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Ishi demonstrating the Mongolian release. (All photographs of Ishi courtesy of Lowie Museum of Anthropology, University of California, Berkeley.)

Hunting With Ishi – The Last Yana Indian

SAXTON T. POPE

Theodora Kroeber's brilliant and compassionate Ishi in Two Worlds (1961) refocused attention on the tragic story of Ishi, the last Yana (Yahi) Indian. Almost forgotten today—except among the older generation of California anthropologists—is an account of Ishi and his hunting techniques which appeared as the first three chapters of Saxton T. Pope's Hunting with the Bow and Arrow (1923a). Long out of print and seldom available because of the demand for used copies among archery enthusiasts, Pope's book is matched among the classic works on American archery only by Maurice Thompson's The Witchery of Archery (1878). Thompson's account of his hunting experiences with bow and arrow in the Okefenokee Swamp after the Civil War led to a rise of interest in archery in America in the late nineteenth century. This interest was on the wane when Pope's book appeared. Pope's work, along with its sequel, The Adventurous Bowmen (1926), which recounted his safari to Africa to hunt big game with bow and arrow, helped stimulate a revival of archery as an American sport which continues to this day. Although the essay reprinted below is

non-technical in nature, Pope was a keen observer of Ishi's hunting methods, and he provides a wealth of ethnographic detail.

Saxton T. Pope was born in 1875 in Fort Stockton, Texas. He was a man of varied interests and many unusual accomplishments. During his high school years, he built an airplane that would rise and fly, and throughout his life he maintained close associations with the world of aviation, including the Wright Brothers. He graduated from and served as an associate clinical professor of surgery at the University of California Medical School in San Francisco. As a surgeon, he helped develop the science of blood transfusion and intra-tracheal anesthesia with surgery of the heart and lungs. He was the first person to use a bamboo pole for pole-vaulting, and he held the world's record for flight shooting in archery. Pope first met Ishi in 1911. He learned to speak the Yana language and became a close friend as well as the personal physician to Ishi. His interest in archery first developed under Ishi's guidance in 1912. His technical works include Yahi Archery (1918), The Medical History of Ishi (1920), and A Study of Bows and Arrows (1923b).

THE STORY OF THE LAST YANA INDIAN

THE glory and romance of archery culminated in England before the discovery of America. There, no doubt, the bow was used to its greatest perfection, and it

decided the fate of nations. The crossbow and the matchlock had supplanted the longbow when Columbus sailed for the New World.

It was, therefore, a distinct surprise to the

first explorers of America that the natives used the bow and arrow so effectively. In fact, the sword and the horse, combined with the white man's superlative self-assurance, won the contest over the aborigines more than the primitive blunderbuss of the times. The bow and arrow was still more deadly than the gun.

With the gradual extermination of the American Indian, the westward march of civilization, and the improvement in firearms, this contest became more and more unequal, and the bow disappeared from the land. The last primitive Indian archer was discovered in California in the year 1911.

When the white pioneers of California descended through the northern part of that State by the Lassen trail, they met with a tribe of Indians known as the Yana, or Yahi. That is the name they called themselves. Their neighbors called them the Nozi, and the white men called them the Deer Creek or Mill Creek Indians. Different from the other tribes of this territory, the Yana would not submit without a struggle to the white man's conquest of their lands.

The Yana were hunters and warriors. The usual California natives were yellow in color, fat and inclined to be peaceable. The Yana were smaller of stature, lithe, of reddish bronze complexion, and instead of being diggers of roots, they lived by the salmon spear and the bow. Their range extended over an area south of Mount Lassen, east of the Sacramento River, for a distance of fifty miles.

From the earliest settlement of the whites, hostilities existed between them. This resulted in definitely organized expeditions against these Indians, and the annual slaughter of hundreds.

The last big round-up of Mill Creek Indians occurred in 1872, when their tribe was surprised at its seasonal harvest of acorns. Upon this occasion a posse of whites killed

such a number of natives that it is said the creek was dammed with dead bodies. An accurate account of these days may be obtained from Waterman's paper on the Yana Indians (1918).

During one of the final raids upon the Yana, a little band of Indian women and children hid in a cave. Here they were discovered and murdered in cold blood. One of the white scouting party laconically stated that he used his revolver to blow out their brains because the rifle spattered up the cave too much.

So it came to pass, that from two or three thousand people, the Yana were reduced to less than a dozen who escaped extermination. These were mainly women, old men and children. This tribal remnant sought the refuge of the impenetrable brush and volcanic rocks of Deer Creek Canyon. Here they lived by stealth and cunning. Like wild creatures, they kept from sight until the whites quite forgot their existence.

It became almost a legend that wild Indians lived in the Mount Lassen district. From time to time ranchers or sheep herders reported that their flocks had been molested, that signs of Indians had been found or that arrowheads were discovered in their sheep. But little credence was given these rumors until the year 1908, when an electric power company undertook to run a survey line across Deer Creek Canyon with the object of constructing a dam.

One evening, as a party of linemen stood on a log at the edge of the deep swift stream debating the best place to ford, a naked Indian rose up before them, giving a savage snarl and brandishing a spear. In an instant the survey party disbanded, fell from the log, and crossed the stream in record-breaking time. When they stopped to get their breath, the Indian had disappeared. This was the first appearance of Ishi,¹ the Yana.

Next morning an exploring expedition set

out to verify the excited report of the night before. The popular opinion was that no such wildman existed, and that the linemen had been seeing things. One of the group offered to bet that no signs of Indians would be found.

