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IVORY, ELEPHANTS, AND MAN: A SURVEY

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Abstract: It is well known that elephants face two basic threats to their existence. One is the fact that they bear large tusks, the primary source of ivory since prehistoric times. The other is that their natural habitats are being destroyed by human expansion. While the latter problem is at least being temporarily staved off in certain regions by the creation and expansion of sanctuaries, the ivory problem seems to defy rational solution even in protected areas, especially in Africa. This problem is neither so simple as it appears, nor is it a recent phenomenon. The roots go back to the beginning of civilization and beyond. Certain paradoxes apparently implicit in the history of the ivory trade, and in man's long-term association with elephants, can be explained in the framework of various bioeconomic correlations and in terms of man's own evolutionary heritage. The implications of biology and history do not necessarily predicate contradiction, confusion, and extinction. A proper comprehension of the ivory trade is essential to any organized solution.

More than 25,000 years ago at a place called Dolni Vestonice in what is now Moravia, Czechoslovakia, a Stone Age people hunted the wooly mammoth (Mammuthus primigenius) with obvious success. Clustered at and around the site where these people lived are the fossilized bones of hundreds of these great extinct beasts. Mammoth bones apparently were used as supports for simple skin-covered dwellings, as parts of barricades to protect the hunters from predators, and some as makeshift coverings for the bodies of the dead. At the same site archaeologists found what some believe is the oldest portrait of an individual human. It is the head of a woman, carved in ivory (Fig. 1). Not far away was found the skeleton of a woman of about 40, perhaps a priestess, for the body was buried separately from the others; festooned with used and valuable flint tools, sprinkled with red ochre, and covered by two mammoth shoulder-blades. Research indicates that this woman had a slightly deformed face. The carved ivory head found nearby is strikingly similar. It is symbolic. Gazing at us from across more than 250 centuries, this pensive face is mute testimony to an association between man and elephant that began even earlier, and that continues to this day (Jelinek, 1975; Starr, 1973).

It remains an awesome association, full of natural drama and mystery. Mammuthus primigenius for all its outward difference was similar in many respects to its surviving cousins of today; gigantic, lumbering yet nimble, ranging the vast landscape of grassland and forest. Like man a social animal, wandering in presumed family groups. But unlike its cousins, the Asian elephant (Elephas maximus) and the African elephant (Loxodonta africana), the mammoth and its kind soon passed from the face of a changing earth. There is evidence that mankind was at least partly if not wholly responsible for the extinction of the several species of mammoths, as well as other large mammals of the Pleistocene (Martin and Wright, 1967). But my purpose is not to debate the overkill hypothesis. Whatever their impact, men hunted primarily for food; ivory was but an incidental material that was collected.

Figure 1. Head of a woman carved in mammoth ivory. This specimen is from Dolni Vestonice, Czechoslovakia (about 25,000 years ago); now in Moravské Museum, Brno. Photographed by Alexander Marshack.

My point is rather that the use of ivory taken from one or another species within the family Elephantidae of the order Proboscidea is an ancient practice -- dating back at least as far as the first evidence of human esthetic production for its own sake. The widespread use of ivory for both practical and decorative (or religious) purposes in dozens of other Palaeolithic sites is an indication that humans valued ivory fifteen millenia before the invention of agriculture. The properties of ivory, especially its durability, elasticity and beauty, are well known; so I will not detail them here, but it might be useful to note that from the Palaeolithic Age (Upper Pleistocene) ivory could be considered one of the most coveted and persistently useful of durable animal materials, and it remains so to this day despite the invention of petrochemical plastics. Among organic substances ivory is unsurpassed for such practical purposes as making fish-hooks, harpoons, spear and arrow-heads, needles, handles, containers,combs -- and for purposes of fine sculpture and small-scale carving of all kinds. The art of ivory carving runs like an unbroken thread through history in nearly every known society in the Old World and more recently in the New (Levick, 1924). Men traded ivory over huge distances long before King Solomon received "ivory, apes, and peacocks" in tribute from afar -- indeed long before any advanced civilization emerged. Ivory is almost indestructible if properly maintained; its lineamental beauty and burnished sheen are enchanced by time, and its value increases with age. Like gold, ivory is a criterion of wealth (Kunz, 1916; Moore, 1931b), and thus differs from perishable animal products; hides, skins, or horns (Jordan, 1956).

In historic times ivory has been regularly obtained in significant quantities only from elephants, either by hunting them or by collecting the tusks from the carcasses of those dead of natural causes. This has long been the case in spite of the fact that teeth from the walrus (Odobenus rosmarus), narwhal (Monodon monocerus), and sperm whale (Physeter catodon) were commonly used in certain northern zones before those animals became scarce. The considerable trade in fossil mammoth ivory (between Siberia and the United Kingdom for example) that culminated in the 18th and 19th centuries, was, of course, destined to eventual depletion. Furthermore, organized elephant hunting is at least as old as Homo sapiens, probably much older. Our hominid ancestors in Africa apparently hunted relatives of the modern elephants well over a million years ago. And the hunting heritage of mankind remains powerful; its pervasive influence has reverberated through all the millenia since, despite the fact that the invention of agriculture and the domestication of animals long ago rendered hunting and gathering obsolete for most of mankind. Though it is true that in early civilizations big-game hunting was often reserved only to the nobility for sport -- for the most part peasants could kill only smaller or so-called "varmint" species whose local abundance might be deemed incompatible with agriculture -- wild elephants unfortunately fit the latter category as well as the former. And even more importantly, elephants possess those great and gleaming tusks; hence from the beginning they have had more to offer when killed than merely meat (Ardrey, 1976; Carrington, 1958; Coon, 1971).

