EDITORIAL:
WE HAVE NEVER BEEN MODERN

ANTHROPOGENY FIELD COURSE

CARTA-INSPIRED SYMPOSIUM & PUBLICATIONS

AWARDS & HONORS

IN MEMORIUM: BRUCE McEWEN

CARTA SYMPOSIUM

2019 ANTHROPOGENY FIELD COURSE

EXPLORING THE ORIGINS OF TODAY'S HUMANS

A flood of new information from ancient DNA, fossils, archeology, and population studies sheds more light on our origins

Inside this Issue...
At the time of this publication, a little less than seven years have passed since CARTA presented its symposium *Behaviorally Modern Humans: The Origin of Us* (May 2013).

Since then, a flood of new information from ancient DNA, fossils, archeology, and population studies necessitates revisiting the topic with a new symposium, *Exploring the Origins of Today’s Humans* (February 21, 2020).

*Exploring the Origins of Today’s Humans* will ask: where did we humans come from and when did we become the dominant species on the planet?

Available evidence indicates that all humans living today are derived from a relatively small population that arose in Africa beginning roughly 300,000 years ago, which then spread throughout Africa and eventually the rest of the planet.

In the course of this diaspora, our ancestors mated with other human-like species and assimilated some of their DNA, but eventually replaced all of these other close evolutionary cousins without exception – leaving only one human species today.

*Exploring the Origins of Today’s Humans* seeks to summarize current knowledge and update conclusions since the previous symposium in 2013.

Curious about where we came from and how we got here? Consider attending one of our **FREE** symposia on anthropogeny (the study of human origins) where experts present on topics addressing the origins of the human phenomenon. Can’t make it in person? We also offer a **FREE LIVE WEBCAST**. For more details, including registration, the live webcast, or for information on past and future events, please visit: **carta.anthropogeny.org**
Today’s researchers studying the origins of our species have been inundated with new data revealed through advances in technology, refined genomic and dating methods, as well as new discoveries. However, this largess provides a challenge in integration and description that ultimately begs for reflection. CARTA Member Iain Davidson’s (PhD, U of New England, emeritus) profiled chapter (see “CARTA-inspired Publications”) reminds us that in our quest to identify “ourselves” in the past, our own un-recognized biases often reify cultural categories with biological data.

In contextualizing the myriad talks and speakers “Exploring the Origins of Today’s Humans,” on February 21, 2020, I’m reminded of philosopher Bruno Latour’s assertion, “we have never been modern.” With some indulgence, I ask that we take a brief look at some of the changes over the past decade within the sciences surrounding anthropogeny (with a focus on paleoanthropology), and how these altered perspectives regarding who we are today and how science is practiced impact our views of the human past.

Since we must begin somewhere, I’ll begin in 2013, the time of CARTA’s last symposium on this topic. In retrospect, many forces have since intervened to change our frame of reference for today’s humans. For me, 2013 was the year that, as a member of an underground team composed solely of early-career women scientists (from the U.S., Canada, and Australia), I helped excavate the first remains of the then unidentified hominin now known as Homo naledi. These bones had recently come to light through the amateur exploration of two local South African cavers belonging to the Speleological Exploration Club (SEC). This unexpected discovery precipitated a half-decade of further exploration into the depths of South African caves beyond the so-called “twilight zone,” an area that popular wisdom had deemed the limit of hominin wandering. Post-naledi, it might be argued that field exploration has seen a resurgence, at least in some regions, and this has been rewarded by yet-undescribed discoveries deep within other caves.

Early in 2013, a now well-known survey was deployed, and in 2014, four intrepid women scientists of another kind (including CARTA Member Katie Hinde, PhD, ASU) published the “Survey of Academic Field Experiences (SAFE): Trainees report harassment and assault,” which gained traction in the media as SAFE13. As the first empirical examination of scientists’ experiences of harassment during fieldwork, the study exposed the dark underbelly of work in the field. SAFE13 and the later qualitative SAFE2 (2017), brought many uncomfortable but necessary conversations to the forefront of various field sciences and challenged the ways that diversity and inclusion initiatives were previously implemented.

