THE IVORY TRADE

(1) THE COMMERCE IN IVORY
(2) BIOLOGICAL ASPECTS
(3) DISCUSSION AND RECOMMENDATIONS
(4) TABLES

(A CONSULTANCY UNDERTAKEN FOR DR. IAIN DOUGLAS-HAMILTON ON BEHALF OF THE UNITED STATES FISH & WILDLIFE SERVICE OF THE DEPARTMENT OF THE INTERIOR, AND THE INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE AND NATURAL RESOURCES, MORGE, SWITZERLAND

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CONTENTS

INTRODUCTION

ACKNOWLEDGEMENTS

VOLUME 1

1. HISTORICAL PERSPECTIVES OF THE AFRICA IVORY TRADE 1
2. TUSKS — THE TRADE COMMODITY 20
3. THE IVORY TRADE PRE-1914, VOLUME AND VALUE 25
4. THE RAW IVORY TRADE 1915–1978, VOLUME AND VALUE 31
5. THE COMMERCE IN WORKED IVORY 71
6. THE IVORY TRADE IN HONG KONG, INDIA, GERMANY, MALAWI AND THE USA 76
7. THE ROLE OF IVORY 107
8. ATTEMPTS TO REGULATE IVORY TRADING 117
9. ON THE CAUSES OF FAILURE 131
10. CITES AND THE IVORY TRADE 141

VOLUME 2

1. IVORY — THE POPULATION INDEX 147
2. IVORY — THE STANDING CROP 154
3. HUNTING EFFECTS 157
4. INFORMATION FROM TUSKS IN TRADE (A) 166
4. INFORMATION FROM TUSKS IN TRADE (A) 175
5. NATURAL MORTALITY 190
6. IVORY WEIGHT 199

VOLUME 3

1. DISCUSSION 207
2. RECOMMENDATIONS 225
3. REFERENCES 227

VOLUME 4

TABLES
APPENDICES

1. THE CONSULTANCY’S TERMS OF REFERENCE.


3. MONETARY CONVERSIONS USED IN THIS REPORT.

4. ANNUAL CATCHES OF SPERM WHALES AND THEIR IVORY PRODUCTION.

5. NATIONAL PARK AND NATURE RESERVE AREAS USED IN COMPUTING TABLE 161.

6. MANPOWER NEEDS IN NATIONAL PARKS — MALAWI.

7. SOMALI POACHING IN KENYA.

8. PROJECT ACCOUNTS.
INTRODUCTION

The ivory trade is one of men's oldest, reaching back at least to Aurignacian times. Since then it has never let up. Today it is probably larger than at any time past and encompasses by far the greater majority of the world’s nations. Its turnover runs to hundreds of millions of dollars a year and the investment into billions. It was a grand delusion to assume that one man in one year with $45,000 could document it. Then grand delusion is not alien to conservation, and providing one bears this in mind at least some of the terms of reference (Appendix 1) have been met.

In the normal course of events I would not submit what follows as a final report- I would consider it no better than a first draft — replete with error and miscalculation — which I would like at least a further year to polish, ponder and research. It has been particularly galling to have to leave out far more material than has been included. However times are not normal and the work was funded in the belief that a crisis was at hand. It is worth presenting the data in this rude, unfinished form so that the crisis can be resolved. That, at least, I think the evidence which follows should accomplish.

Trade statistics are boring and interleaved in a report break continuity. I have therefore included these in a separate Volume to be referred to as necessary. Biological data as well are tabled separately. I have presented raw data somewhat copiously, for it gives subsequent researchers the means to check my conclusions and assumptions. It also provides the wherewithall to undertake far more complete analyses than I have had time to do, and at the same time dispenses with the tedious process of re-collecting facts.

There is no 'new' data in this report : it all derives from the private /published work of others or previous personal research. Anyone could have collected it, given time, and in
many respects it is rather surprising that it hasn't been put together ere this. The only singular influence I can bring to bear upon the subject of ivory is having seen it from a variety of angles these past 24 years. It started in 1956 when, as a fledgling game warden in the Kenya Game Department my job was to arrest poachers — which I did under the leadership of the late David Sheldrick and Bill Woodley. However I got to know the poachers too, and a more decent band of men I have yet to meet. While prosecuting them and sending them to jail — and I reveled in the analytic procedures of law — I never had a man sent down with a clear conscience. In all honesty none of us did. In time this led to the evolution of a large game management project in which it was hoped that the 'poachers' could find legitimate employment in elephant hunting. The project failed — principally because it was planned too naively, but I gained yet further insight into ivory.

Later I joined four colleagues in founding a wildlife research and management consultancy, and undertook a wide range of projects the length and breadth of Africa. They encompassed censuses and surveys, ornithological collections, analyses of records and the drafting of wildlife legislation. They also involved large-scale elephant reductions and research — the results of which have been published elsewhere. Through this I sold ivory on my own behalf.

Later still I undertook research for ivory traders for, contrary to popular opinion, there is much about the business which they too don't understand. This reached a point at which I could learn no more unless I entered the arena for myself — which I did — and bought ivory on a client's behalf. Such is the stigma upon ivory traders that it is often assumed that I had to pass beyond the pale of legality to do this, which was not true. It rounded off my perspectives in ivory. I can now speak of sport-hunting, poachers, prosecuting, game cropping, 'control' work, drafting law, and trading ivory from personal experience.
This survey was planned for ten months collecting data and getting up to date, and two months analysis and writing. The aim throughout was to secure an overview and then work backwards filling in detail. My strategy was to head first to where I knew I would get information and avoid areas of complication and language problems where time would be insufficient to cover the ground with confidence. Thus I built my scaffolding on English-speaking ground, and from there extrapolated what I could to the I Francophone lands. It seems to have worked overall.

As a matter of ethic I have refrained from divulging the names of my informants or giving details of their businesses. The public have no more right to know this than they have to know the detail of private tax returns and bank accounts and I respect the convention.

It is disappointing not to be able to encompass all the material to hand on the subject of the ivory trade: there simply wasn’t sufficient time. For the same reason I ask indulgence over the piecemeal approach to Volumes 2 and 3 — they were planned to be far bigger.

Finally I have used the term Negro herein to denote the black, non-Cushitic, non-Hamitic, non-Khoisan peoples of Africa. It has never been other than a descriptive term in my lexicon and it came as a surprise to learn that it is considered denigrating — at least in academic circles. I never meant to use in such a context and this assurance stands.

Throughout the report I have used the term tonne in its dictionary sense, i.e. 1,000 kilograms. References to money are in £ Sterling up to and including 1914, and US Dollars after this, unless otherwise stated.

The project accounts are included as Appendix 8.


ACKNOWLEDGMENTS

Though it appears under one name, this report is the work of many. I am indebted to all who helped whether or not their names appear below.

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Among others whose assistance I would like to record and whom I thank are:
I was honoured by the trust of ivory traders for access to their stocks and business records in circumstances where they had many reasons to withhold it. For this I am particularly grateful.

My thanks to Iain Doug1as-Hamilton for favouring me with this consultancy discussions and access to his own and IUCN Elephant Survey data.

The general and unstinted help of Miranda Bell and her unfailing good humour lightened and shortened a laborious task, and is much appreciated. Finally my deepest gratitude to Christine, my wife, who typed this report, proof-read it, corrected grammar, all in the hours after a full day's work elsewhere.
Africa is the world’s largest source of ivory and may have been so for the past two millennia. Virtually all the civilised peoples of antiquity who plundered or traded with Africa sought ivory (and gold). Because the written records were made ex-Africa, there has been a wide misapprehension that the Negro peoples of the continent did not regard ivory with the same avarice as Europeans and Asians. Its modern expression is apparent in the belief that the ivory trade is largely an alien imposition upon Africa.

This is not true. African involvement in the ivory trade, now and in the past, has deep roots in indigenous values to which external economic influence is additional. Evidence in support of this is abundant in literature and applies to all parts of the continent.

Petherick (1869), the first white man to record impressions of the Zande (Niam-Niam) of what is now southern Sudan and northern Zaire wrote:

"The only use made of ivory by the Neam Nam (sic) was for ornaments, such as bracelets and necklaces; some were ingeniously cut in imitation of cowrie shells; and neatly cut flakes, like the scales of a fish, were curiously attached to a band like piece of ribbon and worn by the females round the neck. Both men and women wore their hair plaited in thick masses, covering the neck to the shoulders. This they combed out with long ivory pins, from six inches to upwards of a foot in length — one extremity pointed, the other increasing in thickness like a cone, three or four inches of which were carved into pretty patterns, and dyed black with the decoction of a root. When the hair had been arranged, two of the largest of these pins were stuck horizontally through it at the back of the head; between these smaller ones were inserted, forming a semicircle similar to a Spanish lady’s comb."

Driberg (1923) recorded of Uganda's nilotic Lango:

"The only mark of aristocracy is a bracelet of ivory worn on the left wrist, or suspended from the neck over the chest an ivory ornament called ogwil (carved to contains fat for anointing the body and often delicately stenciled in block point). These are only worn by
men who are chiefs or come by descent, however remotely, from the stock of chiefs, although any man is allowed to possess the unworked tusk..."

Roscoe (1911) writing about the Bantu Baganda also illustrated indigenous ivory value:

"Before the arrival of Arab traders the value of ivory was not fully appreciated, though the people had already found a use for it. Though the trade in ivory within the country was small, it was enough to encourage the King to keep hunters and to exchange the ivory for women and cattle; there was also an important traffic in ivory ornaments which kept a number of men employed. Ivory bracelets (magemu) were worn by women and children... Small ivory discs were used as currency before the introduction of cowrie shells; the ivory-workers made them for the King, though the latter had not the monopoly of making them; any skilled workman who could obtain the ivory was allowed to make discs without let or hindrance. The King, however, retained the most skilled ivory-workers in his service, and they dared not make bracelets or other ornaments without permission. The fact that most of the ivory belonged to the King also placed a restriction upon the making of discs for other people... Most of the chiefs of the district had their huntsmen who captured elephants and paid their masters in ivory for the privilege of being allowed to hunt on their estates."

Leiris & Delange (1967) reviewing African art comment on the use of ivory in Central and West Africa. The Luba and Leya of the Zaire (Congo) basin made ivory carvings "and among other articles reserved for the more privileged (were) lovely headrests."

The Mayombe of the lower Congo forests made sceptres — symbols of authority — of ivory. The Benin, famous for their art, also revered the medium:

"the...ivories of the Benin were produced by craftsmen grouped in guilds and working under the aegis of the sovereign."

The Bamenda in Cameroun so regarded ivory that:

"its prestige value...often outweighed its commercial value. " (Chilver 1961)

and that ivory armlets were worn by men of rank. An almost
pan-African custom was that the chiefs or kings laid claim to one tusk of each elephant killed — usually that on the underside of the carcass which touched 'his' soil (among many Livingstone 1857; Powell-Cotton 1902).

The point is thus made that independently of alien influence, Africa's sub-Saharan people have seen ivory in the same light as other races. Traditionally it was precious, commonly associated with social privilege and revered as a medium for art and ornament. That this regard persists one need only look to the national emblems of Tanzania and Botswana, for both sport a tusk as a symbol of wealth. In consequence it is inevitable that ivory would have been bartered and traded between groups and tribes. This intra-African commerce was the earliest cornerstone of the African ivory trade.

The inter-continental trade in ivory from south of the Sahara is likely to have started several millennia ago; perhaps even before the Pharoah Necho II (BC 611) dispatched the first recorded expedition to circumnavigate Africa. A gold trade developed between the Phoenicians and tropical West Africa after Hanno established settlements there in BC 570 and it is difficult to believe that they would not also have traded ivory. The Periplus of the Erythiaean Sea of 60 AD indicated that ivory was exported from the East African coast in great quantities.

By the 7th century Arabs were settled along the continent's eastern coast and, maintaining contact with their regions of origin, it is almost certain that there was movement of ivory. Davidson (1966) quotes the Arab traveller al'Masudi complaining that Chinese officials went to court in palanquins veneered and decorated with ivory:

"That is where the ivory goes, and were it not for this demand, there would be plenty of ivory in our Muslim countries."

The tone suggests that he felt Arab (i.e. African rather than Indian) ivory was being diverted from where he would have it go.
Certainly by the time of Vasco da Gama's arrival in the Indian Ocean (1497), ivory was flowing to India from a number of places on the East African coast through the hands of Arab and Indian merchants. The trade seemed to depend on Africans bringing the ivory to the coast, for there is little record of these traders venturing into the hinterland.

Ivory is bulky and heavy and in the absence of navigable waterways, wheeled transport and roads, or pack animals susceptible to tsetse fly, can only be moved by human portage. To move large quantities of ivory needs considerable manpower. In the fragmented tribal societies which prevailed widely in Africa, the organisation of large-scale portage was difficult.

Thus, in all likelihood, tusks were traded in small quantities over short distances between neighbours. Ultimately they might reach the coast — but through an erratic and haphazard process. The difficulty of moving ivory — bulky, hard to conceal and immensely valuable — had, and still has, great influence on the manner of its trade.

European intervention in Africa's ivory trade can be considered under four regional headings:

A. The East African
B. The West African
C. The Sudanic sphere — covering the Nile basin and Ethiopia (Abyssinia), and
D. The Cape or Southern.

A. The East African
The East African ivory trade was dominated by two anomalies to the prevailing fragmentation of African society. In the hinterland of what is now Mozambique (and throughout this report I refer to Mozambique in the sense of its present area rather than the coastal island and port only) where the Shire river joins the Zambezi, were the Maravi people. Between them and the coast were the Yao and the Makua. Even at the time of the first Portuguese, these tribes were sufficiently organized
to permit long distance trade and portage. This was markedly developed, particularly with the Yao, from the fifteenth to mid-eighteenth century (Alpers 1975). In consequence there was a flow of ivory from deep within the continent. That this was working well before Vasco da Gama’s arrival is likely, for the Arabs and Indians were actively moving ivory from Kilwa when the Portuguese entered the region.

The second similar anomaly concerned the Kamba people of what is now east-central Kenya. They too had a tradition of elephant hunting and ivory portage (Lindblom 1920). The age of the Kamba trade is not known. Suffice it that it was well developed in the 19th century and on this score alone is likely to have functioned in at least the preceding century.

The Mozambique ivory trade between the 16th and 19th centuries has been well documented by Alpers (1975) and it is from his work that I draw the following synopsis.

From early on in their tenure of the African coast, the Portuguese set out to dominate the Mozambique ivory trade. Their strength was primarily naval enabling them to control sea traffic and ports but they lacked the manpower to control large tracts of the African hinterland. Their policy was therefore to cultivate good relations with the Makua and Yao, and encourage them to bring ivory to the ports. Arabs and others were kept away or under control through naval might. This policy of friendship on land and aggression at sea worked for 100–150 years and the ivory trade grew both in quantity and in its African organisation. A Royal instruction to Governor Frois in the late 1720s was a reiteration of what had worked successfully to that date; he must:

"not allow any European nation whatever to hold trade or commerce with the Negroes of the (East African) coast" nor permit "any of the said nations to establish themselves in the land ...for which it is very necessary that no offence should be given to the Kaffirs inhabiting the said shores."
However in the 17th century Portuguese control in the Indian Ocean began to slip. Mastery of the seas was being eroded by other maritime powers, notably Britain, Holland and France. Also the Portuguese lacked business acumen and capital. For both they leant heavily on Indian merchants in Goa — the star of their Indian Ocean enterprise. Through these connections, Indians (Banyans) were able to enter and trade in the Portuguese African bases. The Banyans were soon displacing the Portuguese in the ivory trade — to the latter's intense dismay. Despite all forms of hindrance, inconvenience, licensing and harassment — short of deportation which the Portuguese Crown a would have forbidden for its implications in Goa — Indian erosion of the Portuguese position in ivory continued.

