



Canadian Association for Physical Anthropology
Association pour l'Anthropologie Physique au Canada

Newsletter

1998

No.1

Bulletin

ABSTRACTS

of the 25th Annual Meeting

November 6-8, 1997

London, Ontario



University of Alberta
Edmonton

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June 1, 1998

Enclosed in this mailing are the Abstracts from the last meeting of the Canadian Association for Physical Anthropology and the Call for Papers for the next meeting.

CAPA members voted at the last meeting to publish two issues of the Newsletter per year: one in the spring, to contain the abstracts of the last meeting and to be mailed with the announcement of the next meeting; and another in the fall, to be distributed at the time of the annual conference. Normally, I expect to distribute the spring issue in the first week of May, and the fall issue in the first week of November. I continue to refine the appearance of the Newsletter and am experimenting with different paper weights, binding, etc.; I will happily entertain any suggestions you might have. In the next issue we will move, I hope, to a digital reproduction system that will print black and white photographs in reasonable resolution.

The deadline for submission of articles, book reviews, news, etc. for the next issue will be October 1st, and I will issue a "call for submissions" via e-mail not later than September 1st.

Best wishes,

Nancy Lovell
Newsletter Editor

Abstracts
(Alphabetical order by first author)

Similarities and Difference Between the Terry Collection and the Grant Collection: The Implications of Collection and Sample Selection When Developing Sex Determination Methods.

JOHN ALBANESE (ESP) McMaster University

The maximum vertical diameter of the head of the humerus and the maximum diameter of the head of the femur were collected from 52 skeletons from the Grant Collection, at the University of Toronto, and compared to 100 skeletons from the Terry Collection, now located at the Smithsonian Institution. Single variable sex determination methods were developed from the Grant Collection sample and applied to the Terry Collection sample and vice versa. This study suggests that 1) the selection of the reference collection and sample will have an effect on the widespread reliability and accuracy of the method; 2) the importance of "race" as a factor when determining sex will vary depending on the collection from which the method was developed, the specific measurement that is considered, and the sex of the individual in question; 3) in this case (only?), the homogeneity between and within these samples and collections in the head of the humerus make it a better discriminator of sex than the head of the femur.

Skeletal Variability in Recent North Americans: Implication for the Development of New Sex Determination Methods.

JOHN ALBANESE (ESP) McMaster University

In order to assess some of the biases in reference samples used to develop sex determination methods, FORDISC 2.0 was used to identify some of the differences in the pattern of sexual dimorphism between a sample from the Forensic Data Bank (University of Tennessee) and a sample from the Grant Collection (University of Toronto). It was found that when long bone length were not included in the FORDISC analysis, some Grant Collection individuals were more typical of the reference population (Forensic Data Bank). Many others who should have been typical according to conventional thought were not.

The Irish Population of 19th Century Belleville: "Stepping stone" Migrants? (Poster Session)

K. BECKETT, C. CRINNION, T. FARMER, C. NEILL, & D. PRATTE, McMaster University.

The Irish population of Belleville, Ontario during the 1860's and 1870's represented a large portion of the total population of the city, due in part to emigration from Ireland following the Irish Potato Famine of 1847. This study is based on data extracted from the 1861 and 1871 Belleville population censuses. There were 1227 (%=559; &=668) individuals with Ireland recorded as their place of birth in the 1861 census and 1027 (%=463; &=564) in the 1871 census. These two Irish sub-samples were used to examine the process of migration in mid-19th century Belleville, Ontario. The null hypothesis tested in this study was that young, single men and women would be more likely to use Belleville as a "stepping stone" community on route to their ultimate destination. Our findings that approximately two-thirds of the Irish enumerated in the 1861 census were not present in the 1871 census suggests this was in fact the case. Statistical analysis demonstrated that age, sex, marital status, and socio-economic status were all influencing factors in Irish out-migration. Young, single Irish immigrants of low socio-economic status appeared to be the more transient sub-population. It was found that the characteristics of this group of "leavers" more closely resembled the population leaving Ireland following the famine than did the "stayers".

Food fortification to overcome micronutrient malnutrition: A global overview and an Ecuadorian case study.

PETER R. BERTI, Centre for Indigenous Peoples' Nutrition and Environment (CINE), McGill University

Micronutrient malnutrition affects more than one-third of the world's population, including more than 2.1, 1.5 and 0.25 billion suffering from iron, vitamin A, and iodine deficiency, respectively. The consequences range from impaired growth to mental retardation to death. There is now a world-wide effort to virtually eliminate vitamin A and iodine deficiency and reduce iron deficiency by one-third the current levels by the year 2000. Poverty alleviation is the preferred approach—dietary improvements parallel increased economic well-being—but it is a long-

term solution. An effective short-to-medium term solution is the micronutrient fortification of foods already consumed by the at-risk population. Success stories include the fortification of salt with iodine in most of the 118 countries where iodine deficiency is a problem, and fortifying sugar with vitamin A in Guatemala. The recent implementation of iron and B-vitamin fortification of wheat flour in Ecuador is another potential success story. The effect that the fortification may have on nutrient intake in one community is examined. It is shown that if the fortified wheat flour is incorporated into bread and pasta, and dietary habits do not change, it would substantially reduce the prevalence of riboflavin and folate deficiency.

Excavations at the late Miocene hominoid locality of Rudabanya, Hungary.

DAVID R. BEGUN, University of Toronto

In the summer of 1997 excavations jointly sponsored by the University of Toronto Paleoanthropology Field school and the Geological Museum of Hungary were carried out at the late Miocene hominoid locality of Rudabanya, Hungary. Work was concentrated in two previously unexplored portions of the site to test a number of hypotheses concerning the environment of deposition and the taphonomy of the locality. Students and researchers excavated and mapped one meter sections and collected data on sediment and specimen orientation, inclination, and size. Numerous fossil vertebrates were recovered in situ and from approximately 5 tons of washed sediment. Four specimens of the primitive catarrhine *Anapithecus* were recovered. Specimens from the eastern end of the site are stratigraphically above those from further west, and were associated with channel or overbank deposit with some evidence of periodic subaerial conditions. The more westerly specimens were found in a very fine-grained clay indicative of shallow lacustrine conditions. This finding calls into question a previous suggestion that the *Anapithecus* specimens accumulated at Rudabanya during a very short span of time as a consequence of the hunting behavior of *Dryopithecus*. In addition, a new maxilla of *Anapithecus*, found lower in the section than other specimens from the site, is smaller and morphologically distinctive, suggesting either a higher range of variability or more than one species of *Anapithecus*. Excavations by the University of Toronto Paleoanthropology Field school and the Geological Museum of Hungary are scheduled to continue over the next three years in the hopes of obtaining additional fossil material and more evidence of depositional events that will together aid in the interpretation of the paleobiology and evolutionary relationships of both *Dryopithecus* and *Anapithecus*.

