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Tropical Forests in Prehistory, History and Modernity, by Patrick Roberts, 2019. Oxford: Oxford University Press; ISBN: 978-0-19-881849-6 hardback £85. xvi+350 pp.

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The perceived wildness of tropical forests may be a feature that they share with other apparently 'un-domesticated' natural environments, but characterization of tropical forests and the communities within them has often gone beyond this to become the embodiment of an essential primeval quality in popular and scientific discourse. Entwined with archetypal qualities, these environments have come to represent the quintessential 'pristine' verdant environment; one that before the arrival of colonial powers and industrialization was barely marked by the passage of humanity. In this well-written and highly accessible book, Roberts sets out to challenge that perception, tracking in the process a diverse record of human interaction with tropical forests that plays out not only on a global scale, but also through deep time. The notion of virgin tropical forests and of Indigenous cultural isolates within them are pervasive themes that this book challenges repeatedly in an effort to recast objectively how both are seen. Roberts writes in the opening chapter (p. 5): 'despite popular belief, significant human manipulation and alteration of tropical forests are not recent phenomena ... and it is increasingly recognized that each forest is, in fact, a dynamic "artefact" of millennia of human interactions'. Building evidence through the course of the volume, he presents a compelling case for the importance of interweaving disciplinary specialisms such as ecology, conservation and global change science, palaeoecology and archaeology with the available wealth of local knowledge in that recasting, but also as a robust and realistic approach to addressing the crisis in sustainability in the tropics that we now face on a global scale.

The volume is divided into nine chapters. Beyond the introduction these cover the evolutionary history and ecological state of tropical forests (2); the relationship of early hominins to these environments in an evolutionary context (3) and then hominin global dispersal (4); the place of tropical forests and Indigenous forest subsistence strategies in the story of landscape management and domestication (5); the rise and fall of urban forms (6); the removal of tropical forest societies from history and placement within isolated primeval conceptions (7); the incorporation of archaeological approaches into modern conservation and in helping to define the Anthropocene (8); and a synthesis chapter (9) that makes the case for presenting and accepting these environments in their reimagined form.

In chapter 2 the author unpicks the definition of the term 'tropical forest' and challenges widespread regard that this environment is formed of stable and monolithic conditions. Key modern tropical forest formation types are introduced and then examined, though it may be said that there is no explanation on what basis these should be taken as definitive or enduring through time. More specific ecological and geographic detail would have been useful here alongside the more

general regional-scale remarks. It would also have been helpful if these had included more direct reference to figure 2.8 (itself rather small for differentiating the different formations covered in the accompanying legend). Ethnographic perspectives of tropical forest are also introduced in this chapter, ahead of considerable and justifiable emphasis later in the book. The text goes on to highlight the recent growth in archaeological datasets from tropical forests, before exploring the impact of CO₂, precipitation and wider atmospheric drivers (e.g. ENSO); noting the value and restrictions of palynology, and the potential of isotopic analysis to unlock further our understanding of environmental change. As Roberts states (p. 49), in order to model past fluctuations in tropical forest structure and extent, 'regionally and temporally-specific approaches to tropical forest reconstruction are essential ...'. This leads into an overview of hominin evolution in relation to tropical forests and the identification of the need for tropical forest *prehistories* (i.e. plural as opposed to singular). The linkage between tropical forest and human action, impact and evolution, and the diversity of tropical forests does come through here, as does a sense of how these data can be and are being recovered in the field. Overall, the chapter extends the introduction, with broad coverage and mostly light detail; though some elements, such as the different types of forest formation, are not directly revisited (an opportunity missed in light of the above quote) as the book's narrative unfolds, most are expanded upon and explored in satisfying detail in the remaining chapters.