As Portuguese naval power waned, so there was a resurgence of Arab influence along the East African coast to the north of Mozambique. Indians took advantage of this too, and were soon competing against the Mozambique Portuguese from ports under the umbrella of Islam, as well as from within Portugal's own domain. They encouraged the Yao to bring ivory to Kilwa just to the north of the Mozambique border.

From the middle of the eighteenth century a new influence appeared on the Mozambique coast which was to have far-reaching effect: commercial slaving. Slaves had been a feature of East African coastal life for centuries, regardless of whether under Arab or Portuguese rule (Martin & Ryan 1977). However, large-scale commercial slaving was alien. French development of the Mascarene Islands (Mauritius and Réunion) called for cheap labour — and the Mozambique coast was the nearest potential supply. Coming at a time when their fortunes in ivory were dwindling, the Portuguese were disposed to try new ventures and supply slaves. Demand for Mozambique slaves soon spread to the Caribbean and Brazil. These events were further exacerbated by British activity to close the West African slave trade, depriving the displaced slavers to seek new sources of human cargo.
By 1790 (and perhaps earlier) slaves had replaced both ivory and gold as Mozambique’s major export. Between 1770 and 1794 some 69,973 people had been sold — mostly Makua and Yao. This severely disrupted ivory trading as it had been conducted up to that time. The internecine warfare integral to commercial slaving made it impossible for lightly armed caravans to make long trading journeys with precious cargo. With the disruption of Maravi, Yao and Makua society, ivory could only be moved by heavily armed bodies and called for a wholly new approach: the ivory transporters had to be able to fight their way to market. Fighting and slavery were so closely connected that the movement of ivory by slaves was inevitable.

The Arabs, with Indian capital, were quick to take advantage of the situation. He who supplied the ivory transporter with a military capacity would not only get ivory, but stood to make a profit from slavery to boot. Thus a strong Arab–Yao ivory/slaving trade grew out of the Portuguese policies in Mozambique. The human concern over slaving has tended to obscure the ivory element and it is worth pointing out that even in the decline of the Mozambique ivory trade, when slavery was taking its place, a tusk of very moderate proportions was still far more valuable than a man. Thus wrote Fr. Pinto (a cleric) in 1799:

“A tusk of ivory weighing one arroba (15 kg) to one and a half arrobas (22.7 kg) is purchased for two or three pieces of cloth and some ten hides. A slave is evaluated at a bit of cloth…”

A similar quote from a decade later:

"Colonist travellers...give for each slave they buy...five Indian sheetings and for ivory six or seven sheetings... Cazambe's people understand that ivory is more valued in Tete than slaves."

Leaving Alpers (op.cit.) we can now turn to the north of Mozambique. With the onset of the 19th century, there was a consolidation of Arab influence. This culminated with the Omani - Sayyed Said bin Sultan — moving his seat from Muscat
to Zanzibar in 1831.

Financed by the omnipresent Banyans, large well armed Arab and Swahili expeditions set off for the interior. They secured ivory through trade, force and extortion, but having obtained it were faced with ivory's perennial problem — that of transport. They took slaves to carry it and sold them at the coast. It was a situation which had West African precedent but which was never so stark in its simplicity. Soon the whole of the interior of the continent around lakes Tanganyika and Malawi was in the grip of the system. Ivory was the prime product: slaves (as transport) secondary to it, with a useful re-sale value.

It is of particular note here that yet further to the north, where the Kamba retained cohesion and were able to manage the ivory flow, slaving did not develop. This is not to say that slavery didn't exist. The Kamba themselves had slaves. Indeed I can recall from my childhood a very old Kikuyu (neighbouring tribe to the Kamba) being very disapproving of the Kamba - they couldn't be trusted. The gist of what he said was that he who went alone to trade with them was a fool — for he would be sold along with his goods! If one went to trade, one went in a large, armed party. Anecdote apart, the point is that Arab-Swahili intervention and organisation was unnecessary for as long as the indigenous alternative worked.

**B. The West African**

Though they may have been the first of the modern white nations to cruise the West African coast, the Portuguese were unable to monopolise it as they had the eastern seaboard of Africa. Soon they had intense competition from other maritime nations. In 1530 William Hawkins of Plymouth in England sailed his 250 ton "Paule of Plimouth" for Brazil (Hatch 1969). On the way he put into the African coast of Guinea and traded with Africans. From them he bought elephants' teeth or ivory and, in this first recorded contact between a Briton and sub-Saharan
Africa, he started the British ivory trade. In the following years he sailed again for Brazil. In 1540 he sent the same "Paule" under John Landye as Master. The bills of lading from the trip provide a character picture of this original Anglo-African trade. The outward cargo included "matchettes, combs and sarpe (handbills), copper and lead mellios (bracelets), woollen cloth and night-caps." The "Paule" returned to Plymouth with 12 elephant tusks.

Soon French, Dutch, Spanish, Danish, Swedish and Hanseatic ships were plying the West African coast in competition. Slaving was the major trade providing labour to the New World. Nevertheless ivory was always an item of considerable importance and because of the need for portage, was inextricably entwined with slavery and was often the more profitable element. This is apparent in the following extract from Mayer (1928) for the last part of the 18th century:

"As it may be interesting to learn the nature of trade on this coast - which is commonly understood as consisting of slaves alone — I thought it well to set down the inventory I made out of the caravan's stock and its results, as the various items were intrusted (sic) to my guardianship. The body of the caravan itself consisted of seven hundred persons, principally men; while the produce was as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3500 hides</td>
<td>$1,750</td>
</tr>
<tr>
<td>19 large and prime teeth of ivory</td>
<td>1,560</td>
</tr>
<tr>
<td>Gold</td>
<td>2,500</td>
</tr>
<tr>
<td>4 600 pounds small ivory</td>
<td>320</td>
</tr>
<tr>
<td>15 tons rice</td>
<td>600</td>
</tr>
<tr>
<td>40 slaves</td>
<td>1,600</td>
</tr>
<tr>
<td>36 bullocks</td>
<td>360</td>
</tr>
<tr>
<td>Sheep, goats, butter, vegetables</td>
<td>100</td>
</tr>
<tr>
<td>900 pounds beeswax</td>
<td>95</td>
</tr>
</tbody>
</table>

Total value of the caravan's merchandise $8,885

Our profits on this speculation were very flattering, both as regards sales and acquisitions...ivory was purchased at the rate of a dollar the pound for the best, while inferior kinds were given at half that price...the slaves were delivered at the rate of one hundred "bars" each. The "bar" is valued on the coast at half a dollar; but a pound and a half of tobacco is also a bar, as well as a fathom of ordinary cotton cloth, or a pound of powder, while a common musket is
equal to twelve bars. Accordingly where slaves were purchased for one hundred and fifty pounds of tobacco, only eighteen dollars were, in reality, paid; and when one hundred pounds of powder were given, we got them for twenty dollars each. Our British muskets cost us but three dollars apiece; yet we seldom purchased negroes for this article alone."

Thus a slave costing $20 was the equivalent of a sound tusk of little over 20 lbs - and this would be a small one.

In the eighteenth century West African trade was entered vigorously by traders from the north—eastern seaboard states of the U.S.A. particularly from Salem, Boston and New York. Some of their records (as presented by Bennett & Brooks, 1965) give a clear picture of the situation. The connection between ivory and slaves was thrown into stark relief when Britain forced the cessation of West African slaving. Typical are these comments from one Samuel Swan, trader, to his principal — merchant John Tidd in Boston:

"May 16 1809...Since the destruction of the slave trade the Crew (= Kru, a West African people) Country is full of ivory" the gist of this being that now slaves were illegal, ivory was difficult to move.

About 1816 the same Swan still obviously regretted the lack of slaves:

"They (referring to island trading posts off Bissau) are but little visited by the negroes; they find it more troublesome and expensive to transport wood, wax and ivory to them in canoes than they did the more manageable and saleable traffic of their fellow creatures."

The same situation is further emphasised by a record made by the captain of the British warship HMS Cyclops:

"but understand that the produce of the interior is conveyed to the Sea Coast by Slaves, and on arrival, the slaves themselves are disposed of by their Owners to the Slave Dealers, and their burdens generally consisting of Ivory, Coppir (sic) or beeswax, to the legal traders. It is clear therefore that the Slave Trade fosters the Legal one, more especially as the
Slave and his burden, are bartered for the same kind of goods, the principal portion of which is a species of light cloth" (quoted in Bennett & Brooks, op.cit.)

This setback to the West African ivory trade came at a time when the industrialisation of Europe and the eastern U.S.A. was raising demand for ivory to unprecedented levels. Strenuous efforts were made to obtain supplies through 'legitimate' trade in West Africa but demand could not be met. The traders had to look elsewhere. Led by the American merchants of Salem, they turned their eyes to Africa’s east coast and joined the Indians in Zanzibar.

C. The Sudanic Sphere
Simultaneously to the Omani/Arab penetration of central Africa from the east, came another Arab thrust from the north up the Nile. Seeking ivory to supply a voracious European demand, the traders pushed further and further southward, collected ivory, then slaves to carry it, returning home to sell both. In its wake it brought the inevitable social chaos and competition between the two Arab powers — one under the suzerainty of the Khedive of Egypt, the other under the Omani Sultan of Zanzibar.

A sub-section of the Sudanic sphere operated through Ethiopia. Ivory obtained in the south-west of that country and from what is now the southern Sudan, northern Uganda and northern Kenya moved through the highlands of Ethiopia, down to Red Sea ports, and on to the overseas markets. The onset of this ivory route is poorly documented. Suffice it that it had connections with the east coast of Africa and was probably operating early in the 1800s. It will receive later mention as it extended the 19th century mode of the ivory trade well into the 20th century.

D. The Cape or Southern
Because of its aridity and short grasslands, a substantial portion of southern Africa - the Karroo, Transvaal highveld
grasslands and the Kalahari - was devoid of elephants or only had very small populations. The majority of those which did occur, were located along the southern coast, in the east and to the north in what is now Mozambique, Rhodesia and Botswana. From the time of the white men's arrival they hunted these elephants, pressing further and further east and north with the expansion of settlements.

The ivory trade in southern Africa differed from that elsewhere in several major aspects. Overall, relatively low human densities existed and large—scale portage by humans was difficult to arrange — either by slaves or hired help. This was aggravated by the political turmoil which pervaded the African politics of the region from the late eighteenth until well into the nineteenth century. Where people were relatively abundant, they were warlike, particularly the Nguni groups who possessed a military competence unsurpassed by indigenous Africa. Peaceful travel and portage through the lands of these warring factions was difficult, if not well nigh impossible.

Where southern Africa differed from the other ivory regions was in the absence of tsetse from extensive areas. The ivory hunters and traders were able to move their cargo by ox-wagon. Thus it was that in the tsetse-free areas elephants had all but disappeared by the turn of this century. Those which remained were in isolated pockets along the southern coast or in the tsetse areas to which the traders could not get their transport. It yet again stresses that the major constraint upon large-scale ivory trading has always been ability to move the commodity.

**THE IVORY BASE FOR SLAVING**

That the ivory trade was a primary stimulus to slaving in east, central and Sudanic Africa has long been recognised by historians (e.g. Northway, 1954) but ignored by the public. The evidence is clear; ivory was more valuable than men and
those sent to suppress the slave trade were well aware of this.

Livingstone commenting from the southern end of the slaving system wrote in 1863 (Fletcher 1950):

"Get possession of the ivory trade as I propose to do on the lake and you render the trade in slaves unprofitable. I tried it though unintentionally in the Makololo country. Slave merchants came from Banguella to the subject tribes east of that people and annually carry off large quantities of ivory and slaves. The ivory was purchased for hoes and Sekeletu — having many smiths under him who yield an annual tribute in hoes — I suggested he should purchase the ivory of the eastern tribes with them. He did so for the sake of the profit on the ivory and the Banguella traders ceased to go to that district. One of them told me that it was better to get slaves nearer the coast if no ivory was to be obtained for them to carry. The fact of the matter is slaves cost so much for sustenance when a long way from the coast that without ivory they are a losing speculation."

Gessi (1892) presents a similar appreciation from the Nile:

"One of the principal objects of this expedition...was the suppression of the slave-trade. The Colonel (referring to Gordon — then Governor of the Sudan) did not therefore think of treaties, but went straight to his end, cutting off the evil at the very root and prohibiting the trade in ivory. A proclamation by the Commander-in-Chief of the expedition, declared that from that day the article ivory was a Government monopoly; whoever possessed ivory must, by a certain date, deliver it up and dissolve the Company of traders. This was a blow at the very heart of the slave-trade."

Schweinfurth (1872) complements the picture:

"It is a fallacy to suppose that the pursuit of elephants is merely a secondary consideration in these enterprises of the Khartoum merchants...If it had not been for the high value of ivory, the countries about the sources of the Nile would even now been unfolded to us as the equatorial centre of the great continent: they are regions which of themselves could produce absolutely nothing to remunerate transport. The settlements (of the traders) owe their original existence to the ivory trade." (Note, in contradiction of this lucid view and in keeping with the overall picture, Schweinfurth did also hold that slaves were more profitable than ivory.)
Johnston (1903), one of the most able and erudite of the early British administrators said:

"In the forties of the last century Nubian slave-traders started in numbers to explore these regions, firstly to purchase ivory, and secondly to acquire slaves."

Once again the decline of the East African-Sudanic ivory trade came about through the British suppression of slaving. The American merchants who were dominating Zanzibar's commerce to the west in the mid—nineteenth century noted this with dismay. Charles Ward (merchant and later U.S. Consul in Zanzibar) wrote to his Principal, John Clayton, on July 3rd 1850:

"The people of the Interior of Africa use Slaves to bring Ivory to the Coast and will not sell one without the other...In consequence of the acts of Her Majesty's Ship of War Castor & the Edict of the Sultan (banning many aspects of slavery) the American trade must be very seriously affected. Zanzibar is the Depot of American trade on the East Coast of Africa. The last year it amounted to about 1,000,000 dollars."

(Bennett & Brooks, op.cit.)

After a British man o'war had blown an Arab slave—ship out of the water the U.S. Consul was highly incensed and on May 11th 1861 wrote the following to his Secretary of State in Washington:

"The strong measures taken by the English Government to suppress the Slave trade are very injurious to business and as Slavery among the Arabs is merely a name, their Slaves being treated like members of their families, these proceedings seem unnecessary"

(Bennett & Brooks, op.cit.)

These merchants were something of an anachronism. Being from the Puritan north—eastern U.S. they were (at least at home) abolitionists where slavery was concerned. The first U.S. Consul to Zanzibar (appointed in 1839) was Richard P. Waters — a vociferous anti-slaver in Salem. Yet in Zanzibar he typified his peers by selling cloth, guns and powder to the Arabs to enable them to obtain slaves, and the product Elephants’ teeth — which made their ventures worthwhile. On the one hand they condemned the institution, yet on the other
they facilitated it and benefitted from it enormously. Northway (1954) commented thus:

"The manufacture of ivory combs in Connecticut, besides the desire for highly spiced foods, helped extend a vicious system; at the same time the manufacture and trade in American firearms made it possible for the Arabs to do so (slave) on a larger scale than ever."

