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*(Accepted December, 1969)***A PETUN BURIAL IN NOTTAWASAGA TOWNSHIP, ONTARIO ABSTRACT**

The burial is reported of an adult female having unusual archaeological, ethnological and pathological interest.

INTRODUCTION

The burial was encountered by Mr. J. Allan Blair, accompanied by the writer, early in 1969, in the course of examining the probable route of a former Indian trail through the north-east quarter of Lot 28, in Concession 10, Nottawasaga Township, about 1½ miles north-west of the Village of Duntroon. Fragments of human skull, pelvis and smaller bones, human teeth, small scraps of decayed and in part charred bark and wood, as well as several stones, larger than usual in this sandy area, were seen on the surface of the ground. This material was evidently scattered by ploughing. The presence of a burial was not altogether unexpected. There are reasonably reliable reports of an ossuary discovered by pioneers on the same farm. On the strength of these reports, even though the exact site had been lost for over a century, the writer had already assigned it the Borden designation BcHb-13 (Borden, 1952; Garrad, 1967). Some forty years ago the present owner, Mr. Wesley Baker, had ploughed up a single burial somewhere in the same field to which the writer assigned the designation BcHb-13(1). Mr. Baker remembered that his find included a skull and long bones, thus leaving no doubt that the burial about to be described is a second one, and not the remains of the first. It is therefore recorded as BcHb-13(2).

The site of the burial is on the south slope just below the crest of a morainic ridge oriented north-west to south-east. This prominent ridge, which forms part of the Corn Hill Moraine (Chapman and Putnam, 1966), lies some 400 ft. above the present level of Georgian Bay, and not far south of the post-glacial Lake Algonquin beach. Other human burials have been found on neighbouring farms in the glacio-fluvial deposits of this ridge (Blair, 1952; Garrad, 1967). A trail along this ridge would conveniently link two nearby historic Petun (*Tionnontate*) village sites, the closest of which is believed to have been *Etharita*, home of the Jesuit Mission St. Jean.

Excavation took place in April 1969 to salvage the burial, determine its nature and to protect the human remains from further destruction.

THE EXCAVATION — THE SKELETON LEVEL

Pre-excavation surface examination revealed that human bone fragments had been carried a considerable distance from the main centre of concentration directly over the grave, where the sandy earth of the plough zone contained many broken human bones. Several long bones had been pulled into an upright position by the plough. The weathered and bleached appearance of some of the fragments indicated they had been brought to the surface in previous years, and that therefore the destruction by cultivation had been going on for some time.

The burial was first surrounded by a circular trench dug to a level below the burial site into the sandy sub-soil. This left the feature on a pedestal with ample room to view and work the vertical and horizontal planes. Excavation thereafter was by trowel and brush, neither of them ideal tools in the damp sand conditions of this site.

The dark plough zone was easily distinguished, standing in marked contrast to the yellow sand below (Photo 1). Once exposed, it was evident that the feature on the pedestal had been an oval pit, reaching a depth of 19 inches below the bottom of the plough zone, or about 27 inches below the present surface. Since the human remains were not in the bottom of the pit, but had been raised on a catafalque, the entire skeleton lay within the plough zone, and had therefore been disturbed. Only some upper front teeth, some fragments of the frontal bone, right humerus and right fibula, which were *in situ* (Photo 2).

At its maximum the pit measured only 47 by 35 inches. These measurements, together with the position of the few *in situ* remains, were in keeping with a flexed articulated burial lying on the right side, with the face directly down (Figure 1). Fragments of bone identified as the left parietal, right parietal, right humerus, right pelvis, right patella and right tibia, were low in the plough zone, close to their original position. The only vertebra found was lying some 15 inches out of place, at the bottom of the pit. This seems to indicate that there was both time and space enough, before the grave collapsed, for the bones to separate and fall out of position, so that not all misplacement may be due to farming activity.

Other broken bones and fragments recovered from the surface and the plough zone were found to fit together, permitting some restoration.

