

# Tusklessness Problem Or Solution



## **Tusklessness: Problem or Solution? Unpacking the Complexities of Elephant Evolution**

The absence of tusks in elephants – a phenomenon increasingly observed in some populations – presents a complex conundrum. Is it a devastating problem signaling ecological collapse, or a clever evolutionary solution to human-induced pressures? This question has sparked passionate debate among conservationists, scientists, and the public. This comprehensive blog post delves deep into the issue, examining the scientific evidence, ethical considerations, and potential implications of this remarkable evolutionary shift. We'll explore the causes, consequences, and potential future scenarios for tuskless elephants, offering a nuanced perspective on whether tusklessness is ultimately a problem or a solution.

### **H2: The Rise of Tusklessness: A Response to Poaching Pressure?**

The dramatic increase in tuskless female elephants, particularly in certain African regions, is strongly correlated with intense ivory poaching. For decades, the relentless demand for ivory has decimated elephant populations, selecting for individuals lacking the very trait that makes them vulnerable: large, valuable tusks. This selective pressure, driven by human activity, has inadvertently accelerated the frequency of a naturally occurring genetic mutation resulting in tusklessness. The increased prevalence of tuskless females isn't necessarily a natural evolutionary trajectory; rather, it's a stark testament to the devastating impact of human actions on wildlife.

### **H3: Genetic Mechanisms Behind Tusklessness**

The genetic basis of tusklessness is becoming clearer through ongoing research. Scientists have identified a specific gene, linked to the *Loxodonta africana* genome, that plays a crucial role in tusk development. Mutations within this gene can significantly reduce or eliminate tusk growth. Understanding the genetic mechanics behind this trait is pivotal for predicting future population trends and developing informed conservation strategies.

### **H4: The Evolutionary Trade-offs: Are there downsides to Tusklessness?**

While tusklessness offers protection from poaching, it's not without potential downsides. Tusks play crucial roles in elephant social interactions, foraging, and defense against predators. Tuskless elephants may face challenges in competing for resources, particularly food, and might be more vulnerable to certain types of predators. Furthermore, the long-term consequences of this altered gene pool remain largely unknown. This lack of understanding highlights the need for continued research into the broader ecological and evolutionary implications of tusklessness.

### **H2: Conservation Implications: A Shifting Paradigm?**

The rise of tusklessness forces a reevaluation of traditional elephant conservation strategies. Focusing solely on anti-poaching efforts is no longer sufficient. We need to consider the genetic implications and the potential long-term consequences of a tuskless elephant population. Conservation efforts must adapt to this new reality, incorporating genetic monitoring and research into their strategies. This may include exploring techniques to enhance genetic diversity and mitigate the potential negative impacts of reduced tusk prevalence.

### **H3: Ethical Considerations: Human Interference in Evolution**

The human-driven selection for tusklessness raises complex ethical questions. Are we ethically justified in inadvertently altering the natural evolutionary trajectory of a species? While the intention is not malicious – protecting elephants from extinction – the unintended consequences necessitate careful consideration. Balancing human intervention with the principle of allowing natural selection to take its course is a crucial challenge for conservationists.

### **H2: Looking to the Future: What does a Tuskless Elephant**

# Population Mean?

The future of elephant populations, particularly with the increasing prevalence of tusklessness, remains uncertain. While it provides short-term protection from poaching, the long-term effects on elephant behavior, social dynamics, and overall fitness need careful study. Continued monitoring, genetic research, and robust anti-poaching measures are crucial to ensure the survival and well-being of elephant populations, regardless of their tusk status.

## Conclusion

The question of whether tusklessness is a problem or a solution is not a simple yes or no. It is a complex issue reflecting the devastating impact of human activity on wildlife populations and forcing us to confront the ethical dilemmas inherent in conservation interventions. While tusklessness might appear to be a survival mechanism in the face of poaching, it's a symptom of a deeper problem and its long-term consequences remain largely unknown. Only through ongoing research, collaborative conservation efforts, and a commitment to tackling the underlying causes of poaching can we ensure a healthy and diverse future for elephants, with or without tusks.