The value of slaves relative to ivory in Zanzibar's imports between 1861-1865 was: slaves $600,000; ivory $1,773,481 (from Bennett & Brooks table E, op.cit.) In the decade 1860-69 Zanzibar's imports of slaves reached c.20,700 per annum (Martin & Ryan, 1977).

However, the most telling evidence of the connection between the ivory trade and slaving, and how the former brought about the necessity of the latter, emerges from Baker's account of his endeavours to end slavery in the Sudan (Baker 1874). Ivory was so valuable that even though the anti-slavers recognised its role in setting up the institution they so opposed, when they came across it they had to accept it - if only on their employers' account (with Baker this was the impecunious Khedive of Egypt). They would no more think of abandoning a stock of ivory than they would a sack of gold. Even if they couldn't carry it, it would be buried or hidden for subsequent retrieval.

It was inevitable that in harassing the slavers and setting their captives free, Baker should become possessed of large quantities of ivory. He had obviously foreseen this, for on his way southward he obtained cattle to use as carriers in place of slaves. These were entrusted to local people to be recovered on his return - bor so he hoped, but he hadn't reckoned with the African pastoralists' attitude toward cattle. Returning down the Nile he accumulated 3,200 tusks:

"The cattle that had been given to the native carriers for the transport of ivory to Gondokoro had only partially been returned...It was now necessary to move the ivory together with all the establishments to Gondokoro. This would require at least 6,000 cows. It was a complete fix."
And so it was, for he never did get his cattle, learning lesson one of the slavers: if tsetse didn't bar cattle transport, militant native pastoralists would!. He then fell back on humans and employed porters — only they were not keen on the idea. Not being one to accept defeat, he wrote:

"It would have been the height of imprudence to have permitted the immediate departure of our carriers before I had arranged for the future, thus about eighty were secured by the soldiers, including the Sheik's (local chief) son, from a general stampede that took place...In the evening they were secured by a slight line round each man's neck and connected in gangs of five."

However in the night they bit through the lines and rushed away. Three were shot dead in the escape (Baker was sorry!) The man sent to suppress the slave trade was forced by circumstance to quite literally make slaves — in order to transport ivory.

The anti-slavers and explorers of the mid-19th century gave way to administrators as the continent was partitioned by the European powers after the Berlin Conference of 1884. By gaining complete control of the ports, by denying the institution of slavery — the only mass transport system that was workable without industrial capital — they changed the great nineteenth century ivory trade. The flow of ivory did not stop as Pax Europus now permitted the safety of unarmed portage and the introduction of roads, rail and steamers on the waterways. Once in control and governing, the colonial administrators needed funds. Among the first acts of colonial government was laying claim to the ivory of the land, not for the impediment of slavers, but for revenue.

Until 1905, ivory was Uganda's foremost commercial export (Thomas & Scott, 1935).

Nalder (1936) writing of Equatoria in the Sudan, wrote:

"Ivory was for many years the only produce of any importance...the chief deterrent (of trade) has undoubtedly been transport costs. Mongalla (on
The upper Nile) is probably as far from a port as any place in Africa and in spite of having the Nile at its doors, freight charges to the coast were such as to prohibit the carriage of everything except ivory... In this undeveloped land money, except for ivory, is not to be had for nothing."

The same theme repeated itself the length and breadth of Africa and receives further consideration in chapter 8.

**THE ABYSSINIAN TRADE**

In Abyssinia (Ethiopia), and the farthest reaches of the southern Sudan and northwest Kenya, the 19th century trade persisted well into our own times. Nalder (1936) provides the base for the following outline.

Abyssinian trading caravans had long had peaceable contact with the people in south—eastern Sudan. At some point early in the nineteenth century this region was entered by Swahili entrepreneurs from the eastern coast, who came up from Mbale on the western slopes of Mt. Elgon, In consequence a tsetse free trade route developed between this settlement and the Abyssinian town of Maji, traversed by donkeys and mules carrying ivory.

"This no doubt attracted the riff-raff of what is now Kenya, the Swahilis, Baluchis and the rest arriving at Maji were employed by the Abyssinians, and especially the Bank of Abyssinia (a private Bank until 1931) to hunt ivory for them at rates of interest which could never be paid off and plunged them deeper and deeper into servitude. They received a big reinforcement from a number of Darley's (Captain Darley — an explorer of the region about the turn of the century) carriers who, paid off at Addis Ababa, struggled south homewards and found themselves completely destitute by the time they reached Maji. The Swahili were apparently not, as is often assumed, free bands of brigands doing what they listed, but financially enslaved to the Abyssinians who used them not only as elephant hunters, but as the chief instrument of their raids."

In 1900 the extent of this ivory trade was substantial, routed through either Addis Ababa or Harrar. Powell-Cotton (1902) observed that the volumes for that year were c.60 and
c.43 tons respectively - an addition of c.100 tons to the annual Sudanic exports.

Long after the Sudan was under British 'control', the Abyssinian—Swahilis ventured as far as the Nile and, on occasion, crossed it and hunted its western bank.

"Ivory was what they wanted and a favourite modus operandi was to issue rifles and ammunition to the (local) chiefs on the understanding that there would be a supply of ivory ready when they returned next year. Hence they were not unpopular and were on particularly good terms with the Topotha (a local tribe) ...Investigations...revealed...that practically all the Bari (another Sudanese tribe) Chiefs had poachers' rifles" (Nalder op.cit.)

Yardley (1931) gives some idea of the vigorous British reaction; co-ordinated military operations were launched from Kenya and Uganda in the south and from the Nile in the west.

In 1910, a company of the 4th Battalion King's African Rifles was formed as the Northern Uganda Patrol with the specific task of closing the Maji–Mbale trade route. The conflict was protracted and resulted in numerous military skirmishes. In 1917 the ivory hunters were 'roughly handled' at Tibilit, but certainly not defeated, for they continued ivory raiding in this area until 1929 at least, often taking reprisals on the local population. In 1929 they were actually camped on the Nile, 28 miles north of Mongalla (the seat, at the time, of the (British administration of the southern Sudan) when set upon by Moysey Bey of the Sudan Defence Force (army). Eight were killed and the rest rounded up as they struggled back eastwards towards their Abyssinian bases:

"With motor roads and wireless communication it is now extremely difficult for them to get away" (Nalder 1936).

The salient feature of this Abyssinian ivory trade was that it was almost impossible to stop for as long as the raiders could retreat into Ethiopia. It had reached the point requiring military solution similar to the numerous guerilla situations that have prevailed since World War 2 in which nothing suffices
short of 'hot pursuit' over the border. More detail is given on the problem in Appendix 2. The issue was approached by the British representatives in Ethiopia:

“In 1922 Hawkins, then Consul of Maji, gave an amnesty to the original Swahili who had been financed by the Bank of Abyssinia. In 1928 Captain Holland was able to repatriate via Kapoeta (in the Sudan) a large number of men women and children, Uganda or Kenya subjects” (whose origins were mainly at the Omani Arab/Swahili Coast) (Nalder op. cit.)

However this extension of the nineteenth century ivory trade did not disappear completely until the conquest of Abyssinia by the Italians in the 1930s.

I have quoted this Abyssinian example at some length for several reasons. It illustrates that ivory was worth 'military' action well into this century — some of those involved in the 1920s may still be alive. It has a number of parallels in modern times and provides a background against which they may be discussed later in this report.

The historical evidence is unequivocal. Other than gold, ivory was for centuries Africa's most valuable export. Unlike gold, which could be found in few places, ivory was available everywhere. Its carriage presented difficulties which triggered major political developments. As much as any other single item ivory shaped modern Africa.
To give perspective to the commercial chapters which follow, this section introduces ivory as seen from within the trade. Underlying all aspects of the business is the psychological phenomenon that we hold things valuable if made of ivory: however ivory is not valuable because things are made from it. It has little utilitarian worth and in consequence is not open to substitution. In the same way that glass may look like diamonds, brass may look like gold and cultured pearls are difficult to tell from those which are natural, the look—alike, the artificial, never detracts from the value of the genuine article. The uses to which ivory may be put are legion and have but one thing in common — they will be valuable.

Elephants' tusks exhibit great variation in size, shape and quality. They range in weight from 225 grams to over 100 kilograms; in length from 15 cms to nearly 300 cms and in circumference from 8 cms to over 60 cms. As will be seen in Volume 2 these qualities are the products of growth, age, sex and region of origin. Male tusks are larger than females' which seldom exceed 10 kg in weight. Male tusks are thicker and more conical than female tusks of the same weight. Tusks from Africa's savannahs are referred to as "soft" or "white"; those from the lowland equatorial forests are "hard" or "yellow". Soft ivory tends to be curved, hard ivory is rather straight. However while all these variations are recognised and taken into account by ivory traders (even if they are unaware of the biological causes for them) the basic measure in the business is weight.

There are many trade terms for tusks which vary from region to region. Some of the more common which are still in use or which appear in the historical literature are:
### European

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Male Tusks</th>
<th>Female tusks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–2.2</td>
<td>Milk teeth, small scrivelloes and hollows.</td>
<td>Milk teeth, small scrivelloes</td>
</tr>
<tr>
<td>2.2–4.5</td>
<td>Hollow scrivelloes</td>
<td>Solid scrivelloes bagatelles</td>
</tr>
<tr>
<td>4.5–9.0</td>
<td>Half hollow scrivelloes</td>
<td>Solid scrivelloes, bali scrivelloes</td>
</tr>
<tr>
<td>9.8–18.0</td>
<td>Small, medium, bangle</td>
<td>Small</td>
</tr>
<tr>
<td>18.0–25.0</td>
<td>Medium-large or large prime</td>
<td>–</td>
</tr>
<tr>
<td>25.0+</td>
<td>Extra-large, large-prime</td>
<td>–</td>
</tr>
</tbody>
</table>

### Indian

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Male Tusks</th>
<th>Female tusks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–2.2</td>
<td>Dandia</td>
<td>Dandia</td>
</tr>
<tr>
<td>2.2–4.5</td>
<td>Makasum</td>
<td>Makaub</td>
</tr>
<tr>
<td>4.5–9.0</td>
<td>Fankda</td>
<td>Calasia</td>
</tr>
<tr>
<td>9.8–18.0</td>
<td>Cutchi</td>
<td>Calasia</td>
</tr>
<tr>
<td>18.0–25.0</td>
<td>Vilaiti</td>
<td>–</td>
</tr>
<tr>
<td>25.0+</td>
<td>Big Vilaiti</td>
<td>–</td>
</tr>
</tbody>
</table>

A tusk is often considered of 3 parts (Fig. 1) – the Hollow, the centre and the tip or point. In addition all tusks have an outer ‘skin’, bark or ‘crust’ which manufacturers have to remove before working on the ivory. Running longitudinally down the centre of a tusk is a small hole – frequently only apparent as the minutest pinprick. This is the ‘heart’.

Tusks are of top quality when they are straight or nearly so have short hollows – i.e. not more than one quarter of total length – and are found or nearly round in cross-section. A tusk is said to be round if the larger diameter does not exceed the smaller diameter by more than one fifth of the latter, both measurements taken where the tusk emerges from the gum.
FIG. 1 A TUSK DIAGRAMMATICALLY
Defects looked for in tusks are:

1) "Shakes" : these are longitudinal surface cracks from which few tusks are free. Normally they go no deeper than the bark and are not serious flaws. However, occasionally a shake goes deeper and becomes a "Split".

2) "Splits" and "Cracks" : in essence these are an advanced form of shakes. Whereas shakes are essentially confined to the outer surface of a tusk, some splits occur on the inner surface of the hollow and are invisible to exterior examination. Splits are a serious flaw.

3) "Ribs" : Irregular longitudinal ridges which may run the whole length of a tusk.

4) "Seams" : These are the reverse of ribs, being longitudinal furrows; both are serious defects.

5) "Rings" : Transverse ridges across a tusk.

6) "Beans" : Small independent bodies of dentine embedded in the matrix of a tusk — usually near the heart.

7) "Open Heart" : The heart is open and a clearly definable hole rather than a virtually invisible channel. Open hearts are often associated with irregularities in the tusk grain.

8) "Coarse grain" : An open as opposed to close tight graining in the cross-section, and

9) Any obvious surface blemish or damage.

As a general rule the larger the tusk, the higher its price. However this is not invariable as for each use there is an optimum tusk form. Obviously large or vilaiti tusks provide greater scope for working than scrivelloes. Thus it would be inconceivable for large vilaiti to be used in making bangles.

For such work Cutchi is the more appropriate size. Large female tusks — ball scrivelloes — were used for billiard balls. Jewelry, inlay material and very small ornaments are fashioned from waste. Even the ivory dust from grinding and sawing had many uses until recently, in tempering certain steel/tools, in the manufacture of some acids, as medicine for both humans and
cattle, calcinated make the basis of a fine printer's ink or % paint (ivory black), in confectionery and as a fertiliser for roses.

Many historical comments on the value of ivory have been made in ignorance of the wide range of uses and prices which prevail at any one time. The error persists today. Prices are quoted without reference to the type of ivory involved. This will receive further illustration in following chapters.

Elephant tusks are obtained in many ways both legal and illegal. Sportsmen seek the largest tuskers; poachers are less discriminating. Elephants killed for crop raiding are frequently female or immature. Many tusks become available through natural mortality. In areas which are thoroughly searched, the tusks found will tend as be small — as mortality is high among immatures. In areas inefficiently searched they will be large, as smaller tusks break down and disappear faster, leaving a residue of large, weathered teeth. Thus different sources produce different types of ivory — often in irregular or small amounts. Individually they do not offer traders or manufacturers wide selection. With so variable a commodity any market which offers the buyer a wide choice of form will be at advantage.

In response, and as a generalisation, the flow of ivory in Africa is from numerous sources in small amounts towards the hands of a few people. It is a prowess of constriction ending in the great ivory marts which over the past two hundred years have included Zanzibar, India, London, Antwerp and Hong Kong. These points offer buyers the widest choice of tusk qualities and sizes. Once selection is made, the flow of the trade reverses and becomes an ever wider dispersal — each successive step toward a more specialised use culminating in the final retail product.
In principle the foregoing process is simple. In practice it is complex. A dealer seeking to fulfill an order for tusks of a specific weight and form may only be able to acquire them by purchasing lots which include others which he does not want. These surpluses have to be set aside, sold separately as they are, or recombined with other lots. They may even be sold back to the original seller. The trade is thus characterised by flow and counterflow and is yet further complicated by the movement of ivory between countries — purely as a vehicle for the movement of capital.
Data on the world ivory trade before 1914 may be abundant, but scattered in dribs and drabs in dusty archives and as occasional sentences through literature. In the course of this survey I have collected but few: sufficient to give only a crude outline of the trade in the past. The data are seldom contemporaneous and have to be linked with assumption and historical insight.

The evidence is assembled in Tables 1, 2 and 3 to give what I have been able to find on Africa's exports, the overseas imports and the price of ivory respectively, before 1914. The origins of the material in these three tables are also presented separately and in greater detail in Tables 4-36. From them the following picture emerges.

