POINTED BARK CANOES OF THE KUTENAI AND AMUR.

BY

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Curator, Division of Ethnology.

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INTRODUCTION.

Among the series of models to illustrate the history of navigation gathered in the U. S. National Museum there is one of a canoe secured a long time ago by Mr. George Gibbs and numbered 641 in the Anthropological Catalogue. Figures of such canoes are given in the Standard Natural History,[1] Lord's British Columbia,[2] Proceedings of the Royal Society of Canada,[3] and by Julian Ralph.[4]

The model in question is not of birch-bark, but of pine-bark (*Pinus monticola*), laid on with the inner or smooth side out. The canoes of this type are all pointed like a monitor, at either end, on or below the water line; that is, they are longest on the line of the keel. When new they seem to be straight along this line, but, from being loaded in the middle, they sag afterwards, and the pointed ends get turned up through striking the shore in landing.

Mackenzie mentions the use of spruce-bark in canoe building, but does not speak of the shape.

A glance at a large collection of American Indian water craft throughout both continents reveals the fact that this pointed type is unique for the Western hemisphere. In the north and east the birch-bark canoes prevail, and farther north the kaiak and the umiak. In the west the dugout is universal and assumes often large size and graceful outline. But every example of skin boat, bark canoe, and dugout on the Western Hemisphere, excepting the Kutenai canoe, is longer on top and narrower at the bottom, or what would be the keel if any were present. In a few local forms of Canadian bark canoes there is a suggestion of a chin at the ends, faintly hinting at kinship with the Kutenai type. Further examination into the water craft of North and South America fails to reveal any such form as that of the Kutenai canoe. The bark boats or "woodskins" of the Amazon and its affluents and

[1] Vol. VI, p. 441.
[2] Vol. II, p. 178.
[3] Vol. IX, p. 15, fig. 4.
[4] On Canada's Frontier, p. 293.

the Orinoco have no such motives.[1] The reader will have to search in another part of the world for similar models, as will be shown further on.

TYPES OF AMERICAN WATER CRAFT, BY AREAS AND FAMILIES.

ZOOTECHNIC AREAS.	PEOPLES.	WATER CRAFT.
1. Arctic.	Eskimauan.	Kaiak and umiak of skin.
2. Canadian.	Athapascan.	Bark canoes.
3. Atlantic slope.	Algonquian-Iroquoian.	Dugouts and rafts.
4. Plains of the West.	Siouan.	Coracle of buffalo hide.
5. Louisiana or Gulf.	Muskhogean.	Cane floats and pirogues.
6. Southeastern Alaska.	Haida-Skiddagetan.	Dugout, exclusively.
7. Columbian region.	Salish-Chinookan.	Dugout and pointed bark canoes.
8. Interior basin.	Shoshonean.	None.
9. California region.	Very mixed stocks.	Dugouts and reed rafts.
10. Pueblo region.	Tanoan-Tewan and Sonoran.	None.
11. Middle America.	Aztec-Mayan.	Reed floats and dugouts.
12. Antillean region.	Carib-Arawakan	Dugout and woodskins—(1) woodskins, (2) buckshell, (3) corial, (4) canoe.
13. Cordilleran region.	Chibcha-Kechuan.	Balsas, reed floats with sails.
14. Upper Amazonian.	Jivaro, Peba, Puno, etc.	Dugouts.
15. Eastern Brazilian region.	Tupi-Guaranian, Tapuyan.	Jangadas or catamarans.
16. Mato Grosso and southward.	Mixed people of Brazilian and Andean types.	Woodskins and dugouts.
17. Argentina-Patagonian region.	Chaco, Pampean, and Patagonian stocks.	Dugouts or none.
18. Fuegian region.	Aliculuf, Ona, and Yahgan.	Bark canoe in streaks or longitudinal sections.

It would occur to any student of technography that in this particular spot the birch trees fail and nature furnishes an excellent substitute in the pine bark. On this point Mr. Gifford Pinchot, of the Forestry Division of the U. S. Department of Agriculture, calls my attention to the following quotations from Sargent's Silva of North America:

The canoe birch is one of the most widely distributed trees of North America. From Labrador it ranges to the southern shores of Hudson Bay and to the Great Bear Lake, and thence to the valley of the Yukon River and the coast of Alaska, forming with the aspen, the larch, the balsam poplar, the banksian pine, the black and white spruces, and the balsam fir, the great subarctic transcontinental forest; and southward it ranges through all the forest region of the Dominion of Canada and the Northern States to Long Island, New York, and northern Pennsylvania, central Michigan, and Minnesota, the bluffs of the Niobrara River in northern Nebraska, the Black Hills of Dakota, northern Montana, and northwestern Washington. An inhabitant of the rich wooded slopes and the borders of streams, lakes, and swamps, the canoe birch, although it never forms a large part of the forest, is very common

[1] Von den Steinen, Unter den Naturvölkern Zentral Brasiliens, Berlin, 1894, p. 120, pl. X.

in the maritime provinces of Canada, in the region immediately north of the Great Lakes, and in northern New England and New York, where it ascends to higher elevations than any other deciduous-leaved tree; it is small and comparatively rare in the coast region of southern New England, in southern New York, and central Minnesota; widely distributed at high latitudes from Labrador to the eastern base of the Rocky Mountains; it is never very abundant there nor a conspicuous object in the landscape, and within the Arctic Circle becomes small and crooked. West of the Rocky Mountains, where it attains its largest size, the canoe birch usually grows singly and is found only along the banks of streams. (Vol. IX, p. 57.)

