

for men, velocity and burden interact to increase energy expenditure on inclines.

#### **The role of the hunter: stable isotope evidence of hunting in adult male chimpanzees.**

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Comparisons with our closest living relatives, chimpanzees (*Pan troglodytes*), can potentially shed light on whether hunting, and associated meat eating or plant food consumption played a larger role in shaping hominin evolution. There is variation in diet amongst different chimpanzee communities, and amongst chimpanzees of the same group. Substantial amounts of meat are eaten by adult male chimpanzees at Taï National Park, Côte d'Ivoire compared to their female counterparts, and juveniles. Additionally the nature of group hunting at Taï suggests that meat consumption is linked to an individuals' role in the hunt. Quantification of meat eating through behavioural observations alone is difficult, however stable isotope analysis can further elucidate the role of meat in the chimpanzee diet. This study employed  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  of hair keratin to determine if behavioural observations of hunting and meat-eating correlate with protein-associated  $\delta^{15}\text{N}$  values. Significant sex differences were confirmed, with adult males being significantly more enriched in  $\delta^{15}\text{N}$  compared to adult females. Furthermore, irrespective of rank, successful hunters had  $\delta^{15}\text{N}$  values ~1.0‰ higher than their less successful counterparts indicating that meat consumption by male Taï chimpanzees is highly dependent on participation in meat acquisition. These results provide a platform for understanding the initiation of the sexual division of labour, and further assist our interpretation of hunting and meat eating in our early hominin ancestors.

*Research is funded by the Max-Planck-Gesellschaft.*

#### **Human childbirth: An obstetrical dilemma or a solo act.**

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The obstetrical dilemma posits that through the evolution of bipedalism and encephalization, childbirth became more difficult for hominin females. Due to this increased difficulty, complications are more likely to arise and women may require assistance during childbirth. Indeed, it is theorized that in response to the obstetrical dilemma the genus *Homo* adapted through obligate midwifery. The term obligate indicates that this particular function, midwifery, is required for life in the same way as an obligate aerobe requires oxygen to grow. This

project seeks to contribute to the issue of the obstetrical dilemma through analysis of qualitative data gathered with 'solo' birth mothers. Solo birth is the term being assigned to birth where the mother catches her own baby without the assistance from another person. Through an online survey and follow up emails, women were asked to describe their solo birth process and particularly how their baby presented and was caught. Thirty-four women responded to the survey indicating they had caught their own baby. The women's responses were qualitatively analyzed. The narratives indicate that the majority of women received support, physical or emotional, during labor and prior to catching the baby. However, the narratives also indicate that the occiput anterior presentation was not an obstetrical problem. For example, when probed about the baby's presentation, one woman stated, "The baby naturally does a little turn to face the mama when coming out." These data suggest that obligate midwifery should be refined to better reflect a woman's ability to birth unassisted.

#### **Resolving missing and unidentified persons cases: Results of multidisciplinary efforts and new data collection technologies.**

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There are an estimated 1000 unidentified bodies in the State of Florida with nearly half of them found in South Florida. The resolution of unidentified decedent cases can be of great importance to the families of missing persons and establishing the identity of the unidentified is vital to the resolution of case status, including judicial activities.

In 2007, Investigator Crane of the Broward Medical Examiner's Office (BME) initiated a resurrection in the interest of unidentified decedents handled by the BME. In her efforts she retrieved over 100 boxes of remains that were not on site at the BME's Office. In October, 2008 while developing the investigatory analysis, the Broward County Sheriff's Office (BSO) and the BME entered into a formal arrangement to examine all missing and unidentified decedent cases within their respective and overlapping jurisdictions. BSO and the BME's Office continued to catalogue the remains to ensure that the proper forensic analysis of all cases be completed and entered into NamUS. To date, over 111 cases with combined efforts have resolved the identity of 11 individuals.

Twenty six unidentified persons were buried by the county prior to the development of contemporary biometric methods, which include STR based typing methods utilizing mini- and Y-STR PCR multiplexes that enables the analysis of inhibited and degraded DNA. The use of these techniques and 3-D GPR technologies will be presented. As Fred Smith has said, the identity is in the anatomy, you just have to look at it properly.

#### **Carnivore-Primate Interactions across fragmented and contiguous forests in N.E. Madagascar.**

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Studies investigating predator-prey dynamics between primates and carnivores are limited given that carnivores are often rare or highly elusive and predation events are difficult to observe. Understanding how carnivores influence primate density and behavior is fundamental to the study of primate ecology and essential for their conservation. From June 2011 to March 2012 our team collected an average of four GPS points per day on a group of three silky sifakas, top 25 most endangered primates of the world, at the Anjanaharibe study site in the Makira Natural Park, NE Madagascar. In addition, our research team photographically sampled endemic and exotic carnivores, as well as humans using remote sensing cameras for 65 days during the course of this study. Using silky sifaka range and activity patterns, as well as photographically sampled data, we investigated the movement and activity patterns of silky sifakas based on the trap rates, movement, and range of carnivores and humans across the 10km<sup>2</sup> study site. Additionally, we used two species interaction occupancy modeling to investigate the relationship between silky sifakas and their top predators. The findings of this research provide the first direct assessment of carnivore-primate dynamics in Madagascar's eastern rainforest. Moreover, the combination of telemetry and photographically sampled data represents a new approach to understanding the relationship between carnivores and primates throughout a wide range of habitats.

#### **Application and use of cyclododecane, Part II: En bloc removal of osteological remains.**

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This study contributes to ongoing research of cyclododecane (CDD) as a tool in the recovery and analysis of friable osteological remains. Cyclododecane, in either molten or solvent solution forms, has the unique property of sublimation, making its use completely reversible and thus an ideal tool for work with sensitive materials.

In prior lab experiments, CDD proved successful at stabilizing individual fragments recovered from the field through traditional hand-excavation methods. These excavation methods can unfortunately cause damage to friable remains. This continuation study illustrates the development and testing of field methods to remove sensitive remains en bloc using CDD. The goals were complete removal