The data on African exports (Table 1) spans 394 years, 1520-1914. They are solely concerned with Mozambique prior to 1852. There are 5 export records for the 16th and 17th centuries combined, which give an average of 68 tonnes per annum.

The 18th century Mozambique records form a larger sample — 11 years — which give an average 129 tonnes per annum.

Five records from Mozambique between 1800 and 1850 give an average of 113 tonnes a year. Yet Peters (1852) quoted by Sikes (1971) claimed that the annual output from Mozambique was c.138 tonnes a year. In view of the inevitable lapse between collecting data and producing a published work, Peters' record is more likely to pertain to pre- rather than post-1850.

The second half of the 19th century gives wider coverage of African exports. Zanzibar has 5 years' data to give an average of 214 tonnes per annum. Khartoum Sudan has 27 years with an average of 137 tonnes, the Abyssinian outlet for Sudanese
ivory unknown but probably 50-100 tonnes p.a., and the Congo basin 12 years, averaging 230 tonnes per annum.

Between 1900 and 1914 the annual averages were Zanzibar 37 tonnes, Khartoum Sudan 107 tonnes, Abyssinian Sudan 100 tonnes and Congo basin 370 tonnes.

The data on European, American and Indian imports covers a lesser span of 126 years, 1788-1914, albeit I have one quote from Garcias ab Horto (Kunz 1916) which stated that India was importing 272 tonnes of ivory a year late in the 16th century. G The British record is the longest and most detailed, covering 106 out of the 126 year span.

Late in the 18th century Britain’s ivory imports averaged 87 tonnes a year. Between 1800 and 1849 these rose to 204 tonnes annually, between 1850 and 1899 they were 511 tonnes, and from 1900-1914 they ran at 472 tonnes.

Belgian records cover imports for the last years of the 19th century (1888-1899) when they averaged 175 tonnes of ivory a year, and 1900-1914 when they averaged 337 tonnes.

German imports of ivory cover a similar period, averaging 116 tonnes between 1880 and 1889; 203 tonnes between 1890 and 1899 and 313 tonnes per year from 1900-1914.

In addition to Garcias ab Horto's estimate of 272 tonnes in late 1500s the Indian data present a single record of 143 tonnes in 1848. This is followed by a lone estimate of 101 tonnes in 1863 (Bennett & Brooks 1965) and an average of 223 tonnes a year between 1874 and 1884.

The data obtained on the U.S.A. only cover the last two decades of the 19th century and the period 1900-1914. The average imports were 81 tonnes a year between 1880 and 1889; 107 tonnes annually from 1890-1899, and 242 tonnes from 1900-14.
Both sets of data in Tables 1 and 2 indicate a progressive increase in ivory exports from Africa and imports overseas through the period reviewed. In this time the price of ivory also increased from c.£0.2 per kg in 1770 to c.£1.0 per kg in 1900-1914. This is documented in Table 3 and illustrated in Figure 2. Price variations appear in Tables 21, 22, 26, 28, 32, 33 and 36.

Prior to the 19th century it is difficult to construct any picture of the development of the ivory trade other than through assumption. The 16th and 17th century Mozambique export data establish a minimum estimate of 68 tonnes a year. Yet at the same time ivory was leaving the East African coast through the Kamba trade to the north of Mozambique, and from the West African coast through the European trade. The solitary estimate of Indian imports of 272 tonnes a year from this period sets an upper ceiling and it is not outside my belief of what could have been coming out of Africa in this era. The demand for ivory in Europe had yet to become extensive, but it is likely that at least some of the West African ivory went eastwards to India to procure the spices and other commodities so desired in the west. Suffice it that the ivory leaving the area between 1500 and 1699 may have averaged between 100 and 300 tonnes a year.

The Mozambique data indicate a substantial rise in ivory exports in the 18th century. This is also the age in which the Cape ivory trade developed as the Boers thread east and north from the southernmost point of Africa (Bryden 1903).

This may have reached 100 tonnes per year at its height. At the same time the West African trade expanded with Europeans and Americans competing against one another. As the century closed, the Arabs to the north of Mozambique had regained some of the Yao–Makua ivory trade lost earlier to the Portuguese (Alpers, 1975). Taking two figures only — Mozambique’s exports of 129 tonnes per annum and Britain’s imports of 87 tonnes (which may have had an Indian and therefore Mozambique element,
but were more likely to have been predominantly from West Africa, see Table 14), we can postulate that Africa's exports exceeded 200 tonnes a year, and it is likely that the excess was substantial.

The 19th century witnessed a considerable increase in ivory exports. This was already pronounced before 1850. The Arabs reached Lake Tanganyika in search of it and were well established to the south in what is now Malawi. The flow of ivory from the Sudan had also commenced. Mozambique continued to export at least c.113 tonnes a year and Zanzibar had been sending out perhaps as much as 100 tonnes a year to the U.S.A. alone. (Bennet & Brooks, 1965, show that there were two American ivory firms established in Zanzibar at this time. One of them referred to their target as between 54 and 68 tonnes a year. Increase this by half to account for a minimum from their rivals = c.100 tonnes ) The Cape trade was also flourishing an Britain was drawing an average of 204 tonnes a year from West Africa. The combined data suggest Africa's output is likely to have exceeded 400 tonnes a year in the first half of the last century.

Between 1850 and 1899 first the Arabs consolidated their grip on the African hinterlands, then, when they were dislodged, European powers took over the flow of ivory by permitting safe, long distance portage in substitution of slaves. In addition Belgium took over the Congo basin and added a new source of exports to those already established.

By themselves, Zanzibar, Sudan (including Ethiopia) and the Congo basin produced an average of 681 tonnes of ivory a year. The declining output of West Africa, the Cave and Mozambique would almost certainly have augmented this to over 700 tonnes.

In the final years 1900-1914 the combined Zanzibar, Sudanic and Congo basin exports record a decline of nearly 100 tonnes per annum from 681 to 584 tonnes (assuming Abyssinia kept going at 100 tonnes per annum). It remains to be seen
whether these estimates tally with ivory imports to Europe, India and America.

At first glance there appear to be substantial discrepancies. The sum of British, Belgium, German, Indian and American imports average for 1880-1889 is 1076 tonnes a year. Assuming Indian imports retained their level, this will have increased to 1143 tonnes a year in 1890-1899 and to 1587 tonnes between 1900 and 1914. Fortunately imports are ascribed to countries of origin in some data from Britain, Belgium, Germany and the U.S.A. These breakdowns are not entirely contemporaneous, but stem from the same era, 1880-1914. Taking the following "mix of nearest years" - Britain 1906, Belgium 1899, Germany 1896, U.S.A. 1896 — their sum of imports direct from Africa is 565 tonnes (see Tables 20, 25, 27 and 33). Taking a later mix of nearest years - Britain 1912, Belgium 1899, Germany 1912 and U.S.A. 1911 - their sum of African imports is 667 tonnes (Tables 20, 25, 29 and 33). To both should be added a guess of India's imports — say 150 tonnes (based on Table 34). This would raise the mix of earlier years to 715 tonnes and the later mix to 817 tonnes. They do not reflect a decline in the period 1900-1914 as suggested by the African figures.

Further calculation is pointless with such incomplete data. Countries other than the 5 ivory "powers" mentioned also imported tusks direct from Africa albeit in smaller quantities. Nonetheless the evidence clearly indicates that by the end of the 19th century Africa's exports of ivory were at least 700 tonnes a year, and these rose to at least 800 tonnes before 1914.

The breakdown of imports to countries of origin also reveals an important aspect of the past ivory trade. Substantial quantities of ivory recorded as imports do not come direct from Africa, but from nations which merely trade in ivory. These countries were principally the 5 ivory "powers" of the time and the British record of 1912 — presented in Table
37 - provides a typical example of flow and counterflow between them. Fifty-two per cent of ivory imported into Britain was not new ex-Africa, but had come from Belgium, Germany, India or the U.S.A. Similarly 75% of exports was to Germany, India and the U.S.A. Only 32% of imports was retained for manufacture and use in Britain. The major activity of the business was not so much importing new ivory as trading it between industrialised countries. Evidence that this took place as a matter of course is apparent in Tables 20, 25, 27 and 28. This process was of long standing and involved all the major ivory markets. Thus even before 1886 the U.S.A. were exporting ivory to India (Holder 1886).

To conclude this chapter I have summarised the development of the African ivory trade diagrammatically in Figures 3 a-e. In four centuries the outflow of ivory increased from at least 100-200 tonnes in 1500-1699, to over 800 tonnes a year between 1900 and 1914. Prices rose from c.£0.2 per kg in 1770 to 1.0 per kg between 1900 and 1914. Contrary to popular belief the trade was not a simple process whereby ivory moves from producer in Africa through a merchant (or merchants) to a manufacturer, but involved complex flows and counterflows between the trading nations.
FIG. 3 d. THE IVORY TRADE LATE 19TH CENTURY.
FIG. 3 e. THE IVORY TRADE 1900 - 1914.
My brief (Appendix 1) calls for description of the component links in the ivory trade. These are too numerous to detail within the survey's time limits and I have therefore summarised general patterns into two charts: the intra-African national flow chart (Figure 4) and the overseas international flow chart (Figure 5). Both are largely self-explanatory.

The national chart encompasses intra-African movements across borders, and this is treated as a source of ivory along with crop-protection, sport-hunting, found and poached. It is difficult to ascribe proportions of the trade to the various sources as they vary from country to country. Burundi's only ivory source is trans-border. Botswana's predominant source is sport-hunting. Tanzania's is heavily weighted by control shooting, Zaire's, Uganda's and Kenya's main sources have been largely illegal in recent years.

Little ivory leaves Africa as obviously illicit. By the time it appears on the international chart, it has usually acquired appropriate documents and, by virtue of these pieces of paper, is legal. Such documentation is almost invariably acquired through bribery, and the fact that this can be done so easily the length and breadth of the continent, is a point that will be considered later.

The inter-continental carriage of ivory until 1970 was by sea, after which airfreight became widely preferred. Recently there has been a reversion to seafreight for a variety of reasons — the most important undoubtedly being cost.

Figure 5 illustrates a major aspect of the trade: that it is still very strongly influenced by colonial legacies: Anglophone Africa shipping to Anglophone entrepots, and Francophone countries shipping to Francophone countries — predominantly Belgium.
FIG. 4 THE NATIONAL (INTRA-AFRICAN) IVORY FLOW CHART
This chapter is based on annual trade statistics compiled from Customs and Excise data on international trade. They are extensive and some give great detail. There is no more comprehensive a set of records wherefrom to analyse trade but they are not perfect. If they were, the export statements on the quantity of a commodity should tally with the import statements of the recipient country. This seldom happens for a wide variety of reasons.

An export made at the end of one year would be recorded as having taken place within that year by the dispatching country. However if it arrived at its destination early in the following new year, that is where it would be recorded and thereby confuse annual comparisons. It is also perfectly legitimate to re-route cargo in shipment from one destination to another. While this does happen, it is an irregular, rather than regular feature of the trade. With ivory there may be weight changes of up to 3% while in transit — for fresh or 'green' ivory has a high moisture content, which is lost with varying speed according to temperature, humidity and atmospheric pressure.

Then again, there may be differences between countries in the manner of taking records, and weighing commodities. The 'rounding' of weights and values for bureaucratic convenience alone will introduce variations between two records of the same consignment. Thus, in the data presented here, some ivory was originally weighed in lbs, presented as rounded hundredweights in annual trade statistics of export, recorded in kilos of import and rounded to tonnes in the published statistics of import. Each conversion may have introduced substantial error, particularly with small shipments; e.g. 1,400 kg to the nearest tonne = 1, and the 400 kg or 28.6% of the original consignment are expunged from the record. These errors will have been further exacerbated in the conversions and roundings I have made for uniformity in this report. Similarly the values quoted have also been subjected to roundings and then by my conversions into a common currency. They have been based on a single (and where possible average) annual conversion rate, whereas there
may have been a wide range of currency ratios in any 12-month period. Monetary conversions are presented in Appendix 3.

The salient point then is that one should not expect export figures from one country to tally exactly with the corresponding import records in another. All that can be assumed is that there will be a broad agreement between them over time. Where possible I have avoided year to year comparisons, for these are where differences will be greatest. Instead, and where possible, I have favoured spans of longer than 5 years. Arbitrarily I have considered import/export differences which are less than 15% of the export figure to be of no significance.

The data reported in annual trade statistics are derived from the dispatchers' invoices. These may be subject to a variety of biases for business or political reasons. This is particularly the case with value where there are many incentives to avoid duties and taxes by under—pricing commodities. Similarly, political concealment of volume amounts going unrecorded at an official level - may have wide use: e.g. recently to remove the base for ignorant and hostile comment from the western conservation press, whose major source of fact has been published trade statistics. In almost all cases, however, the biases tend to under, rather than over estimate volumes and values. Thus the facts presented herein are more likely to be minima than maxima.

Each country for which I have data is reviewed first independently and then from an international overview.

AFRICA

1. Zanzibar

As far as is known Zanzibar has never had indigenous elephants, although its fauna indicate that at one time it must have been part of the African mainland. Its role as an ivory entrepot has been known for centuries. With the diminishment
of the Sultan's territories in the last century the Zanzibar trade went into decline, so that by 1914 its import/export trade had dropped from over 200 tonnes a year to substantially less than 100 tonnes (Table 7). Data on the years 1914-1924 are absent, but from 1925 to 1976 are available and presented in Table 38. From these it would seem that the missing years (1915-1924) saw trade at a low ebb. In 1925 imports were at 26 tonnes and appeared to be increasing, for the following year they rose to 41 tonnes. However, with the onset of the Great Depression, they fell back to a low of 11 tonnes in 1931. From that point on they rose more or less continuously until 1962 when they reached 228 tonnes — a growth of over 750% or c.15% per annum. Thus, by the early 60s, Zanzibar had regained the level of imports that it had a century previously.

Zanzibar's exports closely followed imports and are presented in Figure 6 and Table 39. Until the outbreak of war in 1939, Britain was the island's largest market. India took over from Britain throughout the war and held dominance until 1958 when, in turn, it was replaced by Hong Kong.

Zanzibar's return to prominence in the ivory trade came about through Indian traders and their dispersal throughout British and Belgian Africa in the early years of colonisation. Their distribution is reflected in the varied and far-flung sources of its ivory: over the period reviewed, Zaire supplied 31% of ivory imports, Tanganyika 24%, Mozambique 18%, Uganda 8%, Kenya 7% and both Somalia and Zambia 5%. Many other countries produced smaller amounts (Table 38).

Having no elephants, the island had no incentive to try to 'regulate' the ivory trade, hence it was free. Anyone who wished to might trade in tusks and the business went beyond merely buying and selling raw tusks. Many were cut into their component parts, debarked and polished, making for a far more valuable (and complicated) trade.
The revolution in 1964 destroyed Zanzibar's ivory trade. The Indians and Arabs who managed it, fled or died. Since then there have been occasional small exports, initially of residual stock from before the troubles, and latterly from mainland Tanganyikan ivory smuggled across. After the revolution, Zanzibar united with Tanganyika to become Tanzania.

Since this union, it has been difficult to separate Zanzibar's trade from the mainland's, and its very occasional exports of ivory are only apparent from Hong Kong's import data (Table 86).

