

maxilla. That neither of them can be mandible follows from the fact that I have already demonstrated the true mandible. Removing the front rings altogether and spreading out flat the two posterior sclerites after removing the internal structures, we have the appearance shown in Fig. 3. In this figure we see the intimate connection between the beak and the maxillary structures. The two bristles are seen to arise from one base, and attached to the same source is the remnant of the maxillary palpus. The organ is much reduced, and probably not functional; but there is no doubt of its nature. By the pressure applied the base of the bristles is torn from the fastenings, which are distorted out of recognition. Figs. 4 and 5 give the true appearance. These two

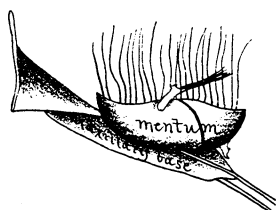


FIG. 4.

bristles represent the lacinia and stipes of the maxilla, developed in exactly the same way in which they are seen in the Diptera. In most species they are quite strongly modified at the tip and there is a permanent distinction in the character of the armature of the two bristles which will be of assistance ultimately in distinguishing the parts.

The remaining maxillary part, the galea, I identify with the beak, denying thus its character as labium and grown-together labial palpi. No one has questioned the fact that the beak in the Hemiptera is the homologue of the similar structure in Diptera, and this I have shown is a galear development. The steps in the development are clearly shown by studying a series of the long-tongued Hymenoptera in connection with the piercing Diptera including *Erax* and allies.

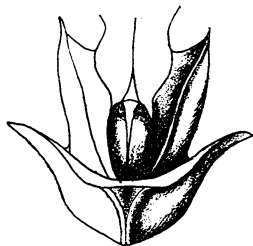


FIG. 5.

Exactly how the change to the normal Hemipterous structure occurred, I have not yet been able to ascertain. In this view the basal segment of the beak through which it is attached to the other maxillary parts, represents the cardo; the second joint the subgalea; while the third and fourth represent the two joints of the galea. In the apparently three-jointed beak the basal segment is so intimately connected with the head that it seems to form a part of it. Dissecting away all tissue from the head and leaving only the cardo of the maxilla and the other internal mouth structures attached thereto, we have the appearance from behind shown in Fig. 5. Centrally there is a boat-shaped structure, on either side of which there is a flat chitinous plate with two leaf-like membranous processes attached. On each side of this central plate, and imbedded in the tissue, is one of the

lancets. Seen from the side, as in Fig. 4, the boat-like form of the central organ is more obvious as are also the maxillary base and the lancets issuing therefrom. This boat is formed of two parts closely united along a suture which is parallel to the line of the suture separating the labrum, the anterior portion belonging in the cavity behind the labrum, the remainder belonging to the central head cavity. That portion of the process belonging in the frontal portion of the head is shown in Fig. 2 superiorly. Through the centre of this boat on the inside is a thin membranous plate, longitudinally furrowed in its centre, and from this central furrow sending up long flat filaments, the nature of which I have not recognized. This boat-shaped process I homologize with the mentum in mandibulate insects, the fulcrum of the Diptera. It is all that remains of the labium or second maxilla, if my interpretation of the structures is correct. Exactly at what point in the development the missing structures were lost, I cannot yet say; it will require close study in groups in which I have as yet no material at all. I am confident, however, that the above explanation of the homology of the structures will prove the true one.

JOHN B. SMITH.

Rutgers College, N. Y.

#### THE ETYMOLOGY OF THE TWO IROQUOIAN COMPOUND STEMS, -SKĒ<sup>n</sup>-RA-KEQ'-TE' AND -NDU-TA-KEQ'-TE'.

STUDENTS of Iroquoian terms have made attempts to analyze these two interesting compound-stems, but in making these analyses they overlooked the force and exact meaning of the component elements of these two stems, and so the etymologies they have put forth are erroneous. Too much weight was given to so-called "accepted authority," and indiscriminating compilation took the place of careful research.

It appears from the evidence of language that hitherto all students who have attempted to analyze these two compound terms have been misled by a mistranslation of the noun *Gaskenra*, made by Father Bruyas in his work mentioned below.

