
THE WHISTLES AND REED INSTRUMENTS OF
THE AMERICAN INDIANS OF THE
NORTH-WEST COAST.

By The Rev.F.W.Galpin,M.A.,F.L.S..



MARCH 10, 1903.

SIR C. HUBERT H. PARRY, BART., PRESIDENT,
IN THE CHAIR.

*THE WHISTLES AND REED INSTRUMENTS OF
THE AMERICAN INDIANS OF THE
NORTH-WEST COAST.*

BY THE REV. F. W. GALPIN, M.A., F.L.S.

THE Pacific seaboard which bounds the territory of British Columbia on its west side is marked by frequent inlets backed by high mountain ranges and fringed with numerous islands, whose rocky heights, crowned with spruce and cedar, testify to their having at one time formed part of the mainland itself. Scattered along this coast in a territory about a thousand miles long by one hundred and fifty miles wide and separated from the inhabitants of the interior by natural barriers of hill and forest are certain Indian tribes of a peculiar and distinct character. Not only are their complexions surprisingly light coloured,—in some instances almost as fair as those of Europeans and in no way due to recent intermixture with white races—but in customs and laws, in arts and handicrafts, they show themselves superior to all other existing Indian tribes. It is with these “Indians of the North-West Coast” as they are called that the present paper deals, and for this purpose they may be divided into five closely related but distinct families*:

1. THE SALISHAN inhabiting the eastern part of Vancouver Island and the opposite mainland.
2. THE WAKASHAN (including the Kwakiutl) who occupy the western side of Vancouver Island and the mainland north of the Salishan.

* *cf.* Classification by J. W. Powell. American Bureau of Ethnology, Vol. VII., 1886, with map. Also F. Boas, Kwakiutl Indians, U.S. Nat. Museum Report (1895), reprint 1897, p. 320.

3. THE TSIMSHIAN who live on the mainland around the mouth of the Skeena River and immediately above the Wakashan tribes.
4. THE TLINGIT OR KOLUSCHAN who hold the mainland north of the Tsimshian and also the northern part of Prince of Wales Island.
5. THE HAIDA OR SKITTAGETAN who occupy the southern part of Prince of Wales Island and the Queen Charlotte Islands.

Of these five families the Tsimshian, Tlingit and Haida are the most superior in character and handicraft, and Dr. Franz Boas, who has closely studied the relationships existing between these tribes, is inclined to consider the last two as branches of one common stock.

Their technical skill is shown more particularly in weaving and carving, and specimens of their work in our museums testify to their remarkable ability. But while ample justice has been done by writers and explorers to these branches of industry, an equally remarkable development has been either overlooked or dismissed in a few short and unscientific comments.

I refer to the use amongst these tribes of certain wooden whistles and reed instruments which cannot but astonish musicians by their constructive excellence and striking originality. It may be that, in the words of Lieut. Niblack,* "some of their devices of this kind are essentially for the purpose of making a hideous noise," but the musical antiquarian will regard principles as well as effects; and among these distant tribes of the North-West Coast are to be found not only the principles of sound production employed in our modern organs and orchestral instruments, but also new ideas which will perhaps suggest musical possibilities at present unknown to us.

I will first of all give a classification of the instruments found amongst these tribes, omitting the drums and rattles which seem to be the common property of all American Indians. The drums are generally of the tambourine type,—a single membrane stretched over a shallow hoop—but occasionally a wooden tom-tom in box form without a membrane is used. The rattles, made of red cedar, are distinguished by their artistic and elaborate carving. Instruments of the horn type with cup mouthpieces appear to be unknown to them, as well as stringed instruments, so that the following classification includes all their peculiar musical properties.

* *cf.* Niblack: *Indians of the North-West Coast*, U. S. Nat. Museum Report, 1888, p. 331.

CLASSIFICATION.

GROUP A.—WHISTLES.

CLASS I.—Without finger-holes.

Division *a*.—Mouth blown.

Section 1.—*Stopt pipes*. (As well as the simple form, there are twin, triple, quadruple, quintuple, and sextuple whistles.)

Section 2.—*Half-stopt pipes*.

Section 3.—*Open pipes*.

Division *b*.—Mechanically blown.

CLASS II.—With finger-holes.

GROUP B.—REED INSTRUMENTS.

CLASS I.—Without finger-holes.

Division *a*.—Mouth blown.

Section 1.—*Double-beating reeds* :—

i. Lipped.

ii. Covered. (As well as the simple form, there are twin, triple, and quadruple covered reeds.)

Section 2.—*Single-beating reeds* :—

i. Lipped. (Also a twin form.)

ii. Covered. (Also a "double-action" form.)

Section 3.—*Retreating reeds* :—

i. Terminal. (Also a twin form.)

ii. Lateral. (Also a twin form.)

Section 4.—*Ribbon reeds* :—

(As well as the simple, there is also a multiple form.)

Division *b*.—Mechanically blown.

CLASS II.—With finger-holes.

This classification has been compiled from a personal examination of numerous specimens, some the property of the writer, others preserved in the United States Museum at Washington, the Metropolitan Museum of Art and the Natural History Museum at New York, the British Museum, the Pitt-Rivers Museum, Oxford, and the Ethnographical Museum, Cambridge; also from detailed and illustrated descriptions of collections at Victoria (British Columbia), and Berlin, and from the observations of Dawson, Swan, Niblack, and Boas.

Though other forms may doubtless exist differing from those here described in shape and size,—and two Indian instruments are seldom found alike*—so far as regards the

* The common Indian name for all these instruments, whether whistle or reed, is SK-Ā'NA.

principles of sound production the enumeration is probably complete, and I wish to acknowledge my great indebtedness to the authorities of the National Museum at Washington; to Mrs. J. Crosby Brown, the donor of the unrivalled musical collection in the Museum of Art, New York; to the Ethnographical Department of the British Museum; to Professor Karl von den Steinen of the Ethnographical Museum, Berlin; and Mr. Henry Balfour, Keeper of the Pitt-Rivers Museum, Oxford. For many descriptive details my thanks are due to Miss F. Morris, of New York, and Mr. E. H. Hawley, of Washington.

After a description of the various principles I will make a few remarks on the use of these instruments by the Indians, and offer a suggestion as to the source from which they were probably derived.

DESCRIPTION OF PRINCIPLES.

WHISTLES (Group A) without finger-holes (Class I.).

Division *a*.—Blown by the mouth.

Section 1. *Stopt pipes*.—I place these first because there appears to be every reason for supposing that they were the earliest in use, and now they are the most frequently met with. The oldest existing whistles are of this kind, and the popularity of the stopt-pipe in contradistinction to the open, as in the flutes and bone whistles of other tribes, seems to point to a prehistoric source of origin to which I shall presently allude.

The whistles are made in a simple but clever manner. A piece of straight grained wood, preferably red cedar,* is procured and shaped outwardly by means of a knife to the required form. This is sometimes pear-shaped, but generally resembles an oval or cylindrical tube. Oftentimes it is square or with one flat face and a rounded back—more rarely a flattened, truncated cone. The wood is then split lengthwise along the grain—the lower half is hollowed out with great neatness until the sides are quite thin, a small block being left at the lower end and a large block at the upper. The other half is treated in the same way, but the hollow is not so deep, and an opening is cut through the side—the wood being cut away on the outside to form a lip. The upper blocks of both halves are then slightly grooved to form a shallow channel which, when the two pieces are fitted together again, allows free passage for the air over the languid or whistle embouchure. So deftly

* Besides red cedar (*Thuja gigantea*), spruce (*Picea Menziesii*) and cypress (*Chamæcyparis Nutkaensis*) are used. The wood was originally worked with flint, bone, or jade knives, and rubbed down with shark's skin. Iron was introduced by the Russians about 150 years ago.

is the wood split that no glue is required to render the joined pieces air-tight, but the whole is bound in two or three places with split spruce root or shredded cedar bark,—more rarely with animal sinew—and either left the natural colour or painted with appropriate devices. In some cases, especially with the rude ancient specimens, either the shrinkage of age or the imperfect splitting of unsuitable wood has required an outward application of dark resin along the joint—an unsightly but nevertheless efficient repair. The voicing of the whistles is wonderfully good and would do credit to many a professional organ-builder.