The 'Gin' of King Charlie: An Aboriginal Skull From South-Eastern. (Poster Session) Australia.

R.G. BITTAR, D. DONLON, M. PHAROAH, M. HOUANG, N.G. DAN.

Department of Anatomy and Histology, The University of Sydney, NSW, Australia.

Relatively little is known of its history, however this skull is of particular importance because of the palaeopathology it harbors. A large trephination defect, described by several authors over the past 120 years, overlies the position of the superior sagittal sinus and appears to have been produced by the gradual scraping away of the bone. It is one of only two Aboriginal Australian skulls to date that have been identified as having undergone trephination. A hook-shaped calcified lesion arises from the internal surface of the left parietal bone, and its appearance is consistent with an organized blood clot. The third palaeopathological feature of this skull manifests as an unusually prominent right mental tubercle. Mandibular radiographs reveal a radiolucent lesion which most likely represents a focus of chronic osteomyelitis. Whilst the aetiology of the above abnormalities is impossible to determine with certainty, we discuss the most probable causes as well as illustrate this case with photographs, plain radiographs, and computerized tomography.

Freeing up the Hands of the Midwives: A Case Study of Caesareans on the Rise.

STACIE BURKE, (ESP) University of Toronto

The latter decades of the 20th century have seen a remarkable increase in the incidence of birth interventions such as caesarean and forceps deliveries. While some argue the increase is related to an improved chance of infant survival in risky deliveries, others feel the increase is the result of the medicalization of childbirth. Gibraltar is not immune to this steep rise in birth interventions. For singleton births between 1960-64 (n=1923), 92.5% of babies were delivered vaginally. The remaining 7.5% of births occurred via caesarean delivery. By 1990-94 (n=2137

singleton births), only 79% of infants were delivered vaginally, with caesarean deliveries accounting for the remaining 21% of all births. While case histories list conditions such as fetal distress, maternal exhaustion, and breech presentation as the causes leading to caesarean deliveries, this research addresses some of the underlying demographic factors (maternal age, SES, parity) influencing the increased likelihood of non-vaginal delivery.

Acute Respiratory Disease in Nineteenth-Century Gibraltar: Exploring Relationships Between Weather and Mortality.

HENRY H.C. CHOONG, (ESP) University of Toronto.

All populations must operate within constraints imposed by geomorphology and climatic factors such as heat, cold, humidity and rainfall. Meteorological conditions are among the most important physical factors affecting the spreading, frequency, and distribution of respiratory disease such as bronchitis and pneumonia by creating environments which allow vectors to flourish. However, the relationship between weather variables and respiratory deaths is far from simple. Even though bronchitis and associated respiratory diseases is most prevalent in the winter months in Gibraltar, it is a combination of temperature, humidity, and wind-speed changes that is associated with the heightened mortality, rather than any factor by itself. Using time-series analysis, temperature, humidity, and wind are used as independent variables to explore the seasonality of mortality from respiratory disease.

Primate Infanticide: It's not what you (don't) see, it's how you think about it.

IAN C. COLQUHOUN, University of Western Ontario

Infanticide, like other behavioural phenomena, can be examined in terms of Tinbergen's "Four Whys": proximate causation, development, phylogeny and function. The latter "why", however, has garnered most attention. This has resulted in one of the liveliest debates in the primate literature today. The opposing viewpoints on the function of infanticide can be described as the "model-driven" and "data-driven" schools of thought. While neither school of thought wholly embraces what could be considered a post-modernist perspective, major aspects of the overall debate project a post-modernist tone. This paper examines some of the ways in which post-modernist influences are at play in the debate over the ultimate function of primate infanticide.

Investigating the Relationship Between Social Roles and Dental Caries.

CATHERINE M. CRINNION (ESP), McMaster University

This research is intended to compare dental disease experienced by different segments of one prehistoric community, in order to identify pathology that may have been encouraged by differential social roles and dietary practices. Preliminary data analysis suggests that adult female Ontario Iroquoians were at greater risk to dental disease than adult males within the same community. Research has been conducted on 47 crania with associated maxillae and mandibles, focusing upon caries, abscessing, pulp exposures and antemortem tooth loss. The individuals examined were interred at the Uxbridge Ossuary (BbGt-1), which dates to circa AD 1440 (Pfeiffer pers. comm.) Results indicate that the average number of caries per tooth was higher for the females than for the males. The Corrected Caries Rate (Lukacs 1995) for the females was significantly higher than that for the males. To explain these results, it is suggested that the daily activities typically performed by male and female adults significantly altered the foods eaten, as well as the frequency and duration of meals. The resulting differences may have been enough to place the females at higher risk of dental disease, with the potential for causing widespread infection, a depleted immune system, and terminal illness.

Physical Anthropology at Quattishe.

JEROME S. CYBULSKI, Canadian Museum of Civilization & Simon Fraser University

This paper reports fieldwork in 1996 at Quattishe, the site of an ancient Gwagimukw Kwakwaka'wakw (Koskimo Kwakiutl) village in Quatsino Sound, northern Vancouver Island. With the support of the Gku-yau-las Cultural Society, we assisted the Quatsino Band with the investigation of variably preserved, sometimes vandalized burial houses in ethnohistoric period graveyards. Human skeletal remains were examined for historical identification. Osteobiographical data allowed inferences about the length of time one of the burial houses had been used, the possible presence of siblings, and possible supporting evidence for the

suspected presence of a non-local native woman. Information was obtained on culturally enhanced head shapes and possible evidence for biliary disease. Funding was provided by the Quatsino Band Council, Canadian Museum of Civilization, and Bastion Heritage Group. We were aided by the British Schools Exploring Society.

A case of traumatic death from the Chalcolithic village of Shiqmim (Israel). (Poster Session)

LESLIE DAWSON (ESP) University of Alberta

Three depressed fractures were found on the cranium of an adolescent boy from the Chalcolithic village of Shiqmim. Two fractures were located on the left side and one on the back of the skull. These lesions are relatively circular and have bone fragments adhering to the margins suggesting that the bone was still fresh. The location and shape suggest that they were caused by a blunt object, such as a stone or macehead, and by a right-handed individual. Since there is no evidence of healing or infection it is likely that all fractures occurred within a very short period of time and that this individual died from these wounds. This individual was buried in a similar fashion to other inhabitants of Shiqmim and there is no evidence to suggest that he was of a unique status in the society.

