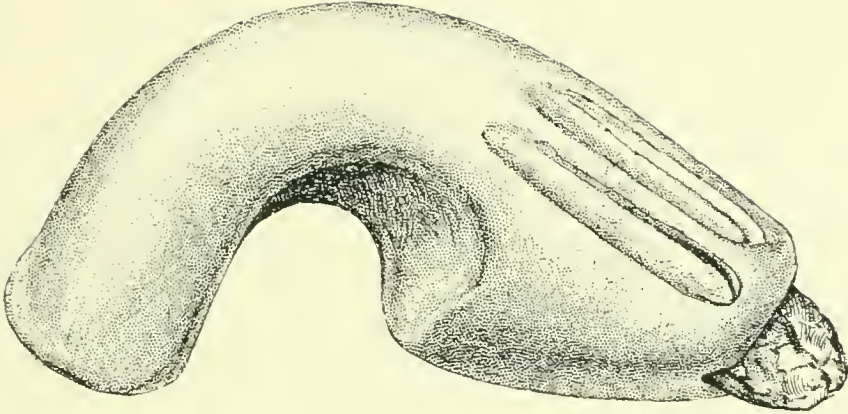
EXPLANATION OF PLATE LXXVIII.

Fig. 1 (*a* and *b*). SCRAPER. Handle of spruce wood, with marked characteristics, resting on the front and long tailpiece and slightly arched up in the middle. Thumb groove profound, finger grooves moderately deep. Undercut two-thirds the distance across the bottom. Between this and the blade is a cul-de-sac for the third or ring finger. The grip is high arched and the flat tailpiece projects abruptly from its base. The socket is broad and intrudes slightly on the sides. Split by a stone blade, the old device of a groove and lashing has been resorted to.

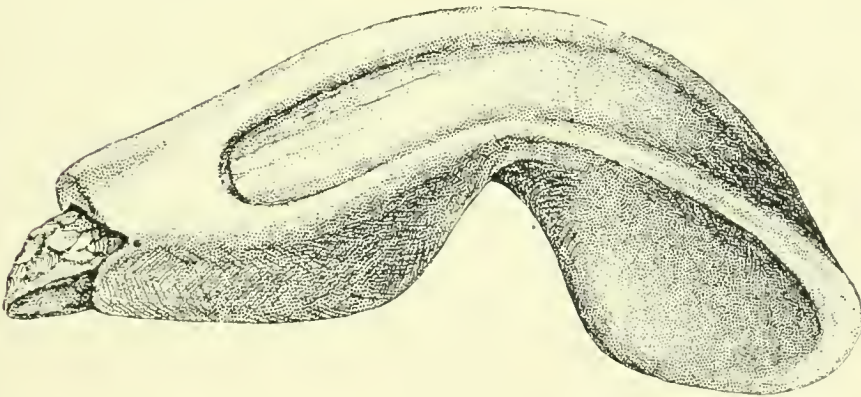
Cat. No. 127886, U. S. N. M. Eskimo of Hotham Inlet, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 2. SCRAPER. Of walrus ivory. A slender spoon-shaped handle. Thumb is scantily provided for and the finger grooves are mere shadows. The undercut is scalloped delicately on its side to receive the string and the middle finger. The socket is very broad and deep but entire on its margin. There is a delicious continuity of curvature over the entire surface of this specimen, so that not a single sharp turn occurs anywhere except in the socket.

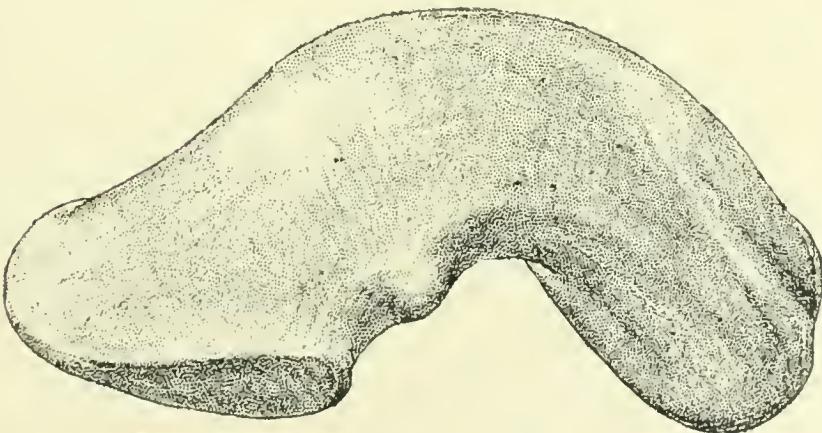
Cat. No. 48624, U. S. N. M. Eskimo of Kotzebue Sound, Alaska. Collected by Capt. P. H. Ray, U. S. Army.



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1b



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SCRAPERS.



EXPLANATION OF PLATE LXXIX.

Fig. 1. SCRAPER. Of spruce wood. High arched on top and resting on its two ends. The thumb groove is deep and pocketed. Finger grooves deeply pocketed and divided by a thin partition. Undercut two-thirds across the bottom, which is slightly arched up. Grip high arched and subtended by a narrow bell-shaped tailpiece, the margin of which is prolonged. Socket a very deep mortise extending to the thumb and finger pockets.

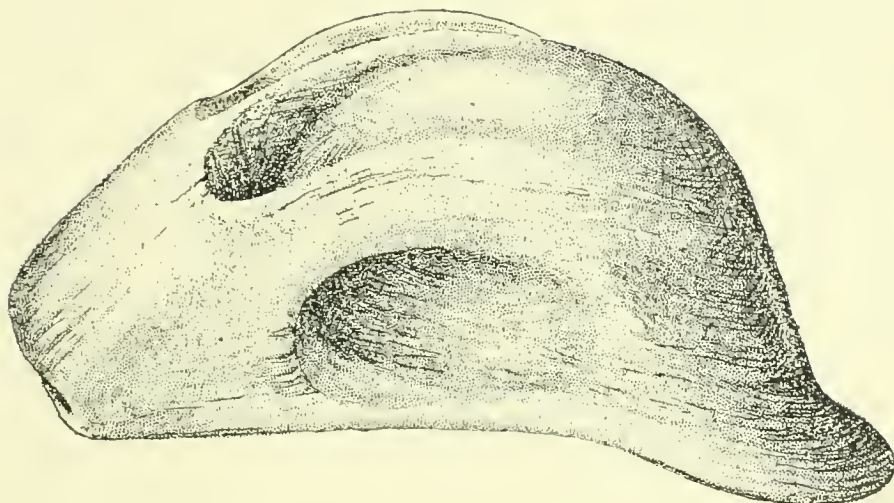
Cat. No. 64177, U. S. N. M. Eskimo of Hotham Inlet, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 2. SCRAPER. Of walrus ivory. An abnormal specimen, made from the proximal end of a walrus tusk. Evidently the maker racked his ingenuity to get the most out of his material. Provision for the thumb and first two fingers is made by the core cavity in front. The undercut trenches largely on the same cavity, which extends onward through the grip. The socket is mortised an inch deep.

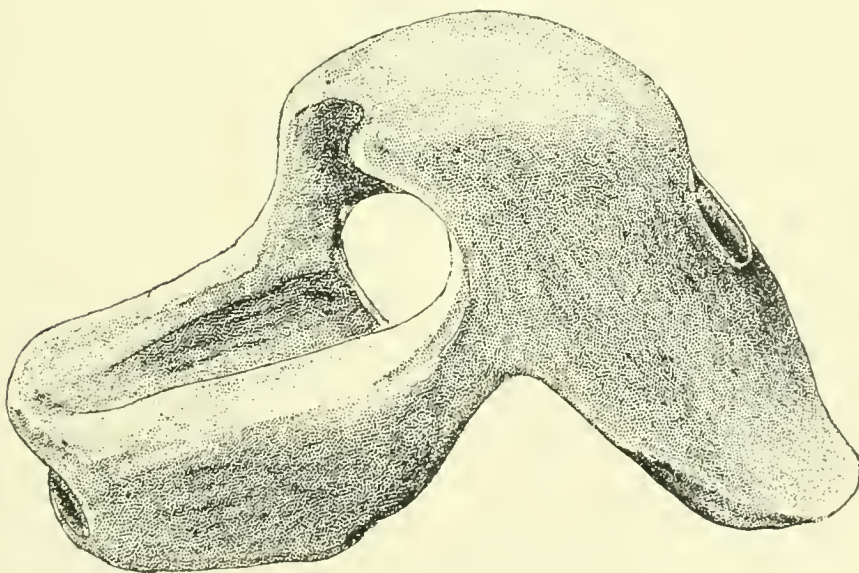
Cat. No. 64181, U. S. N. M. Eskimo of Hotham Inlet, Alaska. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 3. SCRAPER. Handle of pine wood; blade of drab-colored chert; lashing of unshredded sinew, with washers of rawhide. This is a rude specimen, representing only the outline and commencement of the type characters in the one-handed scraper. There is no thumb groove on the side; no finger groove on the top. On the under face of the right-hand side are two very shallow grooves for the ring and little finger. The protection of the hand is secured by the angle of the handle. The blade has chippings only on the upper side. It is laid in a roughly gouged hollow, so as to bring its under surface flush with that of the handle. A Pawnee Indian informed the writer that the careless lashing on so many hafted tools is owing to the fact that the blade is continually taken out to be sharpened, which tallies with Lieutenant Stoney's testimony.