The opening paragraph of chapter 3 makes a thought-provoking remark that sets the tone very well for what is to come. Roberts writes that despite the oft-lauded proximity of other apes to humans behaviourally, even emotionally, they are still popularly portrayed also as analogues for a 'last common ancestor'. He further notes how that perception extends to a view that other apes have been somehow 'left behind' in tropical environments compared to the ancestors of *Homo sapiens*, who emerged through changing adaptations to savanna conditions. This has perpetuated a popular belief that there has been a kind of stasis in the evolutionary trajectory of the other apes; one that is also reflected in the tropical forest habitats in which they live. He argues to the contrary: that in fact what current evidence actually shows is that tropical forests have been locations of dynamism in great ape evolution (p. 71).

Building from this and drawing on his own expertise in isotopic analysis, Roberts explores systematically what is understood by the term 'savanna' and unpacks the complexity behind the simplistic dichotomy to tropical forest (p. 87), before re-evaluating the place of the latter in human evolution. He follows the view that environmental variability has been one of the central drivers in our evolution rather than necessarily access to a single ecosystem type (principally, savanna). There is no *de facto* reason, he argues, why ecological mosaics that included tropical forest elements or resources could not have played an ongoing role in human evolution. However, it is only with the arrival of *Homo sapiens* that there seems to be clear evidence that tropical forests become a focus of hominin activity. While this certainly appears to be the case, the reader is left to wonder if there is a degree of coincidence between the timing of that arrival and the establishment of tropical

forest formations that we recognize as broadly analogous to those of today. If environmental variability is the new pivot-point around which our understanding of tropical forests (and indeed human evolutionary trajectories in relation to them) turns, as Roberts argues, close consideration will need to be made as to where and if we can continue to rely on generic definitions of tropical forest and reliably back-project these into the remote past.

Chapter 4 provides an up-to-date potted history of the global diaspora of *Homo sapiens*. This includes discussion about the growing evidence that what had previously been characterized as the Marine Isotope Stage 5 'abortive' spread out of Africa may have been more widespread and more successful than previously assumed; a shift in interpretation that raises queries against recently prominent coastal dispersal models (p. 101). Roberts argues for the utilization of tropical forest resources during the early expansion of *Homo sapiens* in Africa and into Asia, and as part of later movements within the Americas. He suggests, however, that there remain only a few instances where we can be confident that there was near-exclusive occupation of these environments (p. 105). This does, though, leave one to imagine certain parallels here to the 'isolated tribes' and their forest lifestyle that this book is otherwise arguing we should be distancing ourselves from. Nonetheless, the author's detailed work at Batadomba-lena, Sri Lanka, is cited as a strong candidate for this exclusivity, with human occupation of the island's Wet Zone tropical forest occurring long before any firm evidence appears in other ecological settings, and persisting from 38,000 years ago to c. 3000 years (pp. 102–5). The Niah Caves, East Malaysia, are also discussed in this context (pp. 108–9). Roberts considers it more likely that in Southeast Asia early groups were living in and exploiting mosaic environments (an ecological situation that he returns to in the next chapter). While improving steadily, regional palaeo-environmental records in Southeast Asia remain limited, leaving as still nascent our understanding of prehistoric forest formations; however, such an interpretation is in line with the book's contention that tropical forest variability is the real world situation that needs to be the focus of research (and conservation) going forward. It also accords with the 'plasticity' in adaptive response that appears to distinguish *Homo sapiens* from other hominins in their success and ultimate survival (pp. 116–18).

Chapter 5 examines the distinct nature, development and contributions of agriculture in tropical forests. Through this part of the book, Roberts evaluates the evidence for species management under tropical forest conditions and questions how 'agriculture' has been and should be defined in this wider context of resource use. He points out that even where conceptions of the term are being reconfigured by recent studies into the origins of food production, they are still missing a lot of incipient management practices (pp. 122–5). He does, though, also confine himself to only a subset of such situations within tropical forest where such actions have led to domestication. Trajectories leading towards more intensive husbanding of resources were not, he argues, sudden events, but rather appear to have been developments within a long-term relationship between hunter-gatherer societies and tropical forest