## FAQs

1. Is tusklessness hereditary? Yes, tusklessness is largely hereditary, linked to a specific gene. The increased prevalence we observe is due to the selective pressure of poaching, favoring the survival and reproduction of tuskless females.
2. Are tuskless elephants healthier? Current research doesn't definitively conclude whether tuskless elephants are inherently healthier. While they survive poaching, potential trade-offs in foraging and social interactions need further investigation.
3. Can tusklessness be reversed? Reversing the widespread tusklessness in elephant populations is highly unlikely. The genetic shift is a direct result of human-driven selection pressure.
4. What role do male elephants play in this? While the focus has been on females due to their tusk value, male elephants are also affected. Poaching of males with large tusks has also created selective pressure, although the impact might be less immediately apparent.
5. What can I do to help? Support anti-poaching organizations, advocate for stricter regulations on ivory trade, and educate others about the plight of elephants and the complexities of tusklessness. Supporting responsible ecotourism that benefits local communities and elephant conservation is crucial.

Primack, Johnny W. Wilson, 2019-09-10 *Conservation Biology in Sub-Saharan Africa* comprehensively explores the challenges and potential solutions to key conservation issues in Sub-Saharan Africa. Easy to read, this lucid and accessible textbook includes fifteen chapters that cover a full range of conservation topics, including threats to biodiversity, environmental laws, and protected areas management, as well as related topics such as sustainability, poverty, and human-wildlife conflict. This rich resource also includes a background discussion of what conservation biology is, a wide range of theoretical approaches to the subject, and concrete examples of conservation practice in specific African contexts. Strategies are outlined to protect biodiversity whilst promoting economic development in the region. Boxes covering specific themes written by scientists who live and work throughout the region are included in each chapter, together with recommended readings and suggested discussion topics. Each chapter also includes an extensive bibliography. *Conservation Biology in Sub-Saharan Africa* provides the most up-to-date study in the field. It is an essential resource, available on-line without charge, for undergraduate and graduate students, as well as a handy guide for professionals working to stop the rapid loss of biodiversity in Sub-Saharan Africa and elsewhere.

**tusklessness problem or solution:** *What Makes People Rich and Nations Powerful* ,

**tusklessness problem or solution:** *Ivory, Horn and Blood* Ronald Isaac Orenstein, 2013

Describes the illegal trafficking of elephant ivory and rhinoceros horns and the implications for these endangered animals.

**tusklessness problem or solution:** *Biotic Homogenization* Julie L. Lockwood, Michael L. McKinney, 2001-05-31 Biological homogenization is the dominant process shaping the future global biosphere. As global transportation becomes faster and more frequent, it is inevitable that biotic intermixing will increase. Unique local biotas will become extinct only to be replaced by already widespread biotas that can tolerate human activities. This process is affecting all aspects of our world: language, economies, and ecosystems alike. The ultimate outcome is the loss of uniqueness and the growth of uniformity. In this way, fast food restaurants exist in Moscow and Java Sparrows breed on Hawaii. Biological homogenization qualifies as a global environmental catastrophe. The Earth has never witnessed such a broad and complete reorganization of species distributions.

**tusklessness problem or solution:** *The Beak of the Finch* Jonathan Weiner, 2014-05-14 PULITZER PRIZE WINNER • A dramatic story of groundbreaking scientific research of Darwin's discovery of evolution that spark[s] not just the intellect, but the imagination (Washington Post Book World). "Admirable and much-needed.... Weiner's triumph is to reveal how evolution and science work, and to let them speak clearly for themselves."—The New York Times Book Review On a desert island in the heart of the Galapagos archipelago, where Darwin received his first inklings of the theory of evolution, two scientists, Peter and Rosemary Grant, have spent twenty years proving that Darwin did not know the strength of his own theory. For among the finches of Daphne Major, natural selection is neither rare nor slow: it is taking place by the hour, and we can watch. In this remarkable story, Jonathan Weiner follows these scientists as they watch Darwin's finches and come up with a new understanding of life itself. *The Beak of the Finch* is an elegantly written and compelling masterpiece of theory and explication in the tradition of Stephen Jay Gould.

