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# THE OTTAWA NATURALIST

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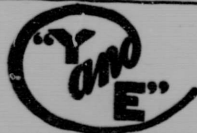
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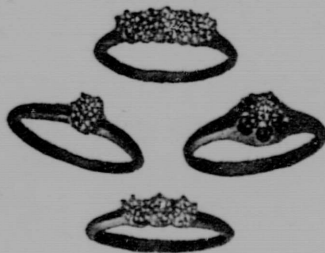
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# THE OTTAWA NATURALIST

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VOL. XXIII. OTTAWA, AUGUST, 1909

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## CERTAIN BIOLOGICAL PRINCIPLES AND THEIR PRACTICAL APPLICATION IN THE IMPROVEMENT OF THE FIELD CROPS OF CANADA.

By L. H. NEWMAN, B.S.A., Secretary, Canadian Seed Growers' Association, Ottawa.

*To learn what is true in order to do what is right is the summing up of the whole duty of man.*—T. H. HUXLEY.

Modern science has done much to awaken a greater interest in the improvement of the lot of man by giving us a better understanding of life processes. A more comprehensive knowledge of the laws which determine our well-being in the physical world has resulted in the control of many dread diseases. A greater knowledge of the interaction of, and the relation between, hereditary forces and environment places within the reach of man a remarkable power in guiding and controlling the creative forces of nature. This last makes possible the betterment of the condition of man through the improvement of his food.

The world's supply of food to-day is directly dependent upon one great kingdom—the vegetable kingdom. At first man depended for his livelihood upon the chase and the fruits, seeds and herbs which nature provided. This source, however, soon required to be supplemented so that we find even our primitive races resorting to the raising of crops as a means of sustenance. The native forms of plant-life which were utilized soon responded to the hand of man, and from this early beginning dates the improvement of plants.

The great complexity and diversity in the forms of vegetation which clothe the surface of the earth has long been a question to haunt the mind of the scientist and the philosopher. That new species were constantly being produced in nature was a recognized fact as long ago as before the birth of Christ, but the exact manner in which these were brought into existence has long remained obscure and puzzling.

For many years our leading naturalists and biologists have been engaged in investigating these problems and in classifying their observations under natural and well defined laws. It is only within recent years, however, that the student of natural progression has been able to deduce from his observations and study any suggestion as to how plants under domestication might be "bred up" by the applications of principles common to all living phenomena.

#### HISTORY OF THE PROGRESS OF THE IDEA OF SPECIES FORMATION.

In order that we may clearly understand the possibilities of the artificial interference in plant life as a means of evolving improved races and strains, and that we may see how far such work is based on scientific and, therefore, sound principles, we shall examine briefly some of the various theories and ideas which have been advanced respecting the manner in which our present species, varieties and strains have come into existence.

We find that the idea of organic progression or evolution had its birth among the early Greeks, its renaissance among the early natural philosophers beginning with Bacon and extending to the time of Herder (1744-1803) and that these men in turn served to inspire further investigation and study by Buffon, Erasmus Darwin and Goethe, all of whom are considered as contemporaries of Darwin, the first real propounder of evolution.

Evolution, as a natural explanation of the origin of the higher forms of life, developed from the mythological teachings of the early Greeks into the general conception of Aristotle (384-322 B.C.) who, over 2,200 years ago, believed that higher forms of life originated or were developed from lower forms in some mysterious way. Development or the gradual perfection in the structure of an organism was Aristotle's main thesis and constituted the principle thought in his natural philosophy. He was also a strong believer in the law of adaptation and in atavism. The principle of Syngenesiis was recognized long before Aristotle's time by Empedocles, who may be said to be the father of evolution. Empedocles conceived the idea of "The survival of the fittest" six centuries before Christ.

Epicurus (341-270 B.C.) established the distinction between natural and supernatural causation, and gathered arguments from his predecessors to support the principle of natural law.

The idea of the changing rather than of the fixed order of things had its origin among the Greeks in Heraclitus (505-475 B.C.)

¶ For many centuries all study was subject to the approval of the church so that from the time when Christian doctrines shook off Aristotelianism or the scientific reading of the Bible until

Suarez' time in the middle of the 16th century no progress was made in the evolution idea.

In the latter part of the seventeenth century and in the early part of the eighteenth there were three main classes of writers, viz.:—The Naturalists, the Speculative Evolutionists and the Natural Philosophers. To the latter class belong such eminent writers as Bacon, Descartes, Leibnitz and, belonging to the German School, Kant, Herder, Lessing and Schelling.

Bacon (1561-1626) was the most active of the early writers in pointing out the evidences of the mutability of species and in attempting to show the bearing which variation has upon organic progression. There was also shown at this time the analogy between artificial selection and natural selection. It is interesting to know that at this early period (beginning of 17th century) mutability of species was recognized and looked upon as a live question.

#### SCIENTISTS OF THE EIGHTEENTH AND NINETEENTH CENTURIES.

In the eighteenth and early nineteenth centuries, we find many writers of note propounding theories as to the manner in which species have originated. De Maillet (1656-1738) tried to show the influence exerted by habit and environment in inducing changes in the nature and form of a plant, but, unfortunately he went to extremes by claiming that modifications acquired during a single life were transmitted in toto.

Maupertuis (1698-1759) advanced a theory of generation resembling closely that of Darwin, and which anticipated to some extent the modern idea as to the causes of fortuitous variations.

Linnæus, a Swede, (1707-1778) the great father of botany, marked the beginning of zoology and botany as now understood. The binary system of nomenclature proposed in his great work *Systema Naturae* enabled him to show the relation of animals and plants to each other. At first, Linnæus looked upon species as having been created directly by the Creator and he believed in the absolute fixity of species. Later, however, he was compelled to alter his views somewhat owing to the multiplication of species which he observed everywhere in nature. We therefore see in the revision of *Systema Naturae*, which he made in 1760, a pronounced change, the mutability of species being more clearly recognized.

