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## CANADIAN ABORIGINAL CANOES.

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Canoeing, it may be remarked by way of introduction, is one of a number of things which have been borrowed, either for use or amusement, from the American Indian. The name, strangely enough, has been introduced from a region at some distance from that with which we are accustomed to connect canoe culture in its typical form, being derived from the word "canoa," in use among the Arawak of the West Indies. This was adopted in a similar form by the Spaniards, and as "canot" by the early French in Canada. The fact that there was already a name in current use, then, is no doubt the reason none of the names applied by the Indians of the Eastern Woodland area of America was adopted.

An Ojibwa term, fairly well-known from its employment by Longfellow in "The Song of Hiawatha", is "cheemaun". A name applied to a very large craft is "nabikwan". A Mohawk appellation is "gahonwe'ia"; rendered by the Onondaga, a related tribe, as "gaho'nwa". It is interesting to note, in the last-mentioned dialects, the close resemblance to the term for a bark bowl or trough.

Quaint early English forms, now obsolete, are "canow" and "cannoe".

There is little doubt that, in the earlier days of French exploration and settlement along the St. Lawrence and of English settlement in New England, the birch-bark canoe of Indian make was very soon adopted as the most convenient method of travel. We can readily infer, also, from early writers and other such sources, the extremely important part played by the canoe in the development of a very large portion of the North American continent.

It would obviously be most interesting to trace the canoe and other such devices to their origins, but there are indications that the problem in hand is one of the diffusion or spread of a cultural trait already elaborated, or partly elaborated, it may be in some other region. This is in part suggested by both the extent and the continuity of the area in which canoes are used. We can see that migrations of population, or the influence of one tribe

upon a neighboring one (accultural influence) would soon disseminate the canoe idea, possibly in a simple form, very widely, and that, under the influence of the varied materials at hand and diversified requirements, specialization in various directions would later arise.

Materials naturally played an important part. In areas where trees were not at hand, or were less convenient, such materials as rushes were sometimes built into a boat-shaped raft (see the balsa of California); or a skin-covered craft was employed, as in the Eskimo area, among the neighboring Kutchin of the Yukon, the Tahltan and other Athabascans of the Mackenzie region, and in some parts of the Plains) see the "bull-boat," a tub-shaped craft of skin and withes, used by various Siouan tribes, including the Mandan and the Hidatsa; also by the Arikara, a Caddoan tribe). The Omaha (Siouan) used hide-covered boats or canoes of ordinary type, but with a rude framework, indicating the slight development among them of ideas regarding navigation. In the last-mentioned craft, an oar or large paddle was used for steering, the paddlers sitting near the bow.

One of the most interesting developments in North American navigation was the canoe of birch-bark, which apparently reached its perfection in the Algonkian area, a region extending from around the Great Lakes, and some distance westward, to the maritime provinces and the New England states, though the birch canoe area exhibits cultural extensions in various directions, but particularly northward and westward to the Mackenzie river basin. There is little doubt that this distribution was largely determined by the range of the canoe birch (*Betula papyrifera*), which extends practically from the Atlantic coast to the Rockies, as well as to some distance south of the international boundary. The disappearance of the birch southward is indicated by the fact that very inferior canoes of elm, buttonwood and basswood bark were constructed by the Iroquois of Central New York state and southward, who evidently found the materials last mentioned

more plentiful. The Iroquois canoe is everywhere stated to have been heavy and loggy, inconvenient for portaging and short-lived generally. In fact, so poor a craft it was in comparison with that of the Algonkians, that the Iroquois are said to have traded eagerly for the lighter and more substantial contrivance.<sup>1</sup>

Bark and skin-covered canoes, however, are not the only craft which have been used by Canadian Indians, since at least two other devices—usually constructed in a very primitive style—are found side by side with considerable advancement in navigation. The dugout, for instance, which is usually little more than a hollowed-out log, is employed by a great many tribes along with canoes of a much superior kind. Another very primitive-appearing contrivance, the raft, is distributed quite widely, though employed to a greater extent in some areas than in others.

It may be unnecessary, or even impossible, for us to decide which of the foregoing came into use first, but we should certainly be quite near the mark in placing the raft first in degree of simplicity, with the simpler class of dugout next.

#### THE BIRCH-BARK CANOE.

Practically everywhere within the region of Algonkian influence proper the birch-bark canoe was essentially the same, such differences as occur concerning mostly the shape of bow and stern, which has evidently been derived almost exclusively from a single pattern, with local variations in the amount of curvature or recurvature and the method of decking over at the ends, where such a device was employed. The Malecite (western New Brunswick) and Ojibwa forms are very good examples of the extremes in outline in the Algonkian region. The Malecite canoe also exhibits the decking-over sheet at the ends, with side-flaps, in a well-developed form. As we proceed westward, this sheet decreases in size in the Algonquin canoe of northern Quebec and Ontario and becomes vestigial in a smaller form used by certain of the neighboring Ojibwa. The same purpose, that of preventing the inflow of water, is accomplished by the recurring ends of the Ojibwa type with which we are most familiar.

Regarding the Algonkian tribes of central Labrador, Turner remarks that "a tribe of great dissimilarity between the Naskopies and the Little Whale River Indians (Eastern Cree) is that the

birch-bark canoe of the latter is much more turned up at each end, producing a craft well adapted to the swift currents of rivers." He also states that "the occupants are skilful boatmen," that "sails are sometimes erected in a single canoe," and that "at times two canoes are lashed together and a sail spread from a single mast."<sup>2</sup>

An offshoot of the Algonkian canoe was the "rabiscaw" of the Hudson Bay Company, an extra large birch-bark craft designed to meet the demands of the fur-trade. A prominent feature was the high, upturned bow and stern decorated with gaudy designs.

At the western extremity of the bark canoe area we find at least two somewhat divergent forms which suggest an attenuation of eastern accultural influence, combined, possibly, with modifications from other sources. The Dog-ribs, an Athabaskan tribe of the Mackenzie basin, like the Ojibwa, construct a birch-bark canoe having separate keel-pieces for the bow and stern. The small and narrow ribs and the slender, widely-separated siding or flooring strips extending from end to end, however, show some resemblance to kayak construction. A special feature (also showing a resemblance to the kayak)<sup>3</sup> is the fairly extensive sheet of decking at either end. Conspicuous side-flaps, of the type found in the Algonquin decking, are lacking. The seams are sewn with spruce root and gummed.

Among the Kootenay and the various Salish tribes of southern British Columbia is found a canoe of pine or spruce bark, rather rude in general workmanship and showing but little external resemblance to eastern forms. The most striking feature is the peculiar pointed extension of the lower part of bow and stern, which is said to be specially adapted to rapid rivers. From a structural point of view no radical difference from eastern types is to be noted. The bark of the yellow cedar (*Thuja excelsa*) is also mentioned as a British Columbia canoe-making material.

A Slave canoe from the neighborhood of Hay river (flowing into Great Slave Lake) exhibits an upward extension at the bow and stern which adds much to its picturesqueness. In other respects it conforms closely to eastern models.

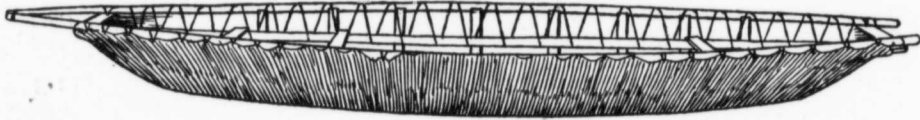
A description of Ojibwa canoe-making will no doubt give a fair idea of the methods employed throughout most of the bark canoe area.<sup>4</sup> The process is most interesting and requires considerable skill.

<sup>1</sup>Dr. E. Sapir, in "Time Perspective in Aboriginal American Culture," Memoir 90, of the Geological Survey (Canada), p. 20, remarks: "Similarly, the clumsy elm-bark canoe of the Iroquois seems less adapted to its cultural environment than the various types of birch-bark canoe of their Algonkian neighbors. We may risk the guess that the Iroquois bark canoe is an imperfect copy in elm-bark, a characteristically Iroquois material, of the superior Algonkian types, and connect this further with the general consideration that the Iroquois were rather more inclined to be cross-country walkers than the neighboring Algonkian tribes, who were more adept river and sea folk."

<sup>2</sup>Turner, Lucien M., "Ethnology of the Ungava District," 11th Annual Rept. of the Bureau of Eth., Washington, D.C., p. 182.

<sup>3</sup>Mention of this resemblance is made by Pettit, in "Autour du Grand Lac des Esclaves," p. 268.

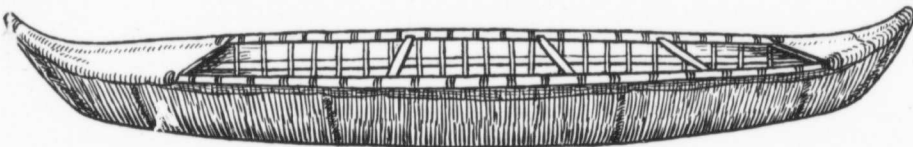
<sup>4</sup>From data obtained by the writer among the Saulteaux, or Ojibwa of the Lake Nipigon region. Permission to use this and other original notes was accorded by the Geological Survey, Ottawa, Canada.