**tusklessness problem or solution:** *World Wildlife Crime Report 2020* United Nations Publications, 2021-03-31 The report presents the latest assessment of global trends in wildlife crime. It includes discussions on illicit rosewood, ivory, rhino horn, pangolin scales, live reptiles, tigers and other big cats, and European eel. The COVID-19 (coronavirus) pandemic has highlighted that wildlife crime is a threat not only to the environment and biodiversity, but also to human health, economic development and security. Zoonotic diseases - those caused by pathogens that spread from animals to humans - represent up to 75% of all emerging infectious diseases. Trafficked wild species and the resulting products offered for human consumption, by definition, escape any hygiene or sanitary control, and therefore pose even greater risks of infection.

**tusklessness problem or solution:** *Conservation Science and Action* William J. Sutherland, 2009-07-01 *Conservation Science and Action* is intended for upper-level undergraduate and graduate

courses in conservation biology. This book reviews the latest thinking and approaches, and in doing so provides a readily accessible reference work for conservation professionals and managers. Because conservation biology is now one of the most dynamic disciplines in the life sciences, William Sutherland and his international team of authors have selected many of the liveliest topics where key advances are currently being made. They stress ideas, point to unresolved issues, and suggest possible future developments. Finally, since conservation is an applied subject, the book's emphasis throughout is on action. Essential reading for senior undergraduate and postgraduate students taking courses in conservation biology, one of the most dynamic disciplines in the life sciences. Contributions from leading figures in the field who have selected the liveliest topics where key advances are being made. Reviews the latest thinking and approaches. Contributors cover a range of taxonomic groups, include aquatic and terrestrial plants and animals, and give examples from around the world. Emphasis given to action, and all chapters have an applied component.

**tusklessness problem or solution: Earth System Law: Standing on the Precipice of the Anthropocene** Timothy Cadman, Margot Hurlbert, Andrea C. Simonelli, 2021-12-13 This book systematically explores the emerging legal discipline of Earth System Law (ESL), challenging the closed system of law and marking a new era in law and society scholarship. Law has historically provided stability, certainty, and predictability in the ordering of social relations (predominantly between humans). However, in recent decades the Earth's relationship in law has changed with increasing recognition of the standing of Mother Earth, inherent rights of the environment (such as flora and fauna, rivers), and now recognition of the multiple relations of the Anthropocene. This book questions the fundamental assumption that 'the law' only applies to humans, and that the earth, as a system, has intrinsic rights and responsibilities. In the last ten years the planet has experienced its hottest period since human evolution, and by the year 2100, unless substantive action is taken, many species will be lost, and planetary conditions will be intolerable for human civilisation as it currently exists. Relationships between humans, the biosphere, and all planetary systems must change. The authors address these challenging topics, setting the groundwork of ESL to ensure sustainable development of the coupled socio-ecological system that the Earth has become. Earth System Law is an interdisciplinary and transdisciplinary research project, and, as such, this book will be of great interest to researchers and stakeholders from a wide range of disciplines, including political science, anthropology, economics, law, ethics, sociology, and psychology.

**tusklessness problem or solution: *The Evolution of Same-Sex Attraction*** Menelaos Apostolou, 2020-10-06 This book provides a comprehensive analysis of the evolutionary origins of same-sex attraction, evaluating multiple existing evolutionary theories. It combines empirical findings with theoretical arguments in order to review evidence on the prevalence rates of same-sex attraction and determine its genetic and environmental basis. Among the topics addressed: Attitudes towards same-sex attraction across human history Assessing the weak selection pressures hypothesis of attraction Assessing the male choice hypothesis of attraction Evolution of same-sex attraction in men versus women *The Evolution of Same-Sex Attraction* will be of interest to academics and students of evolutionary and psychological sciences, filling a gap in literature on the origins of specifically same-sex attraction.