Buffon (1707-1788) took more radical views re the mutability of species than did Linnæus, and laid the foundation of modern evolution in zoology and botany. He was the first to point out clearly the relationship between mutability of species and environment. He is thus the first to indicate some of the causes of mutability.

Erasmus Darwin (1731-1802), grandfather of Chas. Darwin, was one of the poets of the evolution idea. Like some of the early Greek writers he believed in the doctrine of spontaneous generation, but in the lower forms of life only. In the chapter on Generation in his "Zoonomia" (1794) he takes little account of the laws of heredity, but believes that by the addition of parts resulting from changes of environment exciting the "living filament" into action, new characters are acquired and these are capable of being transmitted. This theory it will be seen anticipated that of Lamarck.

#### THE LAMARCKIAN THEORY.

Lamarck (1744-1829) was the real founder of the modern theory of descent and is the most noted scientist and writer between the time of Aristotle and that of Chas. Darwin. Laboring under discouraging conditions and receiving nothing but disdain by the majority of his contemporaries he succeeded nevertheless in contributing much to natural science. In his "Philosophie Zoologique" (1809) he expresses certain views which correspond closely with those held by E. Darwin and expressed by him in his Zoonomia. The main theory which Lamarck advanced and which is now known as the Lamarckian theory in contradistinction to the Darwinian theory, claims that evolution takes place through the inheritance of characters acquired during the lives of individuals so that in time new species may be created. The endeavour to satisfy certain wants brings about certain modifications which are inherited in part at least. This theory made no great impression at the time although it has been revived within recent times by a school known as the Neo-Lamarckians to which school Herbert Spencer and other prominent scientists belong. While the theory seems to explain many of the facts of inheritance yet it fails to show a case wherein a single acquired character has been permanently transmitted. As an instance we have the continued docking of horses and lambs, yet there is no case on record of one of these animals being born without a tail.

Goethe (1749-1832), the great poet of evolution, developed the "unity of type" idea in 1796. This led him to explain the existence of vestigial structures which constitutes one of the strongest evidences of evolution.

Bory de St. Vincent (1780-1846) believed that species are formed spontaneously and that this process goes on more rapidly in countries of comparatively modern formation. His idea was that the existence of a long series of ancestors tends to fix the type.



Isidore St. Hilaire, (1805-1861) son of Geoffroy St. Hilaire, advanced the theory that species were limited in their mutability. He claimed that new characters may be produced as a result of two forces:

- (1) The modifying influence of new surroundings,
- (2) The conserving influences of heredity.

Dr. W. C. Wells in 1813 was the first to apply the principle of "The survival of the fittest." He based his theory on the observation that no two individuals are alike and that those which are best fitted to withstand the exigencies of a particular country or locality are most likely to survive. In 1831 Patrick Matthews applied a similar view in a book on naval timber.

#### THE DARWINIAN THEORY.

It remained with Chas. Darwin (1809-1882), to bring out a well rounded theory attempting to explain the origin of species and varieties. His great work under this name was inspired by an essay by Malthus on "Population" written in 1798. After many years of most thorough work in which he collected an immense amount of evidence he crystallized his views on the subject into a theory known as the "Theory of Natural Selection." In a word this theory implies that favorable variations are preserved while the injurious or inferior variations are rejected. That is to say that in the struggle for existence only the strongest individuals survive while the weaker succumb to the various active forces of nature. This principle assumes that constant variation is going on within the race and that by the gradual accumulation of slight favorable variations new species are formed. Darwin based his theory of natural selection largely upon the results realized by man in artificially selecting from his flocks and herds. He recognized that variation might be induced as follows: (1) By environment. (2) By the use or disuse of parts. (3) By certain inherent forces causing definite variation. (4) By the tendency of variations to become co-related. (5) By reversion. (6) By telegony. Two main classes of variation were recognized, viz.: fluctuating variation and discontinuous variation. Darwin believed that fluctuating variations had been utilized most by the breeder although it is difficult to distinguish between the two. According to Quetelet, Galton and others, these fluctuating variations are grouped around a "mean" in such a way that approximately half are below the mean and half above.

Wagner claims that variation, isolation or selection, and heredity constitute the tripod of organic evolution. In other words, plants are constantly changing in character, and, since like tends to beget like in plants just as in animals, the isolation

or selection from year to year of the most desirable individuals results in a gradual improvement in the race until certain limits have been reached.

While natural selection is, without doubt, a potent factor in the developing or creating of new species in nature, and while its action there may suggest the value of artificial selection as a means of improving domestic types, yet, it fails to account fully for the existence of our present species. This assertion is based on the following facts: (1) Natural selection is based upon variations which it cannot explain. (2) Certain of these variations cannot have been of any possible use to the individual and, hence, cannot have operated in its evolution. (3) Life, according to certain authorities has not been possible on the earth for a sufficient length of time to allow the development of all of our present species, had these been developed as slowly as would be required by the action of natural selection. (4) The numerous transitional links between species, which would of necessity exist had evolution come about as gradually as would be required by the natural selection of the "fittest," are not found.

We must, therefore, look to some internal factor upon which to base the laws governing the origin of species. Darwin himself recognized the insufficiency of his theory at a later date, and attempted to supplement it with his theory of "Pangenesis," but failed to contribute much toward the elucidation of the problem.

