



COMPOSING WORLDS WITH ELEPHANTS

Interdisciplinary dialogues

Edited by
Nicolas Lainé
Paul G. Keil
Khatijah Rahmat


Éditions

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*Interdisciplinary
dialogues*

collection
[mondes vivants]

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Cover: © Paul G. Keil

The mahout, Oupe, caringly hand-feeding the sub-adult female, Rohila, before she returns to the forest for the evening (Kamrup, Assam, 2014).



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FRENCH NATIONAL RESEARCH INSTITUTE
FOR SUSTAINABLE DEVELOPMENT

Paper ISBN: 978-2-7099-2993-6

PDF ISBN: 978-2-7099-2994-3

Epub ISBN: 978-2-7099-2995-0

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FOREWORD

Vivek Menon

Chair of the Asian Elephant Specialist Group (IUCN SSC)
Founder Trustee & Executive Director of the Wildlife Trust of India
Senior Advisor to President, IFAW
President of the Society for Conservation Biology in Asia

Cheek-by-jowl with humans in the crowded neighbourhood of Asia, where six people out of ten in the world live, the second largest terrestrial being on earth barely ekes out an existence. There are nearly 60,000 elephants in Asia, around 50,000 in the wild and 10,000 in captivity. Wild elephants are descendants of an ancient lineage that evolved in Africa around 6 million years ago, moved progressively into Asia and evolved into *Elephas maximus*, the Asian elephant, perhaps around 250,000 years ago. More than 30 species of elephants have existed in the world at one time or another. During the family's early evolution, there could have been nearly two-dozen elephant species alive simultaneously in Africa. Today, only three species—the African forest elephant, the African savannah elephant, and the Asian elephant—remain extant, and the space for the latter to survive is shrinking progressively. Not just geographically but also in the human mind. As the battle for land rages in Asia, the four great elephant attributes of size, nomadicity, social and familial mores and intelligence become key factors to its survival. The first two are directly related. Being mega-herbivores, elephants have evolved through conditioned wanderings. They do not migrate in the real sense of the word but have local and sometimes distant nomadicity when herds move between resource-rich habitats. This allows the vegetation to recover in areas that have been subject to several months of foraging of a giant family. The movements are also influenced greatly by the other two attributes. The social matriarchal family units dictate that adult bulls leave the group; these males wander in a more exploratory

fashion, while herds do so more predictively. Lastly, their great intelligence allows them to modify ancient routes if more profitable ones exist or circumvent human barriers that spring up in more and more locations across their route. While doing so, the chances of encountering humans and having a less-than-pleasant experience is increasing incrementally in Asia. In India, for example, nearly 400 people and 100 elephants lose their lives in these encounters every year. In Sri Lanka, 260 elephants and 80 humans died in the last decade, according to one of the authors in this book. Clearly, in South Asia, the battle lines are drawn. At the same time, elephants tamed by Asians—with techniques that developed nearly 3000 years ago, once for war, then logging and now for tourism, human entertainment and religious purposes—are enslaved by humanity and suffer innumerable welfare issues that result in deaths of both elephants and their keepers, the mahout (to use the Anglicized moniker). As these dramas featuring elephants and humans play out in crowded landscapes, a section of human society worships the animal as a key Hindu deity, Ganesh; others ascribe cultural values to it, such as those binding the kingdoms of Thailand and Laos with the white elephant; there are also the Buddhist regimes of Sri Lanka, Bhutan, and Myanmar, with the incarnations of the Bodhisattva and the elephant. Nations term it the National Heritage Animal, enact strict laws for its protection, pour millions of dollars into its conservation strategy and use it as a symbol in commerce, trade, and sport.

Most scholarship of this intertwined existence of human and elephant has been in the ecological sphere. Social sciences have been scarcely used to study, describe, collate, and narrate this fascinating world of a million interactions. Nicolas Lainé had embarked on one such study when he came to undertake his research for a master's degree and spent some time with me (in hindsight, time that could have been stretched to allow many more interesting dialogues) in India. He followed this up with his doctoral thesis on mahoutship and has returned to the topic with his two co-editors, Paul G. Keil and Khatijah Rahmat, to document the worlds of elephant and human with a multi-hued social lens. The sixteen inter-species and interdisciplinary pieces that make up this volume, grouped around four progressive thinking blocks, provides the reader with an in-depth sampling of these colliding worlds. With the exception of one transgression into Africa (and should there not be more such inter-continental exchanges for these two ancient peoples to discuss their elephant interactions more substantially and frequently?),

the scholarship delves into the Asian collage from gender in the north-east of India to mahoutship in Laos, from the temple depictions of the elephant in southern India to the conflict landscape of Sri Lanka, from the linguistic groupings that command a captive elephant to work for humans to the elephant in Buddhist religion and traditions. There are scholarly essays that tease novel thought processes and alongside evidence-based hypothesis-driven research. All in all, this is a potpourri of dialogues between elephant and man, man and woman and even briefly elephant and elephant. While you are transported to a world (or the many worlds this book wants the reader to visit) of deep reflections through the written word, it comes alive joyously through interleaving creative works of art, photographs and film by three collaborators.

I recommend this treatise to all of you who love elephants and those that are intrigued by the interplay of man and beast, or tormented by the shredded land and emotional landscape in which the two inhabit. For those who are scholars of social sciences, this is a work that must be referred to in their respective fields of study. For those who are ecological scientists, this is an introduction to viewing the elephant not just as a taxon but also through a different prism. For the conservation manager or scientist, the book addresses key issues that move traditional thought from managing species to realising that individuals matter. The last is brought out brilliantly in the sections that deal with individual elephants, named by the humans who live around them, and their individualistic creation of conflict or reaction to barriers to conflict. For the manager who has been used to dealing with the species as a taxonomic whole, the idea that management may need to move to individuals when dealing with intelligent species may be a novel yet critical one to imbibe. For those who wish to peer into the past, it is a slice of ancient history; for those who wish to prophesize the future, it is a socio-scope into what potentially will be. Finally, for a world that is increasingly seeing the elephant as a conflict species rather than a traditional icon, there is the potential to imagine coexistence through ancient wisdom and modern scholarship.

ACKNOWLEDGMENTS

This volume is the extended outcome of the Composing Worlds with Elephants conference that took place online 13-15 December, 2020, during the early months of the Covid pandemic. While virtual meetings and events have become commonplace today, such conferences were still experimental and we were fortunate to have had the generous technical as well as financial support from our respective institutions, including the Czech Academy of Sciences, Macquarie University in Sydney, the Technological Life research cluster at School of Geography and Environment from the Oxford University, and the UMR 208 “Local heritage, environment and globalization”(IRD/MNHN) in Paris. In the process of drafting oral presentations to written chapters, we would also like to thank the Fédération Sciences Sociales Suds (F3S) for providing the initial French translations where necessary.

We would also like to thank all reviewers for generously sharing their time and offering valuable comments, including Sanjay Barbora, Lucy Bates, Geoffrey Benjamin, Bion Griffin, Lynette Hart, Alex Greene, Sarah Jacobson, Peter Kamau, Piers Locke, Ursula Münster, Martin Seltmann, Paul Sidwell, and others. Our aspiration for developing interdisciplinary review processes sometimes involved asking reviewers to offer insights on first drafts that did not strictly align with their chosen field. Their acceptance and interest to review the contributors’ chapters reflect a willingness to go beyond their methodological and conceptual comfort zones, a spirit we admire and effectively helped create a volume for a larger audience.

One particularity of the volume is the inclusion of three artistic interludes inserted between sections. We are extremely grateful to the filmmaker and artist Carlos Casas, The Real Elephant Collective (TREC), and the photographer Philippe Coste for sharing their work and points of view. The volume has been enriched by their projects. This appreciation also extends to Deborah Schrijvers for her nuanced review of

the multi-award winning film *Cemetery* and to the designer, Shubhra Nayar, from TREC, who articulated the crucial ecological questions raised by the Lantana elephant exhibit developed in tandem with the The Elephant Family.

Of course, our gratitude also extends to two great elephant experts from different worlds, Vivek Menon and Nigel Rothfels, who graciously dedicated time to read the volume after its completion and whose thoughtful words now beautifully bookend our work.

We must also give well-deserved thanks to all of the contributors to the volume who, despite having overwhelming schedules and responsibilities, found the time, energy, and impressive insight to craft their respective chapters. Also, we warmly acknowledge the help, forbearance and gentle patience of our editor, Corinne Lavagne, at IRD Editions who also directed Kurt McKean for his close proof-reading of the volume.

Finally, we would like to extend our appreciation to the publishers, IRD Editions, and their platform model which affords an openness fundamental to fostering multidisciplinary. We need spaces which accommodate a set of papers of individual scholars with multiple methods, concepts, styles, and citation practices. In addition, we appreciate IRD Editions' aim to produce texts that are accessible to the Global South, a significant geo-political representative of elephant ranging states. Such a publishing mindset is vital for the fair distribution of knowledge.

INTRODUCTION

MORE-THAN-ELEPHANTS

Despite several millennia of scientific, cultural, and historical fascination, in recent decades much of the general narrative regarding elephants has been driven by the research questions, methods, and concerns of biologists and conservationists based in Africa and Asia. Their surprising discoveries, however, have always run parallel, or tempted interpretation, from other perspectives. Widespread reports of the elephant's unmistakable intelligence, rich social lives, and remarkable personhood, well-known across different cultures that share any intimacy with the species, are explored through a diverse range of perennial questions. Their long-entangled history with humans as working animals or simply living near humans in skillful exploitation of shared environments has prompted the social sciences to explore interspecies relations that challenge binary, often Western, constructs such as the long-held notions of "domestic" or "wild" (LAINÉ, 2020; CASSIDY & MULLIN, 2007). Even within imaginaries, these strange and charismatic beings have attracted the gaze of artists for more than a millennium across cultures (PARKINGTON & PRADA-SEMPER, 2021), sometimes stretching, when we think of Durer's elephant sketches, to places where elephants have never freely roamed.

Composing Worlds with Elephants gathers some of these alternative research approaches. This edited volume expands on presentations, and the lively dialogue they sparked, at an online conference held in 2020. The project was born from a simple desire to reconnect during the isolating and deeply uncertain time of the global SARS-COV-2 pandemic. The remarkable enthusiasm we witnessed suggests that our efforts were timely. We—and all the participants—recognised a latent willingness among scholars to reassess the state of human-elephant knowledge or, at the very least, to explore the body of ideas circulating within this

complex subject. We also observed that while the conference attendees ranged from fields spanning the humanities to the biological sciences, questions often bridged one another. All scholars reflected a great generosity in rethinking their ideas and understanding of elephant identity, agency, and human coexistence. There was a palpable hunger and curiosity to look for clues beyond their respective fluencies.

The chapters within this volume reflect that spirit of disciplinary versatility. They offer the reader a diverse set of topics and questions that are distinguished from the dominant biological, ecological, and conservation approaches to elephant studies. Instead, the reader will find a fluid range of elephant-linked concerns across diverse strands of knowledge, shaping ideas from seasoned as well as emerging scholarly voices. For example, a randomised exploration through just a few of the chapters will take the reader through an intricate linguistic history of a mahout language (Lim, chapter 7), offer brief glimpses into elephant wisdom in their more-than-human botanical knowledge (Lainé, chapter 9), explore conceptual redefinitions of the animal subject itself through time (Rahmat, chapter 13), and a gendered analysis of human-elephant conflict (Banerjee & Sinha, chapter 1).

Despite this eclecticism, however, we cannot claim that this volume offers an exhaustive representation of current research. We recognise that *Composing Worlds with Elephants* does not directly engage with the exciting, equally multidisciplinary work being done in Africa (Moss et al., 2011), nor does it give voice to the elephant diaspora across zoos and sanctuaries in non-elephant ranging states. Our pool of contributors grew quite organically, much like the event that catalysed this project, often from our own curiosities; and as an editorial team of two anthropologists and an animal geographer, this may partly explain the gravitation towards qualitative, cultural, and local contexts. Nevertheless, we underline that these very perspectives, and their often-intersectional nature, are frequently overlooked, much needed, and latent with opportunities for cross-fertilisation.

COMPOSING WORLDS BEYOND “OLOGIES”

“Composing Worlds” has been the consistent theme that captures how our subjects of study are framed. Anthropologist Philippe DESCOLA (2014) coined the term *worlding* from an anthropology of nature,

referring to how beings build their distinctive worlds to constitute a collective. The term captures how we frame our subjects of study. “Worlds” can only be understood in the plural; that is, there can be no homogeneous world or way of representing a subject. There will always be cultural, biological, human and nonhuman perspectives on the environment. The lives of beings must be interpreted within the specificities of the historical, political, and ecological context in which they thrive (VAN DOOREN, 2019). Worlds are always shared, composed with, and emergent; they are entangled with human and elephant bodies and practices but also co-constituted by a broader ecology of organisms, materials, and forces. Worlds are always the result of an unfolding dialogue between multiple perspectives and beings, visible or otherwise. Our mutual positions emerge with, though, and always in relation to, others. Humans and elephants, caught in complex entanglements, both express agency and shape the other in the course of their interactions.

In this spirit, the chapters in this volume reflect many different worlds, be it the disciplinary worlds scholars are trained from, the more-than-human world of elephants the authors are inclined to capture, or the multi-faceted inter-worlding that occurs between humans and elephants. The integration of this volume humbly represents a collection of these attempts at composing worlds. It testifies to why intersections and overlaps are important when tackling the protean nature of the elephant. As fluid beings, often in precarious environments, the dominance of one epistemological approach is always at risk of producing stale lines of questioning and analyses, ever risking a reduction of its complexity. These chapters’ attempts to expand disciplinary boundaries can lead to cross-pollination, or the propagation of more questions and solutions that often require collaboration among scholars with diverse sets of expertise. We anticipate and invite readers to seek these opportunities themselves and discover (as the experience has been for us) unexpected and surprisingly new connections and alluring hypotheses.

The present volume follows a tradition of other notable elephant research anthologies that have attempted to put forward or include multiple disciplines. First came WEMMER & CHRISTENSON’S (2008) *Elephants and Ethics*, which explored the subject of ethics in elephant welfare and coexistence in both Asian and African species and included contributions from scholars from a range of disciplines, including veterinarians, biologists, naturalists, and those from the humanities. LOCKE

& BUCKINGHAM's *Conflict, Negotiation and Coexistence* (2016) soon followed. Focused predominantly on Asia, this volume included contributions from historians, anthropologists and social scientists, as well as biologists writing from a historical perspective. Finally, the recently published *The Elephant Reader*, edited by Ed EMERY (2021), offers an eclectic mix of papers touching on, among many other things, elephants in Afghani history, illegal trade and wildlife crime, elephant ecology, and ancient India. *Composing Worlds with Elephants* builds upon its predecessors by further creating spaces that support diversity, engagement, and novel perspectives in elephant research.

What perhaps distinguishes the collection of chapters in *Composing Worlds with Elephants* is that despite each author's respective disciplinary identity—whether it be geographer, conservationist, human-animal researcher, biologist, or historian—a remarkable few have chosen to stay in their lane and stick within the epistemological tradition that trained them. For instance, there are biologists who draw on humanities-inspired analysis and subject narration to analyse wild elephants (Srinivasaiah and Sinha, chapter 3), a geographer speculating on conservation through a futurist history (Shell, chapter 8), and a behavioural ecologist drawing on anthropological considerations (Mumby, chapter 16). Many chapters cite literature from across the biological and social sciences, pointing to the unexpected ways different fields may inform one another. Some seek to reframe biological analysis through an interspecies and interdisciplinary “biosocial” framework (Keil, chapter 12). All the authors in this volume write with an awareness of their respective discipline's limits, while reaching beyond them. In this respect, the volume pushes the boundaries of how we think about elephants and human-elephant relationships and ultimately, how we practice scholarship and interdisciplinarity.

The boundary-crossing chapters are the latest expressions of a long-running interest, at least within the last ten to fifteen years, to find multidisciplinary solutions and alternative perspectives. This “turn” may be attributed to several factors. It is increasingly acknowledged that managing human-wildlife conflict requires attending to the “human dimension”. This runs alongside the rising popularity of the notion of “co-existence”, a term that asks researchers to rethink conflict by imagining people and wildlife inhabiting shared, rather than separate, landscapes (POOLEY et al., 2021). There is also the “more-than-human”

turn within the humanities, which has attempted to reconceptualise the subjecthood of nonhuman beings and their cultural, historical, and ecological connections with people and environments (KIRKSEY & HELMREICH, 2010). The potential for these perspectives to produce new knowledge about elephants and elephant worlds was presciently anticipated by LOCKE (2013), who, similarly influenced by multi-species research, saw the need for interdisciplinarity in elephant research and “...chart[ed]... the emergence of an interdisciplinary research programme and discursive space for human-elephant intersections...”, what he coined “*ethnoelephantology*”. Whether this growing interaction between different disciplines in elephant studies will eventually coalesce under a single rubric is unclear. However, these shifts in elephant studies have increasingly demanded more diverse methods to understand these animals and the messy complexity of their living with humans. The more-than-human or multispecies turn holds a strong influence across many chapters within this volume (Gandhi, chapter 14, Rahmat, chapter 13, and Lainé, chapter 9, to name a few) and serves as proof of this approach bearing fruit.

THEMES AND CONTENTS OF THE BOOK

Wild relations, wild individuals, wild affects

While the term “wild” suggests free-roaming elephants that live beyond the human, the authors in this segment explore elephant individuals and communities whose lives are deeply entangled with human practices and worlds. Instead of a whole species or population-level focus, authors examine long-term observations of specific, named elephants, studying their relationship with humans. This focus extends from an analysis of “problem elephants” in Africa that have a particular talent for overcoming fences, contributed by Lauren Evans and Redempta Nduguta (chapter 4), to equally-skilled male elephants in India that respond quickly to modern ecological changes, developing surprising new behaviours and modes of inhabiting the landscape, as illustrated by Nishant Srinivasaiah and Anindya Sinha (chapter 3). Other perspectives look closer at the human dimension, though never losing sight of the elephant—by exploring the complex ways that the two species intersect through the shared space of “affect”. Two chapters, in particular, unpack the ways in which it has shaped human-elephant

relations. Elizabeth Oriel and Tony Frohoff (chapter 2) envision affect at multidimensional levels, threading throughout and knotting together human-elephant-environmental entanglements, while Banerjee and Sinha (chapter 1) ask us to consider the oft-overlooked affective aspects of gender and how they might define elephant interactions and agency. When read together, these chapters collectively enrich our understanding of these power-laden, complex, multi-faceted, and unfolding interspecies “contact zones” (HARAWAY, 2008).

Their complementarity also inspires cross-cutting questions, both grounded and speculative, explicit and implicit in the respective texts. How are individual elephants perceived and constructed differently depending on how genders intersect with them? Can we speak about the construction of gender within elephant society? How have fences shaped the affective presence of individual elephants like Rock in Sri Lanka, or how have interactions with human infrastructures in general made elephants more visible, interesting, and problematic in South Asia? While Evans and Nduguta’s questions and research about elephants must be made sense through Kenyan history, society, and ecology, their findings are deeply relevant to Asian elephant contexts (chapter 4). This generalisability extends to all the chapters in this section that raise key questions, develop insightful analysis, and offer generous concepts that can extend beyond the elephant and to other instances of human-wild-life relations. The chapters on wild elephants in this book are examples of cutting-edge research on the growing subject of coexistence (POOLEY et al., 2022).

Mahout-elephant relations from past to present

The next two parts deal with mahoutship in South and Southeast Asia and are entirely devoted to elephant-keeping cultures from past to present. The formal study of captive elephants in South and Southeast Asia has a much younger history than of their wild counterparts. Richard Lair, a renowned elephant expert and consultant for the Food and Agriculture Organisation of the United Nations (FAO), wrote the pioneering book on the subject (LAIR, 1997), gathering an extensive survey of elephant populations in each of the thirteen Elephant Nations of South and Southeast Asia. Mahoutship began entering a state of crisis during this period, with mahouts and their elephant

partners emerging out of forests to begin work in the tourism industry. Lair's documentation of mahoutship and its shifting role in society broke with convention with emerging, often Western, criticisms of this human-elephant relationship. Lair sensitively considered the major role local knowledge played, and should play, for the future of the species. He invited scholars, in particular those from the humanities, to document elephant-keeping culture as vividly as possible before it faced the threat of disappearance. Following Richard Lair's work on mahouts and elephants, the FAO regional office rapidly organised a second regional workshop which offered deeper insights and pragmatic needs (such as registration, economic issues, or legal status) for better management of elephants living with their mahouts (BAKER & KASHIO, 2002).

The elephant holds natural importance for shaping the nation-states of the continent, and together with the strong bonds and unique relations it fosters with mahouts, the subject naturally involves and inspires both history and the broader humanities. One of the shared features of these two approaches is that each contributor tends to associate history and archaeology with other disciplines, such as biology, botany, and linguistics, and somehow makes it resonate with ethnographic insights and case studies from very obscure portions of history. By retracing them within global narratives linked to the history of humans and elephants, the chapters in this volume, not only offer new or alternative interpretations of how the history of human-elephant relations has developed, but also enrich the body of knowledge as a whole.

We see this in Srikumar Menon and Anindya Sinha's chapter, which offers a truly original analysis of the representation of elephants between the 2nd and 3rd centuries CE, where the old Buddhist stupa at Kanaganahalli in Karnataka (India) unveils a truly quotidian account of the relationship between humans and elephants (chapter 6). Another insightful dialogue between the past and present of mahouts and elephants' daily life and evolution is captured by the authors Sreedhar Vijayakrishnan and Anindya Sinha (chapter 10). Starting from a reading of the *Mātangalīla* (a famous Ancient elephant treatise), the mahout's perspective is presented in tandem with recent ethnographic observations that allow us to understand the evolution of mahoutship as a profession among the Malayali. This contrasts with the relationship between the Malasar and elephants in the adjacent Western Ghats, which appear dramatically different and reveal how the daily care and

practices of mahouts from this community represent many forms of mutual respect. Finally, their comparative approach highlights how cultural environments and practices define contemporary elephant management and welfare and how individuality (both of mahouts and elephants) shape these relationships further. In continuation from his major work on the subject, historian Thomas Trautmann (chapter 5) provides an invitation to link history and contemporary ethnography to question the crucial role that local populations, referring specifically to the “forest people” of the Indian subcontinent, played in this venture, tracing how the lineage of mahoutship survived century after century.

The two themes of these parts, history and mahoutship, often bring together novel perspectives on the mahout-elephant partnership, adopting unexpected cross-disciplinary perspectives. Drawing from existing literature from the past and present, a linguistic analysis of mahout command languages provides a historical understanding of elephant handling across South and Southeast Asia. Teckwyn Lim (chapter 7) reinforces the hypothesis that there exists a common elephant culture diffused across South and Southeast Asia. On the other hand, when speculating on the future of elephant conservation in light of the alarming rate of the global human population, Jacob Shell (chapter 8) draws a speculative “archive” from science fiction to seek implications on mahout futures.

The risk of mahoutship vanishing is probably greater now than at any time in the past. Jennifer Crawley’s contribution (chapter 11) points to an overall lack of knowledge and difficulty recruiting young mahouts in many parts of Asia. Her chapter insists on the necessity to engage more with and document existing mahout knowledge. This necessity to fully consider mahouts’ knowledge and relationships with elephants works in tandem with Nicolas Lainé’s chapter, which highlights the mutual benefit of the shared life between mahouts and elephants in Laos, in terms of health and knowledge co-production (chapter 9). Their unique intimacy has even led to a system of medicine and care shared between the two species.

Overall, the chapters in this section show that for all of Asia and across the Ages, mahouts are at the forefront for witnessing what modern scientists or westerners may call elephant intelligence. Elephant knowledge manifests in practices such as self-medication or adaptation and

consideration of new environments or the specific humans they deal with. For example, while focusing on musth among elephants in Assam, Paul Keil (chapter 12) develops a multispecies approach that shifts the focus from individual, behavioural phenomena to a biosocial event. Informed by ethnographic vignettes, the dialogues initiated with ecology, cultural practices and physiology show how musth disrupts the daily routines of elephants and their mahouts.

Thinking with elephants

Elephants push epistemic boundaries. The effortless growth from our call for papers for the volume's last segment is a testament to this phenomenon. Scholars gathered from fields as diverse as behavioural ecology, biology, geography, and anthropology reflect an honest dissatisfaction with either the limits of their discipline or the limits of disciplinarity. Despite the nascency of each discipline's foray into elephants, with scientific explorations of elephants only beginning in the mid-20th century and interest from the broader environmental humanities beginning in the present century, the collection shows a latent hunger to improve upon, or borrow from, varying bodies of knowledge for a more holistic understanding of the elephant.

Part of the pleasure of being editors of such an eclectic volume has been considering the rich ways contributors may cross-fertilise with one another. For example, behavioural ecologist Hannah Mumby's questions (chapter 16) regarding how to measure human influence in elephant studies parallel frustrations, and tempt new possibilities, from conservationist Tarsh Thekaekara's reservations (chapter 15) that disciplinary confinements cause shortcomings in capturing elephant behaviour. Anthropologist Anandi Gandhi (chapter 14), on the other hand, seeks material manifestations of blurred disciplinary boundaries through her fieldwork in Thailand. Finally, animal geographer Khatijah Rahmat (chapter 13) pushes these conceptual arguments further, questioning the epistemic foundations of how information is temporally organised. Overall, these diverse yet simultaneously convergent questions paint the exciting potentialities that elephant study continuously attracts, despite the chapters resting alongside what often feels like perennial questions regarding human–elephant coexistence and the far more longitudinal explorations of elephants in human history.

ARTISTIC INTERLUDES

Readers will notice that the chapters are interlaced with works of elephant-inspired art. The decision to include artists and their crafts is part of the spirit of methodological eclecticism the volume hopes to capture. These images and essays also speak of the human and elephant relationship, offering novel perspectives on elephant worlds that provide spaces for inquiry beyond the confines of academia. Between formal academic chapters, there are reflections on the corporeal elephant's visual, auditory, and mythic manifestations. There is a detailed exploration of Carlos Casas' film *Cemetery* in an essay by Deborah Schrijvers (Artistic interlude 3). Philippe Coste reflects on his experience photographing mahouts and elephants in rural Laos, revealing sensuous, epidermal landscapes and shared interspecies intimacy between mahouts and elephants (Artistic interlude 2). Shubhra Nayar and Paul Keil unpack the Lantana Elephant Project, a migrating installation of over one hundred elephants made from the stems of the flowering plant *Lantana camara*, which asks viewers to reflect on human-elephant cohabitation, the loss of elephant habitat, and histories of colonialism (Artistic interlude 1). Each interlude offers beauty and reflection and invites readers to consider the myriad ways elephants, in their irreducible, creaturely charm, provoke questions, emotions, and craft equally.

FUTURE DIRECTIONS

It is our intention that *Composing Worlds with Elephants* resonates not only with academics but also with a larger audience of conservationists, NGO members, and the general public concerned about the current state of the environment. Though the chapters may not make explicit, prescriptive conclusions, they offer a sensitivity to approaches and insights for understanding subjects entangled in questions of elephant welfare and conservation. We know that the lives of elephants are increasingly at stake in the worlds where humans and elephants overlap, and that these overlapping relationships take on many forms. Though the focus has been on the local, relational level, these contexts will inevitably be impacted by greater forces, such as state-level decisions and global policies. Readers seeking conservation implications will find many aspects within "Wild Relations" that highlight how unique human-elephant landscapes demand and deserve interventions that are sensitive to the historical and political factors that have shaped these contexts. Then

there are the elephants themselves, who have been shown, throughout this volume, to possess remarkable individuality and responsiveness to countless forms of human interruption and intervention. Even for captive elephants, there is tremendous variation in cultural and interspecies practices reflecting an intimate understanding which defies less nuanced, reductive and often Western conceptions that elephant keeping is ethically wrong. Authors, and especially the elephants in this volume, have “spoken” against any single, universal solution.

Instead, the chapters in this volume share situated knowledges that demand an exploration of human and elephant lives beyond binaries and tired misconceptions. This, of course, also includes accounting for the precarious existence of Asian elephants and their capacity to thrive in their native environments; it involves acknowledging the fragile conditions in which mahout-elephant relations and elephant-keeping cultures across South and Southeast Asia presently endure. Awareness of these concerns cannot help but raise the question of how our research can positively impact the subjects we write about, especially politically. As humanities scholars, who must maintain a cautiousness against bias in our research, the active task is to find and foster diversity of interpretation and opinion, encourage sensitivity to differences, and discourage reductive solutions and simple labels of our ever-complex nonhuman neighbours. As sociologist Norbert ELIAS (1993) has made clear, there is a distinction between commitment and distancing. He argued that an involved research means wanting to act without necessarily adhering to a particular ideology. In our case, our modest act is to ensure the complexity and partnership in ideas is always valuable and never forgotten. This, we believe, does justice to the irreducible quality of the elephant and remains a powerful force in securing both the fascination for and the future of an animal we so revere.

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PART 1

WILD RELATIONS, WILD INDIVIDUALS, WILD AFFECTS

CHAPTER 1

POLITICAL AND AFFECTIVE ECOLOGIES OF HUMAN-ELEPHANT RELATIONS

A gendered perspective

Sayan Banerjee, Anindya Sinha

I INTRODUCTION

Relations between humans and elephants are ancient and ever-evolving. Histories and geographies of the land have been co-constituted through material and affective relations between humans and elephants, especially across Asia and Africa (SUKUMAR, 2003; TRAUTMANN, 2015). The colonial expansion by Europeans also co-opted the abilities of these tropical giants into Western modes of accumulation and dispossession, remnants of which are still visible and felt (SHELL, 2019; KEIL, 2020). The various modes of cohabitation with elephants have been depicted through much of written or pictorial history, especially in India, as, for example, in the classical texts of the *Hastividya* or *Mātangalīla*, or through Indian art and sculpture down the ages (see chapter 6, this volume). Modern scientific engagement with human-elephant interactions is, however, fairly new and mostly rooted in the

disciplines of the natural sciences. The social sciences, too, have recently forayed into examining this relationship and have begun to contribute widely and quite critically. Both the natural and social sciences have, however, established rather independent understandings of human and elephant worlds and generalised these interspecies relations into rather simplistic compartmentalisation of conflict versus coexistence. Human and elephant worlds thus become non-overlapping, complex, and self-dependent systems and present virtually no possibilities of an organic fusion of their lifeworlds.

Such disciplinary silos, however, seem to be cracking, as scholars from both disciplines are creating constructive bridges to integrate different perspectives. The results of these dialogues are encouraging, as they break new ground and further intriguing research questions related to possibly resilient human-elephant futures (LORIMER, 2010; LOCKE, 2013; BARUA & SINHA, 2017). Multidisciplinarity has thus truly become the need of the hour to understand human-elephant relations. In such a context, we propose a gendered perspective of the political and affective ecologies of this relationship. We first briefly describe three approaches to examine human-elephant relations and then offer a case study to integrate these approaches through the social category of gender. The ultimate goal of this endeavour is not to necessarily provide an objective understanding of human-elephant relations but to offer novel pathways that could be explored in the near future.

The first of these approaches is located in the field of political ecology, with its well-established body of work providing critical perspectives on how power asymmetries orient human and animal spaces (ADAMS & HUTTON, 2007; SRINIVASAN, 2016; BLUWSTEIN, 2018). Taking into consideration the hybrid subjectivities of the interacting humans and elephants, the second approach is that of affective, more-than-human ecologies, a field that has recently begun to investigate the ethnographies of multispecies assemblages that integrate concepts from ethology, geography, and philosophy, among others (FUENTES 2010; LOCKE, 2013; GOVINDRAJAN, 2018; SINHA et al., 2021). Finally, we suggest behavioural diversity as the third approach, a culmination of insights drawn from studies of humans encountering elephants, as well as other species, with local molecular behavioural responses, generated spatio-temporally, contributing to our understanding of molar behavioural decisions that characterise multitudes of encounters in a variety of

settings (BAUM, 2004; SRINIVASIAH et al., 2012, 2019; McCOMB et al., 2014; EVANS & ADAMS, 2018; VIJAYAKRISHNAN et al., 2018).

I POLITICAL ECOLOGIES OF HUMAN-ELEPHANT RELATIONS

The political ecologies of human-elephant relations aim to examine the impacts of broader sociopolitical structures on landscape configurations, including elephant reserves and elephant corridors, and on the human-elephant encounter itself. The global circulation of material, capital, and labour, as well as the hyper-consumerism of the Global North, has often dictated local land-use planning policies in the Global South, especially in the countries recovering from European colonialism (BRYANT & BAILEY, 1997; ROBBINS, 2011; SULTANA, 2020). These asymmetries result in agricultural and industrial expansion into “natural” spaces of terrestrial and aquatic ecosystems, thereby generating novel human-wildlife encounters with increasing frequency (MADHUSUDAN, 2005; MARGULIES & KARANTH, 2018). At the local level, social and political inequalities shape and modify animal spaces, by changing landscape cover, often leading to their degradation and fragmentation, thereby enhancing the overlap of needs and spaces of resource-dependent humans and wildlife, with the Asian elephant being an important species that is being increasingly negatively affected (BARUA, 2014). The costs and benefits of living close to elephants are also disproportionately distributed according to privileges and rights, typically based on class, caste, gender, ethnicity, place or other social markers (OGRA, 2008; BARUA et al., 2013; JADHAV & BARUA, 2012; BANERJEE & SHARMA, 2022). Although such analysis has often provided critical insights into the causes and impacts of human-elephant encounters, the current approaches adopted by political ecology have often been criticised for an overemphasis on the “human” as their central subject (SRINIVASAN & KASTURIRANGAN, 2016; MARGULIES & BERSAGLIO, 2018). Thus, even though political ecology has considered elephants and elephant spaces, the nonhuman has never become the “lively” actor of its narratives.

| AFFECTIVE ECOLOGIES

The “more-than-human” turn in ecological geography considers a landscape’s evolution as a shared achievement of both humans and non-humans alike (HINCHCLIFFE, 2003; WHATMORE, 2006): animals are then active subjects with wilful agency, capable of affecting lives and landscape-level processes, far beyond themselves. Thus, there have been fervent calls for integrating individual and collective human and animal subjectivities and understanding the affective atmospheres of “other-than-humans” (BARUA & SINHA, 2017; LORIMER et al., 2017). The inclusion of elephant lifeworlds in broader ecological analyses would then lead to the active rejection of any projection of the human merely against the backdrop of the animal and to the prominent recognition of the purposefulness of the elephants’ agency to co-create a world shared with humans and other agencies (BULLER, 2013). Moreover, through INGOLD’s (1995) concept of “dwelling” and HARAWAY’s (2008) idea of companion species, various aspects of the cohabitation between human and nonhuman species are being increasingly examined, whether in homes, cities, forests or even in “rurban” areas, referring to rural spaces experiencing gradual urbanisation (SOROKIN & ZIMMERMAN, 1929; PARSONS, 1949; SRINIVASIAH et al., 2022). The Asian elephant has also found a niche in such research, primarily due to its long history of being integral to several human communities. More specifically, the intimate working relations, circulation of affects—the intensely interpersonal, unconscious, precognitive, often inexpressible, flow of sensations between bodies (ANDERSON, 2006; SINHA et al., 2021)—and the various embodied responses in the construction of lives and landscapes by domestic elephants and their keepers, crosscutting the personal and the professional in their shared worlds, have now been documented in LOCKE’s (2013) and MÜNSTER’s (2016) studies in Nepal and southern India respectively. Such affective, multispecies relations between domestic/wild elephants and humans have also been reported from northeastern India (KEIL, 2016; LAINÉ, 2020) and can be argued to emerge from the historical material politics and interspecies relationships typical of the region. BARUA (2014) has tracked, in great detail, the environmental history, elephant lives and associated subaltern concerns in a co-produced landscape in the state of Assam in northeastern India. He showed how the lives of humans and wild elephants have remained

entangled through the politico-environmental histories of colonial and postcolonial times. Finally, we argue that one must also recognise the multi-layered sociality, complex decision-making processes and sophisticated cognitive abilities that characterise the nonhuman species, so reminiscent of ourselves and our lives, and which warrant a far closer examination of their and our shared lifeworlds (SINHA & SRINIVASIAH, 2021). Our own studies of wild and domestic elephants have, therefore, begun to unravel them as affectively driven, cognitively behaving, subjective individual beings, responding, in their own unique ways, to their respective social and natural environments and histories (SRINIVASIAH et al., 2012, 2019; VIJAYAKRISHNAN & SINHA, 2019).

| BEHAVIOURAL DIVERSITY

While political as well as affective traditions have separately examined human-elephant relations, they find commonality in conceptualising humans or elephants as mere species and not as individuals with situated behaviours. The studies on behavioural diversity in both human and elephant dimensions have, however, documented several individualised behavioural repertoires that critically reflect on the generalised term “human-elephant relations” that is often held to the fore. Integrating the social sciences into ecological research has begun an in-depth examination of local communities’ perceptions, attitudes, and behaviours towards certain wild animals and their spaces. A myriad of demographic, socioeconomic, political, and experiential factors have, in the process, been found to strongly influence specific human perspectives and behaviours towards wildlife, including elephants (OGRA, 2008; HE et al., 2011; ALLENDORF & ALLENDORF, 2013; TALUKDAR & GUPTA, 2018; RAMESH et al., 2019). Across Africa and Asia, for example, some of the important predictors of human responses to perceived “conflict” with elephants are place-based. They range across various geographical factors, including ethnicity, settlement, and agricultural patterns, and other factors, such as human density, household characteristics, and even human aspirations (LENIN and SUKUMAR, 2011). From the elephants’ perspective, more recent, long-term studies of wild elephants in human-dominated, mixed-use landscapes of southern India have

likewise documented behavioural shifts among individual elephants, influenced by their age, sociality or, more importantly, by their individual and herd experiences (SRINIVASIAH et al., 2012, 2019). While studies over the last four decades have shown that patterns of risk-taking behaviour, such as crop-foraging, differ significantly between male and female elephants, as well as across younger and older individuals (BALASUBRAMANIAN et al., 1995; SUKUMAR, 2003; DESAI & RIDDLE, 2015), we have recently reported the formation of stable, all-male elephant groups, comprising socially bonded individuals from different age categories, which have evolved novel behavioural strategies that are particularly adept in reducing human-induced risks and increasing their gains from foraging on agricultural crops (SRINIVASIAH et al., 2012, 2019). Such biological adaptations, which could also be sociological, psychological or physiological, have allowed elephants to survive successfully and occasionally thrive in these unique, human-generated landscapes (Figure 1). Encounters and the resulting interactions



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Figure 1 | A herd of elephants roaming in a tea garden.

As forests shrink in quantity and quality due to political and economic reasons, elephants have behaviourally adapted to a life within tea estates and nearby cropfields, leading to increased material and affective encounters with people.

between humans and elephants are thus never uniform across time or space and, in turn, produce unusual relationships that are dynamic and often modulated by multispecies behavioural shifts and adaptations. Such interacting behavioural diversity, therefore, generates multiple human-elephant relations, each unique to itself and almost invariably confined to particular spaces over defined periods of time.

| GENDER

Gender is a socially constructed category directly bearing on all three approaches of examining human-elephant relations discussed above. Of these, the political ecological approaches have experienced significant expansion following integration with feminist concerns. The other two approaches, however, have not explored how they could be affected by incorporating gender as a focal analytical axis. In order to explore the importance of gender in configuring our notions of human-elephant relations, we conducted a preliminary exploration, using an oral history design, of people's narratives and perceptions of living with elephants in a forest-agriculture landscape in Udalguri, a typical human-elephant "conflict" hotspot in the state of Assam in northeastern India.

Assam has experienced transformations in its physical and human geography through its colonial history, as well as in the post-independence era. Over the last two hundred years, the rapid conversion of forest, grasslands, and communal lands into plantations, reserves and settled farmlands has led to the subsequent settlement of various ethnic groups and their engagement in these "productive" activities (SAIKIA, 2011; SHARMA et al., 2012). This has resulted in strong resentment among the indigenous people of Assam and led to violent episodes of struggle for self-determination in the late-20th century (BARUAH, 1999). Among these social mobilisations, the Bodoland movement attempted to establish a separate territory for the indigenous Bodo populace as a response to the perceived historical injustice meted out to them over centuries (VANDEKERCKHOVE & SUKYENS, 2010; MISRA, 2012). Udalguri has historically been part of this violent landscape. After an agreement between the Indian state, government of Assam and representatives

of the Bodoland movement, an arrangement for a quasi-self-governance system, under the aegis of the Bodoland Territorial Autonomous District, was established in the region in 2003.

The elephant habitat in Udalguri has been partially lost, degraded or fragmented over the last four decades, overlapping with the Bodoland movement, primarily due to agricultural expansion, human migration, and socio-political conflicts over land. As a result, elephant incursions into crop fields and human settlements have significantly increased over the years. Human–elephant encounters reach their peak during agricultural harvest, with the resultant direct impacts consisting of crop and asset damages, as well as injuries and the death of humans and elephants alike. In such a mixed-ethnic and mixed-use landscape, we sought to understand the gender implications of living close to and interacting with wild elephants in the everyday.

Scholarship in feminist political ecology has revealed that resource use is differently structured along gender lines, especially in South and Southeast Asia (AGARWAL, 1992), with gendered asymmetries in survival techniques, everyday responsibilities, and collective action (SUNDBERG, 2017; SULTANA, 2020). Gendered roles and responsibilities, usage of space, division of labour, and asymmetric access to tangible and intangible resources—all tend to produce gendered perceptions of wildlife (KELLERT & BERRY, 1987; HILL, 1998; KURIYAN, 2002; OGRA, 2008; BHATIA et al., 2020), gendered costs and benefits from living close to wildlife (OGRA, 2008; BARUA et al., 2013; BANERJEE & SHARMA, 2022) and gendered hierarchies, both in public and in private (DOUBLEDAY, 2020).

In our rural landscapes, the nature of work, both domestic and reproductive, orients resource requirements and space utilisations, with differential space use leading to women and men experiencing encounters and interactions with elephants differently (BANERJEE, 2017). Across the ethnic groups in our study area, women living in the vicinity of the forest perform specific duties as part of household work, including collecting firewood and drinking water. In the absence of amenities such as liquefied petroleum gas, typically used for cooking, or water pump stations, these duties predispose women to frequent forests, riverbanks or tea estates to collect the necessary resources. This gendered work leads them to encounter elephants at relatively higher frequencies, as these are spaces significantly utilised by elephants in the

course of their movement, foraging or resting. Men, in contrast, interact with elephants mostly in agricultural spaces while guarding crops at night. During the agricultural season, men are “socially expected” to guard crops at night, either individually or in groups, and to drive out invading elephants. Such encounters are typically aggressive and often violent, with many men—and several, usually male, elephants—losing their lives every year.

The impacts of such gendered experiences with elephants, and the responses to them, often become gendered. Our own studies (BANERJEE & SHARMA, 2022; BANERJEE & SINHA, 2023) and those by OGRA (2008), JADHAV & BARUA (2012), GOGOI (2018) and DOUBLEDAY (2020) have also shown that living with elephants imposes disproportionate burdens on men and women. Direct, visible impacts, such as death or injuries, occur more for men due to more close-contact encounters with elephants. For women, the impacts, arising from their continued use of risky spaces, increased workload, and death or incapacitation of the main earning members of the family, are often long-term, uncompensated and hidden. Akin to OGRA (2008), we observed men in our study site adapted to their economic losses through out-migration or engaging in more non-farm, daily-wage-based activities. However, women’s health and adaptation status was typically unchanged or even compromised by their continued use of elephant spaces to fulfil their household work. It was also observed that women’s agricultural and forest-based activities often intensified in the absence of men, who had migrated to urban centres. Thus, socioeconomically modulated gendered roles and responsibilities, along with the differential use of space they entailed, appeared to produce gendered vulnerabilities, risks and impacts that were deeply embedded within the quotidian lives spent amongst elephants.

Gender, we therefore suggest, needs to be studied as a focal political category in our search for landscape reorderings and reconfigurations of elephant spaces. Gendered negotiations of living amongst elephants typically lead to the formation of specific knowledge and perceptions of their behaviour and the development of particular perspectives of other species. Women and men thus often emphasised the problems faced by elephants with analogies that mirrored those in their own lives, leading to an active anthropomorphising of the elephants in distinct ways (BANERJEE & SHARMA, 2022; BANERJEE & SINHA, 2023). Moreover, we believe that such gendered imaginings could also reflect differential

readings of individual elephants on the basis of the elephant's sex and their evidently gendered behavioural profiles (SRINIVASIAH et al., 2012), but these await further elucidation.

Poverty and resource unavailability also emerged as recurrent themes in many of these narratives, wherein humans and elephants were described as being comparatively deprived. Additionally, these anthropomorphised narratives often became gendered when women and men offloaded their respective vulnerabilities to describe the deprived lives and times of the elephants with which they shared their days and nights. Describing elephants' crop foraging behaviour in "human spaces", for example, women often compared such behaviour with their own activities of foraging for firewood and wild vegetables in the forest. In contrast, men who engaged more in non-farm, daily wage-based livelihoods in other villages and towns made sense of male elephant movements through analogies of their daily or periodic migrations in search of work and money to run their families. Even though these observations emerged from asking male and female respondents how they perceived "elephants"—referring to all individual elephants within a singular category—we reiterate that such anthropomorphisms could incorporate further elements of "gendering of elephants", with fe/male elephants being perceived in specifically different ways by fe/male humans. Such gendered anthropomorphisation could also be seen as a way of being in this world, along with the elephants of that place, thereby conceptually "situating" specific knowledge in a spatio-temporal continuum. However, such situated knowledge (HARAWAY, 1988) is often not expressed but only experienced silently, remaining latent and undiscovered. Thus, there is an urgent imperative to explore these affective, dominantly vernacular ethologies, for without them we would have very little understanding of how encounters with elephants and the circulation of affects are themselves gendered, especially given that perceptions towards elephants and material realities are gendered in their own right as well. Finally, we need to unpack how affects and emotions, gendered as they may be, mediate these relations, at least from the human perspective.

While there may indeed be sex differences in human responses towards wildlife, such correlations typically remain limited to explanations based on sex and not gender. Being male or female is often considered a culmination of gendering processes that develop through spatiotemporal as well as eco-behavioural pathways, which are usually place- and

time-sensitive. Without explorations of how gendering develops and is performed, the linkages between sex/gender and one's attitudes and actions towards wildlife will remain incompletely understood. These limitations can also be extended to other social categories, such as caste, ethnicity or class. As gender cuts across all these categories, it could become the foundation for such intersectional analysis. The community that we studied was multi-ethnic, with specific component histories of the people embedded variously in the landscape. Gender relations within these groups were also different, with the men generally being socioeconomically dominant across all ethnicities. How the resultant ethno-gendered perspectives affect the community's knowledge and response to elephants they interacted in the everyday, requires further investigation (Figure 2). Finally, the notion of gendered encounters becomes even more intriguing when we question whether other-than-humans, such as elephants, could themselves also have individualised gendered lifeworlds.



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Figure 2 | Body of a dead elephant visited by the nearby local community.

Live and dead elephants become gendered portals for the local communities to know what elephants are and how to live alongside them.

| SYNTHESIS

Can the current approaches to study human-elephant relations, namely political ecology, affective ecology and behavioural diversity, be integrated through an examination of gender? We suggest that a focus on gender as a developmental process may provide a unique vantage point to explore the interplay of power, affect, emotions, attitudes and actions within the co-constructed lifeworlds of humans and elephants across a shared landscape.

Returning to our postulation that interdisciplinary investigations of multispecies assemblages are becoming essential in the Anthropo/Capitalocene, there is an urgent need to combine the perspectives of political and affective ecologies in locating human-elephant relations, both spatially and temporally. We suggest that the hybrid subjectivities of such assemblages, including their interactions and power asymmetries, be interrogated by studying the individualised lives of both humans and elephants, not merely as a clash of two combative species. Both elephants and humans thus become active lively agents, able to harness their behavioural diversity and adaptabilities to co-construct their shared lives and landscapes over space and time. A directed attention to gender, in addition, could provide a crucial key to comprehensively establish these vital linkages. We are convinced that gender specifically affects all these categories, be they political, affective ecologies or behavioural diversity, and thus serves as an entry point in furthering our understanding of human-elephant lifeworlds through the generation of novel questions, possibilities and capabilities.

We also suggest that before examining the linkages amongst the three approaches through gender, it may be necessary to further our understanding of how gender interacts with affective ecologies and behavioural diversity, in particular sociocultural landscapes. Such considerations require scholarly engagement, in its own merit, with the functional integration of the already established field of feminist political ecology with the emergent fields of “en-gendered” affective ecologies and behavioural diversity; only then will we be able to rethink and reorient towards effective, novel understandings of human-elephant relations in ever-changing landscapes.

| ACKNOWLEDGMENTS

Sayan Banerjee would like to express his gratitude to Dr Shalini Sharma for her intellectual support that made this work possible. He would also like to thank the Rufford Foundation, Inlaks Foundation and the Idea Wild Foundation for fieldwork support grants. Most importantly, we extend our sincere gratitude to the people and the elephants of Udalguri, who let us into their lifeworlds.

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CHAPTER 2

AFFECTIVE ECOLOGIES IN SRI LANKA

Farmers' experiences of relational dialogues amidst elephants in cultivated fields

Elizabeth Oriel, Toni Frohoff

Whether you're a human being, an insect, a microbe, or a stone, this verse is true. All that you touch You Change. All that you Change Changes you. The only lasting truth is Change.

Octavia Butler, Parable of the Sower

I INTRODUCTION

This chapter discusses affective traces or lines amidst the meshwork of humans/elephants/plants/land in Sri Lanka. Drawing on the concept of affective ecologies (SINGH, 2018), in which humans are one among many types of ecological actors, in this chapter we learn from farmers about their experiences and about elephants through farmers' perspectives. We also learn from the regions' ecologies, exploring ways that affect speaks to power and possibilities for mutually-beneficial cohabitation. Affective ecologies provide an aperture to help describe the deeply dialogic and relational processes in which elephants and farmers navigate

landscapes; their actions and states are responses to others and to globalized forces, connecting the micro and macro. This lens embraces complexities that mirror the wicked nature and multi-system context for crop loss by elephants and habitat loss for elephants.

The terms “human-elephant conflict” (HEC) or “habitat loss” do not adequately conjure the daily experiences of farmers and elephants in high-conflict regions, the tense atmospheres and panic in evening encounters for farming families, the loss of traditional access for elephants, and the synergies of intersecting challenges such as economic inequality, climate crisis and faltering soil health. We present farmers’ reports of their experiences to gain insight into the affective ecologies of emplaced human-elephant relations. Each person’s story can be viewed as one of BARUA’S (2016) “encounters”, arising and responding to colonial histories, postcolonial policies, and landscape changes. These histories inspire emotions, tensions and alliances across species, and partnerships that speak to power imbalances.

Affective ecologies are the interstitial tissues of multispecies histories, spaces, social networks and contracts, communities and politics. Affect can be challenging to grasp in the dominant western, individualist epistemology, which tends to place mind and emotion as internal to each being (CASEY, 2021). As Casey contends, emotions are extra-subjective, transmissible and often arriving from the outside; how one is affected and affects spans the personal and the societal. Farmers in Sri Lanka are plagued by numerous health issues (high rates of cancer and kidney disease). These issues coincide with economic, political, wildlife and ecological challenges. While sometimes, farmers direct their violence and rage towards elephants in explosives hidden within fruits (*hakka pata*), many still contend that politicians and economic policies, rather than elephants, are the responsible parties for their crop destruction. Such volatile emotions are also tempered—a tempering mentioned across farmers and witnessed in elephants—through a process that works across internal and external spaces and helps maintain some human-elephant coexistence.

This approach to emotion and affect as external, as moving and living in edge spaces, suggests a reality in which bodies and minds are intertwined (ABRAM, 2012; BENNETT, 2009; VAN MOSSNER, 2017). David Abram writes of freeing the psyche from a confined internal space and thus freeing sentience to return to the visible world (ABRAM, 2012).

Loosening the boundaries of self and mind to outside the physical body corresponds to viewing other animals as social beings and multispecies landscapes as social spaces (TSING, 2013). With 93% of communication being non-verbal (MEHRABIAN, 1971) and meaning-making as a feature across social animals (DAUTENHAHN, 2002, MASSON, 2009), states of being communicate across bodies and impact how each views the world, how each structures past and present. Affective ecologies explore how living systems constitute subjectivities across diverse beings (SINGH, 2018).

Beings are deeply entangled, according to scholars of relational ontology. BARAD (2007) highlights quantum theory as her entry to this entanglement, while INGOLD (2017) speaks of beings as composed of lines, knotted and corresponding within a vast meshwork. These perspectives of social life and the world are foundational to an affective relationality across beings, such that each being's agency is not an internal affair, but is interstitial, composed of an inherent mutuality in which self and other are not separate.

There has been a recent surge in the appreciation of affective evolution as a driving force for cognition, communication, and cultural transmission in—and between—humans and other animals (e.g., ASMA, 2019; BEKOFF, 2000). It is increasingly recognized that cultural preservation in some nonhuman species, including elephants, is vital to their immediate well-being as well as their long-term survival and conservation biology (BRAKES et al., 2019). PLOTNIK & DE WAAL (2014) concluded that “the directionality of the contacts and their nature strongly suggest attention toward the emotional states of conspecifics. The elephants’ behaviour is therefore best classified with similar consolation responses by apes, possibly based on convergent evolution of empathic capacities.” Hence, the importance of determining and valuing the emotional needs and capacities of elephants to their culture, their survival, and to other beings with whom they cohabitate—especially humans—should not be underestimated. Multidisciplinary approaches, ranging from social sciences and ethnology to ethology and neurology, are needed to decipher evolutionary continuity linking human and nonhuman animals and the forces directing their relationships.

Perception is primary in the matrices of intra and interspecies’ culture as basic communication within and across species. Perception becomes a means of survival, particularly in restrictive spaces or close proximity

in human-elephant relations and the ecologies of affect. Farmers in Sri Lanka speak confidently about their ability to perceive and identify elephants' emotional states (e.g., sadness, anger, or anxiety); some philosophers may debate the validity of such perceptions. Yet such communication is embodied and real for phenomenologists such as Merleau-Ponty, who stated that "it is by our bodies that we communicate and also with our bodies we express our vulnerability" (MERLEAU-PONTY, 1968: 135). The field of animal behaviour, notably ethology and cognitive behavioural science, is devoted almost entirely to the study of behaviours via various sensory modalities; elephant researchers having recently created the first exhaustive ethogram of elephant behaviour in a searchable library (POOLE & GRANLI, 2021).

This chapter presents Oriel's findings from research in Uda Walawe in southeastern Sri Lanka, with field work during 2018-2019 that included interviews and participant observation (ORIEL, 2022; ORIEL et al., 2021), synthesized with Frohoff's ethological research (e.g., ORIEL & FROHOFF, 2020). Five dynamic themes thread through encounters on the ground—*perception, ethics, social networks, land, and subjectivities*. These help to identify influences, responses across bodies, and social relations.

| BRIEF HISTORY OF HUMAN-ELEPHANT RELATIONS

Over millennia on the island, farmers and elephants developed a choreography of shared terrain and shared plant foods with traditional rain-fed slash-and-burn cultivation practices (called *chena* in Sri Lanka). As elephants accessed plants after harvests (FERNANDO et al., 2015), and engineered ecosystems in part through seed dispersal (CAMPOS-ARCEIZ & BLAKE, 2011) and trail creation (KEIL, 2020), humans created water tanks that elephants accessed in dry seasons and grew crops—these can be viewed as reciprocally-practised social contracts. Human settlement areas were organized around the logic of multiple species access, with water, field, and forest areas set aside for wildlife (HANDAWELA, 2016). This net of relationality remains in memory, as BERGSON (1988) attests that past co-exists with present, despite the radical changes in physicalities, practices and relationalities.