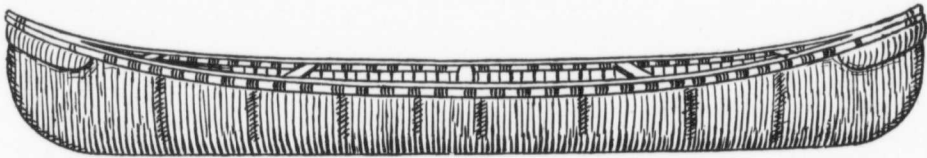
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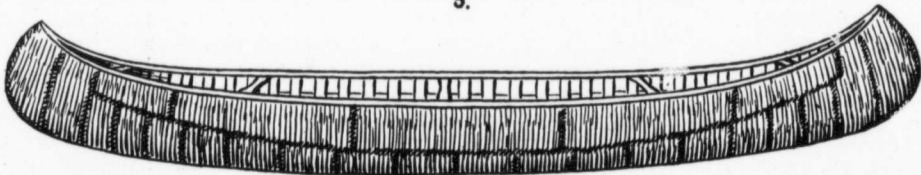
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CANADIAN CANOES.

1, Alaskan Eskimo umiak, or open boat; 2, Labrador Eskimo kayak; 3, Dog-rib canoe; 4, Malecite canoe; 5, Algonquin canoe; 6, Montagnais canoe.

Thin strips of cedar (*Thuja occidentalis*) for the ribs, and the sheeting used between the ribs and bark to prevent injury to the latter, are obtained, split into approximate sizes and placed in water to render them more flexible. Another important requisite is the birch-bark, which peels off most easily late in June or early in July. This is rolled up and laid away in the shade. Towards evening, or at any time, if the day is cloudy, stakes (nine or more to a side) are driven into the ground at intervals to approximate the length and width of the canoe. These are made to flare outward slightly. The bottom pieces of bark are now placed in position, overlapping a few inches in the middle where they are to be joined. A single length of bark is preferred for the bottom. This, however, is not always obtainable, so that two pieces, or even three, may be used. Stones are laid on the bark to hold it down, and a bottom frame, approximating the width of the canoe at the bottom and pointed at both ends, is applied. The work so far is done by the men. The next operation, that of shaping the bottom by making slashes or gores on each side and sewing these with spruce root, is done by the women. The gores are made towards the ends, where the canoe begins to narrow. The upper edges of the bark are also trimmed evenly. The spruce root for sewing has been split by the women to a suitable size and rendered flexible by steeping in fish broth. The men next lay the upper lengths of bark alongside, measure them by trial, then place them in position. The bottom pieces are now scored along the bottom with an axe where they are to be creased for the taper of bow and stern, after which both upper and lower barks are pinched together by stakes driven closely and tied at the top. An inner frame (or "inside gunwale") giving shape to the upper edge of the canoe, and having exactly the right taper and curve, has been prepared beforehand and is now placed between the upper barks and sewn closely and firmly to them. Pieces of cedar, bent to the approved shape of bow and stern, are placed between the barks at the ends of the canoe, the bark trimmed to conform to these in outline, then sewn to them with spruce root. The sewing, as before, is performed by the women, to whom this part of the work is always assigned. Stitches of uneven length are often employed, particularly around the ends, to prevent the bark from splitting.<sup>5</sup> The gores and laps have in each case been well cemented or stuck together with clear gum boiled a little to thicken it.

<sup>5</sup>Other devices for preventing the edges from splitting along seams, are: The sewing of an extra strip of bark around the outer edge of the canoe beneath the gunwale; also the inclusion under the stitches of a strand of spruce root (often used along longitudinal seams where barks are joined). Both of these schemes are employed by the Dog-ribs, Slaves and Chipewyans.

The bottom frame, which is merely temporary, is now removed, the ribs taken from the water, bent to shape around the knee, cut to length and driven into place with a mallet. Other thin strips of cedar, three or four inches wide, are driven between the ribs and bark as the work proceeds. The purpose of these is to form a protective flooring and siding. The canoe, particularly at this stage, is kept well moistened both inside and out. The placing of the ribs and sheeting proceeds, generally speaking, from each end to the centre. Cross-pieces, to keep the top spread, are hammered in at every second rib. The ribs are a couple of inches wide and about the same width apart. When the insertion of ribs and sheeting is completed, the canoe may require a general correction in shape, which is given by tying it between stakes and exposing it for a while to the sun.

The next process, also a woman's job, is to get ready, or rather, to have ready, the spruce gum and to gum the seams. All laps have their outer edges running backwards or towards the stern, so as not to obstruct the motion of the canoe. The spruce gum is obtained from trees which have been gashed the year before, is boiled a while to thicken it and mixed with powdered charcoal—some say, to make it look nice. The bottom seam is coated with clear gum and pegged, not sewn.

A little grease is said to be added to the gum by most tribes to render it more elastic. The addition of the powdered charcoal is not universal.

Among the Micmac of Nova Scotia and Cape Breton the women and girls are said to have prepared the gum by chewing it.

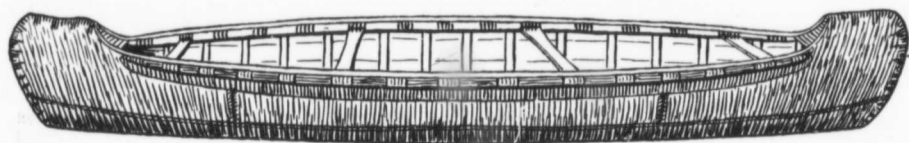
The last step in Sauteaux canoe-making is to attach a top gunwale strip. This is nailed on at present, but may have formerly been fastened on by tying or binding with spruce root.

The Malecite, according to information supplied by Mr. William McInnes, Director of the Geological Survey, Ottawa, construct temporary or emergency canoes of spruce bark which are used for bringing out furs from the hunting camps in the spring. The ribs and frame are roughly constructed of withes or saplings, flattened slightly and rather widely spaced, the bow and stern being chinked with clay.

Mr. McInnes also furnishes an interesting description of the manner in which the Malecite protect the bottoms of birch-bark canoes in shallow streams: Lengths of spruce bark, with the smooth inner surface placed outward, are wrapped around the bottoms of the canoes from end to end and held in position by tying their edges to the thwarts with cedar inner bark. Another material, which is preferred to the spruce bark on account of its lightness, consists of strips of cedar about two inches wide and three-quarters of an inch thick. The strips run



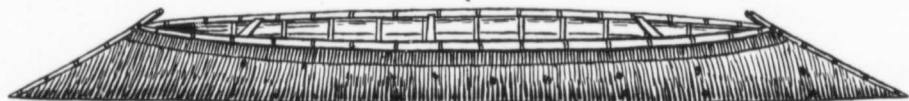
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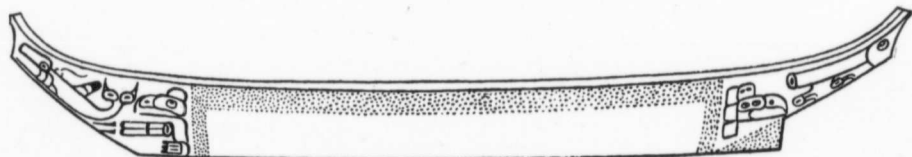
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CANADIAN CANOES.

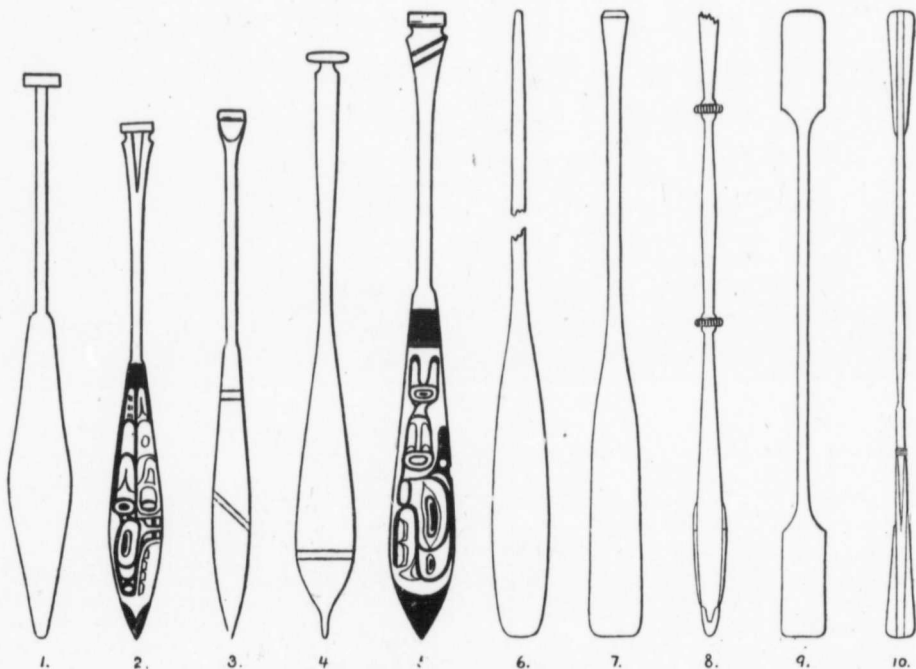
1, Ojibwa canoe (Northern Ontario); 2, Chipewyan; 3, Slave; 4, Kootenay, Shuswap and other southern B.C. tribes; 5, Haida.  
Nos. 3 to 6 on plate 1, and 1 to 3 on plate 2, are arranged consecutively to show how one form may have developed from the preceding.

lengthwise from end to end of the canoe, just high enough along the sides to afford protection from rocks, and are lashed together and to the thwarts by continuous strands of cedar bark which are threaded through perforations in their upper edges.