THE EXCAVATION — THE SUB-SKELETON LEVEL

Evidence that the burial had been associated with wood and bark was visible on the surface before excavation began. After the burial pit was exposed in profile, it was evident that it had been floored, and probably lined, with sheets of bark and weighted with a few small stones. A catafalque had been erected in this bark lined pit, consisting simply of four large stones (Photo 3) on which an unknown number of poles some 2.5 to 3 inches in diameter had been kept damp over the years and was situated below frost level. The poles, in contrast, were very rotten, often merely a streak of mould held in place by the damp compacted sand fill. Scraps of bark on the surface and in the plough zone, as well as a few more stones, suggest that the deceased may have been covered with more bark and weighted with stones, before the grave was backfilled.

Some fairly large sections of the bark flooring were recovered, and some small fragments of the poles. Bark and poles were identified as white birch (*Betula papyrifera*). One edge of the birch-bark flooring, and parts of several of the birch poles, showed minor charring. There was no evidence of a major fire or an attempted cremation, the bones being entirely unburned. If further bedding, such as for example leafy boughs, had been placed between the deceased and the platform, any resulting organic mould was no longer distinguishable from the dark sand fill.

DATING THE BURIAL

The burial lies on a natural route between two contemporary Petun (*Tionnontate*) village sites (BcHb-10; BcHb-17; Garrad, 1967). The nearer village was probably *Etharita*, first mentioned by the Jesuits in 1639. In 1649, it had become one of the principal villages with a population of five or six hundred families (Ragueneau, 1950). The proximity of the burial along a probable trail to this village may indicate an association. Beads similar to the ones found near the burial have been excavated at the village site, strengthening the thesis that burial and village were contemporary. The teeth recovered from the grave have attrition patterns on the occlusal surfaces consistent with the agricultural Iroquoians of that period.