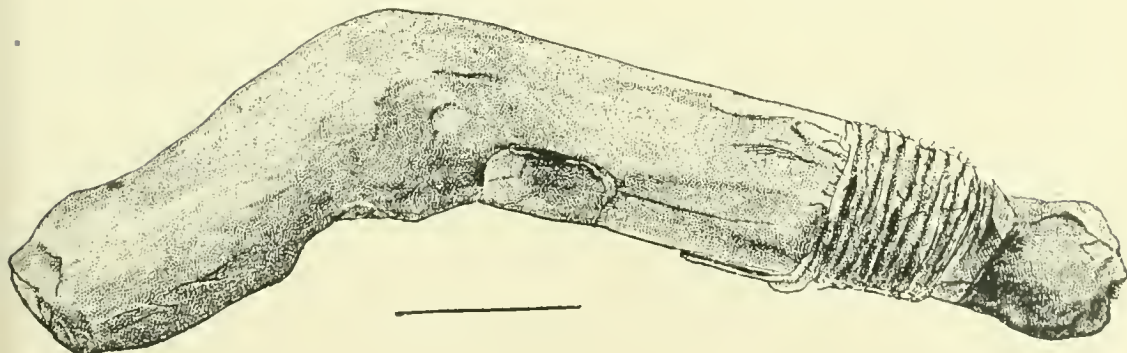
Cat. No. 43405, U. S. N. M. Eskimo of Cape Prince of Wales. Collected by Capt. P. H. Ray, U. S. Army.



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SCRAPERS.



EXPLANATION OF PLATE LXXX.

Fig. 1. FAT-SCRAPER. Dish-shaped. Made from a section of walrus tusk. This form of scraper might easily be mistaken for a dish, but an examination of the edge shows that on one side at least it has been scraped down sharp. There are types of these scrapers—the dish-shaped, the hoop-shaped, the horseshoe-shaped, the knife or spoon shaped, the scoop-shaped, and the ring-shaped, and each shape has a definite locality.

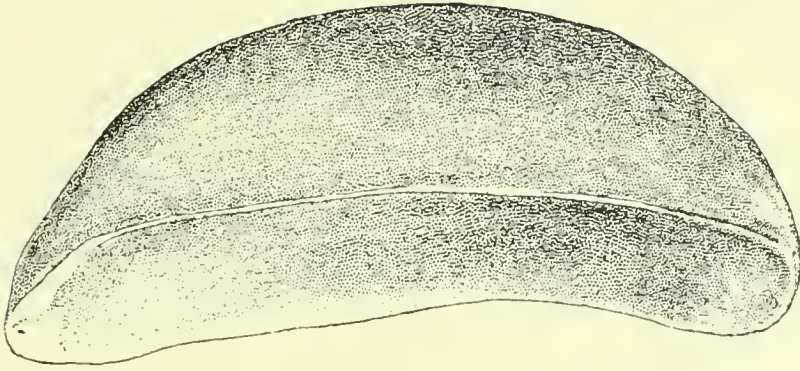
Cat. No. 63355, U. S. N. M. Eskimo of St. Lawrence Island. Collected by E. W. Nelson.

Fig. 2. FAT-SCRAPER. Of walrus ivory. Shaped like an old-fashioned milk skimmer or a grocer's scoop. The form is quite graceful and the graceful ridges on the upper margin afford a firm grip to the hand. This form is in the Straits and Kotzebue.

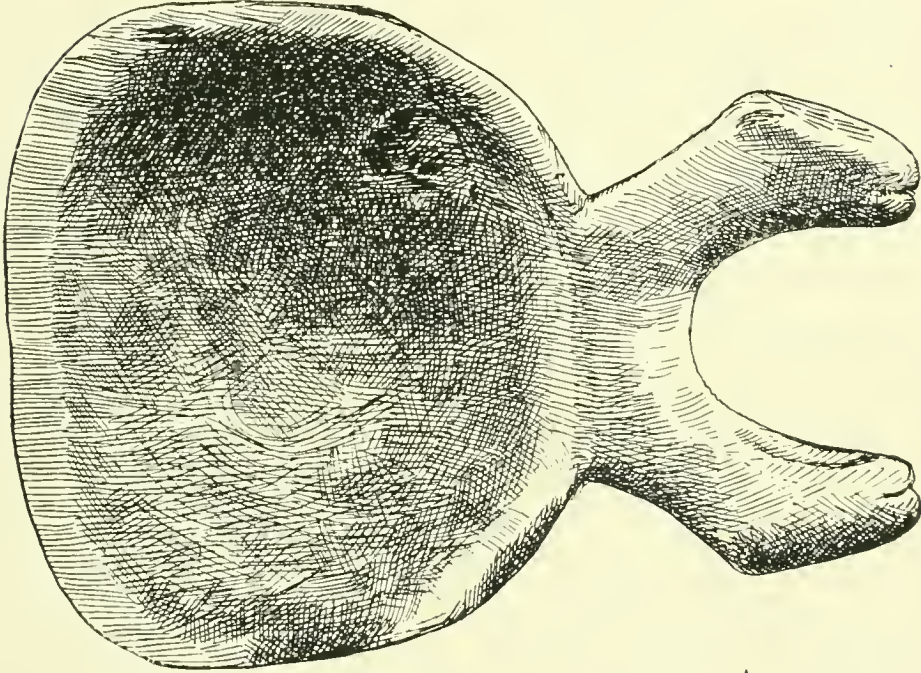
Cat. No. 63900, U. S. N. M. Eskimo of Diomed Islands. Collected by E. W. Nelson.

Fig. 3. FAT-SCRAPER. Fine old specimen of discolored walrus ivory. Blade, ladle, or skimmer shaped. Two prongs carved to imitate bears' heads form the most convenient grip.

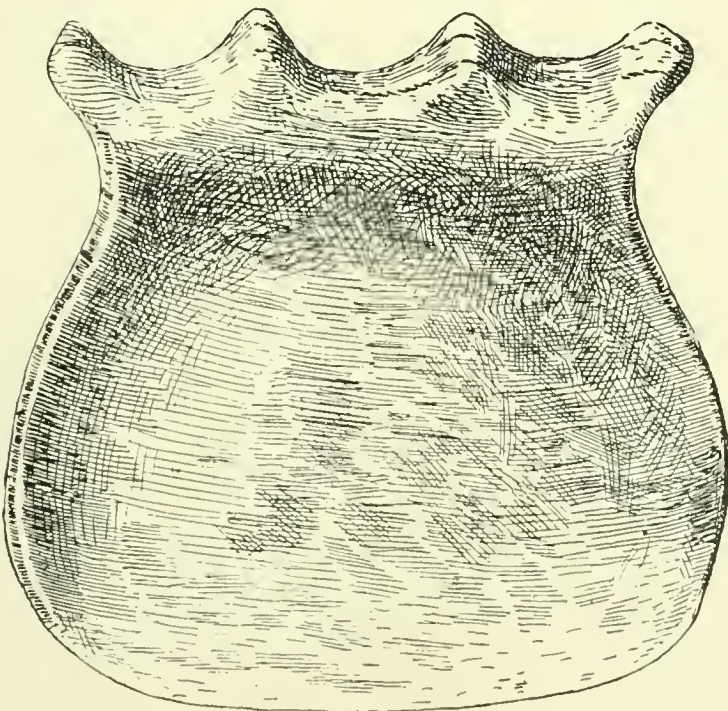
Cat. No. 127896, U. S. N. M. Eskimo of Kotzebue Sound. Collected by Lieut. G. M. Stoney, U. S. Navy.



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FAT-SCRAPERS.

EXPLANATION OF PLATE LXXXI.

Fig. 1. FAT-SCRAPER. A strip of ivory 6 inches long, 1 inch wide, and shaped like a knife blade, one-eighth of an inch thick at the back, where it is also bent and held in position by a rawhide string passed once or twice across through holes in the ends of the ivory and then carefully wrapped around the cross strings. Its use is said to be for scraping fat from seal skins to be put in the soapstone lamps.

