

**Program and Abstracts
For
The Thirteenth Annual Meeting
of the
Canadian Association For
Physical Anthropology**

**Dec. 4 - 8, 1985
Thunder Bay, Ontario**



**Canadian Association for Physical Anthropology
L'Association pour L'Anthropologie Physique au Canada**

We, the organizing committee for the 13th annual Canadian Association for Physical Anthropology conference, welcome you to Thunder Bay. Judging by the number and variety of papers, this year's meeting promises to be very informative. While you are in Thunder Bay we hope that you will engage some of the local scenery, activities (skiing is in full swing and the World Cup ski jumping competition is being held the same weekend) and dining establishments. To this end we have prepared a small brochure, 'Dining and Things To Do in Thunder Bay' for your convenience. The restaurants advertised have been especially kind by financing this brochure, so we hope that you will acknowledge them by patronizing their establishments. As well, the symposia have been scheduled with a two hour 'LUNCH', to reduce the time constraints of the mid-day break.

Several individuals, companies and institutions have provided financial and/or other forms of support to assist in the operation of this year's C.A.P.A. We would like to formally acknowledge them. Dr. Rosehart, President of Lakehead University (conference sponsorship and 'Wine and Cheese'); Dean Weller and Lakehead University's Senate Research (expenses and honourarium for keynote speaker); Ontario Heritage Foundation (expenses and honourarium for banquet speaker); Government of Ontario (opening night reception); Debbie Okun and Ben Kaminski, Media Services, Lakehead University (advertising and graphics); Cindy Lamontagne, secretary, Department of Anthropology, (typing); Charlie Grant, World Wide Travel (donation); Swede Johnston, C.A. Johnston's Electric (donation); Bruno DiGregorio, Bruno's Contracting Ltd. (donation); Donald C. McLean of R.F. Welch Ltd. (donation); Ed Cox, Adam's Distillery (donation); Louis Trocheri of London Wines (donation); Ben Posthuma of White Park Auto (donation); and Joe Logozzo, Iron Range Bus Lines (bus service). Finally, we thank the Valhalla Inn for their excellent conference facilities and their cooperation for arranging this year's C.A.P.A. meetings.

Once again, we hope your visit to the 1985 C.A.P.A. conference is memorable and we thank you for attending and/or contributing. Have a safe journey home.

Sincerely,

The Organizing Committee
for the 13th annual C.A.P.A. meeting

J. Molto

J. S. Molto

A. McLean

A. C. McLean

M. Roberts

M. Roberts

D. Thompson

D. Thompson

L. Tracz

L. Tracz

PROGRAM SCHEDULE
 13th Annual C.A.P.A. Conference
 Valhalla Inn, Thunder Bay, Ontario
 December 4-8, 1985

Registration: Dec. 4, 5:00-7:00 p.m. - BOARDROOM 1
 : Dec. 5-7, Half-hour before sessions - SCANDIA ROOM
 : Registration Fee \$25.00 Full Member
 \$15.00 Student Member
 \$12.00 Guest

Opening Night Reception: Dec. 4, 7:00 p.m. Wine and Cheese,
 sponsored by the 'Government of Ontario',
 BOARDROOM 1

Banquet: Friday, Dec. 6, 7:00 p.m., SCANDIA ROOM
 Fee: \$20.00 / person

Keynote Lecture
 plus 'Wine and Cheese': Saturday, Dec. 7, 7:30-8:30 p.m.,
 Lakehead University

SYMPOSIA

(Note: all symposia are held in the Scandia Room)

December 5

SESSION 1 PRIMATOLOGY AND CONTRIBUTING PAPERS
 9 a.m.-12 p.m. CHAIRPERSON: Dr. J.D. Paterson,
 Dept. of Anthropology,
 University of Calgary

9:00-9:20	* <i>J.C.</i> J.C. Colquhoun McMaster University <i>Student</i>	DOMINANCE AND 'FALL FEVER': THE REPRODUCTIVE BEHAVIOR OF MALE BROWN LEMURS (<i>Lemur fulvus</i>)
9:20-9:40	<i>Leslie Chan</i> F. Burton and M. Broderick, University of Toronto	MONKEYS OF KOW LOON, HONG KONG; A PROSPECTUS
9:40-10:00	J.D. Paterson, University of Calgary	TREE UTILIZATION PATTERNS AMONG THE HOWLER MONKEYS OF LOS TUXTLAS, VERACRUZ

10:00-10:20	G. Ellis, Associate Consultant Thorne, Stevenson and Kellogg	"EXPERT SYSTEMS" IN ANTHROPOLOGY: AN APPLICATION IN PRIMATE COMMUNICATION STUDIES
10:20-10:40	BREAK	
10:40-11:00	D. Gurfinkel, University of Toronto	AN APPROACH TO THE DETECTION OF BLOOD RESIDUES ON STONE TOOLS
11:00-11:20	W. Fox, Ministry of Citizenship and Culture, London	UNMARKED GRAVES IN ONTARIO...A PROCEDURAL UPDATE
11:20-12:00	J.D. Paterson University of Calgary	COMPUTERIZED COMMUNICATION SYSTEM DEMONSTRATION
12:00-2:00	LUNCH	
SESSION 2 2-4:30 p.m.	PALAEOANTHROPOLOGY CHAIRPERSON: Dr. W. Wade, Depts. of Anthropology and Linguistics, University of Manitoba	
2:00-2:25	C. Meiklejohn and C.T. Schentag, University of Winnipeg	THE HEALTH STATUS OF A PRE-AGRICULTURAL POPULATION FROM PORTUGAL
2:25-2:50	L. Pinch, University of Toronto	FACIAL RECON- STRUCTIONS OF FOSSIL HOMINIDS; AN EXPERIMENT IN 'FORENSIC PALEONTOLOGY'
2:50-3:15	W. Wade, University of Manitoba	A REAPPRAISAL OF FOSSIL HOMININE CLASSIFICATION WITH PARTICULAR REFERENCE TO THE ROBUST AND HYPER- ROBUST AUSTRALOPITHECINES
3:15-3:40	BREAK	
3:40-4:30	MOVIE - 'BEYOND AFRICA'	

