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Bones and Archaeology in Ontario

The order of wording in the title of this paper is not intended to demonstrate the priority of bone in archaeological studies, but to point out the importance of skeletal analysis to proper archaeological interpretation.

As archaeologists, we are primarily prehistorians. That is to say, we have dedicated our efforts to a reconstruction of man'S prehistoric past. The key word in this theme is man, and as such, his physical remains deserve as much attention as are given his cultural remains.

On prehistoric sites where burials are found, there is usually a flurry of activity over artifacts that may have been interred with the bodies. This is only proper since this material, whether it consists of potsherds, projectile points, or pipes, or any combination of the three, aids the archaeologist in establishing a cultural and temporal position for that site.

But what about the status of the site if no grave goods can be associated with the burials, or if the association of those present is somewhat precarious? The answer may very well lie in the remains of those people who have been resting peacefully for so many years.

Human osteology, the study of the most durable part of man's anatomy, has recently added a new dimension in the realm of prehistory, especially in Ontario. This is the use of skeletal remains from sites of known cultural sequences to establish first of all, biological, and secondly, chronological relationships of these early Indian groups. The initiating and major endeavor in this respect is the work begun seven years ago by Dr. James E. Anderson of the University of Toronto, who has kindly permitted) me to use some of his findings in this presentation. The basis of this research rests in the phenomenon of human morphological variation. Of specific importance to this aspect is the understanding that skeletons must be viewed as belonging to populations rather than to individuals.

It is quite obvious to us that there are differences between ourselves and populations native to other parts of the world. Yet it is not so striking, until we take a good look at each other, that there is also a heterogeneity to be found amongst ourselves. I'm speaking now of course. of physical rather than social variance. With the possible exception of identical twins, no two individuals in any one population are alike. This is the result of normal morphological variation and is effected by a tremendous flexibility in the genetic make-up of a population.

Because of this variance, population markers can sometimes be found in groups of people which set them off from others. For example, all of us do not have blue eyes. That is, we as a population vary in eye color. Assuming for the moment that we are an interbreeding population, let us see how a characteristic such as eye color may be used to determine one population marker for us.

Disregarding individual side differences in color and assuming that we are represented only by blue, green, and brown eyeballs, we count the number of people here having these three colors. The number of blue-eyed people then, divided by our total represented sample would produce a percentage of blue-eyed persons.

Performing similar computations for the other colors will produce a frequency distribution of each trait as it appears. We thus learn that :10% of the group has green eyes, 60% have blue ones, and 10% have brown. One marker for us then, is blue eyes, since they occur most frequently. This does not necessarily imply that we are closely related to a group meeting elsewhere which demonstrates a predominance of blue eyes. However, if we study a number of traits that can be shown to occur most often in compared populations of large enough sample size, we can pretty well establish a basis for group affinities.

The skeleton, for obvious reasons, cannot furnish data on eye color. Yet, bones show variation as do living people. In fact, differentiation in skeletal traits is sometimes more clear cut than those of soft tissue. Many anatomists through the years have noted anomalies which appear on the various bones. These are of the "have or have not" type and are termed discrete characteristics in technical parlance. They have been shown to occur in varying frequencies in different populations. A few- examples of these are the following.

A perforation is sometimes present in the lower end of the humerus, or upper arm bone. It is called a septa] aperture and seems to be of no clinical importance in living people. Another example is that of the occurrence of small accessory or wormian bones in the sutures of the skull vault. Other traits include multiple foramina, or passages through bone, for nerves and blood vessels where only one is commonly found.

These are just a few of the many variations that can occur in the skeletons of a human population. By calculating the frequency of occurrence of all the traits in any one group, and by testing their statistical significance, population markers may be fixed for different groups. The physical anthropologist can then compare the skeletal populations of one site with that of another to determine affinities. A result of this investigation may be that quite closely related groups from different temporal levels show a divergence in the presence or absence of one or more characters. Some traits may decrease in occurrence through time while others may increase.

We can now turn to a discussion of some recently excavated sites in Ontario in which discrete trait analysis such as this, has been used.

The bulk of burial sites in southern Ontario are from Middle and Late Woodland times. The basis for skeletal analysis used to derive relationships of the people from these time periods come from two major sites.

The first is the Serpent Mounds site on the north shore of Rice Lake in Peterborough County. Excavations were carried out at this site by the Royal Ontario Museum during the 1955-59 field seasons. A final report is presently in press as a combined effort of the archaeology and physical anthropology of the site and is co-authored respectively be Drs. Richard B. Johnston and James E. Anderson.

Two different components at Serpent Mounds yielded human skeletal remains. The first comprised three mounds which were in use as a burial ground during the Point Peninsula manifestation of the Middle Woodland period and has been radio-carbon dated at approximately 128 A.D.

The other component involved material from three field depressions used during late Woodland times for disarticulated multiple burials. These depressions have been referred to as the Pits portion of the site. Here then, were two chronologically separate populations from a common locale.