As the explorers reached the slide of volcanic boulders where the apparition of the day before had disappeared, two arrows flew past them. They made a run for the top of the slide and reached it just in time to see two Indians vanish in the brush. They left behind them an old white-haired squaw, whom they had been carrying. She was partially paralyzed, and her legs were bound in swaths of willow bark, seemingly in an effort to strengthen them.

The old squaw was wrinkled with age, her hair was cropped short as a sign of mourning, and she trembled with fear. The white men approached and spoke kindly to her in Spanish. But she seemed not to understand their words, and apparently expected only death, for in the past to meet a white man was to die. They gave her water to drink, and tried to make her call back her companions, but without avail.

Further search disclosed two small brush huts hidden among the laurel trees. So cleverly concealed were these structures that one could pass within a few yards and not discern them. In one of the huts acorns and dried salmon had been stored; the other was their habitation. There was a small hearth for indoor cooking; bows, arrows, fishing tackle, a few aboriginal utensils and a fur robe were found. These were confiscated in the white man's characteristic manner. They then left the place and returned to camp.

Next day the party revisited the site, hoping to find the rest of the Indians. These, however, had gone forever.

Nothing more was seen or heard of this little band until the year 1911, when on the outskirts of Oroville, some thirty-two miles

from the Deer Creek camp, a lone survivor appeared. Early in the morning, brought to bay by a barking dog, huddled in the corner of a corral, was an emaciated naked Indian. So strange was his appearance and so alarmed was the butcher's boy who found him, that a hasty call for the town constable brought out an armed force to capture him.

Confronted with guns, pistols, and handcuffs, the poor man was sick with fear. He was taken to the city jail and locked up for safekeeping. There he awaited death. For years he had believed that to fall into the hands of white men meant death. All his people had been killed by whites; no other result could happen. So he waited in fear and trembling. They brought him food, but he would not eat; water, but he would not drink. They asked him questions, but he could not speak. With the simplicity of the white man, they brought him other Indians of various tribes, thinking that surely all "Diggers" were the same. But their language was as strange to him as Chinese or Greek.

And so they thought him crazy. His hair was burnt short, his feet had never worn shoes, he had small bits of wood in his nose and ears; he neither ate, drank, nor slept. He was indeed wild or insane.

By this time the news of the wild Indian got into the city papers, and Professor T. T. Waterman, of the Department of Anthropology at the University of California, was sent to investigate the case. He journeyed to Oroville and was brought into the presence of this strange Indian. Having knowledge of many native dialects, Dr. Waterman tried one after the other on the prisoner. Through good fortune, some of the Yana vocabulary had been preserved in the records of the University. Venturing upon this lost language, Waterman spoke in Yana the word, *Siwini*, which means pine wood, tapping at the same time the edge of the cot on which they sat.

In wonderment, the Indian's face lighted

with faint recognition. Waterman repeated the charm, and like a spell the man changed from a cowering, trembling savage. A furtive smile came across his face. He said in his language, *Inu ma Yaki*—"Are you an Indian?" Waterman assured him that he was.

A great sense of relief entered the situation. Waterman had discovered one of the lost tribes of California; Ishi had discovered a friend.

They clothed him and fed him, and he learned that the white man was good.

Since no formal charges were lodged against the Indian, and he seemed to have no objection, Waterman took him to San Francisco, and there, attached to the Museum of Anthropology, he became a subject of study and lived happily for five years.

From him it was learned that his people were all dead. The old woman seen in the Deer Creek episode was his mother; the old man was his uncle. These died on a long journey to Mt. Lassen, soon after their discovery. Here he had burned their bodies and gone into mourning. The fact that the white men took their means of procuring food, as well as their clothing, contributed, no doubt, to the death of the older people.

Half starved and hopeless, he had wandered into civilization. His father, once the chieftain of the Yana tribe, having domain over all the country immediately south of Mt. Lassen, was long since gone, and with him all his people. Ranchers and stockmen had usurped their country, spoiled the fishing, and driven off the game. The acorn trees of the valleys had been taken from them; nothing remained but evil spirits in the land of his forefathers.

Now, however, he had found kindly people who fed him, clothed him, and taught him the mysteries of civilization. When asked his name, he said: "I have none, because there were no people to name me," meaning that no tribal ceremony had been performed. But

the old people had called him Ishi, which means "strong and straight one," for he was the youth of their camp. He had learned to make fire with sticks; he knew the lost art of chipping arrowheads from flint and obsidian; he was the fisherman and the hunter. He knew nothing of our modern life. He had no name for iron, nor cloth, nor horse, nor road. He was as primitive as the aborigines of the pre-Columbian period. In fact, he was a man in the Stone Age. He was absolutely untouched by civilization. In him science had a rare find. He turned back the pages of history countless centuries. And so they studied him, and he studied them.

From him they learned little of his personal history and less of that of his family, because an Indian considers it unbecoming to speak much of his own life, and it brings ill luck to speak of the dead. He could not pronounce the name of his father without calling him from the land of the spirits, and this he could only do for some very important reason. But he knew the full history of his tribe and their destruction.

His apparent age was about forty years, yet he undoubtedly was nearer sixty. Because of his simple life he was in physical prime, mentally alert, and strong in body.

He was about five feet eight inches tall, well proportioned, had beautiful hands and unspoiled feet. His features were less aquiline than those of the Plains Indians, yet strongly marked outlines, high cheek bones, large intelligent eyes, straight black hair, and fine teeth made him good to look upon.

As an artisan he was very skillful and ingenious. Accustomed to primitive tools of stone and bone, he soon learned to use most expertly the knife, file, saw, vise, hammer, ax, and other modern implements.

Although he marveled at many of our inventions and appreciated matches, he took great pride in his ability to make fire with two sticks of buckeye. This he could do in less

than two minutes by twirling one on the other.