The old whistle (No. 1) painted with totemic devices, including the eagle, shows one of the earliest and simplest forms of the stopt pipe and sounds the F above middle C; while in No. 1A, the original of which is at Washington, and is of Haida make, the lip is curiously cut in two different planes. It sounds the A below middle C. The placing of two whistles simultaneously in the mouth probably suggested the twin or double whistle, and museum specimens show two simple whistles bound side by side, or as in No. 2 back to back. The latter specimen gives the notes—



The next improvement was to construct the two instruments in the same block of wood either side by side or back to back; as in No. 2A,* which gives the notes—



In this case the wood is split twice, the middle section being hollowed out on either side, leaving a thin partition between the two tubes. In the Royal Ethnographical Museum, Berlin, there is shown a curious arrangement of the two whistles,† which are placed one above the other with their embouchures on the same side of the block. A channel passing behind the upper whistle conveys the air to the lower.

No. 3 is a small specimen of the triple whistle—two side by side in front and one at the back. The notes are—



* This whistle may have been purposely overblown: when played thus it sounds a unison E flat above treble C.

† *cf.* Boas: Kwakiutl Indians, p. 445, Fig. 74. By mistake it is described as having four voices or notes instead of only two.

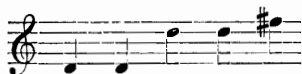
the second note being rather sharp. As in all these compound whistles, the notes can be sounded separately if desired. In the Oxford Museum there is a triple whistle from Alert Bay, formed of three separate instruments bound together with twisted cord, a small whistle being placed on either side of the tapering mouthpiece of a larger one. The notes are G below and G above treble C and C in alt.

No. 4 is a quadruple specimen giving the notes—



In these whistles the block of wood is split first of all on two opposite faces and then on the other two. On these narrower faces the two smaller whistles are placed. In the Berlin collection there is a quadruple whistle with a rounded base terminated by a short handle. It is of Kwakiutl make.

Quintuple whistles are rare, and No. 5 is an interesting and ancient specimen. Here the wood, which is cypress, is split but twice,—once for the two lower whistles and once again for the three upper whistles—the air passage to the small central tube being cut out in the thickness of the wood between the two upper-side whistles. It is bound with cedar bark and sinews and rendered air-tight by resin. The notes are—



Another form of quintuple whistle is in the Berlin collection.* It is in the shape of a cylindrical roller, from the circumference of which five slips of wood have been split off and the tubes for the whistles hollowed out of the five faces as in the simple whistle. In the Metropolitan Museum, New York, there is a specimen of a sextuple whistle constructed in the same way, but in the form of a truncated cone.

Section 2. *Half-stopt pipes*.—It is interesting to find that the charm of the half-stopt pipe—the Rohr flute of our organ-builders—has not been lost on the Indians, for here in specimen No. 6 we find the principle which for three centuries and a-half has found a place in our own instruments. In the bottom block of the stopt pipe a cylindrical hole has been made and the characteristic tone obtained. The note is the F above middle C. In pear-shaped whistles at Washington† and New York there is a similar hole bored slightly on one

* cf. Boas: Kwakiutl Indians, p. 445, Fig. 71.

† cf. Niblack: Indians of North-West Coast. Plate lxii., No. 330.

PLATE II.



WHISTLES mechanically blown.

- 8, 8A. Oolalla or Mountain Demon calls.
8B. Double whistle with bellows.

WHISTLES with finger-holes.

- 9, 9A. Wooden stopt pipes.
9B, 9C, 9D. Open pipes of carved slate.

side of the lower end, which terminates in a small knob. Whether these holes were intended to be stopped by the finger in order to vary the note it is hard to say. Specimen No. 6 gives the D above middle C with the hole closed. It seems probable that they arose from the natural ingenuity of the Indian whistle-makers, and may have suggested the whistles with true finger-holes described below (p. 122).

Section 3. *Open pipes*.—These do not seem so generally used as would have been supposed. In a collection of some fifty specimens at Victoria (British Columbia) there is no example of the open pipe. The original of specimen No. 7 is in the United States National Museum at Washington. It comes from the Queen Charlotte Islands, and gives the note F sharp above middle C. It is made in the same way as the stopp pipe, but the end block is wholly cut away. In the Berlin Museum there is a bone whistle* about four and a-half inches long with an open end, the other end being plugged with a piece of wood as in our recorders and flageolets; this may have been suggested by contact with Europeans.

Division b. *Whistles mechanically blown*.—The sounding of the whistle by means of a compressible bag is undoubtedly of great antiquity, and led up to the more recent use of bellows for the same purpose. I cannot do better than quote the description which Commander Dawson gives of one found by him among the Haida Indians of Queen Charlotte Islands†: "A peculiar and very ingenious speaking doll was obtained at Skidegate. This did not seem to be a mere toy, but was looked upon as a thing of worth, and had previously been used, in all probability, as an impressive mystery. It consisted of a small wooden head three and a-half inches high by two and a-half inches wide and two inches deep from back to front, composed of two pieces of wood hollowed till quite thin, and the front one carved to represent a grotesque face with a large, round, open mouth with projecting lips. The two pieces had then been neatly joined, a narrow slit only remaining within the neck and serving for the passage of air, which then, impinging on a sharp edge at the back of the cavity representing the mouth, makes a hollow whistling sound. To the neck is tied the orifice of a bladder, which is filled with some loose elastic substance, probably coarse grass or bark. On squeezing the bladder sharply in the hand a note is produced, and on relaxing the pressure the air runs back silently, enabling the sound to be made as frequently as desired." The representation of the grotesque face is shown in the Oolalla or Mountain

* cf. Boas: Kwakiutl Indians, p. 445, Fig. 70.

† cf. Report Geological Survey of Canada, 1878-79, p. 140B.

Demon's call, of which there are several specimens in the United States Museum. Though much larger than the so-called "speaking goll" obtained by Dawson, it is constructed on the same principle. According to Dr. Boas* these whistles are all carved or painted to represent a corpse either with hollow orbits or closed eyes: some of them are attached to bellows. They are carried under the arms, hidden by the blankets, and thus blown without being seen. In the British Museum there is a fine old specimen, No. 8, included in the Troup collection from the North-West Coast. Here the sound issues from the mouth of the figure instead of from the nostrils, as in the Washington specimen, of which No. 8A is a facsimile. In the forehead between the eyes will be noticed a small hole: this is roughly made, and appears to be either an accidental breakage or cut for the purpose of varying the note. With the hole closed the whistle sounds B flat below tenor C—when open a sharp E flat above tenor C.

Ordinary whistles with bladders attached are in the Washington, New York, and Oxford Museums. They are generally stopt pipes, rarely half-stopt, and never, so far as has been observed, open pipes. *Double* whistles are also found mechanically blown, and in later specimens bellows with the usual side boards are attached. These bellows are without valves, the air being drawn in through the orifice of the whistle as in No. 8B (Crosby Brown collection, Museum of Art, New York).