December 6

SESSION 3 9 a.m.-12:15 p.m.	POPULATION STUDIES IN BIOANTHROPOLOGY CHAIRPERSON: Dr. A. Petto, Rhode Island College Providence, Rhode Island, U.S.A.	
9:00-9:25	P. Frost, Dept. of Anthropology University of Laval	SEXUAL DIMORPHISM IN HUMAN SKIN COLOUR
9:25-9:50	R. Forsyth, Dept. of Athletics and Recreation, University of Toronto	FACTORS INFLUENCING THE ESTIMATION OF BODY FATNESS OF CANADIANS
9:50-10:15	M.I. Gradie, SOREP Université du Québec, à Chicoutimi	INBREEDING LEVELS IN THE SAGUENAY POPULATION OF QUEBEC AS ESTIMATED FROM MARRIAGE DISPENSATIONS
10:15-10:40	V. McGowan*, M.S. Schanfield and T.E. Reed*, *Dept. of Anthropology, U. of T., Dept. of Pediatrics, Emory University, Atlanta, Georgia	GENETIC VARIATION AT THE IMMUNOGLOBULIN ALLOTYPE LOCI IN CREOLES OF TRINIDAD
10:40-11:00	BREAK	
11:00-11:25	Jean-Marc Elie, Dept. of Anthropology, University of Montreal	A NEW METHODOLOGICAL APPROACH TO DERMATO- GLYPHIC VARIABILITY
11:25-11:50	A. Petto, Dept. of Anthropology Rhode Island College, Providence, Rhode Island	ESTIMATING VARIANCE AND CONFIDENCE INTERVALS FOR POPULATION PROJECTIONS
11:50-12:15	G. Heathcote, Dept. of Anthropology, University of Toronto	NEW WINE IN AN OLD BOTTLE; TRYING TO READ HISTORY FROM SKULLS REVISITED
12:15-2:00	LUNCH	
SESSION 4 2-5 p.m.	SKELETAL BIOLOGY CHAIRPERSON: Dr. F.J. Melbye, Department of Anthropology, Erindale College, University of Toronto	
2:00-2:20	R. Lazenby, Dept. of Archaeology, Simon Fraser University	POROSITY-GEOMETRY INTERACTION IN PRESERVATION OF BONE

2:20-2:40	L. Gibbs, Dept. of Biochemistry, University of Western Ontario	PRELIMINARY REPORT ON THE USE OF CITRATE LEVELS FROM HUMAN BONE AS A POSSIBLE DETERMINANT OF SEX
2:40-3:00	S. Pfeiffer, School of Human Biology, University of Guelph	CORTICAL BONE AGE ESTIMATES FROM HISTORICALLY KNOWN INDIVIDUALS
3:00-3:20	S. Saunders (Dept. of Anthropology, McMaster University) and M. Cook (Dept. of Pathology, University of Western Ontario)	TRABECULAR AND CORTICAL BONE PARAMETERS IN A SMALL SAMPLE SAMPLE OF PROTO- HISTORIC IROQUOIS
3:20-3:40	BREAK	
3:40-4:00	A Katzenberg (Dept. of Archaeology, University of Calgary), E. Melbye (Dept. of Anthropology, University of Toronto), and H. Schwarcz (Dept. of Geology, McMaster University)	FURTHER ANALYSIS OF STABLE ISOTOPES IN THE PREHISTORIC PEOPLES OF SOUTHERN ONTARIO
4:00-4:20	C. Lang, Dept. of Anthropology, University of Toronto	OSTEOMETRIC DIFFERENTIATION IN MALE AND FEMALE HIP BONES
4:20-4:40	N. Ossenberg, Dept. of Anatomy, Queen's University	THE RETROMOLARE FORAMEN OF THE HUMAN MANDIBLE
4:40-5:00	C. Eyman, Dept. of Archaeology, University of Calgary	ON ANOMALOUS BURIALS
6:00-7:00	'CASH BAR' in Scandia Room	
7:00	W. Ross 'A BAGPIPERS CALL TO DINE' 'Banquet' followed by CASH BAR Honourary Guest of C.A.P.A. - Dr. C. EYMAN Guest Speaker: DR. J.E. ANDERSON, Professor of Anatomy and Psychiatry, McMaster Medical Centre Topic: "M.D. OR NOT M.D.? THAT IS THE QUESTION"	

December 7

SESSION 5
9 a.m.-1:15 p.m.

BIOMEDICAL ANTHROPOLOGY
CHAIRPERSON: Dr. L. Sawchuk,
Dept. of Anthropology,
Scarborough College,
University of Toronto

9:00-9:25	J. Kolar, L.G. Farkas and I. Munro, Depts. of Anthropology and Surgery, University of Toronto and The Hospital for Sick Children	PATTERNS OF DYSMORPHOLOGY IN CROUZON SYNDROME
9:25-9:50	A. Herring and L. Sawchuk Dept. of Anthropology, University of Toronto	THE EMERGENCE OF CLASS DIFFERENTIALS IN INFANT MORTALITY IN THE JEWISH COMMUNITY OF GILBRALTAR, 1840 TO 1929
9:50-10:15	P. Connop, Dept. of Community Health and Epidemiology, Queen's University	THE NATURAL HISTORY OF TUBERCULOSIS IN THE CANADIAN INDIAN
10:15-10:40	L. Salter, Dept. of Anthropology, University of Toronto	A PROBABLE CASE OF POTT'S DISEASE IN A PRE-CONTACT SOUTHERN ONTARIO IROQUOIS SITE
10:40-11:05	J. Molto, Dept. of Anthropology, Lakehead University	THORACIC LESIONS IN A MIDDLE WOODLAND BURIAL CIRCA A.D. 230: DIFFERENTIAL DIAGNOSIS
11:05-11:35	BREAK	
11:35-12:00	L. Sawchuk and A. Herring, Dept. of Anthropology, University of Toronto	FAMILY SIZE, DIABETES AND FITNESS; HISTORICAL EPIDEMIOLOGICAL STUDY OF THE GILBRALTAR JEWS
12:00-12:25	J. Melbye, Dept. of Anthropology, University of Toronto	TRAUMA IN AN ESKIMO SAMPLE FROM SAUNATUK
12:25-12:50	D. Notman, Dept. of Nuclear Medicine, University of Minnesota, Minneapolis	MODERN IMAGING AND ENDOSCOPIC BIOPSY TECHNIQUES IN EGYPTIAN MUMMIES
12:50-1:15	A. Aufderheide, School of Medicine, Dept. of Pathology, University of Minnesota, Duluth	LEAD AND BARBADIAN BELLYACHE