Thus the Asian elephants once found in what is today northern Iraq, Syria and Lebanon, were exterminated in those ranges by the 7th Century B.C. Likewise a northern sub-species of African forest elephants was extirpated in all of North Africa before the fall of Rome. By the time Christianity had

triumphed in the West, the coveted ivory that had adorned Mediterranean temples for ten centuries had become scarce. It was transported at great expense and effort for thousands of miles either from the coast of East Africa, across the Sahara from the unknown interior, or from the forests of South Asia (Kunz, 1916; Oliver and Fagan, 1975; Olivier, 1978a and 1978b; Scullard, 1974). With increased rarity, the value of ivory has increased.

In the meantime Indian civilization had learned, perhaps a thousand years before Alexander, to use Asian elephants for work and war. A complex system of mythology and lore had grown up around elephants through the Indo-Gangetic plains and eventually spread down the Southeast Asian peninsula to the South China Sea. Wherever Hindu influence spread, reverence for elephants became common, at least among their lordly owners, their keepers, and of course, among the very mahouts who rode them into battle. A great tradition of nurturing care developed side by side with exploitation and bloody slaughter (Edgerton, 1931; Sanderson, 1962; Sillar and Meyler, 1968). The potentates of T'ang China had gifts of elephants from neighboring Indo-China, and in the kingdom of Champa (in modern Vietnam) the local rulers used them to execute criminals (Schafer, 1963). Turbaned Mogul lords rode to battle in swaying and dangerous howdahs; the better to hunt tigers or observe the prostrate ranks of their subjects in ceremonial parades. In forest preserves, vast territories set aside by the nobility for their hunting pleasure, wild elephants roamed free, threatened only by the occasional keddah (round-up) or the desperate peasant out to protect his crops or to poach ivory within the forbidden lands (Carrington, 1958). For centuries in the Orient, viable herds of tame elephants for work and war had been replenished and maintained almost exclusively by the regular capture of wild ones. Elephants were never properly domesticated in the strict sense of the word. Asian elephants were thus partly protected because they were economically useful beyond the limited value of their relatively small tusks (Deraniyagala, 1951; Edgerton, 1931; Pocock, 1943). Throughout the Indian subcontinent and much of the remainder of the Oriental faunal region this ancient pattern failed only when the use of elephants for ceremony and labor became insignificant; a process that did not fully emerge until the middle of this century. Even then the vestiges of the old pattern held precariously in some regions, only to fall before the shockwaves of the population bomb. Today the wild Asian elephant is very limited in distribution, notably in India and Sri Lanka (Ceylon), with furtive wild herds in Burma, Thailand, West Malaysia, and Sabah (North Borneo). The situation in Laos and Vietnam is uncertain, but indications are that few remain. Asian elephants survive precariously as domestic beasts, useful in certain districts (Eisenberg and Lockhart, 1972; Olivier, 1978a and 1978b; Putnam, 1976; Seshadri, 1969).

For most of human history African elephants enjoyed a degree of isolation from the full-scale ravages of tree-cutting, land-altering man. Africans typically hunted elephants in relatively small numbers for the time-honored rewards of meat and for the associated thrill and prestige that seems to be part of the hunting ritual sometimes even among settled agriculturalists. Some Africans hunted elephants for ivory, even in the time of the Greeks and Romans, but within the vast tropical interior, ivory was largely a valued by-product of the hunt in its more ancient form (Clark, 1970; Jeannin, 1947; Livingstone, 1857; Sikes, 1971). Some elephants certainly were hunted to control their

ravages in favored agricultural zones (Kjekshus, 1977), but the conflict between wild elephants and self-sufficient agriculturalists had not yet become a widespread phenomenon as population density in most of Central and East Africa remained relatively low. Wherever agriculture flourished people could drive the elephants out, but the great animals had plenty of space for refuge (Watson, Bell, and Parker, 1972).

African elephants, nonetheless, provided increasing quantities of the world's ivory. From ancient times most of it was exported from East African ports such as Zanzibar but also from Birikao, Kilwa, Mombasa, and Malindi (Chittick and Rotberg, 1975). The majority of this ivory was exported raw to Asia; to India, where it was made into women's bangles (from the Hindu bangri, for bracelet) and used for exquisite religious carvings; and to Canton in China, where it was further transported to the inland cities and worked into luxury articles of all sorts: painted hen's eggs for the Emperor's festival days, writing tablets, and appliqued ornaments stained in many colors. In China, ivory traditionally ranked below only jade and gold (Cox, 1946; Kunz, 1916; Maskell, 1905).

Even after the decline of Rome in the West, a lot of ivory also found its way to Europe through the agency of Islamic middlemen who sold it at great profit to Jewish or Venetian merchants. These merchants then shipped it into the ports of northern Italy, where young men like Marco Polo watched and dreamed of traveling to the storied lands of its source (Lombard, 1975). In Medieval Christendom, ivory was used almost entirely for religious carvings, and the early Middle Ages were a "golden age" of ivory sculpture despite the scarcity of supply. Like gold, ivory has always been valued the more in proportion to its rarity. Medieval Europeans knew ivory was a safe investment, a hedge against inflation (Beihoff, 1961; Carra, 1970).