The territorial conflict (HEC) in Sri Lanka has led to approximately 260 elephant and 80 human deaths annually in the last decade (PRAKASH et al., 2020). Elephants inhabit 59.9% of the island, and humans dwell in 69.4% of elephant-ranging areas (FERNANDO et al., 2021), with human-elephant spaces as the dominant geographic pattern. Elephant population estimates are achieved through Department of Wildlife Conservation counts using direct counts and signs of presence (amounting to 5,825 elephants in 2013), though these numbers are questioned (JATHANNA et al., 2015). Fernando's research reveals elephant loss of their range by 16% since 1960 (FERNANDO et al., 2021). Landscapes around Uda Walawe National Park (UWNP) in the last fifty years have transformed from subsistence to economic spaces. Similar to what MÜNSTER (2019) describes in Wayanad, India, farmers in this southeastern dry zone contend with the overwhelming issues connected to cash-crop capitalism or "neoliberal crops"—depleted soils, overuse of agrochemicals, farming families' health issues, poor water quality, cycles of debt, and changing monsoon cycles. So much so, that farmers see no future. This suite of socio-ecological relations is not uncommon in Global South countries, which helps explain the despair that drives farmer's suicide rates. While farmers are often the ones who shoot or harm an elephant intruding in their crops, the conflict's roots trace back to colonial times (SUKUMAR, 2011), and in the present day, to landscape designs of the last fifty years, changing cultivation practices, invasive species, lack of coherent governmental department activities, development agency's agendas and economic deregulation which all play intersecting roles in escalating interspecies tensions (BENADUSI, 2015; FERNANDO et al., 2005; ORIEL, 2021).

While Asian elephants (*Elephas maximus maximus*) in Sri Lanka historically have faced continual exile due to changing human land uses, and benefited from human practices in water storage and ancient shifting cultivation (FERNANDO, 2000), they now, in some areas, are forced to inhabit small forest fragments with reduced palatable vegetation and are starving when restricted by fences to protected areas (FERNANDO, 2015). These tight spaces are physical, social, and psychological; movements are restricted, emotions and socialities are strained.

Small-scale farmers have first-hand experiences of cohabitation amidst strained shared spaces and form an important body of socio-ecological knowledge. However, since these actors often have little political voice

in Sri Lanka, many farmers claim they are ignored in Colombo's government offices and international development agencies (supported by BENADUSI, 2015). Farmers I (Oriel) interviewed often lose one-third or more of their crops to elephants. They speak about the emotional states they are in, elephants feel, and what passes between the two species, and the development of a more strained atmosphere in the last twenty years (ORIEL, 2022). For example, elephants are routinely driven away from villages and crops and also translocated to new areas where they have no history of habitation. Farmers say drives do not improve the conflict but make it worse. The elephants returned and became more aggressive (October, 2018¹), which is echoed by FERNANDO et al. (2012). Many report that the more violent or aggressive measures to protect crops from elephants lead to more violent responses, while subtler methods do not. Yet, even with the high number of conflict-related human deaths, farmers and park rangers also report incidents of individual elephants quelling potential conflict and de-escalating violence (October, 2018; September, 2019).

Park rangers, farmers, and elephant researchers in southeastern Sri Lanka agree that elephants during certain times of the year lack palatable vegetation, with over 50% of elephant calves dying of starvation in Yala National Park, southeast of UWNP (*Daily FT*, 2 August, 2018). Large areas of guinea grass (an African grass that elephants favour) have died in UWNP from what is described by locals as a suite of causes, including illegal buffalo grazing, fires set by encroachers, and invasive species crowding out palatable plants (September 2019). Explaining the trajectory of change, one local researcher claimed, "everything changed with the Uda Walawe reservoir," which was built in the 1960s (October, 2018). The dam expanded cultivation and irrigation footprints and the park's boundaries are now developed spaces, with 35,000 families growing sugarcane on the southern border and 82 villages lining the Park's edge. This region is a microcosm, and the farmer-elephant encounters are examples along a continuum of traditional interspecies negotiations and violent confrontations, as each navigates densely developed and enclosed spaces.

1. Dated citations refer to Oriel's interviews.

I FARMERS AND AFFECT

I (Oriel) am visiting a farmer east of UWNP. He is an “outgrower” for a state-owned sugarcane plantation, which was sited here by World Bank advisors (DISSANAYAKE, 2019). The amount the company pays him for sugarcane is often less than what he owes them for seeds, chemicals, etc. Farmers protest these conditions though change is evasive; he says the Forest Department plants trees that do not support pollinators, among other grievances. He also grows vegetables using a modernized version of the ancient *chena* cultivation. While speaking with him, he points out tree crops damaged by elephants (September 2019). Human-elephant conflict in this southeastern dry zone region is relatively high; of the five acres he grows, two are eaten by elephants.

A very close meeting with an elephant left this farmer’s close friend with injuries that led to his death. They were riding bikes on the road at dusk and an elephant approached them quietly, unseen until the last minute. Collapsed under the elephant, the farmer grabbed hold of the giant’s leg, pleading with him, and then blamed him for any future harm. His attempt to appeal to the elephant’s moral sense seemed to effective; the farmer had a prosthetic leg from a previous incident related to human-wildlife conflict, and the elephant destroyed only that one, so saving his natural leg and his life. His friend, however, suffered a broken back in the encounter. Conflict takes a cumulative mental health and physical toll, with damaged crops and bodies being only some of the terrible outcomes. In this case, his friend’s marriage also broke up due to stress from guarding crops all night, every night. Marriage troubles are common in this region. The farmer’s friend ultimately ended his life by drinking agrochemicals.

Farmers dialogue with elephants, whether protecting their crops or pleading for their lives during an attack. Their utterances towards elephants are composed of daily grievances and are affective responses embedded in a wider realm of landscape-level inequalities. Some farmers report that elephants can understand them, and that if they feel angry or resistant, elephants sense their feelings and will be aggressive. Alternatively, if the farmers are more tolerant, the encounter goes better. Yet, it seems like a balance between resistance or tolerance is best struck when negotiating with elephants, especially when crops are at stake;

total passivity can lead to farmers losing everything, as is the case with one woman on the village edge. These same farmers say *that elephants don't have enough to eat*. This observation is spoken so often, it forms a collective shared history and interspecies awareness of suffering.

Temporality shapes these affective encounters. Elephants enter crops at night-time to avoid human presence, which means that light and lack of light and sound and lack of sound play significant roles. Elephants travel so quietly at night, it can be difficult to hear them coming. Shining flashlights into elephants' eyes backfires, one tells me, causing them to be more aggressive. Another explains the flash into the eyes is always followed by a gunshot, a thundercracker or some other aggressive sound. Just keeping the light on a tree and not on the elephant's body is a strategy that eases their aggression. Anger across humans and elephants shapes and informs encounters. Each learns of the others' methods and adapts to them in a dance of advanced adaptation.

Small-scale farmers do not view the territorial issues as “human-elephant conflict” but as “development vs farmers/elephants” (SRINIVASAN, 2021). In 2021, farmers were staging large multi-site satyagraha protests in favour of larger elephant reserves, fences and corridors that they assert will mitigate the conflict. In the Hambantota area adjacent to UW—where the Rajapaksa ruling family built the Mattala airport, Hambantota port, and a cricket stadium—farmers and elephants have been pushed out. The joining of human and nonhuman animal struggles is a form of multispecies solidarity (NIJHUIS, 2021), pushing against development and politics in which more-than-humans have little voice. Multispecies justice is gaining traction, especially in light of the climate emergency, that joins politics, ethics, and ecologies, through embodied encounters towards solidarity across beings (TSCHAKERT, 2020).

| ELEPHANTS' AFFECTIVE ENCOUNTERS

Affect is part of sociability and etiquette; elephants, in their restraint and destructive power, navigate encounters along emotive axes that leave giant wakes. As mentioned earlier, farmers say that elephants can sense humans' inner states, which is not surprising given the sophisticated

perceptual and communicative capacities exhibited by elephants (SOLTIS, 2013) combined with frequently close and intense proximity between elephants and farmers. Elephants are extremely adept at expressing, perceiving, and communicating internal states (physiological, psychological, and emotional) with other elephants (POOLE and MOSS, 2008); this capacity has also been observed in their interspecies interactions with other species, including humans (to the degree that an article in *Nature* was titled, “Elephants have Learned to ‘Understand Human’” (MORELL, 2014). Elephants have even demonstrated an ability to differentiate between ethnicities, ages, genders—and the degree of threat that individual humans pose to them—solely from the sound of human voices (McCOMB et al., 2014, PLOTNIK & DE WAAL, 2014).

As landscapes and culture for humans and elephants have become fragmented, so has the psychology of impacted individuals within and across species. Elephant psychology and physiology are affected in Africa and Asia by habitat loss and systemic issues, leaving farmers and elephants competing in increasingly tight spaces. For the elephants, these at times violent encounters result in elevated stress hormone levels (GOBUSH et al., 2008; VIJAYAKRISHNAN et al., 2018) and psychobiological trauma, including post-traumatic stress disorder (BRADSHAW et al., 2005). In some populations, this traumatization from fragmented habitat and, in particular, disintegrated family and social groups, has been related to a dramatic rise in elephant intraspecific and interspecific hyper-aggression (SLOTOW et al., 2000; BRADSHAW et al., 2005). Traumatized elephants sometimes direct excessive aggression toward humans. Concurrently, human aggression and retaliation become more of a threat to elephants, and the multi-dimensional circle of violence and blaming is self-perpetuating (ORIEL & FROHOFF, 2020).

As described above, spatial relationships on both the micro (e.g., farm scale) and macro (landscape scale) have changed in the UW area in the last fifty years; loss of land and greater interspecies proximity leading to changing affect and responses. Despite varying degrees of acclimation, elephant suffering from loss of terrain quality, quantity (Figure 1), and forced physical proximity to humans in cropped fields, towns, and roads has ethical implications (BEKOFF, 2000; POOLE & MOSS, 2008). The following anecdotes illustrate how loss of terrain leads to different emotions, affective responses, and loss of autonomy, though also to some enterprising responses in which elephants utilize social networks.



Figure 1 | Browsing in Uda Walawe National Park, September 2018.

National parks are not often adequate in size and in plant composition to meet Asian elephants' nutritional and lifestyle needs.

In Uda Walawe, jungle was cut for a sugarcane plantation that is a total exclusion zone for elephants, which expanded the local population by 35,000 humans to work in the plantation, eliminating access to elephants' historic routes. According to an older local man, elephants in UW protested the bulldozers ripping out the jungle by storming them. He drove jeeps in the newly established park and witnessed elephants' responses to the changes. One male, Rambo, started coming to the national park gate in 1991 when he was eight years old (September 2019). He would play a game of storming tourist jeeps and enticed other young males to join in—a male social network. The jeep drivers and guides gave them buckets of water at the Park entrance, and a rapport began. Eventually, Rambo grew comfortable around people, standing by the road and begging for food during certain times of the year. Eventually, other males

followed; at times there could be 50 males begging for fruit on the roadway (FERNANDO et al., 2020). Nearby in the region of Kataragama temple, where elephants have lost immense tracts through the Hambantota developments and other projects, they stop cars on the road and won't let them pass until they offer fruit—an elephant tollbooth and another social network, adapting to human land alterations (Figure 2).

In Panemura, a spring with high salt levels was a site where locals reported elephants would gather and go into a kind of frenzy, stomping the ground to bring up water to the surface. Access to minerals in soil and water is significant to elephants' well-being. This unique site was where the Dutch had built an elephant kraal, a facility to capture wild elephants. In 1950, while capturing a female herd, one male was also captured while mating (KATUGAHA, 2008). When the matriarch of the herd was tied to a tree, the male broke his ropes, knocking over the tame elephants that were enlisted to keep the wild ones in order. At the request of the kraal's owner, the elephant was shot and died quickly. The event sparked outrage and led to a ban on kraals, capturing and



Figure 2 | Male elephant begging.

killing elephants (KATUGAHA, 2008). The affective response of the male protesting the capture carried across to humans as they rose up and demanded an end to kraals.

The feelings that prompt bulls to protest and storm bulldozers travel. The feelings are relational and ecological, connected and akin to the affect embodied in human social movements. Elephants and humans are both responding to injustice, often resulting from disrupted land relations. The conflict has led to solidarity between farmers and elephants in the satyagraha protests. The farmers *en masse* are calling for elephant-friendly management as these two species are linked on the land and across shared traumas. Affect is like a glue or thread that holds beings together on the land, and the shapes of affective threads are informed by ethics, perception, reciprocity, and stress. These threads conduct feelings, shared histories, sense of trust and lack of trust; these co-generate anatomies of multispecies communities.

| DISCUSSION

The relationship between individually experienced and socially transmitted emotional states can be examined through affective interactions, communication, and ecologies. Especially given the long-overlooked capacity for emotion and affective ecologies in elephants as drivers in elephant relations, we recommend that ethnozoological and other explorations of human-elephant relations bring elephant affective ecologies into the forefront of consideration, evaluation, and policy and management. We agree with MUMBY & PLOTNIK (2018) that critical attention to the complexity of the emotional capacities and needs of elephants—as well as humans—must be prioritized in management action plans. Further, our evaluation and research also support the importance of affective ecologies in the development of comprehensive conservation strategies that intersect social and economic justice projects, particularly human-elephant conflict prevention and mitigation plans. Managed elephant ranges, universal basic income to support farmers' subsistence and ease land pressures and local/regional consultancy for HEC policies are examples of equalizing land access and addressing the farmer and elephant versus development paradigm.

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CHAPTER 3

THE OUTLIERS

Reimagining human-elephant relations in rurban South India

Nishant M. Srinivasaiah, Anindya Sinha

Outliers are those who have been given opportunities—and who have had strength and presence of mind to seize them.

Malcolm Gladwell, *The Outliers: The Story of Success*

I INTRODUCTION

About two decades ago, HIR and MAK, two mature Asian elephant bulls, began to range a hundred kilometres from their forested habitats in the Eastern Ghats landscape of southern India in an effort to access rich production areas, six months each year. During this journey, they would traverse highways, railway tracks, canals, electric lines, and townships, not to mention dodging walls, vehicular traffic, and other barriers, taking on considerable risks across this rapidly urbanising landscape (SRINIVASAIAH, 2019). This long and arduous trek across many territorial forest divisions and districts of southern India did not, however, go unnoticed, as it is hard to miss these giants moving through villages and towns, often in broad daylight. Most importantly, they would leave tell-tale signs of crop feeding and broken barriers.

In the relatively recently discovered agricultural areas, however, MAK and HIR were not alone. They formed part of a group, which included ten other male elephants that resided in these human-use areas almost throughout the year, without even having met an elephant of the opposite sex for nearly five years! They were all young adult or adolescent males, dispersing from their natal herds that roamed their traditional forested home ranges in search of new pastures (SRINIVASIAH, 2019). Being younger than HIR and MAK, these ten males had not yet developed set musth periods when they would cyclically experience heightened sexual activity. While the two mature males would often return to their forested habitats when in musth, to be with female elephants, the younger bulls did not seem to experience any such urge, hence remaining in the human-dominated habitats continually (SRINIVASIAH et al., 2019). The only links these young individuals appeared to have with their traditional habitats and conspecific females remained presumably embedded in their memory of life in their natal herds and the information they possibly gained through later interactions with HIR and MAK, when the duo would return from the forest.

To survive in such high-risk, human-dominated landscapes, the males came together to form large and stable all-male groups—novel for Asian elephants—in a highly fragmented, human-dominated landscape (SRINIVASIAH et al., 2019). They would take refuge in small forest patches or waterbodies during the day and forage mostly on crops at night when human activity is at its lowest, thereby actively modifying their sociality and time-activity budgets from those in the forest. Individual males also developed alternative behavioural profiles and displayed different behavioural tactics and strategies based on whether they were in a forest or production landscape, providing evidence of their remarkably plastic behavioural capacities. These strategies were clearly adaptable, as they helped these males maintain good body condition and remain in musth for relatively longer periods of time, possibly leading to improved reproductive fitness as well (SRINIVASIAH et al., 2019). The two mature bulls would occasionally be in musth for up to six months at a time, but the younger males showed signs of musth only once or sometimes twice a year. The formation of such unusual all-male groups, their demographic compositions and unique behavioural adaptations thus suggest to us a complex interplay of *space*, *knowledge*, and *capabilities*—of both people and elephants—that may trigger these emergent behaviours, some adaptive but others, unfortunately, potentially maladaptive in the long term.

SPACE: LANDSCAPES OF EVER-CHANGING PERCEPTIONS

It was just about fifty years ago that the nature of the interaction between humans and elephants saw a paradigm shift in India from being largely persecutory to preservationist. The Wildlife Protection Act of 1972 became a watershed moment, not just for the elephants but for most wildlife across the country. The forested habitats of elephants began to shrink less, and deaths due to poaching and hunting began to decline. More importantly, the capture and killing of elephants became highly regulated. This was especially true for the Eastern Ghats landscape of southeastern India, the land of HIR and MAK. Within this same period, nevertheless, an increasing human population, expanding agriculture and a spurt in infrastructural activities fragmented the elephant forests, setting the stage for the development of new modes of conflict between the two species, violent as before but perhaps less asymmetrical in their physical and psychological impacts (Figure 1). The spread



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Figure 1 | On being chased by farmers, two young adult males, TIN and PT, and a subadult male SAM—from right to left—run towards a banana plantation to take cover.

of agricultural fields, facilitated by a transition from dryland cropping to water-fed agriculture, now provisioned these forest elephants with a staple source of rich human foods, triggering off urbanised wants—relatively rapid behavioural adaptations in response to novel anthropogenic factors—and new opportunities in their lives; a process of synurbisation, or adapting to an increasingly urbanising landscape, as has earlier been defined for humans (SOROKIN, 1928; PARSONS 1949), has thus begun. And most dramatically, all these changes have occurred within the life span of an individual elephant!

The older males, such as HIR and MAK, were born on the cusp of this paradigm shift. They thus escaped the large-scale elephant captures for use as draught animals or being hunted for sport, ivory, or meat in a manner that their ancestors, tragically, could not. In contrast to their predecessors, however, they did not have undivided forests to range in. Their social upbringing, in fact, now involved traversing forest patches fragmented by crop fields, roads, dams, and other infrastructure while striving to avoid humans due to a persecutory fear, which they may have learnt from their mothers or other members of their natal herds. Theirs was possibly the first generation of elephants that initially experienced persecution, as their once pristine forested habitats began to be subjected to rapid urbanisation, with barriers designed and constructed to restrict their movements to the now-protected reserves and sanctuaries. Across southern India, the primary foraging grounds of elephants had by now been converted to rich production areas for humans, with the valleys being cultivated for staple foods, such as millets and paddy. The untameable hills of the Western Ghats, however, remained relatively inviolate, and it was here that most elephants took refuge. The relentless invasion of agriculture, now in the form of coffee and tea plantations, however, further drove the elephants into smaller hilly patches, which were already secondary habitats with poor-quality food for the large herbivores. The process of habitat dispossession was finally complete when grazing livestock, along with their human caretakers, vehicular traffic, heavy infrastructure—and more recently, townships in most rural and peri-urban areas of southern India—exposed these bewildered elephants to a stark, more-than-forest, reality that they had never experienced before.

The destruction of their habitat has been so severe that, in some cases, elephant herds have now been entirely displaced from their natal ranges,

sustaining themselves solely on food grown by people. For others, foraging on crops has become routine when they traverse a matrix of forests and agricultural fields, primarily due to habitat fragmentation. As a result, the perceived organic world of HIR and MAK, especially in their later years, began to increasingly include humans, infrastructure, and novel—but stressful—associations almost daily. For the younger-generation males, such as TIN and SAM, who were born only 15 to 20 years ago and have associated closely with HIR and MAK, interacting with humans has even become the norm, crossing a railway track a regular practice, and water bodies are not just for drinking, bathing or socialising, but for taking refuge from humans during the day (Figure 2). This is an emergent behaviour, which is being shaped, as are other unusual tactics, by the ever-changing perceptions that the elephants are uniquely developing as they, almost systematically, cross the insecure matrices of forest and non-forest habitats across the landscape in their search of food, water, and shelter.



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Figure 2 | SAM and TIN spend their daylight hours in a waterbody neighbouring a cropfield—a novel behavioural strategy to avoid being driven off by farmers.

I KNOWLEDGE: NOVEL CONCEPTIONS OF REALITY

The female elephants in this gradually synurbising landscape may not have, however, experienced such dramatic changes in their life histories, protected as they are by their maternal instincts to keep their young away from the threatening cropfields. The risks involved in these human-use production landscapes may indeed be too high for the calves in these herds (SRINIVASIAH et al., 2012). TIN and SAM, however, spent their adolescent years away from their natal groups in totally dedicated production landscapes within our study area. They thus traversed landscapes far more dynamic in nature than were their traditional forest settings. Changes in forests may occur over seasons, but this production landscape could alter drastically within days. When these rurban elephants—those learning to adapt to rapidly humanising environments—forage in the newly emerging peri-urban habitats, they need to learn to cross unfamiliar roads, avoid buildings and other barriers, and interact with people who could be experiencing encounters with wild elephants for the first time in their lives. The waterbodies have now filled up with water from far away dams, fed through canals, and with water levels totally unconnected to the rains in the region. They can now support crops grown with groundwater available throughout the year, unlike seasonal natural forage. Most importantly, elephants have never encountered these foods in their ancestral lands.

The adaptability of the rurban elephants to living in such dynamic environments is evidenced in their response to our camera traps. While moving out of the forest one late evening, TIN and SAM triggered a camera trap placed next to a regular path to record their movements and study their behaviour. The flash of the camera made them both beat a hasty retreat, probably a reminder of their persecutory fear of humans with torch lights at night, guarding their precious crops, or even shooting at them. Both, however, soon turned around to face the camera, touching their faces with their trunks in a display of ambivalence before eventually choosing to go past the camera toward a neighbouring crop field. From this point onward, whenever they encountered this camera trap, be it at night or during the day, SAM and TIN would make eye contact with it, but they no longer showed any ambivalent behaviour. It seemed to us that they had accepted the camera trap, an alien object, to

be a part of their home range, thereby creating a new mental model of reality within which all encountered cameras were possibly destined to form an integral part (Figures 3 and 4).



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Figure 3 | A subadult male POI and an adult male AMA physically contact one another closely during a bout of affiliative interactions, typically displayed in human-dominated habitats.



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Figure 4 | An all-male group of young individuals, led by the subadult male POB, being driven away from a human habitation.

To improve their chances of survival in such high-risk habitats, we suggest that elephants living in human-dominated landscapes may have to update their mental models of reality much more rapidly than their forest-dwelling counterparts (SINHA & SRINIVASIAH, 2021). Such elephants are, therefore, exposed to a wide spectrum of quotidian interactions and experiences, providing individuals with positive and/or negative behavioural stimuli. These frequent interactions also presumably help formulate and establish the appropriate counter-behavioural responses through reinforcement or feedback mechanisms. Elephants could thus learn to display stimuli-responsive behaviours through trial-and-error learning, all of which emerge from their own first-hand experience but which ultimately contribute to a novel repertoire of behavioural acts and tactics that are specifically chosen as appropriate within their experienced, and now perceived, spaces. However, establishing an adaptive behaviour through trial-and-error could take time and may prove risky, and possibly too costly, for a new entrant in a human-dominated landscape where mortality rates may be several folds higher than in the forests (SRINIVASIAH et al., 2019). We thus believe that active social learning from older and more experienced compatriots, which could lead to the emergence of persistent, culturally transmitted, socioecological traditions, may provide a less risky learning strategy. Such a learning mechanism could also include the emulation of already established behavioural responses of older and/or more experienced male elephants to various stimuli in these landscapes, in addition to time- or situation-tested behavioural strategies gradually incorporated into the developing life-history strategies of the younger males (see WHITEN, 2000 for a review). Finally, one could speculate whether insights individual elephants gain from their experiential learning in certain environments could then be applied to novel situations they encounter in the future (Figure 5).

The high propensity of the rural male elephants to persist in our study of a production-based, human-dominated landscape, replete with highly nutritious food, ample water supply and negotiable infrastructure, allows us to visualise a possibly significant departure in the elephants' conception of an earlier world, when there were only forests with limited water sources, exclusively natural foods and, most importantly, little or no human presence. The information and perhaps knowledge that TIN and SAM obtained by interacting with their peers and, more importantly, with older individuals like HIR or MAK, who



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Figure 5 | PTJ touches his face after inspecting a camera trap.

continued to move between the forest and the production landscapes, could be of prime importance for retaining contact with the ancestral forest in modern-day elephants, but possibly only for a limited, foreseeable future.

| CAPABILITIES: EMERGENCE OF FUNCTIONAL STATES OF BEING AND DOING

Adolescent male elephants, such as TIN and SAM, had typically grown up in and around agricultural areas with conflict as a norm in their everyday. This seems to have driven them to learn to respond to changes in their lived spaces in several ways. Today, these young elephants display unique behavioural adaptations, such as forming stable all-male groups, remaining submerged in large waterbodies close to villages

during the day, suppressing their foraging during the daylight hours—occasionally up to 12 to 14 hours—and feeding exclusively on crops nocturnally: all presumably in response to human activity in their surrounding areas, now devoid of forested habitats. Such behavioural adaptations are clearly extreme, as elephants are usually known to feed for about 18 hours a day and typically require forested habitats. Moreover, it is possible that individuals in these all-male associations coordinate their behavioural activities and tactics in such a way that promotes more efficient and safer crop-foraging behaviour, especially in these high-risk, high-resource areas.

While it might be relatively easier for developing young bulls to exhibit these uniquely adaptable behaviours, it is remarkable that the older mature males, HIR and MAK, actively switch from feeding exclusively at night when in a production landscape to a more diurnal foraging schedule when in a forested habitat. Not merely limited to such behavioural tactics, these males also displayed dramatic variation in their foraging patterns, from opportunistic feeding on crops to that on more natural forage, from living in all-male groups to occasionally associate with herds, and from using waterbodies as refuge to more normal patterns of watering, bathing, or socialising in them, all evidence of their unusual phenotypic flexibility. This behavioural plasticity shown by the older males could be considered lived reality, the norm for many elephants in the human-dominated landscapes of the Anthropocene.

We would like to frame the behavioural adaptation and plasticity displayed by our study elephants in terms of alternate sets of “capabilities”, with such capabilities representing the effective freedom of an individual, at any given time, to choose between different kinds of “beings” and “doings”, or “functioning” in ways that the individual has their own reasons to value (SEN, 1999; NUSSBAUM, 2011). Each elephant, we thus envisage, has a set of basic—read innate, biological—capabilities, contributing to the development of their rather “fluid and dynamic” internal capabilities, including, for example, “their personality traits, intellectual and emotional capacities, states of bodily fitness and health, internalized learning, skills of perception and movement” (NUSSBAUM, 2011, p. 21). However, all of these capabilities develop through interactions with biological, ecological, and anthropogenic environmental conditions.

Each elephant, we also suggest, has the ability to convert these internal capabilities—their available resources—into an active functioning, which incorporates within it such socioecological capabilities as group-living, strong social ties, degree of sexual dimorphism, and other features that manifest during environmentally sensitive stages of growth, development, and reproduction. What must be realised is that the expression of such “combined capabilities” of each elephant is crucially dependent on their immediate environments “allowing” them to completely exercise their choices to “be” and to “do” in accordance with their free will. In a manner similar to humans, therefore, nonhumans—elephants, in this case—appear to actively make choices geared towards fulfilling their ultimate goals or functionings or what they would want to be or do under a set of predefined conditions. They should thus be capable of exercising their normative claims—their freedom to achieve well-being, in terms of their abilities to forage or socialise as they would like to—on a daily basis, a fundamental assertion of the capabilities approach of SEN (1999) and NUSSBAUM (2011). When biologically trivialised for a male elephant, this would presumably translate ontologically to a state enhancing the individual’s survival and reproductive success.

Furthermore, an elephant may be conceptualised to have a particular set of potential beings and doings based on their basic and combined capabilities. The realised set of beings and doings could ultimately be shaped by the learned knowledge they have experientially acquired. This combination of a male elephant’s actualised/realised functionings is thus the life he finally chose and was allowed to lead, a life that could also be construed in terms of the lived spaces of the elephant, a constant struggle between his originally conceived and ultimately perceived spaces (SINHA & SRINIVASIAH, 2021). Ideally, it may be hoped that his conceived and perceived spaces overlap completely and constitute an integral whole, although, in reality, the rapid and disruptive environmental changes being experienced by an elephant today may necessitate, and make imperative, a much more palpable comprehension of a life lived unpredictably, susceptible to its unique quotidian unfoldings. We also believe that these emergent sets of realised capabilities and functionings form the essential prerequisites for human and elephant coexistence in the future, manifesting by way of adaptive behavioural responses of both species to increased interspecies understandings of one another.

| AN OUTLIER'S PERSPECTIVE OF THE ANTHROPOCENE

The behavioural plasticity that an individual male elephant displays in response to a changing landscape, as they emigrate from forested habitats to production areas, sets the stage for space-appropriate behavioural decisions. While land-use and landcover changes may be the major drivers of elephant movement and occurrence, the nature of these elephants' interactions with the human inhabitants of these regions defines their relationship with the landscape and the life-history strategies that they ultimately adopt. While most human-elephant conflict mitigation measures are geared towards either returning the landscape to the conceived space of the elephant—their forests—or the removal of elephants from their current perceived space—the agricultural fields—we strongly believe that it is essential to consider the interactions between elephants and humans to address and increase the possibilities of peaceful coexistence in their “lived spaces”. The many elephants in the production landscapes are, in fact, at the forefront of showing us, through the expression of their capabilities, shaped in part by human presence, decisions, and capabilities, how coexistence may be possible between the two species, largely through the co-creation of alternate sets of multispecies capabilities. The key to conflict mitigation lies in these co-constructed, co-lived spaces. It is unfortunate, however, that the elephants in co-lived spaces are often lost, as it may be hard for humans to accept a perceived space shared with elephants, hardwired as we are to our own conceived space, devoid of beastly creatures. With the loss of each elephant, we directly lose knowledge critical to the survival of the species and indirectly to our own well-being in the Anthropocene.

Capabilities theorists have long suggested that a good and fruitful relationship with nonhumans and the world of nature is an important capability intrinsic to human flourishing (NUSSBAUM, 2006, 2017; LINCH & HOLLAND, 2017; WICHERT & NUSSBAUM, 2017). Unfortunately, negative human-elephant interactions have, over time, served to cripple the capabilities of agriculturists and elephants alike, preventing each from expressing their freedom of choice and thus increasing mutual intolerance and conflict. If unaddressed, the consequences of such intolerance will be increasingly seen in antagonistic behaviours, including damage and destruction, displayed by humans and elephants towards

one another. Our mitigation measures, therefore, need to be aimed at increasing the capabilities of people affected by elephants and vice versa to provide each with alternate capabilities allowing for the achievement of their desired end goals or functionings. The future remains uncertain, but the key to resolving the issues of human-elephant conflict may lie in facilitating the behavioural adaptability of both people and elephants to the changes that are rapidly occurring in their shared environments.

Ranging in areas with human densities of up to 200 individuals/km² and foraging on cultivated crops, the frontier elephants only signify conflict to most people. And such perceived conflict is at its worst, most violent, when it is consumptive, especially over shared food and land resources. Given this extreme behavioural adaptability exhibited by these elephants in effectively responding to any contingency they encounter, we have been quick to judge them as an anomaly. Moreover, they are so different from our conception of their forest-dwelling counterparts that they have even been considered outliers or freaks. In statistical terms, outliers are extreme values that create noise in the data or population and are deemed best removed. For our own outliers, HIR and MAK, juggling between the different realms of reality did indeed prove costly. And hence, unlike the glorious outliers spoken about by the writer Malcolm Gladwell and quoted at the beginning of this essay, HIR was captured and taken into captivity, where he later died. A year later, MAK was electrocuted in a cropfield as he returned to the forest at daybreak. There is no doubt that the same fate will befall the male elephants in our high-risk, human-use study areas; they have very little chance of surviving the threats posed by the landscape.

With their only link to the forest elephant community almost completely cut off, the young males have now started venturing further than ever before. The more fortunate find forests to settle in while the others discover new agricultural fields and get embroiled in more conflict. The twelve males with whom we began this essay were not the only group in our study landscape displaying this behaviour. We increasingly found adolescent and mature male elephants using other production landscapes in the region almost throughout the year. Three other all-male groups, one to the east, another to the west, and the third in the central region of our study area in southern Karnataka—up to 60 individual males have now been discovered to reside outside their traditional forest habitats for varying periods of the year in the western Tamil Nadu districts. With these developments, the production landscapes abutting forested elephant

habitats seem to have become the “bull area” in this Asian elephant community while the females continue to live within the forests. This new emergent behavioural repertoire of the male elephants begs the question of whether we should still consider HIR and his posse of males, and their tactics of survival and reproduction, as outliers. Instead, do these outliers represent the new norm? More importantly, can we afford to treat these outliers as extreme data points, as in statistical analyses, as they alone seem to hold the answer to the increasingly important question of how we can ensure peaceful coexistence with the frontier elephants? The behavioural ecologies of the nonhuman, embedded within the typically human-dominated political ecologies of land and livelihoods, possibly present one of the most important challenges—and opportunities—for lively engagements within the urbanising, multispecies, more-than-human lifeworlds of today. Our common worlds and entwined futures are here and now.

| ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to the different human communities—field associates, farmers, forest guards—who made it possible for us to understand the difficult lifeworlds of the elephants, each through their own unique perspectives. We deeply acknowledge the various organisations and their staff—the National Institute of Advanced Studies, Foundation for Ecological Research, Advocacy and Learning, and the Indian Institute of Science—all of whom have enabled our studies through their unflinching support for our Frontier Elephant Programme over the years.

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CHAPTER 4

THE IMPLICATIONS OF BEING A “PROBLEM” ELEPHANT

Lauren A. Evans, Redempta Njeri Nduguta

I INTRODUCTION

This chapter begins by an electric fence, at dusk in Laikipia, Kenya. The fence has been built to prevent elephants from leaving conservancy land to eat crops on smallholder farms. We are hiding in the bush, on Mutara Conservancy, having just placed a camera trap next to the fence to see how elephants interact with it. A GPS collar on one of the elephants and reports from community scouts told us that elephants broke out here last night to raid crops. As dusk falls, a line of ten bull elephants approach the fence in a great ridge of grey. We hold our breath. They wait, standing still but kicking dust and curling their trunks above their heads, sniffing the air. Suddenly the group parts as the largest bull, a regular breaker of fences, walks towards the wires, curls his trunk over his head and pulls back the wires repeatedly with his tusks. The fence sags and the elephant carefully steps over them, leaving the conservancy where he has spent the day. One by one the others follow. They head for an isolated smallholding.

We were stunned by the skill, strength and cooperation we saw amongst this group of elephants. But most of all, I was struck by the way that elephants do not stay in the spaces we intend them to. Humans have

a tendency to create space and place to control human-animal interactions and to define them with boundaries. PHILO & WILBERT (2000: 14) articulate this distinction as “animal spaces” (set apart from intensive human occupation where wild animals are expected as rightful occupants) and “beastly places” (where animals transgress human spatial orderings and trespass into spaces intended for human occupation, injecting “their own agency into the scene” and creating places “reflective of their own ‘beastly’ ways”). Here, we explore how individual elephants transgress their animal spaces in Laikipia, through the breaking of an electrified fence built to stop them, and move into the beastly places they create as they eat people’s crops and move through farmland at night (EVANS & ADAMS, 2018).

The most intractable conservation conflicts (REDPATH et al., 2015) in Africa are associated with the African elephant, *Loxodonta africana*. They encompass the range of negative interactions that occur between people and elephants sharing a landscape, including damage to crops, property, livestock, risk to human life, and the retaliatory killings of elephants (MARIKI et al., 2015). On the ground, these conflicts are between those who protect elephants—namely wildlife authorities, landowners, wildlife managers, conservation NGOs—and those who experience the cost, and little benefit, from the presence of elephants.

African elephants are subjects of global concern. They have iconic status. Their conservation is enmeshed with the issue of poaching for ivory and framed within global discourses of extinction, crisis and a new militarisation (DUFFY, 2014; LUNSTRUM, 2014). It is also embedded in discourse of animal rights and welfare because of their sagacity and capacity for care, social bonds, memory and grief (McCOMB et al., 2000; HART et al., 2008; DOUGLAS-HAMILTON et al., 2006). African elephants, therefore, create a cosmopolitan convergence of diverse stakeholders and ideologies (BARUA, 2014 a).

The generic literature on African elephant conservation conflicts is ecological. Elephants demonstrate patterns in how they raid crops in space and time. Crop-raiding usually occurs when crops are mature (OSBORN, 2004; CHIYO et al., 2005), at night when human presence is low (GRAHAM et al., 2009), close to water, human settlement and elephant refuges (SITATI et al., 2003; GRAHAM et al., 2010). Elephants navigate smallholders in a way that minimises risk and maximises opportunity for themselves (EVANS & ADAMS, 2018).

In this chapter, however, we examine elephant conservation conflicts as an issue of individuals, that are not carried out by all elephants randomly, but by specific elephants choosing to live, eat and behave in specific places, in specific ways. Male elephants crop-raid more frequently than females (CHIYO et al., 2005; HOARE, 2015): their behaviour is thought to be unpredictable and more risky because of the selection pressure on them, which favours a risky strategy to derive better nutrition from crops (HOARE, 1999). Crop-raiding elephants tend to be larger in body size than non-raiders (CHIYO et al., 2011 a). Furthermore, it is specific individual elephants who carry out most crop-raiding (CHIYO et al., 2011 b; HOARE, 2015).

SWAN and colleagues (2017: 519) define a problem animal as “any individual animal that is responsible for a disproportionately large negative impact on human interests”. Here, we examine the concept, behaviour and implications of being a “problem” elephant. We ask what are the implications of the individuality of elephant behaviour and the individualisation of elephants by people for their conservation? To answer this, we draw on 15 years’ worth of interdisciplinary data from conservation research and practice in Laikipia.

| LAIKIPIA

Laikipia is a dry plateau in north-central Kenya (Figure 1). The area (9,800 km²) is part of the Ewaso ecosystem that is home to the second largest elephant population in Kenya after Tsavo. It holds an estimated 4,475 elephants and is a growing population (WAWERU et al., 2021).

Some residents and users of Laikipia have interwoven and enmeshed histories with elephants. There is a Samburu¹ legend that elephants once lived in people’s homes and worked closely with women (KURIYAN, 2002). In Samburu culture, people respect the deceased by placing green branches of trees onto their graves and do the same when they see elephant remains (*ibid.*). The colonial government laid the roots of a centralised wildlife policy in Kenya (KABIRI, 2010). Pastoralists, including

1. One of Laikipia’s predominant ethnic groups, with origins to the north of Laikipia.

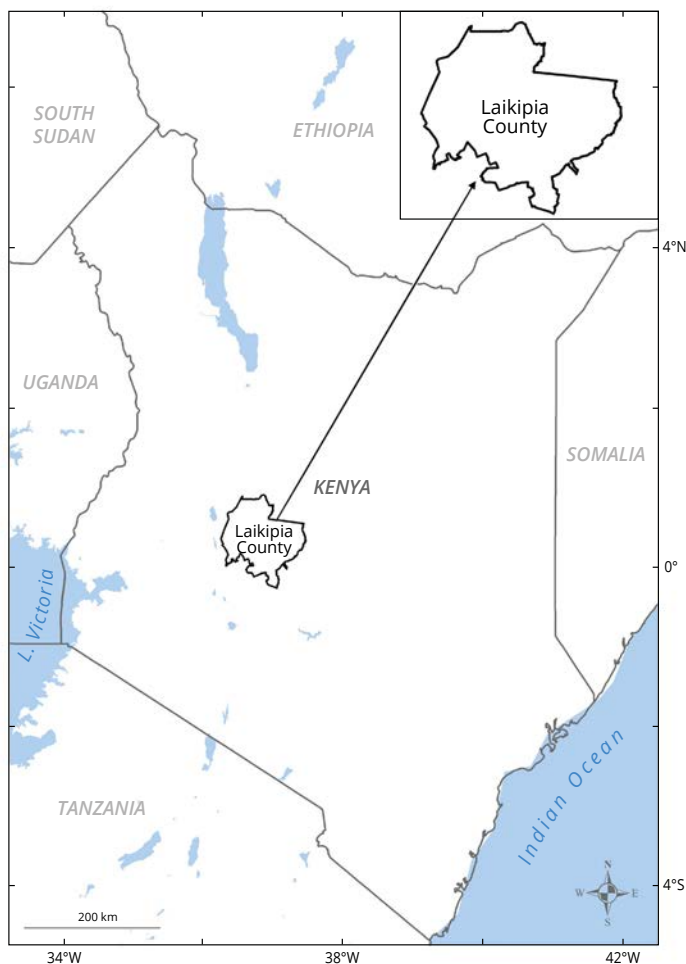


Figure 1 | Location of Laikipia County in Kenya.

the Samburu, were seen by the government as “wayward” and “backward” and in need of “modernisation” (HOMEWOOD, 2005). Enmeshed histories with elephants became othered by the state. Elephants were conceptually placed by people in protected areas where they could generate revenue through tourism and not cause damage to cultivation or pose a risk to people. Increasingly these protected areas have been demarcated with electric fences. After independence in 1963, Kenya saw further centralisation of the control of wildlife and the growing power of other external non-state actors, namely conservation organisations, in wildlife governance (KABIRI, 2010).

Five events in Laikipia’s history have shaped the context of this research. First, during the British colonisation of Kenya, Laikipia was carved into large ranches, owned by European settlers, and used to produce cattle for export. Second, after independence in 1963, many European ranchers left, and their ranches were bought and subdivided into small plots owned by smallholders and used for cultivation (KOHLE, 1987). However, some ranches remained: creating a chaotic juxtaposed mosaic of land use and tenure (Figure 2). Third, during the poaching crisis of the 1970s, elephants moved from the north of Kenya into the safety of the remaining ranches in Laikipia (THOULESS, 1992). Laikipia’s elephant population grew along with the number of smallholders. Elephant conservation conflicts became intolerable for smallholders as elephants living in neighbouring ranches destroyed their crops (*ibid.*). Fourth, conservation developed as a land use on some ranches and they became conservancies, many with high-end, low-volume tourism (LWF, 2012). Fifth, the government, NGOs, and landowners decided that the solution to this conflict was an electrified fence that would trace the borders

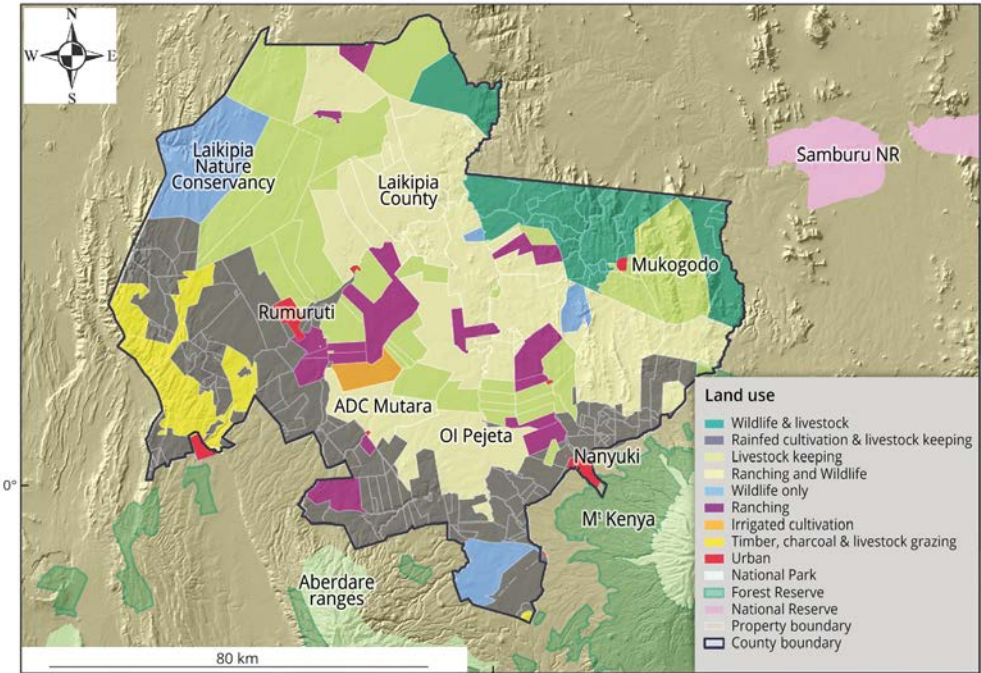


Figure 2 | Land use in Laikipia County.

of ranches/conservancies and divide the entire county into a place for elephants and a place for cultivation (THOULESS et al., 2002). It was completed in 2008 and called the West Laikipia Fence. The fence was, from its conception, political (EVANS and ADAMS, 2016). One journalist claimed that it would “split the country into two unequal parts”, dividing the “haves” who benefit from conservation and the “have nots” who don’t (MBARIA, 2006).

| DEFINING THE “PROBLEM”: INDIVIDUALISING ELEPHANTS

Once built, elephants soon learned to break the West Laikipia Fence to raid crops on the other side, particularly the 32 km section built along Mutara Ranch (Figure 3). This chapter will focus on this length of fence. The authors, working with international conservation NGO Space for Giants² and the University of Cambridge, was monitoring the behaviour of elephants that crop-raided and noticed that it seemed to be certain elephants carrying out the bulk of fence breaks. Joseph Wahome was Space for Giants’ elephant tracker. He was trained in the identification of individual elephants by the Amboseli Trust for Elephants using unique features such as ear patterns (KANGWANA, 1996) and equipped with a digital camera, a GPS and a motorbike. Responding to reports from scouts, he travelled to the site of reported fence-breaks and carefully observed and photographed elephants breaking in by day, or went to the site of breaks to track the footprints of elephants to where they had crop-raided the night before. He recorded any known individuals seen. For any unknown individuals, he recorded their distinct features and entered them into a database.

Wahome named the bulls he identified. He chose names of characters of obvious power or religious significance (e.g., Abe Lincoln, Nelson, Dedan, Tyson, Ishmael³), reflecting the reverence that he held for these

2. Based in Laikipia Kenya (www.spaceforgiants.org).

3. After Abraham Lincoln (US President), Admiral Nelson (British naval hero), Dedan Kimathi (Mau Mau leader), Mike Tyson (boxer), Ishmael (biblical son of Abraham).

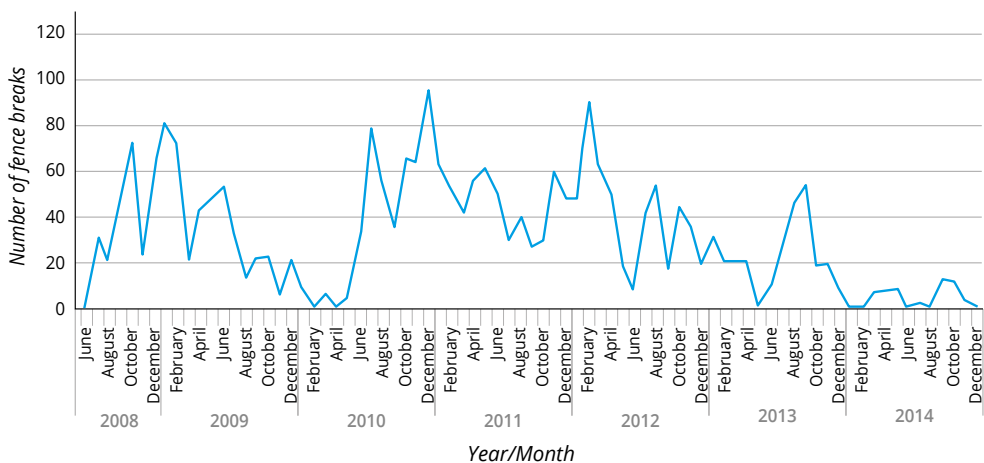


Figure 3 | Fence breaks by elephants on Mutara Ranch fence (June 2008–December 2014).

elephants. He once told us that he only dreams at night of elephants; he said, “I think I am becoming an elephant”. Based on Wahome’s identification data, Space for Giants then put GPS collars on those elephants who were identified in the most fence-breaks (DOUGLAS-HAMILTON, 1998). The collars transmitted each elephant’s location every hour via satellite to an online database that allowed analysis of its movements.

In 2012 Wahome’s observations showed that three bulls were involved in over 67% of all fence-breaks observed. Ishmael, Nelson and Ananais were all old, large bulls (between 35–40 years old). Wahome placed infrared camera traps along sections of fence reported as frequently broken. Their footage and stills showed a distinct “breaker” (Figure 4) that carried out the break whilst the rest of the group waited. Once the “breaker” had broken and crossed the fence, the others followed. Ishmael or Nelson was the “breaker” in all of the films. Followers tended to be younger and smaller bulls.

Once fence-breaking elephants were identified, they were talked about by people in a way that captured the complexity of our responses to them. Since 2010, we have interviewed smallholder farmers, pastoralists, conservancy/ranch managers, and conservationists, including the Kenya Wildlife Service (KWS), about these elephants. In the KWS and other conservation organisations they were called “problems”, “rogues”, or “notorious”. One conservancy manager described them as delinquents, as “gangs of bad elephants that teach each other how to

do bad things...like hoodies". A smallholder farmer called one particular elephant that frequently ate his crops a "monster". He said, "We all know this elephant. He's big, he leads a group of males. He breaks the fence and comes straight here when it's late and he knows we are sleeping. Last night, I ran out with a torch making noise, but it was no use. He ran towards me. He knows that we can do nothing to stop him".

Yet many people, particularly in organisations centred on animal welfare, use a language of empathy: seeing these individual elephants instead as the most "intelligent" or "evolutionarily successful" males. One member of such an organisation told me: "I can call males calm, social, friendly, or not intelligent, aggressive, and dangerous, depending on what I want. They are all just words loaded in meaning...problem elephants are a problem from our perspective and that is the conservation conflict...we define the problem, and by doing so make a problem".

Once Wahome identified an elephant, he shared the name and physical traits of the elephant with wildlife managers, and their names began to be used locally. By individualising and naming them, they became recognisable to those experiencing and managing elephant conservation conflicts. Once collared, those named elephants became even more visible. The KWS then sought advice from Space for Giants on which fence-breaking elephants should be the target of individual management interventions. In this way, the individualisation of elephants by Space for Giants made them targets of sanction.

| MANAGING THE "PROBLEM"

Space for Giants collared Ishmael and Nelson in 2010. A few months later the KWS de-tusked both of them. This involves the removal of two-thirds of both tusks with a chainsaw, below the nerve, when an elephant is immobilised, on the premise that it will lack the tools to break down fences (MUTINDA et al., 2014). Collar data show that compared to the time period before de-tusking, elephants crossed the fence more frequently to access crops in the same period a year later and a year after that. In the two years after de-tusking, Ishmael and Nelson crossed the fence almost daily. They were also spatially loyal in where they broke the

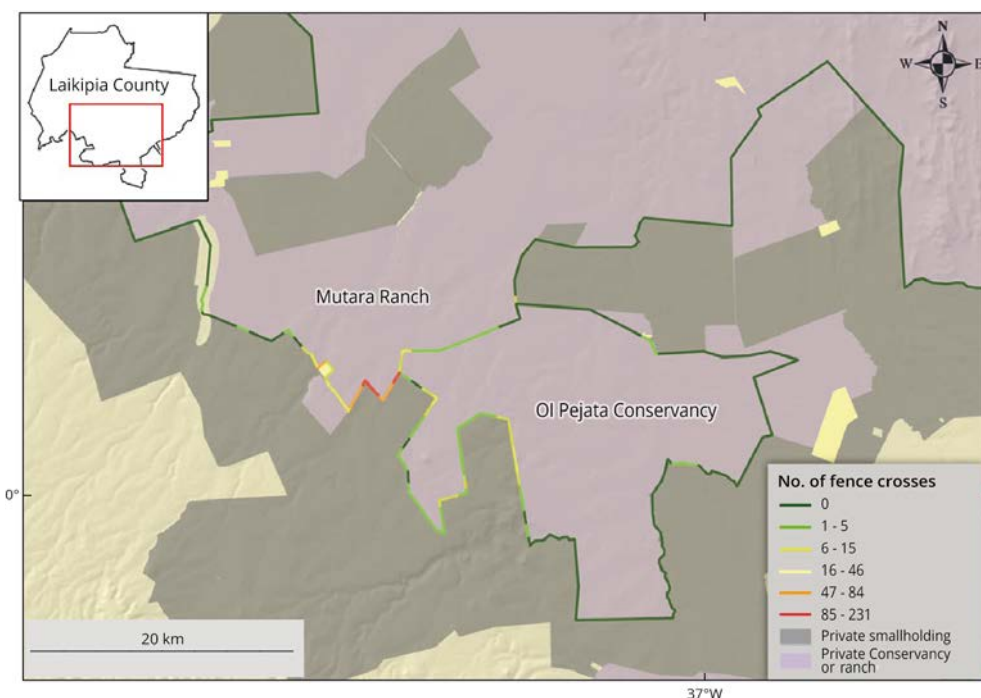


Figure 4 | Intensity of fence crossing by Ishmael (ascertained by GPS collar) per 100m along the Mutara Fence in 2012.

fence - Ishmael crossed two 100m sections of fence over 100 times in one year (Figure 4). In June 2013, the KWS translocated Nelson and Ishmael and ten others 200km to Meru National Park. Nelson died during the translocation. Ishmael spent all of the five months when his collar was working within Meru National Park. And his fellow translocate, Ananais, behaved similarly for the year after translocation, during which his collar was working. This may simply be due to the fact that there was not such a hard boundary between the park and smallholder land as in Laikipia. Although a park warden at the time did tell me that some uncollared translocated bulls began to associate with Meru's oldest, largest bulls and had "taught" them how to break the fence there.

Back in Laikipia, the year after translocation, Wahome identified bulls that had previously been recorded as following breakers, now beginning to lead fence-breaking. Wahome had identified Mweturia as being involved in 22% of breaks before the 12 bulls were translocated to Meru National Park and in 75% of breaks the year afterwards. The West Laikipia Fence

soon deteriorated and lay on the ground with elephants freely walking over it. Crop-raiding crescendoed. Mweturia ate crops voraciously, until one day in February 2018 when he walked south from the West Laikipia Fence to Solio Ranch. He was translocated the day he set foot there along with 19 other elephants 700km to Tsavo West National Park after farmers had experienced relentless crop-raiding. Unconfirmed reports claimed that most of the translocated elephants died en route.

Mweturia's collar died three months after he was moved to Tsavo West National Park. Before this, he spent 70% of his time outside of the park on land used for livestock keeping and cultivation. Back at the site of translocation near Solio, a bull elephant called Khulu remained. The year before translocation he spent 20% of his time on cropland, and in the year after this had slightly reduced to 17%. So the removal of 19 co-“problem” elephants did not have a significant impact on Khulu's crop-foraging behaviour. Crop-raiding continued despite fence-breakers having been removed in both translocations—they were replaced by a pool of followers.

| GOOD FENCES MAKE GOOD NEIGHBOURS?

The West Laikipia Fence, having laid in tatters for three years, was upgraded by Space for Giants and the Laikipia County Government from a tall six-foot design to a short design, a shorter 20 km, and an easier to maintain alignment (Figure 5) with protected posts and wires. Space for Giants had shown this to be the most effective design in deterring elephants because elephants have less purchase to break it. The upgrade of the Mutara fence was finished at the end of 2017. At first, elephants seemed bemused by the new design. Camera trap footage shows a group of bull elephants standing very still at the fence line, exploring it with their trunks. They did this for nine hours.