2:30-4:00 BUSINESS MEETING (Scandia Room)
6:30 Bus to Lakehead University
7:30-8:30 Keynote Address by DR. OWEN BEATTIE
Topic: "RECENT INVESTIGATIONS INTO THE LOSS
OF FRANKLIN'S THIRD ARCTIC EXPEDITION
Place: Upper Lecture Theatre, Lakehead University
8:30-9:30 'Wine and Cheese' in the Faculty Lounge,
sponsored by Lakehead University
9:45 Bus to Valhalla Inn

December 8

Sightseeing, Skiing and Departure

ABSTRACTS

LEAD AND BARBADIAN BELLYACHE

A. AUFDERHEIDE
University of Minnesota

Skeletal lead content has been demonstrated previously to reflect an individual's total lifetime lead exposure. During the American Colonial period such exposure was positively related to socioeconomic status. Wealthy individuals' exposure was primarily acquired by their extensive use of lead-laden containers and kitchenware for food preparation, consumption and storage. In the continental Colonial plantation populations high bone lead levels of plantation owners could be used to separate their remains from those of the slave labour force. Our recent finding of similar high bone lead content in a Colonial black Barbadian slave population was completely unexpected. The source of this lead was traced to both social and industrial houses (to concentrate the harvested plantation sugar product) and distillation apparatus (to convert the molasses into rum). Both of these apparatus were constructed with many lead components. Slaves also consumed large quantities of the lead-laden rum product. Armed with this knowledge the historical sources were scoured, and found to document symptoms and mortality due to lead poisoning of epidemic proportions in Colonial Barbados, unrecognized by contemporary physicians and subsequent historians.

RECENT INVESTIGATIONS INTO THE LOSS OF FRANKLIN'S THIRD ARCTIC EXPEDITION

OWEN BEATTIE
University of Alberta

In the late spring of 1845 the two ships of Sir John Franklin's third arctic expedition left England for arctic waters. The purpose of this three year journey was to complete a Northwest Passage across the top of the North American continent. However, by late 1848 all 129 crewmen had perished in the central arctic archipelago, and both ships were lost. The reasons for the failure of this best equipped and manned of all expeditions ever sent into the arctic are still not clearly understood, and the search for the fate of Franklin has continued from that time to the present. During 1981, 1982, and 1984 surveys and excavations of a number of sites associated with the Franklin Expedition were conducted. The results of these recent investigations are presented in this paper. Included is a description of the skeletal remains of between 7 and 15 Expedition crewmen found scattered along the coastline of King William Island. It is in the vicinity of this Island (located in the south-central arctic archipelago) that the two ships were lost and most of the crews perished. Most of the paper deals with the 1984 on-site autopsy of one of the Expedition crewmen buried in permafrost on Beechey

Island in January of 1846. This small island, located in the central arctic archipelago, is known to have been the first wintering site of the Franklin Expedition. During the first four months of 1846, three crewmen died and were buried there. The historical and medical information derived from a careful and controlled investigation of this site is slowly painting a picture of conditions and problems experienced early-on in the Expedition.

MONKEYS OF KOW LOON, HONG KONG; A PROSPECTUS

F.D. BURTON and M. BRODERICK
University of Toronto

NO ABSTRACT

DOMINANCE AND "FALL FEVER": THE REPRODUCTIVE BEHAVIOR OF MALE BROWN LEMURS (*Lemur fulvus*)

I.C. COLQUHOUN
McMaster University

A generally reported feature of *Lemur fulvus* social behavior is the apparent absence of hierarchical dominance relationships. Another striking aspect of *Lemur fulvus* behavior is the "package" of behavioral changes and fluctuations exhibited by adult males during the breeding season (termed here, "fall fever"). Together, these observations lead to two basic questions: What are adult males doing, in the apparent absence of dominance hierarchies, to gain and maintain access to estrus females? Given the breeding season behavioral changes and fluctuations exhibited by adult males; which changes and fluctuations contributed significantly to male *Lemur fulvus* breeding opportunities, and potential reproductive success? The study period spanned the 1984 (Northern Hemisphere) breeding season, from mid-October 1984 to late-January 1985. Over 300 hours of focal animal observations were conducted on two adult males in a semi-freeranging *L. fulvus* troop, at the Duke University Primate Center in Durham, North Carolina. This paper reviews the first 120 hours of data, compiled over the first 41 days of the study. Using an ethogram of 39 behavioral states, representing the whole gamut of *L. fulvus* social behavior; the role of the "fall fever" behavioral fluctuations in the reproductive behavior of adult males was investigated. Despite several previous reports that *L. fulvus* behavior was characterized by a seeming lack of dominant/subordinate relationships; it was found that hierarchical dominance relationships played an important part in male reproductive behavior. This paper presents a chronological profile of the social interactions of the study's focal animals; following one male's social demise and expulsion from the study troop and his troop-mate's ascendancy to the role of the troop's lone breeding male.