#### ATTEMPTS TO FIND INTERNAL CAUSES OF VARIATION.

Passing on from the time of Darwin we find the leading investigators searching for an internal force to explain the origin of variation. The German botanist Nageli was the first to attempt to find within the organism itself a force which might account for the appearance of strange characters in the offspring. He assumed the existence within the organism of a tendency toward progression or perfect development and believed that in accordance with this tendency organisms are continually varying so as to rise in the scale of nature. He failed, however, in explaining the origin of this internal force, so contributed little toward our better understanding of the question involved.

Another theory is advanced by Mivart to the effect that species have arisen suddenly and not by slow modifications hence the theory of "extraordinary births." An instance of the application of this theory is found in connection with an experiment conducted by Dr. Godron, of Nancy, with *Datura Tatula*, (Purple Thorn Apple), the seed capsules of which plant are normally covered with spines. Seeds of this plant were sown and produced plants among which was found a plant whose seed capsules were

smooth. The seeds of this were preserved and again sown with the result that all the plants coming from them showed the same peculiarity. Each successive progeny from this seed showed the same characteristics as long as the experiment was conducted. When the smooth variation was crossed with the original forms true hybrids were produced which, in the second generation, reverted to the original type.

We probably have many so-called rare species at the present time which have been created in a like manner. Mivart believes that all species arise in this way. He claimed to be able to recognize an internal law presiding over the action of every part of every individual and of every organism as a unit. His theory is a sort of a compromise between evolution and special creation. While it has many things in its favor and while many of the objections which apply to the theory of natural selection do not apply in this case, yet it will not account for all of the facts of nature, and can only be considered to constitute one of the possible factors in organic evolution.

#### WEISMANNIAN THEORY, OR NEO-DARWINISM.

In 1883, Weismann, a German Naturalist, undertook to show how acquired characters cannot be transmitted and how permanent variations can originate. He outlined the development of the individual from the single cell, the fertilized egg, showing how the cell divides and how, while those cells which go to build up the different parts of the body become differentiated, other cells, the reproductive or germ cells, remain constant. Continuing he attempted to show that the property of being able to transmit definite characters to the offspring is peculiar only to the germ cell, hence permanent variations must emanate from this cell. Since environment can effect the body or soma cells and not the germ cell, it is clear, according to Weismann, that acquired characters cannot be permanently transmitted. At the same time it is reasonable to believe that the temporary "fattening" or "starving" of the germ cell due to the favorable or unfavorable environment of the individual which bears it would be noticeable for one or two generations as indeed seems to be the case.

Galton in his book on "Natural Inheritance" disparages the idea that progression can take place only by the accumulation of minute variations, and characterizes such an inference as fallacious.

Bateson, in his "Material for the Study of Variation" refers to the two possible ways in which variations may arise and points out the principle objections to the claims made for fluctuating variations while at the same time he collates many facts respecting the importance of discontinuous variations.

*(To be continued)*

ALGONKIN AND HURON OCCUPATION OF  
THE OTTAWA VALLEY.

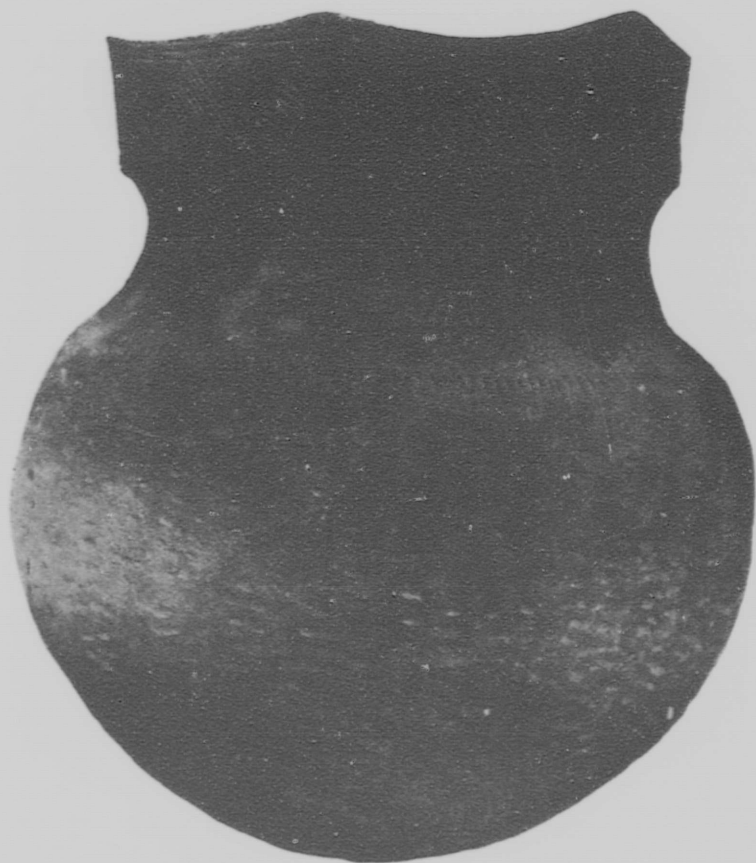
BY T. W. E. SOWTER, OTTAWA.

(Continued from page 68)

Iroquois tradition assigns to Squaw Bay, called also Cache Bay, at Tetreauville, the reputation of having been one of the favorite lurking places of these war-parties. It must have been in those days, an ideal spot for an ambush or concealed camp, as it occupied, for the purposes of river piracy, as unique a position on the old trade route, as does one of our present day toll-gates, for controlling the traffic on a turnpike road. There is no doubt of the place having been used as an Indian camping ground, at least in prehistoric times, as the shores of the bay are littered in all directions with fragments and flakes of worked flint. This is an instance in which tradition is corroborated, to some extent, by archaeology.