The Age of Discovery began a new phase of ivory exploitation that has continued with only minor lapses since the first Portuguese ships coasted Africa five centuries ago. Wild elephants were soon almost entirely eliminated throughout the accessible parts of West and South Africa (Bryden, 1903; Curtin, 1975). Elephants nevertheless remained abundant in the interior until the great 19th century explorers opened up the African heartland to external infuences and a cash economy. As the "gun frontier" moved inland, the ivory trade boomed as never before. And with the ivory boom came new economic arrangements, often alien-induced and controlled, new alliances, radical transformations in traditional political structures, and unprecedented violence to man and beast alike (Alpers, 1975; Birmingham and Gray, 1970; Unomah and Webster, 1976). The process of attrition that took nearly four centuries in West Africa was thus telescoped into a few decades in East Africa.

Some contemporary observers believed that for every tusk carried to the coast a human life was also lost. This may be an exaggeration, but it is true that the slave trade in most of East and Central Africa was intimately linked to the ivory trade (Moore, 1931a). Livingstone graphically described how Afro-Portuguese and Swahili-Arab traders made increased profits by enslaving interior peoples and using them as porters to carry the bulky ivory down to the coast, where both could be sold (Livingstone, 1857, and 1874). Indigenous traders who carried their own trade goods or who hired themselves out as

porters could not compete and were often forced into the ivory-slave trade network themselves. The complex ramifications of the trade in "White Gold" are only just being understood today, a century after it reached its zenith in the political economy of East and Central Africa (Alpers, 1975). Today even more ivory is traded, and the quantities increase year by year, although the relative economy of ivory vis-a-vis other products has declined (Douglas-Hamilton, 1980).

The ivory boom waned in overall importance with the advent of colonialism, which seemed to coincide with a massive decline in elephant numbers throughout traditional hunting grounds. Then came the first serious attempts at game regulation by the colonial rulers. Large reserves -- with limited hunting allowed -- were set aside in districts where elephants and other wildlife remained abundant. For almost five decades, with licensed hunters taking only a small number of elephants and with "poachers" sustaining a fairly regular annual kill, the elephants in East Africa seemed to hold their own* (Graham, 1973). Indeed, early in this century elephants appeared to be increasing in parts of East Africa. Actually, conservation measures accounted for only an insignificant part of this phenomenon. Vast regions where humans once flourished had been depopulated by the ravages of new strands of microorganisms that caused sleeping sickness, rinderpest and other epidemic diseases. Wildlife recovery was largely a natural result of this process, combined with colonial policy that discouraged human resettlement in the ravaged zones (Kjekshus, 1977; Willock, 1964). Great national parks were subsequently created where hunting was altogether forbidden.

In the meantime vast depopulated regions continued to act as huge unmolested breeding grounds, and in many cases the elephant population began an exponential increase. Particularly in Kenya, Uganda, and Tanzania, beginning in the 1930s and lasting in some places into the 1970s, it seemed that elephants had increased to a dangerous degree, posing a renewed threat to agriculture and other human enterprise (Graham, 1973; Laws, Parker, and Johnstone, 1975). Elephants were again perceived as a threat to villagers and farmers, as symbols of wild and untamed land, inimical to the march of "progress" and civilization. Legalized hunting had been proved to have no appreciable impact on elephant numbers, as expensive licenses made elephant hunting prohibitive to all but a few of the rich who hired "white hunters" as guides to assure their bag. But poaching began to increase rapidly. The ivory trade likewise revived, prompted by the availability of concentrated elephant populations within access of poverty-stricken, often displaced human populations that were also increasing exponentially. Poachers killed for meat and to protect their shambas, but most often the incentive was profit from high-priced ivory. As world demand increased, ivory prices skyrocketed (Burton, 1976 and 1977).

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*For "poachers" prior to World War II read: traditional African hunting groups who were no longer allowed to legally take the game they had traditionally hunted before the Colonial Era.

If African elephants had no apparent economic importance aside from their ivory -- that is, if they were perceived neither as regular sources of meat or hides (in the predictable way that cattle are) nor as useful for domestic purposes as in Asia -- then to many people it seemed foolish to protect them, especially if they threatened farms. The notable exception to the idea that African elephants had no economic function as beasts of labor was the experimental station where they were successfully domesticated in what is now Zaire. This failed to take hold because of development and other factors. Under the circumstances an elephant seemed to be more valuable dead than alive; at least its ivory could be sold for profit (Graham, 1973; Melland, 1938).

For these reasons many colonial and later independent African officials were not easily moved by arguments that seemed to put animals above humans on the scale of priorities. Clearly the protection of elephants had become more than a simple issue of conservation. Nevertheless, perception of this reality seemed to be confined to a handful, and most game-management experts and conservationists either ignored the facts or pretended they didn't exist (Parker, 1978).