About this time I became an instructor in surgery at the University Medical School, which is situated next to the Museum. Ishi was employed here in a small way as a janitor to teach him modern industry and the value of money. He was perfectly happy and a great favorite with everybody.

From his earliest experience with our community life he manifested little immunity to disease. He contracted all the epidemic infections with which he was brought in contact. He lived a very hygienic existence, having excellent food and sleeping outdoors, but still he was often sick. Because of this I came in touch with him as his physician in the hospital, and soon learned to admire him for the fine qualities of his nature. Though very reserved, he was kindly, honest, cleanly, and trustworthy. More than this, he had a superior philosophy of life, and a high moral standard.

By degrees I learned to speak his dialect, and spent many hours in his company. He told us the folk lore of his tribe. More than forty myths or animal stories of his have been recorded and preserved. They are as interesting as the stories of Uncle Remus. The escapades of wildcat, the lion, the grizzly bear, the bluejay, the lizard, and the coyote are as full of excitement and comedy as any fairy story.

He knew the history and use of everything in the outdoor world. He spoke the language of the animals. He taught me to make bows and arrows, how to shoot them, and how to hunt, Indian fashion. He was a wonderful companion in the woods, and many days and nights we journeyed together.

After he had been with us three years we took him back to his own country. But he did not want to stay. He liked the ways of the white man, and his own land was full of the spirits of the departed.

He showed us old forgotten camp sites

where past chieftains made their villages. He took us to deer licks and ambushes used by his people long ago. One day in passing the base of a great rock he scratched with his toe and dug up the bones of a bear's paw. Here, in years past, they had killed and roasted a bear. This was the camp of *Ya mo lo ku*. His own camp was called *Wowomopono Tetna* or bear wallow.

We swam the streams together, hunted deer and small game, and at night sat under the stars by the camp fire, where in a simple way we talked of old heroes, the worlds above us, and his theories of the life to come in the land of plenty, where the bounding deer and the mighty bear met the hunter with his strong bow and swift arrows.

I learned to love Ishi as a brother, and he looked upon me as one of his people. He called me *Ku wi*, or Medicine Man; more, perhaps, because I could perform little sleight of hand tricks, than because of my profession.

But, in spite of the fact that he was happy and surrounded by the most advanced material culture, he sickened and died. Unprotected by hereditary or acquired immunity, he contracted tuberculosis and faded away before our eyes. Because he had no natural resistance, he received no benefit from such hygienic measures as serve to arrest the disease in the Caucasian. We did everything possible for him, and nursed him to the painful bitter end.

When his malady was discovered, plans were made to take him back to the mountains whence he came and there to have him cared for properly. We hoped that by this return to his natural elements he would recover. But from the inception of his disease he failed so rapidly that he was not strong enough to travel.

Consumed with fever and unable to eat nourishing food, he seemed doomed from the first. After months of misery he suddenly developed a tremendous pulmonary hemor-

rhage. I was with him at the time, directed his medication, and gently stroked his hand as a small sign of fellowship and sympathy. He did not care for marked demonstrations of any sort.

He was a stoic, unafraid, and died in the faith of his people.

As an Indian should go, so we sent him on his long journey to the land of shadows. By his side we placed his fire sticks, ten pieces of dentalia or Indian money, a small bag of acorn meal, a bit of dried venison, some tobacco, and his bow and arrows.

These were cremated with him and the ashes placed in an earthen jar. On it is inscribed "Ishi, the last Yana Indian, 1916."

And so departed the last wild Indian of America. With him the neolithic epoch terminates. He closes a chapter in history. He looked upon us as sophisticated children—smart, but not wise. We knew many things and much that is false. He knew nature, which is always true. His were the qualities of character that last forever. He was essentially kind; he had courage and self-restraint, and though all had been taken from him, there was no bitterness in his heart. His soul was that of a child, his mind that of a philosopher.

With him there was no word for good-by. He said: "You stay, I go."

He has gone and he hunts with his people. We stay, and he has left us the heritage of the bow.

HOW ISHI MADE HIS BOW AND ARROW AND HIS METHODS OF SHOOTING

Although much has been written in history and fiction concerning the archery of the North American Indian, strange to say, very little has been recorded of the methods of manufacture of their weapons, and less in accurate records of their shooting.

It is a great privilege to have lived with an unspoiled aborigine and seen him step by step

construct the most perfect type of bow and arrow.

The workmanship of Ishi was by far the best of any Indian in America; compared with thousands of specimens in the museum, his arrows were the most carefully and beautifully made; his bow was the best.

It would take too much time to go into the minute details of his work, and this has all been recorded in anthropologic records (Pope 1918), but the outlines of his methods are as follows:

The bow, Ishi called *man-nee*. It was a short, flat piece of mountain juniper backed with sinew. The length was forty-two inches, or, as he measured it, from the horizontally extended hand to the opposite hip. It was broadest at the center of each limb, approximately two inches, and half an inch thick. The cross-section of this part was elliptical. At the center of the bow the handgrip was about an inch and a quarter wide by three-quarters thick, a cross-section being ovoid. At the tips it was curved gently backward and measured at the nocks three-quarters by one-half an inch. The nock itself was square shouldered and terminated in a pin half an inch in diameter and an inch long.

The wood was obtained by splitting a limb from a tree and utilizing the outer layers, including the sap wood. By scraping and rubbing on sandstone, he shaped and finished it. The recurved tips of the bow he made by bending the wood backward over a heated stone. Held in shape by cords and binding to another piece of wood, he let his bow season in a dark, dry place. Here it remained from a few months to years, according to his needs. After being seasoned he backed it with sinew. First he made a glue by boiling salmon skin and applying it to the roughened back of the bow. When it was dry he laid on long strips of deer sinew obtained from the leg tendons. By chewing these tendons and separating their fibers, they became soft and adhesive. Care-



Shaping a new bow.

fully overlapping the ends of the numerous fibers he covered the entire back very thickly. At the nocks he surrounded the wood completely and added a circular binding about the bow.