**tusklessness problem or solution: Elephant management** Robert (Bob) Scholes, Kathleen G Mennell, 2008-03-01 Elephants are among the most magnificent – but also most problematic – members of South Africa's wildlife population. While they are sought after by South African and foreign tourists alike, they also have a major impact on their environment. As a result, elephant management has become a highly complex and often controversial discipline. The information needed to underpin vital decisions about elephant management has largely been unavailable to decision-makers, contested by experts, or simply unknown. As a result, the South African Minister for Environmental Affairs and Tourism convened a round table to advise him on this issue. The round table recommended that a scientific assessment of elephant management be undertaken to gather, evaluate, and present all the relevant information on this topic. Its main findings and recommendations are contained in this volume. *Elephant Management* is the first book of its kind,

combining the work of more than 60 national and international experts. Extensively reviewed by policy-makers and other stakeholders, it is the most systematic and comprehensive review of savanna elephant populations and factors relevant to managing them to date. As such it is of interest to a broad spectrum of readers in South Africa and elsewhere. Above all, it is aimed at helping conservation policy-makers and practitioners to choose the best possible options for the sustainable preservation of these iconic animals.

**tusklessness problem or solution: Of Moths and Men** Judith Hooper, 2002 In this revelatory work, Judith Hooper uncovers the intellectual rivalries, petty jealousies, and flawed science behind one of the most famous experiments in evolutionary biology. Bernard Kettlewell's 1953 experiment on the peppered moths of England made him a media star on the order of Jonas Salk -- but also an unlikely tragic hero. As Hooper recounts in this rollicking scientific detective story, the truth can be subverted when the stakes are very high. Book jacket.

**tusklessness problem or solution: Tiger Bone & Rhino Horn** Richard Ellis, 2013-02-22 In parts of Korea and China, moon bears, black but for the crescent-shaped patch of white on their chests, are captured in the wild and brought to bear farms where they are imprisoned in squeeze cages, and a steel catheter is inserted into their gall bladders. The dripping bile is collected as a cure for ailments ranging from an upset stomach to skin burns. The bear may live as long as fifteen years in this state. Rhinos are being illegally poached for their horns, as are tigers for their bones, thought to improve virility. Booming economies and growing wealth in parts of Asia are increasing demand for these precious medicinals. Already endangered species are being sacrificed for temporary treatments for nausea and erectile dysfunction. Richard Ellis, one of the world's foremost experts in wildlife extinction, brings his alarm to the pages of *Tiger Bone & Rhino Horn*, in the hope that through an exposure of this drug trade, something can be done to save the animals most direly threatened. Trade in animal parts for traditional Chinese medicine is a leading cause of species endangerment in Asia, and poaching is increasing at an alarming rate. Most of traditional Chinese medicine relies on herbs and other plants, and is not a cause for concern. Ellis illuminates those aspects of traditional medicine, but as wildlife habitats are shrinking for the hunted large species, the situation is becoming ever more critical. One hundred years ago, there were probably 100,000 tigers in India, South China, Sumatra, Bali, Java, and the Russian Far East. The South Chinese, Caspian, Balinese, and Javan species are extinct. There are now fewer than 5,000 tigers in all of India, and the numbers are dropping fast. There are five species of rhinoceros--three in Asia and two in Africa--and all have been hunted to near extinction so their horns can be ground into powder, not for aphrodisiacs, as commonly thought, but for ailments ranging from arthritis to depression. In 1930, there were 80,000 black rhinos in Africa. Now there are fewer than 2,500. Tigers, bears, and rhinos are not the only animals pursued for the sake of alleviating human ills--the list includes musk deer, sharks, saiga antelope, seahorses, porcupines, monkeys, beavers, and sea lions--but the dwindling numbers of those rare species call us to attention. Ellis tells us what has been done successfully, and contemplates what can and must be done to save these animals or, sadly, our children will witness the extinction of tigers, rhinos, and moon bears in their lifetime.