Micmac canoes in the Victoria Museum have the ends stuffed for a short distance with moss or shavings, the purpose being to keep the bark from collapsing or wrinkling where ribs are lacking. The stuffing is held in place by thin partitions of cedar, cut to shape and held in position at the bottom by the end of one of the inside sheeting strips. Slave and Chipewyan canoes also exhibit stuffing.

and navigation developed, with the exception that the Eskimo to some extent use large sea-going kayaks for hunting the whale and seal; and also that the Micmacs, like other coastal tribes, sometimes construct large bark canoes for a similar purpose. The sides of the Micmac canoe are up-curved and turned in towards the centre to exclude heavy seas.

The Eskimo kayak, for present purposes, may be regarded as a highly specialized canoe, differing from the Algonkian in the important, though not essential, respect of having the framework so constructed that it is held together independently of the cover; and in the superficial one that the covering



SOME TYPICAL PADDLES.

1 and 4, West Coast paddles, exact locality unknown; 2 and 3, Tlingit (northern B.C.); 5, probably Haida (Queen Charlotte Islands); 6, Kootenay (southern B.C.); 7, Ojibwa; 8, Copper Eskimo; 9 and 10, Central Eskimo. (The last three are neighboring groups).

In spite of its many excellent qualities and historic associations, the birch-bark canoe is evidently on the wane at present as a medium of travel. The factory-made canoe, though modelled after the Indian article, has, in fact, so far eclipsed it that it is seldom seen except among remote and backward bands of Indians who employ it mainly from economy or conservatism.

#### ESKIMO CANOES.

In only one region, the great insular area of the North Pacific Coast, was a true seafaring culture

is of skin instead of bark, to which we may add that of being decked over so as to accommodate, in most cases, but one person.

The upper rim or frame of two pieces is made first, with mortises for the insertion of ribs and thwarts and holes for lashings. The thwarts are placed in position and the upper part or deck practically completed, one of the last steps being the attachment of a middle strip lengthwise along the top, except where it is intersected by the opening or man-hole. The whole affair is then turned top or face down-

wards. The ribs are now shaped and fitted and their ends inserted in the upper side-pieces and secured with wooden pins. The ribs are usually from two to six inches apart. The other longitudinal strips are then attached to the sides, with a similar piece along the middle of the bottom, which, like the other canoes described, is destitute of a keel.

The sealskin covering is sewn together and applied to the framework wet, so that it stretches tightly as it dries. The sewing, as in the case of the Algonkian canoe, is done by several women working together in order to complete the job at one sitting. A double waterproof stitching renders the seams water-tight.

of Yukon Territory and Alaska possesses features which give it an intermediate position between the umiak and the canoe of the region to the south and east. A canoe-like feature is the wedge-shaped bow and stern. A pointed or leaf-shaped paddle is used.

The umiak is said to have been entirely abandoned on the east coast of Labrador.<sup>7</sup> In parts of the latter region and in Alaska it is used largely by the men for whale and walrus hunting as well as for general purposes. Lengthy journeys or migrations are often undertaken in it and its capacity is said to be remarkable.

The bow and stern of the Labrador umiak are



DISTRIBUTION MAP, the dotted portion showing the Eskimo kayak and umiak region, and the part covered by oblique lines, the birch-bark canoe region.

According to E. W. Hawkes, from whose memoir on the Labrador Eskimo the foregoing description is taken, "Great speed is maintained by the Eskimo in their frail kayaks. It is said that a single Eskimo in a kayak will propel it as fast as two white men will a canoe. The Eskimo ventures out in a sea that an Indian would not dare attempt. . . ."

The umiak, an open craft, also used by the Eskimo, presents a somewhat different appearance from the kayak due partly to its not being decked over and partly to its being rather deeper and clumsier in form. In other respects it does not differ materially, a fact which would suggest it as the form from which the kayak was derived.

An open skin-covered boat used by the Kutchin

wider than those of the Alaskan, which gives it a clumsier appearance. It is usually about twenty-five feet long and is steered with a rudder, quite likely an Asiatic borrowing, as are also the oars, rowlocks and sails. In Alaska the umiak is propelled by the more aboriginal paddle, the steering being done with an extra long and heavy one.

#### SAILS.

Sails were nowhere used as an integral feature of navigation except along the North Pacific Coast, where there is also a suspicion of Russian or other Asiatic influence.

The light and rather easily upset birch-bark canoe was evidently unsuited for propulsion by such a contrivance, except in very light breezes, or when

<sup>6</sup>Hawkes, E. W., "The Labrador Eskimo," Memoir 91, Geol. Survey, Ottawa, p. 72.

<sup>7</sup>Ibid., p. 68.

well loaded. That there was some appreciation of the assistance afforded by sails is likely, even though it failed to crystallize into a definite form. Catlin, for instance, states that among the Sioux a man would sometimes stand in a canoe facing the paddlers and hold a blanket spread out as a sail. The upper corners were held by the hands, while the lower part was tied to the body or to a thwart.<sup>8</sup>

Denys, a French explorer, speaking of the Micmac in 1651, remarks: "They also went with a sail, which was formerly of bark, but oftener of a well-dressed skin of a young moose. Had they a favorable wind they went as swiftly as the throw of a stone. One canoe carried as many as eight or ten persons."<sup>9</sup>

Skinner informs us, with regard to the Eastern Cree, that the "Canoes average twelve or fifteen feet in length, but those used by the Labrador

of Athabascans living on Portland Inlet, B.C., used sails of Marmot-skin.

These items, from various regions, suggest that the idea of sailing may have existed in an incipient form here and there, though none of them is perhaps perfectly free from a suspicion of European influence.

Brinton, the well-known anthropologist, states quite positively that no sails were used by the Déné, or various Athabaskan tribes which occupy an immense region extending throughout northwestern Canada. In this he is supported by Morice, a missionary who spent many years with the Déné.<sup>11</sup>

#### PADDLES.

Paddles differ little in pattern throughout the greater part of the area in which we have followed canoe navigation, until we reach the extreme west, or the Eskimo country at the north.



SAULTEAUX CANOE-MAKING: Placing upper barks in position and trimming.

voyageurs are often twice that size and sometimes more. They are capable of bearing enormous weights, and many will hold twenty or more men. The paddles used are short and rather clumsy. They have no swelling at the end of the handle to facilitate the grip. In paddling, the Eastern Cree take shorter and more jerky strokes than their Ojibway neighbors of the south. When a fair wind is blowing, a blanket or even a bush is set up in the bow for a sail.<sup>10</sup>

According to Boas, the Tsetsaut, a small group

<sup>8</sup>Catlin, Geo., "Letters and Notes on the Manners, Customs and Conditions of the North American Indians," London, 1842, p. 214, and plate 294.

<sup>9</sup>Denys, Nicholas, "Description and Natural History of the Coasts of North America," The Champlain Society, Toronto, 1908, p. 422.

<sup>10</sup>Skinner, Alanson, "Notes on the Eastern Cree and Northern Saulteaux," Anthropological Papers of the American Mus. of Nat. Hist., vol. IX, part 1, p. 43.

Those used by the Ojibwa are extremely simple and are usually made of clear cedar. The paddler sits rather low, the toes turned inward and bent backward beneath the body. On a long journey a small pad of leaves or clothing is placed beneath the legs conveniently for sitting on.

A double-bladed paddle is used throughout most of the Canadian Eskimo region, although in Alaska the single paddle is found. Among the Aleuts of southwestern Alaska the paddle is pointed, like that of the Pacific Coast.

The Labrador double paddle is about ten or twelve feet long and made of hardwood or spruce tipped with bone. Leather rings on the handles keep the water from dripping on the paddler.

The British Columbia paddle and that used by

<sup>11</sup>Morice, A. G., "The Great Déné Race," *Anthropos*, vol. 5, p. 441.



certain adjoining tribes, such as the Aleuts and the western or northwestern Déné, is invariably sharply-pointed or lance-shaped and has almost invariably a T-shaped grip.