An Analysis of Inter and Intra-site Mortuary Variability among Classic Lowland Maya Sites.

APRIL DELAURIER (ESP) University of Western Ontario

Although extensive descriptions have been made of Classic Mayan burials, little investigation has been undertaken to understand the social correlates of Mayan mortuary behavior. By conducting cluster analysis of selected sites in the Lowland Maya area using information provided in Welsh's 1988 burial appendices, inter and intra-site trends of mortuary behavior have been identified involving variables of body position, head orientation, burial type and context, and grave goods. At most sites burial position is the variable which varies the most between clusters (burials) than within them. Compared to position, head orientation variables vary less between clusters than within them. At some sites grave goods seem to vary more between clusters than within them, and almost all sites have a similar pattern of variance in grave good distribution. Compared to these other variables, burial type and context tend to be fairly highly variable within clusters rather than between clusters. In general, on the basis of the variables which define large cluster groupings, ideological factors rather than socio-political factors determine mortuary behavior among the Classic Lowland Maya.

Preliminary Results of a Palaeo-dietary Study for Southeastern Manitoba using Stable Isotope Analysis.

DENISE ENS (ESP) University of Manitoba.

Stable isotope analysis often has been used in palaeo-dietary studies with remarkable success. Many of these studies have focused on non-temperate and/or coastal subsistence strategies, or the rise of horticulture. This presentation will consist of the preliminary results based on stable carbon and nitrogen isotope data derived from human collagen, and archaeological and modern biota. The focus of this dietary study is five sites along an inland river system in southeastern Manitoba. The possibility of differentiating between types of temperate zone freshwater fauna, and terrestrial biota in relation to human diet will be explored.

An Increasing Threat And A Diminishing Passion: An Evaluation Of Research On Tuberculosis In Canadian Aboriginals.

TRACY FARMER and KRISTEN BECKETT, McMaster University

It is estimated that approximately one-third of the global population is infected with tuberculosis (TB), with 2.5 million people dying annually from this preventable disease. In industrialized countries the disease primarily affects socially, economically and politically marginalized pockets of the general population. Information collected from Health Canada, Statistics Canada, and the CDC, reveal that while TB rates have fallen drastically in Canada since the middle of the 20th century, tuberculosis still maintains itself in the Aboriginal population at rates approximately ten times higher than is found in the non-Aboriginal population. These high rates are the result of factors such as inadequate nutrition, substandard living conditions, and certain pre-existing medical conditions. Although TB is recognized as a disease rooted in the social context of communities, data gathered from MEDLINE database searches reveal that the

majority of TB studies have been conducted primarily within a biomedical framework. Little attempt has been made to conduct community-level analysis that endeavors to understand the social mechanisms aiding the occurrence and propagation of TB.

Regular periodicity of circaseptan intervals in the tooth enamel of three modern human populations - A study designed to test the principle hypotheses underlying dental histological age estimation using microstructural growth markers.

C.M. FITZGERALD, McMaster University.

Since 1985 a new technique for establishing the rate and duration of tooth development, and ultimately a juvenile individual's age at death, has been used in anthropology. The method utilises an internally calibrated aging standard and is therefore particularly useful for fossils and archaeological remains. It is based on the interpretation of certain histological microstructures in enamel and dentine, which are claimed to be incremental growth markers. These occur in two periodicities: circadian and circaseptan (near weekly). To date no large-scale tests conclusively demonstrating both uniformity and regular periodicity of the long period marker within individual teeth and through the whole dentition have been published. This was a primary objective of this study, which used a sample of one hundred and fifty-eight teeth from individuals of determinate age and sex from three populations. All teeth were sectioned and circaseptan intervals were determined from photomicrographs. Two sections were taken from each tooth, the sampling location within each tooth was recorded, and all populations included multiple teeth from single individuals. The results lend statistically powerful support to the use of microstructural growth markers of enamel in age estimation techniques and growth and development studies.

The Stature of Toronto School Children a Century Ago and Today.

TODD GARLIE and ROBERT HOPPA, McMaster University

A comparison of measurements of height is made for late nineteenth century to early and mid-twentieth century Toronto School children. Changes in total attained stature for age is compared for girls and boys to assess secular trends in height of urban children from Southern Ontario. The data clearly show a positive trend toward increased attained height for age from the earliest to most recent data. Comparison of the Toronto growth profiles to other published 18th and 19th century growth data demonstrates that the secular trend in the Canadian children is a reflection of the continued global trend toward increased height. The implications of this changing pattern over time are discussed in the context of changing urban health and nutrition in the greater Toronto area.

The Impact of Taphonomic Pressures on Human Remains in Caves in the Maya Area. SHERRY A. GIBBS (ESP), University of Western Ontario.

The taphonomy of human remains in caves is very unique. Cave environments experience taphonomic processes not encountered at surface sites. Two examples of such processes are fluvial turbulence, which can commingle remains, and calcium carbonate which conceal and even obscure the bones, as well as making them very fragile. The implications and problems these taphonomic processes have for bioarchaeological analysis will be highlighted. In particular, cave taphonomy and bioarchaeological research, including osteological data of 14 individuals, from Actun Tunichil Muknal (Cave of the Stone Sepulchre) in Western Belize, will be discussed.

Alcohol-Related Mortality in Ontario, 1960-1989: Deconstructing Methods, Deconstructing Explanations.

DEBORAH E. GUSTAVSEN, University of Windsor

Mortality related to alcohol in Ontario, Canada, for the period 1960 to 1989 is examined with a fresh lens. The construction of a database of alcohol-related mortality for the province of Ontario from individual death records, the Alcohol-Related Mortality Project of Ontario (ARMPO) is documented and illustrated as providing a novel alternative to aggregate data. The strategy of approaching alcohol-related mortality from the disaggregate level of individual records is emphasized and illustrated as providing very different explanations for the trends observed and reported for the 1960 to 1989 period. The reported decline in liver cirrhosis mortality rates in Ontario from 1974 or so is illustrated as more apparent than real.

Deconstructing Physical Anthropology: Celebrants or Apologists of the Postmodern Project?