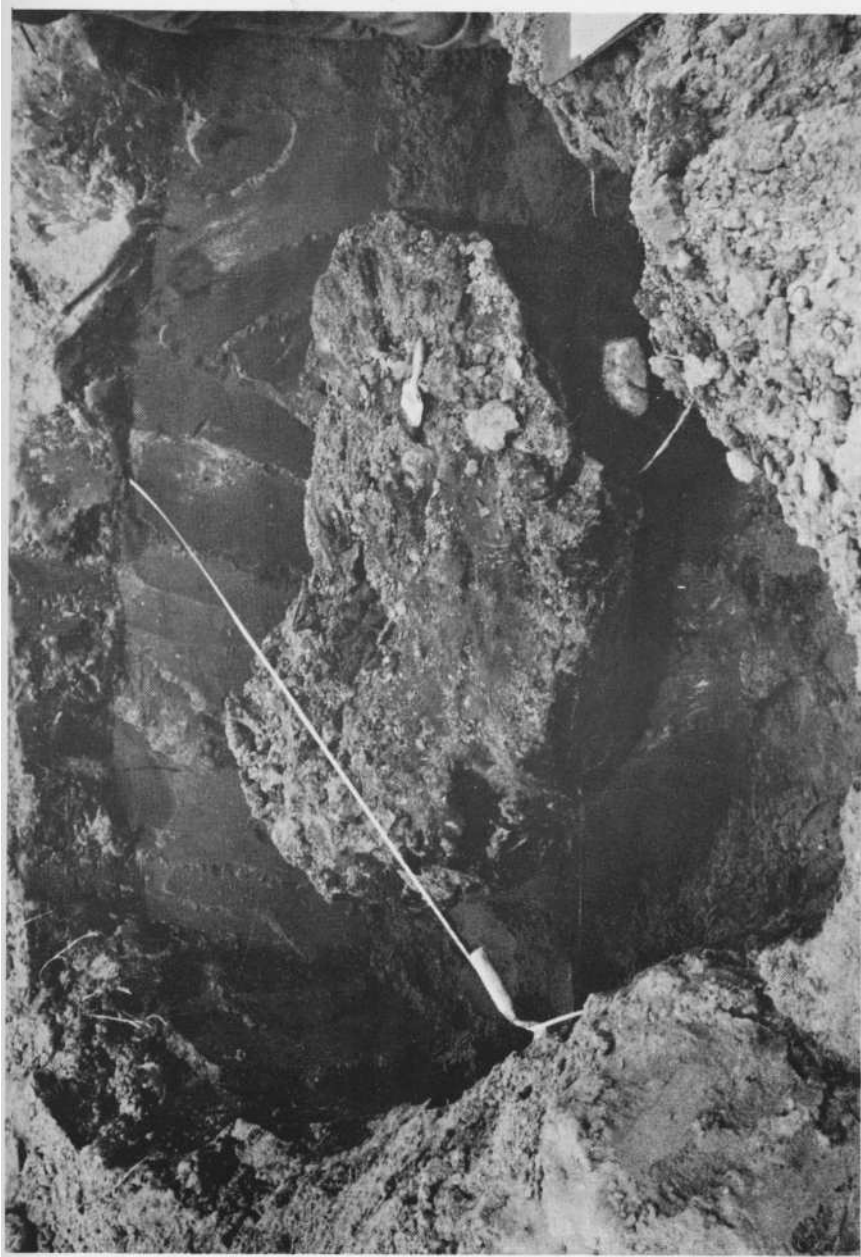


PHOTO 1

The burial feature exposed on a pedestal under reduction vertically and horizontally to expose components. Tape indicates bottom of plough zone. Facing north.



PHOTO 2

The feature further reduced. Human bone and wood pole fragments exposed *in situ*. Bark lining of pit bottom exposed. Facing south.

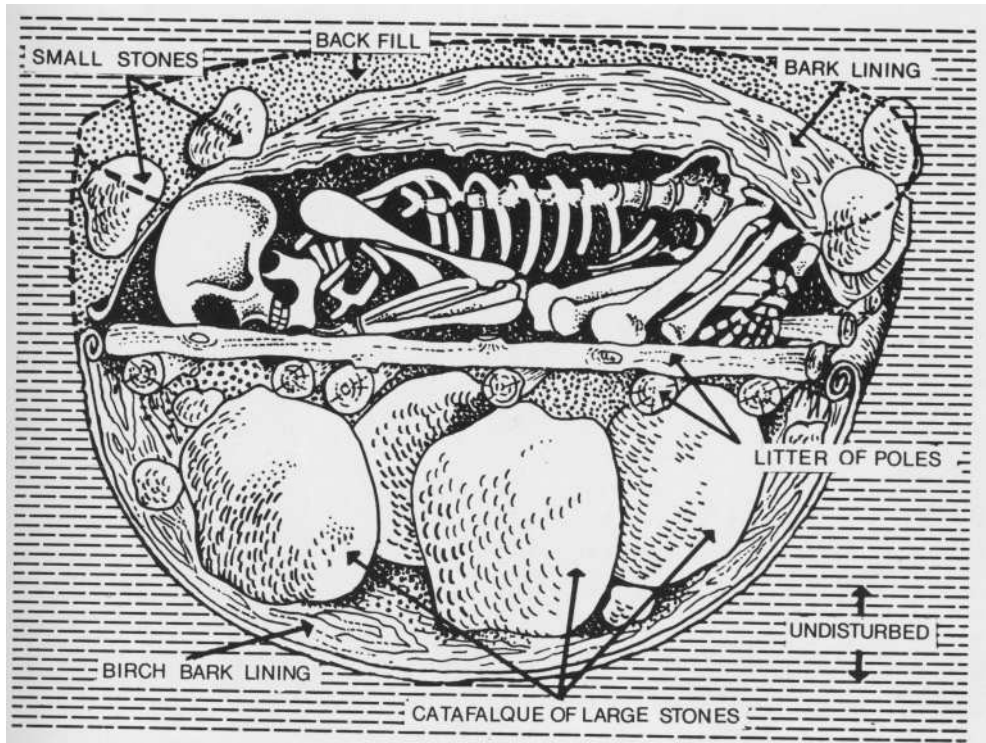


FIGURE 1
The Grave as it may have been.
A conception by artist and archaeologist Mr. Thomas Kenyon.



PHOTO 3

Three of the four stones comprising the catafalque *in situ* resting on the bark lining. From above, top of photo to south.

It is therefore plausible that this is the burial of a villager from *Etharita*, who died during the time of that village's existence (1639 to December 1649).