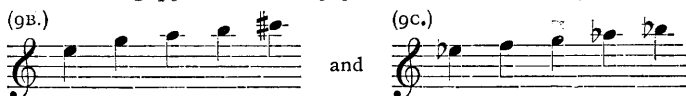
WHISTLES with finger-holes (Class II.).

We are now I think on much more recent ground, partly because specimens of this class are so seldom seen, and partly because the Indians have no idea of instrumental music as an accompaniment to their songs or as a pleasure in itself. The only whistles I have seen with finger-holes which could be considered genuinely Indian are two examples in the British Museum, received in 1892 from Queen Charlotte Islands. The instruments are similar, both measuring twelve inches in length: the front is almost flat, the back convex, and the slightly tapering body is terminated by a long narrow tube forming the mouthpiece. The lower end is stopped with the usual block, and the instruments, ornamented with incised lines and red painted lips, are bound round with the orthodox spruce root. The less elaborate specimen (No. 9) has one hole bored through the front part about half-way up the tube, while a small hole a little way below it is stopped with a plug of wood. The joints of this whistle were faulty, but by stopping the leak and closing the finger-hole the note D above middle C was obtained; on

* cf. Boas: Kwakiutl Indians, p. 653.

raising the finger the octave D was sounded, though rather flat. The more elaborate specimen (No. 9A) has two holes in front and one behind. It also has the plugged hole immediately below the lower hole as in the previous specimen, but covered with the binding. Though also out of repair, I obtained with all the holes closed the note F above middle C, with the lower front hole open B flat, with the two front holes open treble C. The opening of the back hole made no difference, the small hole being placed, as seen in the illustration, opposite the large aperture of the whistle. I failed also to get any notes by "pinching," as on the recorder.

In several museums, as at Edinburgh, Cambridge, and Oxford, and in the British Museum, there are whistle flutes of black polished slate ornamented with totemic designs and carvings. It is known that these instruments are produced by the Skidegate Indians of Queen Charlotte Islands from the rock of Slate Chuck Creek merely by the demand for such things as curiosities by Europeans.* The slate when first quarried is soft and easily worked, but hardens on exposure to the air. In the Pitt-Rivers collection (Oxford) there are three such flutes, two with four finger-holes (9B, 9C) and one (broken) with six arranged in sets of three (9D). The instruments are mounted with hammered metal. The length of the two four-holed flutes is $10\frac{1}{4}$ inches and $11\frac{1}{8}$ inches respectively. In each case the bore is slightly inverted conical, as in the old *flûte-à-bec*, the diameter at the bottom being $\frac{7}{16}$ inch. They yielded the following scales:—



The six-holed flute, $21\frac{1}{4}$ inches in length (9D), being broken could not be sounded, but a similar specimen in the Ethnographical Museum, Cambridge, also decorated with three carved frogs and an eagle, gave approximately the scale of G major. It is needless to point out that these slate flutes are modelled on European instruments, though the two specimens in the Edinburgh Museum of Science and Art were presented more than forty years ago.

REED INSTRUMENTS (Group B) without finger-holes (Class I.).

Division a.—Blown by the mouth.

In this group there is yet further scope for that originality of development and adaptation which the Indians have

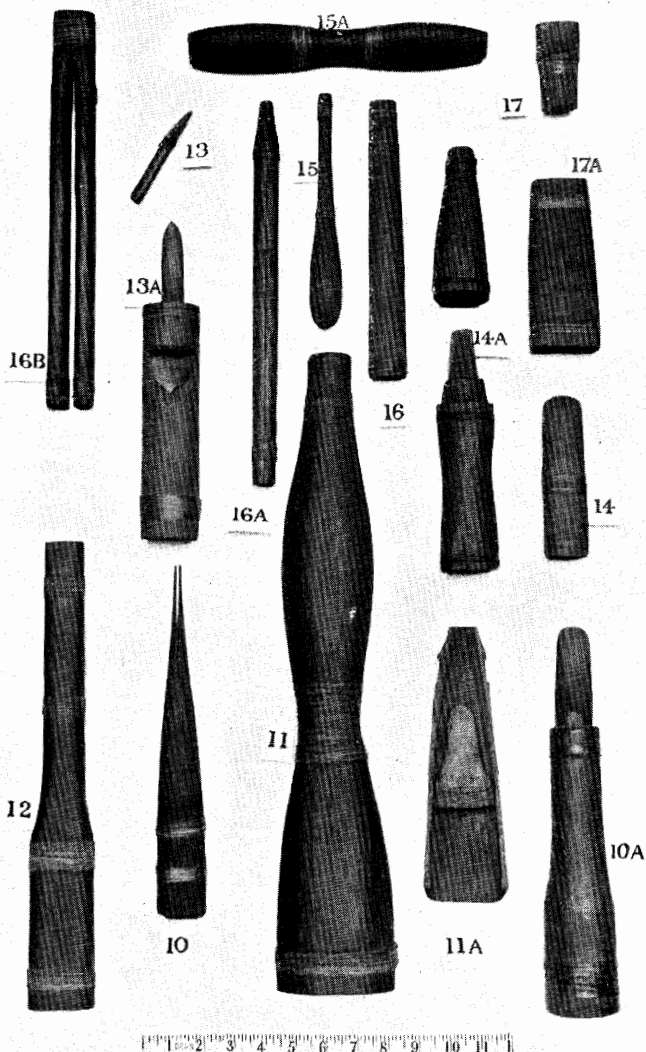
* cf. Dawson Report, 1878-79, p. 149B; and Niblack, U. S. Nat. Museum Report, 1888, p. 329.

already displayed in the remarkable variety of their whistles.

Section 1. *Double-beating reeds.*—We commence with the double-beating reeds, not only because this principle appears to have been longer in use than the others, but because the double-beating reed forms the starting point of two of the three other sections of this group.

The Indian double-reed is not formed of natural reed or cane as among the peoples of other continents, but of wood, generally red cedar or spruce. The wood is split in half lengthwise, the lower part of each half is hollowed out, the hollow gradually diminishing in depth and size towards the upper end of the block. The two halves are then bound together with spruce roots, and the upper part is thinned down on either side until a flat tongue-shaped end is left, split in half by the previous cleavage of the wood. The two thin pieces, which stand slightly apart, vibrate and beat upon each other when the air is impelled through them. The outline of the reed varies from the parallel sides and rounded top which we are accustomed to see in the modern clarinet reed to an elongated form with tapering sides and a blunt point, the exact reverse in fact of the ordinary double-beating reed as used for the bassoon. The simplest form of the double reed is the Lipped Form (Sub-section i.), so called because the reed can be controlled by the lips of the performer, as in No. 10. In probably the more ancient specimens the reed is made in one piece with the tube and is inseparable from it. Sometimes however the reed is inserted into a cylindrical or slightly conical tube made in the same way as the whistle tubes and bound with roots or bark, as in the Tlingit example (No. 10A). But the Indians have also another form which may be called the *covered* reed (Sub-section ii.). Here the vibrating tongues are placed within the tube out of reach of the lips, sometimes just inside the upper end, more often in the middle or at the lower end. The instrument is then sounded by a strong blast blown by the performer through the tube. When the reed is placed in the middle of the instrument, the outline often resembles that of an hour-glass, the vibrator being inserted at the waist and kept in place with asphaltum or resin, as in No. 11. No. 11A in section shows the position and shape of a covered reed used by the Tsimshian Indians of Fort Simpson, British Columbia. The mention of a covered reed instrument reminds us of the mediæval krumhorn and the present bagpipe chanter reed, but the cover of the reed is not removable. As may be imagined, the tone of the wooden reed is marked by a roughness and power which partake more of the timbre of the metal vibrators of the foghorn than the delicacy of the true orchestral reed.