The writer will here cite what has been written by him upon the two stems in question as well as what has been written upon them by other authors who have had access to his writings. This is done for the purpose of showing to what extent Bruyas's erroneous translation has been an embarrassment to all his copyists; for they invariably quote his wrong definition of the noun in question, and yet make remarks, the reasons for which should have led them to the true etymology and signification of the elements and terms in question.

Father Bruyas<sup>1</sup> succinctly says, "*Gaskenra*, la Guerre. Inde *hoskenragetete*. S. 2ae conj. soldat." Again, on page 83 of the same work, he writes, "*OnnSta*, coton, duvet." And immediately below this, "*NondStage'te*, la Guerre. *HotinnondStage'tete*, les soldats."

Father Cuq, following his predecessors in Iroquoian glottology, writes,<sup>2</sup> "*Oskenna*, vieux mot qui n'est plus guère usité qu'en cp. avec le v. wakkehte, porter. Il devait signifier la guerre ou plutôt qq. instrument de guerre. *Roskenrakehte*, au pl., *rotiskenrakehte*, homme de guerre, guerrier, militaire, homme portant armes." This citation may be translated thus: "*Oskenna* [is] an old word which is not much in use now except in composition with the verb *wak-*

<sup>1</sup> "Radices Verborum Iroquæorum," Neo-Eborac<sup>1</sup>, 1863, p. 98.

<sup>2</sup> "Lexique de la Langue Iroquoise," Montreal, 1882, p. 36.

*kehte*, to carry. It must have signified war, or rather some instrument of war. *Roskenrakehte*, *rotiskenrakehte* in the plural, a soldier, warrior, martial man, man bearing arms." Again, on page 35 of the same work, we find, "*Onota*, jonc," i.e., *Onota*, "a rush or reed," being the *onnsta* of Father Bruyas.

Following M. Cuoq, Mr. Horatio Hale says,<sup>1</sup> "*Oskenra* is an ancient word for war. *Kakehte* is to carry. The compound word, *roskenrakehte*, means 'one who carries on war.'"

Lafitau, although clearly pointing out the true origin of the two compound stems in question, fails to deduce from it the exact etymology of either stem. He was evidently misled by the mistranslation of *gaskenra* by la guerre, war, made by Father Bruyas, as cited hereinbefore, for *ka-ske*<sup>2</sup> "*ra*" does not signify war. Before making an analysis of the terms at issue, the writer will here quote at length what Lafitau has written upon them. He says,<sup>3</sup> "Les Iroquois et les Hurons, nomment la Guerre *n'Ondoutagette* et *Gaskenrhagette*. Le verbe final *Gagetton*, qui se trouve dans la composition de ces deux mots, et qui signifie Porter, marque bien qu'on y portoit quelque chose autrefois, qui en étoit tellement le symbole, qu'elle en avoit pris sa denomination. Le terme *Ondouta*, signifie, le duvet qu'on tire de l'épy des Roseaux de Marais, et signifie aussi la plante toute entière, dont ils se servent pour faire les nattes sur quoi ils couchent, de sorte qu'il y a apparence qu'ils avoient affecté ce terme pour la Guerre, parce que chaque Guerrier portoit avec soy sa natte dans ces sortes d'expéditions. En effet la natte est encore aujourd'hui le symbole qu'ils représentent dans leurs peintures Hieroglyphiques pour désigner le nombre de leurs campagnes. Pour ce qui est du terme *Gaskenrha*, il est si ancien que les Sauvages eux-mêmes n'en savent plus la signification. Mais comme il seroit inutile de courir après des étymologies, sur lesquelles les naturels du pays sont embarrassés eux-mêmes, il me suffit de dire, que tout ce que les Sauvages portent dans leurs courses militaires, se réduit à leurs armes, à quelques ustenciles nécessaires dans les campemens, et à quelques provisions de farine préparées de la manière, dont je l'ai expliqué." This quotation may be rendered thus: "The Iroquois and the Hurons call war *n'Ondoutagette* and *Gaskenrhagette*. The final verb *Gagetton*, which is found in the composition of these two words, and which signifies to bear or to carry, shows, verily, that heretofore something was borne to it [i.e., to war] which was a symbol of it [i.e., of war] to such a degree that it [war] had assumed its [the symbol's] designation. The term *Ondouta* signifies the down [the wool-like substance] which is taken from the ear [cat-tails] of marsh-reeds, and it also denotes the entire plant, which they use in making the mattresses (nattes) upon which they lie, so that it appears that they applied this term to war, because every warrior, in this kind of expeditions, carried with him his own mattress. In fact, the mattress is still to-day the symbol employed in their hieroglyphic picture-writing to denote the number of their campaigns. As to the term *Gaskenrha*, it is so old that the Savages themselves no longer know its meaning. But as it would be profitless to run after etymologies concerning which the natives of the country themselves are perplexed, it suffices me to say that the entire equipage of the savages in their military expeditions consists of their arms, of some necessary utensils for the encampment, and of some provision of meal prepared in the manner which I