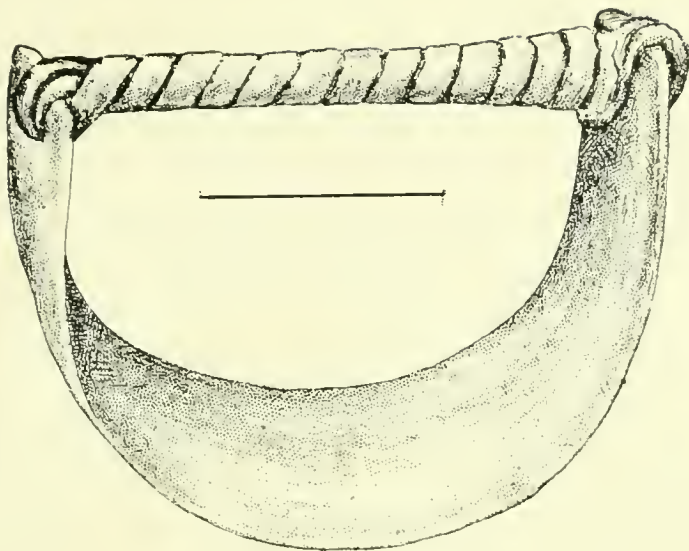
Cat. No. 63642, U. S. N. M. Eskimo of Cape Wankarem. Collected by Capt. P. H. Ray, U. S. Army.

Fig. 2. FAT-SCRAPER. Made of a section of the lower end of a walrus tusk sawed off like a napkin ring. The inner side being soft and the outer side hard, it is the easiest thing in the world to scrape away the soft part, so as to have an edge like the tooth of a rodent. Used to remove fat from skins before dressing them. This form of scraper is not found in the Museum collection except from Sledge Island and the Diomedes.

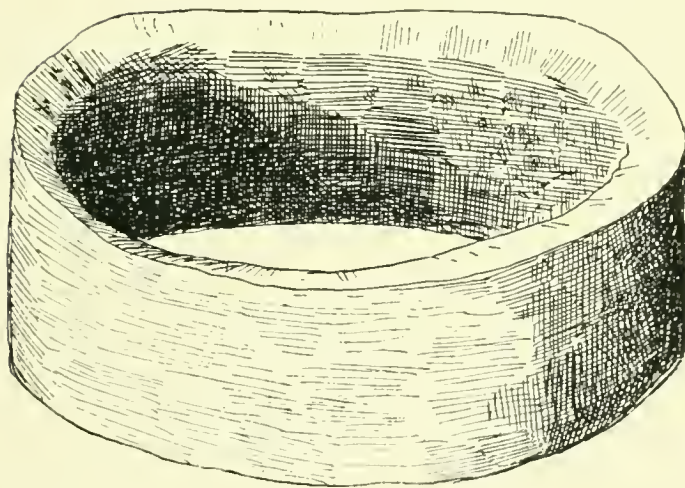
Cat. No. 44990, U. S. N. M. Eskimo of Sledge Island. Collected by E. W. Nelson.

Fig. 3. FAT-SCRAPER. Made of a narrow, thin strip of antler bent in form of a horseshoe and held in place by a strip of rawhide passed backward and forward through two holes in each end and then wrapped in a neat coil across. The loop on the outside of the ends is neatly countersunk. One margin of the antler strip is scraped to an edge from within, so as to preserve the outer hard portion for work.

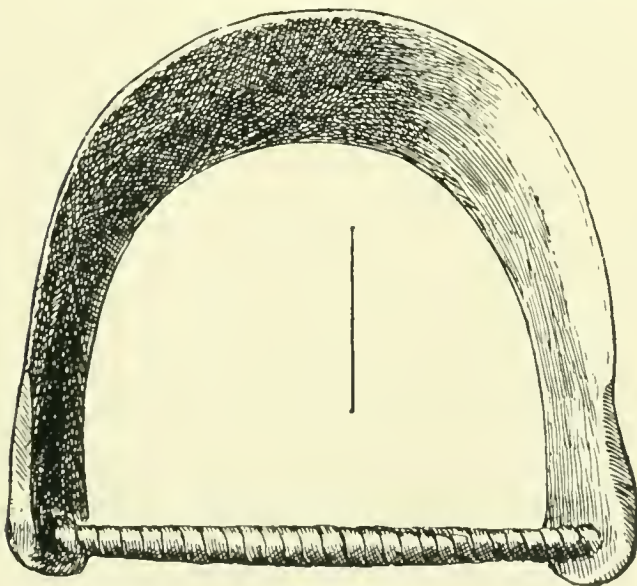
Cat. No. 44771, U. S. N. M. Eskimo of Sledge Island. Collected by E. W. Nelson.



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FAT-SCRAPERS.

EXPLANATION OF PLATE LXXXII.

Fig. 1. SCRAPER. Handle of wood, blade a flat celt of schist let into the lower part of the handle neatly and lashed in place with spruce root. A very large but neatly made specimen. It is an excellent example of transition between the short and the long handle. Place for the thumb is excavated; lift margin for the forefinger on the upper surface, and for the other three fingers underneath. The palm of the hand rests against the depressed end.

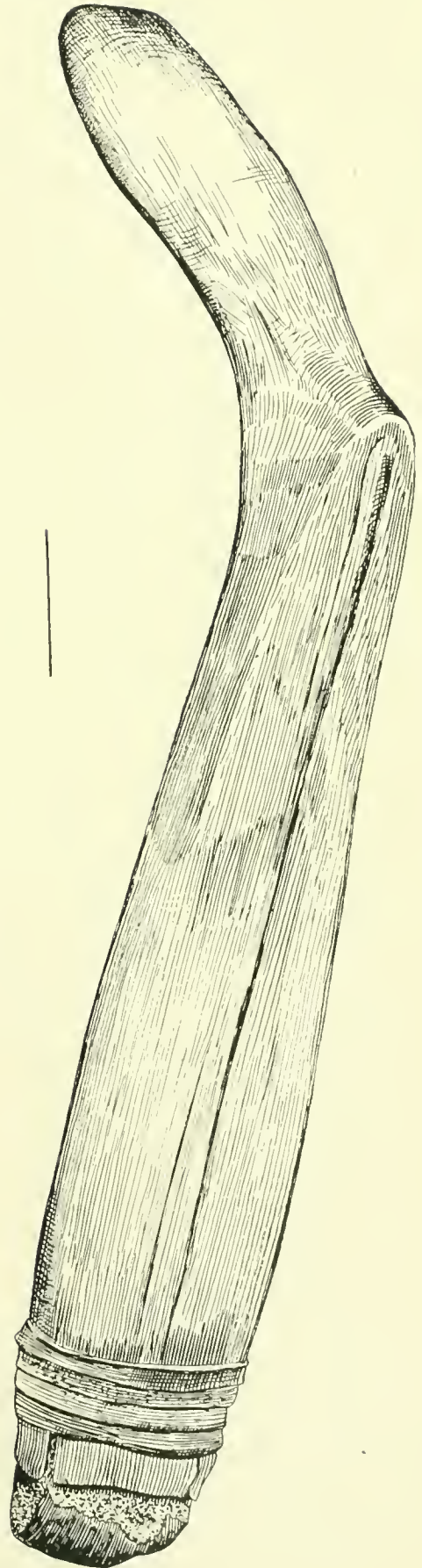
Cat. No. 43927, U. S. N. M. Eskimo of Norton Bay, Alaska. Collected by E. W. Nelson.

Fig. 2. SCRAPER. With wooden handle of medium length. The grip in its curve with the handle suggests a pistol butt. The shaft is a long triangle and on the underside excavated to receive the celt-like blade of hard volcanic rock. This blade has a chisel edge and is held in place by means of a thong of raw seal-hide fastened by tucking the end under. The attention of archaeologists is especially called to the mounting and function of this polished blade with chisel edge, as they have many similar pieces in their cabinets. Length, $11\frac{1}{4}$ inches.

Cat. No. 24689, U. S. N. M. Eskimo of Norton Sound, Alaska. Collected by Lucien M. Turner.



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SCRAPERS.

EXPLANATION OF PLATE LXXXIII.

Fig. 1. SCRAPER. Handle of wood, grip cylindrical, shaft triangular, expanding downward to fit neatly the blade of slate, which lies in a cut on the under side and is held in place by a neat lashing of fine rawhide string.