2. Tanganyika

For the purpose of historical comparison I retain the name Tanganyika because the two elements of Tanzania (Zanzibar and Tanganyika) have had different roles in the ivory trade. Tanganyika has had large numbers of elephants throughout the white man's knowledge of the region. It was probably the major source of Zanzibar's ivory during the last century. The Germans introduced regulations to control the killing of elephant and directed the trade in ivory into the hands of German companies and away from Zanzibar. However, they also encountered widespread rebellion from many of the tribes of Tanganyika throughout the late 1890s to c.1910. These culminated in the Maji-Maji war, which laid waste half the country and caused immense loss of life. It also disrupted the ivory trade very effectively.

With the advent of British rule after the 1914-18 war, the game regulations were modelled on the prevailing British ideas. However, unlike in neighbouring Kenya, these were relatively humane, in that they permitted the local populace to hunt — elephants as well as other species.

Tanzania's ivory production is mirrored in the country's export statistics for 1929-1976 which are presented in Figure 7 and Table 40. This ivory, which was all classified as originating within Tanganyika, rose in volume from c.16 tonnes
in 1929 to a peak of 251 tonnes in 1972. In 1973 exports fell back sharply and are recorded as having stayed below 40 tonnes per annum from 1974-1976.

From the onset of British administration, Tanganyika's ivory trade was dominated by Indians — many of whom were little more than forwarding agents for their kin in Zanzibar or Kenya. Between 1929 and 1948 Kenya and Zanzibar were the country's main markets, with India occasionally taking large consignments. From 1949 to 1965, Zanzibar is listed as by far the larger outlet, after which Hong Kong took over.

Tanganyika's Indians also ran a small entrepot trade between 1929 and 1952 when it petered out. Supplies came mainly from neighbouring Zambia and Zaire (Congo in the records). In 1962 it was banned altogether, in concert with similar actions in Kenya and Uganda. Various reasons were put forward for this: "to prevent poaching in neighbouring states", and "to remove incentive for corruption for the incoming African administrators" being two I heard most frequently.

In pursuance of its socialist policies the government declared a state monopoly on ivory exports in 1969. In 1973 elephant hunting was banned to discourage poaching: the decline in exports that year being attributed directly to this.

Responsibility for managing the state ivory monopoly has passed through the hands, first of the STC (State Trading Corporation), then another parastatal body GAPEX (General Agricultural Produce Export Corporation), before becoming the responsibility of TAWICO (Tanzania Wildlife Development Corporation). In theory all ivory accruing to the state should be delivered to TAWICO for marketing overseas. In practice the situation is confused, and corrupt.

Ivory from elephants shot on control, confiscated or found outside national parks is surrendered to the nearest
administrative centre, registered, and sent to the Government Ivory Room in Dar es Salaam. Here it is sorted, graded and available for buyers to inspect. At this point its disposal should become the responsibility of TAWICO. However, TAWICO has to buy the ivory from the Ivory Room. As it has insufficient funds to do so, the pipeline is blocked in an "intricate tangle. Thus between 1971 and 1976 the Customs record indicates that 552 tonnes left Tanzania while flow between Ivory Room and TAWICO or its precursors is only 168 tonnes.

Ivory from the national parks by-passes the Ivory Room and is delivered direct to TAWICO. It is unlikely, however, that the difference of what has gone from the Ivory Room and what has been exported (389 tonnes) came from the Parks. That private companies do manage to buy ivory and export it is common knowledge and evidence is presented in Figures 8 a-e.

Figure 8 a is a modern Tanzanian export permit made out, as it should be, to TAWICO; 8 b is a similar permit in the name of a private company; 8 c is an obsolete form of permit issued by a game warden to a private company in 1978 and 8 d and e are Chamber of Commerce certificates of origin made out in the names of two companies exporting ivory from Tanzania in 1978. Such practice is common, so much so that many traders were surprised to hear that a state monopoly exists.

The modern situation is not entirely unexpected for, even before independence, the Tanganyika Game Department was never able to reconcile the increases in ivory exports, with its own knowledge of what should have been available.

3. Kenya

As soon as Mombasa became the base for British penetration of Kenya and Uganda it attracted ivory traders. Thus by the turn of the century it was seen as a serious competitor with Zanzibar (Kuntz 1916). The Uganda railway to Lake Victoria and the steamer services to the Zaire borders on Lake Albert
FIG. 7 TANGANYIKA'S EXPORTS OF RAW IVORY
1929-1976
### GENERALISED SYSTEM OF PREFERENCES
### CERTIFICATE OF ORIGIN (Combined declaration and certificate)
### FORM A

**Reference No.** 009360

<table>
<thead>
<tr>
<th>1. Goods consigned from (Exporter's business name, address, country)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NATIONAL TROPHY &amp; CARVINGS CO. LTD.</strong></td>
</tr>
<tr>
<td>P.O. BOX 1234,</td>
</tr>
<tr>
<td>DAR ES SALAAM, TANZANIA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Goods consigned to (Consignee's name, address, country)</th>
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</thead>
<tbody>
<tr>
<td><strong>[Redacted]</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Mode of transport and route (as far as known)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BY AIR ALITALIA</strong></td>
</tr>
<tr>
<td><strong>AZ 1921</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. For official use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[Stamp]</strong></td>
</tr>
<tr>
<td><strong>25 AUG 1978</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. From number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[Redacted]</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Marks and numbers of packages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REMAINING TWO 210 PCB PACKAGES</strong></td>
</tr>
<tr>
<td><strong>IN TWO</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Number and kind of packages; description of goods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TANZANIA 2006 BB</strong></td>
</tr>
<tr>
<td><strong>ENV.No. 1173 15/78</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. Origin (exporting country)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TANZANIA</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. Quantity</th>
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<tbody>
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<td><strong>[Redacted]</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. Number and date of invoice</th>
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</thead>
<tbody>
<tr>
<td><strong>[Redacted]</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[Signature]</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Declaration by the exporter</th>
</tr>
</thead>
<tbody>
<tr>
<td>The undersigned hereby declares that the above details and statements are correct, that all the goods were produced in <strong>TANZANIA</strong> (country) and that they comply with the origin requirements specified for these goods in the Generalized System of Preferences for goods exported to <strong>[Importing Country]</strong>.</td>
</tr>
</tbody>
</table>

**Place and date, signature and stamp of certifying authority**

**FIG. 8.4. EXAMPLE OF A TANZANIA PERMIT.**

**[Signature]**

**NATIONAL TROPHY & CARVINGS CO. LTD.**

**[Stamp]**

**[Signature]**

**[Date and location]**
CERTIFICATE OF ORIGIN

The undersigned, duly authorised by THE ARUSHA CHAMBER OF COMMERCE AND AGRICULTURE, hereby verifies the declaration made below:

<table>
<thead>
<tr>
<th>Number of</th>
<th>Marks and Numbers</th>
<th>Gross Weight</th>
<th>Net Weight</th>
<th>Description of Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 phys.</td>
<td>THE CHICK TRENCHER TFI MADE JUL. 1930 WET HOOK.</td>
<td>5 tons.</td>
<td>5 tons.</td>
<td>5 tons.</td>
</tr>
<tr>
<td>12 phys.</td>
<td>M/S WANGAI KING FACTORY TRANSPORT</td>
<td>5 tons.</td>
<td>5 tons.</td>
<td>5 tons.</td>
</tr>
<tr>
<td>12 phys.</td>
<td>KOLDO, LONG HOOK</td>
<td>5 tons.</td>
<td>5 tons.</td>
<td>5 tons.</td>
</tr>
</tbody>
</table>

The goods specified in the schedule above are for the purpose of manufacture, unless otherwise stated.

For ARUSHA CHAMBER OF COMMERCE AND AGRICULTURE

FIG. 8 e. EXAMPLE OF A TANZANIA PERMIT.
tapped substantial ivory sources, all of which had to pass through Mombasa.

Game laws in Kenya were radical from the outset and, unlike in other colonial territories, they barred Africans from hunting almost all animals — let alone elephant. Nonetheless the 'natives' were encouraged to bring ivory they found to Government for a reward, white men and some Asians shot elephants on licence, and under Government supervision elephants were shot to make way for agriculture, or in retribution for damage to crops. These policies gave rise to ivory exports which moved from c.30 tonnes in 1925 to only c.40 tonnes in 1970, some 45 years later. From 1970 to 1973 exports rose steeply so that in the latter years exports were 260% higher than the average annual export of domestic ivory for the decade 1960—1969. After 1973 they fell back slightly, but remained above 100 tonnes in 1974 and 1975; they then slid to a mere 12 tonnes in 1977. The data are presented in Figure 9 and Table 43.

In addition to domestic ivory, Kenya also fostered a substantial, if erratic, trade in tusks from other countries. The dimensions of this business are given in Tables 44 and 45 and illustrated in Figure 9. From the mid 1930s it was substantially larger than the country's internal legal production.

Throughout the period 1925-1978, the Kenya ivory business has been dominated by Indians. Dealers had to have a licence to engage in the trade and were only permitted to buy from persons with a 'Sale permit' to sell tusks, or from Government at the biannual auctions of official ivory. After independence some African entrepreneurs entered the business — either in partnership or as 'fronts' for Indians. This development culminated in the issue of Collector's Permits giving carte blanche to 'gather' ivory. In effect it both stimulated and legalised widespread elephant killing. The permits were issued
FIG. 9 KENYA'S EXPORTS AND RE-EXPORTS OF RAW IVORY 1923-1977

Exports

Re-exports

T onnes

in the first instance on instructions from the highest authority in the land. Once the system was established it expanded rapidly. High prices in 1973 raised elephant hunting to a 'gold rush' syndrome, and Collector's permits were augmented by licences to shoot elephants, issued at a rate of 7 per day.

Discipline within the Kenya Game Department collapsed after 1970. Government ivory ceased to be sold entirely by auction and much went by private treaty.

"For example, the ivory register in headquarters does not give the impression of a document recording the possession and transfer of articles to the value of hundreds of thousands of pounds. Sources and destinations of pieces of ivory taken on register are not necessarily given; whole pages of entries are crossed out without explanation. This register reveals the sharp increase in the practice of ivory transfer direct from HQ to individuals or dealers rather than via public auction at the ivory rooms. In the sixties over 90% of ivory went to the auctions in Mombasa; in 1970 80% went to the Ivory Rooms; in 1971 and 1972 combined this fell to 44%; in January to July 1975 only 23% of ivory recorded at HQ found its way to the Ivory Rooms. Leading personalities including both Assistant Ministers in our own Ministry (Tourism and Wildlife) were among those buying from HQ."(Internal Office Memo.)

Public outcry led to a closure of elephant hunting. The Minister for Tourism and Wildlife announced in the local press in August 1974 that there would be an end to private export of ivory. However these were words aimed at placating public outcry. Ivory kept coming into the country unrecorded and the home trade continued in private hands until April 1978 when trophy dealing was banned by Presidential decree. Even then business went on in private hands with Government sanction.

In March 1979, the Ministry of Tourism and Wildlife sent a limited circular to 6 international traders for the sale of ivory and rhino horn by confidential 'tender', the secrecy of this sale being highly improper. They were asked to submit bids for:
383 pieces of ivory weighing 861 kg
136 " " " 972 kg
34 " " " 427 kg
4 " " " 95 kg
1460 " " " 1634 kg
30 pieces of rhino horn 26.5 kg

Figures 10 a—d are evidence of the 'unusual' manner in which the export of ivory was permitted. Figure 10 a shows a permit issued to a private company — the United Africa Corporation for 11.1 tonnes of ivory on the 15th August 1975. Figure 10 b is 'unusual' in that it is a permit issued to a Uganda Company to cover cargo in transit. Normally cargo travels on permits issued by the country of origin. In fact the ivory was Kenyan and not Ugandan. Figure 10 c is a permit issued by the Department of Wildlife Conservation and Management to itself to 'possess' trophies, unnecessary as being Government, it has never needed such documents. Figure 10 d is a permit allowing export of ivory, also made out in the name of the Department. This evidence of departmental 'private' dealing is reinforced by the discovery of an account in the name of the Kenya Department of Wildlife Conservation and Management in a New York bank!

In addition to the traffic authorised by the Department of Wildlife Conservation and Management, I have also seen ivory exported in crates marked 'Wooden Carvings'.

4. Uganda

Uganda has a denser human population than either Tanganyika or Kenya and throughout this century competition for space between men and elephants has been intense. From the outset of colonial government this was a problem.

In 1912 natives were issued with rifles to shoot crop-raiding elephants. This proved insufficient. In 1918 District Commissioners were empowered to hire European gunmen to kill
THE WILD ANIMALS PROTECTION ACT
(Cap. 376, Laws of Kenya)

PERMIT OF LAWFUL EXPORT
(Issued under section 37 of the Wild Animals Protection Act)

This Permit of Lawful Export is issued to

[Name and Address]

who, being the holder of a Permit Legal Possession No.

[Permit Number]

for other authority)

is entitled to export the following game trophies to

[Destination Country]

(a) Ivory or Horn Weight (Kg) Registration Mark/Serial No.

[Blank space]

(b) Other trophies

Species Type of Trophy Quantity (in words)

[Blank space]

Signature of Holder

[Signature]

Original - to County of destination

Duplicate - to Customs Port of Ex

Triplicate - In book

FIG. 10 a. EXAMPLE OF A KENYA PERMIT.
FIG. 10 E. EXAMPLE OF A KENYA PERMIT.
CERTIFICATE OF OWNERSHIP (FOR POSSESSION OF TROPHIES)
Issued Under Section 42 of the Wildlife Conservation and Management Act, 1974

Name of certificate holder: WILDLIFE CONSERVATION

Address: Box 4, 92974

No other authority...

Entitled to possess the following trophies:

(a) Trophy or Item (weight kg)
   - Elephant Tusks: (100) pieces weighing (1463) kg
   - Rhino Horns: (1) piece weighing (44) kg

(b) Other trophies:

Given under my hand this 7th day of Aug., 1978

Director

Note: This permit does not authorize the export of the items listed unless endorsed by the Minister.

The signature of the director is under a power of attorney issued to him by the Minister under Section 42 of the Act.

FIG. 10 C. EXAMPLE OF A KENYA PERMIT.
FIG. 10 d. EXAMPLE OF A KENYA PERMIT.
elephants, payment being a proportion of the ivory handed in. This system was closely followed by licensing which permitted a sportsman to kill 20 elephants per licence. These efforts did little to resolve the human—elephant conflict. In 1923 C.F.M. Swynnerton of the Tanganyika Government was sent to advise the Uganda Government on the problem. As a result of his recommendations, a new Department was formed to handle elephant control which became the Uganda Game Department in 1925. In principle this new body was modelled on the Kenya Game Department. Its officers claimed to be predominantly interested in conserving wild life. In fact their main pre-occupation was 'elephant control' and the Department has been a major ivory producer. (Between 1925 and 1959 the Departmental Annual Reports record 34,782 elephants killed in protection of property.) A result of this work is that the range of elephants declined from more than 70% of the country's land area in 1929, to less than 7% today.

Elephant poaching was known to be widespread (Anon. 1939, 1946, 1947, 1948, 1949, 1955, 1957). When Government declared an amnesty in 1968 for all with illicit ivory, paying a reward for tusks handed in, many tonnes were surrendered within six months. That so large an amount was readily available suggests Government tapped an illicit trade. However, through the years the extent of the illegal trade was never documented.