The Western white pine is distributed through mountain forests from the basin of the Columbia River, in southern British Columbia, to Vancouver Island, southward along the western slopes of the Rocky Mountains to northern Montana, and to the Bitter Root Mountains of Idaho, westward along the mountain ranges of northern Idaho and Washington, reaching the sea level near the shores of the Straits of Fuca, and southward along the Cascade Mountains and the Washington and Oregon coast ranges, extending eastward in Oregon to the high mountains east of Goose Lake, and southward along both slopes of the California Sierras to the ridge between Little Kern and Kern rivers, in latitude 36° 25′. In northern Idaho the western white pine grows to its largest size, and is most abundant, often forming an important part of the forest at elevations of from 2,000 to 2,500 feet above the sea on the bottom lands of streams tributary to Lake Pend Oreille; farther east, in Montana, it is less abundant and smaller; in the interior of British Columbia it is not abundant, although it sometimes is large; it is scattered in considerable numbers through the coniferous forests of the coast ranges of British Columbia and through the interior of Vancouver Island; and it is not rare on the Cascade Range, where it ascends to elevations of 5,000 to 6,000 feet, nor on the California Sierras, first appearing singly or in small groups along the upper margin of the fir forest, and attaining its noblest dimensions in California at elevations of about 10,000 feet above the sea, where trees 90 feet high, with trunks 5 or 6 feet in diameter, sometimes occur, and resist for centuries, with their massive trunks, and short, contorted branches, the fiercest Sierra gales. (Vol. XI, p. 23.)

As to the unique shape of the Kutenai canoe on the American Continent, it will not suffice to say that pine bark is more easily bent after this fashion, and that in obedience to the law of economy of effort this was the natural result of employing that material. The writer made experiments with substances having similar toughness and elasticity and found it no more difficult to bend them into the common canoe form than into the monitor form when the material is properly cut out. As to the economy of sewing at the ends, that is difficult to determine. At any rate, the other American Indians invariably slope their birch-bark canoes outward from the bottom at both ends, but the Oltscha and Goldi of the Amur, and even the Tungus and Yakut, imitate the Kutenai tribes and point their birch canoes below the water.

In order to ascertain the distribution and handling of these pine-bark canoes, the assistance of Mr. Meriden S. Hill, secretary of the Tacoma Academy of Sciences, Washington, was invoked, and the results of his investigations will now be given.

THE KUTENAI CANOE.

The pine-bark canoe, pointed at both ends below water, is used in only a circumscribed area on the Kootenai River, and on the Columbia at the mouth of the Kootenai. In order to make sure of this and to know more about the uses of this craft, at the suggestion of the curator of the Division of Ethnology in the U. S. National Museum, an extensive correspondence was conducted with missionaries and others who have spent years on the Kootenai and the Upper Columbia. (Plate 1.)

It is well to say that the birch-bark canoe of regions east of the Rocky Mountains does not exist on the Columbia or the Kootenai, but the dugout, in ruder form, is to be found in many localities, becoming more beautiful and seaworthy as one approaches the ocean. The writer has never heard of any other regularly built canoe of bark or other material in America pointed at or below the water line. All the birch-bark canoes are rounded up the other way, like the prow of an old-fashioned ship or of a lifeboat. It was the writer's purpose to work up the matter with greater detail, but he was prevented by continued illness.

In the second volume of Ross's Fur Hunters he says, speaking of the Kutenai upon the Arrow Lakes, in British Columbia:

> At the water's edge we saw and examined a birch-rind canoe, of rather singular construction, such as I had never seen in any other part of the country, but used by the natives here; for I saw several of the same make when I passed this place two years ago. Both stem and stern, instead of being raised up in a gentle and regular curve, as is customary elsewhere, lie flat on the surface of the water, and terminate in a point resembling a sturgeon's snout. The upper part is curved, except a space in the middle. Its length is 22 feet from point to point and the whole bottom between these points is a dead level.[1]

Such craft must prove exceedingly awkward in rough water, and there is often a heavy swell on these lakes. Dawson has also mentioned these canoes in the following language:

> In addition to the ordinary and always rough dugout canoe made from the cottonwood (*Populus trichocarpa*) probably, and employed occasionally on certain lakes or for crossing the rivers, the Shushwaps in the eastern part of their territory in British Columbia made small and shapely canoes from the bark of the western white pine (*Pinus monticola*). These may still be occasionally seen on Shushwap Lake and in the vicinity of the Columbia. The inner side of the bark stripped from the tree in one piece becomes the outer side of the canoe, which is fashioned with two sharp, projecting spur-like ends, strengthened by wooden ribs and thwarts internally; the whole is lashed and sewn with roots, and knot holes and fissures are stopped with resin. The canoes thus made are very swift, and, for their size, when properly ballasted, remarkably seaworthy.[2]

Mr. G. M. Sproat, author of Scenes and Studies of Savage Life, says that the pointed canoe is the common craft on the Columbia River

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[1] Alexander Ross, The Fur Hunters of the Far West, London, 1855, 2 vols. Vol. II, pp. 169, 170.

[2] Transactions of the Royal Society of Canada, December 11, 1891, fig. 4.

above Colville and on the lower part of the Kootenai. They are in daily use there, but are not known to have existed in any other part of America.

Mr. A. J. Kent, of Idaho, writes that the Kutenai have no other kind of canoe except the one made of spruce, white pine, or cedar-bark, pointed at both ends beneath. These are about 15 feet long and weigh, say, 50 pounds. The bark is very tough and pliable when it is taken off in the spring. The squaws build the canoes when the sap starts, sewing them with rawhide or anything else strong enough, closing the cracks with pitch from the yellow pine. It takes two squaws four or five days to make a canoe, the chief difficulty being to get the bark off whole and to turn it wrong side out successfully.

Mr. John Sizelove, postmaster at Kalispel, says that the pointed canoes are made of spruce-bark peeled off in a single piece. The frame is made of split cedar. The Indians at Kalispel will use no other kind of boat, as these are very light and can be taken out of the water and kept away from snow and ice in winter. This writer states that the points curve upward and do not sink below the water. It is

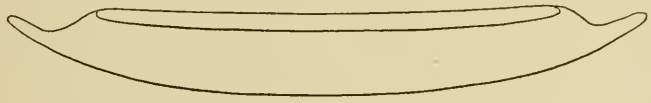


Fig. 1.

OUTLINE OF KALISPEL POINTED CANOE, SHOWING CURVED BOTTOM.

a little difficult to decide at present whether this is a local peculiarity or due to the sinking of the middle when loaded. Mr. Sizelove sends a drawing to confirm his statement (fig. 1).

The Kutenai bark canoes, *ac-so-molth*, are thus described by Mr. D. M. McLaughlin: The pine-bark is cut from the tree in the length required. The gunwales are prepared by splitting three pieces of cedar wood from a stem 3 to 4 inches in diameter, one of them a half cylinder wide, the other two in quarters, placing them about and above the margin of the bark, and lashing all fast with a band of the bark of the vine maple (*Acer circinatum*). After this is finished the ribs, made of the same vine-maple wood split into the required lengths, are forced in between the gunwales. Thin cedar boards are then pushed between these ribs and the bark of the canoe. The ends of the thwarts are forced in between the three pieces of cedar wood, forming the gunwales, closing or opening the canoe as required. These thwarts are then securely bound with the vine-maple so as to keep all stiff and solid, especially the middle one, since it has to bear the greatest strain. Mr. McLaughlin says that the canoes, in spite of their frailty, can stand an extraordinary amount of storm and wave when well managed.

He is sure that when the canoes are first finished they are as straight as an arrow along the bottom. After one has been used awhile the ends turn up more or less, according to the weight put into them. The Indians, after using one, take it out of the water to dry and this has a tendency to draw up the points.

The Rev. Joseph M. Caruana, S. J., gives the following general measurements of the pointed canoe (in Salishan languages, *tlie* or *thlie*), in use among the Lakes or Snaichisti Indians, in Stevens County,

Fig. 2.

POINTED CANOE OF THE LAKE INDIANS, WASHINGTON.

Washington: length, 24 feet; width, 4 feet; depth, 2½ feet; paddle, 6 feet; poles, used perpendicularly in strong currents, 6 feet; mat in bottom to kneel on while paddling, 3 by 4 feet. The same writer says that in 1862 pointed canoes were in great use among the Spokane and Cœur d'Alène tribes, as well as the Colville, or Sgoyelpy, and Kalispel. He crossed many a river on such bark canoes while living among the Cœur d'Alène or Szchizue Indians. These canoes held two persons with luggage. The bottoms were flat and the ends somewhat turned

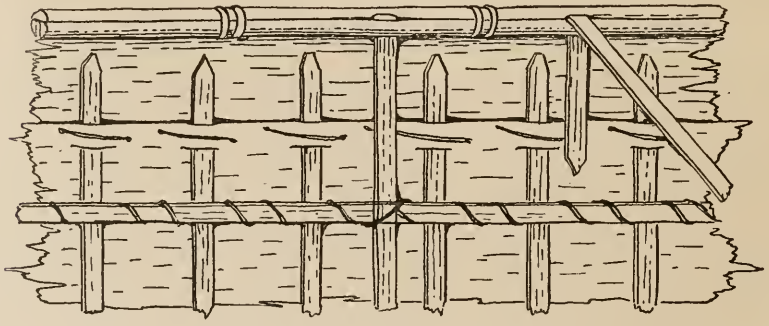


Fig. 3.