Yet within eight days of the Mutara fence being complete, a collared elephant called Naledi learned to break through gates put in place to allow livestock to pass. Space for Giants then electrified the gates. It took 29 days for an elephant to learn to break the wires of the short fence and cross once more into smallholder land. Since the completion

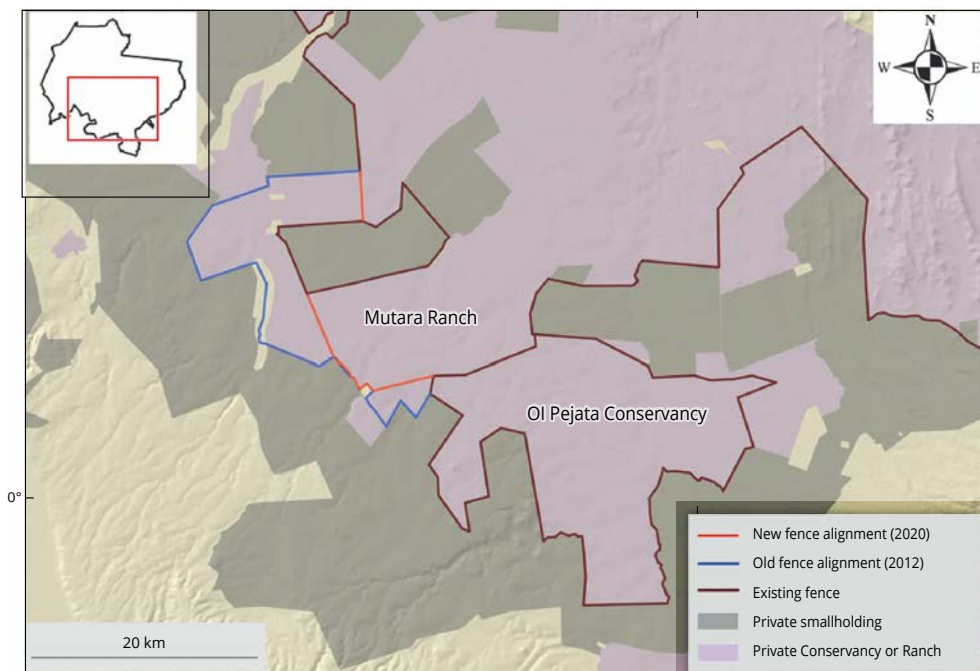


Figure 5 | New alignment map.

of the upgrade, from December 2017 to June 2021 the Mutara fence has been broken 55 times.

By March 2021 the whole West Laikipia Fence had been upgraded. Yet many elephants remained on the “wrong” side of the fence⁴. The KWS and Space for Giants wanted to get all elephants on the right side of the fence. With two helicopters and cars, they drove 49 elephants through a section of fence that had been opened. The scene was chaos for the elephants. A loud helicopter hovered above their heads, diving lower to move them over the fence, while three cars drove close to them, pushing them forwards. Tails up they ran. Females panicked as they got separated from their calves. Two bulls tried to attack the cars that followed them. The fence was closed behind them after they crossed.

4. Partly because of elephants moving through gaps in the fence, and also because of the conflict between conservancies and pastoralists in 2017 which saw the destruction of Kifuku ranch’s external fence and infrastructure. Kifuku ranch then became a refuge for elephants, used as a base from which to crop-raid.

However, two days later, the collared elephant Tumaini moved northwards to a length of fence that had the old tall design in a neighbouring privately owned cattle ranch and broke out onto smallholder land. Yet, for another collared elephant Imara, the newly upgraded fence posed a significant challenge. Imara stayed within 20 km of the fence for close to two months, having been driven across the fence. Until one day in May 2021, when a group of pastoralists damaged the fence by lifting it with sticks to enter the conservancy with their cattle, reducing the fence voltage, where Imara then broke to join Tumaini.

The evolution of the West Laikipia Fence, and elephant behaviour in response to it, has shown that, first, well-designed and maintained fences can reduce elephant conservation conflicts considerably: in 2012 the West Laikipia Fence at Mutara was broken 490 times, in 2020 it was broken nine times. Second, despite this, certain individual elephants learned to circumvent the fence. THOULESS & SAKWA (1995) describe an “arms race” between elephants and wildlife managers as elephants adapt to fence features. However, the upgraded West Laikipia Fence is as sophisticated a design as possible. The only option in an arms race is to build a parallel fence (which has happened on some conservancies in Laikipia). This leaves limited options for wildlife managers to further “manage” these individuals. Third, the upgraded fence not only prevents transgressions but also draws further attention to those elephants who are still willing and able to break it and, in doing so, solidifying them as “problems”.

I “PROBLEM ELEPHANT CONTROL”: THE ELEPHANT IN THE ROOM

Despite de-tusking, translocation, fence upgrading and an elephant drive, certain individual elephants continue to re-assert cropland as a “beastly place”. This pushes the KWS to face the last resort: the taboo subject of “problem elephant control”. In Kenya, before the poaching crisis in 2010, “problem” elephants were frequently shot, often to appease the affected community. Studies have suggested that shooting “problem” elephants not only removes the problem cheaply, but creates

a “barrier of fear” by the trauma caused for other elephants (THOULESS & SAKWA, 1995). Often the elephant’s carcass is left at the fence line as a deterrent.

OI Pejeta Conservancy lies just south of the West Laikipia Fence. After repeated crop-raiding and outrage from farmers living next to the conservancy, the KWS and OI Pejeta shot seven fence-breaking elephants between 2005-2010 to reduce conflict. They reported a considerable reduction in fence-breaking each time an elephant was shot, but over time fence-breaking increased to previous levels. Risk-taking behaviour, therefore, seems to be an ecological niche in bull elephant society that will always be filled. This means that “problem” elephants would need to be shot on an ongoing basis to actively select against risk-taking males in the population. Yet this strategy is not palatable politically and ethically to many groups concerned with animal welfare—including the KWS.

Animal rights groups have had considerable power and influence over the Kenyan government (KABIRI, 2010). We talked with a senior KWS official who was frustrated at the government’s position when individual elephants were destroying the lives and livelihoods of rural Kenyans. He told me that “it is very rare that the Cabinet Secretary should make a decision that an elephant should die...this is because of global activism: people internationally don’t want to see an elephant getting killed”. He asked, “why do we jail a rapist or murderer or criminal? We do it to remove them from society. But if an elephant kills a young boy in Dol Dol why doesn’t that go global?”

| CONCLUSIONS

Elephants are lively and powerful actors in Laikipia: moving across boundaries set by fraught and contested histories (BARUA, 2014 b; EVANS & ADAMS, 2018; LORIMER, 2010). Certain individual elephants are determined to maintain the landscape as a shared space, whatever the wishes and actions of their human protagonists (EVANS & ADAMS, 2018). That means that these risk-taking elephants and people will continue to mix in the same landscapes, with all the problems this implies.

This examination of the implications of being a “problem” elephant in Laikipia creates the following insights into understanding the complex entanglement of human and elephant lives. First, humans help to define the “problem” by individualising elephants and focusing attention on them from those managing and living with elephants. By recognising them as participants in elephant conservation conflicts and subsequently individualising them, conservationists make these elephants targets of sanction.

Second, “problem” elephants are, in effect, the ones in the room, the ones that are hard to discuss, the ones that create confusion and contradictions. Through interventions intended to manage their problematic behaviour, these elephants embody a convergence of contradictory ethical positions surrounding the value placed on human and nonhuman life and raise a number of critical questions for their conservation. For example, from a humanitarian perspective, how can people live alongside elephants that eat their crops in a fraught landscape where those experiencing the costs of elephants receive little benefit from their conservation? Instead, should those emboldened, destructive risk-taking males be shot and selected out of a population to make elephants more compatible as a species that can co-exist with humans? From an animal welfare perspective, interventions that focus on the individual elephant are undoubtedly traumatic for elephants and questionably futile if such individuals continue to break fences and eat crops.

Third, elephants are too vibrant and awkward to conform to the “binary spatial logic” of orthodox land use planning (LORIMER, 2010: 500). Protected areas as currently conceived are too small to accommodate significant numbers of elephants and too rigidly conceived to accommodate their need to move (EVANS & ADAMS, 2018). A more dynamic and resilient conception of animal spaces is needed to accommodate elephant agency (BENGTSSON et al., 2003). The management of elephant conservation conflicts and particularly of risk-taking elephants that do not adhere to our spatial logic will have to be less narrowly technical, taking account of the unique social and political context of the shared landscape and the agency, individuality, and subjectivity of elephants (EVANS & ADAMS, 2018).

Fourth, ultimately elephant conservation conflicts are defined by people’s tolerance of elephants and the impact they have on their lives. If conservation could work with people to build their tolerance of a few

persistent elephants with a predilection for crops, perhaps elephants and people could share space and a future in Africa. Policy interventions such as compensation, land-use planning, and the de-centralisation of wildlife governance and management, have been touted and used as ways to level out this tolerance. Compensation for elephant conservation conflicts, however, has arguably never been effectively implemented (see HOARE, 2015). Longer-term strategies such as land-use planning and the de-centralisation of decision-making relating to wildlife are far more difficult to implement but ultimately more successful than trying to impose a strategy of people constantly fighting politically against the presence of elephants (*ibid.*).

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ARTISTIC INTERLUDE 1

“LANTANA ELEPHANTS”

Shubhra Nayar, Paul G. Keil



INTRODUCTION

If you were in London between November 2020 and July 2021, you might have stumbled upon some members of the hundred-strong elephant herd ranging through the city’s Royal Parks. These spectacular elephants were not flesh and blood but made from the stems of a flowering plant called *Lantana camara* and harvested in India. Lantana is actually an invasive species in India, brought as an ornamental plant by British colonists in the early 19th century. It thrives in forest ecologies affected by hundreds of years of colonial and post-colonial timber exploitation and forest modernization, and now acts as a significant threat to elephant habitat. Unruly lantana growth is a monstrous expression of plantation ecologies (see MÜNSTER, 2021).

The “Lantana Elephants” project is part of the Co-Existence campaign, a partnership between the UK conservation NGO, Elephant Family and The Real Elephant Collective, a not-for-profit, socio-environmental enterprise based in Gudalur, a town in the Nilgiris hills of India. The Elephant Family envisioned a grand travelling installation, a huge herd of life-size Lantana Elephants migrating across several continents to raise awareness about the current threats facing elephants and raise funds for conservation. As partners, the Real Elephant Collective designed and crafted these elephantine models.

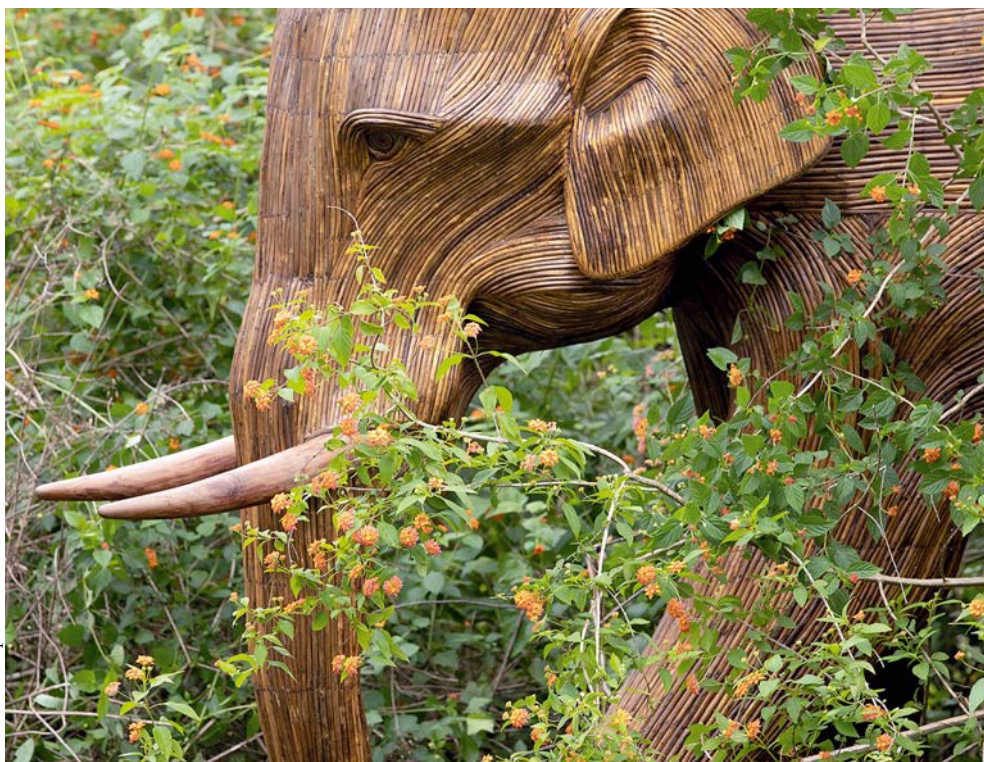


Figure 1 | Lantana bull among lantana plants.

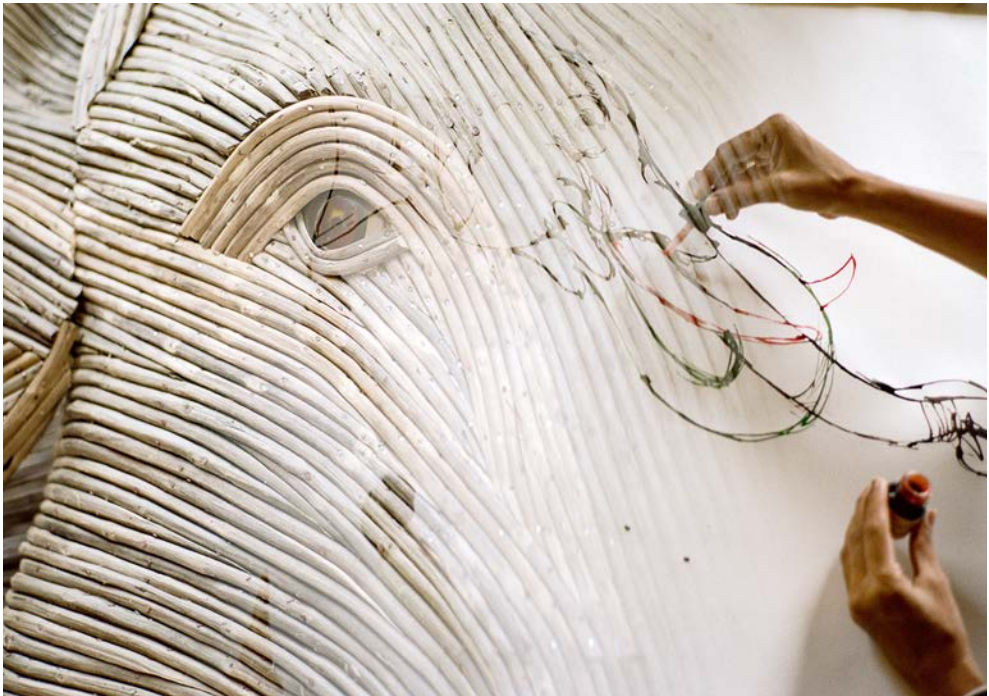
While media campaigns typically framed these elephants by highlighting the problem of habitat loss and human-elephant conflict, there are other ideas and processes behind their development worth foregrounding and which are relevant to understanding the complexities of what it means to live with elephants in the 21st century.

MAKING REAL ELEPHANTS

Some of the Lantana Elephants stand up to 10 feet at the shoulder and, to a degree, recreate the impression of being in the presence of these giants. The dried and treated lantana stalks lend the models an organic quality and invite tactile engagement. The eyes are somewhat larger than regular elephant eyes and more forward-facing, a subtle anthropomorphic modification that The Real Elephant Collective team found helpful in facilitating visitor's connection.

The Lantana elephants are not only life-size but also modelled on real-life elephants who range in Gudalur. An ongoing documentation and tracking research of elephant movement in the area by The Shola Trust, a partner NGO, has allowed The Collective's designers to create portraits of these nonhumans. Some of these elephants are familiar only to conservation groups, others are regular travellers through certain tea gardens, while a few individuals are wildly famous among the public: celebrities with their own names and admired personalities (such as the Nilgiris local hero, Nadodi Ganesan).

The Lantana Elephants have histories and biographies. The Real Elephant Collective Team wrote detailed backgrounds for some of these individuals. These biographies can help visitors imagine these lantana models in vital and nuanced ways, and regard them as more than merely representative of an animal or a species. While it is not unusual for BBC documentaries to use personality to make wildlife engaging, the stories of Lantana elephants are not just a narrative device. They are characterisations that capture the idiosyncrasies of local bulls and herds



© M. Turek

Figure 2 | Nayar inking a Lantana elephant design.

who live in a certain place and are a testament to a relationship they share with local people. They are individuals that have become known through repeated observation and interactions, portraits of elephants only possible from the intimate familiarity that comes with sharing a landscape with them. Lantana elephants are representations of more-than-human persons that need to be understood within the context of their ongoing ecological, social, and interpersonal relationships with humans in the Nilgiris.

Despite the static nature of these model elephants, visitors frequently comment on the uncanny sense of movement evoked by the body. This is surprising given the restrictive material nature of skeletons made from iron and an epidermal layer crafted from dried lantana. Depictions of action are subtle: the characteristic elephantine tilt of the head, curl of the trunk, or a raised back leg. The most powerful sense of animacy emerges not from the body positions but from the “flow of the sticks”—the fluid lines that give form to the elephant’s body.



© The Real Elephant Collective

Figure 3 | Crafting a Lantana elephant foot.

Learning to work with and exploit the possibilities of lantana in this manner was a process of skilled craftsmanship that developed over time as more elephants were made. Coordinating with the designers who drafted models of each animal is a group of men and women who labour to weave together iron and wood and give form to the Lantana Elephants. These members of the Real Elephant Collective are *adivasi* and from the Kurumba and Paniya communities—peoples indigenous to the Nilgiris. Many of these people come from families and villages whose livelihoods are in close relation with forest landscapes and their nonhuman inhabitants, including elephants (for example, see BIRD-DAVID, 1999)

To understand how the Lantana Elephants are imbued with animacy that seems to exceed the limits of their static materials requires grasping the role of the indigenous craftspersons. Making elephants is a creative process. These artists do not simply follow a design but are invested in bringing forth an individual with a unique character. The flow of the sticks seems to capture the lines and musculature of the elephantine body and reveals a familiarity with how these animals look, feel, and move. The capacity to capture elephants in this way is a talent that possibly results from the fact that these indigenous peoples have a history of living in proximity to wild elephants.

THE TENSIONS AND POLITICS OF CO-EXISTENCE

Through their sheer size, power, and intelligence, wild elephants are potentially dangerous. Being in the presence of elephants requires people to take care; they affect and transform how people use space. Walking among the herds of lantana giants in the royal parks of London might give some sense of the formidable nonhuman agency that people who live near elephants are subject to. Perhaps it seems out of place or unreal that these archetypal wild beings have been transplanted into spaces like London, with herds temporarily co-opting its quaint urban parks.

However, this overlap of human and wildlife worlds is neither aberrant nor impossible—the installation calls attention to the reality that people and elephants do actually live together in such a manner. In places like Gudalur, elephants will regularly roam among tea gardens and densely



Figure 4 | Adivasi craftsmen escorting a finished elephant.

populated human habitats and, by doing so, interrupt how people use that space. Interspecies co-inhabitation with such a formidable being is a mundane occurrence for many in India.

Hopefully, this also reminds people in London that the urban park was once shared territory with their own wild animals and may well be again. If people can live with such a large and potentially dangerous animal on a daily basis, it may not be such a big leap for those living in London to invite animals back into their worlds. Lantana elephants can inspire an openness to rewild.

If there were a soundtrack that accompanied this travelling installation of Nilgiri elephants in the UK, it would not necessarily be the sensual sounds of the nonhuman jungle—this is the fantasy of the untouched wilderness. Instead, we would hear elephant rumbles accompanied by the sounds of people, whether it is the excited chatter of observing crowds and the artificial clicks of mobile phone cameras or the anxious shouts of farmers attempting to frighten elephants away from agricultural plots. Sharing space with such an animal can be a tense and exciting encounter, but as we found with the story of celebrity Ganesan, some elephants and people have learnt to tolerate and live passively alongside each other.

In Gudalur, despite seeing elephants on a regular basis, people are still captivated by these giants. The same farmer intensely frustrated with elephants eating their crops will also happily engross themselves for several hours, watching elephants feed, play, or give birth. Elephants interrupt life in negative and positive ways. Co-existence is multi-faceted and complicated. It can be violent and caring, accommodating or in conflict. The Real Elephant Collective found that for visitors to the Lantana elephant installation in Kerala, India, the life-size models have the capacity to evoke a variety of stories, feelings, and memories of encounters with elephants.

The Lantana models are possessed by some of that charismatic elephantine power and demonstrate how many humans around the world share a connection with these nonhumans. It is this seemingly universal magnetism of elephants that enables their “cosmopolitan” quality—they are beings who can “forge connections across difference” (BARUA, 2014: 560). Elephant bodies are enacted in diverse ways, and their meaning and form can vary depending upon the cultural context through which they



Figure 5 | Lantana herd at the water's edge.

travel. Audiences in the UK perceive wild elephants through colonial-inspired stories of exotic Otherness and wilderness, stories through which they approach and are charmed by the installation.

Referring to a previous migrating Elephant Family exhibition—Elephant Parade—Barua argues that through the elephant's cosmopolitanism, these models can “[generate] concerns about conservation” (BARUA, 2014: 8) and reconfigure relations with animals, people, and landscapes in distant places. The Lantana Elephants ask more of its British audience than their conservation awareness, concern, and funds. It also asks people to recognise and inherit the problematic story of this invasive species that connects the society and ecology of India and England. *Lantana camara* was able to colonise elephant habitat because forest was cleared for tea gardens and teak plantations to build tea chests, all products to be sent to England at the time. Environmental modifications under British colonialism are deeply implicated in the current endangered status of the Asian elephant and “human-elephant conflict”. Even the personal, political, and consumer choices that people in the UK currently make in their daily lives can have detrimental environmental effects in other countries.

The problems of “conflict” cannot be solely located at the margins of society, at the boundary of forest and field, at the embodied juncture of rural farmer and elephant. There are broader social forces that have structured and continue to make co-existence with elephants in these spaces difficult. Hopefully, meeting some of the travelling Lantana herd members presented an opportunity for people who live in urban and global centres of power to reflect on their troubling and complicated interconnection with these distant places and come to a better understanding of the problems that Asian elephants—and the humans they live alongside—are currently facing.

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PART 2

LIVING WITH ELEPHANTS

1. FROM DEEP HISTORY TO FUTURE IMAGINARIES

CHAPTER 5

WAR ELEPHANTS AND FOREST PEOPLE

Thomas R. Trautmann

| REVISITING THE ROLE OF FOREST PEOPLE

In my book *Elephants and Kings*, I elicited the main features of a deep history of war elephants in India from the time of the early agrarian civilizations and the logic of patterns that accompanied its spread to the Middle East and North Africa, Southeast Asia and the southwest of China (TRAUTMANN, 2015). The picture that emerged has areas that need clarification, but the substance of it is clear enough.

I revisit here my argument that the war elephant was invented in North India, in association with kingship. In this chapter, inspired by the ethnography of Nicolas Lainé, I should like to reexamine the role in this process of what the ancient Indians call “forest people” and the possibility of their possessing a parallel tradition of elephant capture and use, as he suggests (LAINÉ, 2018; 2020).

There is no evidence of the war elephant anywhere in the world before the late Vedic period, at or after 1000 BCE; and by 500 BCE, or slightly after, the time horizon of the life of the Buddha, according to the Pali Canon of Theravada Buddhism, the war elephant had been normalized as an institution of North Indian states. With this new leg of the army, it now goes upon the four legs of foot, horse, chariot and elephant; it is called the *chatur-anga-bala* or four-legged-army. The Greek writer

Ctesias (5th century BCE) showed that the Indian war elephant was known to the Persian empire of his time. He argues that India had not been conquered by foreigners because of the war elephant, confirming thereby its Indian origin (NICHOLS, 2013).

Although there is no evidence of the war elephant prior to that time, kings ruling the early agrarian civilizations of the Old World had been powerfully drawn to elephants as symbols of their own preeminence. The attraction of elephants as symbolic capital for early kings was not, however, beneficial to the elephants. Kings engaged in hunts of elephants (Assyria and Mesopotamia, Egypt, China), sacrifices of elephants for the funerals of kings (predynastic Egypt), taking of young elephants in tribute (Assyria, Egypt), and capture of young elephants for display in the royal capital (Egypt, Mesopotamia, Indus Civilization). There is, however, no good evidence of the riding of captive elephants, let alone their use in war, until the invention of the war elephant by kings of India. From North India, the institution spread to South India; the Hellenistic kingdoms of Syria (Seleucids) and Egypt (Ptolemies), Carthage, the Indianising kingdoms of Southeast Asia, and Yunnan in China (Figure 1).

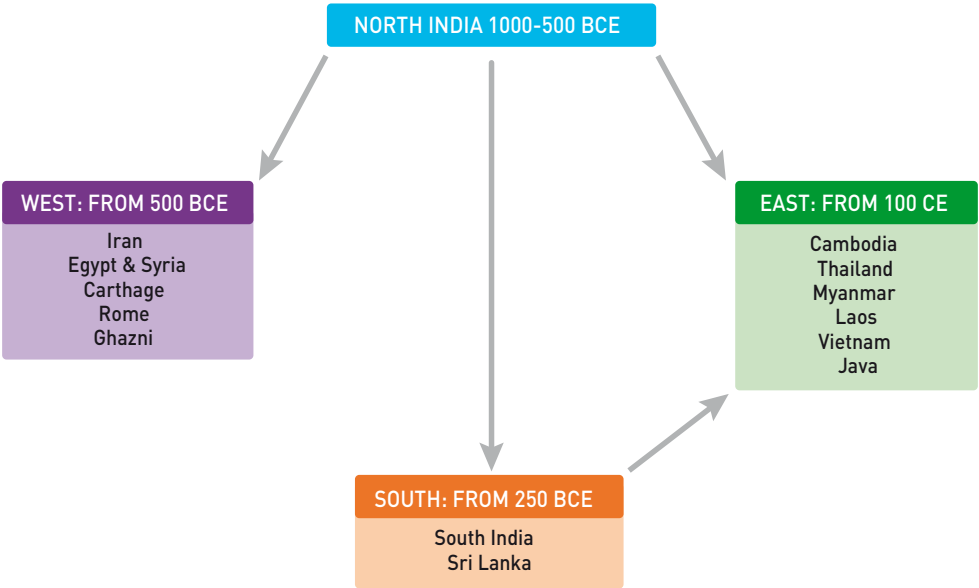


Figure 1 | Diffusion of the war elephant.

The invention of the war elephant abruptly changed the effect of humans (more especially kings) upon elephants, from deleterious to protective. The early agrarian civilizations had increased human pressure upon elephants, and the spread of intensive agriculture into the forest habitat of elephants afforded loci for conflict through elephant crop-raiding, which impinged upon the interests of kings, whose wealth derived largely from farmers. But once Indians began to capture and train elephants for warfare, in the large kingdoms that could afford the expense of upkeep, wild elephants were revalued as a living military store, while war elephants became a critical military asset.

The logic of this revaluation was given in the fact that the elephant is the largest terrestrial animal in our time and does not reach maturity, and usefulness in war, until the age of twenty, according to the *Arthashastra* (KA 2.31.9.), whence it is best left to feed itself and be captured and domesticated from the wild not once for all time, but one by one through the ages. By these means, the Indian kingdom came to be attached to its opposite, the elephant forest. The royal hunt, by the new logic, was reconfigured as a hunt from *atop* elephants, for animals *other than* elephants; and the killing of elephants for food and ivory by forest people was punished by death. The effects were profound. In Syria and China, where the war elephant was *not* taken up, elephants were hunted to extinction; while wild Asian elephants persist today in places which formerly had war elephants and thus *protected* wild elephants, namely (from most to least numerous today), India, Myanmar, Sri Lanka, Indonesia, Thailand, Malaysia, Laos, Cambodia, Bhutan, Bangladesh, China (i.e. Yunnan), Vietnam, and Nepal (SUKUMAR, 2011: 319; TRAUTMANN, 2015).

Those who are often called tribal people are, in the ancient Indian texts, regularly identified with the forest, as “forest people” (*atavi*, *vanacara*). As seen from the vantage of the emerging kingdoms, such people were not conceptualized in relation to a certain kind of social system, toward which the word “tribe” gestures, but an environment, specifically the forest; and that environment was the one preferred by elephants.

What was the effect upon forest people of the world created by Indian kings with elephants, a world governed by a new logic surrounding the production of war elephants out of wild ones by the large kingdoms? The effect we can readily identify is the royal protection of elephants, which would have fallen heavily upon hunters among forest people,

especially those hunting elephants for food and for ivory. Forest people would have been harmed by the revaluation of elephants and the royal ban on elephant hunting.

Paradoxically, royal protection of wild elephants in the royal elephant forest against hunters rested to a significant degree upon forest people employed by the king, if we consult the *Arthashastra* on the matter. The king is advised to establish an elephant forest at the frontier, guarded by forest people and with the help of elephant-forest wardens, keeping under surveillance the boundaries, entrances and exits. The overall objective is to thwart the hunting of wild elephants for food or ivory:

“They should put to death anyone who kills an elephant. Anyone who brings the two tusks of an elephant that has died naturally shall receive a reward of four and a quarter *panas*”(KA 2.2.6 and 8-9).

Forest people and others keep track of elephant demographics and movements on a regular basis for the making of a written record:

“The elephant-forest wardens, assisted by elephant keepers, foot chainers, border guards, forest people, and attendants—their body odors masked by rubbing elephant urine and dung, camouflaged with branches of Bhallataki-tree, and moving about with five or seven female elephants as lures—should find out the size of the elephant herds by means of clues provided by where they sleep, their footprints and dung, and the damage they have done to river banks”(KA 2.2.7).

When the king came to designate an elephant forest, we may take it that forest people already inhabited the same forests. Some of them were drawn into the royal service by the proffer of a wage to help guard the wild elephants against hunters, who may be forest people themselves. Those wages would have been at the lowest end of the scale of wages and salaries, which the *Arthashastra* gives in some detail. For the overseers of the elephant corps and of the elephant forest, the pay is 4,000 *panas*; for the elephant trainer, 2,000 *panas*; and for the guards, 60 *panas* (KA 5.3.11-12, 17.).

This is about as much as the *Arthashastra* says about forest people specifically. They are not mentioned as such in other roles, which are discussed by function rather than ethnic composition, and we are left to wonder in which of these roles forest people would have been employed. In practice, many of these roles may have been filled by forest people, especially those of mahouts (drivers), who are listed among the lowly-paid even

though their skills are essential and, deprived of which in battle, turns a war elephant into a menace to his own side. The trainer is paid distinctly more, and here, too, we may suppose at least some of these would be forest people, if only because they appear as trainers, notably in Assam and other places, in recent times (KA 5.3.12; TRACEY, 1963). It would be reasonable to suppose that many of these roles were performed by royal servants recruited both from forest people and villagers.

The testimony of the *Mahabharata* has a different character in that it speaks of named ethnicities (as distinct from the generic, nameless forest people of the *Arthashastra*, in an unnamed state in an undesignated region of India). Forest people are among the elephant drivers and fighters from elephant back, which shows that military roles as distinct from care-and-management staff will also have been filled in part by forest people. These include Kiratas and Nishadas, Easterners (Prachyas) and Southerners (Dakshinatyas), and Barbarians (Mlecchas) (Mbh. 8.17.1-4; TRAUTMANN, 2015).

The picture so far, sparse as it is, implies that individuals among forest people took up service at a wage from kingdoms. It is not much of a leap to suppose that those positions were passed on through family lineages so that there grew up among forest people (as among non-forest people) lineages of royal servants who learned their skills through unpaid apprenticeships to their fathers or uncles, since it is a common pattern in India for skilled workers and their knowledge to be organized in that way. Such lineages are shown by Piers Locke among the Tharu elephant men at Chitwan in Nepal, under the royal family until very recently, whose sons and nephews, serving as apprentices in the elephant camp, had food (*dal-bhat*) and lodging for free, but at no pay, while they learned the trade (LOCKE, 2006). The unwritten practical knowledge that was transmitted in this way from one generation to the next continued in this mode over the three-thousand-year history of the war elephant.

Besides the mahout, then, and also the trainer, forest people probably occupied roles in the catching of wild elephants for training, too, again because we find them in such roles in recent times. This is abundantly the case in Assam, in its larger boundaries under the British and in the early days of Indian independence, but including now a much-reduced state of Assam, plus Meghalaya, Mizoram, Manipur, Nagaland and the Sylhet District of Bangladesh (S. S. Bist in MILROY, 2002). Here, under the *mela shikar* form of capture by lassoing, the highly skilled

role of *phandi* or lassoer, wielding the *phand* or lasso, is above all in the hands of forest people such as the Khamti, according to Stracey, whose methods have been the object of the ethnographic study of Nicolas Lainé (LAINÉ, 2020). These people, linguistically related to the Shans of Myanmar, raise interesting questions about the origin and spread of the *mela shikar* form of capture. As Stracey notes, Assam in the valley of the Brahmaputra River is not only a prime location for wild elephants and elephant capture for trade, but it is a corridor of connection between two worlds constructed with elephants—India and Southeast Asia—along which techniques of elephant capture, training and management could move from India to Southeast Asia, or from Southeast Asia to India. The Ahom kings who ruled Assam for several centuries were a war-elephant-using people, linguistically related to the Shans of Southeast Asia, who will perhaps have brought some elephant-handling techniques with them; although the text of elephant science or *gaja-shastra* is attributed to them, the *Hastividya* appears to be well within the tradition of such texts in India.

However that may be, it is certain that forest people were regularly involved in the most skilled aspect of *mela shikar* in the Assam of recent times; most skilled because the lasso was thrown while the *phandi's* trained elephant was chasing after the wild elephant target at speed, and often through forest with all the hazards that posed for a *phandi* trying to throw the lasso while trying not to be knocked off his mount by the branches of trees. Dangerous, too, to the target elephant, who could be strangled by the noose if it were not checked by a wooden peg quickly put through the rope at the right point, to stop the noose from closing tight around the elephant's neck.

Thus the roles of forest people can be expanded from the cryptic statements of the *Arthashastra* to include tracking and protecting wild elephants, serving as driver or mahout, and in operations of capture and as trainer after capture. It is likely that in all these roles forest people formed lineages of specialized knowledge and its transmission. But in all truth, these would not be massive formations involving large numbers of forest people, but some few specific lineages of them, though the practical knowledge of which they were the custodians and the embodiment was critical to making a certain kind of world with elephants.

It is apparent from what I have said so far, I hope, that the deep history of the war elephant can be greatly enriched by attention to ethnographies

of elephant-involved human groups in the present, illustrated here by the work of Locke and Lainé, and bringing it into relation with ancient and medieval sources of history, that is, through a collaboration of history and anthropology, the one working upon the past but reaching forward in time, the other working in the present but reaching back in time for connections (LOCKE, 2006 ; LAINÉ, 2020).

Because of the long continuities of practice over the three-thousand-year duration of the war elephant signalled by such examples, we can be confident a collaboration between (ancient) history and (present-day) anthropology can be successful in extending our knowledge of the deep history of the world made with elephants in India and Southeast Asia. This may give us reason to ask what may have been the role of forest people, if any, in the *invention* of the war elephant.

| THE CONTRIBUTION OF FOREST PEOPLE

When I wrote my book, it was my belief that the war elephant was invented but once and that it was invented in India and spread elsewhere, including the very receptive region of Southeast Asia. My reasons were several. I believed the war elephant needed a state society of a kind afforded by the adoption of agriculture, sustaining a large army, and capable of organising the complex teams of specialists to capture, train, feed and otherwise manage and care for the health of elephants. I supposed that such teams included forest people as the *Arthashastra* attests, but were essentially formations of kingdoms of ancient North India. That states were essential seems to be proven by the emergence of the war elephant in Southeast Asia in connection with the first kingdoms there in the 1st century CE. The widespread use of such tools as the *ankusha*, the two-pointed hook for guiding and restraining the war elephant, is a sign of the once-only, state-sponsored invention of the war elephant and its spread from a centre in North India. Forest people, having political formations at a smaller scale, do not seem to be candidates for the invention of the war elephant.

We need also to consider the prior domestication of the large farm animals, including cattle, sheep and goats, plus the horse, which was largely

confined to military use drawing chariots under yoke, on the part of Indo-Aryan speaking peoples closely related to the Iranian peoples, also associated with horse breeding. The mastery of practices needed to manage these large domestic animals must have been an essential precursor of the invention of the war elephant. This is another reason to look to the early agrarian states as the locus of the invention of the war elephant. A final reason would be the movement of such states from horse country in the Indus valley, eastward into the elephant-populated monsoon forests of the Ganga valley, which is the likely place of the invention.

However, reading Lainé's ethnography of the Khamti (LAINÉ, 2020) has made me want to keep an open mind about the contribution of forest people to the invention of the war elephant. His work shows a non-war-related practice of capturing, training and employing elephants in small-scale timber extraction, which has a profile quite different from that of the war elephant, in that wild elephants are captured singly by *mela shikar*, and they are captured *young*, at an age when they are more tractable, not offshoots of the war-elephant complex, he suggests, but a second, parallel tradition of elephant management (LAINÉ, 2018). To be sure, the international trade in tropical hardwoods is a formation of the colonial era, not of ancient times, so the evidence needs further examination. Still, we see here a pattern of practice independent of the war elephant, one which does not depend upon a state.

One point of attack is suggested by the splendid book of P. D. Stracey, *Elephant Gold*, written from the experience gained during a long career in the capture of elephants for the government of Assam (STRACEY, 1963). Stracey's book points out that Assam and the valley of the Brahmaputra River is a corridor connecting India and mainland Southeast Asia and that beliefs and techniques about elephants have moved in both directions across this space. He gives us a survey of the various methods of capture in India and Southeast Asia, presenting it as a historical geography combining knowledge of current methods with some references to ancient sources, notably Megasthenes. This is a sketch, but a very good one, on which we might work. Perhaps a place to start would be the catching practice of *mela shikar*. It is a method that combines simplicity (capture of a single elephant at a time) and great skill and courage (lassoing); it is found both in India and in Southeast Asia; it is associated with forest people; it focuses not upon large male tuskeders to be trained for war, but younger, smaller elephants for riding and work. Possibly the

Stracey historical geography of methods of elephant capture could be a starting point for a collaboration between sources, both ethnographic and historical.

It is far too early to say whether the kind of collaboration proposed can answer the questions I have posed, but at this point, it seems a good prospect. To be sure, the first domestication of farm animals and war horses is only partly knowable in the absence of much direct evidence; there is no reason why the invention of the war elephant should be any different. Still, the evidence we have makes it probable that forest people were present at the creation and will have had pertinent knowledge of elephants that would have made them essential to the invention of the war elephant. It is possible they even had their own practices of capture and training of elephants.

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CHAPTER 6

TUSKS OF WISDOM

The elephant in the Buddhist art of Kanaganahalli, southern India

Srikumar M. Menon, Anindya Sinha

INTRODUCTION

The Asian elephant *Elephas maximus* has always occupied a prominent place in the art of the Indian subcontinent. From Harappan seals (MENON, 2002) to later depictions in Buddhist, Hindu and Jain art, the elephant is arguably the most commonly depicted animal in south Asian culture. In this paper, we discuss the depictions of the Asian elephant and its cultural implications at a recently excavated Buddhist stupa at Kanaganahalli in Karnataka state of southern India.

Kanaganahalli and Sannati are two villages in this region where the remains of an extensive Buddhist religious landscape were unearthed over the last two decades of the 20th century. Although the existence of a Buddhist past in this region was suspected as early as 1954 (SESHADRI, 1965), it was only after excavations from the mid-1980s onwards that definitive evidence began to emerge (POONACHA, 2011). Evidence for a settlement site near Sannati village (SUNDARA, 1988) and brick and limestone stupas (HOWELL, 1995) preceded the discovery of the remains of the Great Stupa at Kanaganahalli (POONACHA, 2011).

| THE BUDDHIST STUPA AT KANAGANAHALLI

The extant structure of the Buddhist stupa at Kanaganahalli consists of a large, stepped cylinder, which must have been surmounted by a now-missing dome, surrounded by a railing. Excavations reveal that the monument possibly began as a simple earthen mound in the 1st century BCE, during the reign of the Mauryan dynasty (POONACHA, 2011). The structure was enlarged and embellished in phases, stretching till the 3rd century CE, by the succeeding Satavahana rulers (POONACHA, 2011), encompassing both the *Hinayana* as well as *Mahayana* phases of Buddhism.

The structure in its final form, decipherable from its remains (Figure 1), had a diameter of 26 m, with a lower, larger cylinder – the Lower Drum, and a narrower, taller, upper cylinder – the Upper Drum. A circumambulatory path girdles the stupa at the ground level and is surrounded by a railing with entryways roughly in the four cardinal directions (POONACHA, 2011). The stupa is constructed of limestone, while rubble, earth and bricks were used to fill the limestone casing of the structure.



Figure 1 | An aerial view of the stupa showing its various components.

The railing of the stupa consists of uprights and crossbars, with a heavy coping running all across the top. These coping stones have images of real and mythical animals, all shown moving from right to left, indicating the clockwise direction of circumambulation, which a devotee should follow. The Lower Drum, 1,2 m high, was clad with 76 limestone slabs, each 0,75 m in width. Four ritual platforms, known as *ayaka* platforms, projected from the Lower Drum, corresponding to the four entryways. Above the Lower Drum is a cornice running all around the Upper Drum, an imitation of the higher-level ambulatory, common in many stupas. This element possibly functioned as a flower receptacle for devotees to deposit their offerings (POONACHA, 2011; SETTAR, 2020). The Upper Drum, 3 m in height, is taller and encased in 60 slabs, each 1,2 m wide, held in position by a collar at the bottom and weighted down with a frieze at the top. The frieze stones were also embellished with figures of real, as well as mythical, animals, proceeding from right to left, reinforcing the indicated direction of circumambulation.

The Lower and Upper Drum slabs were decorated with sculpture in shallow relief, mostly pertaining to the *Jataka* stories of the Buddha in his previous births (RHYS DAVIDS, 1929), narratives from the life of the Buddha or that of his disciples or followers, historical events or of individual people, including prominent rulers (ZIN, 2018). As very few of the Lower Drum slabs remain *in situ*, the sequence of these slabs is undeciphered, with certain narratives having been put forward (ZIN, 2018). The stupa has been enlarged at least twice in the history of the monument, necessitating the introduction of additional slabs encasing both the Lower and the Upper Drums. These slabs were possibly carved more than a century after the initial slabs were embellished, with the difference in treatment by their respective sculptors often evident.

| ELEPHANT DEPICTIONS AT KANAGANAHALLI

The Asian elephant has been depicted on various components of the stupa. Beginning from the railing and working our way inwards, elephants are represented on the coping stones of the railing (Figure 2a), Lower Drum slabs (Figure 2b), friezes on the *ayaka* platforms (Figure 2c), Upper Drum slabs (Figure 2d) and the friezes running above them (Figure 2f).





Figure 2 | Depictions of elephants on the various components of the stupa.

- a- One of the stones that formed the coping of the railing encircling the stupa.
- b- One of the Lower Drum slabs of the stupa, known as the *Bhavachakra* panel, depicting an elephant-drawn cart.
- c- A portion of a frieze from an *ayaka* platform depicting the transport of the relics of the Buddha.
- d- An Upper Drum slab, showing the Satavahana king, Satakarni donating silver lotuses to the stupa, with his royal mounts portrayed in the lower register.
- e- Detail of an Upper Drum slab, showing Chhaddanta, the six-tusked elephant, in a lotus pond with other elephants.
- f- Part of an animal frieze situated above an Upper Drum slab, depicting an elephant in musth.

There are also depictions of elephants on certain special elements, such as the components of finials, atop the dome of the stupa. The popularity of elephants as subjects for the Kanaganahalli artisan is revealed by the fact that 19 out of the 60 Upper Drum slabs contain prominent representations of elephants.

We present an analysis of the elephant sculpture of Kanaganahalli under three broad themes: the natural history and biology of elephants, the handling and behaviour of captive elephants, and the elephant as a symbol in Buddhist religion and rituals.

| THE NATURAL HISTORY AND BIOLOGY OF ELEPHANTS

The artisans who worked on the Kanaganahalli stupa were clearly familiar with the elephant, as evident from their mastery in depicting the anatomy and physiology of the species in their art. It is noteworthy, however, that similar skills are lacking in representations of, say, the camel. Interestingly, depictions of camels at Kanaganahalli exclusively feature the two-humped Bactrian camel, never encountered in southern India historically and hence, potentially unfamiliar to the contemporary artisans.

The anatomy of the elephant has been very skilfully depicted in most sculptures at Kanaganahalli. For instance, the profile view of the fore-quarters of adult male elephants has been portrayed in many of the Upper Drum slabs as the royal mount of historical and mythical kings. These depictions show the accuracy with which certain features, such as the folds of the ear, wrinkles around the eye, the forehead bump, or the tusks and lower jaw, have been carved. Of similar exactness is the frontal view of an elephant sculpted on one of the friezes on an *ayaka* platform, depicting a scene in which the armies of the demon Mara attempt to distract the Buddha from attaining enlightenment. Another *ayaka* frieze showing the transport of the relics of the Buddha—a recurrent theme in stupas—is stunning in its fidelity to the form and gait of the Asian elephant. An excellent example of the ability of the sculptors to execute the form of the elephant in deeper relief than on the slabs is also revealed by a unique finial element of the stupa.

Most depictions of elephants at Kanaganahalli feature captive individuals. The only scene in which elephants are shown in their natural habitat is on one of the three Upper Drum slabs and concerns the *Chhaddanta Jataka*—the birth story of the six-tusked elephant, the Buddha in one of his previous births. The narrative on the panels is of Chhaddanta (“six teeth” in Sanskrit), the six-tusked elephant and his two wives, who live happily in the forest, occasionally frolicking in a lotus pond. A detail of this panel (Figure 2e) shows how elegantly the six tusks of Chhaddanta and the tusks of the females have been depicted. Later in the story, the younger wife becomes upset by her perception of the preferential treatment meted out by Chhaddanta to his older wife and takes her own life, only to be reborn as the queen of Varanasi. She then convinces her husband, the king of Varanasi, to commission a hunter to kill the tusker and saw his tusks off. The hunter achieves this objective with the active cooperation of Chhaddanta, a Bodhisattva or enlightened being. In a particularly poignant scene, the elephant assists the hunter in removing his tusks, saying, “The tusks of wisdom are a hundred times dearer to me than these, and may this good act be the reason for my attaining omniscience” (NIVEDITA & COOMARASWAMY, 1994: 254). Tragically, the queen, on seeing the tusks of the dead elephant, is filled with remorse and subsequently passes away, all perhaps an exercise in futility.

Remarkably, many depictions of elephants at Kanaganahalli show adult male elephants with prominent tusks and in a state of musth (Figures 2a, 2d, 2f). Several of the Upper Drum slabs thus reveal historical or mythical kings in the upper register, with their royal mounts—elephants and horses, shown in the lower register. The elephant, shown as the royal mount in Figure 2d, is in an advanced state of musth, with the flow from the temporal glands streaking its cheeks all the way to its mouth, as is typical in nature.

Another Upper Drum slab shows an ideal *Chakravartin* (literally, “wheel-turning monarch”, an ideal one, upholding the *Dharma*) with the seven jewels that such a ruler is required to possess (ZIN, 2018). The seven jewels are a wife, citizens and an army general, all sculpted in the upper register of the panel, while the Wheel of Law (*Dharmachakra*), a gem, an elephant and a horse are depicted in the lower register. The elephant “gem” in the lower register is also in a state of advanced musth, with temporal fluid streaking down its cheeks and into its mouth.

Trautmann has examined the Indian ideal of a war elephant in great detail, based on sources such as certain sections of the epics *Ramayana*

and *Mahabharata* that describe kingship and warfare, or the *Arthashastra* of Kautilya, the ancient Indian treatise in Sanskrit (3rd century BCE), dealing with economics, statecraft and military strategy (TRAUTMANN, 2015). The canonical Indian war elephant was a fully mature male elephant with long tusks (*sudanta*, in Sanskrit); his ideal age varying from forty (*Arthashastra*) to sixty (*Mahabharata*) years (TRAUTMANN 2015); and ideally in a state of musth, thus ensuring a “state of heightened combativeness” (TRAUTMANN, 2015: 61), arguably more effective in warfare. Notably, a rutting elephant is a traditional trope in classical Indian poetry, as seems to be the case with sculpture, too, with several depictions of elephants at Kanaganahalli as being in musth (Figures 2a, 2d, 2f). The elephants, portrayed as royal mounts in the Kanaganahalli slabs, thus possibly represented war elephants, in accordance with the suggestion that “once invented, the war elephant served ever afterwards as the standard, and all other functions became secondary and derivative” (TRAUTMANN, 2015: 51). The depiction of the “elephant jewel” of the ideal *Chakravartin* is also in agreement with Trautmann’s observation that the enormous amount of manpower involved in capturing, training and deploying elephants in numbers needed for state warfare necessarily put the ownership of the pachyderms squarely within the realm of kingship.

| HANDLING AND BEHAVIOUR OF CAPTIVE ELEPHANTS

The elephant sculptures at Kanaganahalli yield ample evidence of the close acquaintance of the sculptors with the handling and behaviour of captive elephants at the time. They also depict elephants in warfare, providing rare insights into how war elephants were outfitted and handled on the battlefield.

Trautmann has noted that there is no evidence, in either literature or sculpture from early times, for the provision of a *howdah* on elephants during warfare (TRAUTMANN, 2015). This is borne out in all the depictions of elephants at Kanaganahalli. Elephant riders, whether mahouts or royalty (ZIN, 2018), are shown riding bareback, while the elephants are usually encircled with a girth chain or rope. One image clearly shows

the girth rope, as well as a unique harness attached to it, presumably to prevent the rider at the rear from tipping off. The sculptor accurately depicts the manner in which the rider at the rear of the elephant, where its back begins to slope downwards, tucks up his legs to prevent toppling over backwards. The details of this stance reinforce our conviction about the sculptors' intimate familiarity with elephants and their handling.

The war elephants, portrayed in the upper and lower registers of an Upper Drum slab, show part of an army arriving to receive a portion of the Buddha's relics (ZIN, 2018). The two registers of this slab represent three divisions of the army: the infantry, cavalry, and the war elephants. Historian Thomas Trautmann discusses the fourfold army, mentioned in ancient Indian texts, as having four divisions, namely the foot soldier, the horse, the chariot and the elephant (TRAUTMANN, 2015). The chariot is missing in this representation at Kanaganahalli, in spite of earlier Buddhist textual sources referring to all four divisions coming to receive the relics (ZIN, 2018).

The elephant in the upper register, referred to above, has three riders—one sitting in front to control the animal, while an archer sits behind him, with an assistant at the rear, to hand him arrows from four quivers, three suspended on the side of the elephant and one hung from his ear. The lower register, however, depicts only one rider on the elephant. Both the elephants appear to be controlled by the use of *ankush*, an iron hook held by the riders, as in almost all depictions of elephants with riders on them at Kanaganahalli (see, for instance, Figure 2d). The *ankush* has traditionally been used to goad the elephant forward, as well as to restrain it, and remarkably enough, the form of the *ankush*—with points at the end of the shaft and on the tip of the hook—depicted in the stupa, has remained virtually unchanged over nearly two thousand years.

An uncommon use of the elephant, carved in one of the richly embellished Lower Drum slabs, known as the *Bhavachakra* panel (POONACHA, 2011) and usually not met with today, is that of two male elephants pulling a cart or a chariot (Figure 2b). We suspect that the vehicle could actually represent a chariot, as it is being pulled by two tuskers. It may also be relevant to note that virtually all elephants—depicted either in battle, as a royal mount or in pulling a carriage—at Kanaganahalli are tusked males. Female elephants had rarely been carved; they have been portrayed only as the wives or attendants of Chhaddanta or, in one panel, as a companion to a royal mount (Figure 2d).

THE ELEPHANT IN BUDDHIST RELIGION AND RITUALS

The elephant has featured conspicuously in Buddhist religious tradition and rituals. The legend of the Buddha narrates his descent into the womb of his mother, queen Maya, in the form of a white elephant, in a dream (ZIN, 2018). One of the Upper Drum slabs at Kanaganahalli depicts this dream of the queen in its lower register, where the Buddha is shown as an elephant at its top left corner. An elephant also features in an *ayaka* frieze as a member of the army of the demon Mara when they attack the Buddha, as he sits below the Bodhi tree on the eve of his enlightenment. This important event in the life of the Buddha is also depicted on an Upper Drum slab, wherein the elephant is exhibited prominently once again.

The elephant returns to us in several other contexts in Buddhist religious literature. The preaching of the first sermon by the Buddha after enlightenment is shown by the setting in motion of the *Dharmachakra*, or the Wheel of Law. This motif is repeated in several slabs at Kanaganahalli. It is noteworthy that although several animals, such as bulls and occasionally human figures, are featured in the pillar that supports the *Dharmachakra*, it is usually a trio of elephants that directly hold up the *chakra*.

The elephant also plays a prominent role in another legend concerning the Buddha. Devadatta, a scheming cousin of Buddha, hatches several plots to kill him, one of which involves setting a maddened tusker, called Nalagiri, upon him. This attempt fails when Nalagiri calms down in the presence of the Buddha and kneels before him in submission. This legend is carved on one of the *ayaka* friezes, which, judging from the depiction of the Buddha in human form, as well as the diminished quality of carving, could be from a later phase in the life of the stupa.

The elephant seemed to have formed an invaluable part of the religious ceremonies and pageants of early India. For example, the *ayaka* frieze, shown in Figure 2c, depicts the transport of the relics of the Buddha—an important event in Buddhist history—as do two of the Upper Drum slabs (ZIN, 2018). In all these sculptures, the relics are being carried in urns by riders on elephants. According to Buddhist legend, the relics were distributed into eight portions for eight clans, each portion

later enshrined in stupas, to which they were carried presumably by elephants, although, interestingly, some stupas in the Gandharan region are known to depict the relics being carried on camels (ZIN, 2018). Such use of elephants in important religious ceremonies apparently stems from the tradition of the war elephant, as described by Trautmann thus: "... some forms flow from kingship to religion, as when a god or a sacred relic or a newly published book is carried on elephant back, like a king." (TRAUTMANN, 2015: 49) It is noteworthy that religious pageants, similar to this, involving elephants, continue even today, as, for instance, in the Hindu temple festivals of Kerala in southern India (VIJAYAKRISHNAN & SINHA, 2019) and Buddhist Sri Lanka.