The postwar years brought a new phase of ivory exploitation based almost exclusively on illegal poaching and smuggling networks that exploited the often uncertain political and social conditions that came with independence and the "Winds of Change." The price of ivory doubled and then doubled again. The postwar tourist industry provided a tremendous new market for cheaply carved ivory pieces, especially souvenirs and "airport art." By the early 1960s ivory poaching and smuggling had become an organized and highly profitable underground industry, encouraged by the widespread corruption that inevitably seems to follow on the heels of exploitive colonialism. In Uganda, political terror and the breakdown in the rule of law resulted in an almost immediate elephant slaughter starting around 1971. By 1976 it appeared that even in Uganda's two great national parks most of the once-common elephants had been wiped out (WWF/IUCN, 1976). The catastrophic trend has continued to the present. Evidence collected as recently as April 1980 suggests there may be in Uganda as few as 1,200 elephants remaining of a 1973 population of 15,000 elephants (Douglas-Hamilton, 1980). Extended guerrilla wars and unrest had similar results in other places, particularly in Zaire, Mozambique, Angola, Rwanda, Kenya, Chad, and Ethiopia. Poachers operated openly in areas as big as Oregon; and soldiers sometimes hunted elephants with their automatic weapons (Huntley, 1976). The price of ivory continued to rise. Between 1963 and 1977 the price soared from $6 to about $50 a kilogram. In 1977 an estimated 1,100 metric tons of ivory were legally exported from Africa at a value of about $37.7 million, and this probably represents less than half the total (Hallagan, 1978).

Meanwhile the arguments about what to do with Africa's wild elephants had become complicated by new information. In certain ranges, elephants were so abundant that they threatened the natural habitat. In others, they thrived but often raided nearby farms where settlers were moving into marginal land or land that had been abandoned long ago during the great rinderpest and sleeping sickness epidemics. Extensive counting techniques perfected during the 1950s and 1960s had already proved that the apparent increase in overall numbers of elephants was not real. There had simply been many more to begin with than

anyone had guessed. The huge reduction caused by the 19th century ivory trade had by no means brought the African elephant close to extinction, as most colonials believed, though it may have been threatened locally. Furthermore, elephants are normally long-lived and exceptionally adaptable creatures, perfectly capable of moving into new "home ranges" when threatened in their habitats. What actually happened is that surviving elephants had merely clustered within the new reserves or in remote "wastelands" where human harrassment was minimal. Inevitably, as their concentration in these regions reached the limits of the ecosystem's carrying capacity, the elephants raided outlying areas for food (Laws, Parker, and Johnstone, 1975). Several of the national parks created in the late '50s and early '60s had in fact been staked out in regions where a variety of wildlife had gradually clustered over many decades -- refugees, in effect, from man's advance (Willock, 1964). American Fulbright scholars during the mid '50s, quickly supported by other field zoologists and botanists, learned that the teeming wildlife in several of these new parks was not "natural" at all; nor was the vegetation a product of uninterrupted natural cycles. Man's intrusive hand had inadvertently created enormous zoos - artificial collections, in effect, that only appeared to be remnants of the genuine wilderness amid ever expanding man-altered landscapes (Petrides, 1978; Willock, 1964).

Within these regions elephants were simply more obvious: their mass and range -- combined with their capacity to alter the landscape by destroying tree cover and converting woodland into savannah -- caused them to become conspicuous targets. And, as human population recovered and pressed more on the borders of the parks and reserves, the conflict became serious.

In some places, such as Tsavo National Park in southeastern Kenya, a vast, arid region larger than New Jersey, elephants became so numerous that standard game-management concepts worked out over years of rather haphazard experimentation in more favored environments simply could not cope with the problem (Graham, 1973; Sheldrick, 1973). Culling -- a method of control whereby great numbers of wild elephants are shot in a short time to relieve their pressure on the ecosystem and at the same time provide economic benefits in the form of meat, hides, ivory or other animal products -- was immediately proposed as a temporary solution. But the scheme was rejected on the popular grounds that man cannot improve on nature, despite the success of similar cropping projects in Uganda's national parks (Buechner et al., 1963; Glover, 1963; Petrides, 1978). So in Tsavo elephants continued to increase until a succession of severe droughts, combined with a catastrophic decrease in available shrubbery and grass that was a direct result of elephant feeding, culminated in a massive population "crash." Elephants starved by the thousands. Some estimates go as high as 20,000 dead from starvation within the last decade or so. And of course thousands were poached for their ivory. This story has become an international scandal largely because of the photographic exhibits and books of Peter Beard and partly because Tsavo is easily accessible to international travelers and the press (Beard, 1977; Corfield, 1973).

But, of course, Tsavo is not typical; its celebrity might be misleading. There are several places (Tanzania's Selous Reserve is an example often cited) where elephants are abundant and apparently remain an integral part of the cyclic process -- from dense woodland, to open bush, to grassland, to scrubby

woodland again, and back to forest -- that is typical of so much of Africa's changing natural landscape. Yet even that "natural" landscape is shrinking rapidly. The ancient conflict between perceived human and elephant interest that has resulted in the extermination of wild elephants throughout most of Asia looms in modern Africa. Except where only pastoralists or hunter-gatherers occupy the land, the predictable historical pattern will undoubtedly prevail; elephants and expanding agriculturalists are mutually exclusive. The pattern has been clear enough in West and Sudanic Africa for a century or more.