In 2015, the mysterious Rising Star remains were first announced following a ground-breaking early-career researcher description workshop, and by 2017 began to collalesce into a broader picture of human origins, which by now included engrossing details of Denisovan and Neandertal introgression, such as that discussed by CARTA Member Joshua Akey, PhD (Princeton University) in our Winter Symposium. It seemed that a previously unknown, small-brained hominin with mosaic traits (many ancient hold-overs associated with climbing) had evidently been disposing of their dead deep within at least one South African cave in two apparently separate instances (i.e., the Dinaledi and Lesedi chambers of the Rising...
Star cave system). The fact that these strikingly human-like actions, presumably achieved without the use of artificial light, had taken place only 236-335,000 years ago, was made all the more poignant in light of new dates published for the Jebel Irhoud Middle Stone Age site (performed by a team including CARTA Member Jean-Jacque Hublin, PhD, Max Planck). These dates, at 286,000 ± 32,000 years ago, placed the Jebel Irhoud tools and human remains within the same date range as *Homo naledi* (albeit on the opposite end of the African continent).

In the background of these scientific events, social changes within the field began to take root and flourish. In 2016, within the American Association of Physical Anthropologists (AAPA), the Committee on Diversity (COD), chaired by CARTA Member Susan Antón, PhD (New York University), launched the IDEAS: Increasing Diversity in Evolutionary Anthropological Sciences workshop to address underrepresentation of racialized minority scholars in biological anthropology through training, mentoring, and outreach. Meanwhile, back in Africa, the Rising Star Expedition created career paths for a small cadre of South Africans, including Nompumelelo Hlophe (now a PhD candidate), Maropeng Ramalepa, Mathabela Tsikoane, Dirk van Rooyen, and original *Homo naledi* discoverers, Steven Tucker and Rick Hunter, who formed the core of a Wits Exploration Team.

In 2018, a second call for Rising Star excavators went out over social media, this time bringing South Africans Keneiloe Molopyane, PhD (now Curator of Maropeng, the Official Visitor of the Cradle of Humankind), and Kerryn Warren, PhD (UCT), joined by Welsh caver-scientist Angharad Brewer Gillham. The commitment to providing opportunities to women and other groups historically disadvantaged in the field sciences has become an important part of the legacy of a small-brained human relative to its “Modern” human cousins.

To reiterate, much has changed since the last CARTA symposium on the subject of behavioral or anatomical “modernity” some six years ago, but we can also see that it is not merely with regard to a flood of new information from Ancient DNA, Fossils, Archeology and Population Studies. The face of the field of anthropogeny itself is quite literally changing, and the hand of many CARTA Members can be detected in steering its future course. We no longer have the luxury of performing our analyses in a vacuum (if indeed, we ever did), and the future of our sciences will be made stronger and more rigorous through the introduction of different views and biases, bringing us ever closer to our illusive modern ideal.

We hope that you will join us Feb 21, 2020 as CARTA presents, “Exploring the Origins of Today’s Humans,” whether it is at the Salk or in the comfort of your own home via live webstream, as together we tackle these existential questions in the light of various lines of new evidence.

To learn more about how this primate assimilates such knowledge, stay tuned to read my CARTA guest blog on “Twilight Beasts” (www.twilight-beasts.org, @TwilightBeasts on Twitter), which will seek to summarize this provocative symposium.

Further reading:


Hawks, J., et al. (2017), New fossil remains of *Homo naledi* from the Lesedi Chamber, South Africa. eLife, 6, e24232.


During Summer 2019, a small group embarked on a journey to better understand human origins. Visiting important locations throughout the East African Rift, including parts of Ethiopia and Tanzania, our explorers studied fossils, lived with hunter-gatherers, and encountered numerous non-human primates. The following pictures give a glimpse into this journey.

Meet the cast of characters! 1 (from left to right): Fiona Stewart (Liverpool John Moores University, Field Course co-faculty, Anthropology), Vanessa Bateman (UC San Diego PhD student, Visual Arts), Stephan Kaufhold (UC San Diego PhD student, Cognitive Science), Arturs Semenuks (UC San Diego PhD student, Cognitive Science), Rafael Nunez (UC San Diego Faculty), Pascal Gagneux (UC San Diego, Anthropology, Field Course co-faculty), Linda Nelson (CARTA). 2: Arturs. 3: “Wisdom is like a baobab tree: it takes many to grasp it” (African proverb). 4: Stephan. 5: Pascal. 6: The explorers along with their Hadza hunter-gatherer hosts. 7: Alex Piel (Liverpool John Moores University, Field Course co-faculty, Anthropology). 8: Vanessa. 9: Rafael.