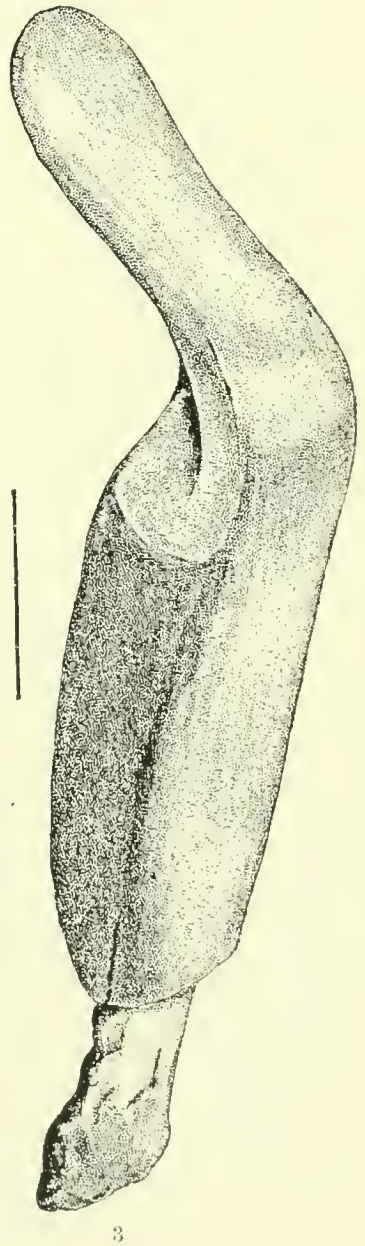
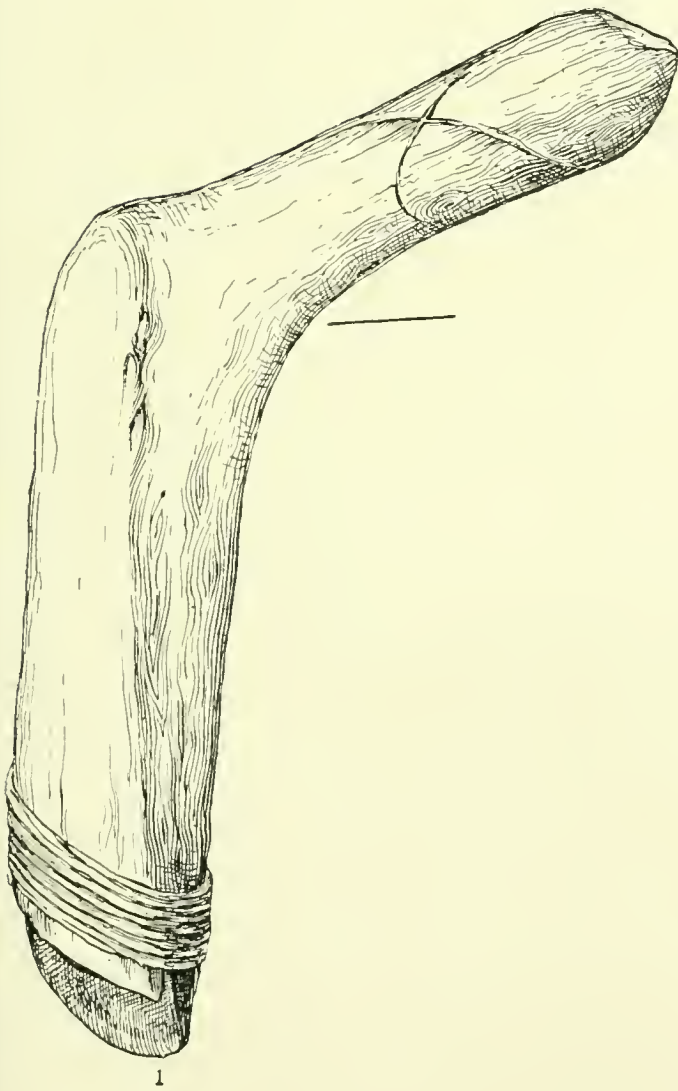
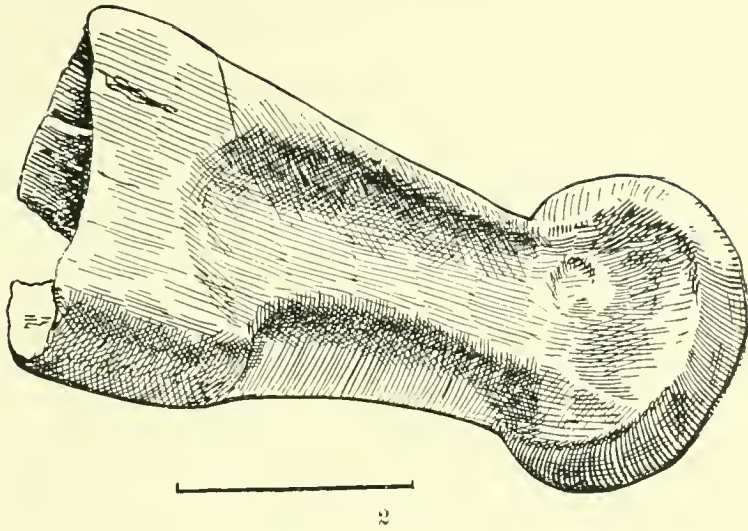
Cat. No. 129216, U. S. N. M. Eskimo of St. Michaels, Alaska. Collected by Lucien M. Turner.

Fig. 2. SCRAPER HANDLE. Of walrus ivory; very old. The noticeable marks are the economy of material, the smallness of the owner's hand, the slight grooves for thumb and first two fingers, and chiefly the spoon-shaped cavity beneath for the ring and the little finger. Length, $3\frac{1}{4}$ inches.

Cat. No. 33093, U. S. N. M. Eskimo of Norton Sound, Alaska. Collected by E. W. Nelson.

Fig. 3. SCRAPER. Handle of spruce wood. This is an interesting connecting link between the shaftless type and the long shafted type of the South. The shaft from the point of the thumb is about $1\frac{1}{2}$ inches; no finger grooves. Under cut two-thirds across. Grip a straight incline without tail piece.

Cat. No. 44086, U. S. N. M. Eskimo of Koyuk River. Collected by Capt. P. H. Ray, U. S. Army.



SCRAPERS.



EXPLANATION OF PLATE LXXXIV.

Fig. 1. FAT-SCRAPER. Made of the radius of the deer. The rounded front portion is cut away so as to furnish a rest on the ridge of the incurved portion, and two edges, one on either side. The hard lower edge of the implement is also ground to a chisel edge like that of a graining tool. Every portion of the implement affording a hard, bony surface has been ground to an edge.

Cat. No. 38490, U. S. N. M. Eskimo of Mission, Alaska. Collected by E. W. Nelson.

Fig. 2. FAT-SCRAPER. Of walrus ivory. Ingeniously carved so as to furnish a grip and a long opening for the thumb. One edge only is sharpened. The implement fits only the right hand and shows that the Eskimo scraped away from himself and not towards himself.

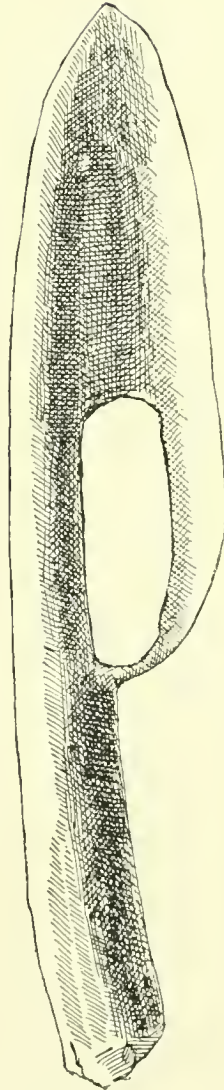
Cat. No. 127508, U. S. N. M. Eskimo of Togiak River, Alaska. Collected by I. Applegate.

Fig. 3. SCRAPER. Made of the rib of a deer, with little or no modification of form. The Indians of California are said to use a rib in the same manner.

Cat. No. 38244, U. S. N. M. Eskimo of Mission, Alaska. Collected by E. W. Nelson.



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SCRAPERS.

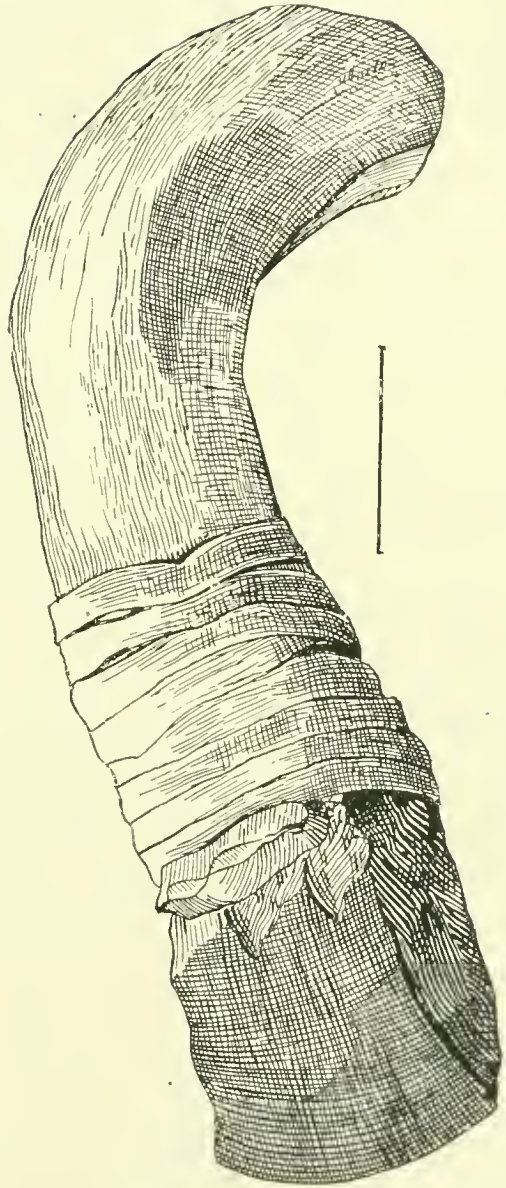
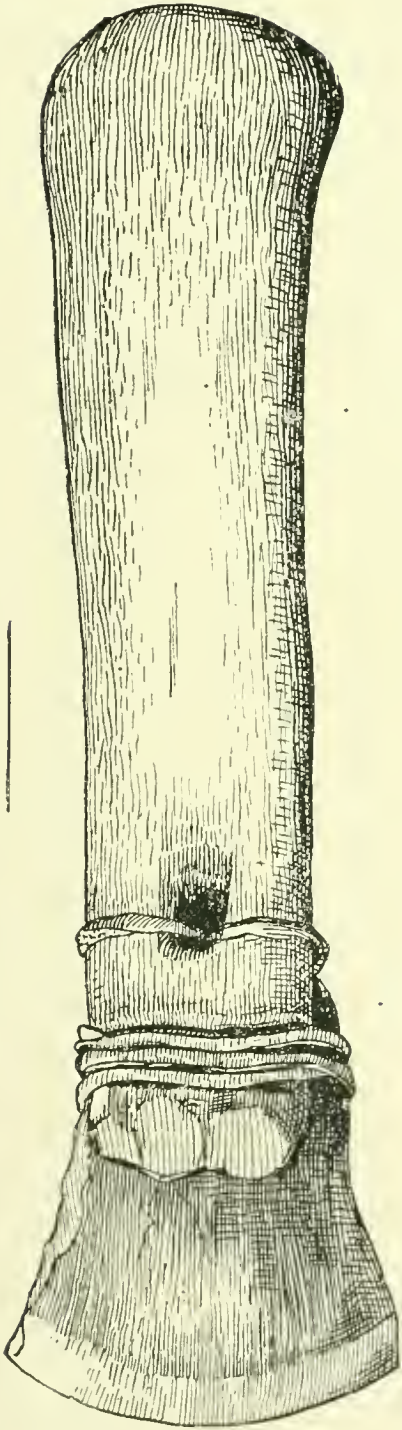
EXPLANATION OF PLATE LXXXV.