During the process of drying he bound the sinew tightly to the bow with long, thin strips of willow bark. After several days he removed this bandage and smoothed off the edges of

the dry sinew, sized the surface with more glue and rubbed everything smooth with sandstone. Then he bound the handgrip for a space of four inches with a narrow buckskin thong. In his native state he seems never to have greased his bow nor protected it from moisture, except by his bow case, which was made of the skin from a cougar's tail. But while with us he used shellac to protect the



Finishing a new bow.

glue and wood. Other savages use buck fat or bear grease.

The bowstring he made of the finer tendons from the deer's shank. These he chewed until soft, then twisted them tightly into a cord having a permanent loop at one end and a buckskin strand at the other. While wet the string was tied between two twigs and rubbed smooth with spittle. Its diameter was one-eighth of an inch, its length about forty-eight inches. When dry the loop was applied to the upper nock of his bow while he bent the bow over his knee and wound the opposite end of the string about the lower nock. The buckskin thong terminating this portion of the string made it easier to tie in several half hitches.

When braced properly the bowstring was about five inches from the belly of the bow. And when not in use and unstrung the upper loop was slipped entirely off the nock, but held from falling away from the bow by a second small loop of buckskin.

Drawn to the full length of an arrow, which was about twenty-six inches, exclusive of the foreshaft, his bow bent in a perfect arc slightly flattened at the handle. Its pull was about forty-five pounds, and it could shoot an arrow about two hundred yards.

This is not the most powerful type of weapon known to Indians, and even Ishi did make stronger bows when he pleased; but this seemed to be the ideal weight for hunting, and it certainly was adequate in his hands.

According to English standards, it was very short; but for hunting in the brush and shooting from crouched postures, it seems better fitted for the work than a longer weapon.

According to Ishi, a bow left strung or standing in an upright position, gets tired and sweats. When not in use it should be lying down; no one should step over it; no child should handle it, and no woman should touch it. This brings bad luck and makes it shoot crooked. To expunge such an influence it is necessary to wash the bow in sand and water.

In his judgment, a good bow made a musical note when strung and the string is tapped with the arrow. This was man's first harp, the great grandfather of the pianoforte.

By placing one end of his bow at the corner of his open mouth and tapping the string with an arrow, the Yana could make sweet music. It sounded like an Aeolian harp. To this accompaniment Ishi sang a folk-song telling of a great warrior whose bow was so strong that, dipping his arrow first in fire, then in the ocean, he shot at the sun. As swift as the wind, his arrow flew straight in the round open door of the sun and put out its light. Darkness fell upon the earth and men shivered with cold. To prevent themselves from freezing they grew feathers, and thus our brothers, the birds, were born.

Ishi called an arrow *sa wa*.

In making arrows the first thing is to get the shafts. Ishi used many woods, but he preferred witch hazel. The long, straight stems of this shrub he cut in lengths of thirty-two inches, having a diameter of three-eighths of an inch at the base when peeled of bark.

He bound a number of these together and put them away in a shady place to dry. After a week or more, preferably several months, he selected the best shafts and straightened them. This he accomplished by holding the concave surface near a small heap of hot embers and when warm he either pressed his

great toe on the opposite side, or he bent the wood backward on the base of the thumb. Squinting down its axis he lined up the uneven contours one after the other and laid the shaft aside until a series of five was completed. He made up arrows in lots of five or ten, according to the requirements, his fingers being the measure.

The sticks thus straightened he ran back and forth between two grooved pieces of sandstone or revolved them on his thigh while holding the stones in his hand, until they were smooth and reduced to a diameter of about five-sixteenths of an inch. Next they were cut into lengths of approximately twenty-six inches. The larger end was now bound with a buckskin thong and drilled out for the depth of an inch and a half to receive the end of the foreshaft. He drilled this hole by fixing a long, sharp bone in the ground between his great toes and revolved the upright shaft between his palms on this fixed point, the buckskin binding keeping the wood from splitting.

The foreshaft was made of heavier wood, frequently mountain mahogany. It was the same diameter as the arrow, only tapering a trifle toward the front end, and usually was about six inches long. This was carefully shaped into a spindle at the larger end and set in the recently drilled hole of the shaft, using glue or resin for this purpose. The joint was bound with chewed sinew, set in glue.

The length of an arrow, over all, was estimated by Ishi in this manner. He placed one end on the top of his breast-bone and held the other end out in his extended left hand. Where it touched the tip of his forefinger it was cut as the proper length. This was about thirty-two inches.

The rear end of his arrow was now notched to receive the bowstring. He filed it with a bit of obsidian, or later on, with three hacksaw blades bound together until he made a groove one-eighth of an inch wide by



Estimating length of wood for arrow.

three-eighths deep. The opposite end of the shaft was notched in a similar way to receive the head. The direction of this latter cut was such that when the arrow was on the bow the edge of the arrowhead was perpendicular, for the fancied reason that in this position the arrow when shot enters between the ribs of an animal more readily. He did not seem to recognize that an arrow rotates.

At this stage he painted his shafts. The pigments used in the wilds were red cinnabar, black pigment from the eye of trout, a green vegetable dye from wild onions, and a blue obtained, he said, from the root of a plant. These were mixed with the sap or resin of trees and applied with a little stick or hairs from a fox's tail drawn through a quill.