DETAIL OF THE LAKE INDIAN CANOE, WASHINGTON.

up. They were fragile and swift. The Indians had no tradition and could give no account of their origin. The canoes examined by Father Caruana had ribs of white cedar, very light and pliable, and bound to the horizontal framework with split cedar roots or willow twigs. The ribs are pointed at the top and do not reach the gunwale, but are forced through the bark and covered in. The chinks are well pitched, especially at the two ends. Mr. Kent, of Bonners Ferry, Idaho, describes one of the canoes as 14 feet long, weighing 50 pounds.

Fig. 2 is of a model of the pointed canoe of the Lake Indians, made

under the supervision of Father Caruana. It is 3 feet long from point to point; open space, 2 feet; width, 6 inches; depth, 4 inches. This represents a larger one, 24 feet in length. Fig. 3 represents the detail of construction in the framework. In putting in the ribs incisions are made into and halfway through the bark of the hull at its upper border. The ribs are inserted into these openings and pushed upward and out at the edge, which has been split for this purpose. The ends of the ribs do not reach quite up to the gunwale. The ribs are fewer in number, but larger, and pass at their ends between the bark and the inside one of the three strips or staves which together form the gunwale. These also pass outside the longitudinal slats toward the hold of the boat, while the ribs pass between the longitudinal slats and the bark sheathing. Slender roots and thin bark ribbons, apparently of spruce, are used in stitching and wrapping the various sections of the canoe together. The seams and joints are well covered with pitch. As in the full-sized craft, the inside surface of the bark becomes the outside of the hull, which is formed of three pieces, as indicated in the drawing. The part marked shows the method of bending on of one of the thwarts. In some cases the ends are pierced and seized or sewed to the gunwale. With this model were two pointed sticks representing the poles used in managing the canoe over swift currents, a paddle, and a mat on which the man kneels.

CANOES OF THE KUTENAI AND OF THE AMUR COMPARED.

Through the researches of Mr. Meriden S. Hill, given in the foregoing lines, and the courtesy of Dr. Demetri N. Anutchine, president of the Society of Friends of Natural Science, Ethnology, and Anthropology in Moscow, and of Dr. N. Doubrovinee, perpetual secretary of the Imperial Academy of Sciences in St. Petersburg, it is made possible to bring into a comparative study two inventions that are like to each other and unlike to any other craft in either hemisphere. It is not necessary to do more than to refer to Mr. Hill's remarks, since he has ransacked the upper drainage of the Columbia in northern Idaho, northeast Washington, and southeast British Columbia. Additional information comes from Mr. A. J. Kent, Bonners Ferry, Idaho, to the effect that the Kutenai tribes are not ingenious; that they follow closely their model; that the squaws make the canoes in the spring, after the sap starts, sewing the parts with rawhide as well as with bark splints, and that it takes from three to five days to finish a canoe. Maj. C. A. Bendire, U. S. A., had traveled often in one of these, and found no trouble in placing therein, besides himself and the boatman, his saddle and outfit.

The Gibbs specimen, No. 641 in the U. S. National Museum, is made of pine-bark (*Pinus monticola*), in three pieces, drawn over a wooden frame, the inside of the bark forming the outside of the canoe.

The framework consists of four longitudinal rods, to which are lashed a series of ribs by means of bark strips. Outside of this frame and next to the bark are a series of false ribs or slats to hold the bark in place. The canoe is straight along the bottom and pointed at bow and stern. The gunwale consists of three long pieces, one, the inwale, laid along the inner margin of the bark; one, the outwale, laid parallel to this along the outer margin of the bark; and the third, the gunwale, which is broader and semicircular in section, is laid on top of all, so as to cover in the upper edge of the bark and the other two strips of the gunwale. The whole are lashed together with bark. This triple arrangement is also found on the upper margin of the bow and stern where the two edges of the bark are joined. The gunwale is held in shape and place by thwarts lashed at their ends. (Plate 2.)

From the descriptions elicited by Mr. Hill concerning full-sized boats, it appears that the model is correctly made, and it is safe to conclude that—

1. The Salishan and Kitunahan tribes that occupy the area included in the Kutenai drainage, make a canoe differing from any other craft known to American tribes.

2. These canoes are made chiefly of the tough leathery pine-bark, on cedar frames and sewed with tough roots, such as the Indians employ for basketry all over this northwestern region.