Fig. 1. SCRAPER. Handle of pine, quite old, slightly fitted to the hand. Blade of slate lashed to the handle roughly by a leather thong passing through a perforation.

Cat. No. 127502, U. S. N. M. Eskimo of Togiak River. Collected by I. Applegate.

Fig. 2. SCRAPER. Handle a curved piece of pine wood, pistol-shaped. Blade a ground celt of black chert, edge wedge-shaped, lashed to the handle with a splint of pine root. The blade is made to fit to the handle by a padding of grass. If the unknown may be explained by the known, this specimen finds a function for many flat, wedge-shaped celts.

Cat. No. 38252, U.S. N. M. Eskimo of Lower Yukon. Collected by E. W. Nelson.



SCRAPERS.



EXPLANATION OF PLATE LXXXVI.

Fig. 1. SCRAPER. Handle a long shaft of spruce with a grip formed by a slight natural bend at the upper end. Blade a thin celt of chert, with edge wedge-shaped, but the two sides are very much rounded; that is, in cross section the edge forms a letter **V** with one limb straight, the other curved outward.

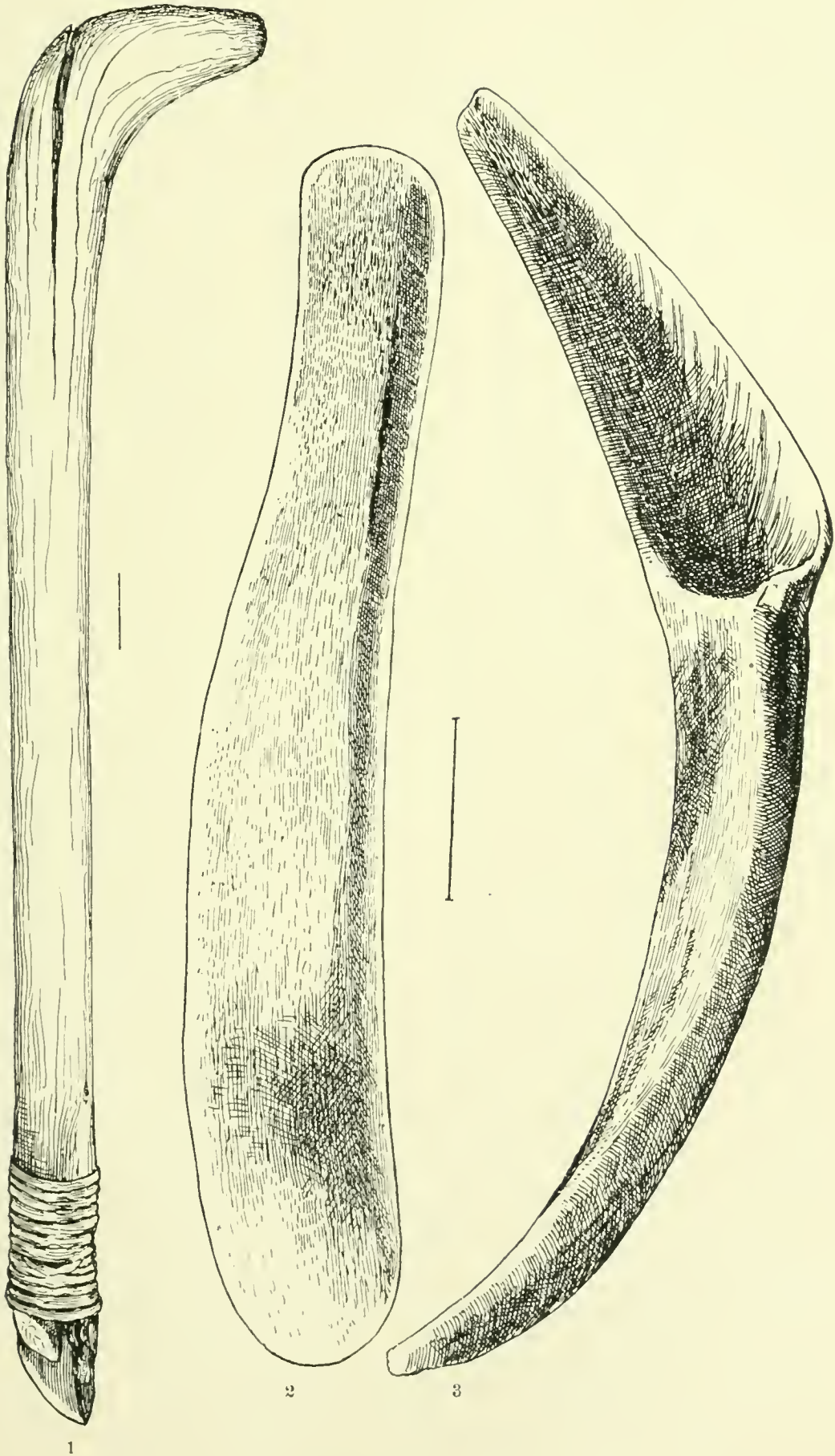
Cat. No. 38603, U. S. N. M. Eskimo of Cape Vancouver. Collected by E. W. Nelson.

Fig. 2. FAT-SCRAPER. Made of antler; the handle, one of the prongs, and the spoon-shaped blade scooped out of the columnar portion. This is a dainty implement for its work.

Cat. No. 37967, U. S. N. M. Eskimo of Chalitmute. Collected by E. W. Nelson.

Fig. 3. FAT-SCRAPER. Made of antler and used for removing the fat from bird and animal skins prior to the curing. The fat is preserved for the lamp. Length, $6\frac{1}{2}$ inches.

Cat. No. 36501, U. S. N. M. Eskimo of Kashunuk, north of Norton Sound, Alaska. Collected by E. W. Nelson.



SCRAPERS.

