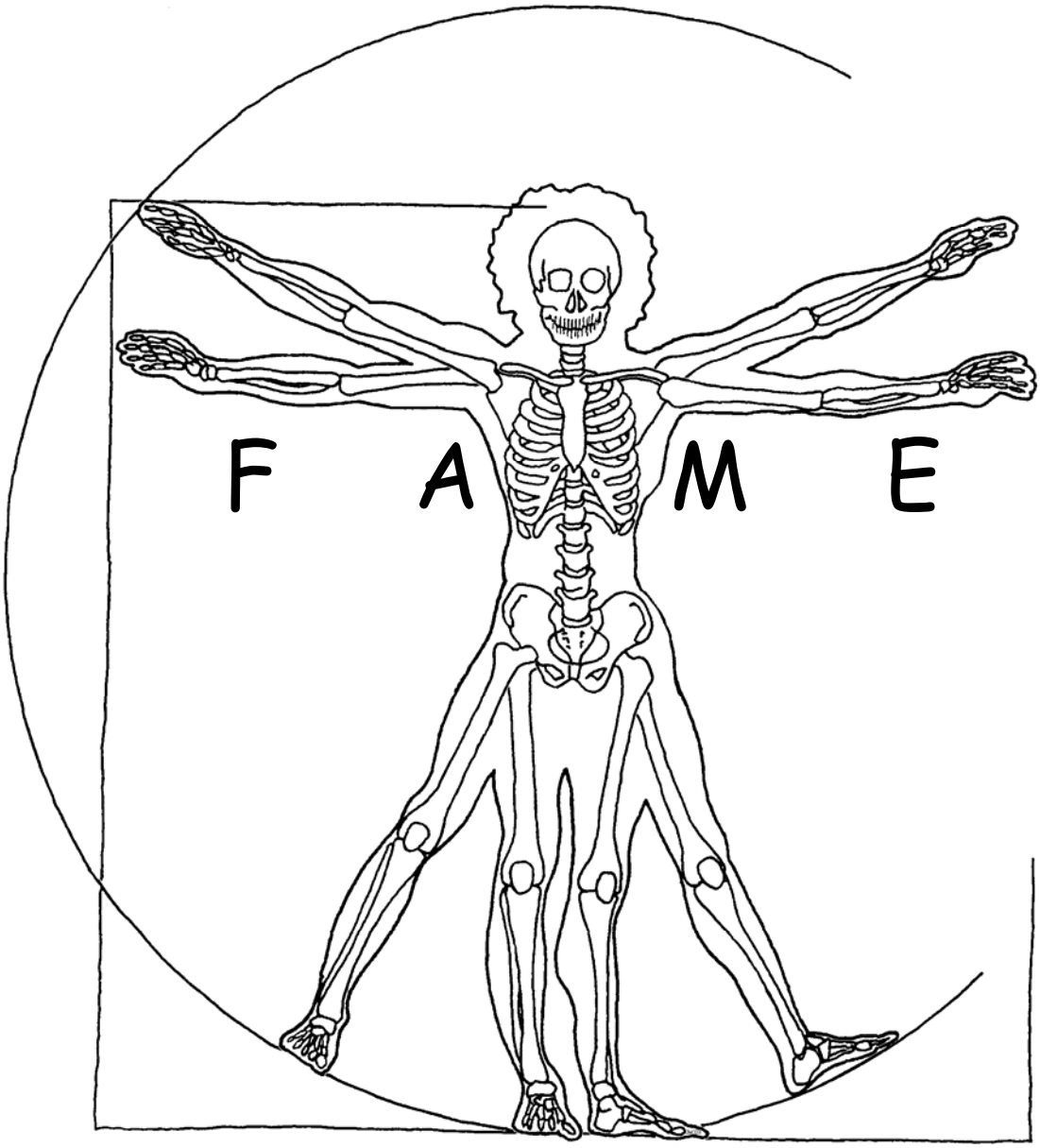
Fysisch-Anthropologische Mededelingen



Newsletter of the Dutch Association of Physical Anthropologists

No. 14, January 2006

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Contents

From the editors

With this new FAME, we continue the "tradition", admittedly started only a few years ago, of publishing the abstracts of the talks given at the Autumn symposium held in November last year, when we not only listened to interesting lectures but also said farewell to the Anatomy Building where we all spent some memorable time.
And of course, you will find the usual section of interesting abstracts and a contribution for the poster presentation section.