THE SKELETAL REMAINS — AGE AND SEX

Although most of the bones were in fragments, after restoration many of the age-indicative features listed by Dr. James E. Anderson (1962) were observable. Particularly noted were the complete fusion of all epiphyses, and the centres of the second cervical vertebra. The coronal suture was not fused. The dentition is characterised by severe caries and moderately worn occlusal surfaces, with the exception of the third lower molar, which shows only slight wear and early caries. The evidence therefore suggests an age at death not in excess of 35 years. The relative lack of wear on the third lower molar, may indicate an eruption just prior to death or the absence of an opposing upper molar. Mr. Patrick Hartney examined all the teeth and observed that the severity of caries and general attrition would normally be indicative of an age well in excess of 35 years, but since there was skeletal evidence of an abnormal life, the value of this single criterion is not necessarily valid. Dr. Howard Savage kindly examined all the re-mains and advanced the personal opinion that the visible evidence seems to indicate that this had been a person in the late twenties to early thirties. Dr. Robert B. Salter, on studying an X-ray of the left femur, commented that the adaptive secondary bone-growth and osteoarthritis would have taken about thirty to thirty-five years to develop (Photo 4). Since the conditions which gave rise to these abnormalities are thought to be congenital, these figures would be expected to coincide with the deceased's age at death.

Dr. Savage, in support of his opinion that the remains are those of a female, pointed to the smallness, lightness and thinness of the bones, the overall smallness of the skull, the small brow ridges, the slight development of muscle attachment sites and the angle of the sciatic notch of the pelvis. Dr. Salter, while mentioning that disuse atrophy may in part account for the general underdevelopment of the bones, agreed that the remains were female.

It will be seen that the very nature of the abnormalities about to be described favour the remains being female.

THE SKELETAL REMAINS — PATHOLOGICAL OBSERVATIONS

The surface characters of the bones of this skeleton are poorly developed, even allowing for a petite, genetically small, female. Without exception, all bones are thinner, lighter, and smaller than would be expected. The right fibula is thinner and narrower than the left, indicating growth inconsistency. Even before the bones were cleaned and restored, Dr. Savage observed that the deceased had most likely been the victim of some systemic disease of sufficient severity and long-standing that normal growth and development had been retarded, and added that this supposition might be verified by x-rays. This indeed proved to be the case. X-rays, kindly provided by Dr. Bernard Reilly, show fairly evenly spaced growth-arrest lines indicative of periodic retardation of the normal growth process, best seen in the proximal end of the left tibia (Photo 5).

After studying the growth arrest lines Dr. Savage reasoned that their cause could be a seasonally recurring physical hardship, or perhaps severe seasonal exacerbations of a chronic disease. Dr. Salter, after his diagnosis of the condition, agreed with Dr. Savage's observation that the even spacing of the lines corresponded with a probable annual cycle, and added that since at least ten lines were visible, the earliest would be from the age of about five or six, the last becoming progressively difficult to locate, as the bone reaches full growth at adole-

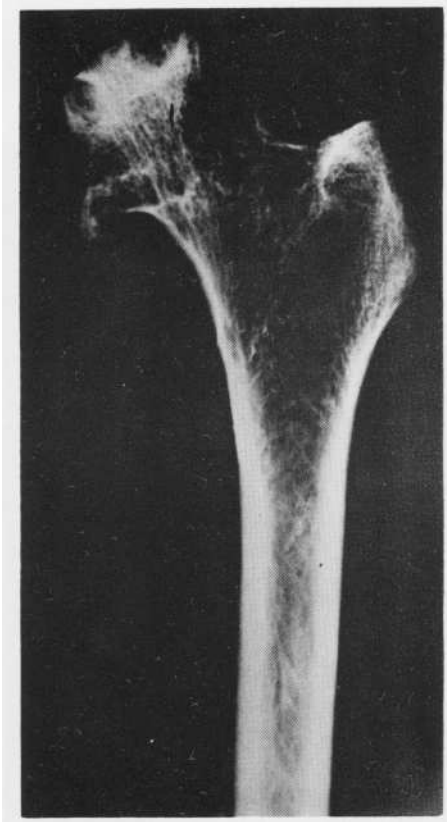


PHOTO 4

X-ray of the proximal end of the left femur. White areas of the head indicate arthritic adaptation to abnormal pressure. The clear dark part of the head to the right of centre was the portion external to the socket.