Today 30 of Sub-Saharan Africa's 49 national parks protect an estimated 200,000 elephants. This is only about 15% of the estimated 1.3 million elephants that are estimated to survive in Africa (Parker, 1978). The remainder roam in reserves and in unprotected areas where dense forest, distance, unarable land, and poor transportation facilities continue to aid sporadic human conservation efforts. But, as Parker has suggested, the very concept of national parks will be proved unviable if the 200,000 elephants in the national parks cannot be protected in the face of increased ivory-poaching and other threats. For the remaining million or so elephants, survival is, to put it bluntly, problematical. Certain game reserves that do not directly border on even marginally arable lands may shelter significant numbers of elephants for some time to come. But most reserves are akin to islands in a sea of expanding humanity. And few reserves are as closely patrolled as the parks. The expense of doing so under current policies would be prohibitive. In such areas, as in unprotected areas, elephants are or soon will be perceived as pests by the surrounding humans (Hanks, 1976; Watson, Bell and Parker, 1972). Even within the parks the burden of effective patrols -- mostly against ivory poaching -- might become intolerable.

Perhaps there is irony in the fact that ivory is and always has been such a coveted and valuable product. Ivory just might be a key to elephant survival. Historians and conservationists alike have only just begun to understand the role of the ivory trade in Africa's changing political economy. Governments in Africa, pre-colonial, and independent, have consistently attempted to monopolize the trade in ivory because they at least recognized its importance in relative economic (if not in symbolic) terms. King Kabarega of 19th century Bunyoro, Mirambo of Unyamwezi in what is today West-Central Tanzania, the tyrant Msiri in his stronghold in southeastern Zaire, Lord Lugard conqueror of Uganda, Leopold II of Belgium and the notorious ruler of the ill-named "Congo Free State," Hermann von Wissman, the first Reichkommissar of German East Africa, Mobutu Sese Seko, and even Idi Amin, all have attempted stringent regulation or monopoly. Yet the illegal trade has flourished.

The economic imperative seems to be quite simple: as long as the elephants are there, ivory will be exploited willy-nilly for the insatiable international market. Ivory trade statistics over the last 80 years or so reveal a glaring contradiction between the quantities of ivory exported and prevailing estimates of elephant numbers. It seems amazing that until very recently this contradiction was hardly noticed (Parker, 1978). Africans, no less than others, have understood the value of ivory, and no attempt to restrict or regulate its commerce by inefficient government monopoly has altered this fact. Synthetic substitutes for ivory are praiseworthy, but they

are as unlikely to affect change in the value of ivory as artificial gems affect the international market in diamonds.

By now it should be apparent that the fragile wall, erected by colonial and independent governments alike to protect elephants (and other animals) from rapidly growing human populations, is all too easily and frequently breached. Conservation as we understand it in the West is -- no matter how essential it may be to the ultimate survival of our biosphere -- largely a preoccupation of affluent urban peoples, of the educated elite. Much of the world's burgeoning human population is too poor and ill-educated to comprehend complex ecological arguments about the necessity to conserve wild things. So when the fragile gates of protection falter, slaughter ensues. Elephants conspicuously fall victim because, as in the days of the Pleistocene hunters, they provide a feast of protein, because they so often threaten subsistence agriculture, and because of those magnificent tusks.

Today the link between ivory smuggled to Hong Kong, Japan, or New York and the purveyor or buyer is as direct as the next airline reservation, the next oil tanker or cargo ship. Whether raw or in artifact, ivory increases despite a degradation in the quality of ivory carving occasioned by the modern boom in cheaply produced curios and souvenirs. In just over 15 years ivory has increased nearly a thousand per cent in value. Some dealers may hoard supplies to produce a temporary decline in exports, and governments may ban the trade altogether, but poaching is unaffected (Anonymous, 1975; Parker, 1978).

One of the little known facts regarding ivory exports from East Africa is that Kenya has consistently provided over 60 per cent of the total in any given year. Indications are that this holds true despite recent attempts at stringent control, including Kenya's current ban. During the 1920s Kenya exported about 20 legal tons each year. Exports rose sharply after World War II and again after Kenyan independence. Exports zoomed to 82 tons in 1971 and to 150 tons in 1972. Recent careful estimates based on comparisons between quantities of ivory legally exported to Hong Kong and Japan, and quantities actually imported in those places, have revealed the enormous extent of the illegal trade (Burton, 1976, and 1977). The best estimate for 1974, a total of 267 tons, is well over twice the official export figure of 121 tons. And since 1974 the ivory trade has vastly increased. Hong Kong imported 450 tons in 1975. Japan imported 197 tons by October of the same year, 82 tons from Kenya alone. These two markets alone are a huge drain on elephant populations, not only in Kenya, but in Uganda, Zaire, and other parts of Central and East Africa. It is frequently alleged that the People's Republic of China imports large quantities of ivory from Tanzania in payment for the Tanzania railroad to Zambia. Ivory is clearly being exploited as never before. As in the past it is a primary source of foreign exchange (Davitz, 1978).

Even Europe and the Americas account for a large quantity of ivory, most of it not technically illegal. Much of this is simply imported by individual tourists or businessmen in the form of carved curios or small gifts such as pendants and bracelets. A lot is also imported to various gift shops and retail outlets, already carved by local craftsmen. Since this is not raw ivory, and hence it cannot be traced, it is difficult to come up with accurate estimates (Hallagan, 1978). Thus the press mostly ignores this aspect of the

trade. Every moderately sized African city that is regularly visited by European or American transients, businessmen, or tourists, not to mention the large cities, has shops that cater to the memento trade. And as it always has, ivory heads the list in value. Accurate figures may never become available, but the best export information, even when it includes estimates of illegally exported raw ivory, probably accounts for no more than two-thirds of the total.