Soon you will be able to go to our newly revamped website, www.nvfa.nl.
Some backnumbers of FAME can also be perused there.

Symposium abstracts

Forensic Anthropology and the RIT investigation of Tsunami victims

Reza Gerretsen and George Maat

Barge's Anthropologica, Department of Aanatomy
Leiden University Medical Center

Immediately after the tsunami catastrophe of Christmas 2004, the Dutch Disaster Identification Team, the RIT, travelled to Phuket in Thailand to begin with the identification of victims who had died from the floods. In the first few days after arrival, the number of victims rose to 3086, 1254 of which were Thai citizens.
Due the inadequate organisation immediately after the crisis, bodies had perished in the poor preservation conditions of the tropical climate. Together with the Thai authorities and the Australian DVI team, a cooling storage container and a post-mortem identification line was set up at an existing Buddhist temple complex at Khao Lak. Later, when many other teams from abroad had joined, a second portable morgue was raised near the airport of Phuket City.
Post-mortem data collected were fingerprints, body surface features, DNA and dental status. It was expected that this data collection process would take about three months to be completed. During that time, matching could begin of these data with the in the meantime collected ante-mortem data of the victims, thus producing the much wanted identifications. This identification process was to continue for many more months.
A presentation illustrating the course of action will be presented.

Puzzels from the Late Iron Age inhumations of Tiel Passewaaij

Steffen Baetsen

Archaeological Centre
Free University of Amsterdam

During excavations in the new housing estate of Passewaaij in Tiel in 2003 and 2004, human skeletal remains were found by the Archaeological Centre of the Free University of Amsterdam.
Three inhumations have been dated to the Late Iron Age. One of these inhumations consists of no more than a partial spinal column, the parts of which are articulated.
In a second inhumation, the skeleton is largely complete but the parts are no longer articulated. In this case, post-depositional processes only provide a partial explanation for the absence and movement of the bone material. There is a possibility that a different method of treatment of the bone material was responsible.
On the basis of examples of English investigations from the same period, suggestions are put forward to explain this absence and movement of the bone material. Investigations of the Tiel inhumations did show indisputably that the human remains were moved when the body had not yet fully decomposed.

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The nunnery "Koningsveld" in Delft

Toineke Westen

In this study 41 skeletons from the cloisters of the nunnery "Koningsveld" were examined on sex, age at death, stature and paleopathological changes, in accordance with the standardized physical anthropological report (Maat, 2000).
The convent was founded as "Campus Regis", meaning "Koningsveld", in Delft in 1252 AD. It recruited almost exclusively noble ladies and it was, with about 20 nuns, not large. In 1572 AD the convent was set ablaze and demolished as the Prince of Orange feared that the Spanish armies would use it as an operating base in the approaching siege of Delft.

A large part of the skeletons that were found in the cloisters were male skeletons,

which is remarkable in a nunnery. Probably, family members of the nuns were also buried here. The probable high status of the deceased is reflected in their stature. The first results of this research will be presented here.