3. The bark is stripped off in lengths equal to those of the desired canoes, about 15 feet, and in order to increase its gliding quality is turned inside out.

4. At a convenient distance from the ends the margins of the bark are firmly tied together. Between these two points of union the edges are forced apart and held in place by thwarts varying in length. Outside the two points of union the ends of the bark are pinched together and triangular pieces cut from the corners, so that when the sloping edges are joined a sloping or incurved line extends from the points of union on top to the extremities of the bottom, in fact causing the canoe to look at each end something like a modern "ram" or monitor.

5. The bark is strengthened by ribs and by horizontal slats, and the parts are sewed together by means of vinemaple, pine, cedar, or spruce root, or with strips of bark.

6. A gunwale is built up by splitting a cedar pole into three parts, one of them the segment of a circle in section for topwale; the other two, inwale and outwale, are quarters of circles in section, so that they will fit neatly on top and along the outer and inner margin of the upper border of the bark. In this part of the construction the Kutenai craft is in contrast with other northern bark canoes.

By reference to Major Powell's map[1] of the linguistic stocks of

[1] J. W. Powell, Seventh Annual Report of the Bureau of Ethnology, Washington, 1891.

North America, it will be seen that the tribes in Washington using the pointed canoe are:

1. Shushwap, of the Salishan family.
2. Colville or Tgoyelpi, Salishan family.
3. Kalispel, Salishan family.
4. Spokane, Salishan family.
5. Lakes or Snaichisti, Salishan family.
6. Kutenai, Kituanahan family.

In the light of these Kutenai specimens it may be interesting to examine similar craft of Asia. There being no trees yielding bark fit for canoe making along the Arctic coast, it is necessary to trace the fiftieth parallel of latitude, that of the Kutenai canoe, across the Pacific, and this brings one to the Amur basin. Upon this stream dwell Giliaks, Goldi, Manyargs, etc., unclassed ethnic groups—that is, ethnologists have not been able to relegate them to any of the well-known Asiatic families.

An excellent account of these tribes is given by Leopold von Schrenk in a work entitled Reisen und Forschungen in Amurlände. He shows a Giliak man seated in a pointed bark canoe.[1] Layard also figures a Phœnician war galley pointed beneath the water.[2]

Von Schrenk describes three types of boat on the Amur River and about its mouth, the built-up boat, or bateau, the dugout, and the birch-bark canoe.[3] The first named is a sort of flat boat or scow made of three planks hewed out of the larch or *Picea ajanensis*, worked out with adze and knife and fitted together with pegs. Bow and stern boards are set in and the bottom board projects at the bow into a sort of platform, slightly turned up. In many examples considerable style and ornamentation are added, so that Schrenk believes this built-up form to have been introduced under Manchu-Chinese influence from Soongaria. For centuries Chinese merchants, and among them Manchu officials, have come from Soongaria into the Lower Amur country, the former to trade with the people, the latter in order to collect from them the tribute owed to the Chinese Government. The boats in which these journeys are made are indeed much larger and more complicated than the Goldi Giliak examples, but they are on the whole of like construction. It is to be remarked in this connection that the plank boat in use by the Giliaks at the Amur mouth; on Saghalin, by the Oltcha, their neighbors up the river; by the Golde, occupying the stream as far as the Usuri mouth; and by the Oltscha on the seacoast south of the Giliak, is entirely absent from upper Amur areas. Schrenk saw none,

[1] Leopold von Schrenk, Reisen und Forschungen in Amurlände. St. Petersburg, 1881, III, p. 510.

[2] Perrot et Chipiez, Phœnecia, London, 1885, I, p. 34.

[3] Reisen und Forschungen in Amurlände, III. St. Petersburg, 1881, pp. 500–515.

and Maack, following the Amur from the Schilka, encountered the first craft of this kind at the Usuri mouth. Maack also missed the kind of dugout (called *unjamagda* or *awarpe*) resembling in form the plank boat.

The dugout canoe is found in the interior of Saghalin. Schrenk saw a Giliak example (called *mlomu*) in winter in the village of Yokyrn, carefully protected from snow, resting on a frame near the yourt. It was 20 feet long, broadest in the middle and tapering toward the ends. The bow terminated in a point, but the stern was square and perpendicular with a broad let-in, as in the plank boats.

Much simpler and more primitive are the little canoes also excavated out of the Hammagda tree and pointed fore and aft, which, with small differences in proportions, are called by the Oltscha and the Golde *otongo* and *gulba*. Both are of the same form, pointed fore and aft, but the *gulba* in relation to its length is narrower and deeper and with thicker walls than the *otongo*, and for that reason better fitted to be used in rough water and in places abounding in stones and rocks, etc. The dugouts of Hammagda wood made by the Orochi on the seacoast and the mountain streams flowing to the sea and on the tributaries of the Lower Amur or Usuri are the same as those made by the Golde and Oltscha on the main stream. So was the *awarpe* of the Orochis, on the Upper Munamu stream, made and used outward on the Amur. On the contrary, only now and then, throughout the long course of the Amur does one of the Golde, Oltscha, or Giliak plank boats find its way to the Orochi, on the seacoast.