have explained." Again, on page 46 of the same Tome, while discussing the monogrammatic or hieroglyphic picture-writing of the Indians, Lafitau says, "Le nombre des expéditions est designé par des nattes. On distingue celles où il s'est trouvé, et celles où il a commandé, en ce que ces dernières sont marquées par des colliers attachés à la natte." This citation may be rendered thus: "The number of expeditions is denoted by mats or mattresses (des nattes). There is a distinction made between those wherein one was merely a member and those wherein he commanded, in this, that the latter are designated by having wampum-strings attached to them."

It is only by a figure of speech,—by metaphor,—that either one of the compound stems, *n'Ondoutagette* or *Gaskenrhagette*, signifies war or warfare, for neither of the component nouns of the two stems is denotive of war, nor does the verb-stem with which they are compounded signify warring or to make war.

In the following lines, the alphabet used in the orthography of the Iroquoian terms and stems, other than those quoted, is that of the Bureau of Ethnology, Smithsonian Institution.

The verb-stem *-keq-te'*, although having the form of the perfect tense of a simple verb, the present tense form of which is now not in use (being no longer a living form of the verb), has the force and meaning of a present tense; and it is for this reason that its personal or pronominal affixes are those of the perfect tense of regular verbs. It has a specific meaning only; namely, to bear or rather bearing [something] on the back [by means of the forehead strap]. Hence, for the purposes of etymology, to translate it simply by such general terms as "to bear," "to carry," and "to carry on," is a mere waste of time and a confession of the ignoring of its only and specific meaning which requires its composition with such nouns of things only which may be borne on the back. Indeed, the name of the forehead-strap, *ka-keq'-ta'*, is derived directly from it, the initial *ka-* being only a gender sign, and the final *-a'* a nominal formative.

In the compound stem *n'Ondoutagette*, cited by Lafitau, the initial *n* and apostrophe are used for the definitive *ne* pronounced as a proclitic. The noun in it is *on-du'-ta'* (*Ondouta*), which signified a reed or rush, the material for mat and mattress-making; the down, or cotton, of reeds, rushes, and plants; and, lastly, the war-mattress or war-mat.

To confirm what has been advanced in support of the writer's definition of the word *on-du'-ta'*, he will cite what is found in the "Huron Grammar" of Père Pierre Potier, dated about 1750. Therein are to be found the following entries, "*kandôta*, jonc à nattes," i.e., reed or rush for mats; again, under "Meubles d'une Maison," is to be found "*ondôta*, natte de guerre, i.e., war-mat or war-mattress. This is conclusive evidence as to the early meaning of *on-du'-ta'* as pertaining to warfare. Hence, *on-du'-ta-keq'-ta'*, the participial form, signifies, etymologically, 'bearing a war-mat or mattress on the back.' Replacing the initial gender-sign *o-* by the masculine pronoun of the singular third person of the anthropic gender, *ho-*, he, we have *hon-du'-ta-keq'-te'*, "he bears a war-mattress on the back," which was one of the customs of warriors on the war-path.

It has been said elsewhere in this article that *ka ske*<sup>2</sup> "*ra*" (*Gaskenrha*) did not mean warring or warfare. Lafitau states, in the citation from his work above quoted, that, in his time, its meaning was unknown to the Indians themselves. But, misled by Bruyas's mistranslation of it, he

<sup>1</sup> "Transactions of the Buffalo Historical Society," vol. 3, p. 72.