(p. 130 & 147). He cites, for example, how the initial phase of activity at Kuk Swamp, New Guinea (10,200–9910 years ago), revealed considerable landscape intervention (possibly for drainage purposes), but no definitive evidence of plant cultivation, something that only appears in later phases (pp. 125–9). The argument presented is that increased intervention here was in order to maintain access to yams during climatic instability in the early Holocene and/or the encroachment of sub-montane tropical forest. Roberts' own isotopic analysis and study of Kiowa (a site located at the same altitude and ecological position as Kuk) reason against this (p. 130), though he does not develop the point, instead stressing the importance of ecotone situations between lowland and montane tropical forests and grasslands and the maintenance of a 'mosaic' cultivation zone (p. 131).

There is little clear evidence, he argues, linking African crop domestication to tropical forests other than hints that some (e.g. pearl millet) might have occurred within a multi-cropping tropical forest package: something he feels may suggest the emergence of 'more complex ecological contexts' (p. 137) for cereal emergence in Africa. This is perhaps true, but it could just as easily be a coincidence. Indeed, at this point in the text it feels as if a little too much is being made of a rather tenuous connection. Away from cereals, the evidence cited for management of tropical resources (e.g. yams, ground nut and gourds) from the second millennium BC onwards looks to be on firmer ground, with regard to the role that tropical forests played in the early development of food production on the African continent. However, to the reader it is still unclear if tropical forest conditions had a defining part to play in this, and there is a sense that a universal value to tropical forest is perhaps being over-played to meet the focus of the book. On p. 137, Roberts explains that the thrust of his investigation is to understand 'forest manipulation and agricultural origins in tropical forest settings'. This clarifies things, and is not without evidence (e.g. see further discussion on the importance of the Amazon as a centre of agricultural development from p. 141 onwards). That said, at points in this chapter it does seem as though Roberts has slightly tipped his investigation a little too much towards fulfilling a preconceived agenda: to find such origins in tropical forest.

What is undoubtedly true and a point well made is the way evidence for systematic utilization of tropical forest plant foods in New Guinea, Southeast Asia, Central and South America is helping to take perspectives beyond long-held and rather singular Eurocentric narratives (p. 139). At the end of chapter 5, Roberts arrives at another important conclusion in his study. Returning to the significance of mosaic conditions, he proposes that these ecological conditions may be a common feature in the majority of indigenous tropical forest plant domestication. This being so, mosaics were probably key to the long-term sustainability of indigenous forest practice in the past and, with a view to the future, particularly in the context of introducing agricultural forms from other biomes and cultures, more deserving of much closer attention (pp. 147–8).

Chapter 6 reviews the growing dataset of 'urban' landscapes that are emerging from tropical forests (something that is being particularly aided by advances in remote sensing technology) and how these compare and challenge traditional expectations of urban development based primarily on Mediterranean or Middle Eastern archetypes. Backed by a comprehensive and diverse range of examples, Roberts argues that the urban model of hereditary elites controlling densely populated monumental city strongholds (an *intensive* idea of urbanism) is simply not universally applicable. He highlights how research in tropical forests, particularly in archaeology, deals a significant blow to previous conceptions of urbanism, and how this indeed builds on early suspicions. In this respect, he explains that although parallels are often made between Classic Maya city-states and Mesopotamian urban centres, from as early as 70 years ago evidence has been emerging of notable differences that place Mayan centres and various sub-centres within a larger dispersed urban conglomeration (p. 159), a situation that arose out of diverse subsistence patterns that included a range of domesticates and management of wild species and local rather than centralized management of them.