An interesting detail from the transport of the relics on the Upper Drum slabs mentioned above is the use of the ceremonial flywhisk in adoration of the relics. Ceremonial flywhisks, called *chamara*, usually made of yak tail hair, have been a common appurtenance of religious and royal adoration in Indian historical tradition. Similar rituals continue to be seen today in the contemporary temple festivals of Kerala, where the ceremonial flywhisk, called *venchamaram*, is an integral part of the pageant involving elephants. The similarity between the scenes, depicted in slab relief at Kanaganahalli and often encountered in the socio-culturally shaped pageants of today, thus hints strongly at the continuities that have persisted in religious traditions across the Indian subcontinent for over two millennia.

| CONCLUDING REMARKS

The Buddhist stupa at Kanaganahalli is a recently-excavated specimen of early Indian monumental architecture, approximately two millennia old. The stupa is richly embellished with carvings of mythical and historical events and the stories associated with them. The Asian elephant, in turn, has occupied an unusual position, historically, in statecraft and warfare, as well as in religion and ritual in the Indian subcontinent since very early days. They come together remarkably in the sculptural programme of the Kanaganahalli stupa, which testifies to the importance of the elephant in religious and secular life of the Indian subcontinent,

even two thousand years ago. And finally, the skill with which the exquisite elephant images have been carved in the stupa not only offers unique insights into elephant behaviour and the handling of captive elephants in India during the early centuries of the Common Era, but also reflects the intimacies that existed between humans and elephants within the co-constructed lifeworlds of the two species.

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| ACKNOWLEDGEMENTS

We wish to acknowledge the Archaeological Survey of India for kindly permitting photography of the stupa at Kanaganahalli, which is not yet open to the public. We thank Prof. Kailash Rao for his companionship and valuable help in the study of the stupa. We remember, with gratitude, the cheerful assistance of the late *Azeem Bhai* on site at Kanaganahalli, and wish to dedicate this paper to his memory and the wonderful times spent together.

CHAPTER 7

FROM THE MOUTH OF THE MAHOUT

A review of elephant command words

Teckwyn Lim

I INTRODUCTION

People have been catching and taming elephants for thousands of years (SUKUMAR, 2011; TRAUTMANN, 2015). The ability to keep and ride elephants changed the course of history. However, the origin of the art of elephant taming is shrouded in mystery. We do not know when or where elephant culture originated or how it spread. Some clues come from the peculiar jargon that mahouts use to command elephants. Studying the variation of these command words may help reveal the origin of the art.

People have been hunting proboscidea for tens of millennia, but taming is relatively recent. The earliest evidence of the live capture of an elephant is from Egypt, ca. 3750 BCE (VAN NEER et al., 2017). However, taming of the African forest elephant, *Loxodonta cyclotis*, probably only began ca. 285 BCE (GOWERS, 1947). In Asia, the elephant *Elephas maximus* was first captured ca. 2000 BCE in India and ca. 1000 BCE in China (SINGH, 1963). Elephant riding in India started about 500 BCE (SUKUMAR, 2011; TRAUTMANN, 2015). In Southeast Asia, elephant riding commenced ca. 285 CE in the Kingdom of Funan (YUNG, 2000: 12).

There are competing theories regarding the origin of elephant culture. The main theory suggests an Indian origin that spread west to Africa (CHARLES & RHODAN, 2007) and east to China and Southeast Asia (CRAWFURD, 1852; OLIVIER, 1978; ANN BAKER & MANWELL, 1983; MIKSIC & GOH, 2017). A converse view is that the art originated in China or Southeast Asia and then spread to India (KIPLING, 1891). A third possibility is that mahoutship commenced independently in more than one location.

In addition to archaeology, recorded history and cultural anthropology, historical linguistics is another approach for studying the evolution of elephant culture. One particular aspect of the language of elephant culture is its command words. These words are one of three means used to direct elephants, along with touch and gesture (RENSCH, 1957). Elephants remember tone, melody, and phonological form, allowing them to recognise more than 20 verbal commands (EDGERTON, 1931; RENSCH, 1957). Asian elephants typically learn at least eight basic words (WEMMER, 2000), including the directions “Go forward!”, “Halt!”, “Go backwards!”, “Sit down!”, and “Stand up!” (EDGERTON, 1931).

Elephant commands are often a peculiar jargon not used in everyday speech (SHEBBEARE, 1958). This peculiarity often points to the antiquity of the jargons (JENNER, 1992). As a result, similarities in elephant command words are thought to point to historical connections between elephant cultures (CRAWFURD, 1852; KURT, 2005; KURT et al., 2008). However, very limited etymological work has been done in this regard (ZVELEBIL, 1979).

Towards unravelling the history of elephant culture, this paper has three objectives: (i) to assemble a broad collection of elephant command-word lexicons; (ii) to compare the lexicons using a common set of command-word definitions; and (iii) to identify groups of elephant cultures based on the similarity of their command-word lexicons.

| METHODOLOGY

LEXICONS

I compiled elephant-command lexicons from both academic journals and grey literature. I made a focused search on South Asia and Southeast Asia. Particularly helpful was an unpublished compilation of nine commands

in 10 Asian languages presented by German veterinarian and elephant expert Fred Kurt at the European Elephant Management School (KURT, 2005). Similarly helpful was the compilation made by Schliesinger of 10 commands in four Southeast Asian languages (SCHLIESINGER, 2010). My analysis included 20 lexicons. These were compiled from a range of elephant cultures from 12th century India to 21st century Eastern Europe. Details of these lexicons are listed below (box 1).

COMMANDS

I assigned an English word to each command using the definitions below (box 2).

I excluded several words from the analysis. These included words for 16 commands that were only found in one lexicon (Table 1). In addition, the following were single, isolated commands: Perak Malay *koh dbulu* “go slowly” (BUTCHER, 1979); Java Malay *jěrum* “kneel down” (WILKINSON, 1932); and Terengganu Malay *těrum* “kneel down” (WILKINSON, 1932). The following were alternate words in Perak (LUBIS & KHOO, 2003): *chan-chan* “walk slowly”, *deh-deh* “to call it”, *resuk bintun* “retreat”; *resuk* is also used in, *kolong resuk* “turn left”. An alternate word in Myanmar was *yat* “stop” (KURT, 2005). I excluded *ai tshi tshi tshili bullibulli fist* – a command used in Central Europe to “animate” elephants before a circus performance and to command them to urinate and defecate (FREI, 2016). I failed to determine the meaning of the Sukhothai command word **တာဝမံဉ်** *taao wá-máep*. I excluded four command words from Perlis Malay as their glosses appeared jumbled: *ho dit* “go forward”, *koi-koi* “get down”, *saw* “go slowly”, *au* “pick up item” (MOKHTAR, 2006).

CLUSTER ANALYSIS

Recent advances in techniques of phylogenetic analysis have been used to study cultural variation, particularly linguistic variation (BUCKLEY, 2012). Together with other approaches, such linguistic analysis may explain the evolution of elephant culture. To perform this analysis, I compared the command-word lexicons using ALINE, a phonetic sequence alignment algorithm (KONDRAK, 2000). ALINE quantifies the phonemic distance between two words.

BOX 1

ELEPHANT COMMAND-WORD LEXICONS

1. Bangladesh (BD): 9 commands and 12 command words for “Bengal, Assam” (KURT, 2005).
2. Cambodia (KH): 9 command words used by Khmer mahouts (POU, 1986).
3. Europe (EU): In his online Elephant Encyclopedia, veteran Swiss elephant keeper, Georges Frei, gives some 17 command words that are “more or less similar all over central Europe”. They include 12 words in English, 4 in Sinhalese, and 1 in German (FREI, 2016).
4. India: Basavakalyan (IN1): A 12th-century Sanskrit text mentions 16 elephant command words derived from Sanskrit, Kannada, and Marathi (SADHALE & NENE, 2004).
5. India: Karnataka (IN2): 9 command words (KURT, 2005).
6. India: Kerala (IN4): 5 command words (KURT, 2005).
7. India: Mudumalai (IN3): 9 elephant command words, 2 or 3 may be Hindi, 2 or 3 Dravidian, 1 Kanada and the rest of uncertain origin (ZVELEBIL, 1979).
8. Indonesia (ID): 5 words that are vernacular Malay words found in Bahasa Indonesia (KURT, 2005).
9. Karen language (kar): 10 words (SCHLIESINGER, 2010).
10. Kui language (kdt): 11 words (SCHLIESINGER, 2010).
11. Lao language (lao): 11 words (SCHLIESINGER, 2010).
12. Malaysia: Kedah (MY1): 19 words used by Malay mahouts (MAXWELL, 1885).
13. Malaysia: Perak (MY2): 24 words used by Malay mahouts (MAXWELL, 1885; NORMAN, 1895; MILLER, 1927).
14. Myanmar (MM): 7 words for 6 commands. The compound word, “*Chat-met*” (“Lie on one side!”), is an extension of “*Met*” (“Lie on belly!”) (KURT, 2005).
15. Nepal (NP): Gun Bahadur, an old mahout from Chitwan National Park, stated that there were 27 elephant command words used in Nepal, mentioning 10 commands and 4 command words (HUGHES-GAMES, 2015). Kurt lists 9 commands used in Nepal, with 8 command words (KURT, 2005).
16. Sri Lanka (LK): The general manager of the State Timber Corporation of Sri Lanka lists 10 words for 12 commands for elephants used in logging (JAYASEKERA, 1999).

17. Thailand: Lampang (TH1): A brochure from the National Elephant Institute of Thailand, Lampang, lists 14 command words (VORTKAMP, 2006). These commands are supplemented by 2 words from a “Thai” list that is otherwise equivalent (SCHLIESINGER, 2010; BURKE, 2004).
18. Thailand: Mid-south (TH4): 6 words from “Chet”, a mahout from the “mid-southern part of Thailand, near the border with Burma” (VORTKAMP, 2006).
19. Thailand: North (TH2): For “N. Thailand”, 8 words (two hyphenated) for 6 commands (KURT, 2005).
20. Thailand: South (TH5): 3 command words from Chumphon (GILES, 1932) and 11 additional words from Nakhon Si Thammarat (WAVELL, 1964)
21. Thailand: Sukhothai (TH3): An article on a Thai-language website lists 23 words for 21 commands from Tambon Ban Tuek, Sukhothai Province.

BOX 2

ELEPHANT COMMAND-WORD DEFINITIONS

1. Back! To walk backwards, to walk in reverse, to go astern.
2. Bow! To bend front knees and lower the head down, to dip the head (e.g. allowing the rider to mount or dismount).
3. Charge! To run forward as fast as possible, to push past obstacles, to trample on obstacles.
4. Close! To move body and head in the direction indicated; to sidle up to; to move close to an object (e.g. allowing riders to mount from a platform or to dismount onto a platform).
5. Come! To walk forward, towards mahout.
6. Creep! To walk forward at a very slow pace (e.g. when crossing a narrow footbridge).
7. Crush! To step on an object.
8. Drop! To release an object from the trunk; to drop an object on the ground.
9. Eat! To place an object in the mouth and eat it.
10. Feel! To move the trunk forward to feel the object to the front (e.g. prior to a further command).

11. Fetters! To place the feet in the fetters.
12. Foot! To bend, lift up and offer front-right foot (e.g. allowing the rider to mount or allowing the mahout to attach fetters) (Figure 1); cf. "Other!"
13. Give! To use the trunk to give an object to the mahout.
14. Go! To walk forward, away from mahout at a moderate pace; to climb upwards.
15. Grab! To use the trunk to take hold of objects in front; to remove obstructions from paths.
16. Greet! To lift up the trunk; to make a gesture of greeting.
17. Kick! To kick an object forward with the front feet.
18. Left! This word qualifies other commands, indicating the left-side; cf. "Right!"
19. Lift! To use the tusks to lift an object up (e.g. to lift up a fallen log).
20. Look! To look at the mahout; to pay attention to the mahout.
21. Lower! To lower down the front-right foot (e.g. allowing the rider to dismount).
22. Other! To lift up and offer front-left foot (e.g. allowing the mahout to attach fetters); cf. "Foot!"
23. Pick! To pick an object up off the ground.
24. Pull! To walk forward, overcoming resistance.
25. Punch! To use the trunk to push an object.
26. Push! To push forward against an obstacle.
27. Right! This word qualifies other commands, indicating the right-side; cf. "Left!"
28. Roll! To roll over sideways (e.g. to roll while in the water).
29. Side! To step to one side (e.g. to avoid an obstacle on the path); cf. "Left!" and "Right!"
30. Sit! To get down, with the belly on the ground.
31. Slap! To use the trunk to hit an object to the side.
32. Sleep! To lie down on the side.
33. Slow! To walk forward at a slow pace (e.g. over a slippery surface or going downhill).
34. Spear! To use the tusks to impale an object into the ground.

35. Spray! To squirt liquid from the trunk (e.g. onto the back when bathing); to spit objects from the mouth.
36. Squat! To bend hind feet, lowering bottom to the ground, while front feet remain standing.
37. Stand! To get up, to stand on all four feet.
38. Stop! To halt, to stop walking and to stand still.
39. Suck! To inhale liquid into the trunk (e.g. to then spray into the mouth or to spray onto the back).
40. Swim! To paddle forward through the water.
41. Tail! To move the tail down; to keep the tail down; not to swing the tail.
42. Tall! To stand with feet close and back arched.
43. Trumpet! To make a trumpeting sound by blowing through the trunk.
44. Trunk! To move the trunk down; to keep the trunk down; not to use the trunk to hold objects.
45. Turn! To walk forward or to pivot to the right or to the left.

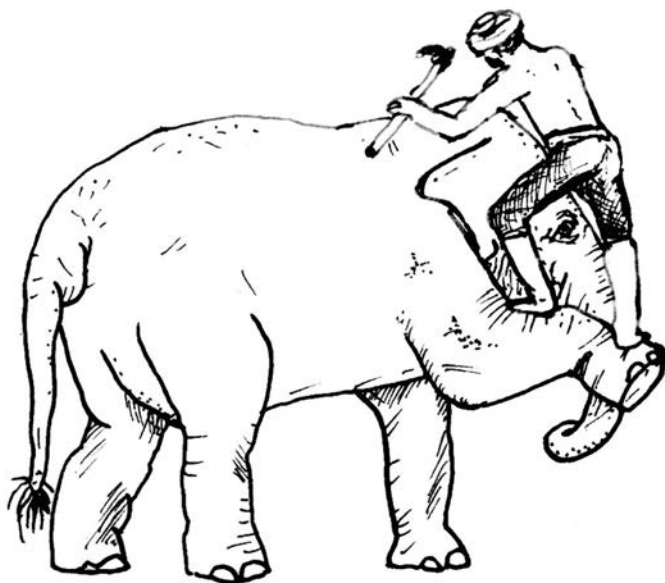


Figure 1 | Mahout climbing on an elephant's lifted foot.

Illustrated by the author.

To facilitate the comparison, I made a broad phonetic transcription of each command word using the International Phonetic Alphabet. My transcriptions excluded reduplication, even though it is common for some command words to be repeated (e.g., Thai *ma-ma-ma-ma* “Come!” (VORTKAMP, 2006) was transcribed simply as /ma/).

Using the R programming language (R CORE TEAM, 2013), I used the “*alignR*” package to calculate a distance matrix for all the lexicons (DOWNEY et al., 2017: 140-141). I identified groupings of lexicons using hierarchical cluster analysis (the “*hclust*” function of R). I compared the following linkage methods: (i) complete-linkage clustering; (ii) average-linkage clustering using the unweighted pair-group method with arithmetic mean (UPGMA); and (iii) centroid-linkage clustering using the UPGMC method. Finally, I compared the linkage methods by mapping the clusters.

| RESULTS OVERVIEW

In total, I found 205 elephant command-word types, with several morphemes having variable meanings, depending on the lexicon (summarised in Table 1, with details in Annex 1). There were, on average, 10 elephant command words in each lexicon, with the largest lexicon being that of Perak Malay (MYpk), which included 24 command words.

| ANALYSIS

The elephant-command lexicons of mainland Southeast Asia were all clustered together, as illustrated by the map below (Figure 2). Complete- and average-linkage methods identified two sub-clusters in this region. There were no close groupings between any of the other lexicons. The Karen and Myanmar lexicons were not close to the other lexicons of mainland Southeast Asia. The Indonesian lexicon was not grouped with mainland Southeast Asia.

Table 1 | Elephant command-word lexicons.

[illegible]

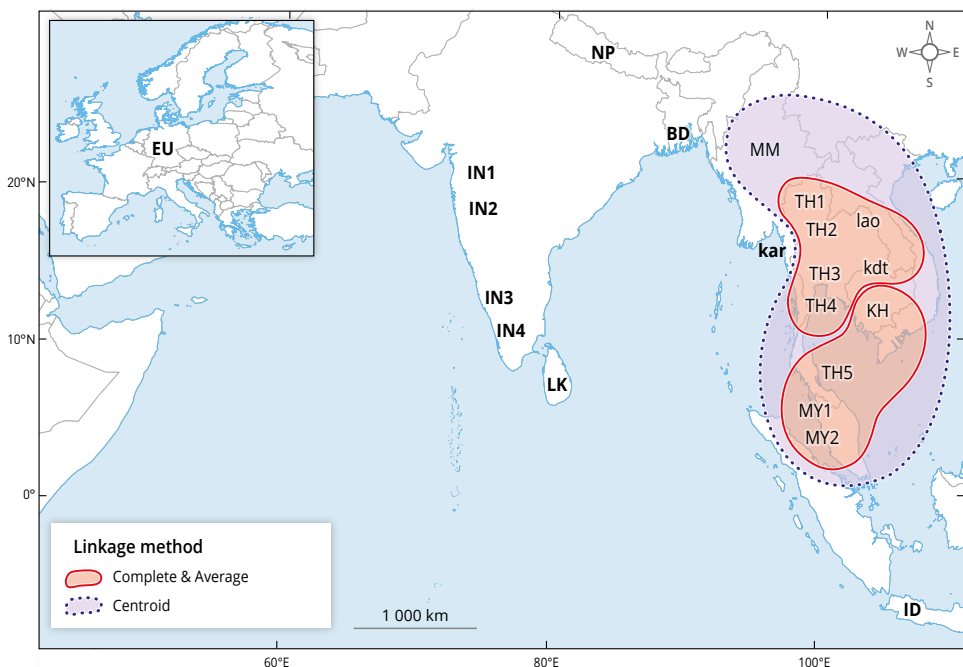
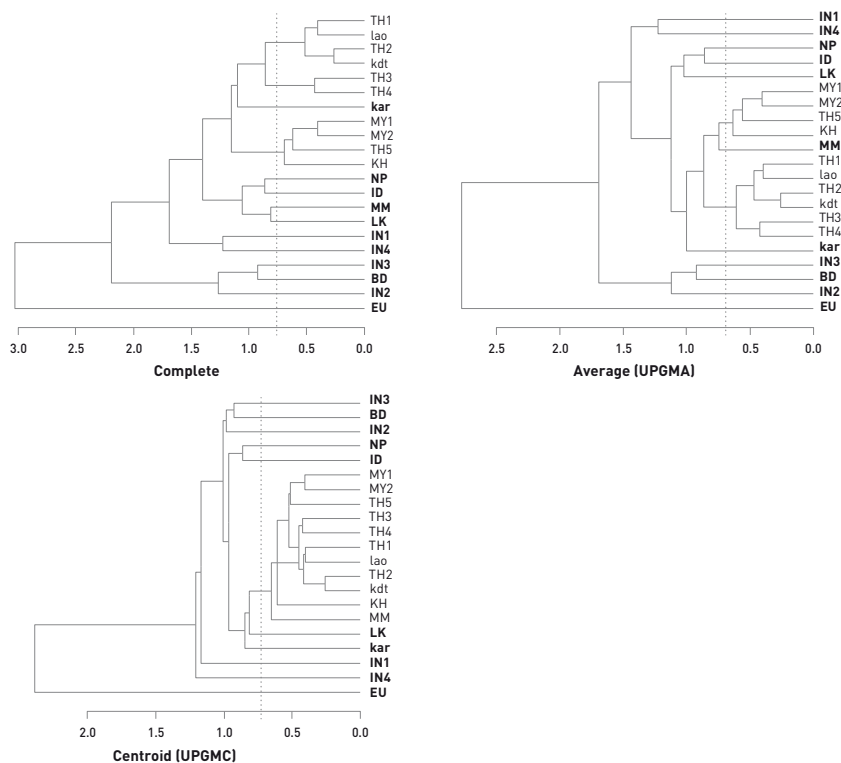


Figure 2 | Elephant-command lexicon clusters using three linkage methods.

DISCUSSION

The clustering of elephant-command lexicons in mainland Southeast Asia supports the possibility of a common origin. This is interesting because the vernacular languages of this region come from several distinct language families. For example, Thai and Lao are Kra-Dai languages; Malay is an Austronesian language; Khmer and Kui are Austroasiatic languages; while Karen is a Sino-Tibetan language (EBERHARD et al., 2021).

It has long been noted that the elephant lexicons of the Siam-Malay Peninsula contain words that are neither Malay *nor* Thai (SKEAT & BLAGDEN, 1906 a). It was thus speculated that the command words in the region were from an earlier culture, such as a pre-Malay Austronesian culture or a Mon-Khmer (Austroasiatic) culture (MAXWELL, 1906). Skeat and Blagden found a few of these words were “almost certainly” derived from a Mon-Khmer source (SKEAT & BLAGDEN, 1906 b: 469 n. 2). In contrast, the Cambodia elephant-culture lexicon is mainly Khmer and contains very few loanwords (POU, 1986). With this context, the findings of the present study point to a Mon-Khmer origin for the elephant command words of the Peninsula. As mentioned by Skeat and Blagden, this suggests that it was “Mon-Khmer speaking individuals who had acquired the art of taming elephants and imparted it to the Malays.” (SKEAT & BLAGDEN, 1906 b: 469 n. 2).

There is also historical evidence for a Mon-Khmer-speaking civilisation in the Peninsula (LOW, 1851; SKEAT & BLAGDEN, 1906 b; LINEHAN, 1936; BENJAMIN, 1987; BENJAMIN, 1997). The Mon language was the main civilisational language until the Malays arrived in the 16th century (BENJAMIN, 1987). And, at that time, the Khmer language and culture were also important influences here (BENJAMIN, 1997). When the Malays arrived, they adopted certain aspects of the Mon language and culture (ANDAYA, 2001). Indeed, the *Sejarah Melayu* states how it was the raja of Pahang (on the east coast of the Peninsula) who taught the art of elephant taming to the Malays of Malacca (LEYDEN, 1821; MAXWELL, 1906).

The question then arises as to where the Mon-Khmer elephant tamers had themselves learnt the art. It could have been transmitted from elsewhere or have arisen locally. Diffusion from India is suggested by

the fact that the early Southeast Asian kingdoms had Indian roots (MABBETT, 1977). Furthermore, several core aspects of the local elephant culture are of Indian origin (CRAWFURD, 1852; MAXWELL, 1882; MILLER, 1927). The common Malay word *gajah* “elephant” and literary Khmer *gaj* “elephant” both come from Sanskrit *gaja* (POU 1986). However, as noted, the elephant command words are not of Sanskrit origin. This raises three possibilities: (i) the art was transmitted without a lexicon; (ii) the local command words are calqued on the original Indian words; and (iii) the art of elephant taming arose independently of Indian influence. Evidence suggesting an indigenous origin comes from bronzes suggesting that elephants have been managed by Khmer communities since prehistoric times (TRANET, 1990). Similarly, rock carvings in Sumatra point to the existence of a “non-Hinduised” elephant culture in the region (JAN & VAN DER HOOP, 1932).

CONCLUSION

The elephant command lexicons encapsulate a relationship between mahout and elephant that dates back more than a thousand years. This paper demonstrates that phylogenetic analysis of these lexicons provides evidence for the origins of elephant culture. More detailed etymological studies may support the groupings suggested by the analysis of the lexicons. Combining these findings with further historical evidence will also help. Ultimately, however, a region’s elephant culture forms an important part of its heritage, regardless of where the art of taming originated.

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| ACKNOWLEDGEMENTS

I acknowledge useful feedback on an earlier draft of this paper from Geoffrey Benjamin, Cindy Chen, Khatijah Rahmat, L. P. Williams, and one anonymous reviewer. This idea for this paper arose from my PhD funded by Yayasan Sime Darby (grant M0005.54.04), supervised by Ahimsa Campos-Arceiz and Alex Lechner, evaluated by Tapan Kumar Nath and Ran Barkai, and reviewed (in part) by Mathieu Guérin and Sumit Mandal.

Table 2 | Elephant lexical commands in vernacular languages.

Lexicon	Commands														
	Bowl	Trunk	Back!	Charge!	Close!	Comel	Creep!	Crush!	Dropl	Eat!	Feel!	Fetters!	Foot!	Give!	Grab!
B0 Bangladesh				piʔʔu											
EU Europe				gobak hik		kumʔija			laʔ				lift		
ID Indonesia				mundur											
IN1 India: Basavakalyan				hede		ʔehij	letsʔa			duir			brʔale de	hede	gʔe
IN2 India: Kamataka				det										mal	dar
IN3 India: Mudumalai						doʔ				tiʔa				hala	halo
IN4 India: Kerala															noʔa
kar Karen language	taʔalorj		taʔokaj			ij							sosauw		
kdt Kul language	maeb		Boj			ma							surj		bej
KH Cambodia			daʔ	don									taʔun		kan
lao Lao language	taʔlorj		Boj			ma							surj		bej
LK Sri Lanka	daʔa		Beʔ							piʔeʔet	haʔbeʔi			daʔa	udeni
MM Myanmar			sout											teʔ	
MY1 Malaysia: Kedah	lut	oʔij				teʔi		kuʔt		kelam			sonj	kot	aubun wei
MY2 Malaysia: Perak	lot	oʔij	taʔo	riap	hiʔ	taʔim		kuet		raʔaʔ			taʔarj	kot	kan
NP Nepal	kʔol		taʔʔau						ko						
TH1 Thailand: Lampang	taʔʔlon		sok			ma							sonjsun	pej	hupsun
TH2 Thailand: North			toj											pej	
TH3 Thailand: Sukhothai	taʔlorj	ja	dun			maʔi				seo ma	sonj			schik	yok
TH4 Thailand: Mid-south						ma									
TH5 Thailand: South		daʔ	toj			maʔ		kuj					cun		kuak

Commands

Lexicon	Other!	Pick!	Pull!	Punch!	Push!	Right!	Roll!	Side!	Sit!	Slap!	Sleep!	Slowly!	Spear!	Spray!	Squat!	Stand!	Stop!	Suck!	Swim!	Tail!	Tall!	Trumpet!	Turn!
B0 Bangladesh								be!t	tere	tere						me!te	d!ut	ts'up					
EU Europe					pu			daun	ledaun							ʔep	stand						
ID Indonesia								to!ur								baun	diam						
IN1 India: Basavakalyan				hu				fapa	vi!u	he!aja			higa	ts'uru	kʰ	nahnu	ma						
IN2 India: Karnataka								be!t	tere	tere						som	ts'o!o	ts'ap					
IN3 India: Madumalai								ba!ta	tre														
IN4 India: Kerala								averdini	kedane							elanaday	ni!ke						
kar Karen language								minoer				kaj				ts'itelo	hoa						
kdt Kul language								druu				goy				luk	hau						
KH Cambodia								truu	kraap				dak	doh	haaw								
lao Lao language								moap				goy			nan	lukk'huu	hau						
LK Sri Lanka						pu!u		hide	diga														
MM Myanmar								met	ts'atmet							ta	hauwlar						
MY1 Malaysia: Kedah								teruu				koy				puu	ho	ou	tu!j	riarj	riak		diao
MY2 Malaysia: Perak	ts'ano!				on	ambu	gullj	pa!ha	teruu			ko!hoj			celut	tu	ho		tu!j	riarj			
NP Nepal										sut						ma!el	ts'op						
TH1 Thailand: Lampang								mas!ong	non!onj	goy			nan!onj	log!ken	ho								baan
TH2 Thailand: North								non!onj					nan!onj	luk	haou								
TH3 Thailand: Sukhothai								bon				tao	hao	jot									pei
TH4 Thailand: Mid-south								som					don	hau									
TH5 Thailand: South	au	goom						som	tot	hu!j			tan	ho									

CHAPTER 8

MAHUTO-FUTURISM

Human-elephant cohabitation in the ecumenopolis

Jacob Shell

I INTRODUCTION

Many conservationist studies concerned with the future of Asian elephants look to a short-term temporal horizon, analysing land use or funding possibilities for the next decade or two. While this temporal framing has value, it misses a looming problem for the elephants, as well as for a great many other species: the plausibility that the planet-wide human population will increase so dramatically over the next century and beyond that entire habitats will become erased.

With this plausibility in mind, this paper adopts a more futurist orientation and begins from a premise that radical shifts in human techno-social organisation will take place which urbanise tropical and temperate forests. From this vantage point, the concept, or spectre, of the “ecumenopolis,” developed by 1960s-70s urban planning theorist Constantinos Doxiadis, merits attention within environmentalist discourse. The ecumenopolis is an eventual *planet-wide* human city. Conservationist thinkers need to imagine problems and possibilities in a potential ecumenopolitan planetary future. This is especially pronounced for conservationists who are concerned with species whose corporeal spatial needs exceed those of humans: conservationists

concerned, that is, with megafauna like Asian elephants. Will there be room for elephants in an ecumenopolis?

This essay is divided into three parts. The first part addresses a premise (one that is increasingly widespread) that planetary human population growth is on the cusp of a permanent plateau—a premise which I critique here, instead stressing the need to think in terms of persistent human population growth and an ecumenopolitan planetary fate. The second part of the paper pivots to considering Asian elephants and their capacity for integration into environments thickly settled with human beings. This section is especially concerned with empirically observable situations, in the present day or in recent decades, where human communities have been able to simultaneously absorb elephants into the human work environment (as opposed to recreational environments), while also generating positive biometrical outcomes for elephants in terms of reproduction and life expectancy. This dynamic, associated in particular with the forest mahouts of Myanmar (Burma) and Northeast India, significantly widens the scope of future possibilities for human-elephant co-species cohabitation. The third part of the paper shifts gears again, looking beyond this empirically-grounded discussion of the mahout-elephant duo's socio-geographical capabilities to various artworks which begin to visually and narratively articulate a “mahuto-futurism” to elephant conservationists and planetary futurists alike.

| DEMOGRAPHIC PLATEAU OR ECUMENOPOLIS?

Conservationists' assumptions regarding future human population growth in upcoming centuries are powerful, though perhaps understudied, factors shaping their strategic decisions regarding what sorts of projects and ideas to invest in and what sorts to put aside or ignore. The present world population (as of 2021) is 7.9 billion. Numerous high-profile population projection agencies and demographic research bodies anticipate a plateauing of population growth by around the turn of the next century—a plateauing due, according to these agencies, to various modern conditions associated with diminished fertility rates (conditions such as widespread education for women, family planning biotechnologies, etc.). A few examples will suffice. The United Nations

anticipates a population plateau of 11 billion in the early 22nd century (UNDP, 2019). The Wittgenstein Center for Demography anticipates a plateau of 9.4 billion as early as 2070 (OUR WORLD IN DATA, 2016).

Note that these anticipated peaks are not so far beyond the present world population. Thus, if these projections are right, then a conservationist who has developed strategies intended for a world with 7.9 billion people—that is, for today’s world—can reasonably expect that the same strategies will work in a world with nine or ten or eleven billion people. If, instead, the conservationist is expecting a world population in a few centuries which will be, say, *five times* the present population, then the conservationist will be likelier to recognise the need for a radical new environmental paradigm for that upcoming hyper-populated world and to stagger present-day environmentalist resources (intellectual, institutional, geopolitical) accordingly. Clearly, conservationists’ intellectual relationship with these demographic projections matters a good deal.

The main reason to be at least somewhat sceptical of the “near-term plateau” projection is thousands of years of history. We are in a population growth slowdown phase. But overall human population growth has gone through periods of growth-slowdown and short-lived plateauing before, such as during the early medieval period (when the “plateau” was around 220 million) (McEVEDY & JONES, 1978). The slowdown period was, of course, followed by explosive population growth. In other words, the “plateau” proved illusory.

A useful theoretical counterpoint to the presumption of a near-term demographic plateau is to be found in the concept of the *ecumenopolis*, coined by 1960s-70s urban planning theorist Constantinos Doxiadis. The *ecumenopolis* is a hypothesised future planet-wide city. Thinking from the vantage point of the 1960s and 70s, Doxiadis imagines major metropolises soon agglomerating to form regional supercities; regional supercities agglomerating to form continent-cities; and eventually, these continent-cities agglomerating to become a *single, worldwide city*: a continuous field of high-density human population. The most comprehensive elaboration of the concept is in the 1974 book *Ecumenopolis: The Inevitable City of the Future*, which Doxiadis co-authored with the architect and (intriguingly) musicologist John G. Papaioannou (DOXIADIS & PAPAIOANNOU, 1974). The authors see as the proper role for future urban planners the spatial and administrative disciplining of this urbanising

world-force into selected mega-density corridors. For the leftover spaces between these corridors, Doxiadis calls, in a related work, for the cultivation of hybrid urban-garden zones, what he calls *entopias* (DOXIADIS, 1975). Doxiadis and his intellectual cohort derive the need for this paradigm shift in global urban planning from the assumption that the multi-millennial pattern of human population growth, extending back to the agricultural revolution, will continue into and demographically define the third millennium AD (DOXIADIS & PAPAIOANNOU, 1974). The emphasis for them, however, is not on demographic projection *per se* but rather on the issue of spatial planning. This, I would submit, is how conservationists today should be thinking about future planetary possibilities as well. The key question is not whether the future global population will be one number or another (this is impossible to credibly predict), but rather: how can first-order environmentalist concerns like species-conservation even *function* if the future planetary surface (perhaps even including the oceans, though Doxiadis does not explore this possibility) becomes *ecumenopolitan*? Perhaps the world will never actually become much more ecumenopolitan than it is now; but conservationists should begin to build a collection of possible solutions for the ecumenopolitan dilemma, at least to keep in their back pocket. And, for elephantologists, this conceptual imperative should loom especially large—I would even argue it should be a core theoretical device configuring this entire field of inquiry. The question of species conservation in the planet-wide city is, after all, especially pronounced for megafauna whose corporeal spatial needs exceed those of humans. Such megafauna cannot plausibly cohabitate with humans in urbanised landscapes, given the current spatial paradigm determining how urbanisation unfolds.

I ASIAN ELEPHANTS IN HUMAN WORK ENVIRONMENTS

In the early 21st century, roughly a third of Asian elephants are to be found not in the wild, far from humans, but rather in cities, towns, and villages. Many of these elephants experience poor biometric outcomes in terms of reproduction and life expectancy. Some, however, experience positive biometric outcomes (SHELL, 2019). Conservationists should take

note of this latter group and gauge their situation's potential for emulation and scalability. The fact that, instead, international conservationist discourse has mostly overlooked this subset of Asian elephants—that is, those who dwell in environments dense with humans and also experience positive biometrical outcomes—is, I would contend, a reflection of conservationists' overly-narrow futurological assumptions. Conservationists are imagining a future planet with a human population size not unlike the present one: a planet where existing forest ranges, free of substantial human settlement, can plausibly receive legal protections as the proper grounds for wildlife conservation and re-expansion of endangered forest species like Asian elephants. Most conservationists are *not* imagining a future ecumenopolis-like planetary situation where there isn't enough space for vast urbanisation- and agriculturalisation-free zones.

The existence, in the present era, of elephants who spatially cohabitate with humans and also reproduce at a promising rate (one birth every 11 or 12 years during the female's three-decade period of fertility) and live relatively long lives (six or seven decades) thus starts to look far more significant when an ecumenopolitan image of the future receives proper conceptual consideration and emphasis. These elephants, which number eight or nine thousand overall, are the “forest work elephants” of the forest ranges of Myanmar and Northeast India (SHELL, 2019; LAINÉ, 2020). They facilitate human-imposed, forest-centric tasks such as moving felled timber, transporting goods and people across roadless forest terrain, and transporting goods and people during monsoon season, when roads become flooded or otherwise obstructed by weather debris (SHELL, 2019). These forest-work elephants experience relatively good biometrical outcomes because, unlike tamed elephants in most tourist parks, zoos, circuses, etc., they are given the freedom to wander the forest on a nightly basis. Here in the nocturnal forest, Asian elephants are far more comfortable mating than when they find themselves in enclosed facilities (CLUBB et al., 2008; TAYLOR & POOLE, 1998; KURT & MAR, 1996). Despite receiving this periodic time away from humans, forest work elephants are still very much absorbed into human work communities. These communities are not “cities” as we would conventionally understand cities, but rather are densely settled social geographies affiliated with the work elephants' human riders, their mahouts.

Just *how* spatially absorbed the elephants are into these human communities depends on which region of elephant-based forest work one

is looking. As recently as the 2010s, two patterns of co-species spatial integration were empirically observable. In Kachin State, Myanmar, and eastern Arunachal Pradesh, India, mahout families tend to live in busy roadside towns with much else going on besides elephant-based work; elephants only occasionally show up to the outskirts of the town to fetch people or supplies to bring farther afield, to forest camps. The elephants and their mahouts spend far more time at these camps, and mahouts' non-mahout family members only rarely venture this far away from town life. By contrast, in southern and central Myanmar, at least up through the mid-2010s, this spectrum is more collapsed into a single co-species space: here, government-administered "mahout villages" have mahouts, mahouts' family members, and elephants all in the same village space, with elephants exiting the village core for forest timber to haul, or for their nightly period of rest and potential mating in the forest (SHELL, 2019). These mahout villages, organised by the Burmese forestry department and Myanmar Timber Enterprise, come closest to conveying how human families and elephant families can productively (and *re*-productively) cohabitate within a relatively dense social space.

The continued existence and health of the surrounding forestland itself is, of course, necessary for the sustainability of this arrangement, and in a sense this necessity limits the potential of these sylvan work elephant zones for extreme human density. Recall, though, that Doxiadis's ecumenopolis scheme calls not only for well-planned hyperdense human corridors but also leftover *entopian* zones with mixed city-like and garden-like spatial features. Could a future mahout-village with surrounding sylvan hinterland be like an entopia and thus find a place for itself in a wider planetary ecumenopolis?

The necessity of the forest also limits the long-term scalability of timber-felling as a form of value for working elephants to provide to their affiliated human community. Indeed, recent government constraints imposed on elephant-based logging in southern and central Myanmar signal this limit. Yet, the more *transportation*-oriented functions which present-day forest work elephants perform do not compromise the forest cover. These transport functions are all too often overlooked compared with the more commodity-centric (and perhaps more visually striking) timber-hauling functions; they shouldn't be. Furthermore, while the forest work elephant's ability to transport people and cargo across roadless areas may eventually become obsolete as road networks

expand (a likely eventuality in an ecumenopolitan future), the forest work elephant's ability to facilitate transport when floods have rendered the roads unusable for regular automotive traffic seems much likelier to persist as a uniquely valuable, non-obsolete elephant-reliant function.

This point about transport during floods is worth lingering upon, for the future ecumenopolis may very well prove to be a place where floods still happen; and the *well-planned* ecumenopolis may need to be a place where many water features are intentionally permitted to ebb and flow with the coming and going of seasonal and other Earth-system cycles. High-profile science-fictional visual portrayals of “planet cities”, such as Coruscant in George Lucas's *Star Wars* universe, usually show a planet whose entire surface has been infrastructurally rigidified into so many inflexible superhighways and supercanals of titanic planetary scale—as if the whole planet had become a single concrete orb-shaped edifice. The more plausible ecumenopolitan outcome—and one more in keeping with the spirit of Doxiadis's original concept—is a planet where omnipresent urbanisation and agriculturalisation are spatially integrated with the physical likelihood of persistent geomorphological dynamism: spatially integrated, that is, with rivers that migrate as silt builds up and erodes; with shorelines that change location as sea levels fluctuate and tectonic plates churn; with topography that becomes reconfigured due to seismic activity, vulcanism, and landslides. If the ecumenopolis has cycles of flooding, and if it has transient, dynamic boundaries between land and water features, it may, in fact, *require* a transport-creature (though perhaps a robotic one) very much like an Asian baggage elephant: quadrupedal, attuned to humans' needs in a given situation; terraqueous in mobility; capable of fording or swimming transient water courses; capable of going where the fixed infrastructure cannot go. In my research, I have indeed observed elephants used for flood-time transport in Assam and Myanmar (SHELL, 2015; SHELL, 2019).

Thus, a future ecumenopolis may not have sufficient practical incentives to establish vast, human-free forest preserves intended for big herds of wild megafauna—indeed, the point of the preceding thought experiment has been precisely to bracket and set aside that entire thread of possibility. But, the ecumenopolis *may* very well have sufficient numbers of humans in tropical flood-prone areas that the planet-city *does*, in fact, have sufficient incentive to seed into certain planned “entopia” zones,

various mahout villages and sylvan hinterlands. With these elephant-sustaining zones in place, ecumenopolitan administrators could send teams of logistical relief elephants into flooded areas to ferry people and cargo across transient shallows which other vehicles cannot traverse.

I MAHUTO-FUTURIST IMAGES

I close the essay with an exploration of three visions which I would characterise as “mahuto-futurist”: as imagining a future in which the mahout-elephant duo has retained, or reasserted, its practical importance and value. I draw attention to these images in the spirit of cutting against the grain of technological assumption; or, put another way, in the spirit of visually expanding elephantologists’ feel for “the futurological” as a conceptual device which organizes strategic thinking in the here and now.

The first, “Springlife Factory”, by the illustrator Julien Gauthier (Figure 1), is concept-art inspired by the 2009 bio-punk novel *The Windup Girl* (BACIGALUPI, 2009). Bacigalupi’s novel is set in 23rd century Bangkok, in a future world, partially dystopian, where progress in conventional

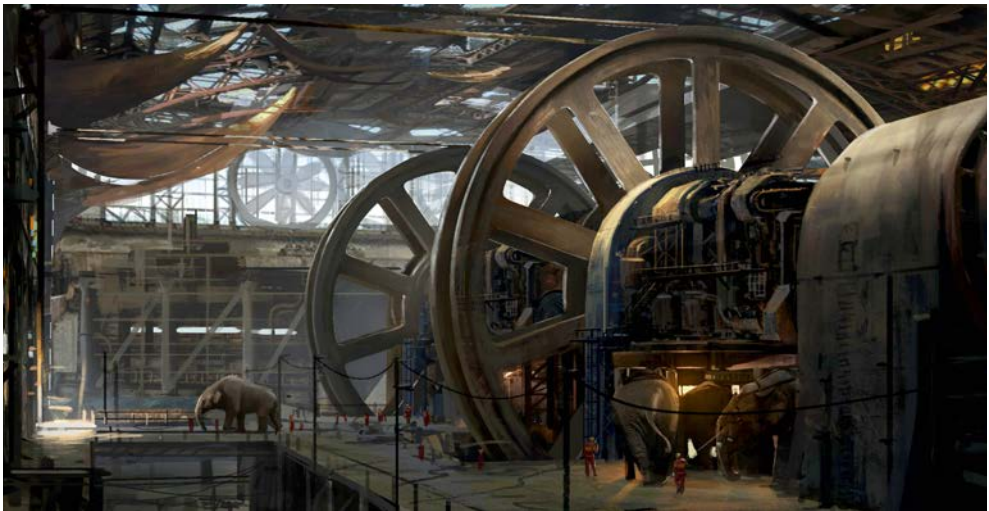


Figure 1 | Julien Gauthier, “Springlife Factory” in *Bangkok XXIII* series. The 2010s (exact date of production not specified).

energy technologies has stalled, but progress in biotechnologies like cloning and genetically modified organisms has raced ahead. Thus, in cities like Bangkok, certain kinds of “joule”-intensive activities such as ground transport, lifting, and dragging rely on cloned giant pachyderms called “megadonts.” These creatures are not described at length in Bacigalupi’s book, comprising just one part of the rich background scenery of the world Bacigalupi has woven into narrative being. Yet the few details the author offers about the urban-megadont dynamic are suggestive. For example, Bacigalupi imagines the megadonts’ mahouts, or drivers, as unionized, and their union is one of the most powerful political factions in the city. This aspect contributes to the political intrigue which is at the core of the story in *The Windup Girl* (BACIGALUPI, 2009).

In Gauthier’s visual scene, presented as part of a series the artist calls *Bangkok XXIII*, Gauthier has put Bacigalupi’s megadonts to work in a factory making coil springs. This is another detail from the book: the potential energy of coil springs has become especially important in this energy-scarce future world order. In another illustration in *Bangkok XXIII*, Gauthier shows the megadonts’ dragging containers to hovering zeppelins, further associating the cloned elephantids with such “backup” techno-mechanical principles which have taken on new importance in a world without fossil fuels (Figure 2).



Figure 2 | Julien Gauthier, “Airship Cargo” in *Bangkok XXIII* series. The 2010s (exact date of production not specified).

In both Bacigalupi's storytelling and the Gauthier imagery, the lives of the megadonts register as drearily negative and work to convey *The Windup Girl's* dystopian undercurrent. This is, perhaps, an image of elephantid survival, but survival into a slave-like and mechanical condition—a condition which one supposes elephants today, were it possible to ask them, would never choose even if the only other option were extinction. Nonetheless, it does present a narratological and visual template for imagining a kind of megafaunal survival, however bleak, into a potential hyper-urbanized future.

A more positive image is to be found in the futurist artwork of a Soviet painter, Gennady Golobokov (<https://jacobshell.carbonmade.com/projects/7203478>). This work from 1976 is entitled "Genetics Research Institute." It shows two biological engineers in the interior of a lab space; outside, two additional human scientists are interacting with a pair of woolly mammoths. One of the mammoths is an adult, and the other a juvenile. The painting is unusual within Golobokov's oeuvre of futuristic imagery, which mostly focuses on outer space, showing cosmonauts triumphantly exploring and settling far-flung corners of the galaxy. This painting instead spatially redirects that thrust of fantastical and heroic techno-progressive energy downward towards a more familiar (but in its own way also mind-bendingly immense) space, the Siberian taiga. Unlike the Gauthier imagery, the Golobokov painting makes ambiguous whether any of the humans present are really "mahouts"—whether, that is, they intend to train and do co-species work with these revived elephantids. The outdoor cross-species encounter does seem to indicate that the mammoths are quite tame or at least friendly towards the humans. But the artist is not interested in explicitly conveying the practical meaning of this friendliness. Though this thread of possibility was likely not directly imagined by Golobokov, from the vantage point of the 21st century, we can imagine that these mammoths have been brought back to "do a job" for the benefit of the planet's denizens within and beyond the taiga. Some scientists today argue that a reintroduction of neo-mammoths (cloned from spliced mammoth and Asian elephant DNA) into Siberia and subarctic North America would stabilize the carbon-sequestration capacity of the taiga and tundra (MANN, 2018). In this scenario, the "job" of the revived elephantids would be the steadying of the ecumenopolis's planetary "HVAC system". Likely, neo-mammoths with this level of responsibility would require human handlers of some sort.

Another image in this subgenre of visual work imagines a futuristic role for elephant-like creatures evocative of known practical mobilities observable in some of the elephant-mahout settlements in Myanmar and Northeast India in the 21st century: evocative, that is, of trained Asian elephants' unique abilities as creatures of transport in forested and monsoon-soaked landscapes. This is a work by the science-fiction illustrator Frank Paul, which adorns the back cover of the April 1961 issue of the pulp magazine *Amazing Stories* (<https://jacobshell.carbonmade.com/projects/7203478>). Only one line of text, on the previous page of the issue, describes the image: "Phantasmagoria of a Venusion scene". The odd suffix, "-ion," may be a simple mistyping of "-ian," or it may be a subtle signal to the reader that the scene is not necessarily "Venusian" in the sense of being located on the planet Venus. (The landscape is watery and intensely fecund, both qualities associated with the Roman goddess.)

Active during the middle of the 20th century, the artist has picked up on trained Asian elephants' practical association with terraqueous transportation and with movement between dense human settlements and sylvan hinterlands surrounding these settlements. The artist has then accentuated this association along fantastical lines: the mahout village is a mahout city; Paul's elephantids have fins for navigating in the water; the giants are large enough to take a busload rather than a mere handful of human passengers. Viewers may be struck by how the elephantids keep their trunks upturned for oxygen while they swim. This feature is, in fact, something which present-era "ferry elephants" do—such as those that took passengers back and forth across the Sissiri River in Arunachal Pradesh, India, as recently as 2017 (SHELL, 2019). But Paul's creatures' trunks seem to be upright by default, rather than slack. The elephantids of the "Venusion scene" have been bioengineered, perhaps, for the transport needs of the monsoon-city of the future. However, they seem to radiate a degree of agency and triumph that Gauthier's haplessly enslaved factory megadonts do not. Paul's elephantids have access to what appears to be an open hinterland of tropical trees and orchids. Perhaps they, like many of today's timber and transport elephants in Myanmar and Northeast India, enjoy a long daily period of rest and relaxation there.

How Paul arrived at these visual associations, especially between elephantids and terraqueous transport, is unclear. The artist does not seem to have spent time in South or Southeast Asia. It is plausible that, during

the 1950s, he read some of the well-circulated accounts of the China-Burma-India theatre of World War II in which transport elephants feature prominently (see WILLIAMS, 1950).

| CONCLUSION

The value of these images for elephantologists is not that they should provide “models” for what a human-elephantid future ought to look like. Elephants should not necessarily be bioengineered into subarctic carbon-negators or finned lacustrine ferry-creatures, and one should hope they won’t be bioengineered into factory grunts. Rather, the images’ value is that they help carve out a badly-needed imaginative frontier where a distant human future still entails spatial cohabitation with elephantid megafauna. These images are a signal to think as much about 2300 as 2030.

Clearly, the present demographic situation of Asian elephants is dire enough that we need *some* conservationists who are focused on the near-rather than long-term horizon. But we need the latter, more futurological, current of thinking, too, not least because certain aspects of the existing human-elephant dynamic take on new conceptual importance when they’re considered with long-term planetary possibilities in mind. I have presented the mahout-elephant duo’s unique mobility during flood season as an example. Some readers may dismiss as implausible, as merely a daydream, the notion of a future world which is hyperdense with humans but also has—in the “entopias” between the densest urban corridors—a half million or so elephants who specialize in teraqueous and trans-sylvan transport. I contend that such a world is at least as plausible as one where a vast wilderness reserve, vast enough for half a million wild elephants, somehow finds room for itself between India and China. This “vast wilderness reserve” scenario seems especially implausible if the human population over the course of the next several centuries fails to settle into a permanent plateau of only 9-12 billion people.

Elephant conservationists should open themselves to a current of thinking and imagining which I have here called “mahuto-futurist.”

If humans and elephants are going to cohabitate on a densifying, *ecumenopolitanising* planet, the mahout cannot become an obsolete figure because the mahout, and the forest-oriented mahout, in particular, is the essential link between a biometrically healthy elephant and a densely humanized planetary space. To many, the mahout-elephant pair may register as an anachronism out of a more animal-centred chapter of the human experience, a chapter which much of the rest of the world moved on from long ago. The articulation of alternatives to this assumption, whether through reference to futurist imagery or research on the unique, in some ways irreplaceable capabilities and mobilities of the mahout-elephant partnership in the here and now, is a vital task for those who want to expand the range of known options for how to share a shrinking planet with other forms of sentient life.

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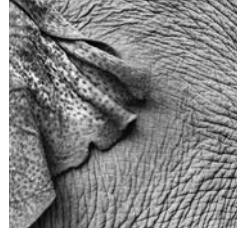
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ARTISTIC INTERLUDE 2

MY PHOTOGRAPHIC EXPERIENCE WITH ELEPHANTS AND THEIR MAHOUTS IN LAOS

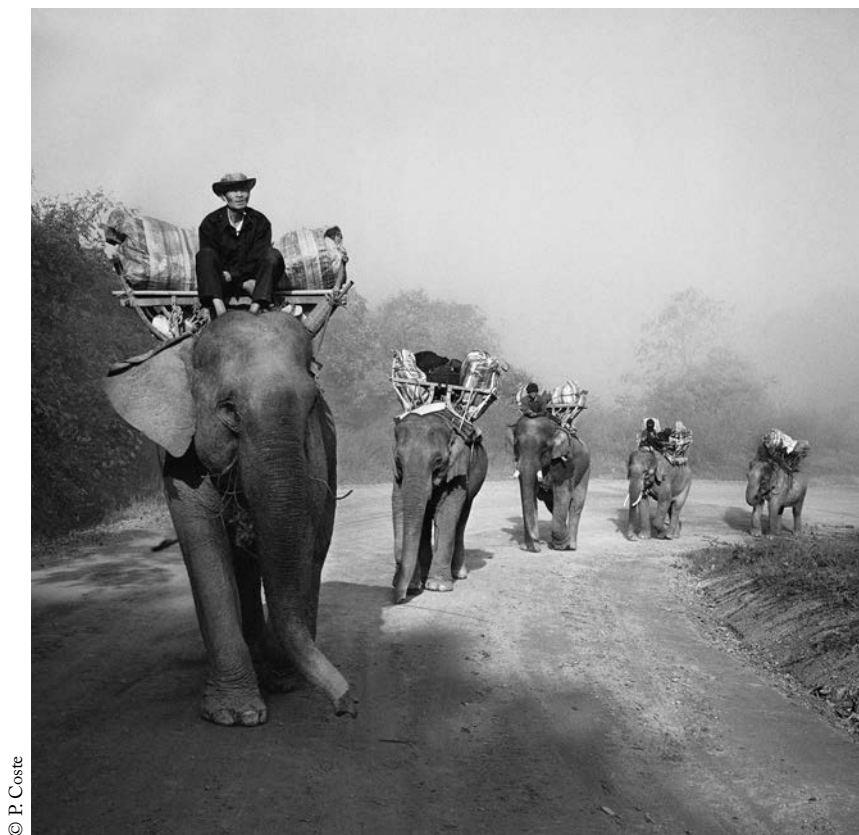


Philippe Coste

Having grown up in France, I never really had the opportunity to get close to elephants before moving to Laos in 1999. In fact, when I first came to the country formerly known as “the million elephants and the white parasol” (*lan xang hom khao*), their presence was already discrete. And for a long time, my contact with these animals was mostly by chance. A few fortuitous encounters with mahouts and their elephants on the roads of northern Laos were enough to stimulate my curiosity about the relationship between humans and these extraordinary animals.

In 2004, I undertook a visit to the region of Hongsa, famous for its large elephant population. At that time, travelling to Hongsa was a real expedition. A large part of the road had not yet been paved, and the trip was made either on the terribly dusty tracks of the dry season or the muddy and sometimes impractical ones of the rainy season. These harsh conditions made me realize that the most appropriate way to get to this remote district was to travel by elephant!

During one of my first stays in Hongsa, I met a mahout named Pheng and Mae Bouakham, his elephant. Pheng and I became close friends. And thanks to his help, I was able to undertake a lengthy photographic assignment in the villages and forests of the province of Sayaboury. Several stays in the area allowed me to explore in more detail the



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Figure 1 | *Serie Of Elephants and Men.*

astounding proximity mahouts have with the largest of the land mammals. For nearly ten years, I documented the various activities of village life in which elephants participated. If logging is an important part of my images, it is because during those years it was the main occupation of both men and elephants.

At that time, I was mainly photographing in argentic and in black and white. A little before coming to Laos, I had exchanged my SLR camera—24x36—for a medium format camera—6x6—very compact and easy to handle, perfect for reportage. In order to maintain an aesthetic continuity with my first Laotian images—mainly portraits and scenes of life, as well as a series on rice cultivation—the square image format (6x6) and black and white were naturally imposed for this new project.

Later, at exhibitions where I was invited to display my work, it was often pointed out to me that the black and white made my elephant images difficult to date: that they could just as easily have been taken at the beginning of the 20th century or even earlier. This impression of timelessness is further emphasized by the fact that in Laos, forestry work employs few modern machines and equipment. My photos are a reflection of their time; they show a reality in decline. In the course of a few decades, most of the nation-states in the region have taken measures to conserve biodiversity and have banned—or minimized—logging. The resulting loss of income has gradually led people to employ elephants in other tasks, mainly in tourism, a buoyant economic sector, until the recent Covid pandemic. At the same time, probably because elephants were becoming more visible and accessible, many journalists and tourists drew the attention of the general public to the arduousness of logging



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Figure 2 | *Serie Of Elephants and Men.*

and even more so to the mistreatment of these animals. While being considered a living God and companion for many peoples in Southeast and South Asia, the elephant can also be the object of culturally institutionalized mistreatment. Today, there are countless press articles, reports and videos widely circulated on social networks which reference this problem, but at the same time project a very biased Western vision of the elephant situation in Asia.