British Columbian influence in this respect seems observable eastward as far as the Slaves and the Chipewyans, who have the paddle obtusely-pointed.

#### WINTER TRANSPORTATION.

A conveyance of the type represented by the canoe, which is suitable mostly for summer, naturally supposes a corresponding winter contrivance, especially for the northern part of our range. That this was, or is, actually the case is suggested by the close correspondence of the dog and sledge or toboggan area with that of the canoe (Eskimo Athabaskan and Algonkian). The exceptions to this are found principally on the West Coast, where conditions are favorable to water transportation through-

Dugouts seem to have been used to a limited extent by the Ojibwa and by the Menominee, a tribe living in northern Michigan and Wisconsin, and fairly closely related to the Sauk, Fox and Kickapoo. This usage may also have been induced by a scarcity of the ordinary material, which is birch-bark.

The eastern dugout region seems fairly continuous southward from among the tribes mentioned, and would probably be contained very largely by the southern half of the Eastern Woodlands area, to which we might no doubt add the eastern half of the south-eastern area.

The canoe in common use on the lower Mississippi is a dugout, called "pirogue" by the French. The bow of this canoe is broad and sloping. The average measurement is forty feet by three in width, with a thickness of about three inches. A canoe



Saulteaux Indian inserting ribs.

out most of the year; on the Plains, where the travois replaced the sledge or toboggan, and canoeing was of relatively slight importance; and in the southern part of the Eastern Woodlands, where the snowfall is comparatively light.

#### THE DUGOUT.

The dugout, in most cases a rather crude canoe made by charring and hollowing-out a log, also has quite a wide distribution and is found, as already noted, in many regions where a more advanced type of canoe is also used.

Among the Iroquois, who were noted as different canoe-makers, it was quite extensively employed, and is still used for the navigation of small streams for trapping and other such purposes. The scarcity of better materials may have been a factor in its popularity. The favorite Iroquois material is pine.

of this size will carry twelve persons. The material is usually some light or buoyant wood. A craft called by the same name is still to be found in the old "Acadian" region of eastern Canada. The material used is white pine. A black walnut dugout is used on the Arkansas. Besides a dugout, the Chitimacha of the lower Mississippi manufacture an elm-bark canoe.

Bushnell, in speaking of the Choctaw of Bayou Lacomb, Louisiana, states that "dugouts were employed on the creeks and bayous, but evidently only to a small extent." The Creoles at present make dugouts eight or twelve feet in length from logs of black gum.<sup>12</sup>

Those in use among the Creeks (a Muskogean tribe related to the Choctaw) were made of cypress

<sup>12</sup>Bushnell, D. I., jr., "The Choctaw of Bayou Lacomb, Louisiana." Bulletin 48, Bureau of American Ethnology, p. 18.

and are said to have had their ends slightly elevated and pointed.

Among the northern Ojibwa, Cree and Algonkian tribes generally, the dugout is conspicuous by its absence. The same remark holds good for the Plains tribes and for the Eskimo.

The Iroquois method of making a dugout is probably typical for the whole eastern region in which it is used.

A tree of suitable material and size was first cut down—in former times by burning, the fire being localized by applying some damp material above the point where the tree was to be burned through. The log was cut to length in the same way. The next step was to build a number of small fires at intervals on top of the log, then hack away the charred part with adzes. The fires were rebuilt and the work continued in this way until a suitable hollow was obtained. The ends were shaped in a similar way. The same method of hollowing-out dugouts and large wooden bowls is practised by the present-day Iroquois.

Among the Déné, the adoption of the dugout is considered by Morice to be of fairly recent origin, dugouts of balsam poplar having, in his opinion, replaced the original spruce-bark canoe. These dugouts are sometimes thirty feet in length by not more than three in the middle and are said to possess no elegance or design of beauty.

Along the Pacific Coast the dugout is the characteristic craft and is here elaborated into an article possessing graceful lines and considerable beauty of workmanship. Its development, both in the matter of size and finish, was no doubt due at least partly to the size and workability of the coniferous trees of the coast region, as well as to the decreased demand for portability. A factor which must have greatly improved the product of the last century or two is the introduction of modern tools. Huge sea-faring dugouts were, and are still occasionally, made by the Haida and neighboring tribes of the northern Pacific Coast.

An interesting feature of construction is the retention of the simple or primitive method of alternate charring and hacking in hollowing-out the interior. The final adzing imparts a fine scale-like appearance. When the adzing has been completed the canoes are given additional beam by filling with water, which is heated with stones, after which the sides are forced apart by means of thwarts.

British Columbian dugouts in general bear a degree of interresemblance in outline and structure that suggests a common cultural or intercultural origin. A groove inside the stern provides a rest for the whaling and sealing harpoon.

The eastern dugouts, already described, though possessing some broad features of resemblance to

those of the West Coast, are sufficiently different in general character to suggest a development under differing conditions.

#### RAFTS.

The raft is at least the crudest of the navigatory devices mentioned and possesses a distribution which is practically universal, though used in many regions merely as an occasional or emergency craft. Its form is usually extremely simple and seldom exhibits anything which can be dignified by the name of design or style, though occasionally there are exceptions to this. The balsa, found among certain California Indians and in isolated localities southward to Chili, is really a raft composed of bunches of tule or rushes tied together, although its pointed ends give it some resemblance to a canoe.

Regarding the northern Déné, we have the statement of Morice to the effect that they occasionally make use of rafts. "They are made of three dry logs bound together, with their larger ends aft, while a slightly tapering shape is given their opposite extremities. The logs are fastened together fore and aft by means of ropes, which, when of truly aboriginal make, are of twisted strips or willow bark, starting from one end of a crossbar placed over them and going round each of the logs and the bar alternately. Among the Loucheux, these primitive embarkations are used in combination with regular canoes."<sup>13</sup>

#### GENERAL REMARKS.

Decking, so prominent in Eskimo canoes, has been observed to be less extensive in the Dog-rib bark canoe, and still slighter in the Chipewyan, Algonquin and Malecite. It is interesting, however, to find it outside the Eskimo region. The side flaps of the Algonquin and Malecite and some Ojibwa decking sheets have been already referred to.

Sewing, like covering materials, exhibits changes based on geographical location, these consisting mainly of a transition from sinew (used by the Eskimo) to spruce root (used by nearly all Canadian tribes excepting the Eskimo and Kutchin); or, in a few cases, to the bast or inner bark of the basswood and elm (used by the Iroquois).

The seams in all bark canoes are gummed.

The wide, flat rib is characteristic of the Eastern Woodlands and extends westward to the Slave country. This is accompanied by an inside sheeting which covers the bark completely. Contrasted with the wide, flat rib, though not differing from it in principle, is the narrow and widely-spaced rib of the Eskimo, Kutchin and Dog-rib crafts.

A feature which seems to be closely associated with the birch-bark canoe in general is the separate strip or piece used to give shape to the bow and stern respectively. These are also possessed by the

<sup>13</sup>Morice, A. G., "The Great Déné Race," *Anthropos*, vol. 5, p. 443.

Kutchin skin canoe. In the Eskimo canoes\* they are continuous with the central strip along the bottom.

The differences in outline, which constitute the most striking superficial variations among the canoes described, are dependent principally upon the shape of the end strips or "fashion-pieces" just referred to. A reference to Plates 1 and 2 will show that a series may be found starting with a very simply curved bow and stern piece (Kutchin and Dog-rib) and proceeding to one having an almost perpendicular upper portion (Algonquin and Malecite), and from the latter form to one which is considerably recurved (Slave, Chipewyan, Ojibwa, Montagnais, Micmac).

The gunwale is another interesting item. Among the Slaves and the neighboring Dog-ribs there are two gunwale strips, an inside and an outside, bound at intervals with the sewing or binding material. A similar feature links together the Algonquin and the Malecite. An inside gunwale to which the upper edge of the covering is sewn continuously, is found among the Chipewyan, Ojibwa, Montagnais and Micmac. An upper or top gunwale characterizes all the Algonquin canoes. The Algonquin and Malecite have consequently all three gunwales; inside, outside, and top. The maximum of protection or reinforcement is evidently gained by this employment of three protective strips along the upper edge, although at some addition of weight.

## THE FLORA OF KAPUSKASING AND VICINITY.

BY CAPT. T. W. KIRKCONNELL.

Pastures new are always seen through an alluring mist of anticipation, and when, some two years ago, it was my military misfortune but botanical privilege to be detailed for duty on the staff of Kapuskasing Internment Camp in further New Ontario, I waited with intense interest for my first opportunities for exploration. During my exile, unkind weather and strenuous duties have permitted far fewer local excursions than I had hoped for, yet I have been able to gain a fair approximate knowledge of the sub-arctic conditions that obtain here and of the vegetation which they have evolved.