<sup>2</sup> "Mœurs des Sauvages Amérindiens, Comparées aux Mœurs des Premiers Temps," Tome I., 194-5 pp. Paris, 1724.

doubtless asked them if the word meant war, and, receiving a negative reply, he at once inferred that as it must be an archaic word for war its signification had been forgotten by the Indians; for was it not still the component element in a compound meaning war and warrior? This inference, however, was erroneous.

Since it is compounded with the verb-stem *-keq-te'*, it must like *on du'-ta'* signify something which had to be borne on the back by the warrior. Under the heading, "Meubles, mesnages, outils," i. e., "Family or household goods, tools, etc.," Fr. Gabriel Sagard, in his "Dictionnaire de la Langue Huronne" (1632), wrote "Ballet, *Oscoera*." In the fifth edition of the "Dictionnaire de l'Academie Françoise," Paris, 1825, there are two forms of the word "ballet" given; one of these is "balle," signifying a large pack of goods, bound with cords, and wrapped in coarse linen cloth, and the other is "ballot," meaning a large pack or bundle of family or household goods. The word bale is evidently the correct rendering of this word. But it is very improbable that a bale as such formed a part of the family and household goods and tools of the early Hurons. It is likely, however, that *oscoera* signified a mat woven from the common Indian hemp (Apocynum Cannabinum), and thus merely a form of the modern Mohawk, and perhaps proethnic, *oska'ra'*, flax, hemp, tow, the Tuskarora form of which is *u'-ska-rè*, meaning shawl, blanket, bedding, bed-cover, whatever is spread to lie upon; being found in *yä-čka-re n'-kua'*, "one uses it to spread," which is a descriptive name of a carpet. Father Bruyas (on page 115, op. cit.) has "*Gentskaron*, estendre, mettre la natte," i. e., to spread or lay the mat or mattress; and "*Gentskare*, S. natte, avoir une natte," i. e., a mat, to have a mat, mattress. Père Pierre Potier (op. cit.) has "*kaskara*, tout ce qui sert à coucher," i. e., all that which is used for bedding. It is thus seen that the noun-stem *-skar-* has the same meanings that *-ndut-*, the stem of *on-du'-ta'* has, but it has a wider application in the modern vocabulary. There is no attempt made here to connect these stems etymologically, but a similar sematologic development only is shown in the two stems.

The stem of *ka ske<sup>n</sup>'ra'* is *-ske<sup>n</sup>'r-* or better *-ske<sup>n</sup>'r-*. In the stems *-skar-* and *-ske<sup>n</sup>'r-*, we have two generic noun-stems, having the same consonnatic sounds, sustaining one to the other the same positions in the two stems respectively, but differing in the interconsonantic vowel which vocalizes them. Nevertheless, it is assumed that these two stems are derived from one and the same proethnic source. It is clear that the stem *-skar-* is the older form, in that it is the simpler of the two. The change of the mid-stem vowel *a* to *e<sup>n</sup>* is explained by the presence of the "interrupted explosive," represented by an apostrophe before a following *r* and by the presence of a *k* immediately before the vowel changed. The cause of the change was the "interrupted explosive," which became a part of the stem by analogic metathesis, a procedure which is not unknown in this language. So that there exists no formidable phonetic difficulty in the way of regarding the two stems *-skar-* and *-ske<sup>n</sup>'r-* as derivatives from one and the same proethnic form, having the meanings possessed by the stem *-skar-*, already given above. Thus, it appears that *ka-ske<sup>n</sup>'ra'* meant a mat or mattress; and this is the meaning which is absolutely required by the verb stem *-keq-te'* with which it is compounded.

Thus, both the compound-stems *-ske<sup>n</sup>'ra keq-te'* and *-ndu-ta-keq-te'* were denotive of a custom of the Iroquoian warrior when on the war-path. The pronominal prefixes have been suppressed for brevity's sake. Prefixing the pronoun

of the third person masculine singular of the anthropic gender, *ro-*, to the first, we have *ro-ske<sup>n</sup>'ra-keq-te'*, "he bears a mat on the back;" and *ho-*, a dialectic form of *ro*, to the other we have *ho ndu-ta-keq-te'*, he "bears a mat on the back." So that in the baldest English a warrior was a "mat — or mattress — bearer," in the tongues of the Iroquoian peoples.