His usual design was a series of alternating

rings of green and black starting two inches from the rear end and running four inches up the shaft. Or he made small circular dots and snaky lines running down the shaft for a similar distance. When with us he used dry colors mixed with shellac, which he preferred to oil paints because they dried quicker. The painted area, intended for the feathers, is called the shaftment and not only helps in finding lost arrows, but identifies the owner. This entire portion he usually smeared with thin glue or sizing.

A number of shafts having been similarly prepared, the Indian was ready to feather them. A feather he called *pu nee*. In fledging arrows Ishi used eagle, buzzard, hawk or flicker feathers. Owl feathers Indians seem to avoid, thinking they bring bad luck. By preference he took them from the wings, but

did not hesitate to use tail feathers if reduced to it. With us he used turkey pinions.

Grasping one between the heel of his two palms he carefully separated the bristles at the tip of the feather with his fingers and pulled them apart, splitting the quill its entire length. This is called stripping a feather. Taking the wider half he firmly held one end on a rock with his great toe, and the other end between the thumb and forefinger of his left hand. With a piece of obsidian, or later on a knife blade, he scraped away the pith until the rib was thin and flat.

Having prepared a sufficient number in this way he gathered them in groups of three, all from similar wings, tied them with a bit of string and dropped them in a vessel of water. When thoroughly wet and limp they were ready for use.

While he chewed up a strand of sinew eight or ten inches long, he picked up a group of feathers, stripped off the water, removed one, and after testing its strength, folded the last two inches of bristles down on the rib, and the rest he ruffled backward, thus leaving a free space for later binding. He prepared all three like this.

Picking up an arrow shaft he clamped it between his left arm and chest, holding the rear end above the shaftment in his left hand. Twirling it slowly in this position, he applied one end of the sinew near the nock, fixing it by overlapping. The first movements were accomplished while holding one extremity of the sinew in his teeth; later, having applied the feathers to the stick, he shifted the sinew to the grasp of the right thumb and forefinger.

One by one he laid the feathers in position, binding down the last two inches of stem and the wet barbs together. The first feather he applied on a line perpendicular to the plane of the nock; the two others were equidistant from this. For the space of an inch he lapped the sinew about the feathers

and arrowshaft, slowly rotating it all the while, at last smoothing the binding with his thumb nail.

The rear ends having been lashed in position, the arrow was set aside to dry while the rest were prepared.

Five or ten having reached this stage and the binding being dry and secure, he took one again between his left arm and chest, and with his right hand drew all the feathers straight and taut, down the shaft. Here he held them with the fingers of his left hand. Having marked a similar place on each arrow where the sinew was to go, he cut the bristles off the rib. At this point he started binding with another piece of wet sinew. After a few turns he drew the feathers taut again and cut them, leaving about a half inch of rib. This he bound down completely to the arrow-shaft and finished all by smoothing the wet lapping with his thumb nail.

The space between the rib and the wood he sometimes smeared with more glue to cause the feather to adhere to the shaft, but this was not the usual custom with him.

After all was dry and firm, Ishi took the arrow and beat it gently across his palm so that the feathers spread out nicely.

As a rule the length of his feathers was four inches, though on ceremonial arrows they often were as long as eight inches.

After drying, the feathers were cut with a sharp piece of obsidian, using a straight stick as a guide and laying the arrow on a flat piece of wood. When with us he trimmed them with scissors, making a straight cut from the full width of the feather in back, to the height of a quarter of an inch at the forward extremity. On his arrows he left the natural curve of the feather at the nock, and while the rear binding started an inch or more from the butt of the arrow, the feather drooped over the nock. This gave a pretty effect and seemed to add to the steering qualities of the missile.

Two kinds of points were used on Ishi's



Breaking obsidian for points.

arrows. One was the simple blunt end of the shaft bound with sinew used for killing small game and practice shots. The other was his hunting head, made of flint or obsidian. He preferred the latter.

Obsidian was used as money among the natives of California. A boulder of this volcanic glass was packed from some mountainous districts and pieces were cracked off and exchanged for dried fish, venison, or weapons. It was a medium of barter. Although all men were more or less expert in flaking arrowheads and knives, the better grades of bows, arrows, and arrow points were made by the older, more expert specialists of the tribe.

Ishi often referred to one old Indian, named *Chu no wa yahi*, who lived at the base of a great cliff with his crazy wife. This man

owned an ax, and thus was famous for his possessions as well as his skill as a maker of bows. From a distant mountain crest one day Ishi pointed out to me the camp of this Indian who was long since dead. If ever Ishi wished to refer to a hero of the bow, or having been beaten in a shot, he always told us what *Chu no wa yahi* could have done.

To make arrowheads properly one should smear his face with mud and sit out in the hot sun in a quiet secluded spot. The mud is a precaution against harm from the flying chips of glass, possibly also a good luck ritual. If by chance a bit of glass should fly in the eye, Ishi's method of surgical relief was to hold his lower lid wide open with one finger while he slapped himself violently on the head with the other hand. I am inclined to ascribe the

process of removal more to the hydraulic effect of the tears thus started than to the mechanical jar of the treatment.

He began this work by taking one chunk of obsidian and throwing it against another; several small pieces were thus shattered off. One of these, approximately three inches long, two inches wide and half an inch thick, was selected as suitable for an arrowhead, or *haka*. Protecting the palm of his left hand by a piece of thick buckskin, Ishi placed a piece of obsidian flat upon it, holding it firmly with his fingers folded over it.