DEBORAH E. GUSTAVSEN, University of Windsor

Anthropology, physical anthropology in particular, is in some sense inherently postmodern; valorizing heterogeneity, incommensurability, difference, fragmentation and maintaining a healthy skepticism of universal truths. However, often from behind a veil of science, physical anthropologists are reticent to call attention to the constructed nature of their concepts and methods. This paper argues that in physical anthropology we need neither celebrate nor totally dismiss the discourse of the postmodern. For all postmodern's hazards and rhetoric, there are challenges and critiques which promise new perspectives and modes of thought.

Methodological Concerns Surrounding Medical Anthropology and Community Health: An Analysis of the North Carolina Chinese Health and Nutrition Survey.

STEVEN HARRISON (ESP) University of Toronto

The University of North Carolina at Chapel Hill began their longitudinal Chinese Health and Nutrition Survey in 1989. This survey was to cover issues of health affecting individuals in China, primarily in urban areas, but also to a certain degree in regions deemed "rural". This distinction was based on economic factors and to some extent social factors, but not on geographic distribution. Information was gathered quantitatively concerning health, access to health care, and attitudes/understandings concerning health. In Medical Anthropology many of us use quantitative methods to enforce or substantiate findings we have discovered or achieved through qualitative analysis, i.e. Quantification has its limitations and place within our paradigm. Although we are closely associated with the works of Community Health experts and Epidemiologists, we must be wary of the fundamental differences which exist between our distinct methods of analysis. In this presentation I will illustrate the methods chosen by the University of North Carolina in their research, and show modifications that have been made to these methods in order for their utilization in my PhD studies.

Body Height and body mass in our Neanderthal cousins.

HERMANN HELMUTH, Trent University.

Body size, expressed as height or stature, is an important determinant of many other biological variables. Thus, it is surprising that many textbooks portray a wrong picture of Neanderthal height as being "very short" or "just over 5 feet". It is shown on the basis of 30 long bones from 12 males and 3 females that Neanderthals' height averages between 164.8 and 168.2 (males) cm resp. 150 to 153.4 cm (females). This height is indeed 12-14 cm lower than the height of post-WWII Europeans, but compared to Europeans some 20,000 or 100 years ago, it is practically identical or even slightly higher. Considering the "stocky" body build of Neanderthals, new body weight estimates show that they are only slightly above the cm/weight or the Body Mass Index of modern Americans or Canadians. The much maligned very short, stocky Neanderthal males as depicted in so many reconstructions, is therefore, another unwarranted act of discrimination against our fossil cousins.

Trade, traffic and the transmission of infection.

D.A. HERRING, McMaster University, and L. SATTENSPIEL, University of Missouri-Columbia, Columbia, Mo.

A large literature notes that trade routes provide a ready means for disease to spread from place to place. In our research on the impact of the 1918 influenza pandemic on three Hudson's Bay Company posts in Manitoba (Norway House, Oxford House and God's Lake), we find immense differences in the volume of traffic, variety of destinations and origins of travelers, distances traveled, and tempo of trade-related travel during the annual cycle. The traffic patterns at Norway House can be characterized as constant, cosmopolitan and weighted toward the summer months, while God's Lake represents the other end of the spectrum, with smaller, less dramatic pulses of local travel occurring primarily in the winter and spring. The patterns reflect the distinctive economic roles of the two posts: Norway House as entrepot and transshipment centre for the fur trade, and God's Lake as hinterland fur supplier to Norway House. The opportunity for infectious diseases to spread to and from these places is clearly different. Presumably, similar variation operated in earlier periods and must be taken

into consideration when postulating the spread of epidemics for which documentation is limited or non-existent. This research is supported by the National Science Foundation.

Acute Epidemics and Chronic Infectious Disease in a 19th Century Fur-Trade Community: Examining Cause of Death Data for Moose Factory, 1851-1899.

ROBERT HOPPA and ANN HERRING McMaster University

Cause of death data derived from Anglican Church burials records are discussed for the fur trade center of Moose Factory from 1851 to 1899. Of the 520 burials listed in the burial registers, 348 have a recorded cause of death and approximately two thirds of the latter are tuberculosis-related. When the cause of death data are partitioned into tuberculosis vs. other causes, then analysed by sex, season of death, and burial cohort, no statistically significant differences in survivorship between TB and other causes of mortality are detected, despite significant differences in the incidence of TB mortality relative to other causes. However, young and middle aged adults proved to be significantly more likely to die from tuberculosis than from other causes. These age groups constitute the fundamental productive and reproductive segments of the community. Our findings suggest that tuberculosis was both chronic and endemic at Moose Factory by the nineteenth century, forming a constant background of adult mortality against which acute epidemics were overlain. (This research is supported by the Social Science and Humanities Research Council of Canada (#756-95-0181) and McMaster University Arts Research Board (#5-58547).)

Enamel Hypoplasia in a 19th Century Historic Sample

ANNE KEENLEYSIDE, Royal Holloway University, UK and SHELLEY R. SAUNDERS, McMaster University

Osteologists have observed differences in the prevalence of enamel defects among social groups. There have been claims that the peak age of occurrence of enamel defects in subadult skeletal samples is associated with weaning or post-weaning stress. The St. Thomas' Anglican Church nineteenth century skeletal sample provides an interesting perspective on these questions since there is documentary information available on socioeconomic conditions, health, diet and infant feeding practices for Belleville in the 1800's. Enamel hypoplasia was recorded on the maxillary and mandibular dentitions of 253 individuals. The prevalence of enamel hypoplasia is relatively low in this sample and the degree of disruption is mild in most instances. Males have a significantly higher percentage of defects than females for both maxillary and mandibular canines. Estimates of the earliest age of occurrence of defects range from 1.5 to 3.0 years with a peak at 2.0 years for the maxillary central incisor and from 2.5 to 3.5 years with a peak at 3.5 years for the mandibular canine. The prevalence of hypoplasia in this sample conforms with expectations of general health and socioeconomic conditions but the calculations of peak age of occurrence of defects do not match with other skeletal, documentary and historical information about infant feeding and childhood stress.

Validation of Bitewing Radiographs for Human Forensic Identification.

STANLEY L. KOGON, University of Western Ontario.