Roberts uses Fletcher's 'agrarian-based low density urbanism' to good effect as a way of articulating these differences. The *extensive* urban infrastructure of this model incorporates central areas of ritual, commerce, etc. drawing people in centripetally, while village foci provide a centrifugal counter – a system and a tension, which Roberts argues, could have left this system vulnerable (pp. 181–2), but one that is also suited to urban adaptation to the dispersed biodiversity of tropical forests. This latter reasoning could have been usefully substantiated ecologically, particularly as the author sought not only to contrast extensive to intensive urbanism from a tropical forest perspective, but also to compare urbanism development between different tropical forest settings. The narrative is delivered from an environmental perspective that takes the reader through a series of case studies in North and Central America, Southeast Asia, South Asia, then to South America and the Pacific (though it is not so clear why they have been tackled in this order). The chapter recognizes ecological significance and variability, but the emphasis is placed on exploring urban trajectories themselves (p. 167). Roberts' argument that emerges, highlighting the significance of variability in urban development (and even the potential significance this may hold for future planning), is well made and coherent, but as a consequence is more limited in its use of finer and specific ecological detail.

The contents of chapter 7 follow very smoothly and cogently from a clear statement of intent at its outset (p. 186): to examine how Eurocentric concerns and perspectives have 'contributed to the removal of tropical forest societies from history and their placement into isolated, primeval conceptions of tropical forest environments'. Roberts proceeds with a thoughtful discourse about the rise of the 'ecologically noble savage' view of Indigenous groups and how, more lately, a perceived need to adapt to extreme levels to survive in tropical settings has become embodied in popular mass media 'reality' and documentary television. While this

view of tropical forest existence may highlight and exalt the depth to local knowledge characteristically possessed by Indigenous peoples, Roberts goes on to explain that it has also tended to make this a single and defining feature, one that tends to ignore the many and varied history of these communities, which for many include phases quite different to those taken to characterize them today (pp. 195–9). Indigenous tropical forest communities, he contends, are still often viewed as the unchanged isolates. Like their forest homes, they are also often seen as ‘passive victims of capitalism and colonialism’ (p. 206), something he shows to be a significant oversimplification. The chapter highlights how Indigenous groups have been impacted by multiple external and internal pressures, marginalization, translocation and changes in characterization, but also how they have always been [adaptive and active agents who utilise socio-economic connections with the outside world to their own ends](#): ‘cultural elements were adopted, transformed, and rejected as was seen fit’ (p. 203). The evidence presented demonstrates how they have been central to growing trade networks in the Late Holocene and probably earlier.

As one reads through Roberts’ book there is occasionally a sense that, despite its subject coverage, it could be simply one in a series of ecologically focused volumes on human adaptation to and modification of different types of environment. What makes it essential to study this particular environment can become obscured behind the details presented. Not so here. The fact that tropical forest has been used repeatedly to epitomize culturally specific (and usually external) views of this varied environment, and the place of human society within it has tended at best to lead to only a partial appreciation of the complexities of that relationship and at worst a spurious one, highlights the value and relevance of Roberts’ volume, not just in realigning our perception of its role in our past, but also revising how it can be sustainably conserved into the future.

The central relevance of the volume is clearly evident again in chapter 8. Here Roberts reminds the reader that tropical forests are becoming the most threatened terrestrial environments after the polar ice-caps, and with human alteration of these environments carrying potentially massive importance, given the role they play in regional and even global climate systems and biodiversity. He emphasizes (p. 213) how they have become a ‘cultural battlefield between local populations reliant upon living within them and business and governmental interests seeking to extract from them’. That tension is explored to great effect, though explicit linkage back to the core message of the chapter, and indeed the book, is not always so clear. Sometimes it feels like answers are being presented to unspoken or unformed questions. Nonetheless, Roberts’ stated aim here is to evaluate (p. 214) ‘to what extent the “Anthropocene” can be used as a framework to bring the archaeological evidence for human tropical forest modifications to bear on present-day interests, threats, and conservation solutions’. There is little to disagree with in this contention. He explores the different ways the term ‘Anthropocene’ is now being used, and what it implies, along with a commentary on the impact of cash-cropping and illegal wildlife trading (a topic that carries particular poignancy in 2020 in the context of the

current pandemic). The image of forests emptied of wildlife (p. 221), particularly mammalian, is powerful, but is not just a prospect for the future: it is unfortunately already a fact, even in protected tropical reserves. The consequences of this to the long-term maintenance, stability and resilience of tropical forests remain unknown, though the prospect cannot be good. (Note the Latin name that Roberts attributes to tigers is incorrect: *Panthera pardus* is leopard; the correct binomial is *Panthera tigris*; the Sankar *et al.* 2010 citation quoted refers to a sub-species *Panthera tigris tigris*.)

