

## Research Interests – Dr. Patrick Roberts

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As a W2 Research Group Leader in the Department of Archaeology, Max Planck Institute for the Science of Human History in Jena, Patrick Roberts's research innovatively combines methodologies from the Social and Natural Sciences to explore the human past. He has set-up one of the only stable isotope laboratories fully dedicated to the analysis of archaeological materials anywhere in Germany. Dr. Roberts and his Research Group are pushing the boundaries of existing isotopic approaches, including compound-specific analyses, applied to fossil teeth and bones, plant remains and sediments in order to investigate topics as diverse as: how Pleistocene humans adapted to new environments as they ventured across and beyond Africa, how the ecosystems of now-extinct megafauna changed towards their final moments on Earth, and how European colonialism impacted cuisines in different parts of the world. Roberts is particularly concerned with ensuring that archaeology and palaeoecology are brought to bear on 21st century concerns of climate change, sustainability and human-induced environmental change.

Dr. Roberts has become particularly renowned as a world-leading archaeological scientist for his work revealing the past occupation of tropical forests by our species. The evolution of our species in Africa, and its Pleistocene dispersal around the planet have, in popular and academic thought alike, often been associated with sweeping savannah ecosystems or protein-rich coastal habitats. Tropical forests, by contrast, have tended to be seen as pristine, natural, barriers to human populations. Roberts has applied his diverse scientific toolkit, including isotopic methods, to archaeological sites in Sri Lanka [1] and Southeast Asia [2] to demonstrate that, from our species' very first arrival in these parts of the world 45 000 years ago, it was willing and able to successfully exploit the diverse plant and animal foods of tropical forests. Not only that, but Roberts has used this work to argue that it is in fact adaptation to extreme environments such as these that makes *Homo sapiens* unique [3], and left it the last hominin standing on the face of the planet as other species struggled with Pleistocene climatic variability [4].

Dr. Roberts has not stopped there, however. Combining state-of-the-art, multidisciplinary methods including palaeoecological coring, archaeobotany, dendrochronology, archaeozoology, plant genetics and LiDAR remote sensing from the sky, he has shown that past humans did not just adapt to tropical forests, but also modified them. He has written the first landmark

global academic appraisal of human history in tropical forests, “Tropical Forests in Prehistory, History, and Modernity”, which is published with the esteemed Oxford University Press [5]. Here, as well as in a prominent high-impact review paper [6], Roberts has highlighted that, contrary to our ideas that “agriculture” or “cities” are impossible in tropical forests without large-scale destruction, these environments were sites of some of the earliest human experiments with plant cultivation and domestication, are the origins of many of the groceries that stock our kitchens today, and were home to some of the largest pre-industrial cities ever to have existed. We simply have to alter our Euro-American assumptions as to what farming and urbanism can, and perhaps should, be.

Together, Roberts’ work is emphasising the need to treat tropical forests as important sites of cultural as well as natural heritage. This is perhaps most clear in a research project coordinated by Roberts, that links three Max Planck Institutes across three different sections, to study human history in the Amazon Basin. The research team is analysing the growth rings and genetics of living trees to demonstrate that they act as “time capsules” [7] of human management that has left legacies still growing within this supposedly “pristine” forest. Roberts has worked closely with Indigenous populations in Sri Lanka [8] and Australia [9] to support the recognition Indigenous knowledge and their crucial role in the conservation of tropical forests. His palaeoecological and archaeological research has documented the crucial nature of Indigenous stewardship for these environments, and the essential role of Indigenous populations in maintaining biodiversity, carbon storage, and resilience of these threatened environments today.

Dr. Roberts’ work in tropical forests has seen him engage closely with the increasingly popular concept of the “Anthropocene”. Tropical forests are critical to a variety of earth systems, with local impacts potentially combining to have regional and global ramifications for rainfall, soil stability, temperature and even the atmosphere. While we often associate the Anthropocene with a 21st century “spike” in human impacts on the natural world, Roberts is using historical and archaeological datasets to demonstrate that its roots extend much further and are far more unequal than many of us would like to assume. Roberts is the Principal Investigator of the ERC Starter Grant “PANTROPOCENE” project, which seeks to explore how past human impacts on tropical forests have left legacies of deforestation, conservation and climate lasting to the present-day. In particular, he is focussed on the role of European colonialism in introducing disease, profit-driven approaches to land-use, and new systems of settlement and administration and their impacts on millennia of Indigenous knowledge, land management and social and political justice [10].

The significance of tropical forests to global climates, biodiversity and economies means that understanding past human interactions with these environments is essential and by 2050 over half of the world's population will live in the tropics. Dr. Roberts' has been particularly concerned with communicating these points to conservation scientists, policy makers and the public and has participated in UNESCO panels and given talks to GEO, Deutschlandfunk and Latest Thinking. He is also the author of the popular book "Jungle: How Tropical Forests Shaped the World and Us" [11] that is soon to be published with DTV in Germany and Penguin Random House in the UK. This book highlights how the growing archaeological and historical record of the tropics indicates that we all need to acknowledge the colonial abuses that have restricted Indigenous land management in the tropics and led to economic imbalances between Euro-America and the equatorial regions. It is essential that we develop more just, sustainable futures for these environments and their occupants, if we are to continue to reap the enormous benefits they provide to our planet as a whole.

## References

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