PLATE III.



REED INSTRUMENTS without finger-holes.

Double Reeds: 10, 10A. Lipped forms. 11, 11A. Covered forms. 12. Twin form.
 Single Reeds: 13. Simple form. 13A. Twin form. 14. Double-action form.
 14A. Covered form.
 Retreating Reeds: 15. Terminal form. 15A. Twin Terminal. 16, 16A. Lateral
 forms. 16B. Twin Lateral.
 Ribbon Reeds: 17. Simple form. 17A. Multiple form.

The same desire for a concord or discord of sounds which led the Indians to produce the double, triple, quadruple, quintuple, and even sextuple whistles, also suggested the association of two, three, or four double-beating reeds in one air chamber. The reeds are usually small and placed at the lower end, which is flattened for the purpose, while the upper part of the tube is tapered for convenience of blowing as in No. 12, which is a Tsimshian twin reed.*

Section 2. *Single-beating reeds*.—The simple form of the single-beating reed is, I am inclined to believe, only a late arrival amongst the Indians of the North-West Coast. It consists of a small hollow bone—an eagle bone—with its end cut down on one side to form a “lay” as in the modern clarinet mouthpiece, and a slip of wood bound on with spruce root or sinew to form the reed which is controlled by the lips (No. 13). Much the same must be said of the covered single reed (14A), specimens of which will also be found in the Metropolitan Museum, New York. Here the “lay,” which is pointed and narrow, is formed of wood and made in one piece with a wooden tube constructed in the same way as that of the whistles. The reed is made of metal, cut, I am told, from disused meat-tins, and is wedged in between the two halves of the tube. The vibrator is covered by a removable cap (as in the pigorn or hornpipe) also made in halves and pierced at the top with a hole for the breath. Now although the Indians have known the use of copper for centuries and have found it easily reduced to thin plates by hammering, the reeds of these instruments are of a metal introduced by Europeans. It may be that an older form exists with both body and reed of wood, but of this primitive form no specimens have as yet appeared.

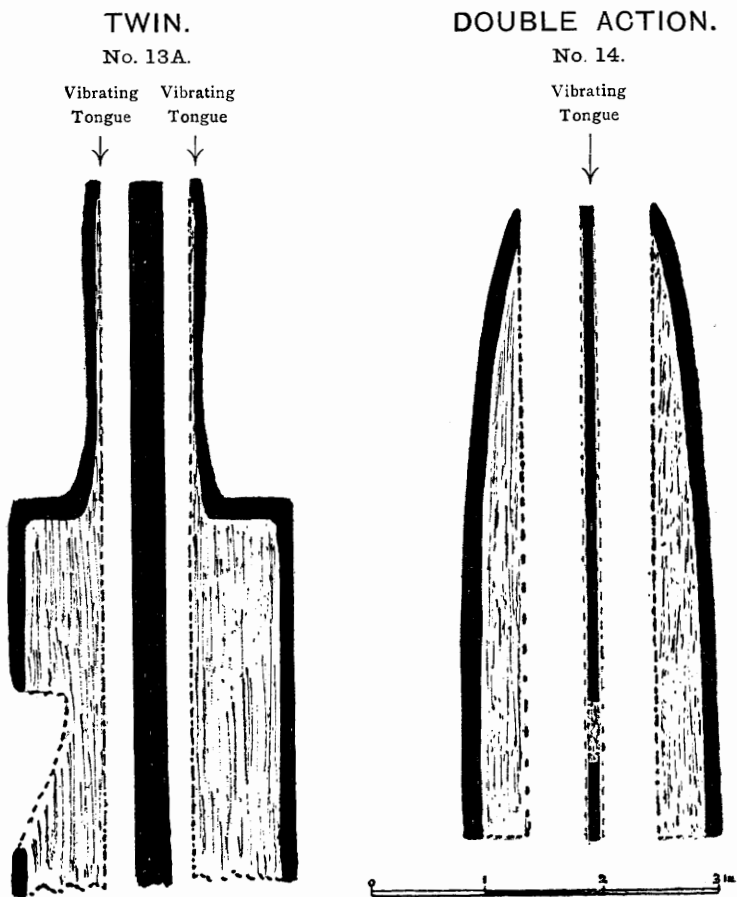
I say this because in an instrument received from British Columbia, and having every trace of authenticity and age, we find a *wooden twin* single-beating reed of an original and early character, obviously derived from the double-beating reeds already mentioned.

In this specimen (No. 13A) not only is the block split in

* There are two particularly curious and deceptive forms which have come under my notice. In one of them the twin reeds are inserted into the upper end of a wooden tube, and though the tops of the reeds are visible they are beyond the control of the lips. Outwardly their form is very similar to that of the reed instruments described and figured below under Section 3, Nos. 16, 16A. There is an old and perfect specimen in the British Museum with the reeds in position, but as the little reeds are easily lost, it may be that this form is often overlooked or mistaken. There can be little doubt but that all wooden tubes with *both* ends open should be referred to the present sub-section, the reeds in this case having been lost. The second curious and deceptive form is also shown in the British Museum collection, the outline somewhat resembling the form figured below under Section 3, No. 15A. The mouth-hole is also placed in the middle, but at either end of the tube is a small double-beating reed.

half, hollowed out, and thinned to a flat tongue in the upper part as described in the construction of the double reed, but before the halves are bound together a piece of flat wood

SECTIONAL DIAGRAM.



SINGLE-BEATING REEDS.

Showing the peculiar evolution from the Double-Beating Reed.

($\frac{1}{4}$ inch thick) is placed between them, thereby not only making the tubular body into two half-tubes, but providing between the two halves of the reed a solid lay on which each

half vibrates, so converting the vibrators into a twin single-beating reed (*see* sectional diagram). The notes given by this specimen are:—



the pitch of one of the reeds being raised by means of a large ornamental hole cut in the half side of the instrument. In 1858 a double single-beating reed was produced in France by MM. Bornibus and Besson,* but it was a development from the ordinary single reed or a clarinet mouthpiece with a double lay. Here on the other hand we find the single-beating reed derived from the double, an original idea I believe.

Another form of the same principle has also been received from British Columbia (No. 14), and I conclude by experiment that it is a single reed of the "covered" kind. The method of construction is similar to that of the ordinary double reed, except that the upper part, though tapering, is not so thin. Between the two halves a flat piece of wood only $\frac{1}{8}$ inch in thickness is inserted before they are bound together. Now had the upper part been thinned sufficiently we should have had a form similar to that just described; but it is in this case left rigid, and the flat inserted piece is rendered pliant and flexible by cutting away, so that it becomes the vibrator and, when the breath is forced into the instrument, oscillates between the two halves, beating on each alternately, thus forming a "double-action" single reed uncontrolled by lip pressure (*see* sectional diagram). I am not aware that this principle is recognised or known elsewhere.