In his right hand he held a short stick on the end of which was lashed a sharp piece of

deer horn. Grasping the horn firmly while the longer extremity lay beneath his forearm, he pressed the point of the horn against the edge of the obsidian. Without jar or blow, a flake of glass flew off, as large as a fish scale. Repeating this process at various spots on the intended head, turning it from side to side, first reducing one face, then the other, he soon had a symmetrical point. In half an hour he could make the most graceful and perfectly proportioned arrowhead imaginable. The little notches fashioned to hold the sinew binding below the barbs he shaped with a smaller piece of bone, while the arrowhead was held on the ball of his thumb.



Flaking a point with deer horn.

Flint, plate glass, old bottle glass, onyx—all could be worked with equal facility. Beautiful heads were fashioned from blue bottles and beer bottles.

The general size of these points was two inches for length, seven-eighths for width, and one-eighth for thickness. Larger heads were used for war and smaller ones for shooting bears.

Such a head, of course, was easily broken if the archer missed his shot. This made him very careful about the whole affair of shooting.

When ready for use, these heads were set on the end of the shaft with heated resin and bound in place with sinew which encircled the end of the arrow and crossed diagonally through the barb notches with many recurrences.

Such a point has better cutting qualities in animal tissue than has steel. The latter is, of course, more durable. After entering civilization, Ishi preferred to use iron or steel blades of the same general shape, or having a short tang for insertion in the arrowhead.

Ishi carried anywhere from five to sixty arrows in a quiver made of otter skin which hung suspended by a loop of buckskin over his left shoulder.

His method of bracing or stringing the bow was as follows: Grasping it with his right hand at its center, with the belly toward him, and the lower end on his right thigh, he held the upper end with his left hand while the loop of the string rested between his finger and thumb. By pressing downward at the handle and pulling upward with the left hand he so sprung the bow that the loop of the cord could be slipped over the upper nock.

In nocking his arrow, the bow was held diagonally across the body, its upper end pointing to the left. It was held lightly in the palm of the left hand so that it rested loosely in the notch of the thumb while the fingers partially surrounded the handle. Taking an arrow from his quiver, he laid it across the

bow on its right side where it lay between the extended fingers of his left hand. He gently slid the arrow forward until the nock slipped over the string at its center. Here he set it properly in place and put his right thumb under the string, hooked upward ready to pull. At the same time he flexed his forefinger against the side of the arrow, and the second finger was placed on the thumb nail to strengthen the pull.

Thus he accomplished what is known as the Mongolian release.

Only a few nations ever used this type of arrow release, and the Yana seem to have been the only American natives to do so (see Morse 1885).

To draw his bow he extended his left arm. At the same time he pulled his right hand toward him. The bow arm was almost in front of him, while his right hand drew to the top of his breast bone. With both eyes open he sighted along his shaft and estimated the elevation according to the distance to be shot.

He released firmly and without change of position until the arrow hit. He preferred to shoot kneeling or squatting, for this was most favorable for getting game.

His shooting distances were from ten yards up to fifty. Past this range he did not think one should shoot, but sought rather to approach his game more closely.

In his native state he practiced shooting at little oak balls, or bundles of grass bound to represent rabbits, or little hoops of willow rolled along the ground. Like all other archers, if Ishi missed a shot he always had a good excuse. There was too much wind, or the arrow was crooked, or the bow had lost its cast, or, as a last resource, the coyote doctor bewitched him, which is the same thing we mean when we say it is just bad luck. While with us he shot at the regulation straw target, and he is the first and only Indian of whose shooting any accurate records have been made.



Shooting from characteristic squatting position.

Many exaggerated reports exist concerning the accuracy of the shooting of American Indians; but here we have one who shot ever since childhood, who lived by hunting, and must have been as good, if not better, than the average.

He taught us to shoot Indian style at first, but later we learned the old English methods and found them superior to the Indian. At the end of three months' practice, Dr. J. V. Cooke and I could shoot as well as Ishi at targets, but he could surpass us at game shooting.

Ishi never thought very much of our long bows. He always said, "Too much *man-nee*." And he always insisted that arrows should be painted red and green. But when we began beating him at targets, he took all his shafts home and scraped the paint off them, putting back rings of blue and yellow, doubtless to change his luck. In spite of our apparent superiority at some forms of shooting, he never changed his methods to meet competition. We, of course, did not want him to.

Small objects the size of a quail the Indian could hit with regularity up to twenty yards. And I have seen him kill ground squirrels at forty yards; yet at the same distances he might miss a four-foot target. He explained this by saying that the target was too large and the bright colored rings diverted the attention. He was right.

There is a regular system of shooting in archery competition. In America there is what is known as the American Round, which consists of shooting thirty arrows at each of the following distances: sixty, fifty, and forty yards. The bull's-eye on the target is a trifle over nine inches and is surrounded by four rings of half this diameter. Their value is 9, 7, 5, 3, 1, successively counting from the center outward. The target itself is constructed of straw, bound in the form of a mat four feet in diameter, covered with a canvas facing.

Counting the hits and scores on the various distances, a good archer will make the following record. Here is Arthur Young's best score:

March 25, 1917.			
At 60 yards	30 hits	190 score	11 golds
50 yards	30 hits	198 score	9 golds
40 yards	<u>30 hits</u>	<u>238 score</u>	<u>17 golds</u>
Total	90 hits	626 score	37 golds

This is one of the best scores made by American archers.

Ishi's best record is as follows:

October 23, 1914.			
At 60 yards	10 hits	32 score	
50 yards	20 hits	92 score	2 golds
40 yards	<u>19 hits</u>	<u>99 score</u>	<u>2 golds</u>
Total	49 hits	223 score	4 golds

His next best score was this:

At 60 yards	13 hits	51 score	
50 yards	17 hits	59 score	
40 yards	<u>22 hits</u>	<u>95 score</u>	
Total	52 hits	205 score	

My own best practice American Round is as follows:

May 22, 1917.		
At 60 yards	29 hits	157 score
50 yards	29 hits	185 score
40 yards	<u>30 hits</u>	<u>196 score</u>
Total	88 hits	538 score

Anything over 500 is considered good shooting.