NATURAL HISTORY OF TUBERCULOSIS IN CANADIAN INDIANS

PETER J. CONNOP
Queen's University

This is a multidisciplinary study to document the natural history of tuberculosis in Canadian Indians. An historical and scientific literature review has provided substantial evidence of tuberculosis among the North American Indians in the pre-Columbian era. The principle paleo-pathological findings from Indian skeletal remains display tuberculous infection of bone primarily as Pott's Disease of the spine. There is a potential reservoir of tuberculosis infection in a wide variety of animal species, which contributed to Indian diets. Following European contact and subsequent confinement of Indian people to reserves with major changes in lifestyle, early epidemiological reports show that tuberculosis reached almost epidemic proportions. With major contributions from socio-cultural factors, it appeared that the Indian people had less natural immunity to tuberculosis, or a greater predisposition to infection due to possible genetic factors. Current immunological and genetic research of the Human Leukocyte Antigens have identified an eightfold increase in frequency and severity of tuberculosis among Blacks HLA phenotype Bw15. An historical review of reports, tuberculosis association correspondence and government statistics have documented the effects of tuberculosis among the Canadian Indians. This is supplemented by a current epidemiological study of tuberculosis in James Bay Indians.

UNE NOUVELLE APPROCHE MÉTHODOLOGIQUE POUR LA VARIABILITÉ DERMATOGLYPHIQUE

JEAN-MARC ELIE
Université de Montréal

L'étude de la variabilité des dermatoglyphes digitaux en anthropologie physique a été effectuée pendant plus d'un siècle à l'aide de systèmes de classification dont les échelles étaient surtout nominales. Ces méthodologies qui font usage de critères qualitatifs ou de variables discontinues sont inefficaces pour des études biologiques ayant pour objet l'examen des interactions environnementales et génétiques au sein de populations humaines. Des informations pertinentes sur la morphogénèse des dermatoglyphes nous amène à considérer comme légitime la mesure de la courbure d'une courbe plane sur la topographie produite par la projection cylindrique d'un dermatoglyphe digital. Cette méthodologie semble très prometteuse.

A NEW METHODOLOGICAL APPROACH TO DERMATOGLYPHIC VARIABILITY

JEAN-MARC ELIE
Université de Montréal

The study of dermatoglyphic variability in physical anthropology has been carried out for more than a century with the help of some systems of classification which use basically nominal scales. Methodologies using qualitative criteria or discontinuous variables were not so effective for the studies assigned to examine environmental and genetic interactions within human populations. Some relevant information about the morphogenesis of dermatoglyphics lead us to consider as legitimate, the measurement of the curvature of a planar curve on the topography produced by the cylindrical projection of a finger print. This methodology seems to be promising.

EXPERT SYSTEMS IN ANTHROPOLOGY: AN APPLICATION IN PRIMATE COMMUNICATION STUDIES

G. ELLIS
Associate Consultant; Thorne, Stevenson and Kellogg

Recent developments in microcomputer hardware and software will soon make artificial intelligence application in "expert systems" a cost and labour effective reality for many, even moderately computer literate anthropologists. This paper briefly discusses why and where these systems will be of use to physical anthropologists, and outlines the basic steps involved in building a user friendly expert system. Examples and illustrations will be taken from the author's experience in developing a predictive knowledge base for bonnet macaque vocal communication using two MS-DOS implementations (Augmented Prolog for Expert Systems and the MICRO PS Expert Systems Generator).

ON ANOMALOUS BURIALS

C. EYMAN
University of Calgary

NO ABSTRACT

UN LOGICIEL D'ENTRÉE DE DONNÉES ANTHROPOMÉTRIQUES

FRANCIS FOREST et CHRISTIAN MASSE
Université de Montréal

Les observations anthropométriques sont sujettes à de nombreuses erreurs: erreurs de technique, de lecture de l'instrument, et d'enregistrement sur un médium informatique. En nous appuyant sur la liste officielle de 126 mensurations du Bureau de Normalisation de Québec, liste à l'élaboration de laquelle nous

avons grandement participe, nous avons pu rediger un logiciel micro-informatique qui verifie chacune des mensurations, au moment meme ou elle est observee. Cette verification, pour chacun des deux sexes, se fait par regression multiple sur le poids et la stature.

A PROGRAMME FOR ENTERING ANTHROMETRIC DATA

FRANCIS FOREST and CHRISTIAN MASSE
Universite de Montreal

Anthropometrical data are subject to many mistakes: technical errors, false reading of the instrument, mistakes when recording the data. For the 126 anthropometrical measurements adopted by the Bureau de Normalisation du Quebec, a list that we developed with other specialists in Quebec, we produced a micro-computer program that verifies each data at the same moment it is observed on the subject. This verification, for each sex, is based on a multiple regression on weight and height.

FACTORS INFLUENCING THE ESTIMATION OF BODY FATNESS OF CANADIANS

R.D. FORSYTH
University of Toronto

This study evaluated the factors influencing the estimation of body fatness (BF) of Canadians. A random sample of 155 males and 125 females was evaluated by hydrostatic weighting (HW) and stature, mass and 35 anthropometric variables (10 skinfolds, 15 girths and 10 diameters). Best regressors were selected by Maximum R² Stepwise Improvement for both skinfold thicknesses (S) and all variables (circumferences, skinfolds and diameters, CSD). BF was also determined from sum of skinfolds scaled by stature and mass on the basis of reference males and females (applied Behrke; AB). Multivariate factorial analysis by sex, age (<30, 30-39, >.40 years) and high fat/low fat (HF/LF) levels - based on group median HW values - showed a significant overall ANOVA (p <.05). Body fat from both CSD and AB methods did not differ from HW at any age or sex. However, the CSD method significantly underestimated the BF of the HF groups while overestimating that of the LF, for males and females. The procedures were cross-validated on an independent sample of Canadians (N=66 females, 109 males).