Lacking a seaport, Uganda never developed an entrepot trade in the same manner as Kenya. Indeed, at the outset ivory was sold by auction in Kampala, but before the second World War this changed and the Kenya Government auctioned all Uganda's ivory in Mombasa on commission. This system continued until 1967, when, once again, auctions were held in Kampala. Thus while ivory in transit from Zaire moved through Uganda to get to Mombasa, the country did not develop an entrepot trade. As elsewhere in East Africa, Indians managed the Uganda trade until 1971 when all of their race were deported.
Law and order deteriorated so rapidly under Amin that from 1971 the official records of exports are of dubious value. The series of data from 1929 to 1976 are presented in Figure 11 and Table 46. These fluctuate about the 20-30 tonne level from 1929 until 1974 with a depression during the war years and a major peak to over 60 tonnes in the late 1960s. This is accounted for by the reduction of 2,000 elephants in the then Murchison Falls National Park (Laws, Parker & Johnstone, 1975) and the ivory amnesty already mentioned which crossed the annual divide between 1968 and 1969. After 1974 exports appear to have dropped steeply to c.5 tonnes in 1976 - the lowest official export since the preceding century.

The few imports of raw ivory are presented in Table 47.

It is known that the Customs record is incomplete. Kyemba (1977) states that the former President — Milton Obote — and his then Chief of Staff, General Amin, were involved in large—scale ivory smuggling from Zaire in the mid 1960s, volumes of which never appeared in the official statistics.

With the disintegration of Government under Amin a variety of permits were issued authorising ivory export — some for large enough amounts to belie the veracity of the Customs record. Samples are presented in Figures 12 a–c.

5. Sudan

In the last chapter it was apparent that the Sudan was a major ivory producer through much of the 19th century and up until 1914. However, the trade diminished considerably and though I have no data for the years 1915-1973, we have Nalder’s (1936) comment:

"Ivory was for many years the only product of any importance: supplies gradually diminished and in 1952 the demand practically died away..."

From this it is apparent that the trade dropped substantially after 1914 - as was the case in East Africa, although the volume taken by the Abyssinian-Swahili brigands (Chapter 1)
THE REPUBLIC OF UGANDA

THE GAME (PRESERVATION AND CONTROL) ACT

LICENSE TO PURCHASE AND EXPORT GAME TROPHIES

(issued under section 17 of the Act)

PR. Min. P.O. No. 309, 1973

Kampala

Date: 14-10-73

Kampala

The holder of this licence, is permitted to purchase and export trophies of specimens of species in accordance with the provisions of the above Act.

Fee: Shs. 2/50

Chief Game Warden.

*Indicate here the nature of the trophy(s) issued.*

FIG. 12 a. EXAMPLE OF A UGANDA PERMIT.
REPUBLIC OF UGANDA
MINISTRY OF WALL RESOURCES
GAME DEPARTMENT
OFFICIAL GAME TROPHIES INSPECTION CERTIFICATE
covering
GAME TROPHIES FOR EXPORT

PLACE: KAMPALA

DATE: 21.7.76

I hereby certify that the Game Trophies herein described below have in my opinion been obtained legally in accordance with the Game Trophies Act and that the said Game Trophies have been licensed for export.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>NO. OF PIECES OR PEGS</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAW IVORY</td>
<td>3007 PEG. RAW IVORY</td>
<td>5207 KG NRT.</td>
</tr>
</tbody>
</table>

Identification marks: EST. 4/76

Consignor: UGANDA ARMS CO.

Address: P. O. Box 1128, KAMPALA

Consignee: 

Address: 

Conveyed by: ROAD THROUGH AKABA PUBLIC ROAD SERVICE TO BAHORU IN TRANSIT

Licence No.: 30635

(Shipping Marks): NONE

Authorized Licensing Officer: William

Original to Consignee
Duplicate to Chief of Vessel
Triplicate to Consignor
Quadruplicate to Commissioner of Customs & Excise, Uganda,
P. O. Box 444
KAMPALA, UGANDA.

FIG. 12b. EXAMPLE OF A UGANDA PERMIT
**REPUBLI| OF UGANDA**
**MINISTRY OF ANIMAL RESOURCES**
**GAME DEP. MINT**

**OFFICIAL GAME TROPHIES INSPECTION CERTIFICATE**

covering:

**GAME TROPHIES FOR EXPORT**

**PLACE**

KAMPALA

**DATE**

31.7.1978

I hereby certify that the Game Trophies herein described below have in my opinion been obtained legally in accordance with the Game Trophies Act and that the said Game Trophies have been licensed for export.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
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<th>WEIGHT</th>
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</thead>
<tbody>
<tr>
<td>RAW IVORY</td>
<td>1537 PIECES OF IVORY</td>
<td>6837 KG. NETT</td>
</tr>
</tbody>
</table>

Identification marks 

**UNR. 7/78**

Consignor 

**UGANDA AUTHORISED EXPORTS LTD.,** KANDALU.

Consignee 

and

Address

Conveyed by

ROAD THROUGH KAMPALA PUBLIC ROAD SERVICES, LTD.

To Kampala in Transit

License No.

38795 of 9/4/78

(Shipping Marks) 

**NONE**

Signature

Captain

Authority of Licencing Officer

**FIG. 12 c. EXAMPLE OF A UGANDA PERMIT**

Original to Consignee
Duplicate to Chief of Vessel
Triplicate to Consignor
Quadruplicate to Commissioner of Customs & Excise, Uganda,
P. O. Box 444
KAMPALA, UGANDA.
until 1930 went undocumented. However, the trade did not die out completely, for a number of Arab ivory merchants in Khartoum have an unbroken record of business which extends, through fathers and grandfathers, back into the last century. Further, there are a number of old ivory carvers in Omdurman and Khartoum who have been in business all their lives.

In 1955 southern Sudanese troops mutinied in Juba and precipitated a cessionist guerilla war which raged until 1972. The main source of Sudanese ivory was in the south and the war greatly slowed down ivory trading in the traditional manner: i.e. from the negro southerners, to urban, Arabised northerners, thence down the Nile to Khartoum. However, the southern rebels (AnyaNya) did use ivory to obtain provisions and weapons, selling it across the Zaire, Uganda, Kenya and Ethiopian borders.

Seventeen years of war destroyed the southern Sudanese economy. At its end, the region was back in the same position it had been at the turn of the century. The only source of revenue of any consequence was, once again, ivory. In 1973, as part of the celebrations to commemorate the first anniversary of the war's end, it was decided to hold an auction of ivory.

This I organised for the Regional Government. It coincided with the onset of a spectacular rise in the price of ivory which precipitated a scramble for ivory throughout the south. As part of a consultancy for a client firm, I used the opportunity to enter the trade, buy ivory and obtain insight into the business both locally and internationally.

Ivory stockpiled during the war poured forth and it was instructive to see who had it. Prior to my arrival ivory had not been moving fast or in quantity, as sufficient transport did not yet exist to move it. However, by flying to outlying posts, I was able to get to it, rather than it having to come to me. Thus I bought from Negroes, Greeks, Indians, Arabs, Englishmen, an Irishman, from traders and companies, from game
wardens, Government Ministers, peasants, pilots, policemen; from administrators and AnyaNya rebels, hotel receptionists and a judge. The incentive to digress on this episode is (great, but suffice it that I was shown that Sudan is still a major source of ivory. It also showed conclusively that its value and use is as embedded in Africa today as ever it was a hundred years ago. It also brought home very forcefully that, as always, transport is the major constraint upon the flow of ivory, for I was totally unable to move what I knew to be available, despite having funds to purchase everything I saw.

The Sudan's exports of raw ivory from Customs records for 1973-1977 are presented in Table 48. From my own experience I am certain that they are too low. The Sudan has rigorous exchange control laws, and substantial duties have to be paid on ivory exported. The economy is frail and many luxury goods were difficult to obtain. It is thus an ideal climate for illegal export. Figure 13 shows a permit issued to a trader for 2190 tusks — at least 1095 elephants. In the same period (the latter half of 1978) I personally saw documents authorising the export of a further 15.6 tonnes and an order for an additional 16 tonnes from Sudan (which would not have been placed without some confidence that it would be fulfilled). Thus from permits issued, the Sudan's exports in 1978 should have been 52 tonnes (with a possibility of a further 16) but this does not show in the Customs record.

While the trade figures for 1978 are incomplete at the time of writing, the levels of 'export' are substantially higher than in previous years and not in accordance with the country's policy of 'limited' elephant hunting.

6. Ethiopia

Since the Italian conquest of Ethiopia in 1933, there has been little official trade in ivory. The country has a few elephants around Harrar and along the south-western border with
**THE DEMOCRATIC REPUBLIC OF THE SUDAN**

**GAME AND FISHERIES DEPARTMENT**

Export permit for live wild animals or parts thereof issued under Section 19 of the Preservation of Wild Animals Ordinance, 1925.

**NAME:** Mr. Ehsan Alnalla El Awd

**OCCUPATION:** Merchant

**OF:** P.O. Box No. 473, Khartoum.

This permit is to authorize Ehsan Alnalla El Awd to export 2190 pieces Ivory Parts, weighting 23300 Kilos to Hong Kong, these elements were hunted or taken and by permit from this department.

<table>
<thead>
<tr>
<th>No.</th>
<th>Animal</th>
<th>Alive or Skinned</th>
<th>First or Second</th>
<th>Weight Kilos</th>
</tr>
</thead>
<tbody>
<tr>
<td>2190</td>
<td>Ivory Parts</td>
<td>First and Inspected by Officer</td>
<td>20000</td>
<td></td>
</tr>
</tbody>
</table>

**Country of Origin:** Sudan

**This permit expires on:** 20th June, 1926

**Fee paid:** £ 1.00

**Place:** Khartoum

**Date:** 20th June, 1926

**Director, GAME DEPARTMENT**

![Signature]

**FIG. 13 EXAMPLE OF A SUDAN PERMIT**
the Sudan. In 1968 I made an aerial reconnaissance along the border, saw no live elephants, but many tracks and a number of skeletons indicative of hunting. I gained the impression that elephant densities were light—to-moderate and that there were probably more elephants than was or is held to be the case in conservation circles. The areas in which there are were elephants, are remote and somewhat lawless. They serve as refuges for fugitives, both from the Sudan and Ethiopia — at that time a substantial number of Sudanese AnyaNya were there. On these grounds alone there must have been an ivory trade of sorts, but inhibited by the limited transport facilities.

In 1973 I visited Addis Ababa and enquired after the availability of ivory. The maximum I could have purchased was c.10 tonnes, most of which was said to have come from the western border, or from within the Sudan.

In 1976 one firm offered a company in the U.S.A. 7 tonnes and seemed to be seeking outlets for regular supplies. From this very limited evidence it would seem that there is still a small flow of ivory from Ethiopia. Officially, however, exports are less than 1 tonne a year. The only data available are presented in Table 49.

The Department of Wildlife Conservation and Development believes that less than 5 elephants were killed legally between 1974 and 1979, but that illegal hunting took place to an unknown degree (Survey Questionnaire).

7. Zambia

Zambia has a substantial elephant population (e.g. Caughley 1973) but a 'low profile' in the public ivory eye. Nevertheless it had both an external and internal trade in ivory artefacts, which entailed importing carved items as well as local manufacture — the market for which was the relatively large, urban and affluent mining community of expatriates.
Data on the import and export of ivory are presented in Figure 14 and Tables 50-54. Table 51 gives the only Customs data of this survey which are backed closely by evidence from the local conservation authority in Table 52. The pattern of raw ivory exports is of interest in that for nine of the 14 years covered — 1964, 65, 66, 72, 73, 74, 75, 76 and 77 - they are remarkably constant, averaging 26 tonnes in a range of 20-33 tonnes. The intervening period of 1967-1971 averaged 49 tonnes, but exports were erratic, ranging between 2 and 113.9 tonnes. This was also the period in which the Government was enmeshed in a controversial elephant cropping project in the Luangwa Valley of Zambia and I assume that the pattern of exports was in some way linked to the conservation politics of the time.

In the past Zambia sold much of its ivory to Mozambique. This stopped when that country became independent. With physical isolation from sea ports, a political outlook which denies rapprochement with Rhodesia, a fall in the price of copper and a general economic performance far behind expectations (Jolly 1978), Zambia has had to impose stringent exchange controls. These have recently included a ban on exporting ivory. At the same time the circumstances have created considerable incentive to use it to move capital away from the country. In the main this has taken two channels. Until the ban on exports most ivory was grossly undervalued to minimise what had to be returned to the country and to allow the balance between the real and invoiced price to be paid overseas.

The other channel has been the more unusual outright smuggling through concealment. One ruse used was sealing ivory in containers, bribing Customs officials not to inspect them too closely, and shipping the containers out as "heavy machinery parts" for repair. Thus Hong Kong obtained ivory imports from Australia whence the 'machinery parts' had been shipped.
Other ruses have included equipping trucks with false floors or hidden compartments and also dummy fuel tanks. In addition to Zambia's own smuggling there is also a through—flow of ivory from neighbouring Zaire and a possible back—flow from Malawi. Both streams have been predominantly directed toward and through South Africa. Some attempts have also been made to ship through Malawi where at least one such consignment has been seized. From the markings on the tusks it was apparently Zambian Government ivory!

Assertions were heard from a wide variety of sources that a senior officials in the Zambian Government were implicated in widespread ivory exports.

8. Malawi

Malawi has its elephants (c.4,000) concentrated in sanctuaries - national parks, game reserves or forest reserves — and under more effective supervision than any state with the possible exceptions of South Africa and Rhodesia. Export of raw ivory is not encouraged. That recovered from the country's elephants is sold to local craftsmen. It is then carved and sold to tourists who may export their purchases without let or hindrance. The volume of these local raw ivory sales is given in Table 55 and average c.1.2 tonnes a year. There is some poaching of Malawi's elephants, but it is within the population’s capacity for replacement (Anstey and Bell, pers. comm.)

Attempts to smuggle ivory into Malawi are recurring and fall into two classes. The first concerns commercial consignments from both Zaire and Zambia, which are routed to overseas destinations through Malawi's Chileka airport. Several such consignments have been intercepted by the Malawi Customs Investigation Service and confiscated. (This ivory is sold by international tender if it is greater than can be absorbed into the local carving trade.) The photographs in Figure 15 are in fact from such a case when a vehicle and its contraband were seized after crossing the Malawi border.
Malawi's facilities are too small for any major ivory traffic to develop without becoming conspicuous and detectable.

The second form of smuggling concerns ivory brought into Malawi as barter currency to purchase goods unobtainable in Mozambique and Zambia. In view of the depressed economies in these two countries and the healthy conditions in Malawi, there is said to be a constant dribble of tusks across the border. Because these come in, carried by people on foot, using numerous, unpoliced backwood trails, interceptions are infrequent but do occur. What happens to this ivory is largely a matter of supposition though it is believed that a certain amount is taken in by the local carving industry. Some has certainly been bought by private individuals and freighted out as personal effects. If it accumulates into larger consignments, the most likely way in which it would leave the country would be by heavy road transport through Zambia and Botswana to South Africa. However, only one such consignment has been detected in recent years (Anstey pers. comm.) Alternatively this ivory could be railed away from Malawi through Mozambique, but by both rail and road it would have to be disguised as something else or hidden as in Figure 15.

