have had much to do with the manner in which houses, boats, etc., have been made. On the southward slopes of those hills habitations are built to catch the more direct rays of the sun and to shield the inhabitants from the merciless north winds (Fig. 1). With the art of the house-builder two implements in the Ray collection are intimately connected, the stone hammers (Figs. 2, 3, 4) and the elk-horn wedge (Plate X, Fig. 79).

The hammers are of dark, heavy schist or basalt, bell-shaped, and frequently with greatly expanded tops or pommels. While the specimens agree in general outline, there is not the same conventionalism and finish that are found farther north.

These hammers are still used by the old men among the Hupas, but none of them are able to make one. Those now in possession are much battered, have been handed down for generations, and are highly venerated.

The wedges are made of the antler of the wapiti or American elk (*Cervus canadensis*, Estleben), and are extremely hard. A close inspection of any collection of so-called bone implements will reveal a large percentage made of this substance. These antler wedges are used by canoe and house builders to split the redwood logs. By means of stone axes and fire a tall straight redwood was felled or one already fallen cut the proper length. By means of a row of antler or wooden wedges and the stone hammer just described, deftly administered, slabs and puncheons of required size were removed, and when necessary adzed down to a tolerable evenness.

Especial care should be taken to distinguish these bell-shaped hammers from pestles (Fig. 52*d*). The latter are designed to mash, triturate, or macerate something in a mortar of wood or stone. Coming in contact with the mortar chiefly at the edge of its base, the pestle must necessarily have a rounded bottom, and it may be safely asserted that no savage ever flattened or hollowed the bottom of an implement and carefully squared its base for the purpose of knocking the rim off the next moment.

The mallet or stone hammer is designed to strike a wedge or handle of wood, bone, antler, etc. Coming in contact with these softer substances in the middle of its base, that part of the mallet is usually flattened or convex. The edge may be fractured, but it is seldom worn away.

Houses of the Yurok and Karok were sometimes constructed on level earth, but generally they excavated a round cellar 4 or 5 feet deep and 12 to 15 in diameter (Fig. 1). Over this they built a square cabin of split poles or puncheons, planted erect in the ground and covered with a flattish puncheon roof. They ate and slept in the cellar (it being only a pit, not covered, except by the roof), squatting in a circle around the fire, and stored their supplies on the bank above next to the walls of the cabin. For a door they took a puncheon about 4 feet wide, set it up at one corner of the cabin, and with infinite scrapings of flints and elk-

horns bored a round hole through it, barely large enough to admit the passage of an Indian on all fours. The cabin being built entirely of wood and not thatched accounts partly for the healthy looking eyes of the Klamath tribes. A space in front of the cabin was kept clean-swept, and frequently paved with cobbles, with a larger one placed each side of the door holes, and on this pavement the squaws sat weaving baskets.

The assembly chamber of the Karoks in California is wholly underground and oblong, the dimensions being 10 feet by 6 feet and about 7 feet high. The roof is flattish and level with the earth. It is puncheoned up inside and air-tight, except the hatchway at the side.

This structure is used as club-room, council-house, dormitory, sudatory and medical examination room. No squaw may enter on penalty of death, except to stand her examination for M. D.

During cold weather perpetual fires burn, and there are enough in each village to furnish sleeping room for all adult males thereof. The wood is gathered by the men. (See Powers' Cont. N. A. Ethnol., III, p. 25, for curious manner of cutting this wood. Also his frontispiece for a picture of the sweat-house).

Another style of lodge very seldom seen was as follows: A circular cellar 3 or 4 feet deep and 12 feet wide was dug and the side walled up with stone. Around this cellar, at a distance of a few feet from the edge of it, was erected a stone wall. On this wall they leaned up poles, puncheons, and broad sheets of red wood bark, covering the cellar with a conical-shaped inclosure.

Sometimes the stone wall, instead of being on the inside of the wigwam, supporting the poles, was on the outside, around the end of the poles, and served to steady them.

Shiftless Indians neglected to wall up the cellars either with stone or wood, leaving only a bank of earth. In the center of the cellars was a five-sided fire-pit, walled with stone, as in the common square cabin. This cellar was both dining-room and dormitory; a man lying with his head to the wall had his feet in comfortable position for toasting before the fire. Under his head or neck was a wooden pillow a little rounded out on top. (Fig. 5, Powers', p. 74.)

The most humble dwelling of all is called the "wickiup," which is little more than a booth, with wind-break on the north side, awning overhead, and the minimum of comfort and safety everywhere.

The Hupa houses are said to have been half cellars, half shanties, the eaves of the roof only a foot or two from the surface, in which they slept on the ground, formerly on skins, latterly on blankets, their pillow-blocks of wood 12 inches long at the top, 3 inches wide, and four inches high, resembling the neck part of an ox-yoke inverted (Fig. 5). The North American Indians did not generally use such head-rests, which are very common in China and Japan and among the two Oceanic races—the Malayo-Polynesians and the Papuans. Lieutenant Ray says that many of the old people still use these pillows. Stephen Powers also mentions