UNMARKED GRAVES IN ONTARIO: A PROCEDURAL UPDATE

W. FOX
Ministry of Citizenship and Culture, London

Since the 1978 moratorium under the Ontario Heritage Act on research-related excavation of Native graves, there has been established an informal series of operational guidelines for the

rescue exhumation of all human remains from uncovered unmarked graves. The Ministry of Citizenship and Culture has undertaken the initiative, by default, for establishing these guidelines through liaison with the various provincial agencies involved in unmarked grave investigation and with both the academic and Native communities. Recent administration changes in the Cemeteries Branch of the Ministry of Consumer and Commercial Relations have thrown into question past rescue response procedures; however, a less ad hoc and more generally satisfactory unmarked grave exhumation policy appears likely to develop as a result.

SEXUAL DIMORPHISM IN SKIN COLOUR

P. FROST
Laval University

Spectrophotometric studies carried out across a wide range of human populations show that women are lighter in skin colour than men. Year by year breakdowns of changes in skin reflectance with respect to age show no significant sex difference from infancy to puberty. From puberty throughout adolescence, both sexes lighten in colour, but this lightening is greater in women than in men. The consistency of this pattern across different cultures, as well as precautions taken to minimize the effects of tanning, suggest that sexual dimorphism in skin colour is physiological in origin and not due to differences in lifestyle. Various theories invoking sexual selection or physiological advantages have been proposed to explain the evolutionary origin of this difference in complexion between the sexes.

DIMORPHISME SEXUAL DANS LA COULEUR DE LA PEAU

P. FROST
Laval University

Des études spectrophotométriques réalisées à travers une grande étendue de populations humaines révèlent que les femmes possèdent un teint plus clair que celui des hommes. Des analyses "an par an" de la réflectance de la peau par rapport à l'âge ne révèlent aucune différence sexuelle significative depuis l'enfance jusqu'à la puberté. Durant la croissance les deux sexes s'éclaircissent, mais cet éclaircissement est plus fort chez les femmes. La stabilité de ce "pattern" à travers différentes cultures, de pair avec des mesures prises pour minimiser les effets du bronzage, suggèrent que les origines du dimorphisme sexuel de la couleur de la peau se trouvent dans la physiologie humaine et non pas dans des différences de style de vie. On a proposé en tant qu'explication évolutionnaire de ce phénomène soit la sélection sexuelle soit l'avantage physiologique.

PRELIMINARY REPORT ON THE USE OF CITRATE LEVELS FROM HUMAN SKELETAL REMAINS AS A POSSIBLE DETERMINANT OF SEX

LINDA GIBBS
University of Western Ontario

Citrate levels in bone samples taken from individuals of the Stirrup Court cemetery have been estimated in order to evaluate a possible method for the chemical determination of the sex of human skeletal remains. The results appear to confirm previous observations on differing levels of bone citrate in male and female skeletal remains, and suggest that the method may be a reliable sexing technique.

INBREEDING LEVELS IN THE SAGUENAY POPULATION OF QUEBEC AS ESTIMATED FROM MARRIAGE DISPENSATIONS

MARGARET I. GRADIE
Université du Québec à Chicoutimi

Roman Catholic marriage dispensations can provide a quick estimate of inbreeding in a population. This is useful where inbreeding levels are suspected to be high, but large pedigrees are not available. This paper presents the results of analysis of the Catholic marriage records of the Saguenay-Lac-St. Jean region of Quebec. Over 83,000 first marriages recorded between 1842 and 1971 are used. Inbreeding coefficients ranged from 0.0 to .004. Overall, levels are lower than those estimated for other regions of Quebec, but temporal and spatial variation is observed. These patterns are described, and their implications for the incidence of genetic disease in the region discussed.

NIVEAUX CONSANGUINS DANS LA POPULATION SAGUENAY (QUÉBEC) ÉVALUÉS SELON LES PRATIQUES DE MARIAGES

MARGARET I. GRADIE
Université du Québec à Chicoutimi
Les dispenses de l'église catholique peuvent fournir une estimation rapide de la consanguinité dans une population. Cette méthode s'avère utile dans les populations où on soupçonne une consanguinité élevée et dans lesquelles on n'a pas d'informations généalogiques suffisantes. Cette communication présente les résultats d'une analyse des mariages catholiques de la région Saguenay-Lac-St-Jean au Québec. Plus de 83,000 mariages enregistrés entre 1842 et 1971 sont utilisés. Les coefficients de consanguinité varient de 0.0 à .004. En général, le niveau est plus bas que les estimations pour les autres régions de Québec, mais des variations dans le temps et l'espace sont observées. Ces résultats sont décrits, et les implications pour l'incidence des maladies héréditaires dans la région Saguenay sont discutées.

AN APPROACH TO THE DETECTION OF BLOOD RESIDUES ON STONE TOOLS

D.M. GUREINKEL
University of Toronto

Recent publications (notably Loy, 1983, Science 220: 1269-1271) have suggested that blood residues can be detected on stone tool surfaces. This discovery along with the possibility of determining the species of origin of the blood has many implications. The most noteworthy is the more certain identification of tools and tool use. However, since many organic compounds, for example, plant and microbial constituents and soil humus, are ubiquitous in the environment, it is vital that a procedure be developed that unambiguously distinguishes between these compounds and any true blood proteins which may be present. The experiments being conducted in order to develop this procedure will be described.

NEW WINE IN AN OLD BOTTLE: TRYING TO READ HISTORY FROM SKULLS,
REVISITED

GARY M. HEATHCOTE
University of Toronto

A method for inferring population historical relationships among regional groups of archaeologically-derived human skeletal samples is outlined. This method provides human osteologists with an approach which is analagous to the direct and inferential historical approaches of archaeologists.

THE EMERGENCE OF CLASS DIFFERENTIALS IN INFANT MORTALITY IN THE
JEWISH COMMUNITY OF GIBRALTER, 1840 TO 1929

ANN HERRING and LARRY SAWCHUK
University of Toronto

An examination of 334 reconstituted families in the Jewish community of Gibraltar revealed statistically significant class differences in infant mortality in the 1870-99 marriage cohort. The emergence of significant class differences was linked to a deterioration in sanitary-social conditions in Gibraltar and specifically, to overcrowding. Improved ecological conditions from 1900 onward were associated with a significant reduction in infant mortality and convergence in this measure between classes. The findings suggest that the Judaic tradition and the hierarchical welfare system did not effectively buffer Jewish families of low socioeconomic status when living conditions were harsh.