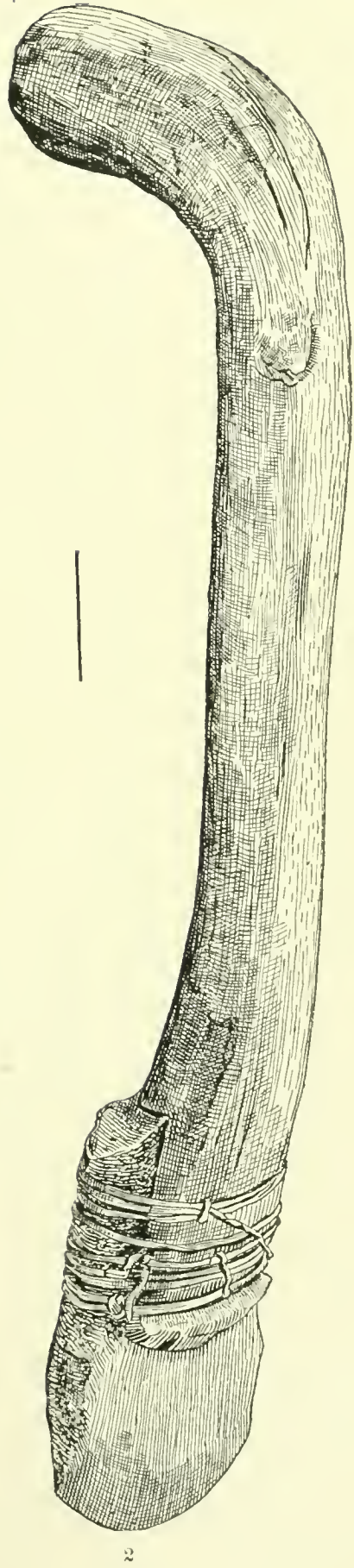
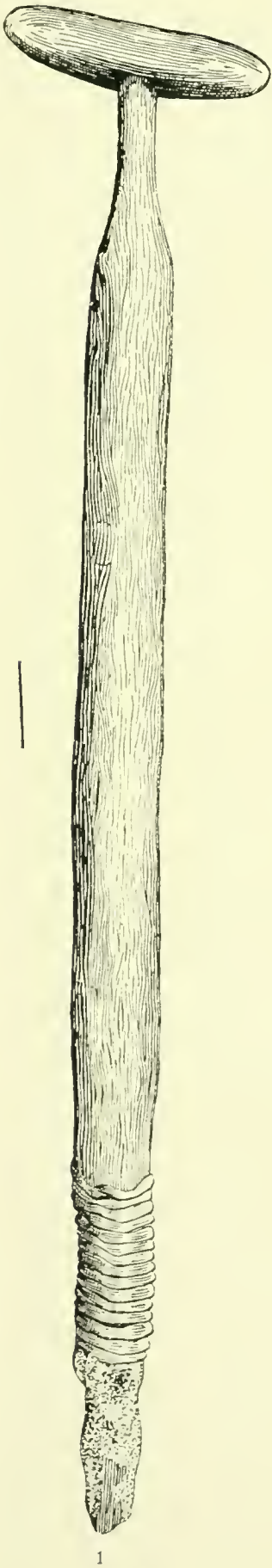
EXPLANATION OF PLATE LXXXVII.

Fig. 1. SCRAPER. Handle of wood 15 inches long. Grip a crutch handle mortised to the end of the shaft perpendicularly to the edge of the blade. Blade a long, narrow celt of schistose rock fitted to a shoulder of the shaft and held in place by a neat seizing of spruce root. The crutch handle is confined to Big Lake and the region around Bristol Bay.

Cat. No. 38838, U. S. N. M. Eskimo of Big Lake, Alaska. Collected by E. W. Nelson.

Fig. 2. SCRAPER. Handle a natural curve of spruce wood. Blade a very wide celt of schistose rock, fitted to a notch in the handle, and held in place with a lashing of fine rawhide string. The unique feature of the specimen is the disproportion between the blade and the handle.

Cat. No. 38828, U. S. N. M. Eskimo of Big Lake, Alaska. Collected by E. W. Nelson.



SCRAPERS.

EXPLANATION OF PLATE LXXXVIII.

Fig. 1. SCRAPER. Handle a forked stick of spruce with the bark still on. Blade a celt of hard slate fitted to a notch on the handle and held in place by a lashing of rattan. This seizing shows the happy faculty of the Eskimo in grasping every available thing that comes to his hands.

Cat. No. 55910(e), U. S. N. M. Eskimo of Bristol Bay. Collected by C. L. McKay

Fig. 2. SCRAPER. Handle a natural curved stick of spruce. Blade a very long, smooth celt of schistose rock, set into a notch on the handle, 4 inches long and held in place by a seizing of spruce root. Rather a clumsy piece.

Cat. No. 55910(e), U. S. N. M. Eskimo of Bristol Bay. Collected by C. L. McKay.

Fig. 3. BEAMING TOOL. Made of a strip of hoop iron inclosed between two half cylinders of wood and held in place by seizing of pine root at the end. The iron is ground to an edge along one margin and the wood has been chamfered away to give the edge a chance to work. This is an excellent specimen, showing the hair in the interstices.

Cat. No. 55912, U. S. N. M. Eskimo of Bristol Bay. Collected by C. L. McKay.



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SCRAPERS.





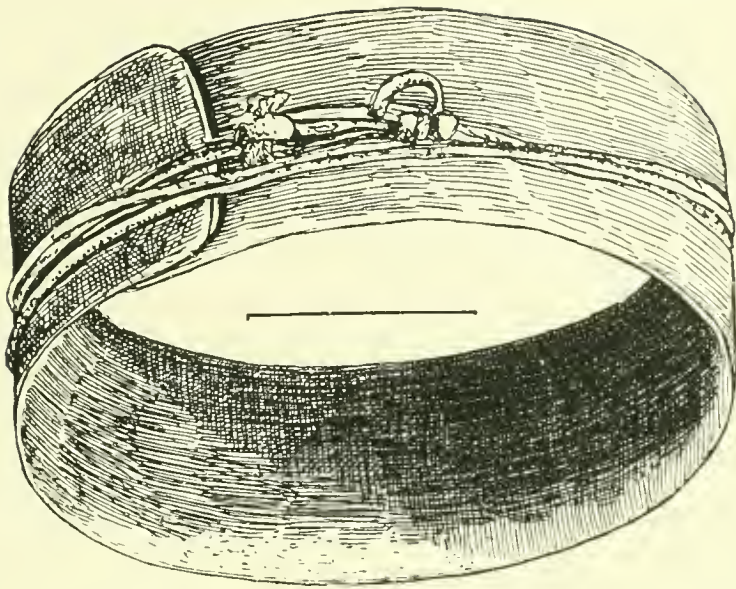
EXPLANATION OF PLATE LXXXIX.

Fig. 1. FAT-SCRAPER. Made of a thin band of antler bent in form of a hoop, ends overlapping but not interlocked. Held in form by a rawhide string wrapped three times around the exterior. A unique specimen.

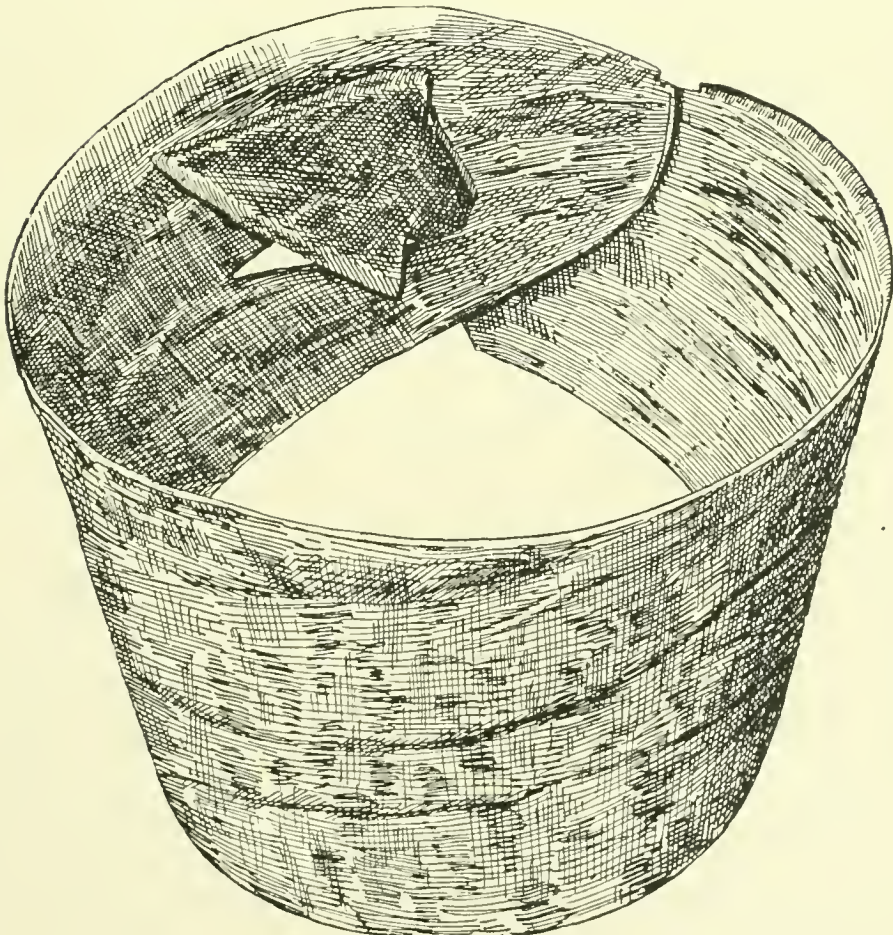
Cat. No. 127792, U. S. N. M. Eskimo of Nakneek, Alaska. Collected by W. J. Fisher.

Fig. 2. FAT-SCRAPER. Ingeniously made of a broad, thin strip of the outer crust of antler, wide in the middle and narrow at the ends. This strip is bent in shape of a truncated cone, and one end cut, arrow-shaped, is thrust through a triangular cut in the other end and tangled. Of course all this was done when the horn was softened. This type is confined to Bristol Bay.

Cat. No. 55911, U. S. N. M. Eskimo of Bristol Bay. Collected by C. L. McKay.



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FAT-SCRAPERS



EXPLANATION OF PLATE XC.

Fig. 1. BEAMING TOOL. Made from the tibia of a horse. There has been little or no modification of the bone. The fibula furnishes a most excellent natural edge for the tool.