My photos do not aim to fall into this stumbling block nor condemn local practices. My curiosity led me to take an interest in these practices from the inside, and to confront generalized discourses and prejudices with the reality of the field.

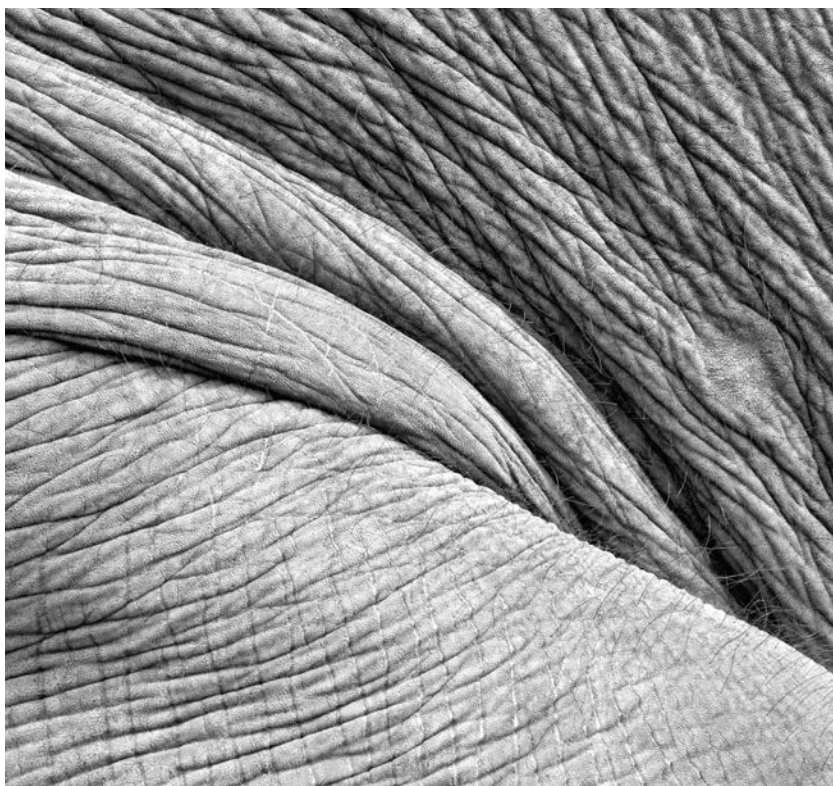
I had become aware of the existence of elephant abuse even before I started photographing. One of my previous travels in Southeast Asia took me to northern Thailand to visit an elephant hospital located



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Figure 3 | *Serie Of Elephants and Men.*

between Lampang and Chang Mai. Shortly before I went there, the hospital had attracted international media attention because it had taken in and equipped Motala, an elephant in her fifties who had lost a foot after stepping on an anti-personnel mine in Burma. On the day I visited, the hospital had no patients. I saw neither elephants nor veterinary care, but I was able to visit the facilities. A notebook available to visitors allowed me to read the history of all the elephants treated at the hospital. One story, in particular, caught my attention. Some Buddhist monks had bought a young male elephant to use in the construction of a pagoda. Once his participation in the construction of the temple was completed, the monks illegally rented him out to work in the logging industry. A few years later, alerted by the police, the provincial veterinary services had recovered this elephant in a state of advanced malnutrition and unable to walk. His mahouts were forcing him to work more than ten hours a day and were not providing him with enough food.



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Figure 4 | *Serie A fleur de peau.*

To prevent him from escaping their mistreatment, they tied him up at night. And in order to maintain good work performance, the mahouts compensated for his lack of food by giving him high doses of amphetamines. The veterinarian's intervention saved his life. After receiving treatment, the animal managed to recover physically, but it seems that it was marked by this experience and lost the ability to communicate with its congeners.

Having this story in mind, I started shooting. However, during the ten years spent photographing people and elephants in their daily tasks, I never witnessed any violence towards animals. Nor did I ever seek to photograph such situations. This choice was made not to deny the existence of such practices but because my experience in the field has allowed me to understand that violence against Asian elephants is not necessary. So rather than denouncing situations of mistreatment—mistreatment that can be similar to those we see in the West or elsewhere with domestic animals involved in our economic activities—I preferred to document what we could call good practices, which reveal the intimacy between a mahout and his elephant. In my opinion, cultural knowledge and local practices should not be considered *a priori* as favouring animal exploitation. On the contrary, any long-established interspecific relationship should be considered capable of guaranteeing the conditions for harmonious coexistence between humans and animals, notably through work. This is what is shown in the works that have nourished my photography; I am thinking of those of the sociologist Jocelyne Porcher, who conducts research on animal husbandry (PORCHER, 2017) or Nicolas Lainé's work on Asian elephants (LAINÉ, 2020).

Far from the images and representations of violence and abuse of elephants portrayed in the West, the daily efforts of Pheng and his mahout friends demonstrate practices that respect the needs and rhythms of elephant life. The income generated from logging supports their families. Without elephants, they simply could not work or benefit from this resource. Securing their income is not the only reason for the care and consideration they give to their fellow workers. The benevolent attitude of these mahouts is an expression of mutual knowledge and trust, qualities which make coexistence with elephants possible. Ultimately, it is this shared interspecies relationship that I have attempted to capture in my photographs. I entitled my first series: “Des éléphants et des hommes—(*Of elephants and men*)”.

In 2009, after several years spent photographing men and elephants at work in the Laotian forests, I took some close-up photos of an elephant's skin while trying out a new digital camera. Unlike my medium format film camera, this digital SLR allowed me to use a macro lens. The first images I got were so surprising that I decided to explore the aesthetic possibilities offered by macro photography. To do this, I had to get much closer than usual to the elephants, sometimes holding my lens at a distance of only a few centimetres. In the beginning, this approach was not very comfortable. Closing one eye, fixing the other in the viewfinder, concentrating on the framing, limiting your field of vision to a few centimetres of skin and not seeing anything else of the animal implies a loss of reference points. The abandonment of the peripheral vision, so sensitive to movements, does not allow it to anticipate those of the elephant. Photographing in these conditions requires a renunciation

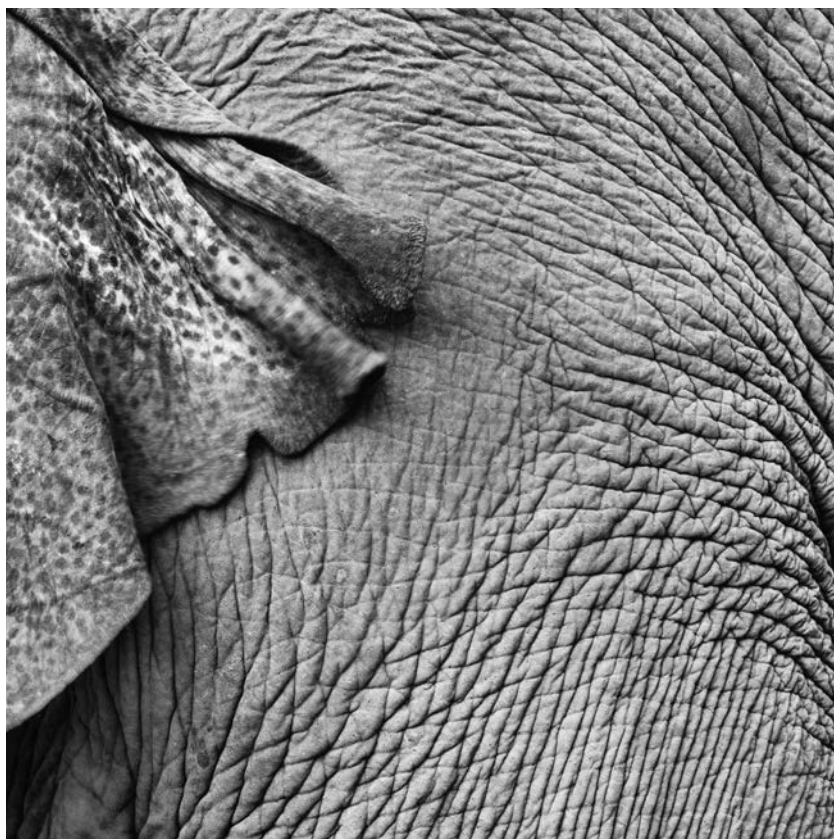


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Figure 5 | *Serie A fleur de peau.*

of our instinct of preservation in the face of the dangers that the proximity to such a powerful animal can represent for humans. But thanks to the complicity of my mahout friends, who watched me evolve and grow close to their elephants with an amused eye, I quickly succeeded in overcoming these first apprehensions to explore the animal in its smallest details by playing with the forms and the materials that my new photographic material offered to my glance. The result is the series of images “*A fleur de peau—(Skin deep)*”.

My photos are directed at the general public. The series on the shared life of humans and elephants aims to raise awareness of the risk of the disappearance of this multi-millennial way of life. The close-up images place the public within reach of the elephant and invite them to feel its surprising sensuality made of incredible landscapes.



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Figure 6 | Serie *A fleur de peau*.

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PART 3

LIVING WITH ELEPHANTS

2. MAHOUTSHIP

CHAPTER 9

LAOTIAN MAHOUTS AND ELEPHANTS

Glimpses into a multispecies system
of medicine and care

Nicolas Lainé

| EXPLORING HUMAN AND ELEPHANT KNOWLEDGE IN LAOS

Drawing on ethnographic data gathered among the Tai-Lue in north-western Laos, this chapter focuses on medicinal practices and care of working elephants. As part of a comparative anthropological project on pathogens (KECK et al., 2021), where I inquired into local perceptions of elephant diseases (LAINÉ, 2018), my informants insisted that village elephants have a rich knowledge of forest plants that they consume when they are sick. That is to say, mahouts are aware that when provided the plants necessary for a healthy diet, sick or infected elephants will supplement this diet by searching for specific plant species and parts of plants (bark, leaves or roots) that may be medicinal. In villages, contrary to elephant management in tourist or conservation centres, mahouts and elephant owners do not claim to control all aspects of animal feeding and care. For them, the forest is the equivalent of a pharmacy (*hank ka ya*) where elephants can choose from a diverse abundance of

vegetation and encounter a selection of medicines on their own. When a village elephant appears to be sick, the mahout voluntarily leaves the animal alone in the forest for a few days so that the elephant becomes healthy (*sabai*) again.

From a local standpoint, an ethnoveterinary analysis of practises of health and care for elephants in this region must include an additional and essential more-than-human element. That is, respect for the knowledge of the elephants themselves and their capacities for self-medication. Thus, the scope of my ethno-veterinary research was expanded to look at the diet of village elephants while searching for any possible converging utilisation of plants across humans and animals (LAINÉ, 2020 a). For data collection in the field, I mobilised two methods. First, the tools of ethnographic inquiry, which involve immersion with the population concerned, repeated observation of practises and their variants, and the observation and conduct of semi-structured interviews and life stories. Second, I mobilised the tools and methods of ethnoscience, including ethnobotany and ethnozoology (HUNN, 2012). A total of 36 mahouts and elephant owners were interviewed in northern Sayaboury province, primarily in the villages surrounding the town of Hongsa, between June and August 2016.

Drawing on my mahout-elephant ethnography, I will first report on a set of ethnoveterinary practices observed among mahouts and elephant-health specialists. These observations will highlight the similarities in human and elephant treatment, both in terms of rituals and medicinal remedies. Then, based on observations of the elephant diet, I will focus on specific specimens of plants to forward the hypotheses that medicinal knowledge is co-constructed and shared between humans and elephants. The conclusion highlights the existence of a multispecies system of medicine and care among Laotian mahouts and their elephants. This concept of multispecies medicine, in connection with other mahout/elephant research in Asia, will help open a broader reflection on the intimate and reciprocal influences of elephants and local populations. Considering their long cohabitation over several millennia and in the same environment, I will argue that the mutual attachment of humans and elephants constitute a multispecies culture based on sharing a set of practices and knowledge through imitation or interspecies borrowing.

| LOCAL KNOWLEDGE OF ELEPHANTS

In Laos, village elephants benefit from a management and care system that involves the mahouts and the animal's owner. Moreover, depending on the nature of the symptoms exhibited by the animals, they can call upon specialists: the *mo*. In Laos, but more generally in the Thai language, the term *mo* refers to anyone endowed with a specific talent, knowledge or power, in particular doctors, magicians, astrologers or fortune tellers (POTTIER, 1973). Some of these specialists—the *mo phi*—carry out their treatments via incantation; other specialists—the *mo ya*—by the use of plants. In order to distinguish between these two aspects of therapeutic treatment in Laos, I relied on the distinction made between ritual medicine performed by the *mo phi*, and remedial (plants) medicine by the *mo ya* (POTTIER, 2007).

RITUAL MEDICINE

In Laos, the everyday relationship between elephants and their mahouts is highly ritualised. As spirits (*phi*) are believed to be omnipresent in everyday life, elephants, like humans, must be sure to live in harmony with them in their daily routines. For example, every evening, when the mahouts leave their elephants in the forest after a day's work, the mahout must inform the spirit of the forest (*phi pa*) and the god of the soil and land of the specific territory (*chao don chao dee*) of the presence of the animal on their place, and ask them to take care of and protect the animal in case of attack by other animals, and also by evil spirits (*phi phai*).

The ritual specialists, *mo phi*, intervene throughout the life of the animals. When elephant capture was still in practice in Laos, these specialists were indispensable for the smooth running of operations. According to the pit trap method (*khoun xang*) used in the northwestern part of the country, *mo phi* were first responsible for bringing the captured animal back to the village and ensuring that it was not followed by the animal's mother or by malicious spirits. These specialists were then in charge of training the captured animal through a ceremony that bonds the elephant to the household of its owner. In the village, each elephant belongs to its owner's household, of which he is considered as a true family member. Thus, each

village elephant lives under the protection of the spirit of the house, the *phi huean*. For example, whenever an owner leaves his home for several days to work with the animal in the forest or for any other purpose, he has to inform his *phi huean* and ask for protection for both himself and the animal in the form of prayer. In addition to their protective role, the *phi huean* has the ability to act directly on the health or behaviour of the elephants, depending on the state of social relations between people. An intervention of a *mo phi* is often called to mediate the relations between humans, elephants and the *phi huean*. Animal owners also have to call upon these specialists if they want to sell their elephant, as well as when the animal dies. In this case, the *mo phi* carries out the ritual of detachment to assure the elephant's family that its spirit will not return to disturb them and that any bad omens are discarded.

In Laos, on the occasion of the New Year (*pi mai*), elephants celebrate in the *baci* ceremony (Figure 1). This ceremony aims to gather the vital force (*kwaan*) present in the animal body. This belief, and the related ceremony, concerns other large mammals such as buffalos. The *baci* ceremony takes place in three stages and is usually held in the enclosure



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Figure 1 | A *baci* ceremony observed in Viengkeo.

of the elephant owner's household. The first step is to chase away evil spirits from the elephant's body, then to call back and gather the *kwaan*, which is done using white thread tied to the animal's legs, ears and trunk. Each member of the household is then invited to go and attach a white string to the elephant's ears, feet and trunk. These strings are connected to each other and held by the *mo phi*, who will first ask the *kwaan* to remain in the body. He will then feed them and make wishes, in particular for the animal's good health.

The *baci* ceremony I observed during fieldwork refers to the soul-calling ceremony found in many other places in Southeast Asia. For example, a similar practice, known as *giju*, is found among the Karen of northern Thailand (GREENE, 2021). The *baci* ceremony is very common in Laos. Since humans are also believed to possess *kwaan* in their bodies, the ceremony is also held for them. This last point and the others presented above underline that in Laos, there is a correspondence between the ritual treatment of humans and elephants.

THE MEDICINE OF PLANTS

In the village, the *mo ya* heals people and animals with the help of remedies composed of plants. Regarding therapeutic practises in Laos, French ethnobotanist Jules Vidal, who conducted extensive botanical exploration in French Indochina, reminds us that “9/10ths of the substances used in the art of healing are of plant origin” (VIDAL, 1961: 602).

Mo ya use therapeutic codices called *Thamla ya*, literally “treatise on plants”. Apart from elephants, the recipes may apply to several animals, such as horses or buffaloes. Each treatise describes a set of compositions of plants for daily care, with generally one or more variants if the first does not work. There are, for example, compositions to combat constipation; others are for if the animals have sore legs, a blocked jaw, skin irritation, loss of appetite, sore throat, or when the animal shows signs of weakness or low blood pressure. For example, to treat abscesses caused by the rubbing together of the different ropes needed to manage elephants working in the forest, it is prescribed to first boil some *nam hanh* (*Acacia concinna*) roots and then wash the elephant's skin with it. Then, the abscesses are rubbed with mango bark, *mak kok* (*Spondias pin-nata*), and left to dry. This operation must be repeated daily until the abscess deflates and heals.

In the village of Viengkeo, I collected and analysed a specific *Thamla*, which includes the preparation of vitamins for elephants: *ya bam loung* (literally “ball of plant vitamins”). A preparation of *ya bam loung* consists of a mixture of a dozen (according to some variations) different ingredients. These vitamin balls are prepared in large quantities, more than 40 balls at a time, enough to fill a bag of rice for storage. They are given to elephants especially when the animals are involved in heavy work such as logging, operations that take place over several days or even weeks. The vitamin balls are an indispensable food supplement taken into the forest with all the other working equipment. Different preparations serve different purposes. For example, when an animal appears too strong or dangerous to humans, as with excitable male elephants in the period of musth (*gnoi nya*), mahouts intend to calm and weaken them by giving elephants *mak phak*, made from the fruit of a vine plant known as the wax gourd or winter melon (*Benincasa hispida*).

Drawing on their immediate environment, and taking into account the health condition of the animals, mahouts from northwestern Laos have developed unique forms of ethnoveterinary knowledge and practices. However, while the information presented so far indicates a local system of care regarding the primary day-to-day needs of village elephants, another aspect of this system includes the ability of the elephants to maintain their own health. Based on an exploration of the diet of elephants *in situ*, i.e. in the village and the surrounding forests, the following section reports on the ability of elephants to select and consume particular plants on specific occasions.

| AN ELEPHANTINE KNOWLEDGE?

During fieldwork, I explored the elephant diet via an ethno-ethological approach (BRUNOIS, 2005). Access to the elephants’ knowledge and understanding of their environment was obtained through the mahouts’ mediation, particularly how they perceived the elephant’s behaviour. I first questioned the mahouts about their knowledge of the plants consumed by elephants and also went out into the forest with them and the animal. I directly observed which species and plant parts (root, branch, fruit, leaf, liana, bark) elephants consumed. Fieldwork outings occurred

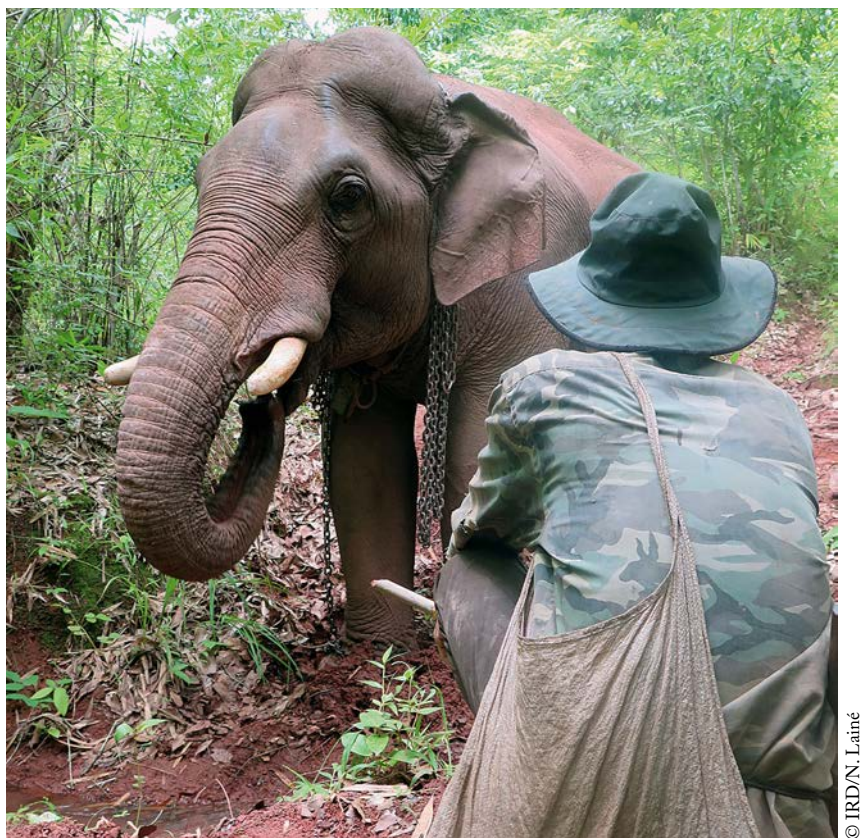


Figure 2 | A mahout observes his elephant feeding in the forest.

in the morning, accompanying the mahout as they went to fetch the animal or following the mahout and elephant during their daily activities at work (Figure 2).

GLIMPSES INTO THE WORKING ELEPHANT DIET

As a large herbivorous mammal, an elephant can consume up to 250 kg of vegetation per day (SUKUMAR, 1993). Elephants spend a significant part of the day eating or searching for food, and their diet varies considerably depending on the environment. My examination allowed me to highlight general information on the elephant's diet and to note important variations in the plants consumed throughout the year. For example, during the dry season (*ladou leng*), elephants consume more

bamboo shoots (*nor mai bon*) and bananas (*kwai*). Interpretations provided by mahouts suggest that these foodstuffs contain large amounts of water. However, also according to mahouts, elephants do not have much choice in the dry season and must eat whatever they find. This is not the case during the monsoon season (*ladou phone*), when they have more choices and can diversify their diet. Elephants prefer the leaves from a variety of bamboo sprouting during this period (*may bon/may lai* of at least 8 varieties). During this period of heavy rainfall, elephants eat fewer bananas, eating only banana flowers instead (*douak kwai*).

At first sight, it was difficult for mahouts to list all the plants eaten by their elephants, which could span more than a thousand species, according to some. Nevertheless, some with whom I decided to conduct fieldwork were able to distinguish between plants consumed strictly as part of the diet, called *ahan xang*, and those indicated as part of the medical diet, i.e. medicinal plants called *ya pua xang*. Based on this distinction, and drawing on mahout observations, I systematically categorised types of elephant symptoms (fatigue, diarrhoea or digestive problems, injuries, etc.) as well as the corresponding plant species that elephants were said to consume in order to maintain themselves in good health or for treatment. The mahouts, who have accumulated knowledge about elephant feeding habits over generations, have thus been able to “be attentive to the ingestion of unusual material”, as Gillet and Pujol pointed out back in 1969 (GILLET & PUJOL, 1969), and as Krief and Hoste remind us when they present the conditions to detect self-medication behaviour in animals (KRIEF & HOSTE, 2014).

Among the plants repeatedly said to be consumed for treatment, two, in particular, caught my attention: the first because it may provide an example of elephant self-medication and the second as a potential example of the sharing of medicinal knowledge with humans.

ELEPHANT SELF-MEDICATION AND CONVERGENCE OF MEDICINAL-PLANT USE BETWEEN HUMANS AND ELEPHANTS

The first of these plants is a liana, called *kheua nam nê* (*Mucuna pruriens*). The owner was quite clear on the reasons why his elephant

consumed this plant. Although available throughout the year and in abundance, his elephant consumed it only once a year and always during the same period (generally in January). The animal only took about ten bites each time. For the rest of the mahouts interviewed, this liana is not part of the regular diet of elephants. Discussion with the owner led to the hypothesis that this liana plays a deworming role. Moreover, as the owner indicated, this elephant had subsequently been rented out to a tourist camp, where it had undergone deworming by injections. Since then, he has no longer observed his elephant consuming this liana. Several *in vivo* and *in vitro* chemical analyses do indeed point to a deworming role for the leaves of this vine (THYAGA et al., 2017; VASUDEVA RAO & SHANPRU, 1991).

The same applies to the roots (*bak*) of *mak khunta* (*Harrisonia perforata* - Rutaceae), which have proven virtues against diarrhoea (*ya tai thong*). Several ethnobotanical studies, and in particular those of Jules Vidal for Indochina, suggest the roots have antimicrobial, anti-oxidant, but also anti-malarial and anti-inflammatory properties (VIDAL, 1961). In 2015 in the village of Ban Ha, 82-year-old Chanty Vanadee, a former elephant owner, shared an anecdote with me. He recalled an afternoon in the forest with his elephant when he noticed that the elephant's belly was particularly swollen. Despite his commands, the animal did not want to go straight back to the village and did not listen to him. The elephant seemed to be looking for something in the forest, which he found when he saw the *thun khunta* tree. At that moment, Chanty even had to climb down from the neck of the animal, which literally uprooted the tree to consume its roots. Soon after, Chanty remembers that his animal was defecating in large quantities, more than usual. When he returned to the village, the animal's belly was no longer as swollen and appeared healthy. Recent research linking elephant self-medication practices and human pharmacopoeia elsewhere in Laos (DUBOST et al., 2019) and in Thailand (GREENE et al., 2020) have shown similar results regarding such species.

Mak hunta is also well known to the mahouts and the owners I met during the survey. On several occasions, the plant was mentioned as one of the remedies given to elephants in case of diarrhoea or dysentery. Mahouts are familiar with the leaves of this shrub because they are also boiled and eaten as an herbal tea in case of acute diarrhoea in humans.

I MEDICINE AND CARE AS PART OF HUMAN-ELEPHANT MULTISPECIES CULTURES

In Laos, the ethnographic survey revealed a similarity in the ritual treatment of humans and animals (i.e., protection by the same domestic spirit or the collective *baci* ceremony). On the other hand, information collected on elephant diets revealed a possible convergence of plants used for medicinal purposes between humans and animals. Such is the case regarding *mak khunta*. In the village, the leaves of this bush are boiled and consumed as herbal tea. From the animal's point of view, it is the root that is eaten and not the leaves. This points to what Jules Vidal had already noted, humans and animals can consume the same essences, but if animals consume the raw materials, humans transform them (VIDAL, 1958). Such convergence, which deserves to be deepened and extended to the entire elephant diet, reminds us of what Hubert Gillet wrote in 1969 in his ethnobotany course at the National Museum of Natural History in Paris about human-animal cohabitation and the feeding behaviour of wild animals: "It is possible that the observation, made by some natives, of the occasional removal of certain bark from trees in the African savannah may have drawn their attention to these trees as medicinal plants" (GILLET & PUJOL, 1969: 19-20).

From a local point of view, there is no doubt that elephants possess an intimate and detailed knowledge about their environment. Mahouts and elephant owners, who are engaged on a daily basis with them, clearly understand the skills and capacity of elephants and mobilise this elephantine knowledge in a variety of situations. In Laos, for example, elephant knowledge of their environment was exploited by elephant catchers, who dug capture pits on migration routes in mineral-rich soil called *pong*, which is well known and sought after by wild elephants (LAINÉ, 2017).

To some extent, the Laotian human-elephant system of medicine and care can be considered as one aspect of a broader multispecies human-elephant culture, as shown by anthropologist Alexander Greene among the Karen and elephants in Thailand (GREENE, 2021). In my recent book (LAINÉ, 2020 b) on the relationships between the Khamti and elephants in Northeast India, I also touched upon the idea of the existence of an elephantine culture at the village level. This was reflected in the implication of individual animals approaching wild herds in the forest or

during the socialisation process of newly-caught elephants. Both these operations are made possible only thanks to the active participation of *konkie*, or adult village-elephants. Later on, when the animal is put to work, there is no specific elephant training. Instead, as soon as they reach their adult size, elephants are taken along in the forest in order to observe their congeners and learn from them. It is indeed by imitation that they learn how to achieve the requested tasks in the forest. Clearly, the present Laotian case on medicine and care for working elephants not only expands the role of social transmission of practices between elephants regarding plants, it also opens possibilities of shared and co-produced medical knowledge with humans.

Be it in Laos in the present case, or Thailand, Northeast India or elsewhere in Asia, the daily engagement of humans and elephants have led to a mutually beneficial sharing of affects, meaning, and a distinct knowledge of the environment, which could be considered as a unique multispecies culture. Within this continent especially, the long-term shared life (LESTEL & TAYLOR, 2013) between local humans populations and elephants offer those in the animal's charge access to the "world" of elephants, to observe them and include some part of it in their own practices to enrich their knowledge. Elephants can remind us that we, as humans, are not the sole repositories of knowledge when it comes to biodiversity. On the contrary, we must learn to collaborate with nonhuman animals and consider them as co-producers of knowledge. That elephant-keeping cultures in South and Southeast Asia have integrated elephantine knowledge into the understanding of their environment undoubtedly represents a crucial starting point for learning new ways of living in an endangered planet.

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CHAPTER 10

NĀGĀDHYAKSHAÇARITHA*

Elephant-mahout relationships in two communities of southern India

Sreedhar Vijayakrishnan, Anindya Sinha

I INTRODUCTION

*nāgādhyakṣastu dhīmān narapatisadrśēā
dhārmikāḥ svāmibhaktāḥ
śud'dha: satyapratijñēā vyaśanavirahitāḥ
samyatākṣēā vinītāḥ
utsāhī drṣṭakarmā priyavacanarata:
sadgurēārāttaśāstrēā
dakṣēā dhīra: śaraṇyēā gadaharaṇacaṇēā
nirbhaya: sarvavēttā*

Shloka 1, Chapter XII, Mātangalīla

“The supervisor of elephants should be intelligent, king-like, righteous, devoted to his lord, true to his undertakings, free from vice, controlling his senses, well behaved, rigorous, tried by practice, delighting in kind words, his science learned from a good teacher, clever, firm, affording protection, renowned for curing disease (in elephants), fearless, all knowing” (Translation: EDGERTON, 1931).

* *Tales of Elephant-Guardians*

The treatise *Mātangalīla*, the *Elephant Lore of the Hindus*, supposedly written by Tirumangalath Nilakantha sometime between the 15th and 16th century CE (GEETHA, 2013), closes with a detailed discussion of—what we would like to call “*Nāgādhyakṣaḥarīṭha*” or Tales of the Elephant-Guardians—the qualities of elephant-men or mahouts, prescribing that such individuals should be intelligent, righteous, in control of his emotions and senses, and well behaved (EDGERTON, 1931). A detailed chapter on mahouts in such a classic magnum opus on elephant care indicates the importance of having the right handlers for elephants. Animals brought into captivity from the wild, deprived of their natural behaviour, including ranging or sociality, tend to undergo immense stress. One of the most significant roles of a mahout is to ensure that the individual is managed with the least stress possible (Figure 1).



Figure 1 | The tusker Koodalattupuram Ramachandran, his mahout Gopalan Nair, and his *kavadi*, photographed by the late Krishna Rao c. 1930.

One of the earliest detailed photographs of a captive tusker, the image shows how and where a Malayali mahout and his assistant, the *kavadi*, position themselves next to their ward, the mahout usually holding the tusk and the *kavadi* standing close to the forelimbs of the elephant.

Over the years, the roles and responsibilities of a mahout have evolved to be specialised in different elephant-keeping cultures, although the overarching duty continues to be tending to the needs of the elephant. While elephant capture in India was brought to a halt legally in 1972, elephants continue to be removed from the wild, not in large numbers as earlier, but sporadically, as a conflict-mitigation strategy, under the provisions of the Wildlife Protection Act of 1972.

Capturing and training elephants for war and draught purposes are historically ancient, with their first-ever evidence harking back to the Indus Valley civilisation (SUKUMAR, 2003). Over the centuries, however, elephants have been employed for a variety of purposes, including the construction of architectural monuments and megastructures (KURT & GARAI, 2006) or the transport of water from streams and rivers to temples for religious purposes, a practice that continues in Tamil Nadu state in southern India. A simultaneous development was the gradually increasing involvement of elephants in temple pageantries, with their subsequent commercialisation leading to several elephants acquiring the status of matinee idols (VIJAYAKRISHNAN & SINHA, 2019). In this long history of elephant capture, training, and keeping, a rarely acknowledged facet is that of elephants being trained as *kumki* or *koonki*: individuals used to capture, or more recently, even drive wild elephants, or for other activities of the state forest departments.

While working-elephant management has been discussed in great detail by various authors in the past (EVANS, 1910; MILROY, 1922; STRACEY, 1963), little emphasis has been laid on understanding the cultural practices of training and upkeep of elephants, traditionally developed and maintained till now by various communities. The purpose of this chapter is thus to discuss certain, often contrasting, mahoutship practices in elephant management across two different communities in southern India. We attempt to depict the nature of human-captive elephant relationships in a forest-camp setting through observations and historical notes and reflect on the deep bonding between elephants and the Malasar mahout community of the Anamalai hill tracts in Tamil Nadu. We simultaneously discuss some aspects of the traditional practices of the mahouts of Kerala, another southern Indian state, the trajectories that the human-elephant bond has taken in this state over the years, and how this relationship is inherently different from what the Malasar share with their animals. Numerous intricate practices of the past have faded

away now, largely due to a lack of interest. Hence, we briefly record here some of the existing practices borne out of traditional knowledge and outline some pointers that could be further investigated in the future.

I ELEPHANT CAPTURE IN SOUTHERN INDIA

Elephant capture and training have been practised principally across northeastern and southern India and in other parts of Asia since historical times, but the practices observed today appear to be an amalgamation of indigenous techniques with those adapted from Southeast Asia, primarily through colonial influences (KRISHNAMURTHY & WEMMER, 1995). The large-scale demands for elephants by the timber industry had prompted their capture from select landscapes, mainly across the southern and northeastern states of the country. The pit-fall method was widely practised across southern India, especially in the Madras Presidency since 1889 (VARMA et al., 2010), and timber camps were set up in various forested regions of the state. These are pits, fourteen to fifteen feet deep, padded with a layer of brushwood to prevent injuries to the animal, and covered with leaves, branches or twigs, excavated along routes frequented by elephants (STRACEY, 1963). Although these capture exercises wound up in the early 1970s, elephants continued to fall into these abandoned pits and had to be rescued and either left free or brought to camps, in case of ailments or injuries, until the 1980s.

In 1874-1875, George P. Sanderson, a British naturalist who worked in the public works department in the princely state of Mysore, introduced the *kheddah* technique, wherein elephants were driven into a fenced, ditched enclosure. This soon became the main technique of elephant capture in Northeast India and the forests of Mysore (STRACEY, 1963), although most other parts of the Western Ghats continued to have the pit-fall capture method, mainly performed by members of native communities. In the Nilgiri hills, the Paniya, Kuruba and Kattunaicka populations were largely involved in this profession while, in the Anamalai hills, the Malasar and Kadar performed these captures and the subsequent training of the captured elephants. The hill tracts of Anamalai belonged to the princely states of Kollengode and Cochin, from where

elephants were captured by the native tribes for the *zamindar* or the landlords and used in forest-based activities, principally timber logging and transportation.

Elephants were also captured in large numbers by the Raja of Nilambur and the Koyappathodi Haji, primarily from the Nilgiris, most of which were used for timber-logging purposes (DANIEL, 1998). The surplus elephants and those that did not fit the timber-logging work were auctioned out and went to the stables of temples and landlords, and to zoos. Such sales of elephants, through large *mela* or fairs, were also prevalent in northern India; these included the famous Sonepur Mela of Bihar state, where hundreds of elephants were once traded alongside other livestock. As recently as in the late 1980s, following the ban on capture and auction of wild elephants, several hundred elephants used to be a common sight at the mela, and the supply from this fair helped increase and maintain the captive populations in the state of Kerala (CHEERAN, 2012).

In Tamil Nadu, the association of elephants with temples dates back several centuries, as indicated earlier, although the departmental use of elephant power started largely in the 1850s. The formal capture of elephants in the state was commissioned by the Imperial Forest Department towards the end of the 1800s, with the current camps being established much later, during the early-to-mid 1900s (VARMA et al. 2010). While temporary or seasonal camps were frequently established at various places in the past, largely depending on the availability of water and forage availability, as well as pending work assignments, Theppakadu in the Mudumalai Tiger Reserve and Topslip in the Anamalai Tiger Reserve are presently the only two permanent forest elephant camps in Tamil Nadu.

| DHRE, JHEREK...

THE MALASAR AND THEIR BONDING WITH WILD ELEPHANTS

The Kollengode Rajas of the erstwhile province of Kochi in Kerala and the Gounder community of Vettaikaranpudur in Tamil Nadu used to regularly capture elephants from the Anamalai hills, with help from the

Malasar in the early- to mid-1900s. The animals were calmed down and trained inside a *kraal*—large, wooden enclosures with typical dimensions of 3.7 m x 3.7 m x 4.3 m, often aided in their construction by elephants themselves (Figure 2)—within which individual elephants would be maintained for a period of about 90 to 120 days until basic training was complete.

The elephant commands used by both the Kuruba and Kattunaicka in Mudumalai and by the Malasar in Anamalai are largely a mix of Urdu and Assamese, indicating the influence that northeastern Indian techniques have always had on the training practices in the southern parts of the country. What is most striking, however, is that the training protocols practised in these regions are different from most others, with their primary focus being on establishing close bonding with the animals rather than asserting one's dominance. As compared to several other training systems across the world, the Malasar techniques include a combination of primarily positive, reward-based reinforcement techniques, with minor punishment only to correct undesirable behavioural acts. The training thus starts by feeding the elephants sugarcane and jaggery, besides the regular rations and cut fodder. This constitutes the first step of training the individual, as it invites the elephant to come close to



Figure 2 | A captured elephant in a *kraal*, Anamalai hills.

the bars of the *kraal* to collect either the sugarcane or the supplementary feed, handed over to their trunk or directly placed in their mouth. *Dhre* is the command given by the mahout for the elephant to collect the sugarcane using their trunk and *Jherek* for them to stand by the bars while the mahout reaches out to touch the animal—the first instance to get them acclimatised to human touch—or to place food in their mouth.

The first two weeks of training usually involve attempts to subdue the aggression of the elephant—which repeatedly strikes the bars in attempts to break free—through constant attention, feeding and tending to its every need. Once the mahout perceives positive responses from the animal and the animal begins to calm down, training progresses to the next phase, wherein the mahout enters the *kraal* and begins to interact with the elephant physically and more intensely, with only a crossbar separating the duo. This is the phase when the mahout starts using a combination of positive reinforcement and mild punishment to train the individual with basic commands. This is followed by attempts to gently sit atop the elephant, which is initially typically resisted by the animal through a vigorous shaking of the body. This mode of interaction reduces over time to the point when the individual allows the mahout to sit atop and slowly begin issuing commands.

The Malasar were initially brought to the hill tracts of the Western Ghats during the elephant-capture days, after which they settled there, eventually becoming native to the hills (T. Panneerselvam, pers. comm.). Unlike the Kuruba and Kattunaicka, who speak their own dialects, however, the Malasar have incorporated Tamil, the local language, into their own over the years, with the improvised commands they now use for the elephants displaying a smattering of Tamil words as well. Many of these Malasar mahouts seem not to know the comprehensive list of 48-odd commands that the community previously used to train their elephants, using only about one-third of that vocabulary, having maintained only those necessary for their day-to-day work. There is, therefore, a dire need to urgently preserve this dying traditional knowledge and the skills that accompanied the Malasar elephant-training procedures.

Comparable to mahout practices observed elsewhere (KEIL, 2017; LAINÉ, 2020), the Malasar interact with elephants as if they are members of their own family, with all members of the mahout's family, in turn, often developing close bonds with the elephants, a historical tradition that continues even today.

An interesting consequence of the strong familial bonds that develop between the Malasar and their elephants is that mahoutship has not been a male preserve in this community, a unique divergence from what is usually seen in other mahout communities. Topslip, for example, had a woman mahout, Kaliyamma, who habitually took care of the tusker Pandiyan, one of the Tamil Nadu Forest Department's largest bulls in the 1980s and 1990s, in the absence of her mahout husband.

| ELEPHANT MANAGEMENT BY THE MALASAR

The Malasar are particularly known for their skills in managing individual elephants with behavioural issues of unpredictability, which often results in undesirable interactions with humans (V. Kalaivanan, pers. com.). Punishing such individuals is usually counterproductive, as the pain threshold of the animal is easily crossed, making them more averse to humans, and leading to other negative interactions. Such individuals begin to distrust humans, and the only way to rectify the situation is to gain their trust once again—a long and complex process for which the Malasar community seems to have an exceptional talent. In general, the forest camp elephants of southern India appear to be far less stressed—as they are usually free to graze in the wild—than their completely captive counterparts in temples and other private establishments (KUMAR et al., 2014). The forest camp elephants, therefore, seldom display any kind of stereotypic behaviour as compared to individuals maintained under strictly confined conditions. The few camp elephants that exhibit such behaviour had either returned after being initially sent to temples or had been kept in prolonged confinement elsewhere owing to their behavioural unpredictability. This is, however, a relatively novel phenomenon, resulting from changes in the present-day handling practices from earlier, when elephants had never been rigorously confined by their mahouts.

The elephant-keeping culture in the forest camps of Tamil Nadu is perhaps the only one across Asia where there is no use of the *ankush*—the sharpened goad with a pointed hook that has been used ubiquitously in managing captive Asian elephants and which first appeared in India in

the 6th to 5th century BCE—in controlling the animal, either within the *kraal* or during their handling at other times. The Malasar, Kattunaicka and the Kuruba of Tamil Nadu only use long *Diospyros* sticks to manipulate their elephants, with most controls being exercised from atop the elephant through foot commands. The management of musth is also different in these communities from what is typically observed at other locations, with the animal being left alone, tethered on extended—often 30 m or even longer—chains, close to water bodies, to ensure free access to water and food (Figure 3).

Another rather common practice among the mahouts in the forest camps is to regularly use dikamali oil, a concoction prepared from neem *Azadirachta indica* oil, dikamali *Gardenia gummifera* resin, camphor and



Figure 3 | A Malasar mahout feeds his elephant in peak musth with a ball of *ragi* or finger millet.

Most other management systems typically secure tuskers in musth and avoid any contact, given their behavioural unpredictability at the time.

garlic. Dikamali oil prevents infections quite common in these areas by preventing insects from laying their eggs along the tusk groove and on the nails of elephants.

| RELIGIOUS BELIEFS AND PRACTICES

The Malasar are known to worship their local deities at a few sites in the Anamalai hills, where annual festivals are typically held as well. Before every new initiative undertaken by a mahout, such as capturing an elephant, starting their training inside a *kraal*, bringing the individual out of the *kraal* or taking the animals out for work, special rituals are followed, and offerings of food and flowers made to these deities. The community primarily worships *Amman*, a form of Goddess *Durga*, at a shrine inside the *shola* forests in these hills. Offerings are also made to *Amman* after rain showers during drought years, as water is the most essential of commodities for the survival of both humans and nonhumans in these often-sparse habitats, critically important, as it were, for the production of graze and browse. All along the hill roads that lead to an elephant camp are little niches where *Amman* and the other gods reside and where the community members stop to light a lamp or an incense stick, especially when going out to work with their elephants.

In addition to their noticeable worship of the forest deities, there is a widespread belief, prevalent even today, that the Malasar are involved in sorcery and that their witchcraft practices and the use of special spells allow them to bring elephants under their control. Some of these beliefs appear to be fuelled by the occasional presence of flowers, lemons or chillies—often hung up outside homes in southern India to ward off evil spirits—at sites where the Malasar tether their elephants.

Interestingly, these practices are rather similar to those observed amongst several Malayali mahouts in Kerala, who make special offerings and conduct certain rituals to keep elephants exclusively under their control, not allowing other mahouts and *kavadis*—assistant mahouts—to handle them. Such practices, of course, warrant separate, detailed anthropological and psychological analyses to understand how they generate confidence in one's abilities in these contexts.

| NŪR PARANŌ ĀR ŌŌNI ORAṬI... THE MAHOUTS OF KERALA

The title of this section—derived from a classic statement popular among Malayali mahouts, the origin of which is lost in the mists of antiquity—refers to the process by which an elephant needs to be corrected during its training. It literally translates to “say a hundred times, act like you are about to punish six times, and then punish once” and intends to establish the apparently time-tested observation that punishment should only form a minor component of controlling an elephant in captivity. This lesson, one of the key learnings imparted by senior Malayali mahouts to their apprentices in earlier days, now appears to be long forgotten.

Unlike most other Indian states, Kerala has had a long history of intimate association with elephants in captivity, with the animals having come a long way from being war machines of past battlefields, to symbols of pride and status for landlords in bygone eras, as drought animals in timber yards of the recent past, to religious icons carrying idols of deities in temples, a role in which many tuskers have now become celebrities on social media (VIJAYAKRISHNAN & SINHA, 2019). In this complex history of elephant-keeping in Kerala, however, elephants have broadly been categorised into two main groups: festival and timber-logging elephants. The work culture of the mahouts, involved with the maintenance of these two classes of elephants, accordingly, also evolved differently from one another. The former primarily involved training elephants to be docile and relaxed during temple rituals and festivities, given their routine exposure to loud percussion ensembles and noisy crowds, while the latter was about treading rugged terrains, hauling heavy logs from inaccessible areas to motorable roads and ferry points. It is not surprising, therefore, that the timber elephants never attracted enough attention to historically feature in written or visual records over the years, unlike their temple counterparts. One of the most majestic of the temple tuskers even had a biographical film—*Guruvayur Kesavan*, directed by Bharathan in 1977—made after him. Several communities of mahouts, who worked in the timber coupes, also, unfortunately, failed to be acknowledged in the annals of the elephant-mahout history of Kerala. Northern Kerala, for instance, had numerous families engaged in this profession, but as most of the elephants in this part of the state, where pageantries have always been a rarity, were timber animals, the

family histories of these mahouts have never been recorded. In contrast, several temple elephant mahouts find mention in different classical texts, such as the *Aithihyamala*, *A Garland of Legends*, an early 20th-century text in eight volumes by Kottarathil Sankunni that documents the lives of a vast spectrum of eminent personalities of the state. With timber logging being banned across the country following the landmark Supreme Court judgement of December 1996 (<https://indiankanoon.org/doc/298957/>), most members of the timber-elephant mahout communities slowly phased themselves out of the trade.

Notably, there are also differences between the work culture of mahouts of northern, central and southern Kerala, largely dictated by the differential nature of the work in which their elephants have been involved. The elephants of central Kerala, for example, have largely been festival elephants, seldom deployed for other purposes. Such individuals usually have three mahouts attending to them, with the chief mahout having the greatest control over the animal while the other two assist him in their daily chores. Similarly, the restraining items typically used by Malayali mahouts, including a stout stick, the *thotti*—a Kerala-specific version of the *ankush*—and a *valiya kol*—a long pole with a distal tapering end, armed with a sharp pin, and a blunt base, made of a hard, iron piece—also vary in their usage across the state, with mahouts from certain localities preferring to use either of them more often than the other, depending on the nature of their work.

Erstwhile techniques of training an elephant, while being largely dependent on dominance establishment, as is typical, were never imposed forcefully but through constant engagement and tending to the animal's needs, thereby building trust. This was largely possible in earlier days when the transportation of elephants was on foot, and the long distances thus travelled gave enough time for mahouts to understand and predict the behaviour of their elephants and act accordingly. Long scrubs, when the elephants were bathed in streams, rivers or tanks during such travel, also improved bonding and reduced tension between the duo, another rare sight today, wherein the commercial mushrooming of pageantries has forced them to rapidly cover long distances in trucks that are a cause of enormous stress (VIJAYAKRISHNAN & SINHA, 2022).

Kerala, tragically, is now one of the few Indian states where human-captive elephant conflict has increased significantly in the recent decades, with an average of about ten mahouts getting killed by their

elephants in peak festival years. This is largely a result of recent management problems, including, perhaps most importantly, the frequent change of mahouts experienced by elephants, leading to a failure in the development of any kind of stable, positive relationship between the animals and their mahouts. The increasing demand for elephant participation in these pageanttries has also increased the workload, and thereby stress, of the elephants involved in such festivities. There has been an inevitable recruitment of untrained mahouts, who are sorely unaware of elephant behaviour and biology, leading to an increase in incidents of conflict and often-unchecked animal cruelty within these newly developing elephant communities (VIJAYAKRISHNAN & SINHA, 2022).

It can thus be reiterated here that the participation of the indigenous mahout communities is gradually on the wane, and their special skills to manage elephants with minimal stress to the animal and with negligible negative interactions are rapidly disappearing (VANITHA et al., 2009). The situation in Kerala is particularly worsening, with the observed increase in conflict incidents and reported casualties in recent years being attributed to the presence of non-traditional mahouts, who are increasingly becoming the primary caregivers for most temple elephants across the state (PANICKER et al., 2003).

| EPILOGUE

Elephant capture and training are primarily based on the principle of dominance establishment in almost all elephant-management cultures across South Asia. As local knowledge suggests, a mahout needs to replicate, in captivity, what has been experienced in the wild by an elephant, according to its age and to the best extent possible. Such caregiving could include providing allomothering care to rescued calves, minimal punishment to growing juveniles and subadults to correct their occasional undesirable behaviour and a combination of exercising dominance while providing reassurance to older individuals. Such practices are typically observed among the traditional mahout communities and accompanied by an overall healthy handling of elephants by these communities. On closer examination, it is evident that there

are acceptable and relatively unacceptable practices amongst both Malayali and Malasar mahouts, to name just these two communities. Future elephant management protocols should comprehensively include the best practices from all possible systems.

The widening interface between elephants and humans has inevitably resulted in intense, often negative, human-elephant interactions, widely referred to as human-elephant conflict. Globally, most attempts at mitigating such conflict have almost invariably failed, making it one of the most significant conservation challenges of today. While reactive measures, such as captivity and translocation, have not produced desirable results in most cases, they continue to be used, often driven by public pressure and campaigns. The branding of certain elephants as problem individuals and their removal as a conflict-mitigation strategy has gained momentum in recent years, resulting in a gradual increase in captive elephant populations.

There will be inevitable circumstances in the future where elephants will need to be captured and brought into captivity to forest camps. In such cases, the requirement for skilled, passionate mahouts is also an inevitability, for such individuals alone can attend to the animals with minimal stress on either side. While the influx of elephants into captivity may be disputed on the grounds of animal rights and welfare, inevitable captures warrant ensuring elephant wellbeing in captive settings, and this is perhaps only possible in the forest camps. While it is essential that the carrying capacities and the local ecological conditions of these camps be assessed, what is perhaps even more important is that we continue to foster and care for the centuries-old traditions of mahoutship, which have nurtured many generations of elephants. These are practices that have long contributed to key infrastructural developments in elephant management and caregiving while guarding elephants and their forests for centuries. It is an urgent imperative that we recognise and preserve these traditions, continue to learn from the age-old custodians of these practices, and take these steps before all is lost to us forever.

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ACKNOWLEDGEMENTS

This short note about the Malasar and Malayali mahouts reflects Sreedhar Vijayakrishnan's experience spent working alongside both these communities. The manuscript has benefited immensely from our long, informative conversations with Thangaraj Panneerselvam, retired Range Forest Officer, Tamil Nadu Forest Department; N. S. Manoharan and V. Kalaivanan, both senior veterinarians who have served in the Tamil Nadu Forest Department. We thank Prasanth Varma for allowing us to use photographs from their wonderful collection. We express our sincere gratitude to Palanisamy, Mani, Prasad, Kethan, Late Alagesan, Murugan, C. Manikandan, Late P. Ramakrishnan, Bhaskaran Nair, S. Manikandan, Ramadas and an exhaustive list of other mahouts, with whom no day has passed by without us learning something new.

CHAPTER 11

MAHOUT-ELEPHANT RELATIONSHIPS

A review of the literature

Jennifer A. H. Crawley

I INTRODUCTION

The millennia-long relationship between humans and Asian elephants has been dynamic throughout history and is still undergoing change today. Elephants have been employed for transport, warfare, religious ceremonies, logging and, more recently, tourism. In present times, many countries across the Asian elephant range in South Asia have an intimate relationship with elephants, which are of great cultural, logistic and economic importance. Consequently, over 25% of the remaining Asian elephants today live in captivity, mostly within their range countries (Figure 1), whilst factors such as poaching and habitat loss threaten the wild population. Whilst there has always been both cooperation and conflict between humans and elephants, major changes have occurred in the last century, especially recent decades, concerning the human-elephant relationship. For example, there have been shifts, particularly in the west, in general attitudes concerning the ethics of keeping elephants in captivity (WEMMER & CHRISTEN, 2008), modern technological developments have replaced traditional elephant use, such as in logging, transport and agriculture (PHUANGKUM et al., 2005; HART & LOCKE, 2007; SUTER et al., 2013), and there have been increasing conflicts

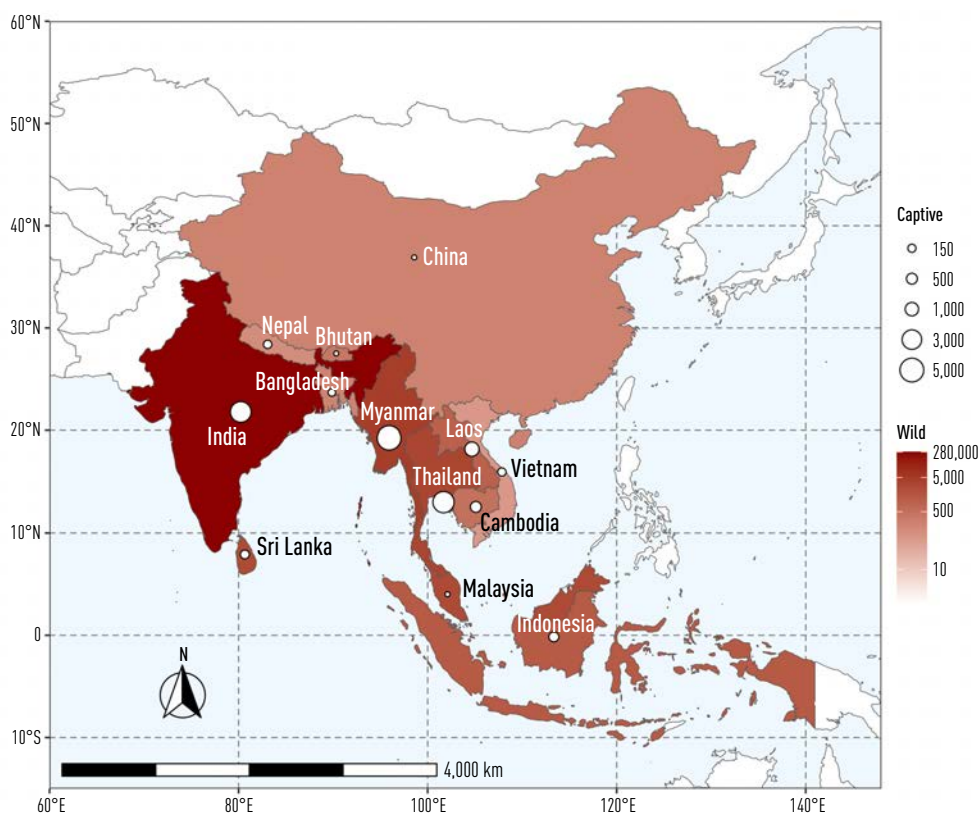


Figure 1 | Population size estimates for Asian elephants in the wild and captivity.