FURTHER ANALYSIS OF STABLE ISOTOPES IN THE PREHISTORIC PEOPLES OF SOUTHERN ONTARIO

M. ANNE KATZENBERG, F. JEROME MELBYE,
and HENRY P. SCHWARCZ
University of Calgary, University of Toronto,
McMaster University

In a previous study by our group, the introduction and adoption of maize into southern Ontario was well documented through analysis of stable carbon isotope values from human bone collagen. The prehistoric and early historic sites reported in the earlier study covered the period from B.C. 2300 to 1640 A.D. However there was a gap in the temporal sequence at precisely the time that maize came into the area (i.e. between A.D. 300 and A.D. 1200). In this paper we present new data from analysis of stable isotopes of carbon and nitrogen in human bone collagen from five sites dating from 700 A.D. to 1240 A.D. These data indicate a progressive increase in the quantity of C4 plants, such as maize, in the diet, as expected. The results support earlier hypotheses concerning the fairly rapid adoption of maize into a formerly hunter/gatherer subsistence.

PATTERNS OF DYSMORPHOLOGY IN CROUZON SYNDROME

J.C. KOLAR, L.G. FARKAS and I.R. MUNRO
University of Toronto, and
The Hospital for Sick Children

For the past twelve years, the Craniofacial Assessment Team at the Hospital for Sick Children has been engaged in a long-term study of the surface morphology of the craniofacial complex of pre- and post-operative patients with congenital anomalies of the head and face. The evaluation is based on a series of standard anthropometric measurements supplemented by additional methods developed expressly for clinical use. A battery of proportion indices illustrates a wide range of inter- and intra-areal proportions of the head and face. Data collected since 1973 have allowed the team to determine objectively the components of several rare craniofacial syndromes and to compare these results with the clinical literature. To date, a total of 61 Crouzon patients, with craniosynostosis and orofacial defects has been evaluated pre-operatively. To eliminate age and sex differences, the data have been standardized using the Z-score transformation. The head typically is high, broad and short with a high, broad forehead, even after early suture release. Orofacial defects include maxillary and mandibular hypoplasia. The mandible is high and narrow. The orbits show a mild tendency toward hypertelorism. The nose tends to be short with a low root. An examination of the patterns of dysproportion in Crouzon syndrome reveals that, in the greatest number of cases, these result form a combination of normal and abnormal measurements. This has important implications in surgical planning.

OSTEOMETRIC DIFFERENTIATION IN MALE AND FEMALE HIP BONES

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This paper addresses the issue of osteometric differences present in male and female hip bones. A series of modified measurements were taken on a sample of dry hip bones, from the Grant Collection in the Medical Sciences Bldg., at the University of Toronto. The results were subjected to various statistical tests in order to determine the degree and significance of sexual dimorphism. The metrical variation found in size, length and proportionality according to sex in the hip bone will assist in identifying the sex of human skeletal remains in both the archaeological record and in forensic studies.

POROSITY-GEOMETRY INTERACTION IN THE PRESERVATION OF BONE STRENGTH

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The mechanical competence of a bone is a function of its geometric, physical and material properties. Since material properties are generally constant for mammalian bone tissue, functional adaptation in conformance with Wolff's Law is achieved through the interaction of geometric (size and shape) and physical (porosity and mineral density) properties. Relative to the direction and magnitude of the loads normally imposed on a bone, various configurations of geometric and physical properties can be identified which enhance or diminish ultimate bone strength. In older people, particularly post-menopausal women, a net bone volume loss occurs, manifested as an enlarged medullary cavity and increased porosity of the endosteal cortex. Were this net bone loss distributed randomly without regard for existing bone geometry, a coupling of a weak geometric configuration with a weak physical property configuration would be inevitable, and potentially disastrous in terms of the element's resistance to failure. An automated image analysis of femoral cross-sectional microradiographs suggests that net bone loss is not distributed randomly, but in fact occurs with particular regard to cross-sectional geometry in order to preserve mechanical competence. The results of this analysis are interpretable within our present understanding of strain-mediated bone remodeling.

GENETIC VARIATION AT THE IMMUNOGLOBULIN ALLOTYPE LOCI IN CREOLES OF TRINIDAD

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The sera of a sample of Creoles from Trinidad were tested for the presence of Km(1), A2m(1,2), G1m (a,x,f,z) and

G3m(g, g5, b0, b1, b3, b4, b5, c3, c5, s, t). Eight haplotypes occur in polymorphic frequencies (>0.01) in this population, including known African, Asian, Caucasian and Amerindian marker haplotypes. Significant differences were found in the frequency distributions of three Gm haplotypes and the frequency of Kml when tests of significance were applied to these data and data from Creole populations of Belize and St. Vincent ($p < .01$). The Creoles of Trinidad and St. Vincent are more similar in Gm haplotype distributions than Trinidad and Belize populations. Previous testing revealed no significant differences between St. Vincent and Belize Creoles at the Ig allotype loci. Analysis of migration patterns in the Caribbean suggests that different rates of Asian migration have maintained regional diversity at these loci, while continuous gene flow from the eastern Caribbean to Trinidad has had a relative homogenizing effect on the gene pools of this area.

THE HEALTH STATUS OF A LATE PRE-AGRICULTURAL POPULATION IN PORTUGAL

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A joint Canadian-Portuguese research project concerned with the transition from hunting-gathering economies to agriculture is now in its' second year, under the joint direction of Dr. Mary Jackes, Dr. David Lubell and Dr. Christopher Meiklejohn. Besides the excavation of new archaeological sites, it has been largely involved in the restudy of the classic late Mesolithic sites of the estuary of the River Muge, periodically excavated for over a century. This report is concerned with the general theoretical focus of the project and, more specifically, with the analysis of cranial and dental materials studied by the two current authors during the summers of 1984 and 1985. The principal findings of the cranio-dental study present an amalgam of health and disease. Cranial disease and trauma is almost non-existent in the materials examined. A similar diagnosis was obtained for postcranial materials studied by Dr. Mary Jackes and Dr. Gerd Weih in 1984. However, the dentitions show a number of traits indicating poor oral health, in some ways more characteristic of an agricultural population than one that is still involved in food gathering. These include high levels of caries associated with strong dental wear, evidence for periodontal disease, enamel hypoplasia and, in the deciduous teeth, circular enamel defects. These are still in the process of being studied and, in some ways, are paradoxical. The report will centre upon the nature of the reported pathology and some initial explanations will be attempted.