Schrenk saw among the Birari of Ossika on the Amur a dugout canoe called by them *mango*, 28 feet long, 3 feet broad, and 1 foot deep, and another time one still larger, in which Biraris from the Aar River were returning from their summer fishing grounds on the Amur to their winter settlements. It was deeply laden and carried mast, and sail made of canvas, and held at the corner with the hand instead of with shrouds. On the testimony of the Birari these boats were made from the stem of the abundant *dshagda* tree (*Pinus sylvestris*, L.).

Canoes made of a wooden interior structure covered with birch-bark are more commonly in use than dugouts among the Oltscha and Golde on the Lower Amur, and they are employed also by the Tungus on the Amur tributaries and throughout the streams of the Stanavoi Mountains. In general, of like type everywhere, having the two ends similarly pointed, these bark canoes called *dsai* by the Oltscha and Golde, in their outlines and proportions, as in individual traits, present many peculiarities. However, corresponding nearly to the *gulba* and *otongo* dugouts of the Oltscha and Golde, there are two forms of bark canoes, one deeper and narrower in proportion to the length, generally decked a little with bark at bow and stern; and a broad, flat, and open form, with ends strongly upcurved. Of the former Von

Schrenk furnishes a lithograph[1] and of the latter a woodcut, showing a Goldi man at the mouth of the Usuri River sitting in his *dsai*. The former, through its light form and the deck over the bow to keep off the spray of the turbid waters, is better adapted to use on the upper streams. The latter, on the contrary, furnishes more room for the fishing and hunting outfit and for the game. The handling of the canoes is precisely the same as that of the dugouts, the *otongo* and the *gulba*.

The measurements of the Oltscha canoe were 18½ feet long, 2½ feet broad in the middle, depth 11 inches. In managing these frail and light canoes the Amur-Tungus, Oltscha, Goldi, and other tribes, like their Siberian congeners, develop a skill and dexterity which, at times, in the mad rush of the swollen streams, not seldom recalls the hardihood and readiness of the Aleuts in their baidarkas, and is in strong contrast with the clumsiness and prudent foresight of the Giliak at the Amur mouth and on Saghalin Islands. What the snowshoes are in winter the birch-bark canoes are to the Tungus as soon as the waters have thrown off their icy coverings. Their light weight allows also the carrying of them with ease over long portages and in visiting other waters, either in hunts or migrations. Thus the birch-bark canoe furnishes the unique, typical, characteristic conveyance to the hunting, fishing, wandering, hungry Tungus. Also the Birari and the Managér have bark canoes of the form and structure of the *dsai*, but twice as long, while the width is the same. Schrenk saw among the latter an example 35½ feet long and only 2 feet 2 inches wide. Such a boat is like the Aleut baidarka with several holes, and more like the great *mango*. These are propelled with poles or with two or three double paddles, and are worked by men paddling first on one side and then on the other, shooting forward with great velocity.

The pointed dugouts, as well as the birch-bark canoes, are found also among all the aboriginal tribes of the Upper Amur. Since these are chiefly nomads living by the chase, who only occasionally go down from their hunting grounds and the Amur tributaries to the main stream in order here to prosecute their fishing, these simple, easily repaired, and, on occasion, readily transported craft, which are also available in rapid as in still water, suffice for all their needs. Not merely the narrow patterns, like the *otongo* or the *dsai*, are thus diffused, but also those of large dimensions. In such boats they migrate from winter to summer quarters and back, transporting not only women and children, but a multitude of tools and utensils.

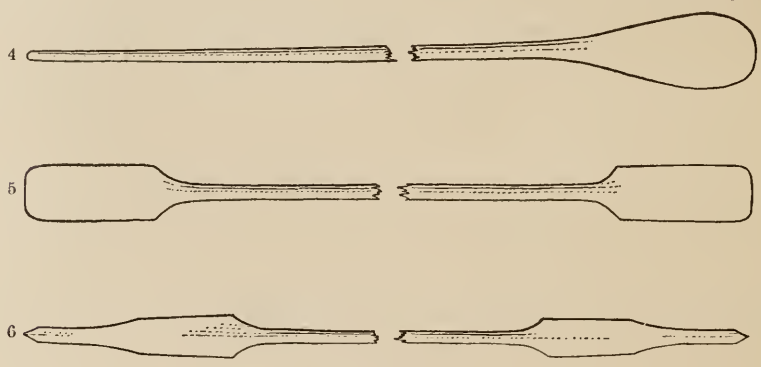
In the museum of the Imperial Academy of Sciences of St. Petersburg are three models of pointed canoes, all made of birch bark. Through the kindness of Dr. N. Doubrovinee, secretary, I am able to

[1] Reisen und Forschungen in Amurländе, III, pl. XXXVIII, fig. 5, p. 510.

reproduce them here. The rudest paddle, a Tungus example, has a simple handle with oblong elliptical blade, without decoration (fig. 4). The Yakut paddle is double, with cylindrical grip and oblong pentagonal blades, square on the outer ends (fig. 5). The Goldi paddle has a similar grip and hexagonal blades with long tapering points, a gracefully shaped implement (fig. 6).