Kapusksing, in the so-called "Clay Belt," is situated on a river of the same name which joins the Mattagami, about one hundred miles from James Bay. The region exemplifies in its flora the inevitable selection power of rainfall, temperature, and soil. Lying within the path of the broad cyclonic disturbances that traverse North America from the southwest, it has an abundant rainfall and is consequently completely forested, except in the extreme north where under duress of temperature trees give place to scrubs. It also borders on the great north-western reservoir of high pressure and so tastes the first bitter cold of anticyclonic gales. The menace of winter is felt throughout the greater part of the year, and during 1918 frost was registered in every month without exception. The great penetration of the winter frosts cannot fail to have a discouraging effect on plant life. During August, 1918, a drain was being dug through the camp at Kapuskasing and ice was encountered at a depth of four feet. Snow also persists in the bush until late in the summer. As a result, only species that are exceedingly toler-

ant of cold have survived the selection of ages, and even existing life is dwarfed and stunted. Finally, the soil almost everywhere is a heavy clay resting on gneiss and covered with from one to four feet of rich vegetable mould. Thousands of square miles have absolute homogeneity of conditions and the flora shows like lack of variety.

The change from Southern Ontario is marked and complete. As one travels northward from North Bay, the transition in the character of the forestation cannot fail to attract attention. In the long climb into the rock country deciduous trees are left behind more and more; white pine is supreme in parts of the Timagami area, but before Cobalt is reached the last white pine has disappeared; and in descending into the Great Clay Bog of the North one sees mile after weary mile of stunted spruce (*Picea mariana*), broken at intervals by ridges of poplar (*Populus balsamifera*), aspen (*Populus tremuloides*), and birch (*Betula alba*). First impressions of the endless leagues of spruce are peculiar. One might almost, by a stretch of the imagination, conceive of the scene being laid in Paleozoic times amid the forest of progressive Equisetales and Lepidodendreae which clothed the lower James Bay slope when the world was some æons younger. Closer inspection finds other trees eking out a minority existence. Cedar grows along river-bottoms, as do Alder and Willows. Balsam and Jackpine (*Pinus Banksiana*) are occasionally found, and the Mountain Ash (*Pyrus americana*) flourishes as a large shrub on higher ground. Any tamarack that I have found has been dead, apparently the victim of the Larch Sawfly.

My first botanical survey of the bush country impressed me more with the abundance of the species that were missing than with that of those present. After the swamps and bogs of Southern Ontario the new field seemed miserable and poverty-stricken. One of my earliest quests was for orchids. In Old Ontario I was on speaking terms with some thirty-two of these little aristocrats and the possibility of making some new acquaintance among them always added the keenest zest to a day's botanizing. Kapuskasing has treated me but poorly in this regard for here I have met only four species, all familiar. I found some *Habenaria hyperborea* growing sturdily in the lush grass beside the railway track, a common enough acquaintance before, but welcome now for the family's sake. Later search located

than two or three blossoms at a time, but here I could count thirty within a radius of three paces and over a hundred in sight. I felt myself a second Odysseus in Ogygia, with the rôles of infatuation reversed, and it finally needed the Hermes of a ravening appetite to tear me away from the spot.

Nor are orchids the only rare visitors; for even plebeians are very sparsely distributed here. The spring woods show few of the familiar faces of the south—no Hepaticas, White or Purple Trilliums, Bellworts, Leeks, or Dog Tooth Violets. I have found a few unhealthy specimens of *Sanguinaria canadensis*, *Viola cucullata*, and *Anemone parviflora*, but there is little else reminiscent of an Old Ontario spring. *Trillium cernuum*, a smaller plant than its brother *T. grandiflorum*, and characterized



Weiswinin Falls, May 22, 1917.

*Microstylis monophyllos* and *Corallorrhiza trifida* on a damp, wooded hillside. They, too, were not prizes to bear home in triumph for the admiration of friends—poor, shy slips of green, they are the despised Cinderellas of their kind, with just a touch of inherited grace in their soberness. But one pleasant surprise was in store for me. I was tramping one mild June day through an open spruce woods that crowns the steep bank just below Weiswinin falls on the Kapuskasing. There was little undergrowth but a wonderful carpet of moss, a most beautiful display of *Hypnum Crista-castrensis* spread out like elfin ferns. Then suddenly I burst into an enchanted glade and saw the ground dotted with gems of purple and white and gold. It was the most wonderful bed of *Calypto borealis* that I have ever seen. I had never before come across more

by a recurved peduncle whereby the blossom hides its face among the leaves whorled below, is met with occasionally. *Coptis trifolia* is plentiful in June.

The slashed clearings and "brûlé" have a somewhat different flora from the woods. The first-comer to push through the mould was a stranger to me, and one whom I have never identified to my complete satisfaction in Gray. In the main it seems to answer to the description of *Anaphalis margaritacea*, var. *occidentalis*, being an erect diœcious composite, with linear-lanceolate, subtomentose leaves and small whitish florets. It is, however, more fleshy and herbaceous than the Pearly Everlasting, flourishes in mucky loam, and never attains more than 3 dm. in height. *Corydalis aurea* and *C. sempervirens* are ubiquitous in burnt-over areas, their supremacy being undisputed until the later arrival of

*Epilobium angustifolium* and *Cirsium muticum*. An abundant companion of these is *Mertensia paniculata*, a sturdy vagabond with purplish-blue flowers, handsome when young but becoming disreputable with age. *Caltha palustris* and *Veronica americana* succeed one another along swampy rills. The Crowfoots are represented by *Ranunculus abortivus*, plain but hardy, *R. pennsylvanicus*, and our childhood friend, *R. acris*. There is not much further change until autumn, when Asters and Goldenrods brighten the fields for a season.

Bog societies present little that is new. Sphagnum Moss, Labrador Tea, Laurel (*Kalmia polifolia*), *Linnaea borealis* with its delicate twin blossoms, *Galium boreale*, *Pyrola chlorantha*, *Pyrola asarifolia*, *Moneses uniflora*, and quaint *Mitella nuda* are perhaps representative. I have yet to find the Pitcher-plant, Sundew, Valerian, and Gaultheria. Where spruce bog thins out into poplar knolls you find *Actaea rubra*, *Apocynum androsaemifolium*, *Aralia nudicaulis*, *Prunella vulgaris*, and sometimes a patch of *Pedicularis canadensis*.

Ecologically, one might almost speak of "portage societies" for I have found the open ground about portages a rich hunting-ground for species lacking elsewhere. There, outcropping gneiss is thinly upholstered with sod and abundant moisture tempers frosts and fosters vegetation. At the foot of rocky cliffs just below Kabahose falls, a forty-foot cataract some twelve miles south of the camp, I discovered last June an Eldorado of *Primula mistassinica*, a charming little flower, easily rivalling *Campanula rotundifolia* in grace; and when scattered along the brim of a magnificent foam-flecked pool of black water, it was doubly beautiful. Another "find" in the same spot was *Clematis verticillaris*. Beside Weiswinin falls, too, I gathered in a goodly harvest during the summer months. Blue-eyed Grass (*Sisyrinchium angustifolium*), two less common Cinquefoils, *Potentilla fruticosa* and *P. tridentata*, and two unfamiliar Fleabanes, *Erigeron hyssopifolius* and *E. racemosus* grew there in abundance, along with *Aquilegia canadensis* and *Lilium philadelphicum*.

Weeds, the *profanum vulgus* of civilized fields, have immigrated but little so far, and the few ruffians to be found in this new country can be blamed on balast and poor seed. My rogue's gallery comprises the Catchfly (*Silene noctiflora*), Chickweed (*Stellaria media*), Ox-eye Daisy (*Chrysanthemum Leucanthemum*), Vetch (*Vicia Cracca*), Hound's Tongue (*Cynoglossum officinale*), and Shepherd's Purse (*Capsella bursa-pastoris*), but none grow yet in sufficient quantities to harrass the farmer.

Cryptogamic life I must dismiss briefly. Ferns are less plentiful than further south, but there is an abundance of Bracken, Bladder Fern, Maidenhair Fern, and Oak Fern. The Equisetaceae are well represented, and there is a great plenitude of Lycopods, especially *Lycopodium clavatum*, *L. dendroideum*, and *L. complanatum*. Many glades on higher ground can boast of a charming Lilliputian forest of these dwindling descendants of the Coal Measures. Mosses abound in the woods and are exuberant under portage conditions, *Bryum* and *Hypnum* forms predominating as usual. New "brûlé" is often a moist mass of Liverworts. Among fungi my most welcome finds were *Coprinus micaceus* and *Morchella deliciosa*, and these I did my best to exterminate.

A man of grass will be pardoned for venturing a few closing remarks on the zoology of the district. The only fish in the Kapuskasing river are pike, pickerel, black bass, and suckers, all of small size. Precipitous falls between here and James Bay apparently discourage ichthyic development. Insect life is plentiful (my fellow officers wax profane over armed hosts of *Anopheles*) but lacks the variety of the lower latitudes. In seeking Coleoptera I have found the Buprestidae and Cerambycidae well represented, while my Pay Sergeant, Alex. Miller, of Toronto, whose hobby runs to butterflies, captured some thirty-six different Rhopalocera during the summer of 1918, chiefly of the genera *Argynnis*, *Brenthis*, *Grapta*, *Vanessa*, *Lycaena*, and *Pieris*.