**tusklessness problem or solution: Management Issues & Options ,**

**tusklessness problem or solution: Primate Anatomy** Friderun Ankel-Simons, 2010-07-27 *Primate Anatomy* is unlike any other work on primates: it systematically reviews the biology of all living primates, including humans. It describes their bio-geographical information and provides crucial data pertaining to their body size, fur coloration external distinguishing features, habitat and basic life strategies. Now in its third edition, *Primate Anatomy* discusses species that are new to science since the last edition with details concerning anatomical features among primates that were re-discovered. New research in molecular primatology is also included due to recent relevant findings in molecular biology in accordance with new technology. The basics of biological taxonomy are introduced, along with photographs of all major groups. Important new and controversial issues make this edition key for every primatologists, anthropologist, and anatomist. - Offers up-to-date reviews of molecular primatology and primate genomics - Concentrates on living primates and their

overall biology - Discusses the genetic connection of function where known - Introduces primate genomics for the first time in a textbook - Provides instructive and comprehensive review tables - Includes many unique, novel and easily understandable illustrations

**tusklessness problem or solution: Population Genetics and Fishery Management** Nils Ryman, Fred Utter, 2009-10 Since the first publication of Population Genetics and Fishery Management in 1987, significant technological, analytical, and conceptual changes have occurred. By explaining basic population genetics in a fisheries context, the text continues to serve as an excellent starting point for approaching complex recent developments.

**tusklessness problem or solution: Elephants on the Edge** G. A. Bradshaw, 2009-10-06 "At times sad and at times heartwarming . . . Helps us to understand not only elephants, but all animals, including ourselves" (Peter Singer, author of Animal Liberation). Drawing on accounts from India to Africa and California to Tennessee, and on research in neuroscience, psychology, and animal behavior, G. A. Bradshaw explores the minds, emotions, and lives of elephants. Wars, starvation, mass culls, poaching, and habitat loss have reduced elephant numbers from more than ten million to a few hundred thousand, leaving orphans bereft of the elders who would normally mentor them. As a consequence, traumatized elephants have become aggressive against people, other animals, and even one another; their behavior is comparable to that of humans who have experienced genocide, other types of violence, and social collapse. By exploring the elephant mind and experience in the wild and in captivity, Bradshaw bears witness to the breakdown of ancient elephant cultures. But, she reminds us, all is not lost. People are working to save elephants by rescuing orphaned infants and rehabilitating adult zoo and circus elephants, using the same principles psychologists apply in treating humans who have survived trauma. Bradshaw urges us to support these and other models of elephant recovery and to solve pressing social and environmental crises affecting all animals—humans included. "This book opens the door into the soul of the elephant. It will really make you think about our relationship with other animals." —Temple Grandin, author of Animals in Translation

**tusklessness problem or solution: The African Elephant** United Nations Environment Programme, 1989

**tusklessness problem or solution: Joint Species Distribution Modelling** Otso Ovaskainen, Nerea Abrego, 2020-06-11 A comprehensive account of joint species distribution modelling, covering statistical analyses in light of modern community ecology theory.

**tusklessness problem or solution: Sources of Light** Daniel Nunn, 2012-07 Takes a look at sources of light, and explains the difference between things that make light and things that don't.

**tusklessness problem or solution: Evolutionary History** Edmund Russell, 2011-04-11 We tend to see history and evolution springing from separate roots, one grounded in the human world and the other in the natural world. Human beings have, however, become probably the most powerful species shaping evolution today, and human-caused evolution in other species has probably been the most important force shaping human history. This book introduces readers to evolutionary history, a new field that unites history and biology to create a fuller understanding of the past than either can produce on its own. Evolutionary history can stimulate surprising new hypotheses for any field of history and evolutionary biology. How many art historians would have guessed that sculpture encouraged the evolution of tuskless elephants? How many biologists would have predicted that human poverty would accelerate animal evolution? How many military historians would have suspected that plant evolution would convert a counter-insurgency strategy into a rebel subsidy? With examples from around the globe, this book will help readers see the broadest patterns of history and the details of their own life in a new light.

**tusklessness problem or solution: Megaherbivores** R. Norman Owen-Smith, 1988 An account of the limitations and advantages conferred by large body size.

**tusklessness problem or solution: The Amboseli Elephants** Cynthia J. Moss, Harvey Croze, Phyllis C. Lee, 2011-03-15 Elephants have fascinated humans for millennia. Aristotle wrote of them with awe and Hannibal used them in warfare. This book is the summation of what's been learned

from the Amboseli Elephant Research Project (AERP) - the longest continuously running elephant research project in the world.