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Anaemia and ancient burials

Piero Giordano

Clinical Biochemical Molecular Geneticist
Hemoglobinopathies Laboratory
Centre of Human and Clinical Genetics
Leiden University Medical Center

Porotic Hyperostosis (PH), found in ancient burials, is usually interpreted as a non-specific sign of anaemia which could have several causes, among which malnutrition, and in particular iron deficiency, seems to be the most obvious.
This was recently also the case in two excavations from the Roman Empire and the early medieval Roman Period. PH was observed to occur in many skeletons, especially in children, which led to the idea of endemic malnutrition and iron deficiency.
In a more open-minded observation, based on the underlying mechanisms of anaemia and the endemic occurrence of hereditary anaemia and malaria, a very different picture can be formed of the origin of PH.
Based on the arguments put forward, it seems that PH was not so much caused by a shortage of pasta in the mediterranean diet of these Proto-Italians, but rather by two equally selfish macro molecules that were partly in competition and partly in symbiosis in their shared biotope, in particular the genome of man and the much older genome of plasmodia.
The story ends, how else, with the observation that 2000 years later, medical science, and in particular applied medical science, has still not understood that every attempt at taming the ‘selfish molecule’ is − for the time being − a lost battle, and that prevention is and remains better than cure.

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Homo sapiens during the Late Pleistocene in a tropical rainforest fauna in East Java

Paul Storm

A Dutch-Indonesian research team of Naturalis in Leiden and the Geological Museum in Bandung describe in the Journal of Human Evolution of October 2005 a fossil human premolar which was found together with animals from a Javan tropical rainforest.
In addition, the team, organised by Paul Storm, reported the *in situ* find of fossil teeth elements of orang-utans from a new findspot on Java, Gunung Dawung. This find is remarkable as since time immemorial no large tropical rainforest animals such as orang-utans have been encountered on Java. The human premolor has been identified as orginating from a Modern Human (*Homo sapiens*).
Research so far has shown that this rainforest fauna can be dated between 80,000 and 120,000 years old. This means that the oldest Modern Human has been found in this part of the world – the Indonesian Archipelago and Australia – in this East Javan tropical rainforest fauna.
An interesting conclusion is that the archaic fauna with Java Man (*Homo erectus*) was replaced c. 100,000 years ago by a modern tropical rainforest with Modern Humans. As interesting is the notion that not so long ago two species of humans must have lived 'cheek by jowl'. The prehistoric "Hobbit" (*Homo floresiensis*) was still roaming the island of Flores c. 18,000 years ago, whereas Modern Humans had long since arrived in Java.

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Abstracts

STUDY OF THE RELATIONSHIP BETWEEN A PERSON'S STATURE AND HEIGHT OF AN EAR IMPRINT FROM THE FLOOR.

Lugt, C. van der, N.J.D. Nagelkerke, and G.J.R. Maat

Medicine, Science and the Law 45: 135-141, 2005.

Occasionally ear prints are found at crime scenes. The height of the imprint of the ear may provide the police with information regarding the stature of the perpetrator and may therefore help to narrow down the number of suspects. The research provides calculations for the determination of the stature from the height of the tragus imprint found at crime scenes. It takes into account various variables such as age, stature and gender.

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HUMAN REMAINS FROM SCHAGEN MUGGENBURG-I

Maat, G.J.R.

In: Landscaping the powers of darkness and light: 600 BC- 350 AD settlement concerns of Noord-Holland in wider perspective, L.L. Therkorn, ed., Amsterdam University, Amsterdam, 333-341, 2004 (published in 2005).
(chapter in book; no abstract available)

✲

TWO MILLENNIA OF MALE STATURE DEVELOPMENT AND POPULATION HEALTH AND WEALTH IN THE LOW COUNTRIES

Maat, G.J.R.

International Journal of Osteoarchaeology 15: 276-290, 2005.

This paper offers a review of shifts in average male stature and their relationship with health and wealth in the Low Countries from 50 to 1997 AD. Twenty-one population samples were studied to cover the full time span. To make data compatible, so-called 'virtual statures' were used, i.e., the statures which adult males were supposed to have had at the end of their growth period before they started shrinking due to aging. Original data were extracted from '*in situ* (in the grave) measured statures', 'calculated statures' and 'corrected cadaveric statures'. Where possible, maximum femoral lengths were also collected from the same population samples to check if trends in stature development were in agreement with raw skeletal data. A long phase of stature decrease from c. 176 cm to 166 cm, a so-called 'negative secular trend', was noticed from the Roman Period up to and including the first half of the 19th century. This was followed by a sharp and still ongoing increase in stature to 184 cm, a typical 'positive secular trend', from the second half of the 19th century to the present time. General shifts in stature and 'outliers' illustrative for the process are viewed in the context of socio-economic, demographic, health and nutritional factors.