My register of birds totals about forty to date. The Whiskey Jack (*Perisoreus canadensis*), the Arctic Redpoll (*Acanthis linaria*), and the Snowflake (*Plectrophenax nivalis*) winter with us, the latter two whirling about in flocks of hundreds. Spring brings Horned Larks and Juncoes, and later on Robins, Song Sparrows, Phoebe, and the Veery Thrush. I have seen very, very few warblers. Ducks, Rails, Bitterns, and Sandpipers haunt the swamper stretches of the river, and a pair of Herring Gulls (*Larus argentatus*) have returned here summer after summer to fatten on the garbage from the internment camp. Our most distinguished visitor has been a Snowy Owl (*Nyctea*) who lit a few feet from my office door one cloudy noon last November. He was a magnificent specimen, white without a sullyng fleck, and must have measured four feet from tip to tip of his great wings. We were permitted to step almost up to him before he took to flight and floated noiselessly away. Had murder been desired, a child could have shot him.

## BIRD PROTECTION IN CANADA.

Canadian conservationists are to be congratulated upon the success so far achieved in bird protection in the Dominion. Probably the most important step ever taken in any country in this direction is the ratification of the International Migratory Bird Convention with the United States whereby the two great North American powers are bound to cooperate in the protection of migratory game and other birds. This is now the law of the land and founded upon international treaty.

In addition to a number of bird reservations created in the west we have lately achieved the following in the east: Point Pelee, Ontario, on Lake Erie, established as a wild life sanctuary; its unique bird life will be permanently retained in coming Canadian generations and a place reserved for them where they may see and hear the Mocking Bird, Cardinal, Carolina Wren and other southern birds of song and story within our own borders.

Lately, a bill has passed the Quebec Parliament preserving Percé Rock, the bird ledges of Bonaventure Island, and Bird Rock, all in the Gulf Coast, as permanent bird havens, and the threatened destruction of some of our national wonders is prevented.

The next serious protection problem is the condition of bird life on the north shore of the Gulf of St. Lawrence, the "Canadian Labrador." Today we have every reason for serious effort in this direction,—economic, that a necessary food supply shall not be lost to the inhabitants of this bleak and desolate coast; sentimental, that no form of innocent life perish from the face of the earth; and moral, that we live up to the conditions and responsibilities imposed upon us and agreed to by us in the solemn treaty we have entered into. The following correspondence from those who speak from first hand observation on the Labrador coast, will indicate how critical this question is and how necessary it is that all join together in assisting and supporting Dominion officials in this direction.

BOSTON, MASS., DECEMBER 11, 1918.

To the Editor of THE OTTAWA NATURALIST:

The following note received by me from Dr. Robert T. Morris, of New York, which he has allowed me to use in any way that will do good, is deserving of the widest publicity.

The chapter he refers to in my book was published in advance in 1916 in the seventh annual report of the Commission of Conservation of Canada, and describes in detail the terrible destruction of bird life on the coast of the Labrador Peninsula. The subject is so important, if the bird life of this region is to be saved, that I have taken the lib-

erty of quoting from this chapter some suggestions which I believe to be of vital importance.

"What then is to be done? Is there no hope for the birds and for the people to whom the birds are such a valuable asset? I think there is. I believe that the whole problem can be solved most rationally and satisfactorily for all concerned by the immediate establishment of *bird reservations*. These should be islands or groups of islands or suitable portions of the main coast that can be watched by guardians. Here the birds should be undisturbed and allowed to rest, feed and breed in peace. The people should be made to understand that these reservations are not established to cut down their hunting, and thereby invite poaching and violation of the laws, but for the purpose of preserving and increasing the birds so that there shall be better shooting for everybody on the coast.

"A campaign of education is necessary, therefore, and I believe that the bird reservation will do more good in making the people understand, not only the need of bird conservation, but its advantages. The game wardens will be looked upon, not as enemies to be avoided and cheated, but as friends who are working for the people's good. If the matter is well managed, the people will regard their reservation with pride, and public opinion will keep the birds there inviolate. The wasted regions near fishing villages now devoid of all sea-bird life on the one hand and the crowded bird reservations on the other will be powerful object lessons in this process of education. I would suggest the placing of a brief notice on each reservation, printed in English, as well as in French, Montagnais or Eskimo, where these languages are used, worded somewhat as follows:

## "BIRD RESERVATION

"The purpose of this reservation is to preserve the birds from destruction and to increase their numbers, so that there will be better shooting on the coast. The people are asked not to disturb the birds or their eggs on this reservation and to avoid the use of guns in its neighborhood."

CHARLES W. TOWNSEND.

616 Madison Ave.,

NEW YORK CITY, NOVEMBER 15, 1918.

To DR. CHARLES WENDELL TOWNSEND,

98 Pinckney St.,

Boston, Massachusetts.

Your treatment of the subject of conservation in Labrador in the book, "In Audubon's Labrador", which I have read with great interest, meets with my approval or more than that. On my trips to the Gulf Coast of Labrador and on the eastern coast

as far north as Hamilton Inlet, I observed that the Newfoundland cod fishermen were in the habit of raiding all the islands and adjacent mainlands on Sunday and making way with the eggs and the young of all the sea-birds. Some of the islands were wholly deserted so far as bird life was concerned and your Captain Joncas told me that in addition to the Newfoundland fishermen a number of men were engaged in the business of eggging and that the eggs were preserved in brine and sold to the crews of various vessels. He said that the egg hunt was continued until such a late date in the season that the young birds which finally hatched were not strong enough to withstand the autumn storms and he had seen thousands of young birds thrown up on the beaches. When I have been on the coast the Newfoundland fishermen destroyed young birds for

sport, leaving them where they fell on the ground if they were of species not good to eat.

The waste of food fish also is very great along the Labrador coast. Small cod and hake which are not desired by the fishermen are often smothered in the traps or killed when the traps are emptied and I have seen them floating for miles on the surface when the trappers were at work. The cod trappers catch a great many adult salmon by setting their nets in the channels when the salmon first make their way towards the rivers. This is illegal, but is winked at by the officials. A remarkable waste of salmon occurs in September when the herring nets are used near the coast. This is the time of year when the smelts are descending from the rivers and putting out to sea. They are captured in quantities in the herring nets.

ROBERT T. MORRIS.

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#### BIRD MIGRATION.

BY H. MOUSLEY, HATLEY, QUE.

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It is rightly said no doubt that "old traditions die hard," and therefore it is not so very surprising perhaps to find in Mr. C. B. Hutching's short note on the above subject in the November number of THE OTTAWA NATURALIST, page 97, that a writer in the *St. Louis Republic*, whilst considering the idea of birds flying in the rarified atmosphere three miles above the earth's surface, and being guided by the topography of the country at night, when flights are mostly made, as being somewhat erroneous, propounds a solution equally erroneous to my mind, when he suggests that they guide their course by means of the stars.

Speaking personally I have long ago given up cherishing "The fairy tales of science, and the long result of Time;" which to put it in a nutshell, amounts to considering birds as self-conscious animals like ourselves, instead of sub-conscious ones, governed by some impulse imperfectly known at present.

To imagine that birds are capable of shaping their course by means of such landmarks as mountains, rivers or even stars, seems to me to be somewhat far fetched, especially when we consider that a large proportion of them migrate at night, and sometimes on the very darkest nights too, when all of these landmarks, including the stars, would be invisible. No, there must be some other explanation to account for this unerring intuition (or call it what you like) in the animal world, and that explanation lies in the fact, I think, that in pure nature there is no such thing as self-consciousness, or the power of reason-

ing, although some of the higher animals, such as dogs, horses, etc., from long and intimate association with man, no doubt at times display traces of it, in the same way that some human beings are still abnormally susceptible to subconscious impressions, a relic of conditions existing before the evolution of self-conscious mind.

All wild birds and animals however I believe are subconscious, and therein lies the secret of their making no mistakes, for they do not reason as human beings do, but know just what ought to be done, and when and how to do it, in the same way as the larva knows exactly when it is full fed and must pupate, as well as where and when and how that process is to be accomplished, and the birds the time of migration, the nesting period, the rearing of their young, and the time to return to their winter quarters, without the aid of any landmarks whatsoever in either case. To understand this more fully one must be prepared to accept the fact that telepathy (now recognized by science, but which up to the present we have been unable to turn to practical account by mechanical means as in the case of the Marconi wireless system) pervades and is general throughout the entire animal kingdom. It is a potential faculty (working on an astral plane unknown to us at present) which inter-connects subconscious mind, and permits silent intercourse to become established. But just as in the case of electricity and wireless telegraphy, electric force must pass in the one case along a wire connector, in the other through a psycho physical medium (ether) before it

can be energized, so in the case of telepathy and telæsthesia which if not identical with electricity operate much in the same way, a circuitous connection must be established before results can be obtained. These results in the case of telæsthesia are no doubt enhanced by the cover of darkness (just as they are said to be in the case of the Marconi system) this accounting no doubt for so many birds migrating at night. In telepathy (mind blending) and telæsthesia (perception at a distance, or power of vision passing the limits of time and space) however the forces operate through a medium not apparent at present to our sense, and therefore we cannot determine the necessary conditions, or realize their full significance, but this may possibly be an open book some day, when sufficient time can be given to the study of life functioning on a plane other than our own.