**tusklessness problem or solution: Conservation Genetics in Mammals** Jorge Ortega, Jesus E. Maldonado, 2020-01-24 This book focuses on the use of molecular tools to study small populations of rare and endangered mammals, and presents case studies that apply an evolutionary framework to address innovative questions in the emerging field of mammalian conservation genomics using a highly diverse set of novel molecular tools. Novel and more precise molecular technologies now allow experts in the field of mammology to interpret data in a more contextual and empirical fashion and to better describe the evolutionary and ecological processes that are responsible for the patterns they observe. The book also demonstrates how recent advances in genetic/genomic technologies have been applied to assess the impact of environmental/anthropogenic changes on the health of small populations of mammals. It examines a range of issues in the field of mammalian conservation genomics, such as the role that the genetic diversity of the immune system plays in disease protection and local adaptation; the use of noninvasive techniques and genomic banks as a resource for monitoring and restoring populations; the structuring of population by physical barriers; and genetic diversity. Further, by integrating research from a variety of areas - including population genetics, molecular ecology, systematics, and evolutionary and conservation biology - it enables readers to gain a deeper understanding of the conservation biology of mammals that are at increasing risk of extinction at local, regional and global scales. As such, it offers a unique resource for a broad readership interested in the conservation biology of mammals and conservation management strategies to better preserve biodiversity.

**tusklessness problem or solution: Rattling The Cage** Steven M. Wise, 2014-07-08 Rattling the Cage explains how the failure to recognize the basic legal rights of chimpanzees and bonobos in light of modern scientific findings creates a glaring contradiction in our law. In this witty, moving, persuasive, and impeccably researched argument, Wise demonstrates that the cognitive, emotional, and social capacities of these apes entitle them to freedom from imprisonment and abuse.

**tusklessness problem or solution: Ethiopia** Mary Anne Fitzgerald , Philip Marsden, 2017-11-20 A lavishly illustrated photographic journey through the history and traditions of the ancient churches of Ethiopia. The ancient Aksumite Kingdom, now a part of Ethiopia, was among the first in the world to adopt Christianity as the official state religion. In AD 340 King Ezana commissioned the construction of the imposing basilica of St. Mary of Tsion. It was here, the Ethiopians say, that Menelik, son of King Solomon and the Queen of Sheba, brought the Ark of the Covenant containing the Ten Commandments. By the fifth century, nine saints from Byzantium were spreading the faith deep into the mountainous countryside, and over the next ten centuries a series of spectacular churches were either built or excavated out of solid rock, all of them in regular use to this day. Lalibela, a UNESCO World Heritage Site, has the best known cluster, but the northern region of Tigray, less well known and more remote, has many churches that are architectural masterpieces of the basilical type. Ethiopia: The Living Churches of an Ancient Kingdom traces the broad sweep of ecclesiastic history, legend, art, and faith in this sub-Saharan African kingdom as seen through the prism of sixty-six breathtaking churches, unveiling the secrets of their medieval murals, their colorful history, and the rich panoply of their religious festivals, all illustrated with more than eight hundred superb color photographs by some of the most celebrated international photographers of traditional cultures. This magnificent, large-format, full-color volume is the most comprehensive celebration yet published of Ethiopia's extraordinary Christian heritage. Ethiopia is the third book on iconic places of worship published by Ludwig Publishing and the American University in Cairo Press, following the bestselling success of The Churches of Egypt and The History and Religious Heritage of Old Cairo.

**tusklessness problem or solution: Mammal Teeth** Peter S. Ungar, 2010-10-01 Winner, 2010 PROSE Award for Excellence in the Biological Sciences. Professional and Scholarly Publishing division of the Association of American Publishers In this unique book, Peter S. Ungar tells the story of mammalian teeth from their origin through their evolution to their current diversity. Mammal