This picture collage: To represent the human characters of the field course, this collage takes the shape of a recently discovered Middle Stone Age obsidian point found at the Fincha Habera rock shelter in the Ethiopian highlands dating to ~47,000 years ago.
Chimpanzees of East Africa!

These snapshots represent just some of the chimpanzees (*Pan troglodytes*) our intrepid explorers encountered. Studying the biology and behavior of our closest living cousins is valuable for their conservation and helps us to understand ourselves.
When you think of large African animals, elephants are most likely to come to mind. So what better way to represent the other, non-primate, animals our fearless explorers found along their journey?

These are just some of the animals encountered in Tanzania. 1: **Black chested snake eagle** (*Circaetus pectoralis*); 2: **Olive baboons** (*Papio anubus*); 3: **African bush elephant** (*Loxodonta africana*); 4: **African buffalo** (*Syncerus caffer*); 5: **Masai giraffe** (*Giraffa camelopardalis tippelskirchii*); 6: a herd of **blue wildebeest** (*Connochaetes taurinus*); 7: **Hippopotamus** (*Hippopotamus amphibius*); 8: **Grant’s Gazelle** (*Nanger granti*); 9: **Spotted hyena** (*Crocuta crocata*).
Landscapes of Tanzania!

A small sampling of the ecosystems of Tanzania. 1: Ghideru Ridge (with smoke from burnt Datoga cattle corral); 2: Ngoro-ngoro Crater; 3: Mbulu Highlands (dense farming); 4: Issa Valley River (lush gallery forest); 5: Olduvai Gorge; 6: Ghideru Ridge (Acacia-Commiphora woodland overlooking Yaeda Valley); 7: Serengeti (grassland); 8: Yaeda Valley (baobab tree); 9: Issa Valley Grassland (as seen by a bipedal hominin); 10: Eastern Rift Valley (near Mto Wa Mbu); 11: Maasai Village of Endulen.
The following awards and honors were received by CARTA members during the past year.

### AWARDS & HONORS

**Polly Wiessner**  
*Arizona State University*  
Awarded the Queen’s Jubilee Medal, Papua New Guinea, in cultural research, preserving cultural knowledge, and cultural education, 2019.

**Wenda Trevathan**  
*New Mexico State University*  
Elected as Fellow (Section H) of AAAS, 2019.

**Rachel Caspari**  
*Central Michigan University*  
Elected as Fellow (Section H) of AAAS in November 2019.

**Rob Knight**  
*UC San Diego*  
Received the American College of Nutrition Grace A. Goldsmith Award, 2019, and the NIH Director’s Pioneer Award, 2019.

**Todd Preuss**  
*Emory University*  
Promoted to full Professor of Pathology and Laboratory Science, 2019.

**Amy Non**  
*UC San Diego*  

**Briana Pobiner**  
*Smithsonian Institution*  
Elected as a Sinai and Synapses Fellow, 2019-2021.

**Wendy McEwen**  
*Arizona State University*  
Awarded the Queen’s Jubilee Medal, Papua New Guinea, in cultural research, preserving cultural knowledge, and cultural education, 2019.

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**In Memoriam: Bruce McEwen**

It is with great sadness that CARTA recognizes the passing of pioneering stress hormone researcher, colleague, friend, and CARTA Member, Bruce S. McEwen, PhD, (Harold and Margaret Milliken Hatch Laboratory of Neuroendocrinology, Rockefeller University), who died on Jan. 2, 2020, aged 81.

Bruce was professionally active right up to the end of his life, and CARTA was fortunate to have him speak on October 11, 2019, when CARTA/KIBM presented, “Impact of Early Life Deprivation on Cognition: Implications for the Evolutionary Origins of the Human Mind.” He presented his talk, “The Resilient Brain: Epigenetics, Stress, and the Life-course,” via previously recorded video. This presentation may be accessed via the CARTA video archives: [https://carta.anthropogeny.org/events/sessions/resilient-brain-epigenetics-stress-and-lifecourse](https://carta.anthropogeny.org/events/sessions/resilient-brain-epigenetics-stress-and-lifecourse).