The bitewing radiograph, used primarily to disclose interproximal caries, is the most common radiographic format in Dentistry and therefore these films are frequently used for forensic identification. However, their application for this purpose has never been validated. The effectiveness of these radiographs has recently been evaluated in a blinded, controlled study. In particular, the sensitivity, specificity and accuracy of antemortem/postmortem comparison of matched and artificially non-matched pairs of bitewing radiographs in adults with few characteristic metallic dental restorations were assessed by both expert and non-expert observers. Additional validity studies of the comparison of these radiographs in children, adolescents and in cases where an extended time lapse occurred between the antemortem and postmortem films, completed the study. Although the results of these investigations give scientific support to the continued use of these films, caution is suggested when using bitewing radiographs in the identification of children and when extended time lapses occur between a/m and p/m.

Intention or Accident? Evidence of Cranial Trauma from the Strait of Georgia. (Poster Session)

CATHERINE A. LATHAM and ERIN STRUTT, University of Bradford, England

Events of interpersonal violence on the northern coastal areas of British Columbia are well recognized in both ethnohistorical and archaeological sources. To date there has been a lack of osteological evidence supporting such conclusions on the south coastal areas of British Columbia, specifically from the Strait of Georgia archaeological sites. During the 1984-1987 excavation seasons at the Pender Canal site (DeRt 2) on Pender Island (5000-250 BP) 149 human burials were recovered under the supervision of Dr. R. Carlson and Dr. P. Hobler of Simon Fraser University. Of these 149 burials we have analyzed 103 individuals, 12 of which exhibit bony changes indicative of traumatic injury other than cranial deformation. This poster presentation will attempt to outline the osteological differences in cranial trauma due to inter/interpersonal injury, accidental injury, and pathology.

Radiogrammetric Assessment of Skeletal Aging in the Second Metacarpal.

RICHARD LAZENBY, University of Northern British Columbia

A return to greater use of second metacarpal radiogrammetry in fracture risk assessment and population comparison ignores several theoretical and methodological issues which diminish its utility in these realms. This paper considers the impact of some of these, including the presumption that biological significance only follows from statistical significance, and the inappropriateness of the assumption of circularity in the construction of bone mass indices. The latter especially has the potential to inflate the number of false positives in risk assessment. Using left and right second metacarpals from the St. Thomas sample ($n = 320$), a series of reduced major axis models are presented which adjust radiogrammetric data to values consistent with the geometric variability of the metacarpal midshaft. Application of these formulae to a hold-out sample ($n = 36$) showed no significant differences between actual and predicted values for measures of area (total and cortical) and bending rigidity (I_x and I_y).

Body Size And Proportionality Of Late Stone Age Khoisan In Southern Africa.

A. LOCKER (ESP), University of Guelph

In studies of human variability, biological anthropologists attempting to account for global variability in body size rely in part in Bergmann's rule and Allen's rule. In the southern coastal region of Africa, with a mean annual temperature of 18 degrees Celsius but varying between 12 degrees Celsius in the winter season to over 25 degrees Celsius in the summer, one would expect adaptation to the sub-tropical climate to include reduced body mass and relatively long limbs, with greater variability in the distal segments, producing a tall, lean physique. Collecting and examining long bone measurements from 77 Late Stone Age adults (41 females, 36 males), with individual radiocarbon dates ranging from 2000 B.P. to 10 000 B.P., two hypotheses are tested: first, that the human morphology observed is adapted to the climatic conditions, and second, that this adaptation increases through time, indicating directional natural selection. Proportionality indices reflect adaptation to a warm climate. The stature and body mass values are low by world standards, however, these estimates are comparable to historic values for Khoisan populations. Throughout the 8 000 year time frame represented by this sample, all values display little variability. These data suggest that stabilizing natural selection, rather than directional natural selection, may have been operating. (This research is supported by a grant from the Social Sciences and Humanities Research Council to S. Pfeiffer.)

Craniometric Trends of Ontario Iroquois in Comparison to FORDISC 2.0 Reference Populations.

AMY MAISH AND SHERRY FUKUZAWA (ESP), University of Toronto

In Ontario, the accurate identification of Ontario Iroquoian skeletal remains would immensely aid the forensic anthropologist. These individuals are frequently represented in forensic investigations within this province. This study examined 59 complete and fragmentary adult crania from two known Ontario Iroquoian sites ($N=21$ Ossassane; $N=38$, Kleinberg). Sex was determined independently by both authors through the examination of morphological traits ($N=27$ males; $N=32$ females) and craniometric data was collected. The racial affinity of the population was tested using the FORDISC 2.0 computer package. The crania were also tested against the Howell's database using the Arikara, Dogon, Eskimo, Santa Cruz, Peruvian, and Northern and Southern Japanese populations. FORDISC 2.0 results were analyzed for the

isolation of trends in posterior probability and typicality of the Ontario Iroquoian to the program's reference populations. Preliminary results indicate that FORDISC 2.0 is not a reliable package for determining the racial affinity of Ontario Iroquoian crania.

Solve the Case: Three Days or Three Hours. (Poster Session)

SUSAN MAKI-WALLACE, Baylor University, Texas.

The expertise of a forensic anthropologist is requested at a crime scene when the remains are otherwise unrecognizable and a determination can not be made as to if the material is human or non-human. In central Texas we are also called to find remains when the murderer has confessed to a specific location. The purpose of this paper is to report several cases the author worked that appear to ignore proper field techniques that would be a benefit monetarily and save time if handled in a different manner. The forensic anthropologist has a special knowledge that is unique. The reported cases are often humorous but provide valuable information to law enforcement officers.

Maxillary Sinusitis Among Fifteenth Century Iroquoian Horticulturists.

DEBORAH C. MERRETT, (ESP), University of Guelph

Sinusitis is a commonly occurring infectious disease in contemporary human populations, which if not treated, can result in changes to bone morphology. The maxillary sinuses act as a physical trap and a site of secretory immunity, forming the body's first line of defense against airborne pathogens. Considered in conjunction with the cultural context, the prevalence of maxillary sinusitis should, in part, reflect the respiratory health of the population, the airborne pathogen level and the air quality in the environment. Three hundred forty seven maxillae of a Southern Ontario Iroquoian population, Uxbridge Ossuary, cal AD 1440, were examined for evidence of chronic infection of respiratory origin. The sample represents a minimum of 123 adults, 22 adolescents, 66 juveniles and 5 infants. The proportion of individuals exhibiting maxillary sinus lesions was explored in segments of the Uxbridge population which differ with respect to age. Changes to bone morphology were observed in 46% of the individuals examined. A substantial proportion of infants, juveniles and adolescents show osseous changes independent of dental deterioration (abscessing). Among adults, alveolar abscessing becomes a confounding variable in the etiology of sinusitis. Special reference is made to tuberculosis which is known to have been present in the Uxbridge population (Braun, Cook & Pfeiffer, in press). It is suggested that the osseous changes of the maxillary sinuses may be used to infer the presence of chronic respiratory infection in past populations, and that the cultural construction of microenvironments conducive to such deleterious health effects is an important factor influencing health outcomes in past, as well as in contemporary, populations.