Section 3. *Retreating reeds.*—The vibrating principle in this section has apparently been derived at least in one form from the double reeds, and seems best described by the term "retreating" reed, a name also applied by Mr. Hope Jones to certain forms of organ reeds or diaphones invented by him. Professor Mason, of the United States Museum, calls it the "inverted double reed." It is the reverse, so to speak, of the ordinary beating reed, in which the normal position of the vibrator is at a little distance from the lay or the other half of the reed, so that when the breath is forced through the reed the aperture is alternately closed and opened. The retreating reed, however, is in its normal condition *closed*, the two halves being in contact. When the air is forced through the reed (from the opposite end to that used in the ordinary beating reed) the halves open and close alternately. The primary action of the ordinary reed is "beating" or "closing," the primary action of the closed reed is "retreating"

* *cf.* Day, Catalogue of Military Exhibition, 1890, p. 70.

or "opening." This principle assumes two general forms, terminal and lateral.

In the *terminal retreating reed* (No. 15) the affinity with the ordinary double-beating reed is very evident. I am indebted to Mr. E. H. Hawley for the following description of the original of this specimen from the Bella Bella (Salishan) Indians: "It is a bit of cedar shaped like an elongated Indian club flattened at the thick end. The wood has been split and the large part or outer ends excavated to form two spoon-shaped sections. The smaller or inner ends have only a little channel cut in them for an air passage: the two halves are then lashed together with split spruce root at the inner end and at the point where the widening out begins: the outer ends are left free. Where the breath is forced in at the mouthpiece it causes the free ends both to open and close, producing a harsh sound."

In the Washington Museum there are also examples of this form from the Skidegate Indians of Queen Charlotte Islands. In the Pitt-Rivers Museum (Oxford) there is a very perfect Tlingit specimen, about ten inches long, from the Stickeen River, the outside of the vibrating portion in this example being broadly octagonal instead of oval. Passing to other continents, an example of this terminal retreating reed appears from Fez, in Morocco, where it is called "lira." It is a piece of reed, one end being open, the other closed by the natural knot. This however has been split longitudinally, and by blowing into the open end the two halves vibrate as the reeds before mentioned. In my own Essex parish the boys construct a similar terminal reed out of the hollow stem of the meadow rush, one end, closed by the natural knot, being split as in the African specimen.

I have applied this form of reed to modern wind instruments, such as the oboe, clarinet, and ophicleide, but failed to produce a musical note. The fact that the reed is out of the control of the lips is not in its favour. As with the other reeds, so with this, the Indians have endeavoured to produce an accord, and in No. 15A we have the twin terminal retreating reed as constructed by the Skidegate Indians. The mouthpiece or blowhole is in the middle or waist, and as the hole is cut right through, it is necessary to close the opposite opening with the finger; then when the air is forced in, the two ends "retreat" and form the twin vibrators.*

* Niblack (Report, 1888, p. 332) unfortunately describes this interesting instrument as "a whistle pure and simple, being blown by applying the lips as in a fife"! It was to this form I alluded when, in speaking of the double-beating reeds, mention was made of a peculiar specimen in the British Museum, shaped and blown as a retreating reed, but having a small double-beating reed inserted at each of the ends which are rigid.

The *lateral retreating reed* is either an attempted improvement on the terminal form or has come from the simple tube which is made up, as before mentioned, of two excavated halves bound together. If the lower end of one of these tubes be stopped and the air forced into the open end, the two sides if not too thick will fly apart at the split and produce the lateral retreating reed. In No. 16, which represents the form used by the Skidegates, and No. 16A, that used by the Massets, both of Queen Charlotte Islands, the walls are very thin and vibrate for the greater part of their length. By pressing the body of the instrument between the forefinger and thumb the vibrating length can be shortened and a note of higher pitch obtained.*

The lateral retreating reed is probably more widely distributed than the terminal form. Mr. Balfour, of the Pitt-Rivers Museum, has drawn my attention to a very similar sound-producer made by the boys in Oxfordshire, and most likely in many other parts of England. The pliant hollow stem of a river reed is cut off just below the knot and again a few inches above to form an open end. An incision is then made with a knife in the side of the tube, and when the breath is blown into the open end the edges of the incision vibrate as in the lateral reed.†

The Ainos of Japan also have a similar vibrator in their "ippaki-ni" or "deer call," which consists of a piece of skin stretched across a flat piece of wood and fastened to it on three sides by sinew. A hole is bored in the wood through a short mouthpiece on one side, and opens out beneath the skin. When the air is forced through the hole the skin rises and falls, or "retreats" and "beats" at its free edge on the flat surface.

As with the terminal reed, so with this, the Indians have constructed twin vibrators as shown in No. 16B, which is a form used by the Massets, and is made out of one block of wood split in half, hollowed out and bound together again.

Section 4. *The ribbon reed.*—This principle is well known from its use in toy instruments and the nasal tones of

* It is necessary for this principle that the lower end of the tube should be closed, and for this purpose the wood is not cut away at the end, but left as a block. Similar tubes with open ends have either been originally intended for the ordinary double-beating reed as noticed on p. 125 note, or must be closed with the hand, which then serves the same purpose as the end block.

† I have since heard that this form is used in Warwickshire. In North-West Essex the popular "squeaker" is the double reed, the hollow stem of the rush being slit down about $1\frac{1}{2}$ inches through the knot, the two halves drawn slightly apart, and the reed thus formed covered with the mouth. In my own county (Dorset) the shepherd boys construct the single vibrating reed from an oaten straw, a thin tongue being cut out of the straw towards the knot.

Mr. Punch. A strip of thin membrane—in the case of Indian specimens an inner layer of bark from the red cedar—is tightly fixed at each end and stretched across a narrow air passage. On blowing through the air passage the edge of the thin membrane vibrates in the same way as children will extract a noise from a blade of grass or lime leaf held between the middle and lower joints of the thumbs. The specimen, No. 17, is from the North-West Coast, and an example in the Metropolitan Museum, New York, has its sides carefully squared and perforated with small holes below the vibrator.

In the United States Museum at Washington an elaborate Tsimshian form occurs, oddly enough described in the report as a trumpet.* It is made in six pieces, and when they are bound together they form five narrow air-passages. A continuous piece of thin fabric is stretched across each passage, the whole instrument thus containing five vibrators. Unfortunately the musical effect is not equal to the ability and ingenuity of construction (No. 17A).

Division *b*. *Reed instruments mechanically blown*.—The sounding of the reed instruments by mechanical means naturally followed the application of the same idea to the whistles. I say it followed, because owing to the strong nature of the wooden reed, the ordinary compressible bladder filled with grass as previously described would fail to give the necessary wind pressure. Therefore examples of mechanically blown reeds are rare, the only specimen observed being of the double-beating form fitted with bellows similar to those of Fig. 8B, and not of a very primitive construction, though painted with totemic designs Indian fashion.† It is from Skidegate, Queen Charlotte Islands, and is in the United States National Museum.

REED INSTRUMENTS with finger-holes (Class II.).