My studies in the field of late have more and more convinced me that in telepathy and telæsthesia we have the means of answering some of those awkward questions which are for ever perplexing the

followers and believers in the old idea that birds are self-conscious beings, and perform their wonderful feats by a process of reasoning. As a matter of fact these facts are not so very wonderful as natural, because they belong to the infallibility of a subconscious, and not to the reasonings and hence mistakes of a self-conscious mind.

In conclusion I see in the late war one of the most definite proofs against the belief that birds are self-conscious for had they been so they would surely have forsaken the battlefields of France and Flanders, which has not been the case. The residents have remained just as usual, and the migrants have come and gone likewise. Thus in face of danger of which they know nothing the birds have kept on the same course and frequented the same places, which for countless ages have been their custom, and despite the noise of battle have nested as heretofore, surely a proof that they do not act on their own responsibility, but are dependent on the ruling of their subconscious minds.

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#### THE WHITE PELICAN, *PELECANUS ERYTHORHYNCHOS*, IN ALBERTA

By F. L. FARLEY, CAMROSE, ALTA.

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Sometime in the summer of 1908, I heard of an island in a lake about 18 miles north of Camrose, where a large number of White Pelicans nested. After more enquiries I learned that the island was in the furthestmost North Miquelon lake, one of several beautiful small bodies of water lying to the south of the Beaver Hills. At the time there were practically no trails leading into that new country, and with one exception no land had been taken up around the lakes; it was therefore in its natural state. I was not able to visit the island until the shooting season opened, when a friend and I drove to the lower lake, and with a row boat worked our way through this and the middle lake, and made a short passage into what we named Pelican lake. This body of water is about two miles long by one mile in width and the timber grows to within a few feet of the high water line. The island is quite discernible about one mile out in the lake. The two outstanding features were the several large nests up in the trees, which turned out to belong to the Great Blue Heron, and the large wave of white which seemed to cover the eastern shore of the island. As we came near this apparent white wave turned out to be Pelicans, some of which were on the beach and others close by in the water.

Before we approached to within 500 yards, those that were not in the water joined the others, and

swam around the south side of the island, and upon our speeding up, they arose, a few at a time, and before we reached the shore the whole flock was high in the air, moving in wonderful formations almost immediately overhead. A small flock seemed to be particularly interested in us and came down to within close range, so close that the black markings showed quite clearly. Others were probably half a mile high, and about half the flock were at such an altitude that they did not look larger than small gulls. When a flock of these birds are wheeling and circling in a close set company of from ten to fifty, their appearance in the air is one of almost unbelievable change. When they are sailing in such a way as to present their horizontal aspect to the distant observer, they are nearly lost to view, but when they are banking for a turn, there comes to view a wonderful brilliance of white wings and bodies, flashing in the sunshine, beautiful beyond the powers of one's mind to imagine, and at a distance of a mile or two the transcendent ease and grace of their flight is intensified, because all hint of effort and of wing motion is lost to the observer.

We remained on the island for about an hour, and before we left the lake the birds had alighted on a long stony bar a short distance to the west of the island. Our estimate of the number of Pelicans, after failing to count them several times, was



about 500. The island is less than two acres in extent. The east end slopes to the water and is quite narrow, and from there to the western extremity the ground gradually rises until it is about fifteen feet above the water. There were at that time about one dozen Balm of Gilead trees, a few willows, and one spruce tree, mostly on the higher part of the island, some of which were dead. The Balm of Gilead trees were about one foot in diameter and thirty to forty feet high. The only grass that grew on the island was close to the waters edge. A very strong growth of nettles covered practically all the higher part of the island. Running through the centre of the island from the south there was a small depression on which nothing was growing, and it was here that the Pelicans nested. Scattered all over this sandy loam were hundreds of eggs which had never hatched, now entirely dried up inside. These were about the size of goose eggs, but the surface was quite rough and chalky.

On May 29 in the following year, 1909, I visited the island again and found about the same number of Pelicans. Most of them on my approach were out on the stony bar, but there were about fifty up the little draw where the eggs were on our first visit. Before I landed these quietly walked to the water and swam away to join the others. The stench that seemed to be everywhere after leaving the water, was beyond description, and I thought it would be impossible to remain long enough to make the investigations I hoped to. However, I soon got used to it; perhaps I forgot it when all the varied sights came before me. Climbing up the bank I soon came to the nests, some with eggs inside, but often with as many outside. The nests were nothing more than depressions in the loam, with a slight banking up on the outside. There was no lining whatever, and it was evident that different birds used the same nests, from the various sizes of the eggs. The number of eggs varied from one to five, and at this date they were very little incubated. About one-third of the eggs were scattered here and there over this part of the island, some quite a distance from any nest, and I concluded that these must have been thrown out by the birds when they left the nests hurriedly, as no doubt they are very clumsy in their movements on land. This, then, would explain the great number of eggs that were not hatched the previous year.

During my inspection of this breeding ground there were many other sights on all sides to interest one. Up in the larger trees there were Great Blue Herons, some on their nests, and others keeping guard. On the small trees were about a dozen Double Crested

Cormorants, some of which were setting on their nests of three and four beautiful bluish eggs. These nests were small and flat, built of sticks and put together very loosely. In a hollow stump I found a Golden-Eye setting on a nest full of eggs. A little further on, a Mallard flew up from her nest of well incubated eggs. House Wrens, Yellow Warblers, Yellowthroats, and Tree Swallows were nesting on the island, and on the shore Spotted Sandpipers and Yellow Legs were feeding.

The following July another visit was made, and as the island was approached the Pelicans came to meet us. Up on the island we could see what looked like a small flock of sheep huddled together. These proved to be the young Pelicans, the entire increase for the year of this colony, nineteen only. It seemed a tragedy to think of this small number from perhaps six hundred eggs. There were the usual number of unhatched eggs lying around, at least several hundred. As I moved toward the young ones they waddled off slowly, but gave no note of alarm. Some of the old birds flew down over the island, and very rarely gave a small cry, this was the only note I ever heard from them. The stench at this time was even worse than in May, likely due to the number of dead fish lying around, which were partly decomposed. About a month later when motoring through the lake we came onto the little flock of young, still nineteen in number.

The following two or three years this colony used the island for their summer home, but the land around the lake was gradually being taken up, and no doubt farm boys wanted to see the big birds, and this with the ever increasing number of motor boats on the lakes, must have disturbed the Pelicans so much that they deserted it entirely. The Government made the lake a preserve and appointed one of the settlers a guardian, who posted notices forbidding anyone landing on the island, but it was too late, and people are wondering where the former owners of the island have gone. A half-breed told me that many years ago the Pelicans nested on all the islands in these lakes, and that they were as plentiful as geese in the fall. He said the Cree name for them was Cha-Chac-Kw.

Last fall, Dr. R. M. Anderson, of the Canadian Geological Survey, and I spent some time on Pelican island, and there were no signs whatever of Pelicans being there during recent years. All the trees had fallen and the entire surface of the island was covered with nettles. I never saw a Pelican migrating, and as Camrose is directly south of where this colony lived, I am of the opinion that they must come and go by night, or they would have been noticed passing over.

## NOTES AND OBSERVATIONS.

Mr. Levi Penney of Woodlawn, Ontario, reported an unusual abundance of fall ducks in Constant bay on the Ottawa river, and attributes the phenomenon to the epidemic, during the shooting season, of influenza, which in various ways prevented the excodus of city gunners.

CLYDE L. PATCH, OTTAWA.

Last fall while rabbit hunting near Ottawa, Mr. Phil. Brady observed, resting about ten feet from the ground in a cedar tree, a Screech Owl which held in its claws an adult Ruffed Grouse. The death of the grouse, the throat of which was torn, cannot with certainty be credited to the owl which may have secured it after it had been killed by another agent; nevertheless the remarkable fact remains that the owl had sufficient strength to carry the grouse to an elevation of ten feet.

CLYDE L. PATCH, OTTAWA.

AN HERMAPHRODITE LOBSTER.—In the month of November, 1917, whilst engaged in making special observations on the lobster at Bay View, Pictou county, N.S., I found in a fisherman's trap, just after it had been drawn out of the sea, a lobster which was absolutely male on the left side and absolutely female on the right side. The specimen was sent intact to Dr. A. P. Knight, Queen's University, Kingston, Ont., with whom I was associated. This find was surely a remarkable one.