It will be seen from this that the Indian was not a good target shot, but in field shooting and getting game, probably he could excel the white man.

ISHI'S METHODS OF HUNTING

Hunting with Ishi was pure joy. Bow in hand, he seemed to be transformed into a being light as air and as silent as falling snow. From the very first we went on little expeditions into the country where, without appearing to instruct, he was my teacher in the old, old art of the chase. I followed him into a new system of getting game. We shot rabbits, quail, and squirrels with the bow. His methods here were not so well defined as in the approach to larger game, but I was struck from the first by his noiseless step, his slow movements, his use of cover. These little animals are flushed by sound and sight, not scent. Another prominent feature of Ishi's work in the field was his indefatigable persistence. He never gave up when he knew a rabbit was in a clump of brush. Time meant nothing to him; he simply stayed until he got his game. He would watch a squirrel hole for an hour if necessary, but he always got the squirrel.

He made great use of the game call. We all know of duck and turkey calls, but when he told me that he lured rabbits, tree squirrels, wildcats, coyote, and bear to him, I thought he was romancing. Going along the trail, he would stop and say, "*Ineja teway-bjum-metchi bi wi*" or "This is good rabbit



After the arrow release.

ground." Then crouching behind a suitable bush as a blind, he would place the fingers of his right hand against his lips and, going through the act of kissing, he produced a plaintive squeak similar to that given by a rabbit caught by a hawk or in mortal distress. This he repeated with heartrending appeals until suddenly one or two or sometimes three rabbits appeared in the opening. They came from distances of a hundred yards or more, hopped

forward, stopped and listened, hopped again, listened, and ultimately came within ten or fifteen yards while Ishi dragged out his squeak in a most pathetic manner. Then he would shoot.

To test his ability one afternoon while hunting deer, I asked the Yana to try his call in twelve separate locations. From these twelve calls we had five jackrabbits and one wildcat approach us. The cat came out of the forest, cautiously stepped nearer and sat upon

a log in a bright open space not more than fifty yards away while I shot three arrows at him, one after the other; the last clipped him between the ears.

This call being a cry of distress, rabbits and squirrels come with the idea of protecting their young. They run around in a circle, stamp their feet, and make great demonstrations of anger, probably as much to attract the attention of the supposed predatory beast and decoy him away, as anything else.

The cat, the coyote, and the bear come for no such humane motive; they are thinking of food, of joining the feast.

I learned the call myself, not perfectly, but well enough to bring squirrels down from the topmost branches of tall pines, to have foxes and lynx approach me, and to get rabbits.

Not only could Ishi call the animals, but he understood their language. Often when we have been hunting he has stopped and said, "The squirrel is scolding a fox." At first I said to him, "I don't believe you." Then he would say, "Wait! Look!" Hiding behind a tree or rock or bush, in a few minutes we would see a fox trot across the open forest.

It seemed that for a hawk or cat or man, the squirrel has a different call, such that Ishi could say without seeing, what molested his little brother.

Often have we stopped and rested because, so he said, a bluejay called far and wide, "Here comes a man!" There was no use going farther, the animals all knew of our presence. Only a white hunter would advance under these circumstances.

Ishi could smell deer, cougar, and foxes like an animal, and often discovered them first this way. He could imitate the call of quail to such an extent that he spoke a half-dozen sentences to them. He knew the crow of the cock on sentinel duty when he signals to others; he knew the cry of warning, and the run-to-shelter cry of the hen; her

command to her little ones to fly; and the "lie low" cluck; then at last the "all's well" chirp.

Deer he could call in the fawn season by placing a folded leaf between his lips and sucking vigorously. This made a bleat such as a lamb gives, or a boy makes blowing on a blade of grass between his thumbs.

He also enticed deer by means of a stuffed buck's head which he wore as a cap, and bobbing up and down behind bushes excited their curiosity until they approached within bow-shot. Ordinarily in hunting deer, the Indian used what is termed the still hunt, but with him it was more than that. First of all he studied the country for its formation of hills, ridges, valleys, canyons, brush and timber. He observed the direction of the prevailing winds, the position of the sun at daybreak and evening. He noted the water holes, game trails, "buck look-outs," deer beds, the nature of the feeding grounds, the stage of the moon, the presence of salt licks, and many other features of importance. If possible, he located the hiding-place of the old bucks in daytime, all of which every careful hunter does. Next, he observed the habits of game, and the presence or absence of predatory beasts that kill deer.

Having decided these and other questions, he prepared for the hunt. He would eat no fish the day before the hunt, and smoke no tobacco, for these odors are detected a great way off. He rose early, bathed in the creek, rubbed himself with the aromatic leaves of yerba buena, washed out his mouth, drank water, but ate no food. Dressed in a loin cloth, but without shirt, leggings or moccasins, he set out, bow and quiver at his side. He said that clothing made too much noise in the brush, and naturally one is more cautious in his movements when reminded by his sensitive hide that he is touching a sharp twig.

From the very edge of camp, until he returned, he was on the alert for game, and the one obvious element of his mental atti-



Demonstrating arrow penetration with a buck.

tude was that he suspected game everywhere. He saw a hundred objects that looked like deer, to every live animal in reality. He took it for granted that ten deer see you where you see one—so see it first! On the trail, it was a crime to speak. His warning note was a soft, low whistle or a hiss. As he walked, he placed every footfall with precise care; the most stealthy step I ever saw; he was used to it; lived by it. For every step he looked twice. When going over a rise of ground he either stooped, crawled or let just his eyes go over the top, then stopped and gazed a long time for the slightest moving twig or spot of color. Of course, he always hunted up wind, unless

he were cutting across country or intended to flush game.