THE EVIDENCE FOR VIOLENCE AT THE SAUNATUK SITE

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The Saunatuk Site (NgIn-1) was excavated by Dr. Charles D. Arnold (Prince of Wales Northern Heritage Centre) in the summers of 1984 and 1985. The site is located east of the Mackenzie delta in the region of Eskimo Lakes (an inlet of the Arctic Ocean). It is thought to have been occupied by the Inuktuut people between 200 and 300 years ago. Essentially, the site consists of the remains of 2 dwellings. Unfortunately, the initial discovery was made by bulldozer operations, and the skeletal remains have been greatly disturbed. It is these remains which are the primary source of interest of this paper. A minimum of 36 individuals have been recovered, based solely on human mandible and mandible fragments. The remaining fragmented bones exhibit cut marks, split long bone shafts and fractures of all bones, especially crania. A large proportion of the represented population is immature.

SKELETAL LESIONS OF THE THORAX IN A MIDDLE WOODLAND BURIAL CIRCA A.D. 230: DIFFERENTIAL DIAGNOSIS

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This paper describes the nature and distribution of skeletal lesions in a young adult male from the LeVesconte Burial Mound, a Point Peninsula site radiocarbon dated at A.D. 230 + 55. A differential diagnosis between tuberculin and mycotic disease is presented in light of clinical, epidemiological and archaeo-subsistence considerations.

MODERN IMAGING AND ENDOSCOPIC BIOPSY TECHNIQUES IN EGYPTIAN MUMMIES

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Egyptian mummies have been popular subjects of radiographic investigation since 1896. Computed tomography (CT) and magnetic resonance imaging (MRI) have recently been added to the growing list of modern techniques used to study these relics. The Minnesota Mummy Project was organized to examine four well preserved Egyptian mummies dating from the XVIIIth (1575-1308 B.C.) and XXVth (715-663 B.C.) Dynasties. Plain radiographs and Ct scans were obtained on all specimens. One individual was selected for additional endoscope and microscopic correlation with CT findings in the thoracic cavity. The collapsed heart was identified by CT. A percutaneous biopsy of the heart was then performed with a flexible fiberoptic endoscope, passed through a small hole drilled into the chest wall. Microscopy of prepared

ventricular specimens revealed striated muscle fibers consistent with myocardium. These results emphasize the utility of CT as a noninvasive paleoradiologic tool. Another mummy was examined by MRI to search for minute quantities of residual moisture possibly trapped within the desiccated tissues. Only a free-induction-decay signal could be obtained, but this was insufficient to generate an image. Thus, it appears that present MRI is not suitable for the paleopathologic investigation of dehydrated structures.

RETROMOLAR FORAMEN OF THE HUMAN MANDIBLE

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Analysis of retromolar foramen (RME) in a large series of mandibles (N 2500) was undertaken to provide descriptive statistics for this variant. RME of diameter 0.5 mm or greater were scored. Consistent with other data on accessory canals in the facial skeleton, RME was found to occur more commonly in native populations of North America than in other populations (Africa, Europe, India, northeast Asia): mean percentages 10.4 and 5.0 respectively. A wide range of frequencies among populations within the same ecosystem and subsistence economy suggested that the trait is predominantly under genetic control. The ratio of bilateral to unilateral occurrences was shown to increase with population incidence, a pattern consistent with the theoretical model of an epigenetic (threshold "quasi-continuous") variant. Male-female differences were not found. Age profiles were characterized by a marked peak in the adolescent cohort. Patterns of intertrait correlation varied from one population to another. In Eskimo and Plains Indians RME was twice as common in individuals with accessory mandibular foramen, and in the Plains samples RME was twice as common also in mandibles with accessory mental foramen as in those without the trait. On the other hand these foraminal variants were not associated in a pooled Aleut and Northern Indian sample. Correlations with presence/absence of third molar and three-rooted first molar were not found. With refinements in scoring criteria, RME should be useful along with other minor cranial variants for ethnohistorical studies. The findings support those based on clinical research, underscoring the value of a routine injection into the retromolar fossa to block pain fibres originating in the molar roots and exiting the mandible through RME.

TREE UTILIZATION PATTERNS AMONG THE HOWLER MONKEYS OF LOS TUXTLAS, VERACRUZ

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In the analysis of the tree utilization patterns of the *Alouatta palliata mexicana* population at the Los Tuxtlas research station (belonging to UNAM), during the period from September 1978 through October 1979, it was noted that males and females have

distinctive use patterns both by tree species employed, and by quadrat of the study area. Utilization patterns by activity were also examined for each sex. The analyses showed a lack of species, and the quadrat location. There were, however, a number of observed regularities in the utilization of some specific trees, and some tree species over the study period. The results will be presented in graphic form, and some explanatory models for them discussed.

ESTIMATING VARIANCE AND CONFIDENCE INTERVALS FOR POPULATION PROJECTIONS

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Demographic projection from small populations is difficult. Migration, birth, and death rates can vary considerably from year to year, and the long-term projections based on samples from different years often produce widely divergent results. Cohort resampling techniques are available to permit the population biologist to provide several estimates of the size and composition of future generations. From these estimates one may compute a sample variance and construct confidence intervals. Wide confidence intervals will be produced when a population is so small that the birth or death of a single individual has a major impact on the projection. Two resampling techniques are used on a population of captive-born cotton-top tamarins (*Saguinus o. oedipus*). Sample cohorts are constructed by a modified jackknifing approach and by the use of three-year overlapping cohorts. Resampling by bootstrapping is discussed and confidence intervals based on *t*, *F*, and chi-squared distributions are compared.