It is also said that Brigham's Creek, called also Brewery Creek, a narrow channel of the Ottawa, was the old Indian portage route for overcoming the rapids of the Chaudière. It may be seen by glancing at a map of the city of Hull, that parties of Algonkians or Hurons, as the case may have been, upon emerging on the main river at the head of this portage, were liable at any time to receive a warm welcome from some surprise-party of Iroquois visitors at the Squaw Bay camping ground. If descending the rapids of the Little Chaudière, they faced a far worse predicament, as, unable to escape or defend themselves in the swift current, they would have been caught, like passing flies that are blown into a spider's web.

It is said that Indian cunning was at length successful in evolving a plan to outwit the military strategy of the Iroquois. As the old portage route had become dangerous it was resolved to have an alternative one. In ascending the Ottawa, this new portage started from the western shore of Brigham's Creek at a point now occupied by the International Cement Works. It continued thence in a westerly direction, skirting the foot of the mountain and passed down Breckenridge's Creek to the outlet of that stream into Lake Deschênes. It was rather a long portage of about a dozen miles, but the Algonkin and Huron had learned in the school of bitter experience, that, in their case, the longest way round was the shortest way home. An aged squaw, who lived in Aylmer many years ago, spoke of a similar forest trail that extended, in the early days, from a point on the Gatineau



This figure represents a clay vessel, which was found by Mr. James Lusk, on his farm, Lot 20, Range XI., Township of Eardley, Wright Co., Que. It was purchased from Mr. Lusk in the year 1903, and is now in the Archaeological Section of the Geological Museum at Ottawa, where it is indexed as No. 3282A. The vessel is 11 inches in height and 33 inches in circumference.

(The photograph, from which this reproduction was made, was kindly furnished by the Geological Survey Department.)

near the site of Chelsea, thence by way of Kingsmere to a point on Lake Deschênes, now occupied by the town of Aylmer.

Reference has already been made to Indian camping grounds, which dot the shores of the Ottawa at frequent intervals. Let us see what can be made out of them, by a close examination of the relics they have yielded. The writer is convinced that these camp sites are of Algonkin origin, and that they bear evidences of casual contact, if not of more prolonged social intercourse with the Hurons. That is to say, that it looks as if the Hurons had been friendly visitors, who had spent much of their time in these Algonkin camps. These camp sites seem to have been selected with a view to observation, defence or escape in cases of sudden attack. The Hurons built their villages at some distance from the water highways, so as to escape observation by inquisitive tourists, who might wish to attack them. They also selected their village sites where the land, within a convenient distance, was suitable for agriculture. The highways of communication used by these village communities, were the innumerable forest trails, which traversed the Huron country in all directions. On the other hand, the Algonkins of the Ottawa have left traces of their camps along the edges of the river, on points of land which afford a good view up or down stream. They have been called canoe Indians and were at home on the water. As they were much more expert in the management of their birchen vessels than the Iroquoian races, they were in a position, on the shores of the river, to escape by water from a too powerful enemy approaching by land, or they could retire to the forest if an overwhelming fleet appeared in the offing.

These camp sites are strewn with fragments of blackish flint, evidently procured from the Trenton limestone at the Chaudière, where it is found in great abundance, especially along Brigham's Creek, the old Indian portage route. Arrow-heads, fabricated from these fragments, are also found on these Algonkin camp sites. But there is also found an arrow-head of a different pattern, that is made from flint that has a lighter color and a broader and cleaner conchoidal fracture than the Algonkin forms. These arrow-heads bear a striking resemblance, in every respect, to those from the Huron country in western Ontario, and there are no flakings of this latter flint to show that they were fabricated in these Algonkin workshops. This seems to be negative evidence that they were not made on the Ottawa, but may have been brought there by Huron visitors. It is not, of course, conclusive evidence of Huron occupation, but rather of Huron contact, more or less prolonged. A long knife of Huronian

slate, discovered on the Ottawa, by George Burland, with a broken gorget and a crescent shaped woman's knife, each of Huronian slate, found on the Bonnechere by Edward Moore, of Douglas, Ont., seem to be additional evidence of the presence of Hurons in the Ottawa Valley.

There are two other camp sites, however, that differ essentially from the foregoing and are without doubt distinctly Huron. The former of these was discovered by R. H. Haycock, of Ottawa, and the latter by Dr. H. M. Ami, of the Geological Survey.

In the fall of 1859 and the spring of 1860, the late Edward Haycock built a residence in the city of Hull, on the point now occupied by Gilmour's Mill. While making excavations for the foundation of a summer house, the workmen laid bare several ash-beds, at a depth of from two to three feet below the surface. Among other things, these beds contained fragments of Indian pottery in great abundance.<sup>1</sup> Mr. R. H. Haycock examined them closely and reports them as having been of a dark brown color, decorated with incised lines, notches and indentations. According to Mr. Haycock's description, this pottery, both in composition and decoration, was similar to that unearthed from old ash-beds in the Huron country, in Ontario.

One may observe, on approaching Hull by the Alexandra bridge, an extensive cut bank of sand and gravel, between the E. B. Eddy Co.'s sulphide mill and the end of the bridge, and between Laurier Ave., and the river. This is the place from which the late Edward Haycock procured sand for building purposes on the Eastern and Western Blocks of the Departmental buildings, at Ottawa. During the excavation of this bank, a great many Indian relics were discovered, such as womens' knives, arrow-heads, tomahawks and pottery, but no description of this pottery is obtainable. Here, according to white and red tradition, many bloody encounters took place between parties ascending or descending the river.