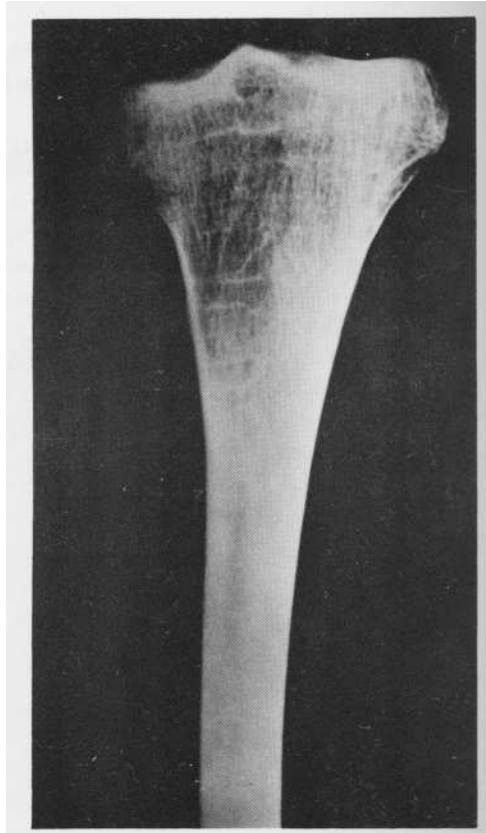


PHOTO 5

X-ray of the proximal end of the left tibia, showing at least ten evenly spaced growth-arrest lines.

scence. The lines are so clearly defined that extended periods of immobility are indicated, such as complete confinement to bed each winter. Sometimes known as *Harris' Lines* and detectable only by radiography, they are caused by the arrested activity of the cartilage and resulting dense calcification (Wells, 1964:155).

EVIDENCE OF SEVERE DEGENERATIVE ARTHRITIS OF THE HIP

The left femoral head is distorted, somewhat less round than usual, pitted and lipped. Dr. Anderson (1962:157) described lipping as "a peripheral growth of new bone, produced along the margin of the articular surface . . . which . . . may become extremely marked, producing disruption of the joint", and as a possible manifestation of osteoarthritis, a degenerative change in the bone. Abnormal new growth of bone can be seen on the femur along the margin of the head, as a pointed spur at the top of the greater trochanter, and on the intervening neck (Photo 6).