On the basis of the technique discussed earlier, it was found that the incidence of some characteristics showed similarities between groups, thus defining a common morphological heritage. But other traits showed distinct differences in occurrence between the Mounds and Pits peoples which are most probably due to chronological separation — a result of genetic change through time.

For example, the septal aperture anomaly of the humerus appeared in 17 per cent of Mounds cases and almost 40 per cent of the Pits sample. The occurrence of accessory bones at the top of the skull demonstrated a decrease in incidence from the Mounds to the later Pits group. Other traits similarly showed significant differences in the frequency distribution in the two populations.

As a test of the validity of these apparent trends, a burial site of more recent use can be referred to.

The Fairty ossuary, a secondary burial place associated with the Robb site to the west of it, has been placed at the terminal point of Dr. James V. Wright's Middle stave of the Ontario Iroquois Tradition — about 1100 A.D. Comparative investigation did in fact substantiate the increasing temporal trend of the humerus anomaly and the decreasing trend in the occurrence of accessory bones as well as establish the biological relation-ship of the Mounds, Pits, and Fairty peoples.

We have thus established a framework for demonstrating similarities and differences through time between various prehistoric populations. But the incidence of genetically discrete traits does not stand alone in these comparisons. Criteria used to describe skeletal morphology of these groups also include quantitative expressions of size and proportion, the result of metrical analysis, and qualitative descriptions of the overlapping forms of certain morphological features.

This last aspect may involve such continuous characteristics as the shape of brow ridges. A continuous roof over the eye sockets seems to prevail in early types, while the later Iroquois form is predominately V-shaped. A gradation does, however, appear in the form of a combination of the two.

There is one occurrence of this situation in the burials recovered from the Surma Site in Fort Erie. On the basis of artifact association, these burials have been dated to the early Late Woodland period. My analysis of the skeletons indicates a close relation between these people and the Pits group from Serpent Mounds, although a fair number of traits are reminiscent of the Mounds pattern. The Surma population is an example of a morphologically transitional population such as would be expected in the temporal position assigned to the burials.

Before closing this presentation, a few words should be said on the contribution of skeletal analysis to the in situ theory of Iroquois origins.

The Glen Meyer and Pickering phases are the earliest manifestations of what we term as Iroquoian culture in Ontario and (late back to approximately 1000 A.D. or Early Woodland times. One burial site has been recently analyzed both archaeologically and morphologically. This is the Bennett site located north of Hamilton. A radio-carbon date of A.D. 1260 ± 60 yrs. has been reported for it by Dr. Wright, and archaeological analysis assigns it to the Late Pickering branch. The subsequent skeletal analysis by Dr. Anderson, the results of which will soon be published, shows a great similarity to the physical type of Late prehistoric Ontario Iroquois. The closest biological affinities are with the Late Woodland skeletons from the Pits at Serpent Mounds.

Another site involved with the theory is the Donaldson Site, radio-carbon dated at about 500 B.C.

The skeletal morphology of the people buried here indicated a different physical type which in fact resembles the Mounds group at Serpent Mounds; i.e., not Iroquois. In other words, an early Middle Woodland type developed in the Bruce Peninsula which underwent subsequent modification through time by dietary and genetic factors. This, and diffusion to the south and east gradually gave rise to the Iroquois morphological pattern. Hence, the later Serpent Mounds group and early Iroquois Bennett population made their appearance. The Surma site skeletons also show- evidence of Iroquois morphology as well as an intermediate position in terms of discrete traits. Furthermore, the geographical position of this site is in the aforementioned path of diffusion, thus tending to favor the skeletal aspects of the in situ theory of Iroquoian origin.

In summary, we have attempted a demonstration of the value of bone study in explaining chronological and developmental problems in Ontario Iroquois archaeology.

We have seen that human beings show a definite variation within and without populations, so to speak. This variation, because it can be demonstrated in the skeletal remains of individuals, can be used as a tool in prehistoric interpretations. The statistical analysis of "have or have not" traits can be used to determine biological affinities of the people who have created the burial grounds where they lay.

The analysis of Middle and Late Woodland skeletons in southern Ontario has provided a basis for determining the biological relationships of both periods. The later Iroquois groups and earlier incipient types, although sharing a common genetic heritage, diverge in certain of these characteristics, and temporal trends in the incidence of traits are evident, whether they be increasing or decreasing.

Together with quantitative metrical expression and qualitative description of form, the technique of discrete trait analysis can be used as an aid in the chronological positioning of a burial site in the absence or insufficient quantity of artifacts. However, many more sites must be studied with regards to this mode of analysis, and the represented skeletal populations must be of large sample size before any tentative conclusions can be reached. 1 need not stress then, that the careful and complete excavation of skeletons at any site is essential to the overall interpretation of the prehistory of Ontario.