In the archaeological department of the Geological Museum at Ottawa, there is a large array of pottery fragments collected by Dr. H. M. Ami, some years ago, from an old ash-bed at Casselman, Ont. In the same cases, are specimens of Huron pottery from village sites in western Ontario, and, in comparing the two collections one is quite satisfied that both are products

<sup>1</sup>"In some places rude pottery is found at a considerable depth, from different causes. In fire-places this may come from the practice of placing the fire in excavations in the ground." Earthenware of the New York Aborigines. William M. Beauchamp, Bulletin, New York State Museum, Vol. 5, No. 22, p. 80.

of the same school of ceramic art. The ash-bed was large and deep and Dr. Ami is of the opinion that it had been used as a fire-place for a considerable length of time. There is no doubt that Dr. Ami's discovery is of the highest importance in establishing proofs of Huron occupation of the Ottawa valley.

There are, also, in the Museum, two perfect specimens of Indian pottery from lot 20, range 11, Eardley township, Wright Co., Que. They were procured from James Lusk, who discovered them on his farm, where they had been washed out of the banks of a small creek during a freshet. They are superb examples of aboriginal art, and it is difficult to understand how they could have been brought to such symmetrical proportions without the use of a lathe. Compared with similar vessels figured in the Ontario Archaeological Reports, it seems impossible to doubt that they are of Huron origin. These vessels are similar in pattern and have been fabricated from the same clayey composition, with the same band, decorated with characteristic incised lines, about the top, and a wave-like edge on the summit of the rim, as are found in some of the Huron forms. As to whether the spot where this pottery was found is an ancient village site, will be an interesting subject for future investigation.

Let us now consider another phase of the question of Huron occupation, that seems to be more conclusive even than the discovery of ash-beds or pottery, the evidences of ossuarial burial. The graves of a nation are indexes of its intellectual development, from the rude cairn of the wandering savage to the Taj Mahal of the imperial ruler. Could we have mingled in the activities of palaeocosmic man, and witnessed the rite of sepulture by which the Old Man of Cro-Magnon was laid to rest in his cave-sepulchre on the Vézère, in the Dordogne Valley, then, the last rites about the grave of that post-glacial patriarch might have yielded us a store of knowledge that would have been invaluable to us in studying the savage culture of ancient Europe, such as the rude efforts of primitive man to interpret natural phenomena or to recognize in the variant manifestations of natural forces the evidences of divine anger or approbation. So, also, if we could have witnessed the burial rites of the Huron nation, in what was called the Feast of the Dead, they would have proved most instructive. They might have cleared up much that is obscure in regard to the ultimate destiny and relationship of the two souls, the one that took flight to the land of spirits, at the hour of death, and the other that awaited the final interment, before taking its departure. They might have given us an insight into the philosophy of Indian burials, which would have explained the presence or absence of warlike or domestic implements in Huron ossuaries. But, fortunately for



archaeology, the Jesuits and other contemporary writers have told us much that is invaluable concerning this important festival.

Reverence for their dead was a marked characteristic of the Huron people, a sentiment that was common among all the red races. It is doubtful if those refinements of Christian feeling that find expression in the mortuary rites of our civilized white races, are one whit more profound than those outpourings of sorrow, which were lavished by the Hurons upon the remains of their departed relatives, at their periodical Feasts of the Dead.

When the early settlers, in western Ontario, were clearing up their lands, they were frequently puzzled at the discovery of large pits filled with human bones, together with warlike and domestic implements and articles of personal adornment, all crowded together in these communal sepulchres. These bone-pits or ossuaries were at first attributed to burials for the disposal of the slain after great battles, or of those who had perished during epidemics of disease. Their true origin, however, was established beyond conjecture by the Jesuit Relations.

Parkman, in the Jesuits in North America, has given us graphic details of what the Hurons considered their most solemn and important ceremonial. It was witnessed by Brébeuf at Ossossané, in the summer of 1636, and a report of it embodied in his Relation of the same year. The following brief description of the solemnity, compiled from the works of these writers, may answer our purpose, without going into details.

Every ten years, or so, each of the four nations of the Huron confederacy held a Feast of the Dead. The time and place, at which the feast should be held, was decided by the chiefs of the nation, in solemn council. All preliminary arrangements having been made, the dead of the past decade were collected from far and near and conveyed to the common rendezvous. Previously however, the corpses which had, as usual, been placed on scaffolds or, more rarely, in the earth, for the time being, were removed from their temporary resting places and prepared by loving relatives for the final rite of sepulture. The bones of such as were reduced to skeletons were tied up in bundles like faggots, wrapped in skins and clothed with pendant robes of costly furs. The bodies of the more recent dead were allowed to remain entire and were clothed also in furs. Then these ghastly bundles of mortality were hung on the cross-poles, which later on sustained the corn harvest, of the principal long-house in the village, and, while the mourners partook of a funeral feast, the chiefs discoursed upon the public or domestic virtues of the deceased. Then commenced the wierd funeral march along the woodland paths

through the gloomy pine forests of old Huronia, the mourners uttering, at intervals, dismal wailing cries, supposed to resemble those of disembodied spirits wending their way to the land of souls, and thought to have a soothing effect on the consciousness still residing in the bundles of bones, which each man carried.

The Jesuits had been invited, by the chiefs of the Nation of the Bear, to come to Ossossané and witness the rite. This great town of the Hurons lay some distance back from the eastern margin of Nottawassaga Bay, in the midst of a pine forest. What a sight it must have been to those Europeans, as, one after another, the weird funeral corteges, converging from the various towns of the Bear, issued from the surrounding forest.

During the delay, in awaiting the complete assemblage of the nation's dead, the squaws ladled out food for the inevitable feast, while the younger members of both sexes contended for prizes, donated by mourners in honor of departed relatives. So great was the assemblage that the houses were crowded to suffocation and large numbers had to camp out, in the adjacent forest. The bundles of dead were hung from the cross-poles in the houses, and in the one where the Jesuits were housed upwards of one hundred packages of mortality decorated the interior of the building. The Jesuits passed the night in one of these places, and endured the ordeal with Christian fortitude.