At sunrise and sunset he tried always to get between the sun and his game. He drifted between the trees like a shadow, expectant and nerved for immediate action.

Some Indians, covering their heads with tall grass, can creep up on deer in the open, and rising suddenly to a kneeling posture shoot at a distance of ten or fifteen yards. But Ishi never tried this before me. Having located his quarry, he either shot, at suitable ranges, or made a detour to wait the passing of the game or to approach it from a more favorable direction. He never used dogs in hunting.

When a number of people hunted together, Ishi would hide behind a blind at the side of a deer trail and let the others run the deer past. In his country we saw old piles of rock covered with lichen and moss that were less than twenty yards from well-marked deer trails. For numberless years Indians had used these as blinds to secure camp meat.

In the same necessity, the Indian would lie in wait near licks or springs to get his food; but he never killed wantonly.

Although Ishi took me on many deer hunts and we had several shots at deer, owing to the distance or the fall of the ground or obstructing trees, we registered nothing better than encouraging misses. He was undoubtedly hampered by the presence of a novice, and unduly hastened by the white man's lack of time. His early death prevented our ultimate achievement in this matter, so it was only after he had gone to the Happy Hunting Grounds that I, profiting by his teachings, killed my first deer with the bow.

That he had shot many deer, even since boyhood, there was no doubt. To prove that he could shoot through one with his arrows, I had him discharge several at a buck killed by our packer. Shooting at forty yards, one arrow went through the chest wall, half its length; another struck the spine and fractured it, both being mortal wounds.

It was the custom of his tribe to hunt until noon, when by that time they usually had several deer, obtained, as a rule, by the ambush method. Having pre-arranged the matter, the women appeared on the scene, cut up the meat, cooked part of it, principally the liver and heart, and they had a feast on the spot. The rest was taken to camp and made into jerky.

In skinning animals, the Indian used an obsidian knife held in his hand by a piece of buckskin. I found this cut better than the average hunting knife sold to sportsmen. Often in skinning rabbits he would make a

small hole in the skin over the abdomen and blow into this, stripping the integument free from the body and inflating it like a football, except at the legs.

In skinning the tail of an animal, he used a split stick to strip it down, and did it so dextrously that it was a revelation of how easy this otherwise difficult process may be when one knows how. He tanned his skins in the way customary with most savages: clean skinning, brain emulsion, and plenty of elbow grease.

His people killed bear with the bow and arrow. Ishi made a distinction between grizzly bear, which he called *tet na*, and black bear, which he called *bo he*. The former had long claws, could not climb trees, and feared nothing. He was to be let alone. The other was "all same pig." The black bear, when found, was surrounded by a dozen or more Indians who built fires, and discharging their arrows at his open mouth, attempted to kill him. If he charged, a burning brand was snatched from the fire and thrust in his face while the others shot him from the side. Thus they wore him down and at last vanquished him.

In his youth, Ishi killed a cinnamon bear single handed. Finding it asleep on a ledge of rock, he sneaked close to it and gave a loud whistle. The bear rose up on its hind legs and Ishi shot him through the chest. With a roar the bear fell off the ledge and the Indian jumped after him. With a short-handled obsidian spear he thrust him through the heart. The skin of this bear now hangs in the Museum of Anthropology in mute testimony of the courage and daring of Ishi. Had this young man been given a name, perhaps they would have called him Yellow Bear.

While he shot many birds, I never saw Ishi try wing shooting except at eagles or hawks. For these he would use an arrow on which he had smeared mud to make it dark in color. A light shaft is readily discerned by these birds,

and I have often seen them dodge an arrow. But the darker one is almost invisible head on. The feathers of the arrows were close cropped to make them swift and noiseless.

The sound of a bowstring is that of a sharp twang accompanied by a muffled crack. To avoid this and make a silent shot, the Indian bound his bow at the nocks with weasel fur; this effectually damped the vibration of the string, while the passage of the arrow across the bow, which gives the slight crack, is abolished by a heavy padding of buckskin at this point.

Ishi never wore an arm guard or glove or finger stalls to protect himself as other archers do. He seemed not to need them. When he released the arrow, the bow rotated in his hand so that the string faced in the opposite direction from which it started. His thumb alone drew the string, and this was so toughened that it needed no leather covering.

In a little bag he carried extra arrowheads and sinews, so that in a pinch he could mend his arrows.

When not actually in use, he promptly unstrung his bow, and gently straightened it by hand. In cold weather he heated it over a fire before bracing it. The slightest moisture would deter him from shooting, unless absolutely necessary—he was so jealous of his tackle. If his bowstring stretched in the heat or dampness, as sinew is liable to do, he shortened it by twisting one end prior to bracing it.

Before shooting he invariably looked over each arrow, straightened it in his hands or by his teeth, rearranged its feathers, and saw that the point was properly adjusted. In fact, he gave infinite attention to detail. With him, every shot must count. Besides arrows in his quiver, he carried several ready for use under his right arm, which he kept close to his side while drawing the bow.

In all things pertaining to the handicraft of archery and the technique of shooting, he

was most exacting. Neatness about his tackle, care of his equipment, deliberation and form in his shooting were typical of him; in fact, he loved his bow as he did no other of his possessions. It was his constant companion in life and he took it with him on his last long journey.

NOTE

1. Ishi is pronounced "E-she."

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