The double paddle is seen in the Giliak's hand in Schrenk's figure. The Goldi and Yakut employ also the double paddle in their pointed canoes, but in the Tungus pointed canoe the simple paddle is used. The single paddle is found elsewhere around the great circle of the earth that includes the two areas of the pointed canoe. The double paddle exists sparingly in the Eskimo area of Alaska and among the same people in Greenland. On all the waters of the southern United States the negroes propel their dugouts and skiffs with the double paddle.

The Tungus model (Plate 3), though clumsy looking, is built up in five sections. Five strips of bark are bent in the middle and united at their edges to form the hull. The four seams extend quite around



Figs. 4, 5, and 6.

TUNGUS PADDLE; YAKUT PADDLE; GOLDI PADDLE.

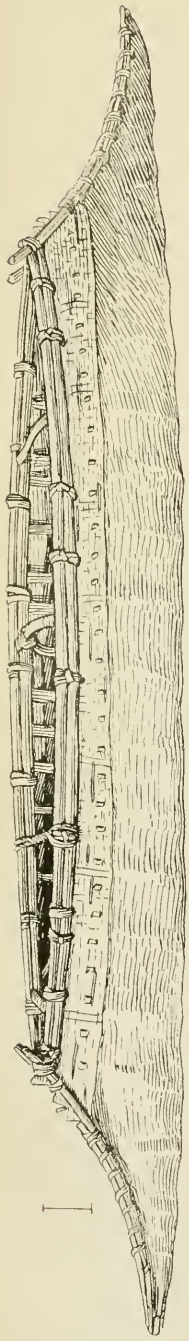
the craft and are rendered tight with pitch. The canoe is kept in form by a series of flat ribs, almost touching one another, and extending along the inside from end to end of the structure, as in a canoe. On the outside of the canoe, along the bottom, a wide strip of bark is sewed neatly, the stitches long on the inside of the boat and short on the outside, passing quite through two thicknesses of bark, including the flat ribs on the inside, holding all together. At the ends the canoe front is straight, the lines sloping inward only a little, so that it is but slightly pointed below. The bark is simply doubled over at the ends and sewed down. On the upper margin strips of wood are sewed on both sides of the bark to form inwale and outwale. There is no top piece except along a short space between the thwarts. Here the side strips for wales leave the margin and pass downward a little to make

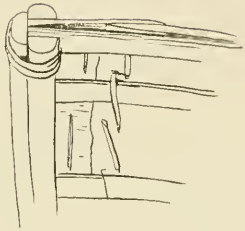
way for the cap piece along the middle. The top piece is neatly chamfered and grooved to fit in place. There are four thwarts, two near the ends of the hold, which are merely lashings, the material passing backward and forward two or three times and then closely woolded, two solid pieces near the middle of the canoe serving as spreaders. The ends of the thwarts are pierced and lashed to the gunwale at the ends of the cap pieces so as to hold all parts firmly together. The Tungus canoe is wide and shallow and is an excellent freight boat.

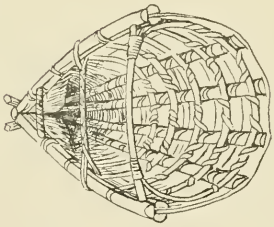
The Yakut pointed canoe (Plate 4) is also made in sections of birch bark, of which, in the model here studied, there are four in number, passing around from gunwale to gunwale, overlapping and stitched together. The bottom is strengthened by adding broad strips of bark from end to end and sewing them down at their edges. At the ends the Yakut canoe is shaped like a snout, the line from bottom upward being incurved. The joint at the ends is a very simple one, the edges of the bark cut to shape and sewed together. The gunwale is formed by a binding of bark turning over and hemmed down, the edges showing on the outside and inside. Two thwarts are held in place by a lashing which passes across parallel and on both sides of the thwart and fastened through the bark sides. The canoe is held in shape by means of flat, wide ribs, whose ends are concealed under the bark binding of the gunwale. The Yakut canoe is a wide craft, better suited to freight than speed. As the model here described is rougher than the others shown, it is possible that the larger ones have better elements of construction.