Data from SUKUMAR (2006) plotted using the *sf* package in R (PEBESMA, 2018).

between humans and elephants due to growing overlap between human and elephant habitats (SHAFFER et al., 2019).

Over their long history living among humans, Asian elephants have never been fully domesticated through selective breeding, as their body size, resource demands, longevity and slow life history are incompatible with reproductive management, and capturing elephants of working age often carried financial and ecological advantages (SUKUMAR, 2006; DRISCOLL et al., 2009; LAINÉ, 2020). Elephants were, therefore, often captured from the wild as needed, and those breeding in captivity regularly mated with wild conspecifics. Therefore, rather than relying on selectively breeding docile and anthropophilic traits as has occurred for many domesticated species (ZEDER, 2012), safe elephant

handling has depended on local knowledge built up over generations of specialized elephant handlers. These specialists are known by many names across Asia, but I refer to them here by their Hindi name, *mahout*. Elephant handling was historically a well-respected profession, in large part linked to the cultural importance of elephants, with the Sanskrit origin of the term mahout translating to “a man of high rank” (MÜNSTER, 2016).

The mahout profession has seen a lot of change in recent decades with a transition from logging work initiated during colonial rules towards tourism-based work in many regions in the contemporary period, which is likely to have had substantial consequences (PHUANGKUM et al., 2005; HART & LOCKE, 2007; VANITHA et al., 2009; SUTER et al., 2013). For example, in Myanmar, this transition has been linked to increased access to education and healthcare for mahouts but reduced household income and job satisfaction (KYAW & SOE, 2020). In Laos, mahouts in the tourism industry tend to earn less than logging mahouts but work with elephants more out of choice than family tradition (SUTER et al., 2013). In many parts of Asia, the respect shown towards elephant handlers is also diminishing, and there has been a loss of traditional mahouts (those with a family history of elephant handling). This will likely have implications for both mahout and elephant welfare (LAIR, 1997; HART & LOCKE, 2007; SRINIVASIAH et al., 2014). A call for more studies (LAIR, 1997) into the human-elephant relationship resulted in a wealth of knowledge on elephant-keeping cultures across Asia (HART, 1994; LOCKE, 2011; MUMBY, 2019; SHELL, 2019; LAINÉ, 2020). However, there has been less focus on documenting the demographics within these communities and how this relationship specifically impacts the elephants. We must document changes in the human-elephant relationship across their range in order to understand the extent of changes and the impact these changes are likely to have on the elephants. It is also important to measure the outcome of change rather than assuming change is always negative. For example, there has been a massive increase in access to technologies such as mobile phones, solar panels, and mopeds in the last decade in Myanmar, with mobile phone use rocketing from <2% of the population to almost 100% from 2011 to 2016 (LING et al., 2015). It could seem like these changes would threaten this profession which relies on mahouts living deep in the forest in prime elephant habitat. However, it allows mahouts improved communication

and connection to their families and surrounding towns and cities whilst allowing their elephants to stay in prime forest habitat, perhaps persuading more traditional mahouts to continue in the profession.

In what follows, I carried out a review of the literature to provide a general overview of i) elephant-keeping systems across their captive range, and ii) how the mahout-elephant relationship impacts the elephants' wellbeing. I argue that whilst the literature suggests that change has occurred across captive elephant populations, more systematic studies are needed to understand the nature and extent of the impact these changing relationships are having on both elephant and mahout welfare.

| METHODS

LITERATURE SEARCH

I searched for relevant documents using both the Web of Science (WOS) and Scopus databases with the search strings “(TI=mahout* OR TI=keep* OR TI=handl* OR TI=caretak* OR TI=traditional knowledge OR TI=indigenous knowledge) AND TI=elephant*” and “TITLE-ABS-KEY(mahout* OR keep* OR handl* OR caretak* OR traditional knowledge OR indigenous knowledge) AND TITLE-ABS-KEY(elephant)” respectively. Searching between 1980-2021 (search date 21.06.2021) returned a total of 92 documents from WOS and 577 from Scopus. After excluding obviously irrelevant papers, there were 42 documents from WOS and 218 from Scopus in the subject areas. I chose terminology spanning different disciplines concerning the mahout-elephant relationship, but as this can differ greatly between studies, the resulting list should be regarded as a representation of the available literature rather than an exhaustive list. Moreover, this analysis mainly focuses on articles written in English, and further analyses encompassing more languages would be highly valuable. I focused mostly on quantitative documentation of experience and demography (question i), which are easier to document, though I included some anecdotal, qualitative research on the impact of elephant keeping systems on the elephants (question ii).

Some papers did not provide specific handler experience but instead ascertained a threshold (e.g., only including handlers with 1+ years of experience), but as they did not provide a representation of the sample population, these data were not included in the summary tables. Some of the literature was pooled as the authors discussed similar research across different studies conducted over many years in the same population of elephants and their mahouts. For example, we pooled results for question i) from similar studies in India (HART & LOCKE, 2007; HART & SUNDAR, 2000; HART, 2005) and Nepal (HART, 2005; HART & LOCKE, 2007; HART, 1994) and Thailand and North America for question ii) (BANSIDDHI et al., 2018, 2019 a, 2019 c; BROWN et al., 2020).

Throughout this paper, I define the term “traditional” as “a long-established practice existing in or part of a tradition”, “expert” as “someone exceptionally knowledgeable or skilful in a particular area”, and “wellbeing” as “the overall condition of an individual”.

OVERVIEW OF THE LITERATURE

I explored the remaining 260 papers for relevance to questions i) and ii), finding a total of 45 studies with information on one or both questions (17 for i), 14 for ii), and 14 for both), 10 of which were not found in the search, but either referred to in the listed papers or previously known to the author (mostly due to being reports or books rather than primary literature). The findings relevant for question i) are shown in Table 1 and for ii) in Table 2 (see Appendix), along with the relevant references and the database in which they were found. The 31 studies for i) were conducted between 1946–2020, with over one-third of the studies (39%) focusing on mahouts from India (12/31), 13% from both Thailand and Nepal (4/31 each), 13% from either Europe or North America (4/31), 10% from both Laos and Myanmar (3/31 each), one study each from Malaysia and South Africa, and two focused on handling worldwide (see Table 1, Annex 1). The 28 studies concerning question ii) were conducted between 1946–2020, with 39% of the studies focusing on elephants in North America or Europe (11/28), 18% from India (5/28), 14% from Thailand (4/28), 7% from Nepal (2/28), one study each from Myanmar, Japan and South Africa, and one worldwide (see Table 2, Annex 1).

| RESULTS AND DISCUSSION

The studies reviewed here provide valuable documentation of the mahout-elephant relationship worldwide, but they also suggest the mahout profession is threatened by low socio-economic status and diminishing knowledge and experience in elephant handling. There are, however, clear regional differences, with mahouts in India retaining the most expertise in elephant handling, along with Nepal and Laos (average 17 years). Mahouts from Myanmar and Thailand had the lowest recorded experience (three years) and shortest relationships (1.5-3 years). However, centralized populations, such as in Myanmar, may retain vital expertise within the mahout system as a whole, with senior mahouts having an average of 19 years of experience. There have been few empirical studies of how specific human-elephant relationships influence captive elephants in range countries, with most studies either anecdotal or carried out in Western zoo environments. Yet, the evidence we do have suggests the relationships between elephants and their handlers have substantial impacts on elephant wellbeing. Generally, we would benefit from more widespread systematic documentation of mahout-keeping systems across different countries and industries, with accompanying study of the impacts of relationships from the elephants' perspectives as part of routine welfare assessments.

Mahoutship has been studied most extensively in India, thanks to a large-scale effort by the Asian Nature Conservation Foundation (ANCF) to study the management and welfare of captive elephants, resulting in reports spanning 12 states in India by Varma and colleagues from 2005-2011. Here, we included these results from two of the main summary reports, which covered a total of 419 mahouts (VARMA et al., 2010; SRINIVASIAH et al., 2014). Although these studies still discuss declining knowledge as a major issue in India, mahouts generally had more experience than those in other parts of Asia, averaging 17 years in studies ranging from 1996-2013 (HART & SUNDAR, 2000; VARMA et al., 2010; SRINIVASIAH et al., 2014). Generally, it seems that maintaining specific mahout-elephant relationships and retaining mahouts for the future is more of a problem, with an average mahout-elephant relationship length of eight years and mahout desire for their sons to follow them into the profession low, especially for non-tribal mahouts (VARMA et al., 2010; SRINIVASIAH et al., 2014). Similarly, in Nepal, mahout

experience was relatively high, with an average experience of 17 years and a relationship with their current elephant of nine years, although studies only surveyed 27 mahouts between 1989-2019 (HART, 1994; MUMBY, 2019). Mahoutship has been well documented in Myanmar recently, with two studies covering a total of 467 mahouts (though there was likely overlap of the same mahouts across studies), who tended to be less experienced, with an average of three years of experience and a relationship of 1.5 years with their current elephant (SELTMANN et al., 2018; CRAWLEY et al., 2019). This is similar to the average three-year relationship found in a survey of 61 mahouts in Thailand (BANSIDDHI et al., 2020). To my knowledge, this is the only study quantifying mahout experience in Thailand. The assessments in Myanmar were limited to the Sagaing region in the north of the country, which, while home to the largest population of captive elephants, may differ from other areas. Given the likely substantial regional differences in the retention of traditional mahouts, further systematic documentation is needed across these countries and throughout Asia, generally in a similar way to India. Notably, as I recorded in my previous research, senior mahouts in Myanmar still had an average of 19 years of experience (CRAWLEY et al., 2019), suggesting expertise is still retained in this population for new mahouts to learn. Laos seems to have retained mahout experience, with a study of 142 participants in 2012 finding an average of 17 years of experience and a 10-year relationship. However, 30% of this sample were not mahouts but elephant owners, which may bias results (LASSAUSAIE et al., 2015). Another study of 60 Laotian mahouts in 2019, however, also found that the majority (82%) had more than 10 years of experience (DUBOST et al., 2019). Mahout demography also importantly seems to differ between industries in Laos. In her research, Suter found logging mahouts to be an ageing population, whilst tourist mahouts were younger and lacked experience (SUTER et al., 2013). Although often not an exclusive relationship, keepers in Western zoos were found to have intermediate experience in elephant handling, with an average experience of seven years and an average relationship length of four years with a specific herd (GORE et al., 2006; HORBACK et al., 2013; CARLSTEAD et al., 2019).

One issue repeatedly discussed across studies was the low socio-economic status of mahouts, which has contributed, along with the inherent risks associated with working with elephants, to the profession being seen as one of necessity rather than choice (LAIR, 1997). Vast improvements are needed to enhance mahout welfare, including mahout living

conditions, salaries, health care provision and training in safe handling. In his report, Varma and his team found that even among mahouts employed by the government in India, only about one in two (55%) had health insurance, which came out of their own salary (VARMA et al., 2010). There were substantial differences in salaries between countries and industries within countries. For example, mahouts from the forestry department in southern India (Tamil Nadu) were paid around twice the salary (114\$/month) of those employed by private institutions (58\$/month) or temples (49\$/month) in 2005 (VANITHA et al., 2009). In Laos, logging mahouts made almost five times the salary of those in the tourism industry in 2011 (SUTER et al., 2013). Conversely, mahouts in Myanmar employed by the government logging department (12\$/month) were paid less than half the salary of mahouts of privately-owned elephants (29\$/month) in 1996 (LAIR, 1997), and a recent report found income to be lower in the newly emerging tourism sector compared to timber camps (KYAW & SOE, 2020).

The socio-economic status of mahouts, in turn, has important impacts on their elephants, as was mentioned repeatedly across studies that elephant welfare directly relates to mahout welfare. For example, low salaries have deterred experienced mahouts from working with temple elephants in India which has been linked to their being overworked, mishandled and involved in more fatal mahout accidents (VANITHA et al., 2009, 2010). There was a general consensus suggesting that if mahouts are underpaid and overworked, they will be less able to care for their elephants, more likely to resort to violence, and more likely to seek extra work for their elephants (VANITHA et al., 2009; VRIES, 2014). This issue is further complicated by the fact that as mahout socio-economic status improves and countries develop, their children will have greater access to education and may be less likely to choose to follow them into the difficult mahout profession, which disrupts the generational transmission of knowledge (LAIR, 1997). Many studies have called for formal training to replace a general reliance on passive observation and apprenticeship in regions where this practice is threatened in order to achieve standard care (SRINIVASIAH et al., 2014). Guidelines have been designed specifically for new mahouts (PHUANGKUM et al., 2005; CHOWTA, 2010) with an aim to introduce certificates of skills, similar to the movement towards accreditation and training in zoos (HUTCHINS et al., 2008). Such training may help to maintain care standards with changing mahoutship but must draw on expertise within traditional mahout communities.

Studies have only recently begun to appreciate the importance of human-animal relationships for animal welfare, beginning with agricultural and companion animals, and recently expanding to zoo animals (HOSEY & MELFI, 2014 a). This was reflected in my findings that over one-third of studies assessing the impact of the handler-elephant relationship on elephants were conducted in Western zoos. These studies provided important evidence that an elephant's relationship and familiarity with its handler influence its stress and fear responses (MARTIN & MELFI, 2016; CARLSTEAD et al., 2019) as well as their psychological and reproductive health (GRECO et al., 2016; SULLIVAN et al., 2016). However, there are substantial management differences between elephants in Western zoos and the majority of captive elephants in Asia, the latter being generally managed in free contact with an exclusive relationship with one or more mahout(s). Free-contact elephants in range countries have been shown to have lower concentrations of faecal glucocorticoid metabolites (FGM), indicators of stress, than U.S. zoo elephants (BROWN et al., 2020) and both higher survival and reproductive rates (CLUBB et al., 2008, 2009). Many of the studies discussing the importance of the mahout-elephant relationship on captive elephants in Asia were based on anecdotal rather than empirical evidence. These opinions are incredibly valuable, with studies generally agreeing that mahouts being underpaid and overworked, coupled with fewer experienced mahouts and faster mahout turnover, will have negative consequences for elephant welfare, as less-experienced mahouts are less able to predict and interpret elephant behaviour and are therefore more likely to resort to force.

However, it is also important to have empirical evidence to understand the extent of the impact on elephants. For example, while mahout experience and specific mahout-elephant relationship lengths are low in Myanmar (three and 1.5 years, respectively), I did not find either to influence physiological stress indicators (FGM and heterophil:lymphocyte; CRAWLEY et al., 2021), perhaps as the senior mahouts in Myanmar have enough remaining expertise (average 19 years) to train new mahouts and maintain quality care. Furthermore, findings from both this research (CRAWLEY et al., 2021) and SRINIVASIAH et al. (2014) suggest that specific relationships may be more important than overall experience in elephant handling, with muscle damage decreasing with longer relationships in working-age elephants in Myanmar, and elephants in India being more cooperative, sociable, and less aggressive towards their assistant mahouts than their main mahouts, who were more experienced

but spent less time with them. Elephants also displayed more positive behaviours towards those with better “elephant keeper practices”, which were seen to decline with higher elephant turnover (SRINIVASAIAH et al., 2014), consistent with other studies finding that elephants were more responsive and sought out more interactions with familiar humans (MARTIN & MELFI, 2016; ROSSMAN et al., 2017; CRAWLEY et al., 2021). For example, elephants were more successful at behavioural tasks with their own mahout than an unfamiliar mahout, including when facing a novel situation, and responded faster when they had known their mahout for longer (CRAWLEY et al., 2021; LIEHRMANN et al., 2021). This, along with findings that a high turnover of staff may increase the chance of attacks both in zoos (GORE et al., 2006; HOSEY & MELFI, 2014 b) and range countries (VANITHA et al., 2009), suggests that changes we see in mahoutship across Asia may have important repercussions for mahout safety in free contact environments and should be taken seriously. Although a number of studies from camps in northern Thailand have shown that management style is incredibly important, with elephants showing higher FGM in the high tourism season, in observation-only camps and camps with ankus use, there has been little assessment of how specific relationships influence elephant welfare, with this highlighted as an important focus of future studies (BANSIDDHI et al., 2018, 2019 a, 2019 c; BROWN et al., 2020).

| CONCLUSION

Overall, it is promising to see many studies documenting elephant-keeping systems across Asia, highlighting the abundance of knowledge and expertise within local communities and the changes that have occurred over the last decades. I argue that we need further systematic study across a range of management systems in different regions and industries and, in particular, further research into how these changing relationships may be influencing the elephants in their care, which will be best achieved through collaborative interdisciplinary research. Particular attention should be paid to smaller, fragmented captive populations such as temple elephants, which may lack a reservoir of knowledge and regulations for handling practices. There is also a growing

demand for more centralized governing bodies to standardize care (BANSIDDHI et al., 2019 b) as well as for organized formal training and certification, but this should be routed in local mahout knowledge and used as an aid to transmit knowledge of experienced mahouts.

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ANNEX 1

DETAILED OVERVIEW OF LITERATURE

Table 1 | Socio-economic profile of mahouts and assistants according to literature available.

Location	N (mahouts/ keepers)	N (elephants)	Year	Ref	Changes in mahoutship
Tamil Nadu, India	16	16	1996	19 ^S , 20, 21 ^{SW}	Logging-> road/forest/ tourism/festival work
Chitwan, Nepal	17	-	1989-1992	18 ^S , 19 ^S , 20,	In transition from family tradition to employment
Tamil Nadu, India	80	135	2003-2005	46, 47 ^W	Fewer mahouts/ elephant in temples (T)
Southern India	1	-	2013	61 ^W	
Europe/North America	-	122	<1946-2002	15 ^S	
Laos	142	80	2012	29 ^{SW}	
Sagaing, Myanmar	210	-	2016-2018	11 ^{SW}	Current mahouts younger, less experienced/committed
North America	277	-	2011-2013	7 ^{SW}	
Chitwan, Nepal	10	10	2019	34 ^{SW}	
Xayabury, Laos	60	-	2019*	14 ^{SW}	
Arunachal Pradesh, India	-	135	2016-2017	56 ^W	
North-East India	-	-	2008-2010	58 ^S	
Sagaing, Myanmar	257	257	2014-2017	39 ^S	
Northern Thailand	-	627	2015-2017	4 ^S	
Northern Thailand	61	-	2020*	2	
Southern India	50	-	2015-2016	55 ^S	Lack of facilities/money maintained plant knowledge
Southern India	1	-	2012	35 ^S	Less logging/government interest-> less interest
Peninsular Malaysia	149	60	2012-2014	65 ^S	
Atlanta, North America	8	3	2001-2002	64 ^S	
Worldwide	242	-	2004*	54 ^S	
San Diego, North America	12	12	2010-2011	22 ^S	
Laos	133	-	2010-2011	45 ^S	Logging mahouts ageing; tourism inexperienced
Northern Thailand	-	153	2007-2008	57 ^S	
India	307	363	2005-2011	48	
Thailand	-	-	2005*	37	Loss of mahout knowledge on elephant diet and handling
Karnataka, Southern India	112	75	2013	42	
Worldwide			1997*	28	Declining respect/pride/ handling skills with development
Sagaing, Myanmar	151	151	2017-2018	12 ^{SW}	
South Africa	13	7	2015	55 ^S	

F= Forestry/logging P=Privately owned; To= Tourism; Te=Temple, I=Indonesia 1993, M=Myanmar 1996, S=Sri-Lanka 1986; *Taken as year of publication

¹70% mahouts, 30% owners, ²28% keepers/mahouts, ³55% covered by health insurance, ⁴Muslim mahouts:2%; Tribal:98%,

⁵Poll of civil service mahouts in Thailand, ⁶Scopus database, ⁷Web of Science database, ⁸Both Scopus and Web of Science databases

Mahout Demography given as mean [range] in years											
Mahout/keeper				Head mahout			Assistant mahout			Family Tradition	
Age	Experience	Relationship	Salary/month (\$)	Age	Experience	Relationship	Experience	Relationship	Salary/month (\$)	Past	Future
-	21.9 [15-27]	12 [2-27]	-	-	53,5	15	13.8 [10-18]	6.4 [6-15]	-	88%	81%
-	12.3 [4-48]	4.4 [1-12]	-	-	-	-	-	-	-	«seldom»	-
-	-	-	F:114;P:58;Te:49	-	-	-	-	-	F:64;P:53;Te:33	67% [56-83]	-
-	25	-	-	-	-	-	-	-	-	-	-
35.6 [20-64]	6.7 [0-30]	-	-	-	-	-	-	-	-	-	-
35.7 ^a [16-68]	17 [1-50]	10 [1-50]	-	-	-	-	-	-	-	-	-
22 [14-59]	3 [0.2-29]	1 [0.1-16]	-	38 [27-59]	19 [6-43]	-	-	-	-	55%	27,5%
36.6 [22-72]	6.5 [1-30]	-	-	-	-	-	-	-	-	-	-
-	21.8 [7-44]	13.2 [0.5-30]	-	-	-	-	-	-	-	10%	0%
[35-78]	82% >10	-	-	-	-	-	-	-	-	-	-
-	-	-	P:112;F:120	-	-	-	-	-	-	-	-
-	-	change rare	-	-	-	-	-	-	-	-	-
24 [14-60]	-	2 [1-4]	-	37 [31-59]	-	4 [0.2-33]	-	-	-	-	-
-	-	-	<250	-	-	-	-	-	-	-	-
-	-	3 [0.2-20]	-	-	-	-	-	-	-	-	-
-	[3-45]	-	-	-	-	-	-	-	-	-	-
60	40-50	10	-	-	-	-	-	-	-	-	-
36 [20-59]	64% >2, 33% >10	-	-	-	-	-	-	-	-	-	-
-	[1-21]	-	-	-	-	-	-	-	-	-	-
-	[5-30] ^b	-	-	-	-	-	-	-	-	-	-
-	-	4,2	-	-	-	-	-	-	-	-	-
41	-	-	To:125;F:>500	-	-	-	-	-	-	45%	19%
-	-	-	120[90-150]	-	-	-	-	-	-	-	-
-	15 ± 0.5	8.3 ± 0.4	105 ^c	-	-	-	-	-	-	34%	low
-	-	-	-	-	-	-	-	-	-	-	-
35	14	<5	-	-	-	-	-	-	-	95%	2%-98% ^d
			I:55;M:12-29;S:35							0% ^e	0% ^e
24.8 [11-59]	4.1 [0-29]	1.4 [0-12]									
	[0.3-20]										

Table 2 | Assessment of Mahout-elephant relationships and their impact according to a literature review.

Location	N(mahouts/ keepers)	N(elephants)	Year	Ref
North America	277	234	2011-2013	7 ^{SW}
Europe/North America	-	122	<1946-2002	15 ^S
Arunachal Pradesh, India	-	135	2016-2017	56 ^W
Sagaing, Myanmar	151	151	2017-2018	12 ^{SW}
Japan	-	6	2016-2018	62 ^S
United Kingdom	-	21	2016-2017	63 ^S
North America & Thailand	-	-	2020*	1 ^S ,4 ^S ,5 ^S ,6 ^S
Chitwan, Nepal	-	42	2014	49
South Africa	13	7	2015	38 ^S
North America	-	3	2001-2011	44 ^S
United Kingdom	-	1	2011	33 ^S
North America	-	89	2012	16,59 ^S
North America	-	170	2010-2012	52
Peninsular Malaysia	149	60	2012-2014	65 ^S
Atlanta, North America	8	3	2001-2002	64 ^S
Worldwide	242	-	2004*	54 ^S
South Africa	-	5	2002-2003	60 ^S
Chitwan, Nepal	17	-	1992	18 ^S
Germany	-	2	1990	53 ^S
India	307	363	2005-2011	48
Thailand	-	-	2005*	37
Tamil Nadu, India	80	135	2003-2005	46,47 ^W
Karnataka, Southern India	112	75	2013	42

FGM= Faecal Glucocorticoid Metabolites, TB=Tuberculosis, H:L= Heterophil to Lymphocyte ratio, CK= Creatine Kinase, *Taken as year of publication, ^AAnecdotal
^SScopus database, ^WWeb of Science database, ^{SW}Both Scopus and Web of Science databases

Measure of mahout-elephant relationship	Impact
African eles: higher "positive interactions with elephants" (positive keeper attitude)	Lower elephant serum cort
Asian eles: higher "keeper as herdmate" / "positive physical contact" / "% ankus interaction"	Lower elephant serum cort
Weaker "keeper-elephant bonds"	Lower keeper job satisfaction
Low familiarity (24% new former keeper)	Higher risk of injury caused by elephant
Lower mahout salary ^a	Traditional mahouts leave jobs ^a
Longer mahout experience (log)	Higher CK (muscle damage) & TWBC (immune response); No change in FGM/H:L
Longer mahout-elephant relationships	Lower CK (muscle damage) after age 18; No change in FGM/H:L
More familiar mahout	More success during behavioural test
Longer mahout-elephant relationships	Faster response during behavioural test
Management style (semi)protected contact	lower tail cortisol (n=2)
Keeper-fed diet	Strongest predictor of nutritional bio-indicators
Observation management style vs riding camps	Higher body condition, cholesterol, glucose, FGM
US zoos vs Thai elephant camps	Higher FGM
High tourism season vs low in Thai camps	Higher FGM
Camps with ankus use vs none	More wounds (27% elephants in camps with ankus use) -> Higher FGM
Restraint use	Elephant injuries (67% camps reported restraint related injuries)
Mahouts underpaid & overworked in high risk job (stressed) ^a	Use more violence/less able to read elephant behaviours ^a
More familiar handler vs less familiar	More interactions initiated, more seeking behaviours
Handler directed exercise	Pregnancy success (less chance of ventral edema)
More familiar handler vs less familiar	More time moving towards handler and less time spent "alert".
Less familiar handlers	More time in physical contact & close proximity (food)
More time interacting with staff	Fewer stereotypical behaviours
Time spent in staff-directed activity	No impact on cyclicity
African eles: More time spent independent of staff activity	Higher chance of hyperprolactinemic (linked to infertility)
Elephants with assigned mahout vs not assigned	Higher risk (5x) of TB
Elephants in protected contact vs free contact	More likely to refuse commands/longer latencies/less patting & rubbing
More experience as keeper/less education	Consider keeper interaction more important as elephant welfare issue
Days with human interaction vs no interaction	Higher FGM (increase may not be biologically meaningful)
Working eles on days without interaction vs wild eles	Similar FGM
Days with human interaction vs transportation/lightning	Lower FGM
Long relationships with elephants ^a	Fewer accidents; Greater ability to interpret behaviours ^a
Succession of drivers working with one elephant ^a	Unpredictable behaviour ^a
Management measure: change foot chain & place	Increased salivary cortisol (higher during introduction to new herd)
Delay in mahout salary payments ^a	Keep elephant food rations for selves ^a
Younger generation of mahouts lacks training ^a	Harsh day-to-day treatment ^a
Frequent change of mahout-elephant pairing ^a	lack trust & understanding of elephant behaviour ^a
Inexperienced mahouts use bad practices (e.g. nylon rope) ^a	Elephant wounds ^a
Temple elephants with fewer traditional mahouts vs forest department/private	More fatal accidents (most overall accidents in forestry)
Lower mahout salary ^a	Mahouts seek extra income (begging) -> elephants overworked ^a
Assistant mahouts (spend more time with ele) vs main mahouts (spend less time)	Elephants more cooperative, sociable, fearful & less aggressive
Lack of employment (logging work) for main mahouts ^a	Reduced time with elephants->resort to force more ^a
Elephants with less time in captivity (<10 years) vs more	Worse behaviour
Older, knowledgeable mahouts & young enthusiastic mahouts vs intermediate	Score higher on "keeper effort" scores
Elephants of mahouts with higher "keeper effort" scores vs lower	Show more positive behaviours
Mahouts with higher elephant turnover rate vs lower	Lower "keeper effort" scores

CHAPTER 12

MUSTH AS A BIOSOCIAL EVENT

How musth disrupts the relational dynamics
of a human-elephant community in Assam

Paul G. Keil

| MUSTH BEYOND BIOLOGICAL AND MANAGEMENT FRAMEWORKS

I had not visited the private elephant camp for two weeks. I stood with Bharat, a senior mahout, at a clearing at the bottom of a forested hill, waiting for the others to bring four Asian elephants down from where they were tethered the night before. As per our usual routine, we would then shepherd them among the trees and bamboo as they fed and socialised until the end of the day. The younger female, Rohila, was the first to descend. As I often did, I stood along the path and made myself available for her to extend me a curious trunk and cursory sniff. Next to arrive was Babul, a bulky bull with tusks. However, as he approached, Bharat gestured that I should step back. “*Babul gorom hoise*”—that is, “Babul has entered musth”. Understanding what this meant, I stepped back five or so metres to remain out of Babul’s reach, but to my surprise, Bharat was unsatisfied and asked that I step back at least twice this distance. Babul sauntered down the path, a slow, heavy, confident swagger, breathing deeply and spitting saliva through his trunk. Temporarily

streamed down the sides of his face, leaving long dark traces on his grey, wrinkled skin. His mahout Oupe followed alongside, continuously tapping his hind leg with a *kanabari* (a fashioned bamboo stick with a sharp end) while rhythmically repeating an encouraging command of “*aget, aget, aget, aget*” (“forward, forward...”). As Babul passed, he paused and briefly directed his attention towards me, ears boldly extended. I was taken aback. Even at this distance, he was still proximally sensitive to and agitated by my presence. I was aware of the elephant’s highly charged, personal space, which I had to respect. Babul appeared, in this moment, a different elephant than the one I had become familiar with over the past few months.

Musth in Asian elephants is commonly defined as a temporary change in post-pubertal bulls. Brown and colleagues describe it as a “physical and behavioural manifestation of physiological changes” (BROWN et al., 2020: 60) that includes temporal gland swelling and secretion, urine dribbling, and elevated testosterone. In a wild setting, musth is associated with changes in intraspecies communication, dominance hierarchies between males, and the facilitation of sexual relations (LADUE et al., 2021; SUKUMAR, 2003). Musth bulls range more widely and contact a broader environment (KEERTHIPRIYA et al., 2020). In a captive setting, musth has been typically framed as a “management” problem (DUEK et al., 2016; SANTIAPILLAI et al., 2011). Captive bulls during this period are represented as being aggressive and non-responsive to commands. Management frameworks focus on implementing the best and ethical measures to control the bull and mitigate injuries to themselves, other elephants, and human handlers. These techniques include isolation and physical or chemical restraint (BROWN et al., 2020).

This chapter explores musth in the captive context. Over an 18-month period between 2012 and 2015, I regularly conducted participant observation with a small group of humans and elephants living and working in Kamrup district, Assam, India. This group constitutes what Dominique Lestel calls a hybrid community: an assemblage of human and nonhuman beings whose lives become interconnected and organised around shared practices and environments (LESTEL, 2014). The analysis of Babul’s musth will draw on ethnographic observations and conversations made while conducting fieldwork with this human-elephant community during early 2013. Aimed at a multidisciplinary audience of elephant researchers, this chapter will represent and conceptualise the

social register through which my interlocutors spoke about the interspecies relationship and the effects of musth. I will examine how Babul, in the grip of this temporary condition, shaped relationships with and between others in his proximity, both elephant and non-elephant (Figure 1).

Musth will not be analysed as a management problem to be controlled, nor reduced to a set of biological and behavioural changes in an individual elephant. Instead, musth will be examined as a *relational* phenomenon. At the level of the dyad, musth is a condition temporarily modifying how the musth bull and other nonhuman or human beings mutually interact. At the group level, musth is a period of temporary disruption to routine interactions and reconfiguration of the broader social dynamics of the hybrid community. In addition to framing musth primarily through social changes, this paper extends the scientific analysis of musth—typically embedded within intraspecies interactions—to



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Figure 1 | Oupe and Babul.

Four weeks after entering musth, while Babul was tethered during the evening, he was attacked by two young male elephants, one of whom pierced him with their tusks. In this photo, Babul, while still in musth, remained placid and enabled his mahouts to treat his wounds.

include an examination of interspecies relations as well. Further, I frame biological and social processes as interconnected in *musth* and conceptualise the *musth* state as a *biosocial* event.

The human-nonhuman community I worked with was idiosyncratic, composed of members with different social, political, and biological histories, and cannot be defined as a homogenous “Assamese” cultural system. The nine mahouts were from minority Rabha and Boro ethnic communities in Assam, most originating near the town of Chaygaon, Kamrup. This area has developed unique elephant cultures under the patronage of pre-colonial, colonial, and post-colonial regimes. Kaushik Barua, the mahout’s Assamese employer, the elephants’ custodian (“one cannot own a god,” Barua once said), and camp manager, is a successful businessman and identifies with a collective of self-proclaimed traditional elephant catching/keeping families who consider these nonhuman beings as extensions of their household. The *gharasiya hati* (“domestic elephants” in the social, not biological sense) were caught, trained, and worked (except the domestic born, Rohila) under different owners and mahouts across Northeast India. Relationships between the actors that constitute this community always included tools (i.e., chains and *kanabari*), which are necessary for mediating human-elephant interactions. Barua’s resources permitted him to employ and house mahouts on a property at the edge of a forest, where he could keep his elephants. This forest is also home to an estimated eighty to one hundred wild elephants and one of the few remaining forests in a now highly-urbanised area. This environment was essential for the specific form that human-elephant relations take in this chapter. The hybrid community, with the mahout-tool-elephant relation at its centre, has been reproduced across South and Southeast Asia for four millennia. Instantiations of this assemblage express some historical continuity yet vary according to ecological, political, and cultural context (Trautmann, 2015). 21st-century variations include interspecies teams illegally hauling timber, manifestations of Ganesh living at temples, and elephants and their mahouts labouring in tourist camps. The concept of a human-elephant community is not limited to mahoutship. It can extend to sanctuaries and zoos in the United States, for example, where people and elephants intimately co-shape each other’s lives.

In this chapter, I build on anthropological research that uses the hybrid community concept to examine mahout-elephant relations in South

Asia. Nicolas Lainé's anthropology of a minority ethnic, elephant-keeping community in Northeast India, analyses collaborative interspecies labour and a more-than-human society in which wild elephants and forest and village spirits also participate (LAINÉ, 2018; LAINÉ, 2020). Piers Locke explores elephants as multifaceted beings (persons, animals, and gods) and how mahout-elephant relations were structured by Hindu ritual practices and institutional discipline in Nepalese government stables (LOCKE, 2017). These ethnographies conceptualise elephants as *social actors* in the hybrid community: skilled, subjective, intentional beings in reciprocal communication with humans in contrast to mechanistic accounts of behaviour (LOCKE, 2013). The exceptional social and cognitive capacities of elephants are highlighted in each case to explore their active role in the interspecies relationship, that is, the animal's *agency* or capacity to shape the dynamics of interactions and joint activities with humans. This research and the research in this chapter represent a multispecies ethnographic approach that studies the entanglement between human and nonhuman beings, nature and culture, as well as biological and social domains of knowledge (KIRKSEY & HELMREICH, 2010). The phenomenon of musth can further our understanding of human-elephant sociality and worlds. When musth is framed as a management problem, it emphasises human power by focusing on planning and control to limit elephant impacts. However, this anthropocentric focus obscures how management is merely a pre-emptive response and an attempt to mitigate an unpredictable, dangerous, and potentially uncontrollable state of being that disrupts regular routines and arrangements. An elephant in musth, I will demonstrate, expresses a formidable nonhuman agency that demands and effects change in the hybrid community.

| HOT HATI

Musth cannot be disassociated from the socio-ecological setting in which it emerges. Its manifestation can vary depending on the presence of other bulls, the environment and health of the elephant (LADUE et al., 2021), and whether they are living in a wild or captive setting. Forest-living, free-roaming elephants in musth are not found to embody states

of stress, contrary to observations of bulls living in constrained and routine working environments (GHOSAL et al., 2013). Even the intensity of musth expressed in captive settings varies depending on how the bull is managed, with techniques differing between regions (SANTIAPILLAI et al., 2011). Some of the characteristics typically associated with musth—such as aggression, unresponsiveness, and unpredictability—are interpretations of behaviour situated within the human-elephant relationship, particularly the working mahout relationship. Before proceeding with a relational analysis of a bull in musth, it is worth understanding the words that interpret his condition. The terms used by mahouts I conducted fieldwork with can provide insight into how musth states are interpreted in different cultures and how bulls in this state are positioned as social actors in Assam.

In Assamese, the formal term for an elephant in musth is *bhati khola*, where *bhati* refers to the temporal glands and *khola* means opened. However, my mahout-interlocutors never used this term in regular practice. Phrases such as *bati gorom hoise*, *pagol etiya* (“the elephant has become hot, he is now crazy”), and *gorom pani* (“hot water”; referring to the temporin secretion—see Figure 2) were common descriptions. The word *gorom*—which means “hot” (as opposed to *thanda* for “cold”)—is constantly used in daily life throughout Assam. It refers not only to temperature but experiences of excitation, agitation, arousal, sensitivity, and volatility in humans. For example, *gorom* can describe a disturbance due to poor health, such as inflammation, fever, and indigestion. A person who is angry or takes part in a heated conversation is *gorom*. *Gorom* describes a bodily, emotional, and subjective state shared across human and nonhuman beings. Hot and cold also describe the potentiality of substances to alter the body. Alcohol can be called hot water. Eating pumpkin can heat the body and excite indigestion. Neem leaves boiled in water can help “cool” an elephant sick from infection. Binary states of hot and cold are part of a South Asian system of classification and diagnosis (MANDERSON, 1987). A *gorom* elephant is an unbalanced subject and must be treated carefully. Their sensitive and volatile responses suggest that the bull senses, perceives, and is affected by the environment in irregular ways.

Pagol means mad or insane and is a term used in relation to people acting unreasonably or outside of regular norms, often disparagingly. Among elephants, *pagol* is commonly understood in Assam as



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Figure 2 | Oupe watching Babul in musth, as he drinks from a stream.

Babul was in an intense *gorom* state at this point. Mahouts could assess Babul's state through both relational shifts and visual signs such as temporin.

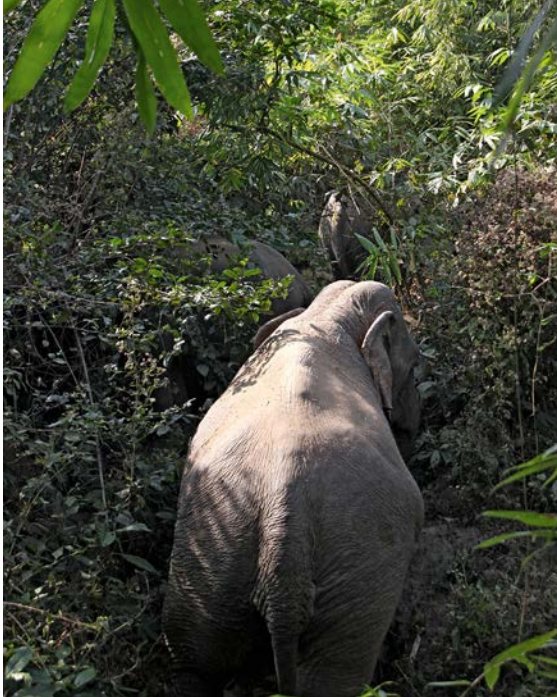
describing a free-roaming or working animal who is out of control and destructive. Among mahouts, *pagol* describes a bull who is gripped by such an intense *gorom* state they no longer respond to commands and behave unpredictably. In such cases, communication between human and elephant breaks down, and, as a mahout explained, “they do not understand their mahouts. They do not understand their owner. They are full of anger”. The elephant no longer perceives the well-meaning intentions of people nor recognises a fostered familiarity. Their clouded judgement must be understood in relation to a broader Assamese belief that elephants, as exceptional, even god-like beings, can demonstrate reliable insight into people's positive or negative attitudes towards them and will treat them accordingly (KEIL, 2017). Musth is a dangerous deviation from that social and moral connection. Although, mahouts recognise that the elephant's overwhelming madness is neither intentional nor can be self-controlled.

| THE IMPORTANCE OF ROUTINE

The photos in figures 3 and 4 were taken two weeks before the noticeable onset of musth. On that day, like every day, we departed at 6.30 am to unchain Babul, Alaka, and Rohila from where they were tethered overnight in the forest. With forelegs hobbled to prevent them from moving too quickly ahead, we followed the elephants to their preferred drinking stream and then guided them up the hill to a location the mahouts knew still had fresh bamboo leaves during the dry season. The atmosphere was relaxed. The mahouts were content to follow the elephant's pace, and the elephants accommodated the mahout's intentions when commanded not to stop and browse. At the hilltop, we watched all three elephants feed among the bamboo and in proximity to each other. Babul kept to himself while the excitable sub-adult Rohila and her "adopted mother", the patient and stoic Alaka, stayed close together. Babul was generally good-tempered yet aloof, a reputation observable through his treatment of elephants and mahouts alike. During this time, mahouts inspected the elephants for any sores or health issues. Work responsibilities were fluid, and other mahouts, like Bharat, occasionally helped to manage someone else's elephant. Later, the elephants were tethered to the hillside, and we returned to camp for lunch.

This is an ethnographic snapshot of the typical morning practice and inter- and intraspecies relations at the time. The group formed over five years. It began with Alaka and expanded as Barua brought more of his elephants and mahouts to this forest fringe site to create and manage an experimental, human-mediated herd in semi-naturalistic conditions. Group dynamics took time to test and establish, including affective relationships between elephants, smooth collaborative relations between mahouts and elephants, and mahouts negotiating working roles and practices among themselves and with the manager. These interspecies relations were developed across the modality of senses, elephant and human knowing each other through sight, smell, and sound. Their bodies, perspectives, affects, and actions became interconnected over time within this hybrid community, organised around routine practices.

Routine is an important part of working and living with elephants. Human and nonhuman *identity*, *agency*, and *interpersonal* and *social norms* are expressed through their day-to-day relations. Indeed, anthropologists



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Figure 3 | Following the three elephants on a path to a stream.



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Figure 4 | Babul in the foreground, a few weeks before entering musth.
The older female, Alaka, feeds in the background. Rohila is off-frame, next to Alaka on the left.

have generally explored mahout-elephant relations through structural continuity and social reproduction. Piers Locke became familiar with the unique personality of Sitasma Kali, a female elephant, and wrote of the interpersonal understanding both species developed through their daily, mutually attuned, joint activities such as morning greeting, feeding, and forest patrolling (LOCKE, 2017). In Northeast India, Nicolas Lainé analysed how elephants caught from the forest learned to live by the norms of the Khamti village, a process of socialisation done through mahout-led training regimes and attachments to more experienced village elephants (LAINÉ, 2018, 2020). Successful collaboration between mahout and elephant—the ability to perform augmentative tasks as an interspecies team—depends on the bond and authority developed and conditioned through the discipline of work and daily rituals, such as bathing.

In these hybrid communities, who the members are and what they can do are potentialities that take shape through their ongoing relationships with each other. The mundane relations of humans and elephants in the group are structured by the “arrangement” of common practices, tools, and environments (LESTEL, 2014). While humans significantly structure the routines of these domestic social worlds, nonhuman bodies and intentions also reciprocally shape the course and outcomes of interspecies activities. Over time, as these arrangements are reproduced daily, human and elephant begin to establish interconnected meanings and affects (LESTEL, 2014), such as a coordinated understanding of how to skilfully perform a certain task (LAINÉ, 2020) or mutual familiarity and the ability to interpret each other. Routine is an important factor in the development, maintenance, and representation of the hybrid community.

| THE DISRUPTION OF ROUTINE

Musth, then, presents a problem. A *gorom* elephant can interfere in regular practices and relations and provoke changes in the mutually constituted identity, agency, and norms of the group. This section will describe in ethnographic detail the changes that occurred as Babul heated up

and cooled down over a two-to-three-month period, an unfolding state that altered the arrangement and social dynamics of the community along with it.

There was an affective shift between elephants during Babul's musth. This led to some elephants disassociating from Babul, and previously unproblematic intraspecies interactions now required mediation by mahouts. Bahadur, the other male, was already less likely to dwell in proximity with other herd members, often due to tensions between him and Babul; however, during the entire period of musth, there was a strictly coordinated effort by the mahouts to avoid having both bulls together at the same time in case they fought. Musth bulls will attempt to exert dominance over other males (SUKUMAR, 2003). I rarely saw Bahadur's mahout during Babul's musth, as he led the bull for the entire day in another part of the landscape. This included being away from the female elephants (and their mahouts), who were allowed to remain and feed in the same area as Babul. However, the older cow, Alaka, demonstrated her awareness of and response to the shifting intensity of musth. During these periods, Alaka, of her own accord, gave Babul a wide berth. And if he drifted closer to her while browsing, she purposefully retreated from him. "She is afraid", her mahout said, interpreting her response to Babul's *gorom* temperament. "She understands what he is like ... But..." he laughed, "Rohila doesn't!" Rohila was implied to be inexperienced with the potential aggressiveness of musth bulls due to her age and the conditions in which she grew up (being born in a domestic context).

In contrast to Alaka, Rohila was drawn to Babul over the course of several weeks, a proximity that mahouts and the manager supported (Figure 5). This emerging connection was striking because Rohila was usually so attached to Alaka physically and emotionally. Rohila also started showing her first visible signs of puberty: her vulva slackened, drooped, and dribbled urine. She spent much of her time being intimate with the male, pressing her smaller body against his, exploring his face with her trunk. One morning, Rohila even squirted water at Babul! Research shows that oestrus females will solicit musth males and are more responsive closer to ovulation (RASMUSSEN & KRISHNAMURTHY, 2000). At first, Babul remained indifferent—even defensive—towards Rohila's clumsy advances. Over time, the bull became more accommodating, reciprocating the cow's attention and smelling her sexual organs.

We can imagine that these observable, physical interactions were immersed within an atmosphere of male and female olfactory chemo-signals through which the two sexes sensed, knew, and affected each other (SCHULTE & LADUE, 2021; see LORIMER et al., 2017 on “animal atmospheres”). The emergence of oestrus and musth are not necessarily connected—musth can arise in the absence of oestrus, and oestrus is cyclical. However, the coincidence of Rohila in heat and Babul’s *gorom* state was speculated to further excite Rohila’s emerging changes. Bull and cow resonated with each other, a synergy that intensified their connection and encouraged new relational opportunities. Or, as mahouts politely interpreted it: *morom* (love).

The social implications of musth are not limited to relations between elephants. While previously expressing an accommodating disposition, Babul, at his most intense, was highly sensitive towards unfamiliar people. “*Beleg manuh mare dibo*”, I was told—“Babul will attack strangers”. Not only villagers in the area were warned to keep their distance from



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Figure 5 | Babul was accommodating to Rohila’s presence yet wary of others approaching.

the hybrid herd, but any mahout apart from his regular handlers, Oupe and Bhupen, needed to carefully modify how they regard and approach him. One day Bharat, who did work with Babul on the odd occasion, was tasked to handle him without his regular mahouts. Bharat faced an indignant, unpredictable, and aggressive individual who was impossible to guide safely at close quarters. Babul was, at this point, *gorom* and *pagol*: filled with madness and unable to recognise Bharat. The bull's response demanded new relational strategies and mediating tools. Adopting an unusual method, Bharat shepherded the elephant using a slingshot, reinforcing his instructions from a safe distance. With some difficulty and risk, he guided the elephant to a stream to drink and then restrained him in the forest for the rest of the day. Musth temporarily transformed the political dimensions of the working partnership. There is a breakdown in the relationship as the elephant is no longer willing to coordinate with mahout intentions and incoherently responds to instruction. Bharat lost the right to command, and the liberties Babul permitted Bharat outside of musth were no longer recognised (see HEARNE, 2007 on authorisation in working animal relations). *Gorom* elephants can assert their power by resisting or suddenly attacking or killing their mahouts.

However, I was impressed how the relationship between Babul and his regular mahouts involved minor changes, at least on the surface. Mentioning my surprise one evening at camp, Oupe brought out the shirt, sweater, long pants, and beanie he wore at work and explained that during musth he used the same set of clothes every day. He never washed these clothes and only wore them when handling Babul. This technique helped maintain a stable working relationship by exploiting what mahouts considered the elephant's primary sense—smell. Oupe never interacted with any other elephant while wearing these clothes. Even after taking a break, sharing a *bidi* (cigarette) with other mahouts, he observed caution by washing his hands and forearms in the stream. The aim was to avoid foreign smells apart from Babul's or his own and maintain a predictable and familiar scent and presence. This discipline meant that Babul refrained from assisting other mahouts with their elephants, as he usually might, and kept his distance from Alaka, Rohila, and especially Bahadur. If an elephant's agitation or *pagol* responses are provoked by the different or unfamiliar, Oupe endeavoured to become more closely aligned with Babul through scent, fostering a shared identity with this nonhuman individual: an identity

distinguished from other members of the community and a kinship which transcended species difference (GOVINDRAJAN, 2018). While Oupe's relational technique is not specific to the elephant-keeping culture of Chaygaon in Assam, by my understanding, it is uncommonly practised and representative of the intimate connection with elephants this culture is believed to possess (SARMA, 2011).

Interestingly, the privileged position that Babul gave to his regular mahouts during *musth* could be exploited by these men to better negotiate with the other mahouts and their employer and manager, Barua. At one point, both regular mahouts returned to their home village for the day, leaving Bharat to manage an irritated Babul (mentioned previously). The coincidental reasons for leaving were, in part, related to one or both of their frustrations during this intense period of additional stress, labour, and responsibility. Their departure was also likely related to a grievance they had with Barua at the time. The mahouts' absence, and the increased difficulty in managing a *gorom* Babul without them, emphasised the value of their relationship with the elephant and so placed mahouts in a stronger position to successfully make their opinion heard. Particularly when protesting to their employer, to whom they were in a socio-economically less privileged position (SCOTT, 1985). *Musth* also changes relational possibilities between humans, and mahouts can leverage this position as a source of political power or resistance. (On a separate yet related point, I spoke with a local farmer who recalled that he had never seen a wild *musth* elephant behave dangerously and unpredictably as he has seen working elephants. He always assumed that the mahouts—whether by food or a magic spell—induced the elephant into their *pagol* state to get out of work!)

| MUSTH AS A BIOLOGICAL AND SOCIAL EVENT

Musth was a period of shifting associations. Social relations expanded and contracted. Depending on its intensity, some were repulsed, some were attracted, and others had to renegotiate or intensify their connection. Hierarchies were challenged, identities were strengthened, unexpected affects emerged, and novel mediating tools were deployed. These

were dynamic changes that could cut across all the groups' relations—between elephants, humans and elephants, and even among humans themselves—and disrupted the social and working routines. These changes are only temporary, a tension that snaps back to the normal arrangement when the musth period subsides. As these ethnographic examples demonstrate, musth is more than biological and behavioural manifestations in an individual bull. Musth in captive conditions can be characterised through its temporary reconfiguration of inter- and intraspecies relations that constitute the hybrid community. Musth is biosocial, where social changes cannot be disentangled from biological changes (see INGOLD & PALSSON, 2013).

Musth determines the conditions of interaction, and its manifestation can be conceptualised as a biosocial *event*. An event has two crucial elements. First, an event refers to a temporal period. Indeed, musth, in its conventional biological conception, is often defined as a condition passing through sequential stages of early, full, and post musth. At my fieldsite, as the intensity of Babul's *gorom* state changed, social tensions and group configurations in the community also shifted. Second, an event refers to a happening that is a marked deviation from the regular continuity of everyday experiences, activities, routines, and relations. Among humanities scholars, events are framed as significant periods, times when norms and order are destabilised, where alliances shift and new political possibilities develop, and often experienced as a period of uncertainty (WAGNER-PACIFICI, 2017). A description of an event captures a multiplicity of linked actors and processes that are implicated in the unfolding of the episode, either giving shape to, or being shaped by, the occurrence (DEBAISE, 2017). Analysis of events often attends to their specificity and uniqueness and attempts to capture the complexity of these episodes across multiple levels, from the individual to the structural. Finally, events in the humanities disciplines are often analysed for their historical significance.

Musth, of course, is neither a one-off episode nor does it necessarily create dramatic changes in the long-term course of the human-elephant community: it is a state anticipated each year and, to a degree, normalised through good management strategies. Still, the concept of an event is useful. First, it attunes the researcher to the disruption, reconfigurations, and uncertainty in human-elephant relations during musth. Second, an event acknowledges musth's specificity and that

changes are situated and best understood within the socio-ecological context in which they occur. Finally, conceptualising musth as a bio-social event offers an integrative framework within which the *gorom* state can be described through interconnected biological and social processes. An integrative analysis of musth requires weaving together a temporal account that links local ecology, cultural practices, hormonal surges, physical changes, sensory signals and pheromonal atmospheres, perception, affect, and relational behaviours, and broader community dynamics

Musth at my fieldsite was an event-full period, with changes that extended beyond the interpersonal and working relationships detailed above. An improved examination of musth would benefit from adopting a method that accounts for all human and nonhuman actors, materials, and practices that gain more significance during this time, whether directly or indirectly coinciding with Babul's *gorom* state (e.g., LATOUR, 2005). During fieldwork, this included increased attention by Barua to inspect the elephants or calls to speak with mahouts and remind them to take care. New and larger chains were supplied and utilised. And a day was dedicated to worshipping the Hindu god, Ganesh, to "clear the air" of "bad feelings built up over the year" and at this critical time. What stood out in my ethnographic notes was the increased entanglement with local wild elephants. A *gorom* Babul toppled the tree he was tethered to and the next day was found wandering freely, striking out his own path inside the forest, possibly "wanting a female." Another night, the mahouts believed that Babul's vigorous and antagonistic presence, along with the scent of people that lingered on him, drew the attention of two young, wild males. They attacked Babul, seriously injuring and weakening him, a change which eventually altered the hierarchical dynamics between him and the other male in the community, Bahadur. Finally, Rohila's oestrus state, inflamed by Babul's musth, attracted the attention of a wild *makhna* (tuskless elephant). He unusually loitered in the area day and night for a month, accidentally frightening villagers collecting wood in the forest. We found him next to Alaka and Rohila one morning. He kept returning and eventually did impregnate Rohila the following year. Musth not only reconfigures community relations but is a time when unexpected connections are sought out and developed beyond the immediate members of the community, with some far-reaching consequences.

| CONCLUSION

This chapter has explored musth beyond physiological, physical, and behavioural changes in the individual bull and analysed its manifestation as changes in the social dynamics of the human-elephant community. Reconceptualising musth's manifestation as an event that encompasses biological and social processes opens the opportunity for an interdisciplinary investigation. Different levels of analysis, from the physiological to the behavioural, relational to the cultural, are not competing but complementary to understanding this phenomenon. While musth is generally analysed for its intraspecies social effects, humans too are shaped by these changes. This integrative biosocial framework, extended to other human-elephant communities situated in different cultural, ecological, and historical contexts, can shed new light on how musth changes the lives of human and elephant actors. While other communities in different regions may be affected by musth differently—whether it is a zoo in the United States preemptively reorganising herd social groups; Thai mahouts restraining, isolating, and avoiding a bull at a tourist camp; or the tragic death of a South Indian mahout at a religious festival—all are examples that reflect musth's power to shape the composition of human-elephant worlds.

A final note: I began this chapter by highlighting the anthropological strategy of framing elephants as social actors to explore their agency in human-nonhuman relations. However, we cannot fully equate the agency embodied in musth to that of Babul as depicted in this chapter—the subjective and intentional nonhuman actor. While musth is expressed through Babul's actions, it is also an involuntary condition that happens to him—in this way, he is not a catalyst of the event but caught up by it. Musth is a periodic surge at the hormonal level that then ripples out and causes corresponding changes in the elephant's body-mind-world. Yet the waves of musth that grip the individual across repeated events throughout his lifetime originated before the organism—this wave is a pattern inherited and repeated across generations; an evolutionary force maintained through fitness. Musth seems to present new challenges for multispecies ethnography and demands a new analysis of human-elephant relations as it also requires a sense of bodies, time, and more-than-human agency that evades social theory and the concept of a social actor.