Craniomandibular variation in the platyrrhine genus *ALOUATTA*: possible influences of hyoid specialization.

J.R. MILLER (ESP) University of Toronto

Functional correlates to primate morphology are frequently based on taxic comparisons that do not include all members of a representative group. This can lead to erroneous interpretations regarding the evolutionary significance of a novel structure. The platyrrhine genus *Alouatta* is traditionally characterized by cranial and mandibular features thought influenced by its extraordinary vocal tract adaptations. Variance within and between species, however, has not been adequately quantified. This study presents new data regarding interspecific variability in the cranium and mandible as it relates to hyolaryngeal adaptation. Craniometric data was obtained from a sample of 160 specimens, representing the 6 commonly recognized species of the genus and using both males and females. Univariate analyses were conducted on both raw and size-adjusted data both by taxon and controlling for sex. The results indicate significant variance within the *palliata*-group, a category characterized by a smaller and less complex basihyoid element, that is attributable to species differences. *A. pigra* is more similar to those species forming the non-*palliata* groups, and significantly different from *A. palliata* for a number of important craniomandibular dimensions thought directly influenced by hyoid size. The most pronounced differences between species occur in the mandible and cranial base. In some cases variables are clinally distributed, polarized by both species possessing hyoid morphology often considered to be the primitive state. Subsequent correlation analysis supports the supposition that enlargement of the hyoid

apparatus is facilitated by preexisting changes in cranial morphology which likely respond to historical and life-history constraints.

A Preliminary Report. Dental Calculus in Two Maya Populations: San Pedro and Marco Gonzalez, in the Ambergris Cay, Belize.

ANGELIQUE MOHRING (ESP) University of Western Ontario

The process of reconstructing prehistoric diets still presents many challenges to anthropologists. Dental anthropology can contribute valuable information in terms of paleodiets and biological and cultural behaviors. This paper discusses the presence, severity and significance of dental calculus measured from the skeletal remains of two ancient Maya populations; Marco Gonzalez and San Pedro. Archaeological evidence has indicated that both populations were dependent on a variety of foods including both maize and marine resources. Calculus deposition was high for both Marco Gonzalez and San Pedro, and certainly significant among juveniles. Calculus distribution is patterned by age, sex and tooth type, both within and between each site. Reasons for this patterning are discussed.

Field Radiology in Archaeology: Penetrating Problems and Illuminating Research in Osteology.

ANDREW NELSON, University of Western Ontario & JERRY CONLOGUE, Quinnipiac College

The use of radiography as an adjunct to osteological research has a long history. It is well recognized that many features of normal and abnormal osseous anatomy simply cannot be visualized in any other manner. In this age of technological advance, there is a perception that good results depend on the use of the newest, most expensive equipment available. However, this makes the osteologist dependent on fixed facilities, restrictive schedules, and large sums of grant support. This paper reports on the successful assembly of a field radiology laboratory at an archaeological site in Peru. Simplicity and cost effectiveness were achieved by the use of clinically obsolete x-ray machines. Instant results were obtained using simple black and white Polaroid camera film and extended exposures. The ability to obtain instant results, and the fact that the radiological facilities were incorporated in the field lab meant that there could be constant feed back in the data recording and analysis process. The ability to construct simple field radiography labs opens important avenues for research to osteologists who may not be able to move their collection to established hospital facilities, to archaeologists interested in analyzing other material remains and to forensic anthropologists who need to make decisions in the field.

Examining the Impact of Psychological Stress as a risk factor: A Case Study of Suicide in Gibraltar.

JOHN D. PURCELL (ESP), University of Toronto.

Suicide rates provide an index of health, social pressure and tension within a community. This study investigated the level of suicide in Gibraltar from 1906-1989. Both male and female crude suicide rates were computed over successive ten year intervals. Overall, Gibraltarian females displayed remarkably low rates as compared to global trends during this period. Among males, suicide rates peaked during 1916-1925, 1926-1935, as well as the most recent time period. The fluctuating rates among males were further evaluated by considering the impact of historical and societal change in Gibraltar.

The Role Of The Forensic Anthropologist In Identifying Aircrash Victims

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Prior to this year, we had never dealt with an airplane crash involving more than four victims (Burlington Air Freight, Toledo, Ohio, 1992). In January of this year we spent 5 _ days as members of a U.S. Public Health Service D-MORT team helping to sort and identify the remains of 29 passengers aboard ComAir 7232, an Embraer commuter turboprop that went down near Monroe, Michigan, during a flight from Cincinnati (Covington, Kentucky) to Detroit. In August, we were again called by D-Mort to spend 24 days helping to sort and identify the remains of 226 passengers aboard Korean Airlines 801, a 747 "jumbo" jet that made a "controlled flight into terrain" on its approach to Guam airport. Apart from numbers of victims, the scene conditions were quite different (50 degrees below zero wind-chill vs 110+ degrees). In this paper we will focus on some of the continuities and discontinuities involved in dealing with two crashes of such different magnitude, especially in regard to condition of the remains and the

role of the forensic anthropologist (vs the forensic pathologist). The role of the U.S. D-MORT teams (a component of the National Disaster Medical System) in multiple fatality incidents will also be briefly described.

Harvesting the Heavens: Health Implications in the Year of Cholera.

LARRY SAWCHUK, University of Toronto

Gibraltar's highly decentralized water system played a significant role in the nature and pattern of cholera mortality during the epidemic of 1865. Analysis showed that mortality rates varied by: geographic location, age, patio size, and religion. Gibraltar's unusual geopolitical status also contributed to the expression of cholera mortality.

Identification And Cause Of Death: A Homicide Involving Skeletal Remains. (Poster Session)

MICHAEL J. SHKRUM, London Health Sciences Centre, MICHAEL W. SPENCE University of Western Ontario, and CHRISTINE D. WHITE (University of Western Ontario)

The skeletal remains of a 54-year-old male were found concealed in a wooded area two years after his disappearance. Post-mortem investigation revealed osseous features consistent with the missing individual's age, race and sex. Specific radiologic and skeletal observations were compatible with the medical and other background history of the deceased. Notably, there was evidence of an old shotgun injury of his leg and the cause of death was a shotgun injury to the torso area. This case illustrates the multi-disciplinary approach by police, anthropologists and medical experts in the successful identification and determination of cause and manner of death of skeletal remains.