His CARTA profile has been archived and you may continue to visit it for details on his work. A summary of his life’s work is available from Rockefeller University at this link: [https://www.rockefeller.edu/news/27135-neuroscientist-bruce-mcewen-studied-impact-stress-brain-died/](https://www.rockefeller.edu/news/27135-neuroscientist-bruce-mcewen-studied-impact-stress-brain-died/).
Transdisciplinary interaction is a core CARTA principle, and our anthropogeny symposia provide a forum for experts from different spheres of knowledge to interact and spark new research on the origins of the human phenomenon. These selected publications were inspired by such interactions. CARTA members are listed in bold. Visit carta.anthropogeny.org for the complete list.


The authors compare gut microbiome composition and functional potential across a diverse range of humans and wild, non-human primates. Surprisingly, humans group more closely with cercopithecines, particularly baboons, than with African Apes, suggesting that diet, ecology, and physiological adaptations are more important than host-microbe co-diversification.


There is increasing appreciation of the role of oligodendrocytes in cognition and in human psychiatric diseases. This study compared gene expression in humans, chimpanzees, and macaques, and found that oligodendrocytes underwent greater gene-expression changes in human evolution than did neurons.


This study establishes differences in gene regulatory architecture between anatomically modern humans and archaic hominins, including in genes associated with skeletal and dental morphology consistent...
with the archaeological record. Results provide an avenue for exploring phenotypic differences between archaic groups from genomic information alone.


Archaeohistory is necessarily an invention of scholars, necessitating rigorous and ongoing re-examination of classificatory definitions and interpretation biases relative to their own historical context. Caution is urged in adopting any archaeological classificatory system without first interrogating their inherent subjectivities and theoretical roots.


Appropriate empirical-based evidence and detailed theoretical considerations are often overlooked when associating observed phenotypic variation with evolutionary explanations. Combining population genetics with precision genome editing tools and methods has the potential to functionally investigate population-specific point mutations, holding “just-so” evolutionary explanations accountable.


The derived human alcohol dehydrogenase (ADH)1B*48His allele is one component of an East Asian specific core haplotype that underwent recent positive selection. These results indicate that this allele has also independently undergone recent rapid increases in frequency in Southwest Asia populations. The emergence of agriculture in these regions may be the reason for this convergence of a metabolic variant.


Sequences encoding Olduvai protein domains have been associated with brain size, cognitive aptitude, autism, and schizophrenia in humans. The current study provides evidence of the genomic events that led to the genomic instability underlying this recent, rapid, and extreme human-specific Olduvai expansion, and which remain highly active in the human genome today.


CD33rSiglec receptors are innate immune cell receptors modulating production of reactive oxygen species, which contribute to aging. We found a strong positive correlation between CD33rSIGLEC gene number and maximum lifespan. Two striking exceptions are humans and orcas, species with prolonged post-reproductive lifespans, allowing care of helpless young by elderly caregivers--The Grandmother Hypothesis.


Human brain organoids have emerged as a promising technique for modeling early stages of human neurodevelopment in the lab. We review the current state of the art on the use of brain organoids from different species and the molecular and cellular insights generated from these studies. We then discuss the limitations and future perspectives of this technology.


The author proposes that cultural continuity balances responsiveness...
and stability in the human epigenome. Cultural tradition and institutions provide stability, allowing for increasing responsiveness, while ‘runaway’ responsiveness is countered by the positive selection of genetic variants that dampen responsiveness. Longitudinal multigenerational testing is required.


This paper reviews the merits of marmosets as a model primate relative to other models (e.g., macaques) and to more comparative approaches. The large number of evolutionary specializations in marmosets warrants special caution in extrapolating results to humans.


The crucial role of thyroid hormone (TH) signaling in embryonic brain development has long been established. This paper reviews the current knowledge of TH delivery, conversions, and function in the developing mammalian brain, and discusses their potential role in vertebrate brain evolution. Future research should be aimed at elucidating TH signaling in nervous system development.


Humans deny, ignore, corrupt or distort reality--a feature that should have limited survival and reproduction. Our ability to read minds of others should also have been initially detrimental, by triggering fear of personal mortality. A rare combination of these two negatives may have breached this “psychological evolutionary barrier,” explaining our planetary dominance and our eventual downfall.