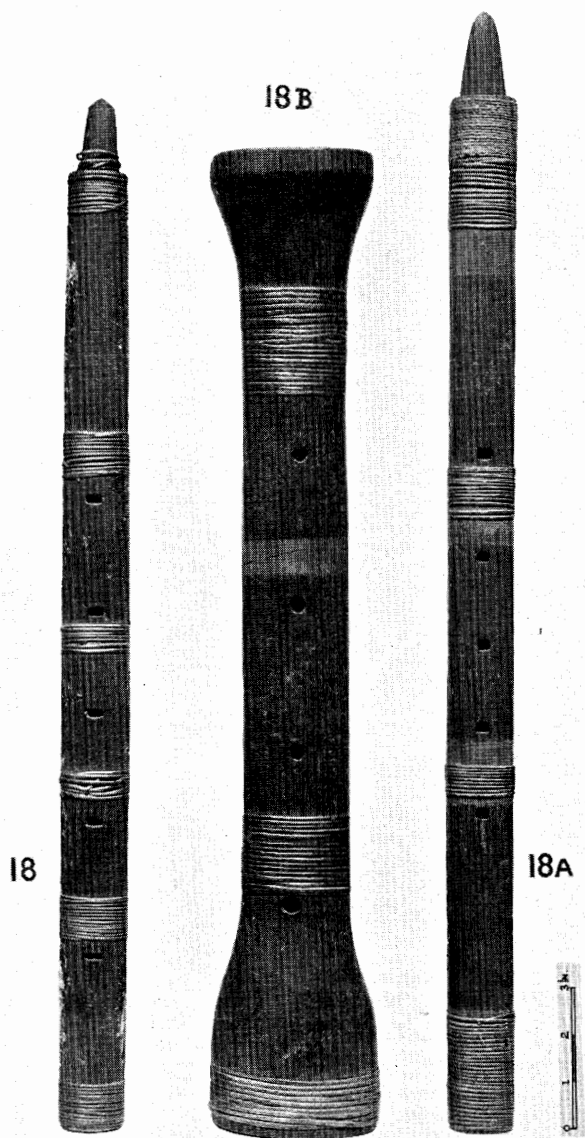
Here again we deal only with the double-beating reed, and all specimens of this class must I fear be considered of later origin than the primitive examples without finger-holes, unless we consider them as survivals of a higher civilization now lost. Examples are certainly rare.

There are in the British Museum two wooden reed instruments (Nos. 18 and 18A) made of split cedar wood and bound in the usual way, collected by Troup, and received by the Museum in 1892 from the North-West Coast. The length of the body is $20\frac{1}{2}$ inches and 22 inches respectively, and the section is in both cases oval ($1\frac{3}{8}$ by $1\frac{1}{8}$ inches), the sides being parallel except just at the upper end. The lower end is

* cf. Niblack Report, 1888, p. 332, Plates lvii. and lxi.

† cf. Niblack Report, 1888, Plate lxii.

PLATE IV.



REED INSTRUMENTS with finger-holes.

18, 18A. Lipped Reeds.

18B. Covered Reed.

closed, the wood not being cut away. Into the other end is inserted a wooden double-beating reed. There are five holes or rather oblong openings in the body of the instruments placed at more or less regular intervals.* I had great difficulty in sounding the more perfect of these two instruments (No. 18) owing to the dryness of the reed and the leakage at the sides, but at last the following scale was extracted—



By closing all the holes no sound of course is produced owing to the end block—a peculiarity observable also in the chanter of the Northumbrian bagpipe.

In the same collection there is a curious wooden tube $2\frac{1}{2}$ inches in length, with enlarged bell ends somewhat similar to that of a trumpet (No. 18B). The body is pierced with four round finger-holes at regular intervals. The instrument is constructed and bound in true Indian fashion, and comes from Queen Charlotte Islands. The bore is slightly oval ($1\frac{1}{4}$ by 1 inch) and the internal diameter of the upper end is 3 by $2\frac{1}{4}$ inches. Though it looks as if it might be blown as a true trumpet, I found it impossible to produce any sound owing to the enormous size of the mouthpiece, and it seems almost certain that it was sounded by means of a double reed inserted at the narrowing of the tube, where some slight traces of fixing resin still remain. The instrument would therefore be of the covered reed type, and the four holes, which are each $3\frac{1}{4}$ inches apart, would be stopped with the fingers of both hands.†

The four finger-holes seem to show that this specimen is genuinely Indian, as this number of holes is characteristic of the more primitive wind instruments of the American Continent.

THE USE OF THESE INSTRUMENTS.

In the Special Exhibition of Musical Instruments at South Kensington, 1872, a small whistle from the North-West Coast with a bladder attached was shown by Colonel Lane Fox (afterwards Pitt-Rivers), with the following description—"A species of small bagpipe. Carried under the arm and pressed to imitate the noise of a duck when decoying them."‡ This specimen is now in the Oxford Museum and is similar to

* Very similar oblong or quadrangular holes appear on a whistle flute from the Lengui tribe of North Chili, South America (Pitt-Rivers Museum).

† At Washington there is a covered double reed without finger-holes, but with the lower end shaped into a bell very similar to that of the trumpet. (cf. Niblack Report, 1888, Plate lxii., Fig. 332.)

‡ cf. Catalogue of Special Exhibition, 1872, No. 516.

those described under "Class I., Division b. — Whistles mechanically blown." On what authority this explanation of its use was made is not known: it is certain however that somewhat similar "calls" are used as decoys as they are by our own fowlers. But these instruments whether whistle or reed are more particularly associated with the ceremonial observances of the Indian tribes.

Dr. F. Boas in his report on the Secret Societies of the Kwakiutl Indians makes frequent mention of the whistle, but as he does not distinguish between whistles and reeds, and includes them all under the first name, we are left to such illustrations as are given to determine the particular forms used.

The principal secret society is that of Hámats'a, with its elements of cannibalism, and the instruments used by the Hámats'a are true whistles, and comprehend all the multiple forms previously described. These whistles are blown when the frenzied Hámats'a is returning from his sojourn in the forest, and are supposed to represent the voices of the spirits with which he is possessed. The commencement of what is termed the "winter ceremonial" is announced by small dance whistles called ts'etsaeqa. All these instruments are deemed sacred and must not be seen by the profane or uninitiated. They are supposed to possess a magic power, which can be thrown over the listeners.* In the dances connected with these ceremonies and in "cultus" dances—a form of popular amusement—the performers wear grotesque masks representing birds and beasts. Underneath the masks is hidden some form of instrument which will imitate the noise of the creature represented.† In the Raven mask of the Lao'laxa dance, for instance, the "croak" is produced by the twin single-beating reed described above, concealed within the long beak of the bird-shaped head-dress.‡

In the Qo'los or eagle dance§ a lipped double-beating reed is employed.

* cf. Boas: Kwakiutl Indians, p. 584.

† cf. Boas: Kwakiutl Indians, p. 629.

‡ cf. Dawson Report, 1878-79, p. 139B. Dawson describes a small apparatus which is held in the mouth to produce a peculiar noise when dancing—the strange and startling sound being supposed to indicate a species of possession in an excited dancer. "One," he says, "which I obtained consisted of a wooden tube roughly oval in section, $\frac{3}{4}$ inch in greatest width, with a length of $1\frac{1}{2}$ inches. This is composed of two pieces tied together with a strip of bark and within it are placed the vibrating pieces, each composed of two flat pieces of wood or reed tied together. In a box in one of the old houses in Parry Passage several such cells were found fitted in trumpet-shaped tubes about a foot in length made of cedar wood, each being composed of two pieces." I presume that Dr. Boas alludes to similar instruments under the name "trumpet whistles." (cf. Boas: Kwakiutl Indians, p. 512. Compare also Lao'laxa horn, p. 430.)

§ cf. Boas: Kwakiutl Indians.

Another dancer called Tše'k'ois is supposed to have many birds within him, the voices of which are heard constantly. For this purpose he has small whistles hidden in his mouth which, according to Boas,* he exchanges from time to time, and thus produces various sounds.

In another dance witnessed by this learned and interesting writer a number of people came in spreading their blankets and imitating the motions and noises of ducks—an excellent opening for "quacks." In a description given by J. G. Swan† we read: "The performers commenced by hooting like owls, howling like wolves, and uttering a sharp whistling sound intended to represent the blowing and whistling of the wind." This latter noise was probably produced by the ribbon reed.