Finally, the signal was given, by the chiefs, for the consummation of the concluding rite. The packages of dead were opened and tears and lamentations lavished upon their contents. Brébeuf refers to one woman in particular, whose ecstasies of grief, over the bones of her father and children, were pathetic in the extreme. She combed her father's hair, and fondled his bones as if they had been alive. She made bracelets of beads for the arms of her children, and bathed their bones with her tears. It was the same divine light of motherhood, which thus irradiated the savage dens of the Hurons, as that which shines in the eyes of the Christian mother, as she weeps over the cold form of one whose brows have been sealed with the sign of the Cross.

The various processions now re-formed and proceeded to a spot in the forest, where a clearing of several acres had been made. In the centre of this open space a huge pit had been dug, ten feet in depth and thirty feet in diameter. Around this pit a rude scaffold had been erected, very high and strong. Above this scaffold rose a number of upright poles with others crossed between, upon which to hang the funeral gifts and remains of the dead.

The different groups of mourners were assigned places around the edge of the clearing. The funeral gifts were now

displayed, among them being many robes of the richest fur that had been prepared, years before, in anticipation of this ceremony. The kettles were then slung and feasting went on until the middle of the afternoon, when the bundles of bones were again taken up. Then, at a signal from the chiefs, the crowd rushed forward from all sides, like warriors at the storming of a palisaded town, climbed, by means of rude ladders, to the scaffolding and hung their dead, together with the funeral gifts, to the cross-poles. Then they retired and the chiefs, from the scaffolding, made speeches to the people, praising the dead and extolling the gifts given in their honor.

During this speech making, the vast grave was being lined throughout with robes of beaver skin, with three copper kettles in the centre. The bodies, which had been left whole, were then cast into the pit amidst great confusion and excitement, and, as darkness was now coming on, the ceremony was adjourned until the next day, the assemblage remaining about the great watch-fires, which blazed about the edge of the clearing.

Just before daylight, the Jesuits, who had retired to the village, were aroused by an uproar fit to wake the dead. Guided by the noise, they hastened back to the clearing where they beheld a spectacle that surpassed anything they had ever witnessed. Brébeuf says that nothing had ever figured to him better the confusion among the damned. One of the bundles of bones had fallen from the poles into the pit and precipitated the conclusion of the rite. Huge fires which blazed about the clearing lit up a fearful scene. On and about the scaffold, wild forms, howling like demons, hurled the packages of bones into the pit, where a number of others moved about amidst the ghastly shower and with long poles arranged the bones in their places. Then the pit was covered with logs and earth and the ceremony concluded with a funeral chant that resembled the wail of a legion of lost spirits. It was the death song of a lost people, the knell of a passing race.

One can imagine, as a spectator of this weird scene, the stalwart form of Brébeuf, towering in the majesty of his foredoomed martyrdom, and glorious in the might of that indomitable courage that triumphed, in the hour of his death, over the ingenuity of his tormentors, evolving in his mind such subtle arguments as might subordinate to higher ideals the rude Nature-worship of Huronian clanship, and win to the service of his Master these hordes of heathendom.

Residents of the Capital will be surprised to learn that a Huron Feast of the Dead, similar to the one already described, was once held in Ottawa, on the spot that now occupies the north-west angle formed by the intersection of Wellington and

Bay Streets. This is no fiction, but a fact, supported by the most trustworthy evidence. The proof is contained in an article in the *Canadian Journal*, Vol. 1, 1852-1853, by the late Dr. Edward Van Courtland, which describes an Indian burying ground and its contents discovered at Bytown (Ottawa) in 1843.

Dr. Van Courtland states that in 1843 some workmen, who were digging sand for mortar for the old suspension bridge, unearthed a large quantity of human bones. He immediately hurried to the spot and found that the contents of an Indian burying ground were being uncovered. The doctor continues:—"Nothing possibly could have been more happily chosen for sepulture than the spot in question, situated on a projecting point of land directly in rear of the encampment, at a carrying-place and about half a mile below the mighty cataract of the Chaudière, it at once demonstrated a fact handed down to us by tradition, that the aborigines were in the habit when they could, of burying their dead near running waters. The very oldest settlers, including the Patriarch of the Ottawa, the late Philemon Wright, and who had located nearby some thirty years before<sup>2</sup> had never heard of this being a burying place, although Indians existed in considerable numbers about the locality when he dwelt in the forest, added to the fact that a huge pine tree growing directly over one of the graves, was conclusive evidence of its being used as a place of sepulture long ere the white man in his progressive march had desolated the hearths of the untutored savage." After two days digging the results were as follows:

"One very large, apparently common grave, containing the vestiges of about twenty bodies, of various ages, a goodly share of them being children, together with portions of the remains of two dogs' heads; the confused state in which the bones were found showed that no care whatever had been taken in burying the original owners, and a question presented itself as to whether they might not have all been thrown indiscriminately into one pit at the same time, having fallen victims to some epidemic, or beneath the hands of some other hostile tribe; nothing however, could be detected on the skulls, to indicate that they fell by the tomahawk, but save sundry long bones, a few pelvi, and six perfect skulls the remainder crumbled into dust on exposure to the air, in every instance the bones were deeply colored from Red Hematite which the aborigines used in painting, or rather in bedaubing their bodies, falling in the form of a deposit on them when the flesh had become corrupted. The material appears to have been very lavishly applied from the fact of the sand

<sup>2</sup>Philemon Wright, with 25 followers, arrived at the site of the present City of Hull on the 7th of March, 1800.