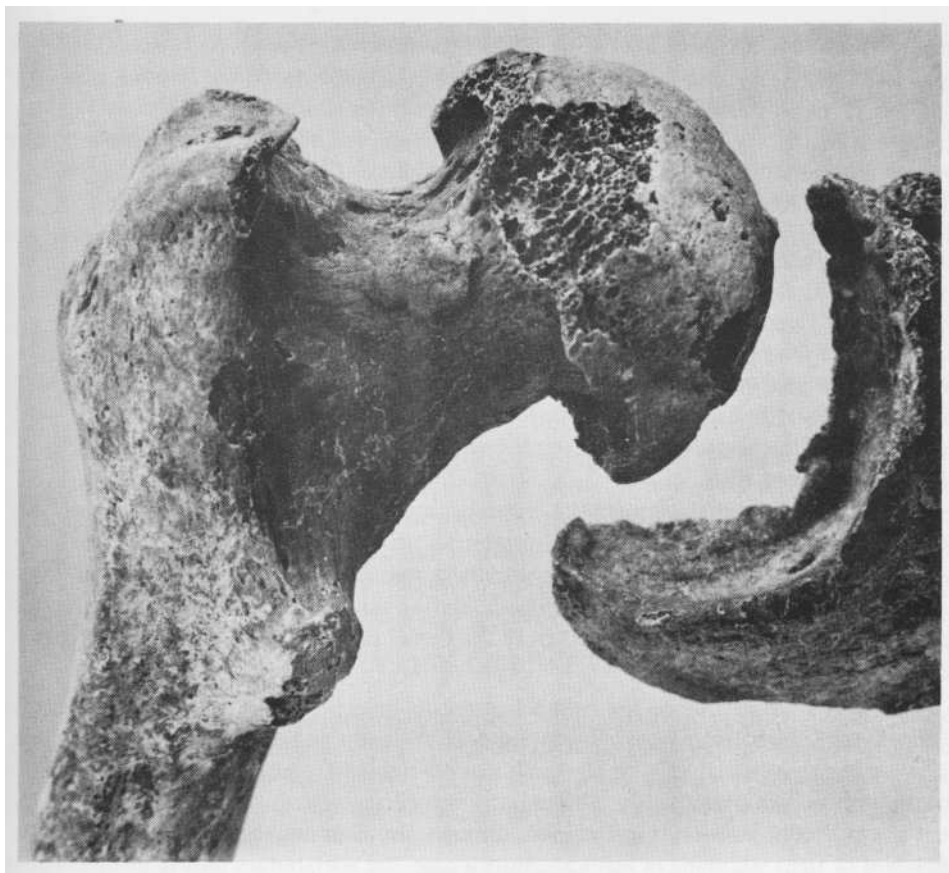


PHOTO 6

Left acetabulum and femoral head showing abnormal arthritic and secondary adaptive bone growth. The head has extensive peripheral lipping, the greater trochanter has developed a bone ridge and spur. New bone growth can be seen on the neck of the femur and on the acetabulum.

Unfortunately the corresponding right femur was not entirely recovered, and the proximal end is not available for comparison.

The acetabular portions of both hips were recovered, and are vastly abnormal. Both acetabula are pitted and distorted, incompatible with a normal articulation of the heads of the femurs. The left acetabulum has gained a raised ridge of bone in the depth of the socket, and the socket-shape of the right acetabulum is much reduced and flattened (Photo 6).

Other than small size and the inconsistency of the fibulae, no other abnormality was observable in the various bones. The articular surfaces of the bones of both knees, left shoulder and left ankle were seen to be normal, suggesting that the arthritis was not general but localised to the hips.

In view of the age of 30-35 years assigned to the deceased, the cause or causes of such advanced degenerative arthritis must be sought elsewhere than in the normal ageing process (Anderson, 1962:154). It is relatively common, for example, for a younger person to develop traumatic arthritis in a joint following an injury. Similar effects may be produced by several

other conditions, among which are failure of the femoral head to be properly nourished (Legge-Perthe's Disease), and failure during growth of the epiphysis of the femoral head to fuse properly, with a subsequent slight change in its position. Considering that only the hip joints were arthritic, the evidence of long-standing disease, the inhibited development of the individual, and the subject's sex, the balance of probabilities for the cause of the degenerative arthritis seem to favour bilateral congenital subluxation or dislocation of the hips early in life (Savage, pers. com.).

CONGENITAL DISLOCATION OF THE HIP

The writer does not presume to be a medical authority, and the following outline re-presents only his personal understanding of the subject, gleaned from reading the authoritative works of Dr. Robert B. Salter (1967, 1968). These works are necessarily grossly abbreviated here in keeping with the presentation from the archaeological and ethnological, rather than the medical, points of view.

For a variety of reasons, among them genetic, metabolic, muscular and hormonal, the hips of a small percentage of children are unstable at birth, and have a tendency to dislocate. This situation usually spontaneously and naturally corrects itself during the first few weeks of life, providing actual dislocation does not occur. During this period, dislocation may occur if the child is suddenly, passively extended from the flexed position it has retained since intrauterine development.

Such actions as pulling on the baby's feet during breech-birth (traction on the lower limbs during delivery), the lifting of the baby by the feet, the early and constant extension of the baby by wrapping it in blankets, or placing it in a cradleboard, could cause complete or partial dislocation of such an unstable hip. This condition is correctable during early life, but deteriorates if the extended position is maintained, through, for example, the continued use of the cradleboard or tight wrapping in blankets. In this case, the acetabulum fails to grow correctly and retains an immature direction (dysplasia). The ilio-psoas muscle, dependent on proper leg and hip action for its development, fails to elongate. The resultant sequelae include "residual deformity and incongruity of the hip joint" in childhood, and "premature degenerative arthritis of the hip" in adult life.

