

thus he inserts his head into the noose. This trap is made of grass or fibrous roots twisted in a rope as large as a man's arm and attached to a pole in such fashion that the elk drags it down, whereupon he speedily becomes entangled in the contiguous bushes and anchored fast.

The eel-trap of Eel River is made of splints, funnel-shape, with a funnel-shaped entrance at the large end through which the creature could wriggle, but which closed on him and detained him inside. Traps of this kind they weight down so that they float mostly below the surface of the water; they then bind them to stakes planted in the river bottom. Thus they turn about with the swish of the tide, keeping the large end always against the current, that the eels might slip in readily. The stakes are driven into hard pack shingle by patiently driving and working them until they are firmly settled. (Powers, 103.)

They construct the toggle-heads of their salmon harpoons (Fig. 80) as follows: A point of antler, bone, or metal from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches in length, more or less flattened, and sharp at the tips, is armed at its lower extremity with two barbs laid alongside, lashed down, and covered with pitch. (Fig. 80.) In the same lashing is included one end of the leader, a short strap of deer raw-hide. Into a slit at the other end is spliced the line, a piece of rope from 1 to 3 feet long, attached at its opposite end to the side of the shaft. Some spears have two or more prongs, each armed with one of these toggle-heads.

When the fish is struck its struggles detach the toggle-head and it is retrieved by means of the line and pole. Toggle-heads of similar type are in use among all the salmon-eating Indians or northwest California. The Hupa annually dam the Klamath at intervals by a structure arranged so that no fish can pass through with the flow of water. The McCloud Indian trap consists of stakes or bushes built out into the river at a fall or rapid in the form of the letter V, having the angle downstream and a basket-trap at the angle. This method proved perfectly worthless, as of course it must be, for catching healthy fish, as this contrivance entraps only the exhausted ones that are going down the river and none that are coming up. They do not use salt in drying their fish, the air of California being dry enough to preserve them without it.

Most of the salmon used for drying are taken in August and September when they are spawning or falling down the river after spawning. They are then easily captured by spearing (Fig. 81.) or by traps. Their spears are very long and carefully made.

The traps are merely baskets of bushes placed at a fall or rapid and winged on each side by a fence of stakes or bushes running at a slight angle up the river, so that the exhausted fish coming down the river finally find their way into the basket and are there trapped.

The McCloud Indians do not try to trap the fish coming up the river, but only those going down, which is just the contrary of the principle of the white man's trap and nets. The Indians very singularly prefer the exhausted and dying salmon for drying.

As soon as a salmon is speared or taken from the trap it is opened (the spawn always being saved as a luxury) and split and hung on a bush or fence made for the purpose in the open air. In the dry air of California the drying process is sufficient to preserve them without salt.

The Indians never use salt in preserving their salmon and will not eat salt meat of any description. When the salmon are sufficiently dried they are tied together in bundles and packed away around the sides of the lodges. These, repulsive as they seem, represent the main support of the Indians during the winter and are highly valued by them.

The dip-nets used in taking eels and young salmon are made triangular in shape, 10 feet by 14 feet, open along the long side of the triangle and closed on the other side and base. They are knit of two-ply twine made from tough fiber. The meshes are three-fourths of an inch square, made with the regular fisherman's knot or becket hitch. (Fig. 82.)

Their seines are also made of this twine, hard twisted, which is itself manufactured from the leaf of a very tough grass or sedge. Each blade of grass produces two strands of fiber. It is stripped when the grass is green by scraping with the thumb nail or a mussel shell fastened on the thumb, similar to the tool employed in scraping down sinew on the bows.

No spindle is used, the fiber being twisted with the palms of the hands on the thigh. The net is knotted like those of civilized people; that is, the thread of each mesh is brought down around the mesh-stick, then through the bight of the stitch above, and fastened by a half hitch quite around both strands of the same mesh.

Specimens of the raw material, fiber, twine, and nets were sent by Lieutenant Ray. The net is in shape of an elongated isosceles triangle, with a long side open,  $10\frac{1}{2}$  feet long and 4 feet deep at the base.

The seine needle has a long and slender shaft (Fig. 82), the two ends resembling a duck's head in outline, the thread passing between the two phalanges of the beak into a wide elliptical space. Length 16 $\frac{1}{2}$  inches.

The Hupa had well-established laws and riparian rights to hunting, fishing, nutting grounds, laws of murder, injury, insulting words, etc.

The sling of the Hupa is a very intricate affair made of buckskin. The thongs of sinew or tough cord are united to the leather by first passing through it and then coiling on themselves. The ordinary loop on one end and knot on the other are also used by them. (Fig. 83.)

#### BOWS AND ARROWS.

The methods of the northern Californian bowyer and fletcher are now pretty clearly understood. For ordinary flaking of jasper or obsidian (Fig. 85) he uses a common pebble hammer-stone, but for detaching flakes of the best quality he uses between his hammer and his core a "pitching tool" or sort of cold-chisel of the hardest antler. (Fig. 93.)

For shaping his points he has an arrow-sharpener of bone or antler  
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