9. Botswana

Botswana, South Africa, Namibia, Lesotho and Swaziland share a common Customs and Excise Union. Trade Statistics are published by the Union and do not give breakdowns for the individual states. There are thus no published Customs data for Botswana's ivory trade prior to 1975, when the country commenced an independent annual trade record. The system for doing this is still in the process of development and in 1975 and 76 values only were published. Such data as are available from this source are presented in Table 56.

While an analysis of export permit duplicates might reveal considerable information on Botswana's ivory trade, no such examination was made and the Department of Wildlife and National
FIG. 15 TRUCKS FITTED WITH FALSE FLOORS AND HIDDEN COMPARTMENTS — TRADITIONAL DEVICES FOR MOVING CONTRABAND — MOVE ILLEGAL IVORY WIDELY IN CENTRAL AFRICA.

(Photos: J. Clifford)
Parks has made no collation of the data. Short of substantial research, the Botswana government is unable to give a clear picture of its ivory trade. Fortunately, however, the major concern trading ivory in the country, Botswana Game Industries (Pty) Ltd. (BGI), provided an insight into volumes.

All tusks taken legally in Botswana are given individual registry numbers; each year the numbers commence at 1. The first tusk to be registered at any station in any year would be given the station prefix of two letters, the number 1 and the year. Thus the first tusk registered in Francistown in 1978 would be FT/1/78. The last number of each year will convey the number of tusks that were registered at that station.

While BGI is unlikely to always purchase the last number it is likely to obtain some numbers during the last weeks of the year and thereby obtain a close idea of the year's total registrations. On this basis it is estimated that for the years 1975-78, BGI bought 59% of ivory registered in Botswana, weighing 43,991 kg: an average of 8,798 kg a year. From this one can deduce that the country's average annual production has been c.14,912 kg per annum — say 15 tonnes.

The number of licences to shoot elephants has varied between c.550 and c.800 per annum over the same period, and A the average weight of tusk bought by BGI is c.12 kg, i.e. 24 kg 8 per elephant. On the basis of licences issued, annual ivory production should have been between 13.2 and 19.2 tonnes.

The two estimates are not unrelated and both are imprecise. Nevertheless as the BGI figure falls between what should become available from licences, I feel that it is a worthwhile guide to the order of Botswana's ivory production.

Unlike many other countries (e.g. Tanzania and Uganda), where elephants conflicting with agriculturalists is a problem, this is not the case in Botswana, and little ivory comes from
this source. Similarly, quantities found from natural mortality are small.

In addition to its own production Botswana, largely through BGI’s international trading, imports ivory from elsewhere in Africa. While this was in principle straightforward, the disturbed political conditions around Botswana now complicate the trade. The situations in Zambia, Rhodesia, Angola and Namibia are all powerful incentives to move capital. Botswana's position makes it an obvious first base into which ivory can be moved. The country's early accession to the Washington Convention on Trade in Endangered Species enhanced this situation as it made Botswana Export Fermirs for ivory worth a great deal more than those from the majority of countries that held back from ratifying the treaty.

In the past two years there has been a proliferation of small ivory exporters in Botswana and a rise in the number of tusks shipped secretly over the border into South Africa. I examined some such ivory in South Africa and in Hong Kong saw applications for permission to import 6 tonnes of ivory from Botswana. The only concern with the capital and established trade position to produce this quantity out of Botswana is BGI, who knew nothing of the applications or the applicant. The conclusion, therefore, is that either there is an extensive poaching operation in Botswana (for which there is little supporting data) or the country is having its name taken in vain for other ivory.

10. South Africa and Namibia

South Africa has one source of ivory of any consequence: the Kruger National Park. Annual cropping programmes to hold elephant numbers to a predetermined level have produced between 1.9 and 6.2 tonnes annually over the past seven years.

Namibia has elephants in a narrow belt across the north of the country, including the whole of the 'Caprivi Strip'.

Trade statistics for the Southern African Customs Union are (given in values only. The data are presented in Table 57 for 1972-77 imports and exports of both raw and worked ivory, and include estimates of weight.

In addition to these exports, South Africa has an ivory manufacturing industry which consumes at least 5 tonnes per annum, and probably more (Trade sources).

The South African/Namibian data do not reconcile readily, with Botswana's statements and the low volumes I believe to be produced internally. Suffice it that the information is too imprecise to analyse accurately. This is in part a reflection of the political turmoil racking southern Africa, which creates a climate for concealment of trade statistics — particularly of a commodity such as ivory.

11. Zaire

Data on Zaire's ivory trade are given in Table 38. They derive from two sources (1) the Department for the Environment, Conservation of Nature and Tourisme (now the Zaire Institute for the Conservation of Nature), and (2) the United States Embassy in Kinshasa. The former covered 4 years 1973-76 and exports are given as 1 to 29 tonnes per annum. The second source covered six years 1972-77 ranging between 0.2 and 1,293 tonnes per annum. They do not correspond. Further, the second source also indicates a very substantial export trade in worked ivory of up to 78 tonnes per annum. All traders I have consulted on the data feel that they are false. The general impression is that Zaire's total exports are between 200 and 300 tonnes a year. The Zairois Government did negotiate an arrangement for selling all official ivory on commission. At the time - c.6 years ago — their 'official production' was c.120 tonnes per annum. However, they planned to raise it c. 200 tonnes per annum. In the end the agreement was abandoned and sales are now back in Government hands.
CERTIFICAT D'ORIGINE ET DE LÉGITIME EXPÉDITION.

Je soussigné DITUSOLALE M'BONGI, Directeur à la Conservation de la Nature et Gestion des Ressources Naturelles, atteste par la présente que Monsieur DIALLO A. CUMAR, résidant au N° 125 Avenue du Mali à KINSHASA/INTANDA, est détenteur de 175 peintes d'ivoire (soit trois boîtes) qu'il a achetées conformément à la réglementation en vigueur en République du Zaïre.

La présente lui est établie pour une légitime expédition.

[Signature]

SECRETARIAT GÉNÉRAL DE LA NATURE

FIG. 16 a. EXAMPLE OF A ZAIRE PERMIT
RÉPUBLIQUE DU BÉTON 
MINISTRE DE LA FAISSON
CONSEILLER DE L'INTERIEUR, 
COMMISSAIRE DE LA FONCTION PUBLIQUE
R.P. 69 - BÉNLE

SÉANCE DU 14 OCT. 1973
322148 - 1973/0079

SÉANCE DU 14 OCT. 1973

Je nomme : LÉOTIL ETIENNE MAITRE INGENIEUR, G. - Enseignant, R.6 - Régional de l'Environnement, Conservation de la Nature et Tourisme pour la Région de l'Ouest, attente par a présenta :

Conformément à la décret de 1973 sur la conservation des espèces de faune et fables, au nom de l'administration, et en vertu de l'autorisation d'ampleur de l'assemblée de l'assemblée du 14 octobre 1973, accordée par le Gouvernement d'Indochine, Conservation de la nature et Tourisme, 

L'ASSEMBLÉE, ......................................

a présenta, en son aide, en R.P. du 14 octobre 1973 : 222 points d'agriculture à la presse, dont les caractéristiques détaillées ci-dessous et qui ont été proposés par la cité :

1 - 322, 3700 An, Patrice

\[\text{\textit{Observation}}\]

\[\text{\textit{Voyageurs divers,}}\]

\[\text{\textit{Allant en Crayon}}\]

\[\text{\textit{à l'égalité}}\]

\[\text{\textit{Pr. T. M. H. P. de la Cité, en \textit{\textit{sic}}}}\]

\[\text{\textit{\textit{sic}}}}\]
RÉPUBLIQUE DU ZAIRE
MOUVEMENT POPULAIRE DE LA RÉVOLUTION

Région du Kivu
Z / Région du Nord-Kivu
Zone de Butembo
Détachement de l'Environnement
Conservation de la nature et le Tourisme

ATTÉestation tenant lieu de certificat
d'agrément des points d'intérêt du 30/03/78.

Nous nous appuyons sur ma, Contrôleur de la Station
de l'Environnement Conservation de la Nature et Tourisme en Zaire
de Butembo, afin que par la présente avoir enregistré 9,500 kg de
peintures d'ivoire appartenant au Citayen:
M. LIVONGO, représenté par le Citayen:
SAI, délégué à cette fin par le Citayen:
par sa mère du:
concurrent par l'Uganda.

Les peintures ont été achetées depuis janvier 1978
et sont prêtes à l'exportation.

La présente attestation est sincère.

LE CONTRôLEUR PRINCIPAL DE L'ENVIRONNEMENT
CONSERVATION DE LA NATURE ET TOURISME STATION
DU ZAIRE,
BANWISHI.

ATTACHE DE MIGUEL DE M. BUCHE.

FIG. 16 c. EXAMPLE OF A ZAIRE PERMIT.
The traders recognize Zaire as the largest source of ivory in Africa. However, they are also aware of the unmentionable political fact that Zaire is virtually a non-state. Large tracts in the east and north are, in many respects, independent of Kinshasa — certainly where rural life is concerned. This is particularly true of the ivory trade. Over the past decade there has been acute competition within the Government for control of ivory exports. This in 1978, Kinshasa issued one export document (Figure 16a), the officers in Mbandaka issued a Certificate of Legal Possession which they meant to be valid for exporting ivory to Hong Kong (Fig 16 b — see bottom right corner above signature “pour exportation ver Hong Kong”), while from Beni yet another document is used (Figure 16 c). In this latter permit is a forgery: compare the shank of the figure 7 at the end of the second typed line in the heading with the shank of the 7 in the fifth typed line in “7,500 kg”. It is obvious that it was originally 1,500 kg.

The bulk of Zaire’s ivory exports come out illegally Through neighbouring states — Congo, Central African Empire, Sudan, Uganda, Burundi and Zambia. In 1973 between 2 and 7 tonnes a week were being brought into Juba, a lot of which I personally saw. The main entrepreneurs in this smuggling were Senegalese. Small quantities are airfreighted to Europe or the Far East as personal belongings; large consignments are sent To Europe, usually Belgium, for disposal.

The magnitude of the Zaire ivory exports is difficult to confirm Because of the manner in which they are mixed with those Of neighbouring counties.

12. Burundi

Burundi has no elephants, but exports substantial amounts Of ivory. These come from two sources — Zaire and Tanzania — in similar proportions. A Burundi export document is attached as Figure 17.
CERTIFICATE OF IVORY PERMIT

I certify that Pierre 038 suit 4,877 kgs = 106 cells of ivory belong to DAKU-FUNESI P.C. Box 2556 Bujumbura, were been examined and found in good condition for exportation purposes.

This permit was issued under Export Licence E1/64702, the ivory referred to in this licence was not obtained in contravention of the laws of this country for the protection of fauna and flora and the export will not be detrimental to the survival of the species.

Destination: [Redacted]

Dr. MUTANTEZA Francois,
Veterinary of Government

[Signature]

REPUBLIC OF BURUNDI
MINISTRY OF AGRICULTURE AND RANCHING
LABORATORY VETERINARIAN

FIG. 17 EXAMPLE OF A BURUNDI PERMIT.
13. Congo

Limited data on the Congo ivory trade are presented in Table 59. A confidential information testifies to having seen large quantities of ivory, and from diplomatic sources ascertained that in 1977 c 83 tonnes were exported. On the other hand the Congo Government informed the U.S. Embassy in Brazzavile that in 1978 the country imported 11 tonnes and exported 17.6 tonnes of raw ivory. The difference between the two, 6.6 tonnes, is assumed to be domestic production from c.15 elephants which the Government say are shot annually.

The records are of doubtful value, however, as I personally examined Congo documents which indicated that more than 20 tonnes left that country in 1978. Brazaville acts as an outlet for Zaire ivory and the two sources are inextricably confused.

14. Cameroon

Little information was obtained in the Cameroun other than the data presented in Table 60. Ivory is trafficked across the border in both directions by Senegalese and the country is considered an easy source of documentation. The same confusion that permeates the Zaire/Congo ivory production also envelopes the Cameroun.

15. Central African Empire

Through the 1970s the CAE has grown rapidly as a major ivory producer. Exports of ivory (Table 61) are the monopoly of one company (La Couronne Import/Export) in which the Emporor has a large shareholding. The company not only trades in C.A.E. ivory but also processes substantial quantities from Zaire, Cameroun, Congo, Gabon, and Chad with attendant confusion or records.

A law exists which forbids the export of tusks under 10 kg in weight, and these are supposed to be retained for local manufacture. However, the law is not strictly adhered to as I
have personally handled many tusks of less than 10 kg from C.A.E. (Volume 2).

16. Gabon

Gabon produces a constant supply of ivory. The Government estimated annual average production to be c.6 tonnes of raw ivory for export, and 0.2 tonnes of carved ivory. The country has no ivory imports. These data are shown in Table 62. However the trade is managed by Senegalese and from what they say, Gabon may produce substantially more than Table 62 indicates. Again there is substantial transborder traffic in both directions.

17. Upper Volta

Upper Volta has a small elephant population and a negligible ivory trade as indicated in Table 63.

18. Ivory Coast

The Ivory Coast is anomalous among African states as an ivory importer and consumer, rather than an exporter. This is not a development of long standing, but something that has developed through the 1970s. Not only is ivory worked in the country, but it also imports carved work in greater quantity than it exports. These data are presented in Table 64. Comparative data indicating the source of raw ivory imports into the Ivory Coast and a suggestion that the data in Table 64 might be underestimates, are presented in Table 65.

The base for this Ivory Coast trade in tasks is the large French community resident in the country coupled with a growing and substantial tourist trade; c.84,000 in 1974 (Anon. 1978) and nearer 100,000 tourists today. Imports of raw ivory are predominantly from Zaire basin francophone countries and are managed by the same Senegalese entrepreneurs.
EUROPE, ASIA AND AMERICA

Note: All E.E.C. countries stopped recording ivory as an individual item in trade records w.e.f. 1st January 1978. From then on it was lumped with a variety of other commodities of animal origin and became irredeemable from them. The E.E.C record therefore stops at 1977.

1. Belgium

Belgium, and principally its port Antwerp, assumed great importance in the world ivory trade once the nation was involved widely in the Congo (Zaire) basin. However, despite handling large volumes of tusks, Belgium never developed a carving or ivory working industry of any consequence. Worked ivory was imported in small quantities from other nations. Its involvement has been with raw ivory as a trade commodity, with little internal use.

The pattern of Belgium’s trade has already been presented in Tables 23 and 24 in Chapter 3, and this is now augmented with Tables 66, 67 and 68 and the whole 90 year period 1888-1978 is illustrated in Figure 18. This started with a rapid rise to an average of over 300 tonnes per annum between 1900 and 1914, a dip during the 1914-18 war, a recovery in the early 1920s, then a progressive fall to nothing in the 1939-45 war. Following this there was a gradual and somewhat uneven recovery to over 70 tonnes in 1960. The volume fell back with the troubles of Zaire’s first five years of independence, then bounced back to over 100 tonnes per annum in the last years of the decade. The picture appeared set for further growth when, inexplicably, the official figures present a sharp reverse and fall to 1 tonne or less per annum today

In fact there was no down-turn in the 1970s and there is at least as much ivory passing through Belgium now as there was in the early 1920s. It does not appear in any Customs and Excise statistics or Annual Trade Reports, because it never comes out of bond.
I shall anticipate points which will be made later in this report, by stating that this development in Belgium's ivory business is not necessarily negative from the aspect of either the conservation of elephants or the ivory traders. Criticisms levelled at it so far have been made in gross ignorance of the background against which the bonded ivory trade evolved.