Is Postmodernist Paradigm Viable in Biomedical Anthropology? A view from cross-cultural mental health.

JOSEPH SO, Trent University

Postmodernism, in its emphasis on multiple realities, subjectivity, abandonment of a grand scheme, and a relativistic view of scientific data, has long been considered anathema to science. While Postmodernism has been for the most part embraced by our colleagues in sociocultural anthropology, it has made little inroad in biological anthropology. A historical reliance on theories from evolutionary biology and natural history have left us without a theoretical framework to call our own. In medical anthropology, a domain where sociocultural and biological anthropologies interface, it should be one area where a rethinking of research strategies incorporating postmodern approach may be warranted. So far this has not happened. An examination of the framework of cross-cultural health and illness, particularly that of mental health, suggests that its basic premises, such as multi-vocalities, patients' perspectives, experiential and phenomenological concerns to be amenable to a postmodern approach. This approach does not necessarily undermine scientific principles that biomedical anthropologists hold so dear. This view is illustrated with the practice of multicultural, community-based mental health as it exists in Canada. If biomedical anthropologists hope to make an impact in anthropology as a whole, we need to undergo a paradigmatic shift to a more humanistic and contextual view of health and illness.

Body size and cross-sectional dimensions of cortical bone in the human femur.

JAY STOCK, (ESP) University of Guelph

The distribution of cortical bone in the diaphysis of the human femur should be highly correlated with body size, due to its relative plasticity and the effects of weight bearing during locomotion. The reconstruction of prehistoric behavior is contingent upon the understanding of this plasticity.

This study compares the cross-sectional geometric properties (CA, TA, I_{max}, I_{min}, J) of cortical bone at the femoral midshaft of two populations exhibiting small adult body size, against a population from the 19th century cemetery at St. Thomas' Anglican Church, Belleville, Ontario (n=226, m=130, f=96). The two small bodied populations are Later Stone Age (LSA) southern Africans dating from ca. 10,000 to 2,000 b.p. (n=14, m=3, f=11), and late 19th century AD indigenous Andaman Islanders (n=30, m=18, f=12). Estimated mean statures of both populations are below the third percentile of contemporary American adult stature. There is significant sexual dimorphism in all properties within each of the three populations, but it is proportionally most pronounced among the large bodied sample. Regression of logarithmic

transformed data reveals populational variability and sexual dimorphism in the relationship between femur length and cross-sectional properties, yet the overall relationship is one of functional equivalence. (This research is supported by a grant to Susan Pfeiffer from SSHRC.)

Changing Patterns of Growth Among Adolescents of the Evenki Reindeer Herders of Central Siberia.

GARY SPENCER (ESP) University of Guelph.

Very little is known about the physical growth of Siberian indigenous groups. This paper presents a cross-sectional assessment of the changing patterns of growth in height, weight, fatness, and fat patterning of adolescents between the ages of 12 and 17 years (1991:n=23-12M,11F; 1992:n=27-11M,16F;1995:n=42-9M,33F), from the Evenki Reindeer herders of Central Siberia. Anthropometric dimensions are compared to the NCHS reference data through the use of z-scores. The Evenki are smaller than the U.S. sample in most anthropometric dimensions, but their growth status appears to be changing over the four-year period. This paper attempts to link these changes to the massive social and economic reforms that have taken place since the fall of the Soviet Union in 1991. (This work was supported by grants from the Natural Sciences and Engineering Research Council (NSERC) of Canada, the U.S. National Science Foundation, and the U.S. Man of the Biosphere Program.)

The Juvenile Skeletal Sample of the Imperial Roman Site of Portus Romae. (Poster Session)

SPERDUTI, A., BONDIOLI, L., PROWSE, T., SALOMONE, F., YANG, D., HOPPA, R.D., SAUNDERS, S.R., MACCIARELLI, R. Museo Nazionale Preistorico Etnografico "L. Pigorini", Sezione di Antropologia, Roma, Italia, and McMaster University

Studies of the mortality and morbidity of infants and juveniles are valuable for reconstructing the living conditions of past populations. The large sample size and excellent preservation of subadult skeletons from the necropolis of Isola Sacra (I-IIIrd century A.D.) offer the opportunity to study paleoepidemiology, paleonutrition and paleodemography of the ancient community of Portus Romae. Portus was the late imperial period seaport which served as the main distribution site for the Roman Empire. There are conflicting views about the quality of nutrition and levels of disease existing both inside and outside of Rome during the Imperial Period. An osteological approach may help to resolve some of the classical interpretations. The total skeletal collection contains over 2000 individuals. For this study, a sample of 248 infant and child skeletons aged 0-15 years were analysed. We report on results of an analysis of age-at-death estimations, growth of long bones, the prevalence of non-specific stress indicators and investigations of specific pathological conditions. The pattern of mortality is not unusual and long bone size appears normal up until late childhood, but there is also definite evidence for specific childhood diseases and possibly, nutritional stress. Recent DNA work does not yet confirm the presence of beta-thalassemia in putative morphological cases. The larger, ongoing "Isola Sacra Project" seeks to develop a comprehensive picture of the skeletal biology of the past population of Portus Romae by taking a variety of research approaches.

The postcrania of Le Moustier :Neandertal features and implications for Neandertal Ontogeny.

JENNIFER L. THOMPSON, University of Toronto, and ANDREW J. NELSON, University of Western Ontario.

The Le Moustier 1 specimen is an adolescent male, dating to c. 40,000 BP. It is the only adolescent specimen to preserve associated dental, cranial, and skeletal elements and so is of critical importance in the study of Neandertal ontogeny. The original postcranial bones were badly burned in a fire in WWII and only vague descriptions of the morphology exist in the initial publications. We describe the morphology of this specimen using best available casts compared against the original descriptions and with reference to existing Neandertals individuals, and assess the skeletal age of this specimen using the degree of epiphyseal fusion and bone lengths. We have established that despite its immature status, the Le Moustier boy demonstrates many of the traits thought to be characteristic of Neandertals. The indicators of ages were assessed using modern human growth and development standards. Modern human growth and development standards were used to assess the age at death of the Le Moustier 1 specimen. Estimates from dental formation and eruption (c. 15.5 yrs) and postcranial epiphyseal fusion and bone lengths (c. 11 yrs), demonstrate a lack of concordance (Thompson & Nelson 1997). Stature estimates (1.40m) based on Feldsman's femur/stature

index indicate that Le Moustier 1 had attained 85% of the average stature of an adult male European Neandertal matching modern human males just beginning their growth spurt. If Le Moustier 1's dental age accurately reflects his chronological age, then this individual would require a greatly accelerated growth velocity in the last few years of his adolescence in order to achieve the mean adult Neandertal stature and indicates that Le Moustier 1 was not maturing according to the same schedule as modern humans.