which filled the crania being entirely colored by it. A few implements and weapons of the very rudest description were discovered, to wit:— 1st, a piece of gneiss about two feet long, tapering, and evidently intended as a sort of war-club; it is in size and shape not unlike a policeman's staff. 2nd, a stone gouge, very rudely constructed of fossiliferous limestone; it is about ten inches long, and contains a fossil leptina on one of its edges; it is used, I lately learned from an Indian chief, for skinning the beaver. 3rd, a stone hatchet of the same material. 4th, a sandstone boulder weighing about four pounds; it was found lying on the sternum of a chief of gigantic stature, who was buried apart from the others, and who had been walled round with great care. The boulder in question is completely circular and much in the shape of a large ship biscuit before it is stamped or placed in the oven, its use was, after being sewed in a skin bag, to serve as a corselet and protect the wearer against the arrows of an adversary. In every instance the teeth were perfect and not one unsound one was to be detected, at the same time they were all well worn down by trituration, it being a well known fact that in Council the Indians are in the habit of using their lower jaw like a ruminating animal, which fully accounts for the peculiarity. There were no arrowheads or other weapons discovered."

It will be seen, from the foregoing, that the worthy doctor had unearthed a small Huron ossuary, similar in its general features to the much larger one at Ossossané, and if the doctor's description is compared with reports on communal graves, in western Ontario, by such eminent archaeologists as Dr. David Boyle, curator of the Provincial Museum at Toronto, A. F. Hunter, George F. Laidlaw and others, one must be convinced that the Wellington Street ossuary was of Huron origin. When the doctor raises the question as to whether the bodies had not all been "thrown indiscriminately into one pit at the same time" he suggests a mode of sepulture that was actually observed by Brébeuf at the Huron Feast of the Dead at Ossossané.

Another small ossuary was uncovered some years ago, on Aylmer Island, when the foundation for the new lighthouse was being excavated. The writer was not present at the exhumation of its contents, but the light-keeper, Mr. Frank Boucher, informed him that the skeletons were all piled together, indiscriminately. It is difficult to estimate the number of bodies interred in this grave, but it yielded about a wagon load of bones. A number of single graves have also been found at this spot, and these, together with the ossuary would seem to prove that Algonkin and Huron occupied this part of the Ottawa Valley and used this island in common as a place of sepulture.

Embowered in the solemn grandeur of a mighty forest of gloomy pine, old Lac Chaudière—our Lake Deschênes—was a fitting theatre for that weird ceremonial, the Huron Feast of the Dead. Resting on the old Algonkin camping ground at Pointe aux Pins—now the Queen's Park—some roving *coureur de bois* might have seen this great sheet of water fading away into the vast green ocean of foliage to the south, and witnessed from his point of vantage the uncanny incidents of the savage drama. From various points on the lake he might have seen, converging on the island, great war canoes, freighted with the living and the dead, the sad remnants of a passing race. He might have heard the long drawn out wailing cries of the living, as they floated in unison across the water, outrivalling the call of the loon or the dismal and prolonged howl of the wolf, as they echoed through the arches of the forest, and as the island rose before his vision, tenanted with its grotesque assemblage of dusky forms, engaged in the final rite of sepulture, he might have mused upon the mutability of human life, in its application to the red denizens of the wilderness, whether in the dissolution of a clan, a tribe or a nation.

We have now reviewed three distinct sets of evidence, which verify one another and sustain, collectively, the hypothesis of Huron occupation of the Ottawa Valley. We have Huron arrowheads and slate implements on Algonkin camping grounds, we have Huron pottery from ash-beds that smouldered, possibly, in Huron long-houses, for considerable periods of time, and lastly, we have ossuaries or communal graves, a mode of sepulture characteristic of the Huron people, and one which would indicate a permanent and somewhat lengthened period of occupation.

Of course, it will be urged that no band of Hurons would have built a village so near the river as the site of the old ash-beds at Gilmour's Mill, in Hull, but, as the Algonkins lived, sometimes, in the Huron country and adopted, to some extent, the customs of their confederates, might not the Hurons, if they came to live with the Algonkins on the Ottawa, have followed the usage of the latter in the selection of their dwelling places.

The evidence, so far obtained, seems to have given us fairly conclusive proofs of Huron occupation of the Ottawa Valley, and the beginning of a new chapter in the history of one of the great native races of Canada, but, as yet, we have no data that gives us a clue to the time of this period of occupation. Our two ossuaries, already referred to, yielded nothing that could be traced to the white trader; yet this is not negative evidence that the interments were made before European contact. The Wellington Street ossuary held quite a number of implements, while that on Aylmer Island had none. As Dr. David Boyle remarks: "The

truth is we are yet in the dark regarding the philosophy of aboriginal burials, and, perhaps will ever remain so." So that in the absence of evidence we can indulge only in conjecture.

It will be remembered that, after the four nations of the Huron Confederacy went down in red ruin beneath the merciless tomahawks of the Iroquois, the conquerors turned their victorious arms against the Neutrals or Attiwanderons; stormed and took their palisaded towns, together with hundreds of prisoners, whom they burnt or adopted, and left a trail of fire and blood along the northern shores of Lake Erie. Then they wheeled in their tracks and rushed, like a pack of famished wolves, upon the Eries or Cats, a kindred tribe to the south of Lake Erie, whom they destroyed utterly in one of the fiercest Indian battles recorded in history. Meanwhile, on the eastern frontiers of the Iroquois Confederacy, the Mohawks were at war with their Algonkin neighbors, the Mohicans, and with their own Iroquoian kinsmen, the Andastes or Conestogas. During a decade of conflict with these opposing forces, a series of bloody reverses had humbled the Mohawk arrogance, when the other four nations of the Iroquois league took up the strife, in the Andaste war. For fifteen years the Iroquois' war-parties traversed the forests towards the Susquehanna before the heroic Andastes were wasted away by the attrition of superior numbers and finally overcome by the Senecas, about the year 1675. Thus, in a period of twenty-five years, from the downfall of the Hurons to the conquest of the Andastes, the Iroquois had triumphed over all the neighboring nations and peace reigned, for a time, over the blood stained wilderness. But, during all these wars, the Confederates were able to send war-parties on the trail to Canada, that kept New France in a turmoil, by cutting off her outposts and wasting her outlying settlements. It is not likely, however, that any of these expeditions went out of their way to attack Algonkin or Huron stragglers on the Ottawa, and these fugitive bands may have remained unmolested for a few years, until their final destruction or dispersion could be made an incident in some more important enterprise of the Iroquois.