I have already alluded to the so-called "speaking doll" and to the Oolalla. According to Niblack‡ the Oolalla whistle is "used only at the commencement of great and important ceremonies to announce the beginning of the distribution of property in the potlatch."

These whistles and musical effects are considered mysterious properties which are passed on from one chief to his successor with great secrecy, each society possessing its peculiar "call." Dawson§ is probably correct when he says that they are no doubt among the devices for obtaining and holding authority over the credulous vulgar. At any rate they are not used by the ordinary members of the tribe, who accompany their dances and songs only with their drums, rattles, wooden tappers, and clackers, as well as with the general clapping of hands.||

Of the use of the instruments with finger-holes we have no account, except that the slate flutes are made for sale as curiosities of workmanship.

THE SOURCE FROM WHICH DERIVED.

When these whistles and reed instruments of the North-West Coast are compared with those of other existing North American tribes their superiority is at once apparent. Amongst some tribes the simple vertical tube blown on the upper edge, as in the Arabian "nei" or the Japanese "shakuhachi," is still used. Amongst others, the popular whistle is a small bone

* *cf.* Boas: Kwakiutl Indians, pp. 493 and 511.

† *cf.* Swan: Indians of Cape Flattery, p. 66.

‡ *cf.* Niblack Report, 1888, Plate lxii.

§ Dawson Report, 120B. *cf.* Boas: Kwakiutl Indians, p. 541.

|| The employment of these whistles and reeds as an accompaniment to vocal music is unknown to the Indians. The popular and secret songs of the North-West Coast have been reported on by G. Dixon ("Voyage round the World," London, 1789); F. Poole ("Queen Charlotte Islands," London, 1872); and especially by Dr. F. Boas in his account of the Kwakiutl Indians (Washington, 1897).

with a notch or vent-hole cut in one side and the end plugged with asphaltum or gum, except where a narrow wind-way is left to direct the air upon the lower edge of the hole. Even in the "chotonka" or "courting flute" of the Kiowa, Dakota, and other Indians, with its six finger-holes and evidently European improvements, the whistle is far more rudimentary than in the specimens from the North-West Coast; while as regards reed instruments, I am not aware that any like those described are in use, unless recently introduced from other continents.

We can hardly suppose, however, that, clever and ingenious as the North-West Coast Indians are, the principles of sound-production used by them are wholly original.

I am strongly of Professor Mason's opinion, expressed in the Smithsonian Report, 1886, that "it is an important principle which archæologists sometimes overlook, that arts may survive and obey the laws of technical evolution, even though the men through whose instrumentality they live and have their being have no immediate blood relationship." If then we can find a people using the constructive peculiarities here described, without necessarily asserting a blood relationship, we may suppose that communication of some sort must have at one time existed between them.

The question therefore is not only what peoples are likely to have come in contact with these Indians, but also how far are the sound-producing principles common to both. I do not propose to enter into the history of the discovery by Europeans of the North-West Coast*—for traces of European influence, chiefly French and British, on the musical instruments during the past 120 years have been already alluded to, and in the case for instance of the simple single-beating reed is fairly evident.

At the close however of the eighteenth century there was a constant trade between this coast and China, and it has been suggested that the advanced skill and technical power of these Indians is due to some such—perhaps still earlier—communication with the Asiatic Continent. But this is not borne out by the musical instruments at any rate; for the employment of the whistle was unknown to the Eastern Asiatics until a comparatively recent period, their flutes being blown either vertically on the upper edge or transversely. Again, the special form of vibrator peculiar to these Eastern people—the free reed—is entirely absent, though it would have been quite easy to construct the reed of wood as is done by the Malays. I do not think that the trade with China or the arrival of any Japanese voyagers can have given to these Indians such musical principles as they have.

* cf. Dawson Report, 1878-1879, 8B seq.

Were it on the other hand Russian influence coming from the north, I do not imagine we should find the tribes most exposed to that influence (in what was once known as Russian America, now part of Alaska) contenting themselves with the drum and a rude rattle of claws and beaks, and altogether ignorant of these instruments.

It appears to me that we must look to Central America—Mexico and the home of the Aztecs—for the main source of inspiration. The whistle head was exceedingly well known to this highly-civilized nation. The ruins of their temples and sepulchres have produced large numbers of specimens—some simple whistles, others double, others with finger-holes. But how did communication between the two peoples take place? It may be, as Professor Mason has kindly suggested to me, that the Aztec tribes came in contact with the North-West Coast tribes *overland*: for the Shoshoni Indians—an Aztec tribe—pushed as far north as the 49th parallel, practically touching the Coast Indians at their southern limit. Or the knowledge of the whistle head may have reached them *by sea*—by coasting canoes,* or through the traffic which we know was maintained, after the fall of the Aztec power, all along the North-West Coast by the Spaniards.

Had the Spaniards however introduced it through European channels alone, and not as the conquerors of Mexico, we should I believe have found a more general use not only of instruments with finger-holes, but of instruments with *six* finger-holes instead of the four or fewer holes characteristic of the primitive Indian flutes and Aztec whistles. From the same source came probably the double-beating reed, though owing to the perishable nature of the wooden vibrators (for they could not be constructed of pottery or stone like the whistles) we have no Aztec specimens extant. The shape of the reed tapering to a point instead of widening out from a narrow base is distinctly peculiar and unlike the European and Asiatic reeds.†

* The Tsimshians, who are coast dwellers settled at the mouth of the great Skeena River, are known to have communicated to the Haida Indians of Queen Charlotte Islands the knowledge of the mystic rites with which the whistles are associated.

† It is interesting to note in connection with the description given above of the hour-glass form of instrument containing a concealed beating reed that in the mounds of Tennessee, Georgia, and the neighbouring States certain stone tubes of hour-glass form have been found and are generally supposed to be trumpets. Owing however to the large diameter of the upper end it is difficult, perhaps impossible, to sound them by the vibration of the lips, though the sound has been described by writers as terrific. And such would be the case if a wooden reed were inserted at the waist as in the common form of concealed reed found amongst the North-West Coast tribes. *cf.* Wilson: *Prehistoric Art*, p. 581.

Amongst the ruins in Mexico have been found specimens of the "Chayna": if this was identical with the "Jaina" of some existing Indian tribes in Peru it was played with a double-beating reed. The Aztec "Acocotl" was also played with a reed. *cf.* Engel: *History of Musical Instruments*, p. 73.

In the religious ceremonies of the Aztecs, which were human sacrifices, music too played an important part, and a flute (so called) was broken by the chosen victim before he met his death.

Linguistic* and other affinities also tend to confirm this theory that at some time and in some way a contact was formed between these coast dwellers and the tribes whose civilization was centred in Mexico.

Whether the Aztecs or their predecessors the Toltecs originated the whistle head we cannot say, or whether they brought it direct from some ancient Siberian home. Perhaps, after all, the myth of the white man who came across the Atlantic in a boat and taught them the arts and gave them the brighter and better side of their religion† may have been a fact, and that Europeans had visited the land of Anahuac before Cortes and his destroying horde closed the history of a highly cultured nation, and so successfully—alas, so unfortunately!—obliterated their past.

Though to ethnologists these few suggestions are probably valueless, my object will have been attained if I have awakened an interest in our fellow-subjects in British Columbia, and classified, in a way more worthy of the ingenuity and originality displayed, the whistles and reed instruments of the American Indians of the North-West Coast.