The femoral and acetabular deformities and arthritis in the subjects remains seem entirely in keeping with Dr. Salter's specifications. It is interesting to note, too, in view of the deceased's feminine petiteness, that "eighty to ninety percent of children with congenital dislocation of the hip are girls. . . . Furthermore, one gets the impression . . . girls . . . more 'feminine' than the average." Pertaining to the use of the cradleboard, Dr. Salter adds that the incidence of con-genital hip dislocation in northern Canadian Indian "tribes in which the cradleboard was used for their children was ten times higher than in those tribes in which it was not used". Although data specifically confirming the use of the cradleboard by the 17th Century Petuns is lacking, ethno-historical sources describe the practice among the related Hurons (Biggar, 1929, Vol.3: 141-2; Wrong, 1939:129-30).

As has been inferred, Dr. Salter very kindly found time (during his vacation) to examine the skeletal remains and the x-rays, to assist our understanding of the subject in general, and of the evidence found in this archaeological excavation in particular. In connection with the left femur (Photos 4 and 6), Dr. Salter commented that the bone spur on the tip of the greater trochanter was probably induced by increased compensatory muscular tension, that the secondary new bone growth seen in the neck was usual in the circumstances, and that the pattern of

the lipping seen around the femoral head, confirmed by pressure patterns in the head from arthritic adaptive development apparent in the x-ray, indicated that the edge of the acetabulum had rested against the top of the head. He also pointed out that part of the head external to the socket lacks the patterns and shows clear and dark on the x-ray (Photo 4). This partial dislocation is known as subluxation.

As mentioned, the degree of arthritic and secondary bone-growth resulting from a condition deemed congenital is in keeping with an age of thirty to thirty five.

On examining the two acetabula, the right indicates an even worse condition than the left, suggesting that the right hip was completely dislocated. Unfortunately, although a large part of the right femur was restored, the head remains missing and unavailable for study. Dr. Salter's comments on the interpretation of the growth-arrest lines (Photo 5), the disuse atrophy apparent in the comparison of the two fibulae, and the general underdevelopment of all the bones, have already been mentioned.

Dr. Salter also added that the smaller size of the right fibula, compared with the left, corresponds with the right acetabulum showing the greater abnormality of the two. The deceased may have been able to drag herself painfully around, but the right leg would have been very nearly immobilised, the pain and immobility increasing with age. Congenital dislocation of the hip is known in most parts of the world, but the highest frequencies are in Amerindians (Wells, 1964:40).

CAUSE OF DEATH

None of the various abnormalities noted are in themselves fatal, and the actual cause of death is therefore not determinable from the recovered evidence. The evidence indicates a life-time of pain and increasing immobility so that massive premature physical degeneration and some degree of spiritual dejection were probably factors in her early demise.

CONCLUSIONS

The burial is probably that of a Petun woman from the nearby village of *Etharita*, who died during the decade 1640-1650 A.D., in her early thirties, painfully crippled.

SPECULATIONS

The lack of ethno-historical data specifically relative to the social customs of the Petun (*Tionnontate*) Indians has already been mentioned. The unusual aspects of this burial seem to justify some speculations on which data yet to be obtained from future excavations may shed further light. The following thoughts are presented for consideration:

Unusual preparation of the grave — the raised "bed" — perhaps a token offering of comfort at last for a person finally released from a lifetime of pain.

Lack of grave goods — perhaps pots and other domestic implements usually placed in women's graves were not merely theirs by possession but also by personal manufacture. A chronic invalid who did not learn the usual domestic arts therefore possessed no property of this type and was buried with none rather than someone else's.

Wooden poles and bark — perhaps part of a litter on which the deceased had laid crippled in life — or a litter prepared to carry her to her grave — an item of such close personal association as to be the equivalent of a pot or other personal possession interred with a woman having had a more normal life.

Charring of the platform/litter poles and bark — perhaps minor use of fire in an associated funeral ceremony perhaps exorcisional in intent — perhaps a ritualistic "killing" of the litter — perhaps a quick way to give the funereal equipment touches of an appropriate black colour (Chadwick, 1897:75).

Unusually advanced degree of caries of the teeth — due to a diet differing from healthier contemporaries — dependency on charity.

Bilateral congenital dislocation of the hips — suggesting the early and prolonged use of a cradleboard — knowledge that this condition is correctable in early life not available to the Petun.

General mode of burial — entirely pagan — no evidence of a Jesuit missionary influence.

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