J. N. B. HEWITT.

Washington, D. C., March 15.

#### FORTHCOMING SCIENTIFIC BOOKS.<sup>1</sup>

THE following is a list of scientific works which will be issued by various English publishers in the course of the spring: —

Messrs. Macmillan & Co. — "Essays on some Controverted Questions," with a Prologue, by Professor Huxley; "The Beauties of Nature," by Sir John Lubbock, F.R.S., illustrated; "Island Life, or The Phenomena and Causes of Insular Faunas and Floras," including a revision and attempted solution of the problem of geological climates," by A. R. Wallace, with illustrations and maps, new and cheaper edition; "The Apodidae," a morphological study, by Henry M. Bernard, illustrated (Nature Series); "Experimental Evolution," by Henry de Varigny; "The Diseases of Modern Life," by B. W. Richardson, F.R.S., new and cheaper edition; "The Geography of the British Colonies" — "Canada," by George M. Dawson, "Australia and New Zealand," by Alexander Sutherland (Macmillan's Geographical Series); "Scientific Papers," by Oliver Heaviside; "The Algebra of Co-Planar Vectors and Trigonometry," by R. B. Hayward, F.R.S., assistant master at Harrow; "Key and Student's Companion to Higher Arithmetic and Elementary Mensuration," by P. Goyen, inspector of schools, Dunedin, New Zealand; "Arithmetic for Schools," by Barnard Smith, late fellow and bursar of St. Peter's College, Cambridge, carefully revised in accordance with modern methods by W. H. H. Hudson, professor of mathematics, King's College, London; "Blowpipe Analysis," by J. Landauer, authorized English edition by J. Taylor and W. E. Kay of the Owens College, Manchester, new edition, thoroughly revised with the assistance of Professor Landauer; "Nature's Story Books," I., "Sunshine," by Amy Johnson, illustrated.

The Clarendon Press. — "Mathematical Papers of the late Henry J. S. Smith, Savilian Professor of Geometry in the University of Oxford," with portrait and memoir, two volumes; "Plane Trigonometry without Imaginaries," by R. C. J. Nixon; "A Treatise on Electricity and Magnetism," by J. Clerk Maxwell, new edition; "A Manual of Crystallography," by M. H. N. Story-Maskelyne; "Elementary Mechanics," by A. L. Selby; "Weismann's Lectures on Heredity," Vol. II., edited by E. B. Poulton, F.R.S.; "Epidemic Influenza," by F. A. Dixey.

The Cambridge University Press. — "A Treatise on the Mathematical Theory of Electricity," by A. E. H. Love, fellow of St. John's College, Cambridge, two volumes, Vol. I. in the press; "The Origin of Metallic Currency and Weight Standards," by W. Ridgeway, professor of Greek, Queen's College, Cork, and late fellow of Gonville and Caius College; "Solutions of the Examples in 'A Treatise on Elementary Dynamics,'" by S. L. Loney, formerly fellow of Sidney Sussex College, Cambridge.

Messrs. Longmans & Co. — "Darwin and after Darwin: an Exposition of the Darwinian Theory, and a Discussion of Post-Darwinian Questions," by George John Romanes, F.R.S., two volumes.

Messrs. A. & C. Black. — "Life in Motion, or Muscle and Nerve," a series of lectures delivered at the Royal Institution, Christmas, 1891, by John Gray McKendrick, F.R.S., illustrated.

Messrs. J. & A. Churchill. — "A Treatise on Hygiene," edited by Thomas Stephenson and Shirley F. Murphy, in two volumes, with numerous illustrations, Vol. I. nearly ready; "Chemical Technology, or Chemistry in its Applications to Arts and Manufactures," edited by Charles E. Groves, F.R.S., and William Thorp (with which is incorporated "Richardson and Watts's Chemical Technology"), Vol. II. "Lighting: Fats and Oils, Candles, Stearine, Gas, Electric Lighting;" "Materia Medica, Pharmacy,

<sup>1</sup> From Nature.