DISCUSSION.

THE CHAIRMAN.—We are enormously beholden to Mr. Galpin for this most entertaining and enlightening lecture, and I think the first thing we have to do is to express our gratitude. It is quite an honour to the Association to have a lecture of this sort, so full of matter, so complete, and so well put in every possible way. (Vote of thanks accorded unanimously.) I do not suppose many opportunities will offer themselves for employing such instruments as we have heard to-day in modern orchestras. The only opportunity I can think of is in Wagner's "Siegfried," when the hero is outside the *Dragon's* cave. If he used the instrument we heard described as the "Raven" instead of his little reed pipe it would doubtless wake the *Dragon* up more speedily. Such experiments have been made, as for instance in a

* In the Koluschan (Tlingit) family remote analogies to the Mexican tongue are in several of the northern tribes more marked than in any other (Gallatin).

† In this golden age, we are told, the air was filled with the sweet melody of birds. Were these the newly-formed whistles? Native song-birds are rare.

recent performance of Saint-Saëns's "Danse Macabre," in which a Burmese Xylophon was successfully introduced.

Mr. SOUTHGATE.—I may mention with regard to the curious drawing of the instrument with the two mouthpieces that there is a specimen in the museum at Canterbury somewhat like this. I remember seeing it some years ago, and was struck with it. The Chairman of the Museum Committee gave permission, and so I got the instrument out and made a drawing of it. As far as I remember it was like this. There was a great deal of ornamentation on it. They told me it had been given to them some eighty years ago by Mr. Lushington. I looked down the tube, and I think our lecturer's suggestion is right. There was evidently a place where the reed had been inserted. In design it resembled the methods used in the chanter of the Scotch bagpipe, and also the plan of the ancient pibcorn, where the reed is placed in a box, and is not under the control of the player's lips.

Mr. WELCH.—I should like to ask Mr. Galpin if he found any nose flutes among those tribes; for if they had derived their musical instruments from the islands of the Pacific Ocean no doubt there would be such.

Mr. GALPIN.—I have failed to find any trace of either the nose flute, or the primitive vertical flute, or the transverse flute. I should add however that there is a theory held by some, and derived from a similarity of carving and other arts, that these tribes are connected with the Maori of New Zealand; and though I do not go so far as to say that we can decide the question of relationship or no relationship by musical instruments, yet it is instructive to observe that the principles embodied in the Maori *putormo* or (so-called) "nose-flute" and the *pumoana* or conch trumpet are quite unknown to the Northern Indians.

Dr. MACLEAN.—I should very much like to ask the lecturer if the North American Indians are unique in having these polyphonic instruments.

Mr. GALPIN.—We find polyphonic instruments in China and the other parts of Eastern Asia, and in the Malay Archipelago, but they are of the free-reed type, a form of sound-producer not used by the Indians. Perhaps also the Chinese pigeon whistles may be considered polyphonic, but they show the primitive construction of the vertical flute. Polyphonic instruments of the true whistle form were known to the Aztecs and ancient Peruvians. In Africa we should not expect to find them, as wind instruments are very undeveloped except on the Mediterranean seaboard, where Arabian and European influences predominate. Polyphonic instruments have been known in Europe at any rate since the invention of the water organ in the third century B.C.

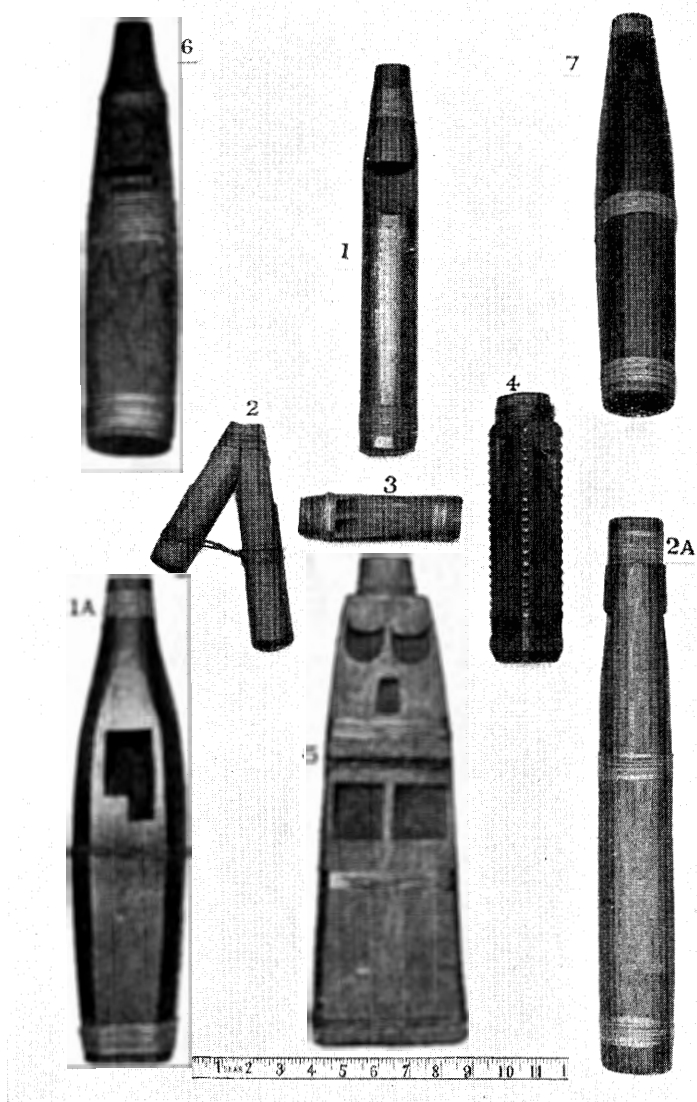
THE CHAIRMAN.—I should be glad to know if there is any connection between the music of the Aztecs and the Zuni Indians and the music of these North-West Coast tribes, as it is an interesting point whether the latter show an independent musical organisation, or whether either group shows kinship with the others; and whether the tradition moved from South to North or *vice versâ*. I hope Mr. Galpin may from the stores of his lore afford us another lecture as delightful as this.

MR. GALPIN.—As we have not considered the vocal music of the North-West Coast Indians to-day, it is impossible to enter upon a just comparison between them and other tribes, such as the Iroquois of the North, or the Zuni of the South, with their interesting ritual music and dances. But as regards the knowledge of the principles of sound production the other Indians are far behind those of the North-West Coast. The instruments they have either remain in a very primitive condition or are evidently due to the contact with Europeans—in the Southern States more particularly with the Spanish civilization. In connection with the remarkable development found on the seaboard of British Columbia, may I call particular attention to the derivation of the single reed from the double. By placing a slip of wood between the vibrating plates of the double reed, a twin reed of the single-beating type is at once formed. I should be very pleased if any of the audience would like to try these instruments after the meeting.

SIR FREDERICK BRIDGE.—I think the double tube anticipates the effect of the *voix celeste*. You see there is the same effect that they have in the French organs in the *cor de nuit* stop: they have two pipes, one tuned a little sharper than the other.

MR. SOUTHGATE.—The same thing prevails in the French harmoniums—the oboe is tuned a little sharper than the *cor anglais*.

PLATE I.



WHISTLES without finger-holes.

- 1, 1A. Stopt pipes, simple form. 2, 2A. Double-form. 3. Triple form (one at back). 4. Quadruple form. 5. Quintuple form. 6. Half-stopt pipe. 7. Open pipe.