Cat. No. 19891, U. S. N. M. Piute Indians, southern Utah. Collected by Maj. J. W. Powell.

Fig. 2. GRAINING TOOL. Made of the tibia of the deer. At the middle part, where the bone is hardest, it is cut in two diagonally so as to expose a square edge on the posterior part. Teeth are cut in this edge to soften the skin after treatment.

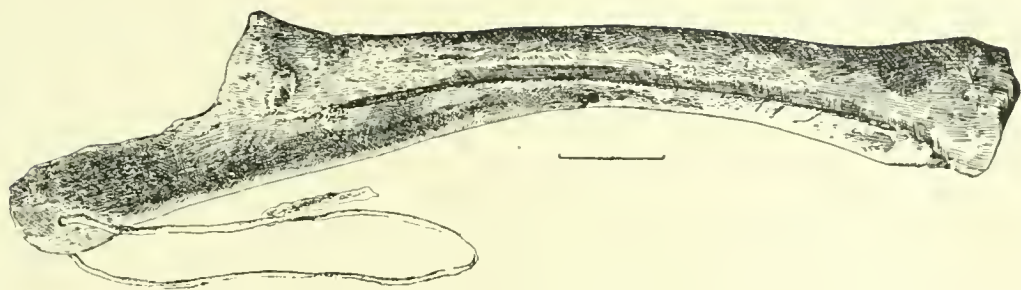
Cat. No. 19894, U. S. N. M. Utes of northern Utah. Collected by Maj. J. W. Powell.

Fig. 3. GRAINING TOOL. Made of the tibia of a horse. The column cut diagonally across the middle or hardest portion so as to furnish a square edge on the posterior side. Very fine teeth have been made along this edge for grain- ing or softening the skin.

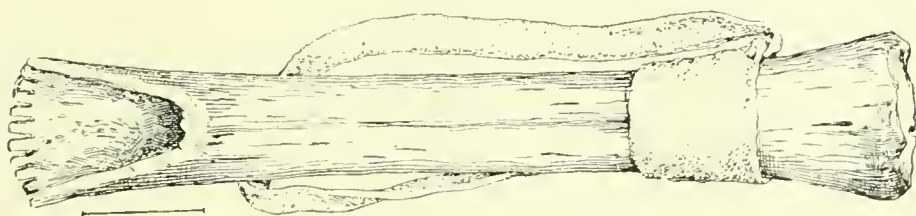
Cat. No. 31316, U. S. N. M. Indians of the pueblo of Isleta, New Mexico. Collected by Dr. H. C. Yarrow and Lieut. George Wheeler, U. S. Army.

Fig. 4. GRAINING TOOL. Made of iron. An old-fashioned wagon skein, used on wooden axles before iron axles were invented. The upper or inner por- tion shows the holes for the rivets. Its edge is serrated for grain- ing the hide. The buckskin thong is wrapped around the forearm and serves as a brace to hold the tool rigid. The shaft is covered with buckskin to protect the hand.

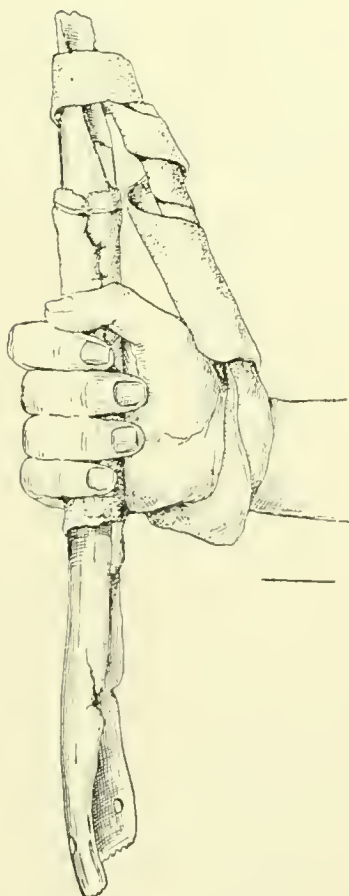
Cat. No. 14196, U. S. N. M. Sioux Indians, Dakota. Collected by Edward Palmer.



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3

BEAMING AND GRAINING TOOLS.



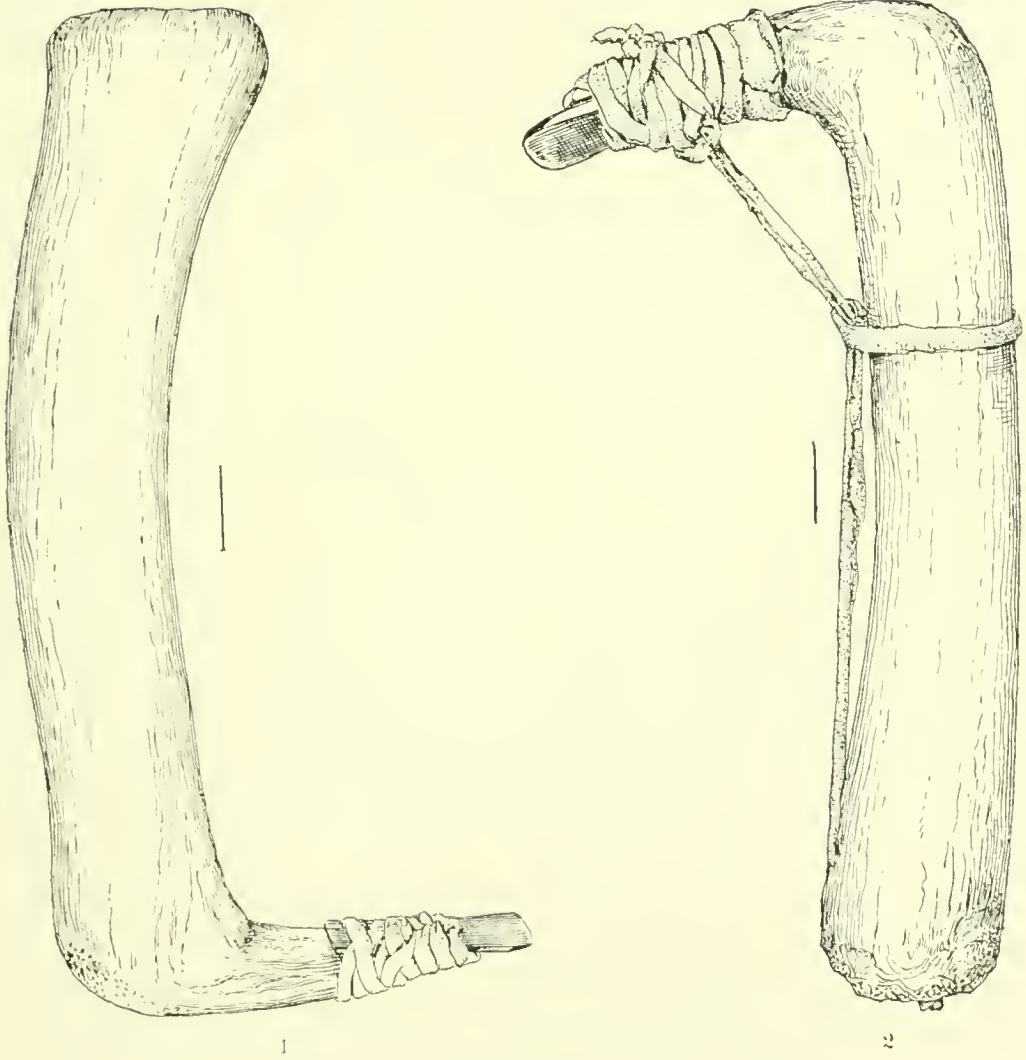
EXPLANATION OF PLATE XCI.

Fig. 1. SCRAPER. Of the antler of the elk, with a provision for the blade left in one of the prongs. In modern times steel takes the place of stone blades.

Cat. No. 6337, U. S. N. M. Gros Ventres Indians, Dakota. Collected by Drs. Gray and Matthews, U. S. Army.

Fig. 2. SCRAPER. Handle of antler. Blade of steel fastened in place with buckskin thong.

Cat. No. 11100, U. S. N. M. Crow Indians, Montana. Collected by Col. James Stevenson.



ADZE-SHAPED SCRAPERS.