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AGE PREDICTION FROM BONE REPLACEMENT. REMODELLING OF CIRCUMFERENTIAL LAMELLAR BONE TISSUE IN THE ANTERIOR CORTEX OF THE FEMORAL SHAFT OF THE PRESENT DUTCH POPULATION. (2nd print)

Maat, G.J.R., M.J. Aarents, and N.J.D. Nagelkerke

Leiden, Barge's Anthropologica 10: 1-44, 2005 (ISBN 90-806456-7-2)

In order to have a simple and little invasive age at death determination method, the known microscopic method based on the replacement of bone tissue with increasing

age was adapted to Dutch (West European) demands.
In transverse sections of the anterior shaft of the femur, the relative decrease in surface area occupied by non-remodelled circumferential lamellar cortical bone together with its enclosed non-Haversian canals was tested as a parameter for passed life time of individuals.
To achieve the best possible accuracy and applicability, a collection of samples from the anterior cortex of the femoral midshaft of 86 males and 79 females, ranging in age from 1 to 96 years of age, was assembled. Detailed instructions were drafted for the preparation of materials and equipment in order to determine the percentage of non-remodelled surface in the subperiosteal area by means of a one millimeter square counting framework of 10 x 10 squares. The framework was projected via a regular drawing attachment into a light microscope with polarization filters. To cover the remodelling process in the entire anterior cortex of a microscopic transverse section, quantitative assessments were done at the most anterior point of the femur shaft and at a point 25º to the left and to the right.
Dependence of predicted age on subperiosteal bone replacement in the *entire anterior cortex* of the femur for males and females combined, appeared to be very significant ($p < .001$). Seventy-eight percent of the variance in predicted age was explained by the covariable percentage of non-remodelled bone. Differences between males and females were negligible and statistically not significant ($p = .622$). In contrast to the dependence of age on bone replacement in the *most anterior part* of the femur only, the dependence in the *antero-lateral parts* was even slightly higher than for the *entire anterior cortex*. Contrary to body frame, dependence of age on cadaveric length for males and females combined was statistically very significant. The latter finding corresponded well with the present strong secular trend in growth in the Netherlands.
In addition to regression equations extracted from the quantitative analyses, a series of characteristic micrographs of human transverse sections through the midshaft of the anterior femur was selected to meet demands for qualitative assessments of age. General views and close-ups exposed to polarized and bright light were prepared for every 10-year age interval, young growing individuals included.

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EXPLORING THE EFFECT OF OCCURRENCE OF SOUND ON FORCE APPLIED BY THE EAR WHEN LISTENING AT A SURFACE

Meijerman, L., N. Nagelkerke, R. Brand, C. van der Lugt, R. van Basten, F. De Conti, M. Giacon, and G.J.R. Maat

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Forensic Science, Medicine and Pathology 1(3) (2005), 187-192

In this study we explored the effect of the occurrence of a target sound on the force that is applied by the ear when listening at a surface, since differences in applied force induce variation in earprints of a single ear. Forty-two subjects each listened four times at a surface. During two of these listening efforts there was silence. While the subjects were listening, we measured the amount of force that was applied to the surface. To explore the effect of the occurrence of a target sound upon applied force, we applied a mixed model analysis of variance. The force applied by the ear appeared to be uncorrelated to presence or absence of a target sound. This lack of association appeared not to be the result of potential confounders. Only repetition, i.e., the position of a listening effort in the series of four, appeared to significantly affect applied force, this force being generally lower during a first listening effort.