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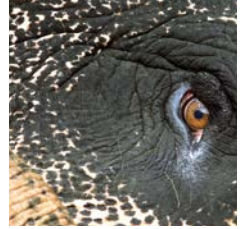
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ARTISTIC INTERLUDE 3

CEMETERY: MULTISPECIES INTIMACIES AND EXTINCTION



Deborah Schrijvers

Spanish artist and film director Carlos Casas' experimental film *Cemetery* (2019) follows the old Asian elephant Nga, possibly the last of his species, on a journey to a mythical elephant graveyard to die. The elephant is accompanied by his mahout Sanra. They are trying to reach their destination while poachers hunt for both Nga and the elephant graveyard, with its promise of ivory abundance. The film comprises myth, documentary, fiction, and visual experimentation and, in this process, becomes a form of visual thinking. *Cemetery* touches upon questions of human-animal communities and relations—most notably human-elephant relations—but also extinction, colonialism, and contemporary capitalism. Due to its visual and auditory richness, I believe *Cemetery* is able to think along with these issues, as it visually re-imagines multispecies relations in an affirmative sense, both grounded in the South-Asian context of the film and with global implications for human-animal relations. The film is able to do this through its emphasis on the symbiotic elephant-mahout relationship, as well as through framing the agentic force of natural environments while engaging with ongoing human practices of exploitation of non-Western matter and life, which are shaped by subsisting colonial structures.

Human-animal and human-nature relations are not a new theme in Casas' filmography, as he previously created a documentary trilogy on

of water for Soviet irrigation projects since the 1960s which has led to an ecosystem collapse. The second film, *Solitude at the End of the World* (2006), follows three men's isolated way of living in the deserted Tierra del Fuego in Patagonia. The last film covers the struggle for survival of Chukchi whale hunters along the coast of the Bering Sea in *Hunters Since the Beginning of Time* (2008). Casas' work has been screened at notable film festivals such as the Venice Film Festival, the International Film Festival Rotterdam—where *Cemetery* was screened in 2020—and the Buenos Aires Film Festival, amongst others. His work has also appeared in international institutions and galleries such as the Tate Modern and the Centre Pompidou. *Cemetery* is the result of ten years of archival research on visual imagery and cultural narratives about human-elephant relations and the elephant graveyard, as well as fieldwork with elephant behaviour scientists and conservationists, and elephants and mahouts co-living in Sri Lanka today. In this sense, *Cemetery* is a result of the intersection of the arts, humanities, and sciences to offer a multi-layered narrative of human-elephant relations.

Casas uses the myth of the elephant graveyard, popularised in adventure films such as *Tarzan the Ape Man* (1932) and *Jungle Book* (1942), as a framework to investigate contemporary human relations to nature and other species and meditates on death, time and extinction. Extinction is a realistic threat to elephants, as the Elephant Listening Project reports that a staggering 60% of all forest elephants have been killed in the past decade. Conservation biologists Jean-Louis Kouakou et al. report that 86% of forest elephants in the previously heavily populated country Côte d'Ivoire have disappeared in the last few decades (KOUAKOU et al., 2020), predicting future extinction without a change of policy. The inability of law enforcement and international agreements such as CITES to protect threatened animals implies that not only policies but also social relations and cultural imaginaries need to change in favour of future human-animal coexistence. Extinction studies pioneers Deborah Bird Rose, Matthew Chrulew, and Thom van Dooren characterise extinction as a biological and cultural complexity of our world and therefore approach it as a *biocultural* phenomenon (BIRD ROSE et al., 2017). In light of this understanding of extinction, theoretical, ethical and political action is required, as well as different stories to inform and imagine these different forms of action. Storytelling can be considered a form of action in itself, as it is a situated approach that invites conversation with a multitude of others and therefore has the potential

to diversify dominant perspectives. Due to its theme and audiovisuals, I argue that *Cemetery* invites viewers to remap current destructive human-elephant relations.

The film is able to re-imagine human-elephant relations through its visualisation of ecological entanglements that shape shared environments and, therefore, interspecies relations and communities. *Cemetery* shows the double bind of contemporary human-elephant relations: on the one hand, there is the intimate and relational bonds exemplified between Nga and Sanra, which is a lifelong meaningful relationship based on care and respect. Their relationship forms the first part of the film and follows their shared daily rituals, notably the baths taken by Nga while being scrubbed clean with a stone by Sanra. The slow pacing of the bathing scene captures their mutual exposure as the camera zooms in on the textures of their touching skins. On the other hand, the film demonstrates the vulnerability of life under postcolonial structures and the ongoing hierarchical species divide, which stimulates the capitalisation of animal bodies. Practices of extraction, like trophy hunting and elephant poaching for ivory, are both historical and contemporary issues that demonstrate the exoticisation of elephants. Although the destructive side of human-animal relations is not central to the film, it nonetheless meditates on the exploitation of hum(animal) cultures



© C. Casas

Figure 2 | Lake.

in the Global South, which destroys the potency of sharing a differentiated world otherwise than through a global capitalist prism. In the process, it kills off species, communities, cultures and local economies. I find this a strong aspect of the film, as I argue that only by explicitly taking into account (settler) colonial histories that continue to produce neocolonial practices of resource extraction affecting both human and nonhuman extinction (and their relational cultures) can alternative futures be imagined.

Casas' non-anthropocentric filmmaking is apparent in the second part of the film when poachers seek to track Nga and Sanra. This chapter is focalised through point-of-view shots of the natural environment, voyeuristically following the poachers. The ocular form of agency this framing creates is fortified by the cinematographic structure throughout the film, which consistently first shows the vegetal or mineral environment before other species enter the shot. This is further emphasised by the meticulous sound editing, which centralises the relational yet diverse environment, as the audio track upon entering the jungle bursts with an abundance of noises made by cicadas, birds, amphibians, monkeys and grasshoppers. The audiovisual, agentic, natural force portrayed by Casas annihilates attempts to reduce the immeasurable relational environment, as the poachers operate within the intersectional colonial logic



© C. Casas

Figure 3 | Nga.

of supremacy over Asia and the nonhuman. The agency of nature is therefore portrayed as more forceful than human weapons and scientific technologies, destroying attempts to enforce colonial capitalism on this dynamic entanglement.

Non-anthropocentric filmmaking is central to re-imagining human-elephants relations in *Cemetery*, realised through the interspersing human and elephant focalisation of the camera in the third part of the film when Nga and Sanra journey to the elephant graveyard. The apparent interchanging point-of-view shots between mahout and elephant asks the viewer to meditate on the importance of this interplay in order to create their own narrative and meaning. The choice of visuals and audio is a clear deviation from the nature documentary genre. The nature documentary keeps distance from animals to enable the viewer to identify the animal at all times and therefore makes it serve as a representation of his species. The nature documentary also frequently uses non-diegetic music to create a narrative reinforced by the voice-over. Through its slow pace, extreme close-ups, human-elephant interactions, shifting focalisations and diegetic soundtrack, the viewer is able to establish a new relation to Nga as a singularity, folding the usual subject-object/human-animal hierarchy.



Figure 4 | Eye of Nga.

The final and fourth chapter of the film shows seemingly non-human landscapes that are predominantly mineral and an ominous soundtrack that juxtaposes the exuberant soundtrack in the chapters before. The entire chapter consists of a series of shots of various rocky and dry landscapes, offering seemingly static images. Audiovisual mirroring the prologue of the film, this chapter proposes an experience of cyclical time, where the end of life is also the beginning, or the beginning of life is the end. Here we view not human or nonhuman time but inhuman or geological time, which I argue allows the viewer to experience duration through lingering, static shots. Inhuman time cannot be perceived by the viewer due to the different perceptions of what constitutes movement or change. Yet, physicality forms a continuation in terms of visual language in the film through an emphasis on surface textures. The defined lines and shapes of the rocks in this final part parallel the elephant and human skin with its lived history imprinted on the surface. Yet, it is more robust and static compared to skin, hinting at a longer, slow-moving history; mirrored by the unmoved framing of the shots. Is this what human and nonhuman extinction looks like? Will transformed life start again afterwards, or will it repeat the cycle? Through this structure of cyclical time, of which death is an inherent part, *Cemetery* suggests that the extinction of human and nonhuman life is an inevitable and natural course. However, it does urge us as viewers to meditate on the human responsibility in the acceleration of this course and on the meaningful human-nature and human-animal relations that are lost in the process. By visually re-imagining multispecies relations through a visual language that diverges from nature documentaries, it tells the story of human-elephant intimacies and ways of living that might inspire the future.

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PART 4

THINKING WITH ELEPHANTS

CHAPTER 13

TIME AND THE ELEPHANT

Temporality as attunement
with more-than-human others

Khatijah Rahmat

If nature is common, why should memory differ?

Diane Owen Hughes, *Time: Histories and Ethnologies*

I INTRODUCTION

Time is a politically malleable device, and multi-temporality can be introduced to uncover new ways of reanimating epistemologically confined subjects (FABIAN, 1983; FITZ-HENRY, 2017). However, applications of critical multi-temporality in the environmental humanities remain focused on long-term environmental hazards such as climate change (ADAM, 1998; NIXON, 2011) and landscape ecology (MANNING et al, 2009). In canonical texts focusing on human and (typically domesticated) other-than-human relationships (HARAWAY, 2008), temporality is considered only partially, with very little animal ontology explored outside “the embrace of the human” (TSING, 2019: 223). The interest in time and animals has sustained the attention of researchers in recent decades,

but the subject remains diffracted across many disciplines with different priorities and epistemic predicates. A dedicated study of multi-temporality and nonhuman animals remains unexplored, though its potential has been acknowledged (ROSE et al, 2017).

Consequently, how may we think of reanimating animal ontology with multi-temporality? The question is presently being explored in my doctoral research, focusing on Asian elephants, with hopes of offering generative implications for other species, or at least large mammals of similar cognitive capacity and equally long histories of coexistence with human populations. My research aims to unpack the ways in which meanings of the elephant are delineated across different knowledge practices (such as history, comparative research, and other intersections in the environmental humanities) and how these evolving meanings, consciously or unconsciously, impact and inform notions of difference, comparison and of agency in animal studies in general. A full elucidation is impossible here; the objective of this chapter is to share some of the possible theoretical advantages of pursuing this line of analysis for elephants and animal agency more broadly.

Thinking of animal ontologies multi-temporally takes inspiration from sociologist Dana Luciano's concept of "chronobiopolitics", which examines the temporal within Foucauldian biopolitics—exploring where meanings ascribed to "life" or "the body" are manufactured through a number of temporalities, diffused across cultural narratives but ultimately suppressed by "overly linear historical frameworks" (LUCIANO, 2007: 12). This research follows after animal geographies' "third wave", which departs from academic turns in the discipline that historically ordered humans as superior and different from other animals. Instead, it accepts that animals also possess subjectivity, histories, and networks (GILLESPIE & COLLARD, 2015). Tracing elephants' chronobiopolitics can thus begin through three identified, though by no means exhaustive, components: i) The elephant's eco-cultural identity, the ecological equivalent of sociocultural identity (MILSTEIN & CASTRO-SOTOMAYOR, 2020) ii) elephants' individual experiences (individual here referring to specific single elephants, or the unique situational circumstances of a specific elephant community) and iii) human-imposed time and how this impacts upon elephant agency. This triad views animal subjectivity, temporality, and materiality as inextricable. Delineating meaning through these chief flows of knowledge offers a mediation between the material

and the theoretical—theory must contend with the data of the real world, allowing for archival and observable research found in the traces and changes affected or impacted by the animal subject.

Gathering multiple temporal dynamics together, “elephant time” thus collects temporal forces that occupy, govern and are governed by elephant individuals, elephant communities, their collective lifeways and the fluid histories that course through their relationships with other-than-elephants. Gathering existing knowledge from diverse fields studying the elephant, a multi-temporal rubric of thinking about elephants, or thinking through “elephant time”, ultimately offers a new language in which to expand the interpretive possibilities of elephant agency. Recognising elephants as multi-chronometric beings and tracing their multi-temporal relationships with their personal history and landscape are, in themselves, practices of attunement as they compel us to think of elephant action and encounter as richly relational, released from a time-locked approach and the vacuum of a single discipline’s perspective (CARTER & CHARLES, 2013).

I CONCEPTUAL FOUNDATIONS FOR ANIMAL TEMPORALITY

Before addressing elephant time specifically, it is worth establishing a few theoretical foundations to how temporality—the experience of time—may be afforded to nonhumans in general. There is significant literature dedicated to how linear time reduces the dynamism of nature’s ontologies (BOSCHMAN & TRONO, 2019). This linearity is rooted in two thinkers and impacts animal agency in two different ways. The first is the Cartesian legacy that maintains a false divide between mechanistic nature and a (human) mind that possesses free will (PLUMWOOD, 2001). The second is the Newtonian belief in absolute time, that is, time that operates separately from human experience. Both have limited our reading of animal agency by instilling the following biases. Firstly, the mechanisation of nature led to the subsequent mechanisation of all beings linked to nature (BASTIAN, 2009), including animals (LESTEL, 2014). Secondly, Newton’s disembodied time eliminates the possibility of imagining an animal participating in the world with its own

performative expression of temporality (ROSE, 2012). Once regarded as machines, animals were dismissed for having none of the interiority required to participate in temporal experiences; temporality was a transcendent experience reserved for man alone (BUCHANAN, 2007). Both notions solidified the process where “anthropological time progressively takes the place of ethological time” (DESPRET, 2015: 45).

Today, however, temporality as an exclusively interior concern is proving unfruitful. Even studies of human subjective time have begun to do away with the idea that embedded and extrinsic times are mutually exclusive. There is the dawning realisation that temporality cannot be understood without the “exterior scaffold” of the material world. New innovations in the field see the “future of time” as moving toward an understanding of “ecologically situated timing” (VALTTERI & LLOYD, 2014: 661). For nonhuman animals, as it will be elaborated, this “ecological situatedness” functions beyond metaphor. There is a growing trend within the multidisciplinary fields studying animal minds to regard animal subjectivity manifesting as “minded bodies, inseparable from mental properties and social encounters” (SMITH & MITCHELL, 2012: 4).

Factoring temporality as “embedded” opens up many conceptual opportunities unthinkable under mechanistic time. It served as the rubric for Deborah Bird Rose to extend the notion of multispecies relationships as “knots of ethical time” (ROSE, 2012: 127). Embracing temporal complexity, Rose appeals to the idea of an ontology founded on ethics rather than metaphysics by pointing out the temporalities embedded in the co-evolved relationships between foxes and myrtaceous flora. Rose points out the rich sediments and webs of genealogical time that orchestrated these resulting relationships and brings to light the interpretive possibilities of noticing embedded time, “where every creature has a multispecies history” and “each (nonhuman) individual is both itself in the present, and the history of its forebears and mutualists” (ROSE, 2012: 136). We can see “histories and futures” (ROSE, 2012: 136) only by seeing animals as embedded in time. The animal reveals its webs of time in how it performs life.

This illustrates how perceptions of temporality and agency are intertwined. Animals, when reanimated with a more generous idea of their agency, refute anthropocentric temporal claims and demand a more complex sense of temporality. Conversely, Rose’s adoption of complex temporality illuminates how we are better able to read animals and their

dynamics. It is useful here to think of Carol Greenhouse's argument that conceptions of time ultimately represent how we conceive of agency (BASTIAN, 2009). Greenhouse defines agency as "the broad and highly varied meanings people attach to questions of possibility, causation, and relevance around the world" (GREENHOUSE, 1996: 83). Many cultures have their own notion of temporality and agency for actors, but temporality can oppress when a Cartesian and Newtonian idea minimises the epistemic space of its "other" actors. It is the dominant conceptions of agency that provide the conceptual means to *see* agency (BASTIAN, 2009; PLUMWOOD, 2001).

| AN ELEPHANT TEMPORALITY

In Vicki Hearne's book *Adam's Task* (HEARNE, 2007), the philosopher and animal trainer reflects on the metaphysical dimensions of animal training. She dedicates a chapter to "horse time" and examines how trainers prepare horses for major competitions when the significance of these events is lost on the horse. After all, she muses:

"...There are differences between the horse's concept of time and ours... They have their own grammar of time. They can't say anything that requires past, present or future tense, but that doesn't mean without us they live in eternity, in the present tense only. Their concept of time might be expressed by saying that the names of their tenses are 'not yet, here and gone'. You can't make appointments with such tenses, but you can remember, and you can anticipate the future with no little anxiety" (HEARNE, 2007: 163-165).

Hearne argues that each species carries its own sense of temporality. It is not that animals have no sense of time but that we, as human observers, blind ourselves from recognising it when we "impose our own stories and our deathly arithmetic on their *coherent landscapes*" (HEARNE, 2007: 165). Animals fashion their own "grammar of time" from their specific world-making and meaning-making structures in the landscape. Animals' temporalities are revealed when we see animals not only crafted in their landscape but also in how we ourselves conceal or oppress their dynamics.

What, then, serves as the grammar of elephant time? As mentioned, early theoretical sketches can identify three chief areas that may offer a starting point. As research progresses, rubrics may change according to elephant geopolitical contexts and histories. There are likely many dynamics to temporality that can be unpacked, with each principle containing its own knots of time that also overlap one another—but the mentioned three areas usefully provide an initial sketch of what can fundamentally shape and govern the elephant’s experience of time. The purpose of determining the areas of an “elephant grammar of time” is to map ways in which to identify elephant agency moving through its temporalities, perhaps especially useful for the situational analysis of researchers in ethnographic study. It serves as a method to cohere the elephant’s complex temporal landscape.

| ELEPHANT ECO-CULTURAL IDENTITY

This analytic regards elephants as aforementioned “minded bodies”, performing in “embedded time”, incorporating Hearne’s sense of a “coherent landscape” literally and metaphorically. The landscape is where we are able to delineate the elephant’s subjectivity through time, examining the numerous components that shape its “eco-cultural identity”: the ecological translation of sociocultural identity, in this case, for animals (MILSTEIN & CASTRO-SOTOMAYOR, 2020). Borrowing from Felix Guattari’s idea that the mind or the psyche is an ecological system, so are landscapes (GUATTARI, 2005). As Oriel and Frohoff argue, “landscape designs correspond to, and reflect subjective positions and perceptions (for elephants)” (ORIEL & FROHOFF, 2020: 131). This is not a major conceptual leap when we recall that the larger majority of studies on elephant personhood and social complexity are grounded on longitudinal field observations (Moss, 1988; POOLE, 1996; and POOLE & Moss, 2008, among key texts) compared to the relatively smaller number of controlled studies (PLOTNIK, 2010).

Beyond the study of elephant cognition, there remains no formal historical study of elephant “domestication” or artificial selection despite their long history with humans (LAIR, 1997). Elephants are instead

known through local oral traditions, based on time and experience with elephants. Even in these circumstances, however, elephant care can be influenced by both human and elephant knowledge in equal measure (GREENE et al., 2020, LAINÉ, this volume). Formal and informal experts have always known elephants through their intimate dialogue with the landscape, a dialogue that shares the common language of time.

Eco-cultural identity examines many dynamics that come to shape the political sphere of the elephant; historical, geographical and social, all of which rely on the elephant's tradition of knowledge inheritance over generations (McCOMB et al., 2001). As individuals, elephants are raised and taught ecological knowledge by their allo-mothers, learning from them for all their lives (EISENBERG, 1981). Even males, upon emigrating from their natal families, remain tolerant of younger males' presences, allowing for the proximity necessary for learning (POOLE, 1996; SLOTOW et al., 2000). Elephant families are sensitive to the historical deaths of influential family members, and their survival is reliant on the stored knowledge of their matriarchs (LEE & MOSS, 2012).

At the same time, their remarkable memories author landscapes. Elephants move through a web of different temporalities, as they are sensitive to seasonal changes, migrating according to the food sources that change with the seasons. The strategies of a matriarch will determine where elephants will build pathways, break forest canopy and dig wells for the flourishing of plant life and other animals, including human communities (FISHLOCK et al., 2015; HAYNES, 2012; WESTERN, 1989). In this way, elephants serve as clocks themselves, their absences and presences marking the beginnings and endings for many other lives.

| HUMAN-IMPACTED TIME

Having a sense of how landscapes cohere for elephants allows us to trace how elephant agency is suppressed under human temporal apparatuses. Anthropogenic deforestation destroying elephant cultures

serves as one example (ORIEL & FROHOFF, 2020). However, there is also the hidden, trans-species dynamic to elephant history. Innovative studies in trans-species history are beginning to show how multi-species collaborations and “agreements” can occur between humans and other intelligent mammals such as whales (DEMUTH, 2019) and dolphins (ORIEL & FROHOFF, 2017) but also how these may be “forgotten” following modernisation, accounting for the anger and violence demonstrated by elephants (with their intergenerational memories) in present-day human-elephant conflict (MÜNSTER, 2016; NAVEH & BIRD-DAVID, 2014).

At a psychological, individual level, we may also begin to consider elephant generational knowledge as information temporally deferred or interrupted for animals under captivity while their trauma operates as presences of the past. Conforming very similarly to the diagnosis of Complex Post-Traumatic Stress Disorder in humans, elephant rehabilitation already involves consciously thinking about elephant histories (BRADSHAW, 2009). Traumas, especially in abused elephants, can be traced back to “the little exposure to normative elephant society”, and stereotypic behaviour can be triggered by the hauntings of old memories in the present (BUCKLEY & BRADSHAW, 2010: 48).

Human-impacted time also exposes how work elephants negotiate and resist human time. Lehnhardt and Galloway trace a pattern by observing how elephants in Sri Lanka, given no free time for foraging, frequently killed their managers (LEHNARDT & GALLOWAY, 2008). This is “almost unknown” (LEHNARDT & GALLOWAY, 2008: 174) in Myanmar, where elephants are free to roam and mate in the forest at night. The same study further noted how no similar attacks could be recollected in Karnataka (India), where elephants work only three days a week.

Human-imposed time upon animals further challenges the lines of difference we presume lie outside capitalism. The elephants’ resistance to human-imposed time is a form of temporal oppression that has parallels to human history with labour. The sociologist Eviatar Zerubavel has explored at length the retemporalization inflicted upon human bodies when the introduction of waged labour dulled attunements to the seasonal rhythms of agricultural labour (ZERUBAVEL, 1985). These are the “hidden rhythms, forms of temporal oppression, that only appear natural to those it privileges” (FREEMAN, 2010: 3).

I INDIVIDUAL ELEPHANT HISTORIES

To trace animals' temporalities, we must think of the animal body as "a site of historiographical and temporal interventions" (LUCIANO, 2007: 18). It is within the elephant individual that these temporalities intersect and go on to generate further bifurcations in encounters. In the case of elephants, analysis must do justice to the temporal complexity their remarkable personhood wields, one so sophisticated that it is able to provoke scientists to consider the possibility that elephants are "capable of imaging their own deaths" (MOSS & POOLE, 2008: 92). This plausibility is not only evident in field study but in the encouraging results from controlled studies on autonoetic consciousness (self-knowledge). Elephants have demonstrated an ability to recall the past, experience the present and imagine their futures (VARNER, 2008), if existing studies of their complex intergenerational culture were not sufficient evidence.

Given the staggering diversity of how elephants respond to human influence (PLOTNIK & DE WAAL, 2014), we must assume a level of individuation to each temporal dynamic, even the individuation of elephant families, based on their past experiences. This approach helps create further distinction between an individual animal, its heterogeneous responses and the behaviours of the rest of its species, which is a key concern within cognitive ethology (BEKOFF, 1995) as well as multispecies studies (KIRKSEY & HELMREICH, 2010).

Most importantly, analysis needs to consider the dynamics of where eco-cultural identity, human imposition and lived memory intersect. What lies outside and within the influence of the human apparatus is made clearer. Although each individual's history and personality are never alike, each holds a microcosm of the complicated dynamics of the multi-temporal elephant world and presents a window to the journey it took into the present. With every individual body encountered, it is useful to think of philosopher Michel Serres' idea of the self as an "intelligent invariant" (HERZOGENRATH, 2011: 158), where all temporal dynamics run like eddies in a stable riverbed. The elephant individual must be read as a steady, ancient river and any analysis a brief plunge.

| READING AGENCY THROUGH ELEPHANT TIME

Finally, tracing elephant time requires a method of attentiveness (DESPRET, 2013) that is able to recognise temporal dynamics, especially temporal dynamics linked to power structures, that may not be immediately observable or tangible in the field, and more pronounced in time-rich studies such as in the histories of science. The practice of unpacking elephant chronobiopolitics is the work of piecing together the “elephant time” studied, analysing hidden spaces or demonstrations of agency as the guiding method.

It has been discussed earlier that it is the conception of agency that allows us to *see* agency. The theory of agency developed follows the work of the sociologist Margaret Archer. ARCHER (2000) offers a relational conception of agency in contrast to performative ideas of agency where the animal *is* its actions (BARAD, 2003; GEIGER & HOVORKA, 2015). In Archer’s view, agency is “employed in the plural” and largely social (ARCHER, 2000; CARTER & CHARLES, 2013). Archer differentiates between the actor and agency. The actor is not reducible to agency because what determines agency is often based on many relationships surrounding the actor, involving, typically, historically contingent, often involuntary relationships. The common example given is that a woman from the Global North may have greater structural advantages towards autonomy than a woman from the Global South. For an example within the context of animal agency, we may see the contrast between an elephant in a zoo versus an elephant that knows its life in the wild.

Archer’s idea of agency is useful as it has formative parallels with both “elephant time” and eco-cultural identity. It is a theory of agency that is sensitive to context and, because of this, is therefore richly temporal, allowing that history does sediment into the present—and that agency is not fixed but is a kind of potential—always pregnant with possibilities in the future. A relational theory of agency accommodates analysis in chronobiopolitics.

Studying elephants often requires multi-disciplinary perspectives (VORTKAMP, 2006). Archer offers a method by compelling the researcher to seek elephant agency framed with its relations, including historical relations, to other agents (be it another elephant or a large-scale anthropogenic effect). For captive animals, the difference between ability

and constraint can be discerned. For wild animals, their landscape of fear can be analysed from a shared and evolving history with humans shaping this landscape. An intricate study of the temporal linkages that shape elephant chronobiopolitics or elephant time refines and makes visible the elephant's agency relational to its time-rich context.

I CONCLUSION

The epistemic benefits and consequences of these ideas to different disciplines, along with the expected tensions between different knowledge practices and how they may be synthesised, are not fully elaborated here. There is room to underline, however, that the chief opportunity of animal temporalities as a concept lies in its potential to flesh out a detailed map of the epistemic confinements enacted by linear time. It becomes a way of framing the animal's relationship with the world that is emergent and multi-faceted, one understood with its own "others". Complex animal time becomes an unexplored "contact zone" (HARAWAY, 2008); a dimension of how animals constitute themselves in their relationships that is not reliant on human relationships as the chief narrative device. The human paradigm is unavoidable, but temporality, as the universal currency of all agents, becomes the mediator instead, allowing for other-than-human perspectives.

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CHAPTER 14

ELEPHANT-FARMER COEXISTENCE

Multiple methods

Anandi Gandhi

The question isn't "What other animals are really like us?", It's "What are other animals really like?" The question is, "Who are they?"

Carl Safina, *Beyond Words*

I INTRODUCTION

How do you prepare to meet wild elephants? I grew up in a part of India where Asian elephants have become ghosts in the landscape. Nothing truly prepares a city-dwelling academic like me for everyday encounters with elephants in the field. Elephant encounters are complex, based on where, how, and by whom they are encountered. These encounters may take the form of startling face-to-face meetings on the road or squinting to see them blending into the rocks of distant hillsides. Often it may be the traces they leave behind in huge plops of dung along firewood-collecting trails or hearing them crossing streams in the silence of the night. Sometimes, it may be witnessing their running bodies, illuminated in the torches used by farmers to chase them away. This is quite

different from being an excited spectator of elephant families moving across protected areas devoid of humans barring the ones in the safari jeeps, or being a consumer of “lively commodities” or the traumatised elephants at a zoo (BARUA, 2016), or indulging in fantasies of pristine elephant lives unhampered by humans in wildlife documentaries. Entering the field as an academic with a desire to know elephant inner and outer lives, their ecologies, and their entanglements in anthropogenic landscapes, requires a very different kind of preparation. How can academic training prepare me to find out, as author Carl Safina would like me to ask of elephants, “who are you?” (SAFINA, 2015).

The moving bodies of elephants navigate and shape ecological, historical, cultural, political, and economic webs of relations and processes. Asian elephant and human lives are entangled. In a world where Asia’s elephant populations have declined by 95% from their historical size (SUKUMAR, 2006) and share shrinking habitats with expanding human populations (MENON & TIWARI, 2019), can humans and elephants coexist? Human-Elephant Conflicts (HECs) in Asia and Africa are taking place within a “...complex nexus of ecological, subjective, and social relations that inform and emerge from one another...” (ORIEL & FROHOFF, 2020: 131). There are many studies on human-wildlife conflict, but most of these studies have focused on producing quantitative data on damage and intervention to mitigate elephant and human deaths (POOLEY et al., 2021). Studies focusing on conflict alone, that are grounded in quantitative data production, cannot address the complexity of entangled lives and examples of coexistence that may also be simultaneously occurring in conflict zones.

Amidst escalating interspecies conflicts in South-East Asia, there are stories of farmers and elephants who have negotiated ways of coexisting with each other. As a doctoral student, I am in the process of studying these examples in eastern Thailand, where some farmers have transformed antagonistic relationships with local and migrating elephants by practising *wanakaset* or forest gardening systems (Figure 1). I often heard this small group of farmers describe their attitude towards the elephants as, “we cannot live together, but we have to survive together.” These attitudes and diversified farming practices exist along with large-scale monocropped farms, increasing local elephant populations and rising elephant presence on farms. I refer to these multispecies agentic interactions and relationships as “elephant-farmer coexistence assemblages”.



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Figure 1 | Mature *wanakaset* (forest gardening) farm: a safe zone for elephants.

I borrow Elaine Gan and Anna Tsing’s conception of “assemblage” to mean a dynamic, precarious, and complex collection of material and non-material multispecies entities and actors in temporal and spatial relationship to one another, coming together and becoming in knots of cohesion and force (GAN & TSING, 2018). To study assemblages of multispecies coexistence, we need methods that go beyond quantitative analysis and conflict narratives. We need methods that can attune to dynamic and complex multispecies entanglements, multi-temporal and multi-spatial histories, and farmer and elephant well-being.

In this chapter, I survey a few different methods for studying nonhuman and human interactions. These methods draw from various disciplines such as anthropology, history, geography, and biology. The three methods explored here include historical ecology, listening, and drawing/diagramming. At different points in its academic history, anthropology has combined social and natural sciences to study human societies.

In more recent years, the discipline has expanded its scope of study to nonhumans and multispecies ethnography (SWANSON, 2019). As an anthropologist, I plan to collaborate with biologists, historians, agronomists, and sound scientists working in Southeast Asia to employ the aforementioned methods. I argue that no single method is adequate for studying complex multispecies assemblages, such as Asian elephant-farmer coexistence in eastern Thailand. When combined through collaborative and transdisciplinary fieldwork, multiple methods that encourage attunement could be the most meaningful way to study elephant-farmer coexistence assemblages.

I begin by expanding on the concept of assemblage and briefly elaborate on how the situatedness of coexistence assemblages within the Anthropocene helps blur ideological binaries widely upheld in HEC portrayals and policies. I then look at why attunement is a meaningful measuring stick to evaluate fieldwork methodologies. Attunement to assemblages is followed by a survey of the three methods and how they add to the recent scholarship on human-elephant studies by geographers and anthropologists. I end by emphasising that the Anthropocene, elephants, and marginalised farmers inspire academics to practice multiple methods and transdisciplinary collaboration.

| ASIAN ELEPHANT AND FARMER ASSEMBLAGES

Assemblages can be understood as a collection of human and nonhuman entities and material and non-material processes that hold together with a certain cohesiveness. Instead of looking for a cause or theory that explains the “why” of an assemblage, I am focusing on the “who” and “how” of assemblages: Who is a part of this assemblage, what can be observed with the senses about the human-nonhuman and nonhuman-nonhuman relations, and what are the patterns of enactments that allow assemblages to hold together. I choose to use the concept of assemblage when analysing farmer-elephant relationships because it helps problematise oppositional binaries such as encroaching farmers versus non-agentic elephants, wildlife conservation versus capitalist development, wild national parks versus anthropogenic landscapes, and nature before humans versus an apocalyptic future. These problematic dualisms often underlie media narratives of

interspecies conflict (for example, there are news articles with titles such as, “In Thailand, A War Between Humans and Elephants Is Brewing”, *Augustman* 17 August 2019), as well as scientific studies on development and conservation (KITRATPORN & TAKEUCHI, 2020), and equally State policies where landscapes are divided into reserves for animals and spaces for humans (BARUA, 2014). Even though conflict situations are made up of many different perspectives and enactments coexisting together, they are coordinated into a singular voice and perspective (ORIEL & FROHOFF, 2020). The singular narrative of conflict made up of the oppositional binary of humans versus elephants is the generally accepted narrative in scientific and conservation studies of human-elephant interactions (KEIL, 2016). However, these binaries are destabilised by many historical and current examples of human-nonhuman cohabitation and co-worldmaking, which have been elaborated upon by geographers, anthropologists, as well as post-humanist, indigenous, Science and Technology Studies, feminist science, and Anthropocene scholars (see BARUA, 2014; KEIL, 2016; MATHEWS, 2020; MÜNSTER 2016; ORIEL & FROHOFF, 2020). Assemblages help us partially visualise blurry boundaries and uncertainties of cohabitation by bringing together multiple patterns of human-nonhuman entanglements and enactments of agency.

Elephant-farmer assemblages are made up of historical, ecological, political, and social forces and actors such as forest policies and State control, colonisation and plantation agriculture, degraded elephant habitat and fragmented corridors, mining and the displacement of ethnic minorities, global capitalism and climate change, nonsecular worldviews and swidden agriculture, traumatised elephants and poor farmers, elephant and human hierarchies and much more. The ways in which these entities become together (coordinate into patterns) to form assemblages can be traced to some key large-scale processes. One such process within which elephant-farmer assemblages are embedded is the Anthropocene. The term Anthropocene is now being used beyond its original geological definition to refer to “the increasing role of human action in influencing the environment” (TSING et al., 2021). According to the authors of *The Feral Atlas*, the Anthropocene is driven by four landscape-transforming, historical, and infrastructural programmes: human invasion and conquest, colonialism and empire building, capitalism, and acceleration (TSING et al., 2021). These four “detonators” of the Anthropocene encompass the complex historical and present circumstances of increasing precarity that throws humans and nonhumans together into tighter shared spaces.

These shared multispecies and multi-use spaces house a complex range of partially overlapping assemblages where boundaries between conflict and coexistence become blurred.

The Anthropocene undoes the nature/culture separation, which has been foundational to Western culture (MATHEWS, 2020). This undoing of binaries, along with the emergence and evolution of multispecies assemblages, forces academics to bridge interdisciplinary divides. For academics studying HECs, this may mean going beyond narratives of conflict to noticing multiplicities of assemblages of conflict, negotiation, coexistence, tolerance, violence, acceptance, reciprocity etc., co-occurring, in partial connection with each other. Assemblages reveal patterns of temporal rhythms and scales in elephant-farmer relationships. Attunement to patterns uncovers which relations are most important when studying particular assemblages. Attunement enhances our capacity to foreground the agency of assemblage actors such as elephants, marginalised farmers, plants, and soil which are often misrepresented or missing in mainstream discourse. As active participants in shared landscapes, elephants are powerful forces who shape ecosystems and policies through the movement of their bodies. Their complex and multidimensional worlds are deeply and historically entangled with ours at multiple levels, as has been elaborated by anthropologists, historians, and comparative psychologists (see BRADSHAW, 2009; KEIL, 2017; LOWE & MÜNSTER, 2016). In the words of Celia Lowe and Ursula Münster, "...Nowadays, elephants learn to live their complex psychological, social, cultural, and gendered lives in close proximity to humans" (LOWE & MÜNSTER, 2016: 124). Attunement to elephant complexity, multidimensionality, and agency reveals the material, psychological, political, spiritual, and ecological entanglements of multispecies assemblages.

I ATTUNEMENT

In the introduction to the book, *The Arts of Living on a Damaged Planet*, the authors write, "To survive, we need to relearn multiple forms of curiosity. Curiosity is an attunement to multispecies entanglement, complexity, and the shimmer all around us" (GAN et al., 2017: 11). Curiosity, paying attention, noticing, embodied engagement, wonder, and reading

landscapes are different ways of attuning to complex worlds. I think of attunement as a mode or state of being that academics do and can cultivate by practising methods chosen with care. When regarding work on corncrake population census tracking, Jamie Lorimer described attunement as an embodied skill. Being able to tune in to these birds takes time, skill, dedication, and what he calls "...a re-organisation of the surveyor's body..." (LORIMER, 2008: 396). This realignment of the body gained through several years of practising attunement helps surveyors get close to the birds and follow their traces.

In his book, *Beyond Words*, ecologist Carl Safina's narration of the work of wildlife scientists he follows reveals their profound attunement with animals. Cynthia Moss, who has spent more than 40 years with elephants; Ken Balcomb, who has spent over four decades listening to whales and dolphins; and Rick McIntyre, who has followed Yellowstone wolves every single day for the last thirteen years, have developed long-term and deep attunement with the animals they study. An exchange Safina had with Katito Sayialel, a Masai conservationist studying elephants in Amboseli National Park in Kenya for over twenty years, disclosed that she could identify a thousand female elephants by sight.

"Some she knows by marks: the position of a hole in an ear, for instance. But many, she just glances at. They're that familiar, like your friends are. When you're studying social relationships as they're all mingling, you can't afford to say, 'Wait a minute; who was that?' You have to know them. Knowing hundreds of individuals is necessary because elephants themselves recognise hundreds of individuals." (SAFINA, 2015: 13)

For these natural scientists, attunement through long-term fieldwork with nonhumans is the basis of knowledge generation about other species. Similarly, many social scientists of various disciplines, such as history, anthropology, and sociology, have immersed themselves in examining human history, politics, and cultures through the long-term study of specific societies and individuals. However, academic publications do not always convey the complexity that researchers may have experienced in the field. Natural science publications tend to foreground populations and species over individuals, and the social sciences may not adequately foreground nonhuman experiences. For example, in the corncrakes census study, the surveyors were bodily attuned to individual birds. However, the particularities of individuals were lost when the encounters were ultimately compiled into a national database (LORIMER, 2008). Similarly,

within the social sciences, critical analysis of the impact of political structures on human-wildlife relations teaches us “...little about elephant lives and what landscapes mean to them...” (BARUA, 2014: 7). Social science scholarship can leave the reader guessing about the agency of nonhumans as shapers of human lives. To study elephant-farmer relations, we need methods that can foreground both human and nonhuman worlds and how the two are entangled within dynamic multiscale, multitemporal, and multidimensional assemblages of individuals and ecologies.

Over recent years, anthropological research has widened to include nonhumans as agents who co-create shared worlds with humans (see multispecies ethnography in KIRKSEY & HELMREICH, 2010). An example is the study of industrial ruins of a coal mine in Denmark (GAN et al., 2018). The authors collaborated with anthropologists, ecologists, botanists, mycologists, and artists to understand how multispecies interactions are intertwined with anthropogenic landscapes. The methods they trained themselves in allowed them to gather knowledge of and from local human and nonhuman long-term residents of those areas, learn about histories of development and social dynamics, and gain insight into plant and fungi landscape dynamics. In this study, acknowledgement of human-nonhuman entanglements is coupled with collaborative, multidisciplinary research and new knowledge-gathering methodologies. From such examples of anthropological studies on human-nonhuman entanglements, I highlight four premises of attuned methods: 1. There are multiple (temporal and spatial) partially overlapping histories; 2. Mundane interactions and movements foster connections between humans and nonhumans and between nonhumans and other nonhumans; 3. Human-nonhuman entanglements co-create landscapes; and 4. Unknowability and uncertainty are an integral part of multispecies entanglements. In the remaining portion of the chapter, I examine three methods that embody these premises of attunement to multispecies assemblages.

| A SURVEY OF METHODS

The three methods that I survey are historical ecology, listening, and drawing. While this is by no means an exhaustive list of methods, I chose to focus on these three because of their growing relevance to

elephant-human relations, commitment to deep attunement, and potential for multidisciplinary collaborative research.

HISTORICAL ECOLOGY

Historical methods generally offer us an imagination of the past and its connection with the present and future. Historical ecology as a research method provides us with tools to envision three main aspects of human-environmental relationships: *longue durée* histories of landscapes, humans, and nonhumans, partially overlapping histories and complexities, and multiscale, multitemporal dimensions of human-nonhumans enmeshments. One definition is as follows: "...historical ecology is a cluster of concepts in a practical framework for studying the past and future of the human-environment relationship..." (CRUMLEY, 2017: S65). Inherent in this definition is the inclusion of humans as part of the environment rather than outside it. Thus, historical ecology is interested in understanding how humans and nature coevolved and transformed over multiple temporal frames and scales. Historical ecology treats landscape evolution and transformation as a complex system grounded in places and histories, going beyond written records into the material and physical evidence of human interactions with biophysical systems.

Elephants inhabit different temporalities than humans. Individual and collective humans, plants, and animals act on various scales. These multiple scales and temporalities are interwoven and linked through multiple histories. Different communities of elephants, plants, and humans have different histories that partially overlap with each other rather than a single historical and humanist narrative. "Multiple histories and rhythms... can help us escape from thinking of nature or history as singular" (MATTHEWS, 2018: 387). Historical ecology methods help us address these historic, present, and future elephant-farmer relations that are part of a complex assemblage. Historical ecology also adds to existing methods that approach HECs as complex systems that take us beyond binary thinking. Some of these approaches include "ethnoelephantology", an interdisciplinary and integrated research programme that takes elephants seriously as subjective agents (LOCKE, 2016) and "bio-geo-graphy" methods that combine history, politics and ecology to study human-elephant-landscape entanglements (BARUA, 2014). Maan Barua makes a case for a methodology that goes beyond typical social

sciences approaches to render visible the “...material lives and spaces of animals, (and) how the latter too participate in processes of knowledge production...” (BARUA, 2014: 17). Historical ecology offers us a multidisciplinary approach through its attention to intertwined histories, theories, and materiality. It draws upon theories, concepts, methods, and evidence from the biological and physical sciences as well as the social sciences (CRUMLEY, 2017: S65) to come to more complete understandings of complex systems. Historical ecology values scientific evidence as well as traditional or local environmental knowledge, combining social and political change with biogeophysical processes. In particular, historical ecology fosters attunement to *longue durée* elephant-farmer entanglements and how these entanglements alter landscapes. In light of the Anthropocene as a time of real and potential catastrophe, historical ecology offers methods to bridge gaps between disciplines and answer the call for academic collaboration.

LISTENING

“...silence. Watch. Simply listen. They will not speak to us, but to each other they say much. Some of it, we hear. The rest is beyond words” (SAFINA, 2015: 8). Safina reminds us that attuning to other species is an art and practice perfected over many years. In a visual culture-based scientific world, most conservation biologists are well-versed in describing and differentiating landscapes and animals by sight. However, differentiating sounds and acoustic communication in animals remains challenging, confusing, and understudied (LORIMER, 2008). Tuning in to traces of elephant presence has focused chiefly on visual methods of tracking presence and absence. Tracking of elephants involves following traces of pathways, droppings, broken branches, destroyed fields, etc. Since elephants are large animals threatened by extinction, tracking and counting their bodies is an obvious research choice. However, elephants live complex social, emotional, ecological, and cultural lives, and they inspire us to attune to more than just their biological and reproductive well-being (LOWE & MÜNSTER, 2016). Since we cannot interview elephants verbally, we need to find “...other ways of listening to their experiences of life on an unevenly changing planet...” (SWANSON, 2019: S272). In his study on *dandis* (pathways), Paul Keil followed elephant traces on pathways to uncover how human-elephant entanglements emerged from everyday acts of meaningful cohabitation (KEIL, 2016).

Trying to know elephants on their own terms through non-visual traces such as elephant communication, in addition to visual noticing, adds another dimension to attuning to traces.

Elephants are highly vocal and rely on acoustic and seismic communication in addition to visual, tactile, and olfactory cues (STOEGER & DE SILVA, 2013). Elephant acoustic communication often occurs at low frequencies or infrasonic aural range (STOEGER & DE SILVA, 2013). This frequency is below what humans can hear. Calls and vocalisations are connected to specific behaviours, and certain acoustic signals may be connected to individuals or dialects of isolated groups of elephants (DE SILVA, 2010). Learning elephant languages and how they intersect with other processes in the landscape may require long hours of listening and watching. Indeed, de Silva spent approximately 3,840 hours in the field listening to and watching elephants. In another study on elephant acoustics, 700,000 hours of recordings from 14 study sites spanning seven years were acquired (KEEN et al., 2017). This kind of long-term attunement focuses on everyday aspects of elephants life as they traverse anthropogenic landscapes rather than just violent encounters.

Listening to elephants and entire landscapes as a methodology is closely aligned with the growing field of *ecoacoustics*. An emerging interdisciplinary science, ecoacoustics “...investigates natural and anthropogenic sounds and their relationships with the environment over multiple scales of time and space...” (FARINA & GAGE, 2017: 1). Ecoacoustics provide a framework where analysis of environmental recordings leads to a deeper understanding of ecological processes (KEEN et al., 2017). In other words, paying attention to sounds can reveal the state and well-being of the biosphere. Listening to elephants can tell us about them as individuals, as a community, as shapers of ecosystems, about multi-species entanglements, and the effects of human activity through time and space. However, listening is an open-ended process, and elephant acoustic researchers are wary about coming to objective conclusions. Most concur on how much more there is to know about Asian elephant communication. The fact that most of their communication is inaudible to human hearing tells us that we can only have partial knowledge of elephant worlds. Staying with unknowability and uncertainty attunes us to the limits of human attention and the ability to connect with what is outside the parameters of human observation and understanding. Listening as a method of attunement encourages researchers to inhabit “...positions of radical uncertainty.” (KEIL, 2017: 206).

DRAWING AND DIAGRAMMING PATTERNS AND TRACES

As anthropogenic landscapes expand into more remote areas and elephant habitats and migratory corridors become fragmented, humans and elephants find themselves sharing many of the same spaces. Apart from the political and historical dimensions of elephant-farmer coexistence assemblages, I am also interested in tracing current and material patterns of land use to understand how human-elephant encounters occur locally within larger contexts such as the Anthropocene. One specific situation that I am studying is of a farmer in *Chanthaburi*, Thailand, who grows favourite elephant foods, such as bananas, wild bamboo, and fishtail palm, for the local elephants in her area on the edges of her farm to mitigate crop damage. These elephants have responded to that by eating what she grows and leaving her main crops alone. My interlocutors say that the elephants are co-stewarding the land with the farmer through joint acts of growing, eating, and protecting. The same elephants also damage mono-crop fields of rice and sugarcane



Figure 2 | Industrial rubber farm: an actor in the elephant-farmer assemblage.

and young palm and rubber plantations. Thus, plants, too, are part of the human-elephant dynamic. Which plants (rubber trees, oil palms, wild bananas) are growing where (private farms, protected areas, edges of fields) and in what manner (swidden, mono-crop plantations, forest gardens) also determines how elephants move in the village (Figure 2, Figure 3). Drawing and diagramming may be one way to attune to these multiway material movements and interactions.

Elephant conservationists have long employed visual tools like photography to observe elephants because individual adult elephants can be identified based on their morphological features (e.g., ear lobe shape, tusk orientation, tail length) (GOSWAMI et al., 2019). However, evidence of elephant movements cannot be adequately captured by photographs alone. In his work on the entanglements of peasants, pine and chestnut forests, ink disease, and forest fires in Italy, Andrew Mathews uses drawing as a method of noticing. He traces “...forms that result from encounters between people and nonhumans (people, sheep, trees), and between nonhumans and other nonhumans (trees, soils, disease, fire)...” (MATHEWS, 2018: 387). Listening to local people’s stories about trees



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Figure 3 | Eucalyptus plantations provide no food, but they help elephants hide.

and their relationships with them, seeing the markings on trees that tell stories of past human-tree interactions, and using drawing as a way of noticing these patterns more deeply permanently changed Mathews' sensorial capacity. Drawing provides a perception shift that can go beyond what words can provide. In their article on Satoyama (village-managed) forests in Japan, the authors use diagramming to "illuminate worlds in motion" and to foreground assemblages rather than autonomous individuals (GAN & TSING, 2018). They argue that diagrammes can represent temporal and spatial multispecies encounters as well as possible ways in which these assemblages hold together.

Mapping, as a form of drawing patterns, tells us larger stories of time and scale. However, maps come with legacies of State power. Cartographies entrench divisions between nature and society (BARUA, 2014). Drawing and diagramming are opportunities to problematise these divisions by depicting material entanglements of elephants, plants, soil, fungi, and marginalised farmers. Drawing elephant-human coexistence assemblage allows us to try to grasp something too large but still empirical. Visual anthropologist Victoria Baskin Coffey writes about her work on mapping the Anthropocene as zooming in and out of patterns, processes, and rhythms in continuous motion while at the same time situating herself through the act of diagramming. Coffey describes mapping the Anthropocene as "...a process of navigation—of finding out, of looking, listening, feeling, and expressing..." (TSING et al., 2021).

| CONCLUSION

The Anthropocene, with its extinctions and unknown ripple effects, inspires collaborations among natural scientists, social scientists, humanities scholars, and artists. Elephants encourage agriculturalists, geographers, biologists, psychologists, and anthropologists to collaborate because of how they weave our worlds together through the complexity of their inner and outer lives. Marginalised farmers who have asymmetrical encounters with elephants and continue to find ways to coexist in precarious conditions motivate academics to work together to find new methods to study their worlds that go beyond conflict narratives and quantitative data. Lessons learned from elephants, farmers,

and the Anthropocene teach us that no single method can provide a well-rounded approach to learning about elephants and farmers and the complex assemblages within which their relations are embedded.

What would collaborative, interdisciplinary research of elephant-farmer coexistence assemblages look like? Historical ecology methods can help us determine large-scale and deep time patterns and events of when and how human-biogeophysical complex systems transform. However, it does not adequately allow us to tune into individual elephant communication and the everyday nature of interactions between farmers, plants, and elephants. Listening and drawing are better suited for getting a sense of the intimacies that emerge from mundane interactions and multispecies entanglements. Historical ecology allows us to imagine farmer, elephant, plant, and geological histories as multiple and partially overlapping across temporalities and scales. Listening reveals how these histories and large-scale processes are co-created by humans and non-humans through material engagements. Drawing helps us see the ways in which elephants shape us, and we shape elephant lives.

This survey has inspired me to think about the kinds of questions multiple methods allow us to ask about elephant-farmer coexistence assemblages. How do the moving bodies of elephants tie multispecies, multitemporal, and multi-spatial worlds together? How have farmers and elephant negotiations shaped biogeophysical landscapes and socio-political systems? How do farmer-elephant coexistence assemblages resist global capital, conservation politics, and State control? And finally, how do we live together? Armed with these questions, methods, and collaborators (hopefully), I feel more ready to encounter elephants in the field.

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CHAPTER 15

HOW ELEPHANTS ARE BRIDGING EPISTEMOLOGICAL BOUNDARIES

Tarsh Thekaekara

| BACKGROUND AND INTERDISCIPLINARY CHALLENGES

Interdisciplinarity has been a growing theme across both the natural and social sciences for some time now, with ecology noting the importance of the “human dimensions” in nature conservation (MANFREDO et al., 1995) and the critical sciences calling for an “animal turn” to “bring the animals back in” to the social sciences (WOLCH & EMEL, 1995). While there has been significant disciplinary crossover, there arguably remains a “great epistemological gulf” (BROSIUS, 2006) that has not yet been overcome. The conservation literature’s engagement with people is almost entirely positivist in its approach, being hypothesis-driven, with quantified data and mathematical models, looking for generalisable patterns at scale. Positivism is, of course, understood in many ways. In this essay, I use its dictionary meaning, “a philosophical system recognising only that which can be scientifically verified or which is capable of logical or mathematical proof, and therefore rejecting metaphysics and

theism” (OED, 2018). While theism is not particularly relevant to this chapter, I assume this epistemological position rejects all other ways of knowing, while the critical social sciences approach is largely post-positivist or interpretivist, with qualitative data and focused on generating new ways to think about human-animal relations. While social scientists are interested in animals and natural scientists are interested in people, the boundary lines are arguably drawn at epistemological approaches and methodology. To overcome this, ADAMS (2007) calls on natural scientists to “think like a human”, with the need being to have “interdisciplinary people” rather than “interdisciplinary teams”.

In this chapter, I argue this is beginning to happen at some level around elephant research. Still, there needs to be a more broad-based understanding of epistemology for it to become more widespread. ADAMS (2007) believes “interdisciplinary people” should perhaps be epistemologically neutral researchers who are equally comfortable in the epistemic foundations of both the natural and critical social sciences. To discuss this further, I use a personal and reflexive approach to examine my own journey of what I call “inter-epistemological” research with elephants and people and also draw on some of the work of some well-known elephant biologists.

I undertook a part-time PhD (2019) that, in total, spanned six years while I worked on applied conservation projects at the human-elephant interface in the Nilgiris, South India, through The Shola Trust, a non-governmental organisation I co-founded. I spent short stints every year in the UK and a full year towards the end writing my thesis, where I was supervised by an anthropologist, an environmental geographer and two human geographers. For the most part, I sat in a long-term ecology lab and interacted with elephant biologists on a regular basis. Interdisciplinarity was always high on the agenda and a natural outcome given the context of my research. Overcoming the epistemological contradictions, however, was a significant challenge. I first encountered this when studying people and their varying interactions with elephants. Given my supervisory team, the qualitative and post-positivist approach was an easy enough choice, using mixed methods with both qualitative and quantitative data (THEKAEKARA et al., 2021). The more serious epistemological challenge I encountered was when we started systematically studying the elephants, an area of research that was clearly dominated by positivism. Here I will first attempt to

briefly summarise some of the ideas around epistemology and then discuss how I negotiated this while studying elephants. I then make a case for more epistemologically neutral research, which can fulfil the requirements of both the positivist and post-positivist approaches without prioritising one over the other.

| DISCIPLINARY BOUNDARIES

Briefly mapping the underlying research philosophy and terms employed is perhaps an important starting point. Any broad-scale simplification is clearly fraught with problematic essentialisation and generalisation, but some heuristic classification remains useful for this essay. I do not attempt an in-depth discussion but highlight some of the key ideas from Alan BRYMAN's (2012) *Social Research Methods* textbook to differentiate between the natural and critical social sciences, which differ in four key ways.

Firstly, though not in order of priority, the natural sciences are usually based on quantitative data. Secondly, the role of theory is deductive, to test hypotheses. Thirdly, a positivist epistemology rejects knowledge that is not collected empirically and cannot be subjected to mathematical analysis or proof. Finally, objectivism is an ontological position that implies every entity has an inherent reality. The critical social sciences, on the other hand, use qualitative data and take inductive approaches to generate new theories. An interpretivist or post-positivist epistemology recognises other forms of knowledge and uses constructionism as an ontological position—that entities are constructed through the perceptions and actions of social actors. These are not rigid boundaries, and qualitative positivism is also a part of social science research (PRASAD & PRASAD, 2002), but I find this generalisation useful in understanding the research around elephants and their interactions with people.