Seeing the forest for the trees: Environmental perception, human health and well-being. LOREN VANDERLINDEN and JOHN EYLES, McMaster University.

This paper reports on one aspect of a transdisciplinary project by Environmental Health, McMaster University and Ecosystem Health, University of Guelph. The research, funded by the Richard Ivey Foundation, London, Ontario, sought to decipher the relationships between human well-being and forest health, as well as to understand how forests are valued by the public. Our case study site was a rare Carolinian (Oak savanna) forest at Pinery Provincial Park, near Grand Bend, Ontario. Guelph scientists determined the health of Pinery's forest, while McMaster researchers conducted focus group discussions with six interest groups (labour, health, business, environmentalists, First Nations and Grand Bend villagers) from London, Ontario and Lambton County. Qualitative analysis of focused discussions revealed that forest values were most often described in the context of how they affected human health and well-being. Results indicate that these participants shared a partiality for, and deep appreciation of forested areas. The great majority acknowledged that their physical, mental and spiritual health was directly affected by environmental conditions, and that they perceived their health to be positively affected by trees and forests. The implications of environmental perception for human health and adaptation will be discussed, with consideration of the literature from environmental psychology.

Dominance, Aggression and Mounting Interactions between Female Japanese Macaques (*Macaca fuscata*).

PAUL L. VASEY, BERNARD CHAPPAIS and CAROLE GAUTHIER, Université de Montréal
The goal of this paper was to determine whether female Japanese macaques (*Macaca fuscata*) participated in same-sex mounting interactions during homosexual consortships to communicate about asymmetries in their dominance relationships and to reduce aggression. Focal data were collected during 21 homosexual consortships involving 14 females living in a captive, mixed-sex group of 37 individuals. We identified eight types of mounts, one solicitation used specifically to request to mount, two solicitations used specifically to request to be mounted, and one behavior employed to facilitate mounts-in-progress (clasping). We tested whether dominant consort partners (1) mounted more and (2) requested to mount more than their subordinate partners and whether subordinate consort partners (1) requested to be mounted more and (2) facilitated mounts-in-progress more than their dominant partners. Finally, we examined whether mounting was temporally linked to the onset of aggressive interactions between consort partners and whether it functioned to defuse incipient aggression. None of these predictions was supported. All types of mounts, mount solicitations, and clasping occurred bi-directionally within consort dyads. Mutual sexual attraction and gratification provided the proximate motivation for these mounting interactions and, in turn, for the formation and maintenance of their homosexual consortships.

A Preliminary Paleodemographic Analysis of Marco Gonzalez and San Pedro, Belize.

CATHY WALPER (ESP), University of Western Ontario

Paleodemography is a valid and valuable tool that can be used to assist in the reconstruction of ancient cultures. This paper deals with a preliminary paleodemographic analysis of the skeletal remains from two Post Classic Mayan villages; Marco Gonzalez and San Pedro, found on Ambergris Cay, Belize. The study has yielded information that can be used to increase knowledge about the lives of these people. Stationary population life table analysis has provided birth and death rates, life expectancies and survivorship rates for both skeletal populations. Comparisons of these data with life table analyses from other archaeological samples such as Tjallinga 33, Libben and Altar de Sacrificios indicates significant similarities in some of the results suggesting that some trends may be deduced.

The Isotopic Evidence of Diet at the Kharga Oasis, Egypt.

CHRISTINE D. WHITE, Department of Anthropology, The University of Western Ontario; FRED LONGSTAFFE and KIM LAW, Department of Earth Sciences, The University of Western Ontario.

Stable carbon isotopes in the hair and skin of 6 Roman-Byzantine Period (400-700 A.D.) individuals from the Kharga Oasis, Egypt, were analysed in order to reconstruct degrees of dietary variability or stability in an oasis ecology. These are compared to 11 previously studied contemporaneous individuals who lived at sites from the Nilotic ecology near Wadi Halfa, in the Northern Sudan. Residues extracted from the Kharga material appear to belong to C3 plants and thus likely reflect resins used in an artificial mummification process. Lengths of hair up to a one year period of growth indicate that diet in the oasis environment is unaffected by seasonality compared with the seasonal shifting of C3 plants (wheat, barley, fruits, vegetables) and C4 plants (millet, sorghum) found at the sites located along the Nile. The Kharga population consumed significantly greater quantities of C3 plants and does not appear to have included C4 plants in its trade with Northern Sudanese populations. There are, however, differences in the social and biological patterning of food consumption between the two sites. The uniformity of diet at Kharga contrasts sharply with the differentiated diets of females and children from males at the Wadi Halfa sites.

Personal Identification of Historic Skeletal Remains: Investigative Approaches.

LYNDA WOOD, JANET YOUNG, Canadian Museum of Civilization and PAUL ROBERTSON, Ontario Provincial Police, Upper Canada Attachment.

On August 26, 1997 we received a call from Upper Canada Detachment of the OPP. A human skull had been discovered during digging for the foundation of a new barn. Initial examination of the skull suggested that the remains were those of a child and initial excavation of the burial revealed decomposed coffin wood and what appeared to be historical coffin hardware. The following day Constable Robertson spoke to the local "hobbyist historian" who reported that the Bellways, a family with six children, moved to the property in 1880, and their eight year old daughter, Margaret Ellen, died at home the following year. The Bellway family descendants were adamant that the remains were not those of Margaret Ellen. In addition, Margaret Ellen's headstone was discovered at the local cemetery. Constable Robertson asked if we would assist him in determining the possibility of the remains being those of Margaret Ellen Bellway. The evidence and information available for this investigation included coffin hardware, coffin shape, a single straight pin found in the lumbar region, and DNA matching with the single living blood relative, Lyle Bellway. Individuals from various disciplines were consulted in an attempt to determine the identity of the remains.

CAPA Newsletter//Bulletin AAPC

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Published by
EduTech Communications
P.O. Box 52135
8210 - 109 Street
Edmonton, AB T6G 2T5