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EARPRINTS IN FORENSIC INVESTIGATIONS

Meijerman, L., A. Thean, and G.J.R. Maat

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Forensic Science, Medicine and Pathology 1(4) (2005), 247-256

This manuscript aims to provide an overview of the theoretical and practical issues surrounding the use of earprints in forensic research. In part 1 we provide a limited

account of the history of earprints in forensic investigations and their use as evidence in court. Criticism of the use of earprints for individualization is addressed and fundamental questions that require further attention are summarized. In part 2 we summarize the results of various studies that we have performed on earprint variation.

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INDIVIDUALIZATION OF EARPRINTS: VARIATION IN PRINTS OF MONOZYGOTIC TWINS

Meijerman, L., A. Thean, C. van der Lugt, R.J. van Munster, G. van Antwerpen, and G.J.R. Maat

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PO Box 9602, 2300 RC Leiden, the Netherlands

Forensic Science, Medicine and Pathology 2(1) (2006), *in press*

We present a study of the variation in the appearance of earprints from 6 pairs of monozygotic twins, applying different methods with varying degrees of objectivity. By analysing prints of monozygotic twins, we purposely select pairs of individuals for whom the degree of inter-individual variation is low.
We first provide an account of the corresponding characteristics and the differences that occur between prints from the individual members. We evaluate differences in both content (i.e., presence, shape and intensity of imprinted features) and geometry (i.e., position of imprinted features). Differences are visualized by way of digital overlays. Differences in geometry are further evaluated by performing a hierarchical cluster analysis using variables derived from the position of seemingly corresponding features.
As a next step, we explore a method to fully automatically analyse prints. In this approach, image regions are selected and matched automatically. A suggestion on how to apply this method to calculate the evidential value of an earprint is provided. To our knowledge, this is the first time that any method capable of fully automated earprint comparisons has been presented in the literature.

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A PHYSICAL ANTHROPOLOGICAL RESEARCH OF THE BEGUINES OF BREDA. 1267 to 1530 AD.

Rijpma, F.E. and G.J.R. Maat

Leiden, Barge's Anthropologica 11: 1-44, 2005 (ISBN-10: 9080645680; ISBN-13: 9789080645684).

A physical anthropological study was performed on the excavated remains of Beguines buried in the cemetery of the Beguinage of the City of Breda. The excavation was carried out by the *Archeologische Dienst Breda* in 1994. The skeletons were transferred to the department of Anatomy of the Leiden University Medical Center for further study. The collection of 120 skeletons dated from 1296-1535 AD. Beguines were religious women who lived together in a cluster of houses, often oriented around a courtyard (the Beguinage). To be able to enter a Beguinage a woman had to buy or build her own house and had to provide for herself.
The results of the physical anthropological research showed the expected nutritional and health state of this middle class social section of the city's population. Once the beguines passed the age of 20 years, their average age at death was 43 years. Other health indicators like stature, incidence of infectious diseases, deficiency diseases and joint degeneration also supported the theory that women who entered a Beguinage were economically fairly well off.

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RADIOLOGICAL FINDINGS IN THE HUMAN MUMMIES AND HUMAN HEADS

Taconis, W.K. and G.J.R. Maat

In: Egyptian mummies. Radiological atlas of the collections in the National Museum of Antiquities at Leiden, M.J. Raven and W.K. Taconis, eds, Brepols Publishers, Turnhout, 53-80, 2005 (ISBN 2-503-51701-3)
(chapter in book)

In the last decades of the past century there has been a steady increase in the

investigation by modern scientific methods of Egyptian human mummies of museum collections in Europe and the United States. From way back, radiological imaging was an important tool in this respect. Thanks to its non-invasive nature, it gives access to extensive knowledge in a relatively easy and widely accepted way.
In addition, as is discussed in Chapter II, tissue samples for biological research can be obtained with a minimum of interventional damage by means of Computed Tomography (CT) guided biopsies. The trend of the increase in radiological examinations worldwide in recent times was dominated by the ongoing technical developments in CT scanning. As a consequence, investigations took place in a more or less random way.
To the best of our knowledge, a systematic examination of large collections of mummies of some important museums has not been performed in recent times. It was decided to investigate the complete collection of the National Museum of Antiquities in Leiden in a systematic way.
The results of all these radiological investigations will be presented and discussed in this chapter, while in Chapter IV a descriptive summary of the technical observations on the exterior and interior of the mummies is given.