Let us now return to the Hurons. In the year 1650, after a terrible winter made horrible by famine, death and the Iroquois, the Jesuits abandoned their last mission fort of Ste. Marie on Ahoendoé—St. Joseph's or Christian Island—and led some three hundred of these unfortunate people to Quebec, by way of the Ottawa. A much larger number, however, who were left behind, were forced by the Iroquois to abandon their fort and retire to Manitoulin Island and the northern forests. But the Iroquois were on their trail; so, finally, loading their canoes, about four

hundred of them took the route of the Ottawa to join their kindred who had preceded them. Other scattered bands followed, from time to time, of which we appear to have no definite record. By this time the whole Ottawa River had been swept by the tornado of Iroquois ferocity and its shores had become a solitude.

Now for our conjecture. Cases are not infrequent in which Indian communities have been forced to abandon their homes, through stress of war, but have again returned to them after some years, when the war cloud had given place to the sunlight of peace. Doubtless, in their wanderings on the northern tributaries of the Ottawa, Algonkin and Huron had alike eaten the bread of adversity and drunk the water of affliction and were ready for any asylum that would afford them a brief period of rest. Now, while the time of the Iroquois was fully occupied in the terrible wars already enumerated, may it not have been possible that some of the fugitive remnants of the Hurons, on their way to Quebec, stopped and settled on the Ottawa, together with similar bands of Algonkins, who had returned to their old camping grounds?

A serious objection, of course, to the theory of Huron occupation of the Ottawa Valley, in the latter half of the seventeenth century, is the presence of Huron pottery in the ash-beds at Hull and Casselman, as the Indians are supposed to have discarded their native earthenware for the brass or copper kettles of the white trader, soon after the advent of Europeans, still, however, it should be borne in mind that the craggan, (see Annual Archaeological Report 1906 (Toronto 1907) pp. 16-18), an earthen vessel of domestic manufacture, made from unrefined clay and similar in design and finish to the very crudest forms of our Indian pottery, was made and used until quite recently— if it is not used, even, to-day—in the kitchens of several of the Scottish Islands, and that these vessels were preferred, for many purposes, to the more costly and highly finished products of modern ceramic art. These craggans were made by housewives to serve, among others, the purposes of drinking vessels and pots for boiling; so that if such prehistoric pottery could have survived among the Scottish Islanders, to a time within the memory of the living in competition with domestic innovations of centuries of civilization, why should not the Hurons of the Ottawa have retained, for a few years at least, the earthenware of their ancestors, under somewhat similar conditions? Finally, William M. Beauchamp<sup>3</sup> refers to a

<sup>3</sup>Earthenware of the New York Aborigines. Bulletin of the New York State Museum, Vol. 5, No. 22, October, 1898, p. 80.



similar survival of the use of pottery, among the Iroquois, as follows: "Refuse heaps, by village sites, usually contain a great deal of earthenware, out of which fine or curious fragments are often taken, and these occur also in the ash beds of the old fireplaces. This is so on some quite recent sites, for while the richer Iroquois obtained brass kettles quickly from the whites, their poorer friends continued the primitive art till the beginning of the 18th century at least." Another statement by the same writer, is important, as it would exclude the probability of our pottery being referable to the Algonkins. He writes, in the Bulletin referred to, at page 76, as follows: "In fact, the Canadian Indians do not appear to have used earthenware in early days, with the exception of the allied Hurons and Petuns, the Neutrals and the Iroquois of the St. Lawrence, all of these being of one family. . . . The nomadic tribes, however, preferred vessels of bark, easily carried but not easily broken. In these they heated water with hot stones, as the Iroquois may sometimes have done."

The above theory, as to the time of Huron occupation, is only a suggestion, unsupported at present by sufficient evidence to prove it. It may turn out, eventually, that the fireplaces of this vanished race grew cold, on the Ottawa, in the dim twilight of a more remote antiquity. Is it possible that, before the coming of the white man, the old Wyandots or Tionnontates, in the course of their traditionary wanderings, so admirably described by William E. Connelley, may have remained for a time on the Ottawa, and left us only their ashbeds and ossuaries to puzzle over?

Another question also suggests itself. Where did the Hurons go to after leaving the Ottawa? They appear and disappear on the stage of tribal activities, either standing boldly forth in some historic incident, or dimly silhouetted by the light of tradition, on the dark back-ground of prehistoric time. Did they migrate, finally, to join their kindred in their distant resting places? Did they fade away, by adoption, into other tribes? Or, were they absorbed by the red cloud of massacre, to disappear forever in the darksome shadow of the illimitable wilderness?

NOTE ON MEGORISMUS FLETCHERI.—In August, 1908, the Destructive Pea Aphis was present in large numbers in the Ottawa district, field and sweet peas in gardens being severely injured. From collected material a number of parasites were reared by me, one kind of which proved to be a new species of hymenoptera. This was recently described by Mr. J. C. Crawford\* as *Megorismus fletcheri*. The parasitized plant lice were conspicuous on sweet peas in my garden.—ARTHUR GIBSON.

\*Canadian Entomologist, March, 1909.

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