Many wildlife experts believe that viable, semi-wild herds of elephants can be preserved into the next century in Africa. It is assumed that the mechanics of conservation will be highly efficient by that time and linked to long-term global networks, and that poaching control will be also effective. The historical evidence, however, suggests that recent local successes, as in the Selous Reserve, or in Manyara National Park (Douglas-Hamilton, et al., 1975), are merely "holding actions," probably more exceptional than typical. Already there is evidence that poaching in the northern Selous Reserve has become extensive, and "control shooting" by wardens is increasing (Davitz, 1978). Successes in Kruger Park and Southern Africa in general, although statistically hopeful in terms of management techniques, hardly inspire hope. Africa's green and lavish parks are famous, but how many tourists stop to think about the surrounding landscapes, proof of ecological chaos, desiccated and grim? Satellite pictures reveal parks and reserves standing out like beacons amid brown and shoreless wastes.

In the face of this litany of unwelcome facts there are some who think we are too late; that the subjugation of the earth and our alienation from it in our progress-oriented, exploitive civilization are too far advanced. And it is surely true that our children will never see the vast herds that awed Burton or Hemingway or inspired the Swahili poets and illuminated the storied nights of Nyamwezi savants who knew a time when elephants roamed the earth in abundance. But we might organize things so that evocative examples are preserved in wilderness habitats. We must, however, be exceedingly careful in the organizing.

There is a growing school of thought, disturbed by the excessive killing of elephants in easily accessible ranges, that would seek a solution through a total ban on ivory. The abolition of the market would remove demand for ivory, and the illegal trade would die away.

More thoughtful observers know that the only way to conserve elephants in the long term is to build up or reinforce proposed or existing National Parks that lie within their range (since the greatest long term threat to elephants is competition with man for habitat), and at the same time to seek united international action to control the trade in ivory. To attempt a total ban, they argue, would almost certainly result in failure. Certain animal products like pelts might be successfully removed from the market and the demand for these would soon die. But these are not durable products like ivory, which increases in value with age over a potential of hundreds, sometimes thousands, of years. There is a widespread new recognition of ivory as a rare and valuable substance, suitable in both raw form and art form, like gold. Also, like gold, the price rise in ivory seems to have been triggered by worldwide financial instability. Certainly the size of the world's investment in ivory is huge. No one seems to know exactly how much it is worth, but it is akin to

the investment in diamonds or gold and certainly runs to many billions of dollars (Parker, 1978). Even if those who hold this ivory could be persuaded to acquiesce in negating the value of their holdings -- an unlikely prospect -- it is almost certain that the knowledge that no further ivory would be legally available would have the opposite effect intended. Illegally obtained ivory would simply become more valuable than ever and the well-established underground network would flourish as never before. The incentive to poach and smuggle ivory would increase accordingly and continue for as long as available elephants survived.

Hence, our dilemma. How can ivory be a key to elephant survival when it is, in many places, the prime reason for elephant destruction? The answer is not easy, but the record of history speaks clearly across the ages. Sentimental arguments, based on false premises, will get us nowhere. There is indeed great hope in the fact that people, the world over, are discovering a new economic value in elephants (and other wildlife); namely their attraction as spectacles of nature. Unfortunately, however grand this new value might become one day, it is unlikely that tourism will replace or overcome the lust for ivory in the short run. Only a few can afford to travel to Africa, or South Asia, to watch elephants in their natural setting. This seems likely to remain true for decades to come. People living in or near the regions where elephants still roam may be likewise fascinated, even educated to appreciate, but they understandably have a primary concern with immediate threats to their crops and with their everyday economic welfare. They do not normally benefit from tourism and have little hesitation in killing any animals that destroy their fields and that might incidentally provide them with meat, plus a very tidy profit from ivory. A typical rural farmer in those parts of East or Central Africa where elephants are found can earn more from a day's hunting for ivory than he might earn through a year's hard labor.

So hard-headed economics must play a role in the struggle to preserve what remains today. We can indeed call upon our historical traditions of protection and care, but these must be backed by intelligent controls that allow for limited exploitation. Rather than attempting to stop all exploitation, we need to channel it in positive directions. Wide application of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), along with stricter application of existing laws, is badly needed. It would be a mistake to fling the emotional charge of "speciesism" at those who favor organized cropping of elephants, for example, and then helplessly watch a species that is currently only threatened become truly endangered. And it would certainly be a mistake to ignore the potential of the ivory trade, properly regulated, as a means of financing and supporting a coordinated program or protection of elephants within their ecosystems. Recent studies submitted to the U.S. Fish and Wildlife Service and to the House of Representatives Committee on Merchant Marine and Fisheries, by Ian Parker and Iain Douglas-Hamilton (Douglas-Hamilton and Parker, 1979), clearly indicate that stringent regulation of the ivory trade (through CITES) cannot be separated from long-term programs to support elephants -- such as the IUCN/WWF/NYZS Elephant and Ecosystems Action Plan, in which specific proposals are identified country by country. Parker and Douglas-Hamilton have suggested several strategies for regulation of the ivory trade, the complete list of which space will not allow here. Among others, such things as a simple system

of permits issued specifically for ivory (to identify real exporters and importers), the introduction of an international system of marketing ivory through the use of a hole drilled through the tusk hollow on the inner side of the curve (whence a metal disc is then riveted through the hole with a standard "pop-riveter"), and united action to apply the CITES treaty through combined police action (including organized searching through the finances of the ivory trade companies), would go a long way toward bringing the ivory trade under control (Douglas-Hamilton and Parker, 1979).