ANDREW HALKETT.

Reading Mr. Harlan I. Smith's note in a recent issue of THE OTTAWA NATURALIST, I am reminded of a mishap which befell another bird some years ago. While passing one of the fine spruces on the grounds of the Ontario Agricultural College, Guelph, my attention was arrested by a fluttering of wings among the branches, which I found to come from a robin dangling by the tail from a tuft of twigs. Excited by my closer approach the bird managed to free itself, leaving behind a half-dozen tail feathers, which proved to be firmly glued to their anchorage by means of ordinary tar! Presumably it had come here and perched, perhaps over night, within tail's-length of the unfriendly mesh of branchlets, after having first frequented some newly-tarred surface in which the tips of the feathers had become daubed.

HERBERT GROH, PRESTON, ONT.

THE CANADA JAY.—There are few campers in the northern woods of Ontario who have not met with the Canada Jay (*Perisoreus canadensis*), one

of the most delightful of birds in spite of its bad qualities—Wis-Ka-Tjan or thief the Indians call it; it has well earned its reputation. The lumbermen have corrupted the name into Whiskey Jack and if any of their number misses some whiskey he is advised to go to this bird for information. Not only will this bird steal everything in the way of food about a camp, but we are sorry to say it will also eat the eggs of other birds as well as their young. If it were not for these bad qualities the most appropriate name for it would be "The Grey Nun" for with its beautiful grey color—white forehead, white throat and black at back of head and neck, also its delightfully soft eyes and gentle manner, it is typical of the nun. Although not seen in large flocks, half-a-dozen or more may often be met, and when they discover a camp in the woods there is great jubilation, we might say laughter, for their note at this time is much like laughter.

It might be supposed that a few such birds, somewhat less than eleven inches in length, could not make much impression on a hanging deer, and the camper would be surprised to find that one of his best haunches had disappeared in a few hours, this taken piecemeal and most of it hidden for future use. Last September when watching these birds it was noticed that they did not carry all their supplies to one place, but to several places and they were often tucked away between a hanging piece of bark and the trunk of the tree.

The Whiskey Jack is probably the easiest of any of our birds to tame. When camping not long ago, and while preparing a duck for cooking, in which one of these birds was much interested, it was induced to come and peck at the duck. Having once tasted this delicious morsel it forgot all fear, and drawing the duck gradually nearer the writer played hide and seek with it round his body and over his thighs the Whiskey Jack following. From that date this bird became our pet and would freely eat out of our hands. It would also come into our tent and wake us up by walking over us if breakfast was delayed too long.

F. F. PAYNE.

AN EPIDEMIC OF ROUP IN THE CROW ROOSTS OF THE LOWER THAMES RIVER, KENT CO., ONT.—Residents of the lower Thames valley, west of Chatham, Ont., report that large numbers of crows regularly winter in western Kent county and roost in the orchards and groves along the river. Mr. John Johnston says in a letter to the writer that "the date when the crows first wintered here was about 1895. It was a mild winter and a very late fall, and not a great deal of snow. They started

to gather in flocks about October. The number I should judge, would be well up in the thousands and it has materially increased ever since. They fed principally on corn and dead animals and also on garbage in the towns. Every time we had a cold spell hundreds of them died. I am told that the place where they have been in the habit of roosting (McGavin's) the ground is now (Feb. 10, 1918) covered with dead crows."

Mr. William Holmes residing about 4 miles below Chatham, relates that there was a great flight of crows in 1904, large numbers remaining all winter feeding on the corn left standing in the fields, or in the fields in stooks. Thousands died. As Mr. Holmes protected the crows on his property, his orchard of 400 trees was "literally packed, and the ground underneath (was also) packed, and the pigs (were) busy every day for weeks eating the frozen and blind, as there seemed to be a disease of the eyes, a white film growth over the eyeball. Though they seemed healthy and strong (they) would walk around as blind as a bat." They remained with him until late in the spring.

There is no doubt but that the affection from which the crows were suffering was the same as that

described by Eldon Howard Eaton\* as occurring in the Canandaigua Crow Roost of New York State in December, 1901. This disease he determined to be "roup," and his description of "the eyes" being "usually blinded by a membrane forming over the exterior of the cornea" agrees accurately with Mr. Holmes' description given above. Eaton states that the disease did not appear either "in the Rochester roost or in that near Niagara Falls" . . . "the disease disappeared with the coming warm weather." The last evidence of it noted by Eaton was on April 6. He states "it is probable that one thousand crows died of this disease during the last winter in Ontario county."

Both Mr. Johnston and Mr. Homes believe that the crows assisted in the spread of the San Jose scale, which Mr. Johnston states was first introduced into the orchards along the Lake Erie shore on nursery stock from the United States. Mr. Holmes informed me that the scale made its first appearance in his orchards the summer following the great flight of crows, and in spite of all his endeavors to check it, in three years' time it had "won out." The whole orchard along the river was killed.

M. Y. WILLIAMS.

\*Auk, Vol. XX, 1903, pp. 57-59.

#### BOOK NOTICES AND REVIEWS.

CLASS BOOK OF ECONOMIC ENTOMOLOGY, with special reference to the economic insects of the Northern United States and Canada. Philadelphia: P. Blakeston's Son & Co., 436 pp., 257 illustrations; price \$2.50.

We were much pleased to see this new volume on insects, prepared by one of our own members—one who is held in high regard by entomologists generally not only throughout Canada, but the United States as well. The volume is a class book of Economic Entomology, with special reference to the economic insects of the Northern United States and Canada. It is a companion volume to Reese's book on Economic Zoology. It is divided into four parts: Part I, discusses the structure, growth and economics of insects; Part II, the identification of insects injurious to farm, garden and orchard crops, etc.; Part III, the classification and description of common insects; Part IV, the control of injurious insects.

Briefly, this new book on Economic Entomology is one which undoubtedly will be well received. It will certainly find a useful place among economic students. The descriptions are concise and to the point, the illustrations well chosen and the printing excellent.—A.G.

THE WORKS OF J. HENRI FABRE. Translated by Teixeira De Mattos. N.Y., Dod, Mead & Co. The writings of the great French naturalist, J. Henri Fabre are only now becoming widely known though the writer was a contemporary of Darwin. To those who do not understand French, these works are now available in their entirety by the English translation.

To the entomologist of the old school who studies nature for the wonders of her works rather than for the shekels which are now offered to a professional student, these volumes will prove a delight, which we believe, has never before been equalled in the realms of science. Nor should they be neglected by the professional who will discover in their contents, details in observation in methods of study and in habits that must prove of great value even to the most proficient.

It is, perhaps, enough in this short notice to say that these works are teeming with facts presented in a manner that only a Frenchman seems capable of, and this lucidity seems to have been fully maintained by the translator.

These works are, to all intents and purposes, without technical language and deal with a great range of subjects as will be noted from the following titles already published: "The Life of the Spider",

"The Life of the Fly", "The Mason Bees", "Bramble Bees and Others", "The Hunting Wasps", "The Life of the Caterpillar", "The Life of the Grasshopper", "The Sacred Beetle and Others".

To review such a remarkable series of works in so short a space is impossible nor has it been attempted. It is enough to say that under each title are provided the life habits of many different insects told with a charm that turns the tedium of ordinary technical science into the wonders of a fairy tale, and yet in the transformation does not at all overstep the realms of truth.

These writings should prove a source of delight alike to the young and grown-ups, and for the parents who wish to instill a knowledge of nature into their children, free from the too common imaginary teachings of to-day, we know of no books that should prove more suitable or more readable, than those of J. Henri Fabre.—N. C.

KEY TO THE ROCKY MOUNTAIN FLORA, by P. A. Rydberg, Ph.D., Curator, New York Botanical Garden: Published by the author; price \$1.60 post paid.

When Dr. Rydberg published his "Flora of the Rocky Mountains and Adjacent Plains," which was

reviewed in "The Ottawa Naturalist" a year ago, field botanists immediately felt the need of something less bulky than a large volume of more than 1,100 pages. Dr. Rydberg has now filled this want in a manner that will please and satisfy both field and herbarium botanists. The recently published Key is a reprint in a somewhat different form of all the keys published in the Flora, and these keys with an excellent glossary and index make a handy little volume of 306 pages of 5x8 inches and less than half an inch thick which can be carried in any ordinary pocket. The Key may in this way be used independently of the Flora and fresh growing specimens be studied before they are collected. Another use to which the Key can be put is in the listing and checking of local floras, an initial letter or some arbitrary sign being used to indicate particular localities, countries or provinces. As the Key covers not only the flora of the Rocky Mountains, but also that of the provinces of Alberta and Saskatchewan and the Kootenay Districts of British Columbia, it should be in the hands not only of all western botanists but of all school-teachers, ranchers, farmers and others who are interested in knowing the names of the flowers which grow near their homes.—J. M.