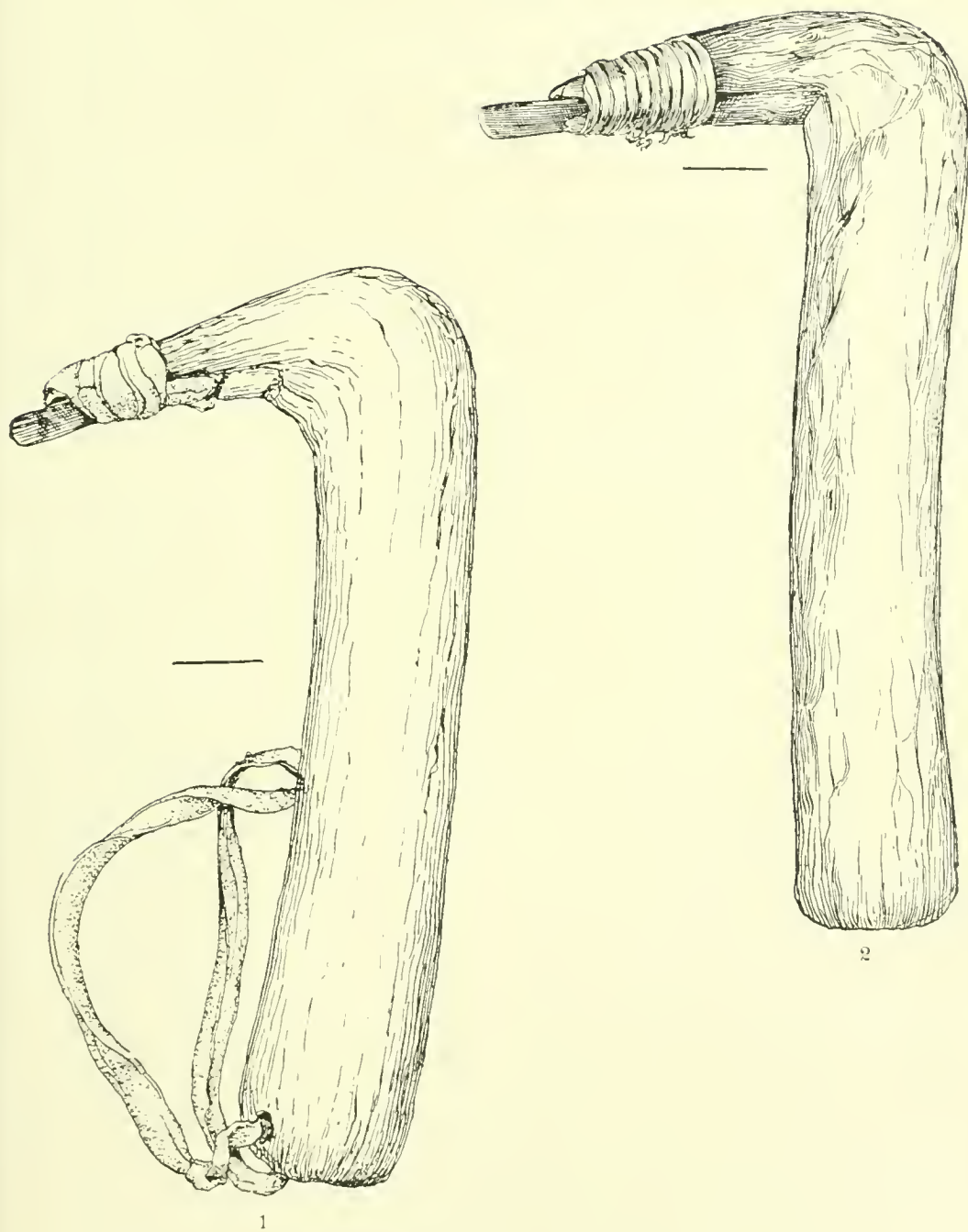
EXPLANATION OF PLATE XCII.

Fig. 1. SCRAPER. Adze type. Handle of the antler of the elk, the grip being the principal column, and the blade attached to a short section of a branching prong. The blade of the modern tool is of iron, seized loosely with a thong of buckskin so as to be removed easily for sharpening.

Cat. No. 11226, U. S. N. M. Piutes of Utah. Collected by Maj. J. W. Powell.

Fig. 2. SCRAPER. Adze-shaped. Handle of wood cut from a natural knee-shaped stem. The blade of iron is lashed to the flat inner face of the handle, which is not shouldered to catch the blow. Length, $11\frac{1}{2}$ inches.

Cat. No. 31317, U. S. N. M. Pueblo Indians of New Mexico. Collected by Lieut. G. Wheeler, U. S. Army.



ADZE-SHAPED SCRAPERS.



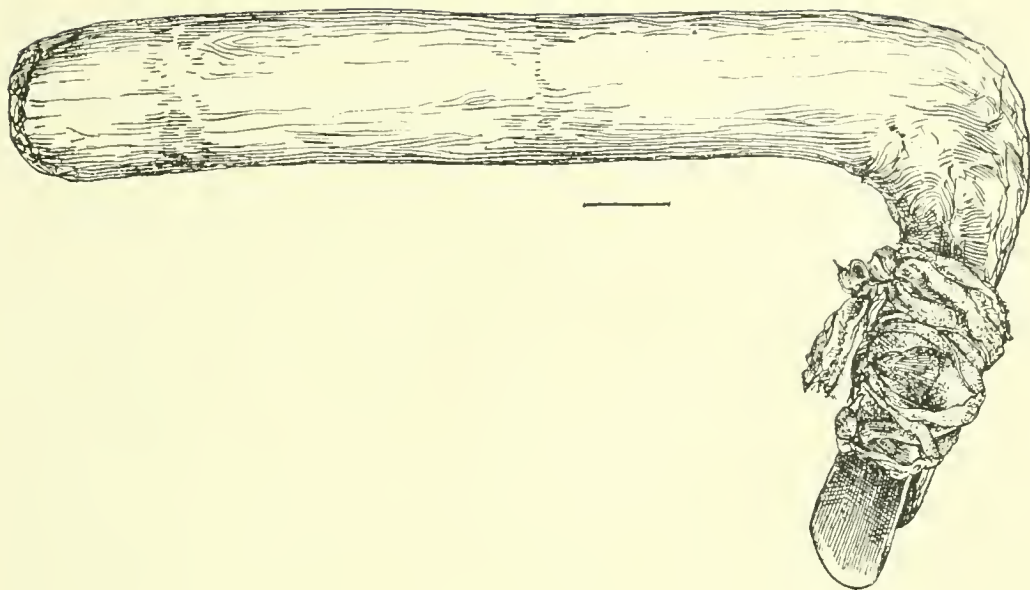
EXPLANATION OF PLATE XCIII.

Fig. 1. SCRAPER. Handle of wood: adze-shaped. Blade of iron, like a plane bit. It is fitted to the handle by a wrapping of buckskin and securely fastened by a rough seizing of buckskin thong and rag. As the blade must be removed constantly for sharpening, the lashing is very rudely done. Length, 12 inches.

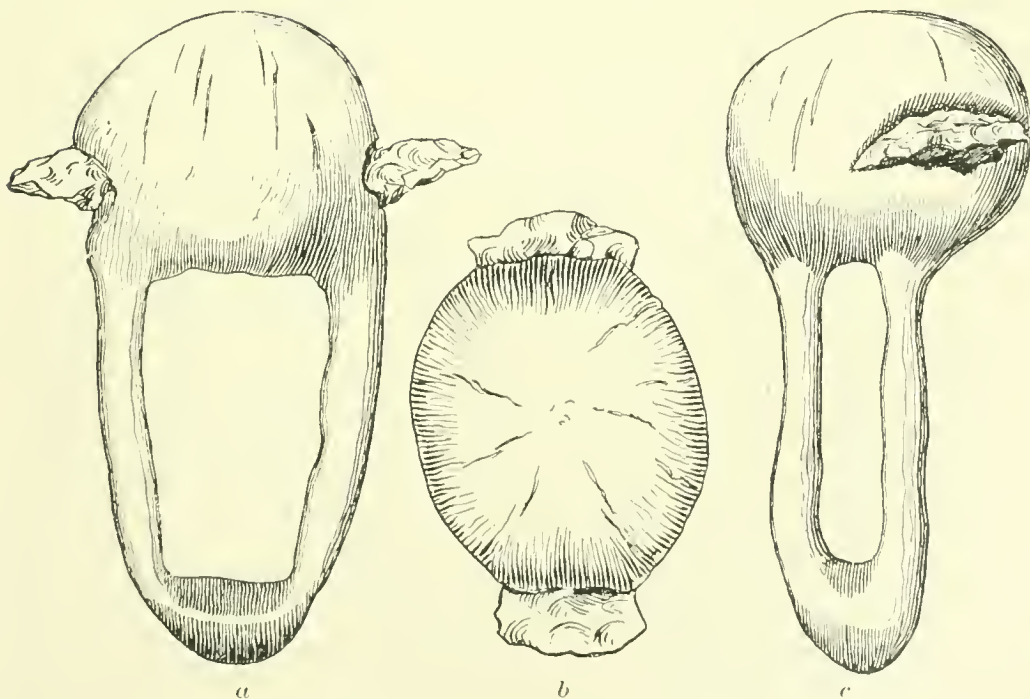
Cat. No. 6896, U. S. N. M. Comanche Indians of northern Texas. Collected by E. Palmer.

Fig. 2 (*a*, *b*, and *c*). SCRAPER. Handle of wood. Blades of obsidian. The obsidian blades are inserted into holes, one on each side of the curious handle, and fastened by a black mastic made with the gum of the colqual. Handle, 5 inches.

Arusi Galla tribes in southern Shoa. Collected by Henry H. Giglioli and described in *Internat. Archiv. für Ethnographie*, Vol. II, page 213.



1



2

ADZE-SHAPED SCRAPERS.