After all, ivory is no less attractive and no less treasured by those who possess or wear it, or only view it in museums, because it comes, for the most part, from elephants. Carefully licensed seasonal hunting and carefully planned culling programs have long been proven generally beneficial to wildlife, especially where man's encroachment has altered the "natural order." Africa today is no longer the last surviving remnant of the Pleistocene (as Theodore Roosevelt once described it). Even its most inaccessible regions are entering, or have entered, the 20th century stream. The task of informed and concerned environmentalists and conservationists is difficult because it is complex. In order for the ivory trade to be effectively regulated it must be brought within a rational system of international regulations closely linked to strictly enforced national regulations, realistically cognizant of the bioeconomic factors.

Thus some elephants will be hunted, exploited. But as renewable resources they will have a more predictable future. The wanton, irrational slaughter of these great beasts because of poverty, ignorance, and fear, can in my view be replaced by pragmatic and ecologically sensible cropping -- where necessary -- a system already proven to yield greater revenue from the hides alone than from the raw ivory. This in turn can help finance long-term conservation efforts and thus enhance revenue from tourism. It is not yet widely understood that all these aspects are linked; tourism, regulation of the ivory trade, and the protection of elephants in viable ecosystems. Tourism *per se* does not yet generate enough direct revenue in Africa to finance adequate patrolling and border control, even within the national parks.

Properly protected and controlled, the remaining elephants may yet continue to enrich the world by their magnificent presence.

Literature cited

Alpers, E.A. 1975. Ivory and slaves: changing patterns of international trade in East Africa to the latter 19th century. University of California Press, Berkeley, 267 pp.

Anonymous. 1975. The July auction. Africana, 5(11):34.

Ardrey, R. 1976. The hunting hypothesis. Atheneum, New York, total number of pages unknown.

Beard, P. 1977. The end of the game. Doubleday & Co. Inc., New York, 230 pp.

Beihoff, N.J. 1961. Ivory sculpture through the ages. Milwaukee Museum Publications in History, No. 3, 93 pp.

Birmingham, D., and R. Gray (eds.). 1970. Pre-colonial African trade: essays on trade in Central and Eastern Africa before 1900. Oxford University Press, Oxford, 289 pp.

Bryden, H.A. 1903. The decline and fall of the South African elephant. Fortnightly Review (new series), 79:100-108.

Buechner, H.K., I.O. Buss, W.M. Longhurst, and A.C. Brooks. 1963. Numbers and migration of elephants in Murchison Falls National Park, Uganda. J. Wildl. Mgmt., 27(1):36-53.

Burton, J.A. 1976. The ivory connection. Part I. New Scientist, 70(996):138-139.

Burton, J.A. 1977. The ivory connection. Part II. New Scientist, 76(1074):168-169.

Carra, M. 1970. Ivories of the West. Hamlyn Pub. Group, New York, 155 pp.

Carrington, R. 1958. Elephants: a short account of their natural history, evolution, and influence on mankind. Chatto and Windus, London, 285 pp.

Chittick, H.N., and R. Rotberg (eds.). 1975. East Africa and the Orient. Holmes and Meier, New York, 283 pp.

Clark, J.D. 1970. The prehistory of Africa. Praeger Publishers, New York, 290 pp.

Coon, C.S. 1971. The hunting peoples. Little Brown and Co., Boston, total number of pages unknown.

Corfield, T.F. 1973. Elephant mortality in Tsavo National Park, Kenya. E. Afr. Wildl. J., 11:339-368.

Cox, W.E. 1946. Chinese ivory sculpture. Crown Publishers, New York, xi + 49 pp.

Curtin, P. 1975. Economic change in precolonial Africa. Wisconsin University Press, Madison, 342 pp.

Davitz, M. 1978. Ivory and elephants. Unpublished Ph.D. Dissertation, 59 pp.

Deraniyagala, P.E.P. 1951. Elephas maximus: the elephant of Ceylon, Vol. I. National Museum of Ceylon, Colombo, 161 pp.

Douglas-Hamilton, I. April 1980. Uganda's elephants face extinction. IUCN Bulletin, 11(4):45.

Douglas-Hamilton, I., O. Douglas-Hamilton, A. Root, M. Kaplan, J. Eames, and L. Noel. 1975. A history of death. Africana, 5(8):13-26.

Douglas-Hamilton, I., and I.S.C. Parker. 1979. Summary: African elephant ivory trade study, submitted to the U.S. Fish and Wildlife Service, and the House of Representatives Committee on Merchant Marine and Fisheries. (See excerpts of Reports in Elephant, Volume 1, Number 4.)