Poster presentations

The eCAP Exhibits Level-Dependent Non-Linearities

Westen, A.A., R. v.d. Hooff, J.J. Briaire, J.J., and J.H.M. Frijns

ENT Department, Leiden University Medical Centre, P.O. Box 9600, 2300 RC Leiden, The Netherlands, (J.H.M.Frijns@LUMC.nl)

Objectives
The eCAP amplitude is commonly interpreted as a measure of the number of excited nerve fibres. Decreasing amplitudes at high current strengths, usually ascribed to saturation effects and stimulus artefacts, are the subject of the present study.

Methods
eCAP responses were recorded in five guinea pigs implanted with the HiFocus electrode, using forward masking with independently varying masker and probe amplitudes. Experimental results were compared with our computational model of the implanted cochlea, calculating the eCAP from simulated single fibre contributions.

Results
A non-monotonous eCAP I/O-curve is found at high stimulus levels if the probe amplitude is either co-varied with the masker amplitude or varied alone. This is also found in the model. In line with the expectations, however, the model depicts a monotonously growing number of excited nerve fibres. Interestingly, at high levels the fibres located centrally in the excitation area yield an atypical response, without a clear negative peak in the single fibre action potential. The total number of excited fibres increases monotonously, but the number of fibres with atypical responses also increases (and often more rapidly) with stimulus level. Therefore, the overall N_1P_1 eCAP amplitude decreases above a certain stimulus level. Although our human cochlear model also predicts such an effect, it was not recognized consistently in actual human NRI recordings.

Conclusions
The observed level-dependent non-linearities of the eCAP I/O-curve are caused by atypical contributions of fibres close to the stimulating electrode. This has

implications for the interpretation of such curves.

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Forthcoming events

April 29, 2006
Themadag Forensische Geneeskunde.
Forensisch onderzoek van het geputrefieerde lijk
Faculteit Geneeskunde en Farmacie, Dienst Anatomo-Pathologie, Afdeling Forensische Geneeskunde.
Vrije Universiteit Brussel
e-mail: upv@vub.ac.be

May 15-16, 2006
Craniofacial Reconstruction of Soft Facial Parts
Katholieke Universiteit Leuven
www.kuleuven.ac.be/fortand

May17-19, 2006
International Symposium on Forensic Odontology
Katholieke Universiteit Leuven
www.kuleuven.ac.be

June 5-7, 2006
2nd International Congres on Anthropology, Human Evolution and Population Bio-Diversity in SE Europe
Athens, Greece
Info: Sotiris Manolis, Laboratory of Biological Anthropology, University of Athens, Department of Biology
e-mail: smanol@biol.uoa.gr

July 8, 2006
Barge Forum
Speaker and title still to be announced

July 21-25, 2006
International Conference “150 years of Neanderthal Discovery”
Info: Silvana Condemi, CNRS, Marseille; Wighart von Koenigswald, University of Bonn; Friedemann Schrenk, Senckenbergmuseum and University of Frankfurt

www.neanderthal.uni-bonn.de

August 28-September 1, 2006
XVI European Meeting of the Paleopathology Association
Fira, Santorini, Greece
www.16thpaleopathology.org
ppa16.biol.uoa.gr

August 31-September 3, 2006
Congress of the European Anthropological Association:
"Man and Environment: Trends and Challenges in Anthropology"
Info: Éva B. Bodzsár, Department of Biological Anthropology,
Eötvös Loránd University, Pázmány P. St. 1/c, 1117 Budapest, Hungary
e-mail: eaa2006@elte.hu
http://eaa2006.elte.hu