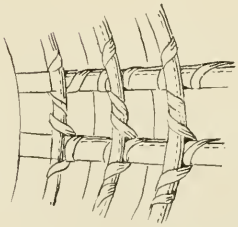
The Goldi pointed canoe (Plate 5) more closely resembles that of the Giliak and of the Kutenai. The hull of the model consists of a single piece of bark (but in full-sized boats it may be in sections) and there is no additional layer of bark on the bottom. The gunwale is formed by clasping the edge of the bark between two strips of wood, forming inwale and outwale, and there are no top strips as in the Kutenai craft. The unique feature in the Goldi canoe is the insertion of a wooden point at either end. This is curved upward gracefully. Another noteworthy feature is the covering of a portion of the hold at either end with a sheet of bark, forming a partial deck. One thwart is shown in the model, though others must exist in the full-sized canoes. Slats are laid along the inside lengthwise and over these are neatly forced in flat-rib pieces at intervals. This is a dainty looking craft, long and slender, and doubtless used for speed and fishing and not for freight. In the middle of the inside a piece of hide affords a kneeling place for the boatman.

KUTENAI CANOE IN MOTION.





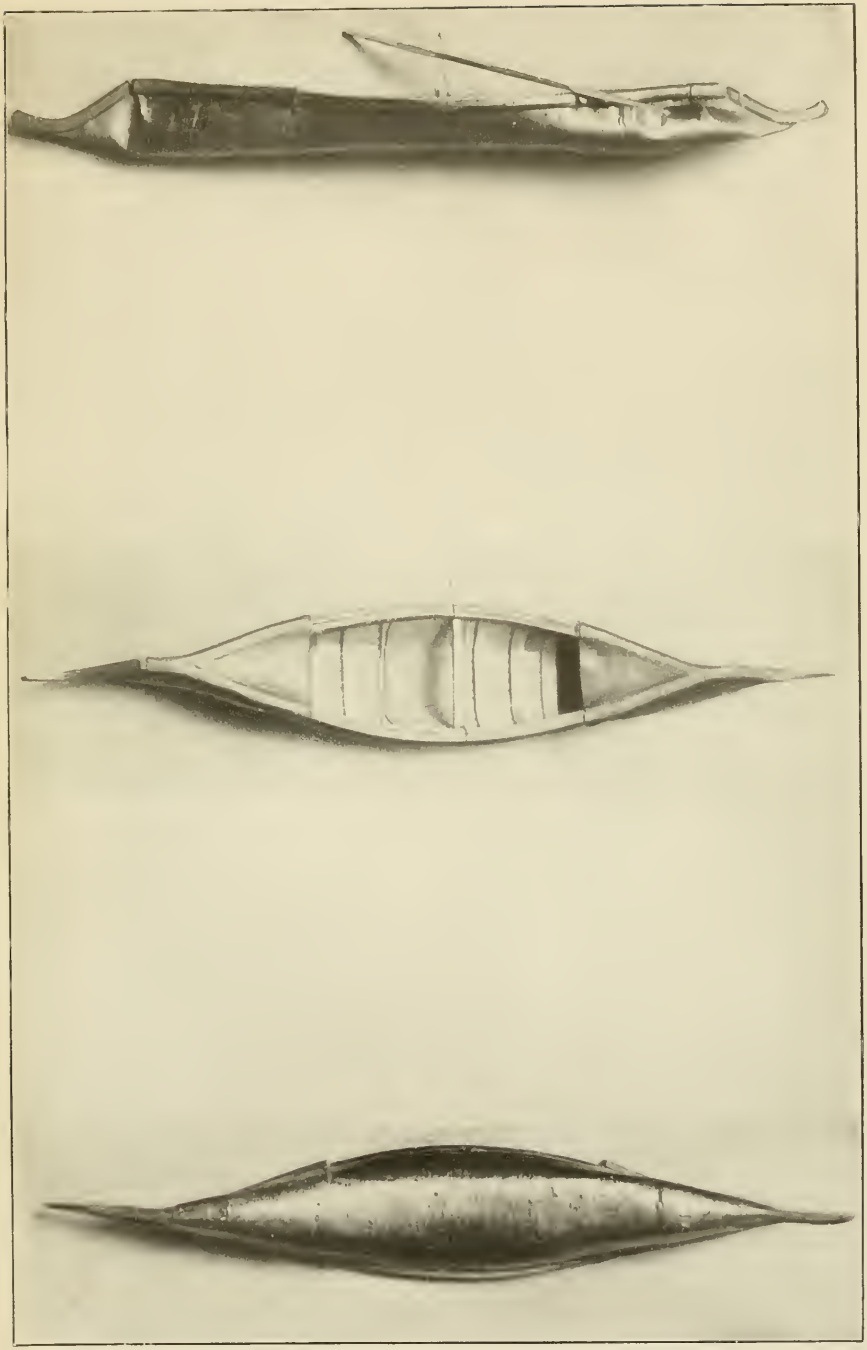




DETAIL OF KUTENAI CANOE.
Cat. No 61, U.S.N.M.

TUNGUS POINTED CANOE.

YAKUT POINTED CANOE.



GOLDI POINTED CANOE.