Teeth traces the evolutionary history of teeth, beginning with the very first mineralized vertebrate structures half a billion years ago. Ungar describes how the simple conical tooth of early vertebrates became the molars, incisors, and other forms we see in mammals today. Evolutionary adaptations changed pointy teeth into flatter ones, with specialized shapes designed to complement the corresponding jaw. Ungar explains tooth structure and function in the context of nutritional needs. The myriad tooth shapes produced by evolution offer different solutions to the fundamental problem of how to squeeze as many nutrients as possible out of foods. The book also highlights Ungar's own path-breaking studies that show how microwear analysis can help us understand ancient diets. The final part of the book provides an in-depth examination of mammalian teeth today, surveying all orders in the class, family by family. Ungar describes some of the more bizarre teeth, such as tusks, and the mammal diversity that accompanies these morphological wonders. Mammal Teeth captures the evolution of mammals, including humans, through the prism of dental change. Synthesizing decades of research, Ungar reveals the interconnections among mammal diet, dentition, and evolution. His book is a must-read for paleontologists, mammalogists, and anthropologists.

**tusklessness problem or solution:** *Nonhuman Primates in Biomedical Research* Christian R. Abee, Keith Mansfield, Suzette D. Tardif, Timothy Morris, 2012-06-07 The 2e of the gold standard text in the field, *Nonhuman Primates in Biomedical Research* provides a comprehensive, up-to-date review of the use of nonhuman primates in biomedical research. The Diseases volume provides thorough reviews of naturally occurring diseases of nonhuman primates, with a section on biomedical models reviewing contemporary nonhuman primate models of human diseases. Each chapter contains an extensive list of bibliographic references, photographs, and graphic illustrations to provide the reader with a thorough review of the subject. - Fully revised and updated, providing researchers with the most comprehensive review of the use of nonhuman primates in bioledical research - Addresses commonly used nonhuman primate biomedical models, providing researchers with species-specific information - Includes four color images throughout

**tusklessness problem or solution:** **CRISPR People** Henry T. Greely, 2022-03-01 What does the birth of babies whose embryos had gone through genome editing mean—for science and for all of us? In November 2018, the world was shocked to learn that two babies had been born in China with DNA edited while they were embryos—as dramatic a development in genetics as the 1996 cloning of Dolly the sheep. In this book, Hank Greely, a leading authority on law and genetics, tells the fascinating story of this human experiment and its consequences. Greely explains what Chinese scientist He Jiankui did, how he did it, and how the public and other scientists learned about and reacted to this unprecedented genetic intervention. The two babies, nonidentical twin girls, were the first “CRISPR'd” people ever born (CRISPR, Clustered Regularly Interspaced Short Palindromic Repeats, is a powerful gene-editing method). Greely not only describes He's experiment and its public rollout (aided by a public relations adviser) but also considers, in a balanced and thoughtful way, the lessons to be drawn both from these CRISPR'd babies and, more broadly, from this kind of human DNA editing—“germline editing” that can be passed on from one generation to the next. Greely doesn't mince words, describing He's experiment as grossly reckless, irresponsible, immoral, and illegal. Although he sees no inherent or unmanageable barriers to human germline editing, he also sees very few good uses for it—other, less risky, technologies can achieve the same benefits. We should consider the implications carefully before we proceed.

**tusklessness problem or solution:** **The Story of Life: Great Discoveries in Biology (First Edition)** Sean B. Carroll, 2019

**tusklessness problem or solution:** The Biology and Identification of the Coccidia (Apicomplexa) of Turtles of the World Donald W. Duszynski, Johnica J. Morrow, 2014-08-04 The *Biology and Identification of the Coccidia (Apicomplexa) of Turtles of the World* is an invaluable resource for researchers in protozoology, coccidia, and parasitology, veterinary sciences, animal sciences, zoology, and biology. This first-of-its-kind work offers a taxonomic guide to apicomplexan parasites of turtles that enables easy parasite identification, with a summary of virtually everything known about the biology of each known parasite species. It is an important documentation of this