The “scientific method” forms the foundation of the natural sciences and is defined as “a method of procedure that has characterised natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and

modification of hypotheses” (OED, 2018). It forms the basis of the natural sciences methodology. A key criticism of this approach, however, has been of “biological reduction” (KOHN, 2007), which is particularly relevant to elephants, where the process of quantification and reducing all aspects of human-elephant interactions to basic measurable variables potentially loses more than it gains. A better understanding of this interface perhaps “...requires recognition and understanding of its complexity, rather than reducing it to its most simplistic parts...” (RUST et al., 2016: 1079). The positivist epistemology that rejects other ways of knowing and does not allow for factoring diverse worldviews has clear relevance for how people live with animals, particularly if a culture practices animism, which regards nonhumans as ontological equals.

Conducting inter-epistemological research, particularly with elephants, is not merely mixing methods but also carefully negotiating the underlying philosophical boundaries of various disciplines, ensuring the requirements are satisfied. While this may seem like a daunting prospect, I argue that it is perhaps already happening with elephants, possibly on account of the species’ own agency where they force relationships with the people studying them.

I UNDERSTANDING ELEPHANTS AND ETHOGRAMS

My lack of training in the biological or animal behavioural sciences and the absence of a formal supervisor in these fields meant I had no set methodological framework to follow. The motivation to study elephants was primarily to more systematically understand elephant individuality—anecdotally, it was common knowledge that elephants, like people, were all different from each other. Some named individuals were known to be “peaceful” and relatively comfortable around people, while most of the elephants were known to stay away from or avoid people. This motivation, though I didn’t realise it at the time, was arguably at odds with the natural science approach, which looks for generalisable patterns.

My intention was to replicate methods used by biologists, and our first task was to create an ethogram for elephant behavioural observation. This consists of an exhaustive structured table of all the precisely defined behaviours an animal exhibits that are mutually exclusive and usually grouped into categories like feeding, social, solitary, aggressive etc. This list is made based on preliminary observations to allow for a quantified measurement/classification of the animal behaviour that is independent of the observer, avoiding subjective, anthropomorphic generalisation in the descriptions and interpretations about behaviour. We had enlisted the help of biologist colleagues to do this. We also wanted to identify individual elephants based on morphology; the ears were key, noting the depigmentation and tears at the edges or folds on top as they got older.

Field work began in 2015, and I distinctly remember one of our first days with biologist colleagues. The forest department staff had all been instructed to help us, and we rushed off to an area where elephants were reported. We got there and found the elephants had just been chased up the hill by the local people and one group of forest staff. There was considerable excitement in trying to retrace the elephants' path and look at the photos of the elephants on local peoples' mobile phones. The Forest Range Officer (FRO) got a call about there being elephants in another place, and we all piled into jeeps and headed off in that direction. There was a commotion at the second place—the elephants were actually being chased, and we could hear people shouting and banging drums in the valley below, though we could not actually see the elephants from the tea-covered slopes we were on. We then got called back to the first place, where elephants had been spotted again. We split up into two groups, not wanting to miss any of the action, and we kept moving around to get a different view and trying to see the elephants. A local estate worker had brought five young tourists to see the elephants. The forest department officers shouted at him for endangering people's lives. He shouted back at them, claiming he could do what he wanted on private land and no one was in danger. The tourists, however, got scared and left. A few hours went by like this. Then finally, one of the watchers came running up to us and called us to the neighbouring hillock, since the elephants were about to be chased out that way. We ran around the hill and waited eagerly. Finally, the elephants emerged, coming almost directly at us. We had our cameras at hand, and about six cameras started

clicking away furiously. Some staff jumped into the frame and wanted us to photograph them and the elephants with “fancy” cameras. The elephants seemed quite calm and composed, all things considered, but soon sensed us and moved back into the wooded valley. We had seen them for all of six minutes. A haggard group of forest department staff then followed. They had lost their voices from all the shouting. They had not had anything to eat or drink all through the day, and it was almost 4 pm. We left all the staff there and started walking back to the main road. We took the first bend around the hill and came upon another tusker. We retreated quickly, then remembered our task was to photograph and observe the elephants, and tentatively began photographing him from a safe distance.

When we sat down later in the evening to take stock of the day, the reaction from the biologist was interesting:

“This place and the elephants are not proper. You can’t do any rigorous behavioural studies with suitable sampling methodology. This is really no place for elephants. No ethogram can be made for this type of situation, where people are chasing them all the time, and it’s a completely unnatural environment. At best, you can try *ad libitum* sampling; no rigorous sampling will work.”

This sentiment highlights the complexity of the region. The context of the elephant observations in the region is relevant; in most instances, elephants were in constant interaction with people: either being chased away from human habitation, being held at bay with smoke/fire screens to allow local people right of way, given right of way while traffic/people were held up, being monitored over a period of several hours in forest patches amidst intense human activity (labourers in plantations, traffic, school children playing/walking etc.), or watched or chased from feeding at a garbage dump. On the rare occasion, elephants could be observed quietly browsing or resting in the hills. Behaviour such as “feeding”, for example, could be at a garbage dump, on local people’s crops while being chased, in a small swamp or patch of natural vegetation surrounded by houses and people, or on a remote hill slope or forest relatively undisturbed by people. Capturing the context of human-elephant interactions was almost as important as the elephant behaviour. A two-tiered ethogram may have worked, first to capture the context of human-elephant interactions and then the behaviour, but collecting enough data to be statistically significant

would be the next challenge. The conservation group Elephant Voices lists 23 contexts of elephant behaviour (avoidance, birth, feeding, play etc.) and a few hundred individual behaviours for the ethogram (their website <https://www.elephantvoices.org> has the full ethogram) without accounting for human interaction. Attempts to create a standard ethogram for all animal behaviour have been criticised since the "...complexity of behavioural output, whose multidimensionality in space and time beggars both verbal and graphical representation..." (DRUMMOND, 1985). It was then reasonably clear that the ethogram would not be the most suitable tool to study individuality and behaviour in the region. The suggestion to use *ad libitum* sampling was interesting, where it is described as "...unconscious sampling decisions, often with the observer recording 'as much as he can' or whatever is most readily observed of the social behaviour of a group in which behaviours, individuals and often the times for behaviour sessions are chosen on an *ad libitum* basis..." (ALTMANN, 1974: 235). This seemed similar to the ethnographic approach we had been using with the people, and we decided to use a comparable approach.

To identify individual elephants, we took photos and videos. Once there were reasonably clear images from the right, left, front and back, the images were laid out along with some notes about the elephant to create an "Individual Elephant Profile" (IEP, see Figure 1). In conjunction with field staff, each elephant was also given an alphanumeric identity (ID) and name. IDs were based on geography or the range they were first sighted in, and MK ("makhna" or tuskless male) or T (tusk) were added for the males (e.g. CMK1, CT1, CT2, etc. were the Cherambadi makhnas or tuskers) (see Figure 2). For the female-led herds, H was added to denote the herd (OVH was the O'Valley Herd or KMH the Kotamalai Herd—and individuals within it were numbered OV1, OV2 or KM1, KM2, etc.). Names were based on some of the characteristics or behavioural traits of the elephant. OVT7/Alibaba Basheer, for example, was the O'Valley tuskless 7, who had perfected breaking electric fences with his tusks and could open any gate. KK1/Rani Kapikaad was the matriarch or "queen" of the Kapikaad forests. We also collected some information around the context of the human-elephant interaction and made detailed notes about what the elephants were doing—what we called "elephant ethnographies" later qualified as multispecies ethnography, as we also significantly engaged with the people (PARATHIAN et al., 2018; KIRKSEY & HELMREICH, 2010).

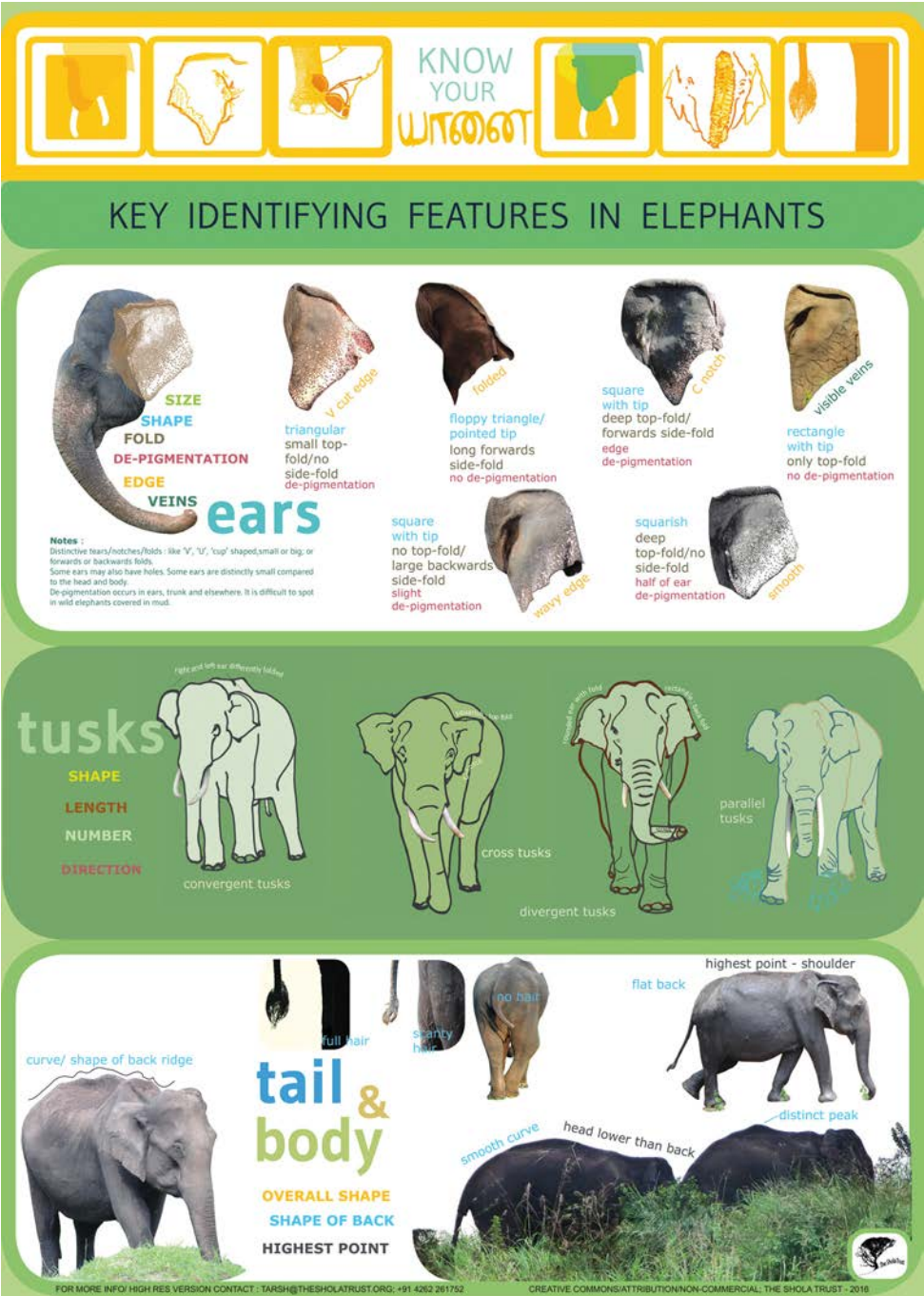


Figure 1 | Poster used to help field staff identify individual elephants (The Shola Trust, 2016).



Figure 2 | Ganesan, the most well-known elephant in the region (The Shola Trust, 2016).

ELEPHANT ETHNOGRAPHIES AND QUANTIFIED DATA

Despite my disillusionment with the ethogram, the need to connect with the existing biological literature on elephants remained. We had no “hypothesis” when we started nor had we structured and quantified the data we were collecting—only detailed notes from each of our elephant observations. But in a few months, patterns began to emerge; there were some elephants from the neighbouring protected area (Mudumalai) that only came out at night, raided crops and went back. Elephants in the Cherambadi region were almost “urban”—they never went into contiguous forests at all and were seen even around houses throughout the day, while the O’Valley elephants would be seen for a few days and then disappear into contiguous forests for a few weeks.

I spoke to biologist colleagues about this pattern, but they were unimpressed—“Do you have any data to support this, or are you saying this based on your perceptions?” The need for quantified “data” was evident, and it was possible to extract this from the qualitative data. At each of the interactions, from our notes we began to “score” the various parameters such as the level of land use modification, the reactions of the elephants to people, the reaction of people to elephants and so on, generating some quantitative “data” to show the elephants were indeed significantly different from each other. We, therefore, fulfilled some of the requirements of the positivist approach and could also retrofit a hypothesis to the study (individual elephants are consistently different from each other in their interactions with people). But the problem of biological reduction that ethological research has been criticised for remained (Kohn, 2007). How could we stay true to the complexity of human-elephant interactions beyond the quantified scores while also presenting all of this nuance to the wider community of elephant biologists?

What I have found particularly interesting is that this problem is linked more to the discipline rather than the individual field biologists who interact with elephants regularly and who often possess a more expansive view of knowledge. Around my home, for example, I encounter four different tuskers—OVT3/Silver Monstera, OVT6/Kokkal Moopan, OVT7/Alibaba Basheer and OVT8/Arumugam Kuppaiswamy. Of these elephants, I “feel” the least threatened by Moopan, followed by Monstera; I will not attempt to move away but will try to be quiet and observe them. With Kuppaiswamy, I am scared and will invariably move further away or even run. With Basheer, I am curious—I don’t feel like I know much about him, so I will try and watch him more but always remain ready to flee. When I encounter the elephants, or if I have to advise family or friends on what to do if they come across them, I will not attempt to use any of my “data” but will rely on my intuitive feelings, which are subjective judgements based on the quality or depth of the interactions, not just on the number of interactions. Discussing this with field biologists, I find they all agree—how you behave around elephants has to be based on intuition, not science or data. They speak of a sixth sense. Some of the more thinking biologists are aware of the limits of the natural science framework—there may be some other interaction between elephants and people (one explained it could “...possibly be based on some electromagnetic waves coming off brain activity...”) that we do not yet understand.

This practical, skilled knowledge that is generated through the continuous negotiation with elephants is something that is discussed extensively by anthropologists. “Skill” is something that is both biological and cultural and is vital to something like an ethnographic method, of knowing what to look for or to “learn to see anew” (INGOLD, 2000); even more so for elephant ethnographies or multispecies ethnography. Biologists engaging significantly with elephants perhaps have developed this skill, even if they are unaware of the anthropological thinking and literature on the subject.

In the writing of many well-known biologists, there is almost a contradiction between their scientific and “popular” writing. In their science, they are objective and detached from the elephants as mere objects of study, while their popular writing highlights their subjective positions and meaningful (anthropomorphic) interactions they have had with the elephants they study. Saba Douglas-Hamilton’s (daughter to Ian Douglas-Hamilton, one of the pioneering African elephant researchers) first interaction with an elephant is one example of this:

“On Saba’s first meeting with Virgo, her mother, Oria, approached the elephant on foot holding her newborn baby in her arms. Virgo let them come close then stretched out her trunk and took a good long sniff of the baby. She then coaxed her own calf forward as if to introduce it to the humans.” (DOUGLAS-HAMILTON, n. d.).

Almost all of the early elephant biologists have written books for popular consumption (e.g., DOUGLAS-HAMILTON & DOUGLAS-HAMILTON, 1975; POOLE, 1996; SUKUMAR, 1996; PAYNE, 1998; MOSS, 2000). These describe their meaningful interactions with elephants in great detail and are not limited by questions of objectivity and distancing themselves from the animals. From these popular writings and from interacting with some of the early elephant biologists (who significantly engaged with elephants in the field), I would argue that all of them have actually engaged in elephant ethnography, and their ethological data is merely a subset of all the information and knowledge they gather about the lives of elephants. The “biological reduction” is only to satisfy the epistemological requirements of their disciplines—the practitioners themselves have never actually allowed the tick boxes in the ethogram to get in the way of their attempts to experience the inner lives of elephants. The biologists, as people, are arguably doing what the more-than-human geographers are calling for, disciplinary boundaries notwithstanding.

Overcoming this “biological reduction”, therefore, may not be as significant a task as it seems; it is merely the disciplinary boundaries that need to be reconfigured. The question of “sensing elephants”, for example, which is being discussed in methods around more-than-human geographies (BROWN & DILLEY, 2012), is something that elephant biologists and others who interact with elephants routinely are all acutely aware of.

| CONCLUSION

CONDUCTING INTER-EPISTEMOLOGICAL RESEARCH

Through my work, I have attempted to balance the requirements of both the positivist and interpretivist approaches to knowledge: to have quantified, verifiable or replicable data, yet also incorporate the depth of qualitative data generated, while being aware of positionality and not rejecting the practical skill, experience and knowledge of human-elephant interactions. Field biologists who regularly interact with elephants have acquired both of these sets of knowledge, but the latter is considered anecdotal and informal. There is clearly tremendous potential for them to more formally engage with the methodological rigour of ethnography and post-positivist approaches to knowledge, bringing greater dimension to their work. Such work is gaining ground at the human-primate interface with “ethnoprimatology” approaches (DORE et al. 2017), now with a dedicated journal titled as such, bridging the ethnography-ethology gap.

Ethnography, or more specifically the growing field of multispecies ethnography, is arguably the most suited to better understand the human-elephant interface. Piers LOCKE and Ursula MÜNSTER (2015: 1) provide one of the most recent descriptions of the phrase, from which I selectively highlight the key elements that are relevant to this essay:

“Multispecies ethnography is a rubric for a more-than-human approach to ethnographic research... acknowledges the interconnectedness and inseparability of humans and other life forms, and thus seeks to extend ethnography beyond the solely human realm... attentive to the agency of other-than-human species... a challenge to the humanist epistemology

upon which conventional ethnography is predicated, specifically its ontological distinctions between nature and culture, human and non-human, subject and object”.

In retrospect, I think there are a few key factors that allowed me to remain “epistemologically neutral” and work with seemingly contradictory approaches to what constitutes knowledge. The first is perhaps my lack of formal training in either the social or natural sciences. In most of my early work, I felt the lack of training in biology was a limitation, but it eventually turned out to be an advantage as I was not trained to prioritise one universalist epistemology over another. More diverse and interdisciplinary undergraduate programmes are a useful starting point, many of which are already in place.

The second is the duration of fieldwork. The average doctorate in the biological sciences involves one year of fieldwork, with many studies based on multiple years’ observations, often driven by the need to have statistically significant data. Engaging with large and potentially dangerous animals like wild elephants is invariably guided by indigenous “trackers”, people with long experience in being in the presence of these animals (SUKUMAR, 1989; EASA, 1988). It takes a few months to get attuned to the field site and for the animals (in some cases) to get habituated to the researcher before data collection can start, which is arguably a more dangerous version of “finding your feet” in ethnography (GEERTZ, 2001: 13). While anthropology has traditionally relied on extended fieldwork lasting over at least a year, human geography relies on fieldwork of much shorter durations (usually on the scale of months), and there remain very few critical social scientists who have been able to significantly engage with elephants, particularly over multiple years. Being enrolled in a part-time programme was a vital element in my trajectory, where much of the work at the NGO was interwoven with the research questions I was interested in. I spent five years doing fieldwork, culminating in a year away from all the complexity and intensity of human-elephant interactions, to be more reflexive when analysing the data and writing the thesis. Conservation practitioners engaging with formal research is perhaps a good way to allow for this, ensuring a commitment to fieldwork over extended periods.

The third is the people I have interacted with, starting, of course, with my supervisors from varying disciplines and my peer group. The students and post-doctoral researchers I sat and interacted with on a daily

basis spanned both the critical social sciences and biology—from geographers and zoologists at Oxford to biologists in India. All of these people were clearly doing interesting and relevant research; continued informal discussions centring on the practice of nature conservation ensured that both these epistemologies remained relevant. This wide and diverse network of people has been critically important in allowing me to remain committed to the two contradictory approaches to research and knowledge.

While not all of these elements in my research trajectory are replicable for other researchers undertaking interdisciplinary research, a number of them are—particularly supervisors from different disciplines, extended fieldwork, and a commitment to the changing realities on the ground and continued interactions with people from different epistemological backgrounds.

Given the context and reality of India—with over two-thirds of the world's Asian elephants and tigers living alongside humans at a high density of over 400/km²—conservation and even ecology must inherently include the human. LEWIS (2003) argues that many of the pioneering ecologists in India in the 1980s, trained in the North American methods from “pristine wilderness”, have always encountered people; they perhaps had a role in “Inventing Global Ecology” by writing humans back into the equation. I would argue that this happened almost unintentionally; questions in ecology could not be answered if the humans were ignored. The hope now is that much of the future research can include the human by design, while taking it a step further—by embracing multiple ways of knowing and practising inter-epistemological research.

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WIDENING THE LENS

Relationships and interactions between humans and elephants in behavioural ecology studies

Hannah S. Mumby

INTRODUCTION

Elephant behaviour and how it relates to the environment has been widely studied from a biological perspective (e.g. SUKUMAR, 2003; Moss et al., 2011). How, why, where and how much humans are implicitly and directly included in these studies is of interest in terms of how animals and humans are distinguished, presented and studied. This is the case for many animal systems (DAVIS & BALFOUR, 1992). Specifically regarding elephants, it also raises questions about the definition of the environment in animal behaviour, how we define wild and domestic animals, as well as the human environments of African and Asian elephants (*Loxodonta africana*, *Loxodonta cyclotis*, *Elephas maximus*) and how these should be included, avoided or discussed when making observations and/or conducting experiments about the behaviour of elephants.

It is notable that the prominent texts on elephant ecology and behaviour often include extensive descriptions of elephant interactions with humans. For example, Sukumar's monograph dedicates an entire chapter to "the interrelationship of culture and ecology". He describes and summarises key trends and events related to the interrelationships

of humans and elephants in broadly chronological order, from the Pleistocene to the time contemporaneous to its writing. That Sukumar included the chapter goes beyond providing informative background material and directly addresses the continued but changing importance of Asian elephants in South Asia.

“Long after the war elephant has faded into history, the elephant-headed god reigns supreme, more popular than ever before, assuming new roles and adapting to changing circumstances. The elephant itself has assumed the role of a flagship in India’s efforts in conserving its forests...” (SUKUMAR, 2003: 80-81).

This link between the historical role of elephants in war, the religious significance of elephants, and the status or use of Asian elephants as a flagship species in conservation is notable not for the novelty of the concept but for its presence in a non-introductory chapter of a book about the behaviour and ecology of elephants. The human environment is clearly presented as a salient context for the subsequent chapters on elephant reproductive and social behaviour and the environmental impact of behaviour, topics frequently studied in behavioural ecology. Because of this, and many other examples, my goal is not to introduce humans into studies of elephant behavioural ecology. Rather, it is to note that they are already present, although sometimes not explicitly acknowledged, and can potentially offer us opportunities as well as challenges in their inclusion in studies using behavioural ecology methods and analytical tools.

The foundation of behavioural ecology studies is the attempt to understand how an animal’s behaviour is adapted to its environment (DAVIES et al., 2012). As with many concepts in science, the simplicity of the statement belies the complexity of addressing it. Behaviour encompasses many aspects of the lives of animals; it can include communication, behaviour associated with reproduction, social behaviour, parent-offspring behaviour, foraging and avoiding predation (DAVIES et al., 2012). Animal behaviour studies have a breadth and diversity of scales, including collective behaviour, whereby the scale is not the individual but instead might be a school of fish or a murmuration of starlings. Animal behaviour can even operate within individuals, as when they are host to parasites. My lens here is not trained on the behavioural aspect of the foundational aim of behavioural ecology but rather on the word “environment” and whether the concept of it, and

being “adapted” to it, are the biggest challenges to the much smaller goal of including interactions with humans and elephants in behavioural ecology studies.

To consider this, we must address what “environment” means and the theoretical basis for analyses of adaptation. Approaching the latter first, it is clear that evolutionary theory, including life history theory (DAVIES & KREBS, 1997), is central to the analytical framework of behavioural ecology. For example, Nico Tinbergen’s oft-referenced four “why?” questions of scientific animal behaviour studies all directly or indirectly refer to evolutionary processes or analyses (TINBERGEN, 1963). The first two, addressing causation (or mechanism) and ontogeny (developmental trajectory), are shaped by evolution. The third, on survival value or adaptive advantage, directly refers to biological fitness and the fourth, on evolutionary history, is specifically concerned with how behaviours evolved. Decades after this seminal work, there remains a consensus that the evolutionary framework is integral to the field (DAVIES et al., 2012).

I HUMANS AND THE HUMAN ENVIRONMENT IN BEHAVIOURAL ECOLOGY

With that consensus, we can move on to the concept of the environment. To me, this is the most interesting aspect of behavioural ecology’s aim. It centres on interaction, specifically the interaction between the environment and animal behaviour. My interest here lies in the question: to what extent do humans form part of the environment for elephants and other species and therefore should be considered part of behavioural ecology studies at this foundational level? This includes acknowledging the human impacts on most environments, even when they are not physically present at the time of a study. More specifically and salient to the study of elephants and humans, I am interested in how researchers, animal caretakers, and veterinarians—people working directly with the animals or within their habitat—also form part of that environment. By extension, the research being conducted becomes a part of the environment. This is not to say that research shouldn’t take place or that behavioural ecology studies have an impact on animals which is unethical,

which is another topic. It is, rather, to consider how humans in the environment and their direct or indirect interactions with animals are part of behavioural ecology and the challenges and opportunities this represents in terms of study design, analysis and interpretation.

To do this, we have to know what a behavioural ecological study is, which is a challenge in itself because of the diversity of study designs. From a methodological perspective, behavioural ecology studies have used both observational approaches and experiments. These observational responses can be highly creative, and might include observing animals to see behaviour such as using tools to forage (SANZ et al., 2013) or analysing interactions such as grooming (HENAZI & BARRETT, 1999). Humans can either be present physically or use cameras, including camera traps (CARAVAGGI et al., 2017), telemetry, and other tracking technology, including pit tags or GPS collars or drones (HUGHEY et al., 2018; LAHOZ-MONFORT & MAGRATH, 2021). The observations might not be of the animal itself but could be based on faeces, prints, hair or the area an animal has used, for example the site it selected for sleeping (CHEYNE et al., 2013). Experiments can include manipulating nests (SOLER et al., 2001), presenting animals with a model conspecific (TURNER et al., 2020), and using playbacks of calls that other animals made (PRAT et al., 2015). The unifying theme is that the responses of an animal to the environment are in some way classified and/or measured, as is an element of the environment, which might be introduced, manipulated, altered or just singled out by measuring it. That is not to say they are the only variables measured, controlled or manipulated, but that it forms the central unifying framework for studies in behavioural ecology.

I BEHAVIOURAL ECOLOGY'S RELATIONSHIP WITH THE WILD

An implicit assumption of behavioural ecology studies is that an ideal study involves observations and experiments of animals conducted “in the wild” (DAVIES et al., 2012). A further assumption is that animals can be habituated to the presence of human observers, who are able

to distinguish between natural behaviour and behavioural responses to observers (CANDEA, 2013). However, many studies investigate the behaviour of captive animals or species defined in the scientific lexicon as domesticated, such as dogs (*Canis lupus familiaris*) (DALE et al., 2016). Domestication is defined as genetic and morphological changes from the originally-wild species as a result of generations of selection by humans to fit human preferences and agro-economic niches (BATES, 2021). Although discussions on what domestication means might seem peripheral to behavioural ecology and scientific studies of animal behaviour, domestication does have relevance because any level of human intervention is generally seen to negatively impact animal behaviour and change it from natural behaviour (GILL et al., 2001). Elephants are an interesting example of this as they both blur the line between “domestic” and “wild” because, despite their history of being kept in captivity, they have not been selectively bred over generations and do not reach the scientific status of a “domestic” animal. Furthermore, elephants that are defined as wild and free-roaming in some studies are often impacted by tourism, hunting or other interactions with humans (GOLDENBERG & WITTEMYER, 2017).

In that way, elephants also bring to light the potential difficulties of applying an evolutionary framework in behavioural ecology. That is, if evolution by natural selection is the theory through which all interactions are analysed, then any intervention by humans, from hunting to observing, could be interpreted as operating in addition to natural selection and, therefore, should be avoided in studies. However, this is a limited understanding of both the evolutionary context of elephants, which have been in contact with human populations for much of their evolutionary history (ANZIDEL et al., 2012; ZUTOVSKI & BARKAI, 2016), and of behavioural responses to humans. If we consider humans as part of the complex environments animals live in, then they are clearly relevant. For example, some terms such as “natural behaviour” can assume a lack of human influence, even as a human observes and describes those behaviours. However, definitions of natural behaviour do include any adaptive behaviour, including responses to humans (ŠPINKA, 2006). In light of the range of human positions and perspectives in behavioural ecological research questions, study designs and writing on animal behaviour, further consideration of how they relate to behavioural ecology studies is justified.

Explicitly stating the presence of humans, even when that presence is indirect, for example, through the process of domestication or through captive settings, can be viewed as highlighting a problem by behavioural ecologists, whose focus is on the animal. Many experimental paradigms focus on controlling study conditions as much as possible in order to isolate measurable effects, often including efforts to reduce the impact of humans in study designs. In studies by my own group, this has included researchers hiding behind a curtain so that elephants do not have access to visual information when the researcher is refilling buckets with food items. This measure draws a direct line to the example of Clever Hans, a domesticated horse (*Equus ferus caballus*). In the late 19th century, Clever Hans became renowned for what seemed to be skills in addition and subtraction (DE WAAL, 2017). The handler asked a mathematical question verbally, and the horse responded by tapping his hoof the appropriate number of times to answer the question. What became clear was that when his owner was behind a curtain, he didn't tap out the correct number. His owner unknowingly gave Hans cues by tensing and then relaxing his body. Frans de Waal highlights the sensitivity and awareness required in animals to notice and respond to human behavioural cues. Even if solving mathematical problems based on human language wasn't possible for Hans, he could do something else that was very informative of horses and their environment; he responded to cues from a human he interacted closely with.

| ELEPHANT RESEARCH

The story of Clever Hans shows that the questions in elephant behaviour we choose to investigate are important. I concede that it presents additional difficulties to include humans in the study environment for certain research questions. One solution often taken is excluding the involvement and interactions with humans from analyses or attempting to account for any variation they introduce as noise. This chapter proposes that the interactions can also be viewed as introducing an additional layer to behavioural ecology studies that could merit further analysis in its own right. That is not to suggest that this proposal is new or that it hasn't been considered before for elephants studies; for

example, previous studies investigated human pointing cues in directing elephants to food (PLOTNIK et al., 2013; SMET & BYRNE, 2013), and analysed how the duration of the relationship between mahout and elephant is associated with the elephant's performance in a novel task (LIEHRMANN et al., 2021). These studies go beyond just acknowledging humans, often mahouts, involved in the lives of elephants and integrate them into the study concept. The expansion of experiments and observational studies of animals to include interactions with humans can provide opportunities through extending or reimagining paradigms that are familiar to evolutionary and behavioural ecologists. For example, social learning tasks that involve manipulating a novel apparatus are often implemented by animals observing other animals interacting with the apparatus (VAN DE WAAL et al., 2013). Such tasks could also be implemented using humans as the "model" individuals that the animal observes interacting with the experimental apparatus, as well as observing other elephants. This would allow us to investigate whether elephants learn from human models, if it takes longer than when they observe a conspecific, and whether it is affected by, for example, if and for how long they have known the human modelling the behaviour.

The aim of one of my group's studies was to analyse food preferences in eight captive Asian elephants using a simple choice test. At the start of the experiment, the elephant was released into the experimental area and allowed to explore two sealed buckets attached to a table. The lids on the buckets had holes. In that way, they had access to the scent of the food, but they couldn't touch it, and the holes were small, so they couldn't clearly see the food inside. After precisely a minute, we drew a black curtain in front of the table and removed the lids from the buckets. We then opened the curtain, and the elephant could eat from one bucket. We randomised the food in the buckets and which side of the table it was presented and performed multiple trials to test whether an elephant chose one food significantly more often than we would expect by chance. There were lots of issues in employing this simple design. Some elephants did not approach the table, whereas others attempted to approach it consistently and had to be moved beyond the experimental area between trials to adhere to the experimental protocol. Some individuals reacted strongly to the curtain: some moved away while others interacted with it. A couple of elephants always went for the bucket on the right or the one on the left or chose to eat from the one they had touched first or last. Some seemed to interact much more with one

bucket, but by the time the curtains had been drawn and opened, they did not go back to that one. It was difficult to manage this experimental design, but importantly, what made it possible was the mahouts that were present with the elephants.

At the study site, Tiger Tops Lodge, outside Chitwan National Park in Nepal, each elephant had two mahouts. Historically, the elephants had been chained at night under structures so they could avoid the rain or dew. Since 2018 they have been kept in fenced corrals, sometimes alone or with another one or two other elephants (MUMBY, 2019). The mahouts clean the corrals and take the elephants to the grasslands to cut and transport grass, which is used for fodder. They also do walks with tourists, feed the elephants, apply medicine and are always present whenever tourists are in close proximity to the elephants. It was essential that they were present for the experiments. Our original intention was that they would stand behind the elephant at a distance of around 5 m as it faced the experimental area and have minimal interaction with the elephant. This might have been acceptable if the elephants had understood all of the intentions of the study design, which we found was an impossibility. The mahouts realised before me that they might need to intervene while the elephants were becoming familiar with the experiment area, the table and eating from the buckets. For some readers, it may seem obvious how integral mahouts would be to this study. However, the standard in behavioural ecology is not to focus on humans that may be involved with the study and to reduce their role as much as possible because they would be seen as affecting the choices the elephant made in ways that are difficult to measure. In doing this, it is possible that the importance of their presence to the safety and smooth implementation of experiments is minimised.

When I viewed the videos of the training phase of the experiment I outlined above, I could clearly see the role the mahouts played in ensuring the safety of the humans and elephants in the experiment area and their attempts to ensure the activities followed the protocol as closely as possible. Therefore, my team decided to study the mahout interventions and elephant responses to them within the training phases. This required us to get their permission to develop detailed ethograms for both the human and elephant behaviour observed so that the videos could be coded and we could address some key research questions. Specifically, what was the elephant doing before the mahout intervened?

How did the mahout intervene? And what did the elephant do afterwards? Taking these directions with our research informs our understanding of interspecific communication. This is just one example of including humans who are present in the study design. Other examples could investigate how individual differences and personality (both in elephants and humans), duration of mahout-elephant relationships, modes of interaction, and elephants learning from humans can affect and interact with elephant behaviour.

In this way, researchers can consider tackling the methodological considerations of designing a study that includes, rather than just controls for, the presence of humans. For example, humans are not just potential sources of bias or misclassification (TUYTTENS *et al.*, 2014). In fact, the different ways how, for instance, two people classify the behaviour of the same animal after receiving the same training and protocol is worth studying in itself. I want to use this opportunity to consider how the findings of behavioural ecology research, such as the studies I describe above, not only relate specifically to the experiment in the study but also how they might alter the researchers' viewpoint and assumptions of their underlying research framework.

Playback studies have made significant contributions to our understanding of the differentiation between stimuli, and responses to them, which could be related to the perception of risk. This includes responses to humans. For example, Karen McComb and colleagues found that African savanna elephants react differently when they are played recordings of people speaking different languages, here specifically Masaai-speakers and Kamba-speakers (McComb *et al.*, 2014). Masaai-speakers are usually involved in herding and pastoralist activities and come into contact with elephants through those activities compared to Kamba-speakers. The interactions between Masaai-speakers and elephants can become negative, for example concerning access to water and grazing spaces. Men have speared elephants, particularly when Masaai lives have been lost in a previous interaction with an elephant. The agrarian Kamba experience fewer of these negative interactions because of their different land use.

In a very simplified way, one might predict that Masaai-speaking men would evoke the most defensive reactions from elephants. The researchers replicated predator playback experiments that had previously played lion vocalisations to family groups of elephants, females and their

offspring. However, instead of the lion vocalisations, the researchers used playbacks of people of different ages speaking their first language, either Masaai or Kamba, saying the phrase “Look, look, a group of elephants is coming” in a relaxed and clear manner. The researchers then looked for responses in the elephants, specifically, defensive bunching of the group with the calves in the centre. The elephants had a significantly higher probability of this defensive bunching, as well as investigative smelling, following the playbacks of Maasai voices compared to Kamba voices.

Additionally, these responses were specific to the gender identities and age of the people behind the Maasai voices. The recordings of women and boys, the groups predicted to present a lower threat, were significantly less likely to produce investigative and defensive behavioural responses by the elephants compared to adult men. These results mirrored the researchers’ earlier findings that elephants reacted to red clothing, the colour often worn by Masaai, and the scent of clothes worn by Masaai, whatever the colour. In summary, it seems that there are significant human impacts on wild elephants that we are able to measure by modifying some typical behavioural ecology experimental designs, including playback experiments. It is possible that the design could be considered to lack nuance because there is also variation between voices on an individual level. But these broad patterns are not intended to indicate the level of resolution at which elephants might be able to distinguish between heterospecific vocalisations. They instead suggest the space for further research into attention, differentiation between humans and reactions to humans elephants may have. I note that we may also study variation in elephant vocalisations, which we know are individually distinct (WIERUCKA et al., 2021), without assessing all of the information that they might encode.

The topic of this chapter interests me because if the direction of research is changing or the lens is being widened to include humans in behavioural ecology studies of elephants, it gives us the opportunity to consider the implications of this change. This includes questions of our positionality, the theoretical foundation of our studies and the potential tensions with application. Reflecting on these could be valuable for behavioural ecological approaches to studies of elephants because it can both acknowledge that humans are not just sources of bias in studies and encourage collaborative thinking around how we include humans

in our work. For example, our inclusion of mahout interventions in how elephants behave in our choice test could be analysed in many different ways to those we decided upon. Our decisions were affected by our experience, training, and the methods we used to collect the initial data in the experiment.

| PARALLELS IN CONSERVATION

Many behavioural ecologists have the goal of applying their research to the wider environment, including changing land use, climate, and responses to invasive species or fluctuations in predator or prey species (BRO-JØRGENSEN et al., 2019). Again, human interactions are often present explicitly or implicitly at different degrees of abstraction in these processes, emphasising that it is imperative to consider the human dimensions of behavioural ecological studies. Furthermore, concerning elephants, it is worth considering what the specific applications of behavioural ecology research are. Oftentimes these link to conservation projects and contexts in which elephants come into contact with humans. These were often confusingly referred to as “human-elephant conflict” (NELSON et al., 2003). This carries the assumptions of adversarial interactions entangled with “conflict” as well as the human vs elephant construct masking the needs, positions and behaviours of many different individuals. More researchers now recognise that the term cannot encompass all the challenges faced in areas occupied by people and elephants, particularly beyond protected areas where biodiversity conservation is among the main management goals. Despite the acknowledgement that a single term will always have limitations, the term “human-elephant coexistence” has now been widely adopted in addition to or as an alternative to the conflict framing (KÖNIG et al., 2020). This process indicates that there is a level of reflexivity in positioning research, particularly when concerning the applications of behavioural ecology studies.

There is interesting potential here for that sense of awareness of terminology, and how it links to the interpretation the researcher has of a research area, to be applied to studies that might initially be viewed as

basic science and therefore not requiring this level of critical analysis. My reasoning for this is not to suppose that the concepts and human dimensions in behavioural ecology and conservation science are identical. Instead, I aim to point out that researchers in behavioural ecology, through the related conservation literature, may have been exposed to thinking about the position and role of humans in studies. Therefore, this experience offers entry points for expanding research on the role of humans in behavioural ecology. I will also use a final example to illustrate this, that of the conceptualisation of knowledge in ecological studies and how it is created in studies of human and elephant interactions. This can also be linked to the conservation science literature, which has strong ties with behavioural ecology. In conservation science, participatory studies are increasingly part of studies involving biodiversity conservation (VILLAMOR et al., 2014). These can include specifically identifying and implementing methods that focus on integrating expertise from the community in which projects take place, allowing community members to be equitably involved with every level of planning and action, and aiming to create a sustainable plan for action (NEL et al., 2016). This expansion of the concept of knowledge is part of a process by which what is considered to be knowledge of the environment has been critically evaluated and reconsidered. In particular, “local ecological knowledge” is now seen as highly relevant to most conservation projects (CEBRIÁN-PIQUERAS et al., 2020).

With the accessibility of this rethinking of knowledge in conservation, it might be the case that behavioural ecology can, with its focus on the environment, better integrate the human dimensions of that environment. That could include the co-production of projects with human participants. In the study on elephant food choice, the mahouts might not initially have been viewed as participants, but they were central in the ability of elephants to participate at all. Articulating their role is not a detraction from the study but a valuable addition that allowed us to consider questions beyond the original study. These include how mahouts intervened, and what proceeded and followed the intervention in terms of elephant behaviour, getting to a fine-scale analysis of interaction as well as a binary choice an elephant made between buckets. However, the scope goes far beyond this, for example, in correlations in personality metrics between elephants and humans they spend time with, the speed of behavioural response to cues from people they do and do not know, and how interactions between humans

and elephants could be associated with welfare indicators. We can also avoid the unplanned developments in my group's study that I outlined earlier in this chapter by considering co-design of study aims with people who will be involved in the project. In doing so, we can take the lead from fields in which participatory approaches and co-production are part of the research toolkit and use them in the conceptualisation of our studies.

Furthermore, I suggest to behavioural ecologists that we carefully examine our widely understood ideas of wild animals, natural behaviour and settings, experimental design and distancing humans from the observations or experiments. In doing so, we can consider how they impact the design, application and direction of behavioural ecological studies, and potentially improve both the clarity and scope of research. I have highlighted the use of conservation research to do this, as it is often accessible in terms of literature to behavioural ecologists, but the possibilities go far beyond that, as the diversity of fields in this volume illustrates. Elephants are an excellent example because of the wealth of research on them, in combination with the different human interactions they experience, including relationships such as those with mahouts. By using such examples, we can support other researchers by transparently reporting study design when humans are involved, proposing questions that include or centre humans as part of the environment, and sharing methods of studies that are co-produced.

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AFTERWORD

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Over and over in the essays in this volume, we read about the complicated worlds in which humans and elephants interact, the borderlands where their cultures collide, and the practices which have made collaborations possible. In his “Foreword,” Vivek Menon described the “intertwined existence of man and elephant,” and this book makes clear that when we ignore how the lives of humans and elephants have always been interwoven, both of their communities suffer. To bring this book to a close, I would like to offer a brief history of what I think many might see as an almost trivial sideshow in the context of the serious challenges of human-elephant cohabitation in the 21st century. I offer the story, though, because I believe it points to both the dangers and hopes embedded in contemporary thought about elephants.

In July 2001, I found myself outside the Museum of Contemporary Art in Sydney, Australia. Watching the ferries coming and going while looking out to the opera house and busy harbour, I wondered about the unusual show I was about to see. When I finally joined the many people entering the museum that day, I couldn’t help but think that as much as the show was about paintings, it was also about the people thronging to see the works and the conversations they were having as they tried to figure out the importance of the exhibit.

There were different historical paths leading people to the show that day. A few visitors followed a trail of interest in non-figurative art in the 20th century. As I caught snippets of their conversations, they reflected upon “the gallery” in defining art, the importance of intention and technique in understanding artists and their works, and whether the

creation of art, the appreciation of beauty, and the ability to experience and reflect upon emotion might possibly be shared with other species. These visitors scrutinized artist biographies posted near the works, the apparent reactions of other visitors, and even the frames around the paintings, as much as they considered the works themselves.

There was another path that was meandering through the museum that day, however. It was built out of the practices of commodification and their relation to the aura of objects in specific times and places. Shaped by a long history of collecting, this path was marked by hyperlinks to an online auction where the works were being sold, the obvious desire of the museum to host a perhaps controversial show that would bring in a large audience, and the brand of the World Wildlife Fund (WWF) that was to receive a portion of the proceeds.

Guiding people along these two paths were the stewards of the “When Elephants Paint” show, the Russian-born conceptual artists Vitaly Komar and Alexander Melamid, who were then already well known for their critiques of “art,” “commodity,” and “realism.” For these two human artists, the show seemed to present the possibility of both puckishly ridiculing the high culture art industry and seriously trying to do something good for elephants and the communities in which they lived.

Komar and Melamid had tapped into a quite old debate about whether the creation of art should be seen as a distinctive marker of humanity. Since the mid-19th century, that argument had led to a recurring interest in exploring nonhuman creativity with captive animals in zoos and circuses. Most of that interest had been directed at primates, but there had been consistent stories of elephants doodling in the sand of their enclosures. Those stories began to spread more widely when 50 drawings and paintings by a young elephant named Siri, who was born in 1967 and is still alive as I write this, were circulated and eventually published by one of her keepers, David Gucwa, and the science journalist James Ehmann in their thoughtful 1985 book *To Whom It May Concern: An Investigation of the Art of Elephants*.

Siri, though, was just one of what would eventually become scores of painting elephants in American zoos in the 80s and 90s. When, then, Komar and Melamid heard in 1995 about one of these “pachyderm Picassos” – Ruby at the Phoenix Zoo, whose paintings were selling well and were being compared by journalists to those of Frankenthaler,

de Kooning, and Pollock – they quickly arranged an opportunity for an extended collaboration with an African elephant named Renee at the Toledo Zoo. In their 2000 book with art historian Mia Fineman, *When Elephants Paint: The Quest of Two Russian Artists to Save the Elephants of Thailand*, Komar and Melamid describe Renee as a “kindred spirit, a fellow immigrant haunted by a similar sense of loneliness and displacement” (p. 13). At a historical moment that would also see elephant *dung* controversially enter an art museum, Komar and Melamid seem to have realized that elephant *paintings* might provide a weighty counterbalance to the art market’s usual posturing about masterpieces, museums, and value.

After working with Renee and then reading about the challenges faced by elephants and mahouts in Asia, Komar and Melamid began pitching an idea of starting an elephant art academy in Thailand to bring needed international attention and financial support to Asian elephants. With eventual backing from the WWF and guidance on the ground from conservationist Richard Lair in Lampang, the artists went to Thailand in 1998, where they eventually collaborated in the opening of art academies in Lampang, Ayutthaya, and Surin. Soon there were stories in newspapers around the world; *60 Minutes* and the BBC showed up with film crews; in New York, Christie’s held an auction and Barneys did a window; elephant paintings were included in the 1999 Venice Biennale; and, in 2001 in Sydney, “Untitled” paintings by Juthanam, Boon Yang, Nawaporn, Bird, Nom Chok, Bok Bak, and others were shown along with photographs of Red Square by a young chimpanzee named Mikki. The review in the *Sydney Morning Herald* on the exhibit’s opening day of June 21st pretty much said it all with the headline, “Give a Pachyderm a Paintbrush and a Whole Circus Comes to Town.” The playfulness of Komar and Melamid was clearly part of that circus. In a typical moment from *When Elephants Paint*, for example, they relate a conversation between Melamid and a couple from Michigan who wondered out loud if the project was a hoax. “Of course, it’s all a hoax!” said Melamid. “But all art is a hoax” (47).

It was perhaps inevitable, after all the hype and press, that a deluge of elephant art would follow in Komar and Melamid’s wake. It was probably also inevitable that the early, seemingly innocent, and even humorous collaborations with elephant artists would be replaced by what have been described as elephant art factories. Then, something

almost miraculous appeared to happen. Around 2008, what became a viral video was uploaded to the internet of a young elephant painting a representational work of a side-view of a walking elephant holding a flower. For many, the work was confounding, and one can still find all kinds of cringe-worthy discussions from the time among artists, art historians, and philosophers about what the work meant. Before long, ethologist Desmond Morris and evolutionary biologist Richard Dawkins were flying to Thailand to observe the artist in person. They needn't have stepped onto the plane. The trick was a classic misdirection. While everyone watched with understandable fascination as the elephant, brush in trunk, carefully applied the paint to the canvas in long, sure strokes, no one noticed the mahout standing behind the artist, unseen by the camera, guiding the elephant with vocal commands and small directional tugs of the animal's ear. The camera's focus was on the trunk and the canvas and not on the larger context. Soon, the paintings of Siri, Renee, Juthanam and others that recalled the spontaneity and vitality of the abstract expressionists were replaced in the market by simple, colourful line drawings of elephants, trees, and flowers. The art market had created a paint-by-numbers for elephants, more and more videos were uploaded, and tourists flocked to watch the bizarre spectacles.

I think one of the important lessons in this story—a lesson repeatedly also drawn throughout this book—is that we must resolutely try to understand the world of elephants as one that is always impacted in important ways by humans. The daily life of every elephant alive today is shaped by the weight of humanity on this planet, and we must resist our persistent desires to think that somewhere there are elephants whose lives have not been touched by our roads, fences, cities, crops, zoos, tourism, climate change, and so much more. There remains much in the story of the popularization and commodification of elephant art that should make us concerned. That many have tried to acknowledge the creativity of elephants and have sought ways to support and collaborate with them remains, I believe, something we can honour in our histories. Like so many of the accounts of human-elephant interaction in this book, the story of elephant art continues to unfold; our best hope, I think, is that we can continue to learn from the past as we work toward more sustainable futures.

LIST OF CONTRIBUTORS

I SAYAN BANERJEE

Sayan trained in both natural sciences and social sciences during his bachelor's and master's degree studies respectively. He is deeply interested in human-wildlife relations, interdisciplinary conservation science and socio-ecological studies of Indian forestry. His various projects have documented indigenous hunting in Nagaland, explored gendered implications of human-elephant interactions, and identified the nature and patterns of community participation in wildlife conservation projects, all in northeastern India. He is currently a doctoral student in the Animal Behaviour and Cognition Programme at the National Institute of Advanced Studies and is also affiliated with Manipal Academy of Higher Education in Bangalore, India, investigating behavioural interactions between humans and wild elephants, and their political implications in the non-protected, mixed-use landscapes of Assam, once again in Northeast India. This study hopes to integrate concepts and methods from animal ecology and behavioural sciences as well as the political ecology of human communities in these threatened landscapes.

I PHILIPPE COSTE

Philippe served as a nurse and lived in Laos between 1999 and 2010. As a self-taught photographer, he became interested in human-elephant relationships in the context of Laotian village life. Numerous stays in the province of Sayabouly with mahouts and their elephants allowed him to produce a series of images on the astonishing collaboration between men and animals in logging operations. He also took advantage of this time to bring his lens closer to elephants, often from only a few centimeters, and let his gaze get lost in the details and textures of the world's largest land mammal. This unusual intimacy birthed a series of strange and poetic images.

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Jennifer is an ecologist and evolutionary biologist whose PhD investigated mahout-elephant relationships in elephants working in the timber industry in Myanmar. Her research focused on the shifts within the mahout

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I LAUREN. A. EVANS

Lauren has worked in conservation, always in an interdisciplinary way, in East Africa for 15 years, where conflicts in conservation are glaring and often uncomfortable. Lauren's PhD and postdoctoral research with Bill Adams at the University of Cambridge looked at the political ecology of electrified 'elephant' fences in Laikipia, Kenya and the agency of elephants as political actors in conservation conflicts. Lauren directed the conservation science department for Space for Giants for six years. Lauren is now a practitioner in nonviolent communication and conflict resolution. She has founded and is directing an organisation, Human Nature, that works to support conservation to better understand and engage with social complexity.

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Toni is the founder and science director of TerraMar Research (TerramarResearch.org). She is an ethologist and behavioural biologist who has specialized in cetaceans—and more recently, elephants—for over 30 years. She has distinctive expertise in both studying and addressing the psychological wellbeing of cetaceans and elephants in captivity and in the wild with an emphasis on the impacts of human interaction. Her writings include her most recent book on dolphins with Yale University Press. Toni continues to consult for a variety of private, government, and non-profit organizations where her work has contributed to the revision and implementation of management and legislation protecting animals in captivity and in the wild in more than a dozen countries.

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Anandi is a PhD student in cultural anthropology at the University of California, Santa Cruz. She is inspired by stories of coexistence in Eastern Thailand. Her approach combines theory and methods from multispecies anthropology, ecology, and agriculture. The last 12 years of her academic training in philosophy, ecology, and anthropology and employment in agriculture and conservation non-profit organizations have been motivated by the question: how is industrial agriculture impacting and transforming farmer lives, indigenous lifeways, and megafauna survival in Asia? Growing up in India, where elephants are revered, has instilled in her deep respect and awe for these intelligent beings. Working with marginalized farmers has made her empathetic towards the precarity of livelihoods in the face of

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Teckwyn is an independent scientist who studies the relationship between people and nature. He wrote his doctorate dissertation on the history of elephants and people in the Malaysian rainforest. Teckwyn is an honorary Associate Professor at the School of Environmental and Geographical

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Srikumar is an architect specialising in ancient and early architecture of the Indian subcontinent within the Heritage, Science and Society Programme, National Institute of Advanced Studies, Bangalore, India. Along with ancient Indian knowledge systems, Srikumar's academic interests focus on prehistoric monuments like ashmounds and megaliths, as well as later monuments, such as stupas and temples. Currently, Srikumar is engaged in efforts to understand the evolution of principles of construction and stone-working in early temple architecture and the practice of architecture in Early Historic to Medieval Periods in India, including tracking early artisans of ancient India. Depiction of animals in early art associated with monuments is an aspect of his work which deeply fascinates him.

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Vivek is a leading Indian wildlife conservationist, environmental commentator, author, photographer and policy think tank with a passion for elephants. Founder of five environmental and nature conservation organisations, he spearheads Wildlife Trust of India as its Founder, Executive Director since 1998. He is the current Deputy Chair of IUCN-SSC, Chair-Asian Elephant SG, Member-SSC Steering Committee and Conservation Translocation SG with over 25 years serving on various Specialist Groups. He is the winner of 2019 Clark R. Bavin Award, 2018 Whitley Continuation Award, 2017 Round Glass Samsara Lifetime Achievement Award and 2001 Rufford Award. Mr Menon is the author of ten wildlife books including the bestselling *Indian Mammals- A Field Guide*, scores of technical reports and more than 250 articles and also serves on a number of governmental and non-governmental boards and committees.

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As a postdoctoral researcher at Aarhus University, Denmark, in Environmental Humanities and Media Studies, Elizabeth studies relational patterns among plants, humans and other animals, and examines the role of language in supporting ecocultural resilience. Her PhD research (Bloomsbury Scholar) on human-elephant conflict in Sri Lanka learned how farmers and elephants negotiate a charged environment and how plants' and elephants' lifeways and symbiotic patterns are instructive towards reducing conflict. She has studied perceptions of wellbeing for other animals, as well as implications of distributed personhood outside the human realm. She founded Storiedseas.org, and is developing Biocultural Field Guides to riparian

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Anindya is primarily based at the National Institute of Advanced Studies in Bangalore, India but holds adjunct faculty positions at ten other research and teaching institutions in India and in the United Kingdom. Notwithstanding his earlier research in the fields of classical genetics, biochemical genetics and molecular biology, his primary research interests, over the last three decades, have been in animal behavioural ecology, cognitive ethology, evolutionary biology, population and behavioural genetics, classical animal studies and the applied philosophy of biology, cognitive science and conservation studies largely involving primates, elephants and other nonhuman species. His current research in natural philosophies, other-than-human studies, art heritage and performance studies involve ethno-ethnographic explorations of nonhuman synurbisation, human-nonhuman relations and the lived experiences of nonhumans, promising unique insights into more-than-human lifeworlds of the past, today and in the future.

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Imprimé en France (La Courneuve) sur les presses d'Isiprint
Dépôt légal : septembre 2023

collection [mondes vivants]

Composing Worlds with Elephants is an interdisciplinary dialogue exploring the historical, social, and ecological entanglement of humans and elephants, a thousands of years old interspecies connection that is multi-dimensional, ambivalent, and always changing.

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