Edgerton, F. (ed. and trans.). 1931. Matánga Líla of Nilakantha, or the elephant lore of the Hindus. Yale University Press, New Haven, 125 pp.
Eisenberg, J.F., and M. Lockhart. 1972. An ecological reconnaissance of Wilpattu National Park, Ceylon. Smithsonian. Contributions to Zoology, No. 101:1-118 pp.
Glover, J. 1963. The elephant problem at Tsavo. E. Afr. Wildl. J., 1:30-39.
Graham, A.D. 1973. The gardeners of Eden. George Allen and Unwin Ltd., London, total number of pages unknown.
Hallagan, J.B. 1978. National Wildlife proposal on ivory trade. Unpublished manuscript.
Hanks, J. 1976. Will wildlife survive? Afr. Wildl., 30(4):29-32.
Huntley, B. 1976. Angola: a situation report. Afr. Wildl., 30(1):10-14.
Jeannin, A. 1947. L'Elephant d'Afrique. Payot, Paris, total number of pages unknown.
Jelinek, J. 1975. The evolution of man. Hamlyn Pub. Group, New York, 530 pp.
Jordan, J.A. 1956. Elephants and ivory. Rinehart and Company, New York, 250 pp.
Kjekshus, H. 1977. Ecology control and economic development in East African history. Univ. of California Press, Berkley, 209 pp.
Kunz, G.F. 1916. Ivory and the elephant in art, in archaeology and in science. Doubleday and Page and Co, New York, 482 pp.
Laws, R.M., I.S.C. Parker, and R.C.B. Johnstone. 1975. Elephants and their habitats: the ecology of elephants in North Bunyoro, Uganda. Oxford Univ. Press, Oxford, xii + 376 pp.
Levick, M.B. 1924. Ivory: man's trophy from cave days to the present. The Mentor, 12(5):52-55.
Livingstone, D. 1857. Missionary travels and researches in South Africa. Maclaren and Co., Ltd., London, pp. 367-396.
Livingstone, D. 1874. The last journals of David Livingstone in Central Africa. Harper and Bros, New York, 541 pp.
Lombard, M. 1975. The golden age of Islam. North-Holland Medieval Translations Pub. Co., Amsterdam and Oxford, 239 pp.
Martin, P.S., and H.F. Wright. 1967. Pleistocene extinctions: the search for a cause. Yale University Press, New Haven, 453 pp.
Maskell, A. 1905. Ivories. Vol. I. Methuen and Co., London, pp. 339-344.
Melland, F. 1938. Elephants in Africa . Scribners, New York, pp. 133-144.
Moore, E.D. 1931a. Ivory scourge of Africa. Harper and Brothers, New York, xviii + 256 pp.
Moore, E.D. 1931b. Ivory: the pearl of the forest. Scient. Amer., 144(1):9-12.
Oliver, R., and B.M. Fagan. 1975. Africa in the Iron Age. Cambridge University Press, Cambridge, 224 pp.
Olivier, R.C.D. 1978a. Present status of the Asian elephant. Elephant, 1 (2):15-17.
Olivier, R.C.D. 1978b. Distribution and status of the Asian elephant. Oryx, 14(4):379-424.
Parker, I.S.C. 1978. Elephants - a valuable resource? Unpublished Manuscript.
Petrides, G. 1978. Personal Interview, Michigan State University, E. Lansing, Michigan.
Pocock, R.I. 1943. Notes on the Asiatic elephant. Annals and Magazine of Natural History, Series II, 10:273-280.

Putnam, J.J. 1976. India struggles to save her wildlife. Natl. Geogr., 150(3):299-343.
Sanderson, I.T. 1962. The dynasty of Abu. Alfred A. Knopf, New York, xv + 376 + viii pp.
Schafer, E.H. 1963. The golden peaches of Samarkand. Univ. of California Press, Berkeley, pp. 79-80.
Scullard, H.H. 1974. The elephant in the Greek and Roman world. Cornell Univ. Press, Ithaca, 288 pp.
Seshadri, B. 1969. The twilight of India's wild life. John Baker, London, total number of pages unknown.
Sheldrick, D. 1973. The Tsavo story. Collins and Harvill Press, London, 285 pp.
Sikes, S.K. 1971. The natural history of the African elephant. American Elsevier Publishing Co, New York, xxv + 397 pp.
Sillar, F.C., and R.M. Meyler. 1968. Elephants ancient and modern. The Viking Press, New York, 255 pp.
Starr, C.G. 1973. Early man. Oxford University Press, Oxford, total number of pages unknown.
Unomah, A.C., and J.B. Webster. 1976. East Africa: the expansion of commerce. Pp. 270-318, in The Cambridge History of Africa, Vol. 5 (J. Flint, ed.). Cambridge Univ. Press, Cambridge, 580 pp.
Watson, R.M., R.H.V. Bell, and I.S.C. Parker. 1972. Men and elephants. Africana, 4(11):20-21.
Willock, C. 1964. The enormous zoo: a profile of the Uganda National Parks. Longmans, Green and Co., London, xiii + 172 pp.
WWF/IUCN. 1976. A drastic elephant decline in Uganda parks. WWF/IUCN Newsletter 1, 4 pp.

Editor's note: This paper by Kenneth C. Wylie was reviewed by three reviewers. Robert C.D. Olivier made some constructive comments, most of which have been incorporated in the final version. Joseph G. Engelhard made many corrections, mostly related to clarification of contexts, and noted that the paper "draws together information demonstrating the ancient historical association of men with elephants. The author guides the reader so as to be able to empathize with the extinct elephant itself and also shows how our own very early forefathers had adoration for these animals." Engelhard, however, did not wholeheartedly agree with the author's conclusion that elephants should be looked at as "renewable resources." Larry Baggett writes: "I was impressed with the research on the subject of elephant ivory but a little confused on whether the elephant population is controlled by ivory need (or lack of it) or by man and his management of elephants and their destructiveness in over-populating an area."