specific area, useful to a broad base of readers, including researchers in biology, parasitology, animal husbandry, diseases of wild and domestic animals, veterinary medicine, and faculty members in universities with graduate programs in these areas. There are about 330 turtle species on Earth; many are endangered, a growing number of species are kept as pets, and some are still used as food by humans. Turtles, like other vertebrate animals have many different kinds of parasites (viruses, bacteria, protozoa, worms, arthropods, and others). Coccidiosis in turtles has prevented large-scale turtle breeding, and represents a serious problem in need of control. This succinct and highly focused book will aid in that effort. - Offers line drawings and photomicrographs of each parasite from each hosts species - Provides methods of identification and treatment - Presents a complete historical rendition of all known publications on coccidia (and their closest relatives) from all turtle species on Earth, and evaluates the scientific and scholarly merit of each - Provides a complete species analysis of the known biology of every coccidian described from turtles - Reviews the most current taxonomy of turtles and their phylogenetic relationships needed to help assess host-specificity and evaluate what little cross-transmission work is available

**tusklessness problem or solution:** Evidence Against Evolution Duane T. Gish, 1972

**tusklessness problem or solution:** **Jungle Man: The Autobiography Of Major P. J.**

**Pretorius C.M.G. D.S.O. and Bar** Major P. J. Pretorius, 2016-01-18 The true story of Major Jan Pretorius, a South African elephant hunter and adventurer, this is a true tale of continuous adventure for a lifetime and considered one of the most extraordinary ever written. Pretorius also gives the first full account of the search for the German cruiser Königsberg which had sunk the Pegasus at Zanzibar and then gone into hiding in the Rufiji delta. "I have never seen a more thrilling story of a hunter's life. It is full of almost unbelievable incidents, of reckless daring, and of hair-breadth escapes. If one knew the writer the interest increases, for he was a quiet, gentle, unassuming person in appearance. What fire lay hidden under those quiet features and that gentle manner! His very person seemed to be a camouflage."—Foreword by J. C. Smuts

**tusklessness problem or solution:** *Conservation and Evolution* Otto Frankel, Michael E. Soulé, 1981-03-12

**tusklessness problem or solution:** **Global Impacts of the Illegal Wildlife Trade** Katherine Lawson, Alex Vines, Royal Institute of International Affairs, Royal Institute of International Affairs Staff, 2014

**tusklessness problem or solution:** **Harvesting the Biosphere** Vaclav Smil, 2012-12-21 An interdisciplinary and quantitative account of human claims on the biosphere's stores of living matter, from prehistoric hunting to modern energy production. The biosphere—the Earth's thin layer of life—dates from nearly four billion years ago, when the first simple organisms appeared. Many species have exerted enormous influence on the biosphere's character and productivity, but none has transformed the Earth in so many ways and on such a scale as Homo sapiens. In *Harvesting the Biosphere*, Vaclav Smil offers an interdisciplinary and quantitative account of human claims on the biosphere's stores of living matter, from prehistory to the present day. Smil examines all harvests—from prehistoric man's hunting of megafauna to modern crop production—and all uses of harvested biomass, including energy, food, and raw materials. Without harvesting of the biomass, Smil points out, there would be no story of human evolution and advancing civilization; but at the same time, the increasing extent and intensity of present-day biomass harvests are changing the very foundations of civilization's well-being. In his detailed and comprehensive account, Smil presents the best possible quantifications of past and current global losses in order to assess the evolution and extent of biomass harvests. Drawing on the latest work in disciplines ranging from anthropology to environmental science, Smil offers a valuable long-term, planet-wide perspective on human-caused environmental change.

**tusklessness problem or solution:** **The Economics of Community-based Wildlife Conservation in Zimbabwe** Edwin Muchapondwa, 2003

**tusklessness problem or solution:** *Primate Adaptation and Evolution* Bozzano G Luisa, 2013-10-22 *Primate Adaptation and Evolution* is the only recent text published in this rapidly

progressing field. It provides you with an extensive, current survey of the order Primates, both living and fossil. By combining information on primate anatomy, ecology, and behavior with the primate fossil record, this book enables students to study primates from all epochs as a single, viable group. It surveys major primate radiations throughout 65 million years, and provides equal treatment of both living and extinct species.ĩ Presents a summary of the primate fossilsĩ Reviews primate evolutionĩ Provides an introduction to the primate anatomyĩ Discusses the features that distinguish the living groups of primatesĩ Summarizes recent work on primate ecology

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