A FOSSIL CAST CATALOGING SYSTEM, USING DBASE III ON AN IBM-PC

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The primate fossil cast holdings of two units at the University of Guelph, the School of Human Biology and the Ontario Veterinary College, have been newly catalogued using commonly available hardware and software. Each cast or primate skeletal element was identified and listed in a file that documents eleven kinds of information, regarding origin, taxonomy, references, etc. The DBASE III software allows information about the casts to be accessed from any keyword or number. Potential teaching and research uses of the system will be illustrated. Listings also illustrate that among the 280 items, U. of G. houses several rare casts, often in duplicate. We hope to encourage greater use of such materials, at least within Southern Ontario.

CORTICAL BONE AGE ESTIMATES FROM HISTORICALLY KNOWN INDIVIDUALS
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Age at death has been estimated using Thompson's histological method (1979) for nineteen adults interred in a cemetery dated c. 1840 A.D. - c. 1890 A.D., as well as three men who were hanged, 1899-1920. All are European, except one hanged man who was of mixed ancestry. Nine of the individuals are historically identified thusfar. Most cortical bone age estimates are quite accurate and all are much closer to known age than estimates from pubic symphyses, ribs, or citrate levels. Position of the four cortical fields (medial vs. lateral) significantly alters the estimates in one quarter of cases. The differences are not predictable in magnitude or direction. Destruction of the periosteal surface via lime placed on the body lead to substantially higher ages by virtue of the fields being positioned farther from the periosteal surface. "Bad legs," modified by fracture or amputation, yield much higher ages than "good legs," though there is some compensatory remodelling apparent in the latter.

FACIAL RECONSTRUCTIONS OF FOSSIL HOMINIDS: AN EXPERIMENT IN
"FORENSIC PALAEOLOGY"

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Reconstructions of facial soft tissue features of fossil hominids have generally been more art than science (i.e., with great latitude of expression based on popular moral and aesthetic values). In the relatively rare instances in which facial reconstructions have employed metric standards of soft tissue thickness, these have been obtained exclusively from human cadavers (principally based upon data provided by Kollman and Buchly, 1898), due to the unavailability of published data from near-human primates. In an experiment in comparative "forensic palaeontology," the author used both recent human data (Rhine, Moore and Weston, 1981) and newly obtained data from chimpanzees (Pinch, Wade and Rhine, 1894) to reconstruct the facial soft tissue contours of a robust (SK48) and a hyper-robust (OH5) australopithecine on laboratory casts. This paper reports the results of that comparison.

A PROBABLE CASE OF POTT'S DISEASE IN A PRE-CONTACT SOUTHERN ONTARIO IROQUOIS SITE

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The skeletal remains of an adolescent female were recovered from a pit in the floor of an Iroquois longhouse at the Quackenbush site, near Peterborough, Ontario. The site is dated at approximately A.D. 1400. This individual manifests lesions which strongly suggest Pott's Disease in a pre-contact situation. The vertebral bodies in her lower thoracic and upper lumbar region were completely eroded with a corresponding fusion of the vertebral arches, which produced an extreme kyphosis in her lower spine. This skeleton added to the cumulative evidence of the presence of "a tuberculosis-like pathology" in pre-contact America.

TRABECULAR AND CORTICAL BONE PARAMETERS IN A SMALL SAMPLE OF PROTOHISTORIC IROQUOIS

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A series of bone parameters were calculated on complete skeletons from the MacKenzie site, a protohistoric Ontario Iroquois village. These included: trabecular bone volume, mean wall thickness and trabecular diameter from iliac crest and femoral head biopsies, cortical thicknesses and cortical areas of femoral shaft cross sections as well as estimates of morphological and histological age. Although the sample is small (eight individuals) to our knowledge this is the first time anyone has made multiple intraindividual comparisons of both trabecular and cortical bone parameters in archaeological skeletons. Obtaining two trabecular samples, femoral head and iliac crest, provides a control for postmortem damage, as is shown in the skeletons from MacKenzie. Both male and female bone values of these individuals fall within published normal limits for trabecular and cortical parameters except for anterior cortical thickness of the femoral midshaft. In one case, there is a discrepancy between the morphological and histological age estimates. The cortical and trabecular values support the histological age estimate. Our investigation emphasizes the need for better population standards of bone parameters to which comparisons can be made.

FAMILY SIZE, DIABETES AND FITNESS; AN HISTORICAL EPIDEMIOLOGICAL STUDY OF REPRODUCTIVE PERFORMANCE OF JEWISH WOMEN

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Analysis of 176 completed Jewish women who were married between 1890 and 1929 in Gibraltar and where cause of death was known revealed that women who died of diabetes (n=25) relative to those who died of 'other' causes (n=151) displayed a "higher fitness" in terms of (i) number of children everborn, (ii) number of children surviving past infancy, and (iii) number of children surviving to sexual maturity. Closer examination of the data revealed that the significance of these differentials were dampened considerably when only fertile women were considered. Factors promoting the "higher fitness" among diabetic women are examined in light of information on birthplace, occupation and other demographic variables.

A REAPPRAISAL OF FOSSIL HOMININE CLASSIFICATION WITH PARTICULAR REFERENCE TO THE ROBUST AND HYPER-ROBUST AUSTRALOPITHECINES

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Since 1959, a watershed year in regard to many biological issues, no new generic names have been assigned to fossil hominines. This practice was consistent with the bias in the early 1960's towards simplification, in reaction to the taxonomic excesses of the preceding hundred years. This reformation has been less than completely successful, however, and over-zealous classification of fossil hominines has been perpetuated, albeit at the species rather than the genus level. This paper argues for a new taxonomic reformation (of hominines at the very least), citing the example of the robust and hyper-robust australopithecines.