The growth of ecotourism, expressly tying in local community involvement and economic support with habitat protection and promotion, has been a positive. As Roberts points out here (p. 232) and reinforces at other points in the remainder of the book, 'the inclusion of populations living in tropical forests, in conservation strategies, is more likely to reconcile interests'. The invasion of exotic species is noted (p. 226) and is one area that could have been expanded upon with regard to conservation and indeed potential changes to the structure and ecological services provided by tropical forests. The author does, though, raise a critical question (p. 236) and one that deeper involvement of archaeological and palaeoecological research will doubtless only further accentuate: to what state should tropical forest be restored?

Roberts concludes (p. 238): '[t]his book has been an attempt to demonstrate that tropical forests have been a consistent part of the human journey.' Such a statement actually rather under-sells the ecologically specific importance of his study by glossing over the very features that have marked it out as so much more than just one in a potential series of volumes about humans and environments. As he has shown through the preceding chapters, that distinction lies not only in their ecological diversity, and place in human societal development, but in the way that tropical forests and the peoples within them have been reduced to static unchanging entities, exploited, protected and portrayed behind a visage of misconception. Roberts' effort at addressing these features of tropical forest lies at the heart of the volume, but it is one that could have been more explicitly woven through the text up to this point. The essential nature and place of tropical forests in our understanding of ourselves and our world is laid out much more clearly in the final chapter.

In chapter 9, Roberts states that an ambition with this book had been (p. 239) 'to have shown that they [tropical forests] should not be seen as "wild" or "static" ... "primeval" or "impenetrable" ... growth in research interest and funding are beginning to reimagine these environments'. While the human relationship to other environments could also be reinterpreted, perhaps more than any other it is tropical forests that are in need of image realignment away from iconic but misguided perceptions. It here becomes apparent what this study actually has been: a synthesis of that reimagining, followed by a drive to go beyond such realization to study the sheer diversity of tropical forest prehistories, histories and modernities. Roberts focuses on not only the changing nature of this environment (pp. 240–43), but also the variability of experience and trajectories of people living in tropical forests. He charts how the impact of tropical forest research – from the explosion in remote

sensing technologies and isotopic analysis to the critical role of local communities and perspectives, to the greater inclusion of the wealth from archaeological and palaeoecological datasets – is changing and challenging the perception of central themes in our understanding of human history, of agriculture and urbanism. He concludes that impact from human activities began to have discernible effects on tropical forests at a continental and global scale from the Late Holocene onwards. In light of this the reader may be left with considerable doubt that the tropical forest types outlined at the beginning of the book can be taken as anything more than the broadest of analogues for past conditions. The range of tropical forest formations that existed prehistorically may have had only passing resemblance to those we are familiar with today – a realisation that is not without consequences for our understanding of human adaptation. What is not considered in this study are the possible impacts to tropical forests caused by the cumulative effects of low-intensity modification by early human groups (consciously or otherwise) stretching back at least tens of thousands of years before the Late Holocene. Researchers in this emerging field will also need to be mindful not to presume that such low-level impact was occurring at a constant rate; to do so could mean falling foul of the some of the very same assumptions about tropical forests that Roberts challenges here.

In a strong and poignant ending to his book, Roberts compares the longevity of tropical forests against the many changes, atrocities, innovations, disasters and expansions that have occurred through human prehistory, history and into the present. For its scope and ambition, this outstanding book must be placed high on the list of essential reading for scientists, policy-makers and anyone interested in the past, present and future of our planet's tropical forests.

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Reference

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