2. Britain

Like Belgium, Britain's interest in ivory has traditionally been trade in the raw commodity and no particularly British ivory artwork has ever developed. Where craftsmanship evolved, it was in the application of ivory to enhance other products. Thus the makers of the best cutlery gave ivory handles to their tableware; hairbrushes of silver were backed with ivory; piano keys given an ivory veneer and bagpipes ivory joints. With the absence of a large ivory crafting community there has been comparatively little demand for raw ivory imports, once Britain's trading position was lost. Today, the bulk of ivory entering Britain is for re-export, with relatively little being taken for internal use. Present demand is less than 5 tonnes a year.

British data on ivory imports and exports are presented in Tables 69 and 70, and illustrated in Figure 19 for the era 1788-1977 (191 years). From the tables where imports and exports of raw ivory are comparable, i.e. 1975, 76 and 77, of the 75 tonnes raw ivory imported, 64 tonnes were re-exported, indicating retention of 11 tonnes in Britain over the 3 years (3.7 tonnes p.a.)

3. France

France owned African ivory lands (e.g. C.A.E., Cameroun, Senegal, Ivory Coast) but never developed an ivory entrepot trade of the order of Britain's or Belgium's. This is not to say that she didn't develop ivory industries, for she did.
"In 1840 there were eleven manufacturers of ivory goods in Dieppe, France; and in nearly every large city London has one or more such" (Holder 1886).

Ivory surplus to these industries was mainly marketed (through London or Antwerp). Today there are only 4 raw ivory traders of consequence in Paris. With one exception, their trade is almost entirely entrepot between Africa and other markets. The one which does more than merely trade ivory is, as to be expected, of long standing while the others are of relatively recent origin.

Data on France's imports of raw ivory are given in Table 71 and re-exports in Table 72. The pattern of imports is shown in Figure 20. This is of interest in that imports were less than 10 tonnes p.a. from 1966-1971, rose six to eightfold between 1972 and 1974, and then fell sharply to 21 tonnes or less after 1975. This rise was an entry into the entrepot business. Between 1966 and 1971 (both years included) imports were 42 tonnes, averaging 7 per annum. Re-exports of raw ivory were slightly under 4 tonnes or an average of 0.6 tonnes a year, indicating an annual internal consumption of c.6.4 tonnes. Between 1972 and 1974, imports totalled 221 tonnes (74 per year) and re-exports 210 tonnes, leaving 11 tonnes in France, an annual average of between 3 and 4 tonnes. In 1975, 76 and 77, imports were 54 tonnes, and re-exports 32 tonnes, leaving 22 tonnes in France, or 7 tonnes a year. Thus internal demand showed little, if any growth over ll years, while the import/export trade expanded by over 900%, then fell back for an overall growth of c.157%.

4. Germany

At the turn of the century Germany was a major 'ivory' nation. This status changed radically during and after the first World War when it not only lost its African territories, but underwent a series of economic crises. The country's ivory carving industry (described in chapter 6) kept going, maintained by internal demand. Again this was disrupted by the
second World War and the partitioning of Germany into the eastern German Democratic Republic and the western Federal Republic. The centre of the country’s ivory crafting was in the west, and by 1952 when our records start, was responsible for imports of c.15 tonnes of raw ivory a year. Germany’s imports and re-exports of raw ivory are presented in Figure 21 and Tables 73 and 74.

From 1952 until 1974 Germany's annual imports averaged 25 tonnes and ranged between 15 and 32 tonnes. There was a slight rise in imports within this period. Before 1967 the 30 tonne p.a. mark had not been reached, but in 1967 and onwards to 1974 it was reached or exceeded on 4 occasions. Re-exports of raw ivory averaged 0.7 tonnes a year, ranging between c.0.2 and 3.3 tonnes, to indicate an average internal demand of 24.3 tonnes per year. There was an increase of re-exports in the years 1971, 72 and 73 as they account for 3 of only 4 years in which re-exports exceeded 1 tonne. However, this does not detract from the picture that for 22 years, 1952-1974, Germany's imports of raw ivory were almost exclusively for its own use.

In 1975, 76 and 77 the pattern changed abruptly. In these three years imports totalled 209 tonnes (70 tonnes a year average) an increase of 180% over the preceding 22 year average. Of the 209 tonnes, no less than 162 (77.5%) came from Kenya. During the same 3 years re-exports of ivory amounted to 51 tonnes (17 tonnes a year average), an increase of 2,329% over the preceding 22 years. Almost all this increase was re-exported to Hong Kong.

The volume of ivory retained internally over the 3 years was 158 tonnes — on average, 53 tonnes a year. This is slightly over double the previous 22 years' annual retentions in Germany; it reflected both an increased internal consumption and the establishment of reserve stocks available for both local use and future export. In 1978 at least 20 tonnes from the
FIG. 21 GERMANY'S IMPORTS OF RAW IVORY
1952-1977
accumulation were exported to China (Trade source) but will not appear in trade statistics. In 1978 there was a sharp decline in ivory imports — though the official trade statistics can no longer be analysed to demonstrate its order with any accuracy.

The rise in Germany ivory imports and exports had little to do with the traditional German ivory-working industry. It was mainly the province of a small group of Indians, working in three 'rings' to get money out of Kenya. Much of this was undertaken with the connivance of the Kenya Department of Wildlife Conservation and Management which provided necessary documents. The Indians worked with or without German partners, one at least of whom is now 'operating' the system out of Namibia and South Africa. However the imposition of CITES regulations has compromised development of the German entrepot trade, as have measures taken by the Kenya Government to remove the senior officials responsible in Nairobi.

5. Italy

Through the Venetian connections with eastern and Arab trade, Italy's imports of ivory stretch back before medxval times. The major use has been closely linked with religious art, and even today there seem to be ties between the Catholic faith and ivory — for Madonnas, Crucifixion figures, etc. Thus Italy's imports of raw ivory have been, and are, predominantly for working within the country. The data are presented in Tables 75 and 76 for imports and re-exports respectively.

Between 1970 and 1977 imports were erratic, totalling 55 tonnes, and varied between 4 and 9 tonnes a year (an average of 7 tonnes) with one exception of 19 tonnes in 1973, when 14 tonnes arrived from Uruguay. Re-exports totalled 0.7 tonnes in the 8 year period indicating an internal demand of c.7 tonnes a year. If the anomalous 1973 import is ignored, the annual demand is c.5 tonnes, with virtually no re-export trade.
6. Netherlands

A trading nation having historic connections with the east, the Netherlands has long fostered an intermittent trade in raw ivory. However as there is only one importing company today, normal trade convention would be compromised if the government revealed detail of the individual's business. Therefore no official data have been or will be released on the country's imports of raw ivory, but the order of magnitude can be deduced from i) African exporters' data, and ii) European, Asian and American importers' figures.

7. Spain

The Spanish ivory trade is similar in many respects to that of Italy. It is heavily oriented toward religious art, but has little official record of entrepot business in raw ivory. Data on the import and export of raw ivory are presented in Tables 77 and 78. They illustrate a relatively constant inflow of between 2 and 8 tonnes (average 4 tonnes) between 1969 and 1974. In 1975 they rose to 19 tonnes, in 1976 to 30 tonnes, and 1977 to 33 tonnes. Response to enquiries suggest that this substantial rise is not taken up in internal consumption, but is being both held and re-exported. In addition, trade talk has it that there is an illegal flow of some consequence from Portugal into Spain.

The re-exports given in Table 78 indicate a negligible volume of raw ivory leaves the country. However, information from within the ivory trade suggests that these data are unreliable.

8. Switzerland

Switzerland has no particular prominence in any aspect of the ivory trade. However, as ivory is frequently used to move capital, and as Switzerland is an economic 'nerve centre', its raw ivory exports and re-exports were examined. The data for the period 1960-1977 are presented in Tables 79 and 80.
Over 17 years, 14 tonnes of ivory were imported — an average of 0.8 tonne per annum. The largest recorded volume in any one year was 1.3 tonnes.

The sum of re-exported ivory is 13.3 tonnes and at face value, it would seem that almost all raw ivory imported is then re-exported. On closer analysis this is not the case. For 16 of the 17 years covered, annual re-exports average only 80 kg, i.e. 0.08 tonne, indicating a retention and internal consumption of 90% of raw ivory imported. The exception is an export of 12 tonnes in 1974 — at that time more than the entire A raw ivory imports of the 14 years 1960-74. It thus seems likely that at least one consignment of ivory entered Switzerland undetected by Customs officials.

9. India

A description of India's ivory trade is given in Chapter 6. Suffice it that the country has for centuries been one of the world's major ivory marts. I have recovered no import data from 1915-1934, though from Zanzibar and the East African records of that time, India was receiving raw ivory from there. By 1934 imports averaged 72 tonnes a year through to 1939. In the second World War India was the only outlet for East African, Zanzibar and Zaire ivory, which could be transported by Arab and Indian dhows. Freed of all competition, the Indians made the most of the opportunity and their imports rose to over 260 tonnes per annum during the war years.

From independence in 1947 India's economy has been unhealthy. Government imposed heavy import duties on luxury goods including ivory. In these circumstances, India was unable to compete with other buying nations and imports have progressively fallen down the years to, officially, less than 10 tonnes p.a. in the late 1970s. The import data are presented in Tables 81 and 82 and illustrated in Figure 22. For reasons outlined in Chapter 6, I believe recent import statistics to be unreliable.
In Table 83 data on the exports of raw ivory are presented. These were obtained as two sets and while one clearly was related to ivory previously imported, it is not clear whether the other represents genuine Indian elephant ivory. After the war India re-exported some of the large stocks of ivory it had accumulated, but since then has not figured as a source of raw ivory of any consequence at all.

10. Singapore

As an affluent eastern entrepot, Singapore seemed a likely ivory trade centre. It has a large Chinese population and also has many Indians who could have trade and family contacts in Africa. The country’s import/export data were examined and information on raw ivory are presented in Tables 84 and 85 for the period 1970-1978.

From 1970-75 imports averaged 0.3 tonne a year. In 1976 and 1977 they rose to 11 and 10 tonnes respectively, and in 1978 to 22 tonnes. In all three years Kenya supplied the bulk of these imports - 79%. Previously the main supplier had been Hong Kong.

Prior to 1976, Singapore had exported a total of 0.6 tonne averaging 0.2 tonne p.a. This illustrates that until then, Singapore played an insignificant role in ivory, purchasing a little from a variety of countries and exporting a similar amount. From 1976 onwards Kenya commenced to use Singapore as a routing post for ivory to Hong Kong and Japan. Thus over the three years 1975-78, Singapore re—exported 31 tonnes of raw ivory, i.e. 72% of what had been received from Kenya.

11. Hong Kong

As Hong Kong is the world’s leading ivory mart, a separate descriptive section (Chapter 6) has been devoted to it. Suffice it here that it has shown rapid growth ever since the last World war, but this appears to have slowed down and may even be declining in the face of competition from Japan. The country’s
data on raw ivory imports and re—exports are presented in Figure 23 and Tables 86 and 87.

Imports have risen from c.71 tonnes in 1952 to over 719 tonnes in 1976, since when they have fallen back to 603 tonnes in 1978. However, fluctuations of 100 tonnes at this level of trade are probably 'normal' and the term 'fallen back' should not be taken other than in that sense. The proportion that exports are of imports (Table 88) show that while Hong Kong is primarily an import working country, it also fosters a substantial distribution trade to other eastern countries such as Thailand, Taiwan, Korea and China.

12. Japan

The Japanese have a long historical attachment to ivory and a large trade in the commodity. Although Japan was not visited during this survey through shortage of time and funds, no less than 36 companies in Japan were identified as importers of raw ivory. This number alone places Japan second to Hong Kong. As the list is not complete, it is possible that there may be even more importers than in Hong Kong.

Japan's imports of raw ivory are presented in Figure 24 and Table 89, and re-exports in Table 90. These have shown a more or less steady rise from c.29 tonnes in 1950 to 368 tonnes in 1978 (i.e. over 1,200%).

Data on re-exports in Table 90 only cover 1970-78, during which period they never exceeded 10 tonnes and averaged only 5 tonnes a year. In 1978 Japan exported only 2.5% of raw ivory imported. These figures establish it as a major consumer of raw ivory — almost equal to Hong Kong. An important difference between the two is that the Japanese are very selective of the ivory they buy and as a rule want tusks that average 14 kg or more in weight. To be able to select, they have to rely on other major ivory centres where large stocks are available.
FIG. 23 HONG KONG'S IMPORTS OF RAW IVORY 1952-1975
FIG. 29 JAPAN'S EXPORTS OF RAW IVORY
1550-1970
13. U.S.A.

A detailed comment on the U.S. ivory trade is given in Chapter 6. The salient aspects of the trade are presented in Figure 25 and in Tables 91 and 92. The first table was compiled of data submitted to me by the U.S. Fish and Wildlife Service. Fortunately additional information was received from a trader K. Enright — which showed that the Government material prior to 1972 included large quantities of whale ivory. This is confirmed by J. Hallagan (see Chapter 6). Information on the world's sperm whale catch is presented in Appendix 4.

Table 92 gives the U.S. elephant ivory trade, with whale teeth extracted. It is the basis for Figure 25. No data are available on re-exports.

The country is a minor importer of raw ivory. However the data give an illustration of what is most accurately termed the "Beilenson Effect" (which I define as 'the unforeseen consequence of law made in ignorance'). Between 1967 and 1975 the average annual imports of raw ivory into the U.S.A. amounted to 5 tonnes, ranging from less than 1 to 9. In 1976 these increased by 600% to 35 tonnes, falling back gradually to 9 tonnes in 1978 (Hallagan in litt.) This spectacular rise in imports was the outcome of a publicity campaign mounted by Representative Beilenson of California, which led to a legal ban on the importation of ivory into that state. This campaign stimulated ivory buying to pre-empt the ban, and investment in the commodity with the certainty that its value in the state would rise dramatically once ivory became a prohibited import. The surge of speculative buying was not confined to California and washed across the U.S. as Beilenson made it known that his intention was to secure a national prohibition in due course.

14. Saudi Arabia

Saudi Arabia's proximity to the Sudan makes it a suitable staging post for Sudanese ivory — usually illicit. Data are presented in Table 93. The figure of an export of 315 tonnes
is so improbable that I disregard it from further consideration.

**COMPARISONS**

Having presented import and export data from a wide range of countries, we are now able to make some estimate of the overall volume of ivory leaving Africa annually. This will be facilitated by brief return to Figures 4 and 5.

The national flow chart illustrates the medley and combination of steps ivory moves through to cross a national border in Africa. This is picked up as a broad generalisation in the international flow chart which presents a pictorial summation of the data in Tables 38 to 93. In essence the flow of ivory is still heavily influenced by recent colonial history and is divisible into Anglophone and Francophone groups. There is substantial overlap between them. The Anglophone group tends to export direct to Hong Kong and have used Germany as an important route post, whereas Francophone's ivory ends up in the Far East but is channelled through Belgium.

Japan draws its supplies mainly from Hong Kong and Belgium enabling it to be selective. However this is not apparent in Table 89, which shows very small imports from Hong Kong and virtually none from Belgium. The observation is summed in Table 94 which shows that Japan discounted at least 98% of the exports sent her by Hong Kong in 1970-78. Similarly she acknowledges only 2 tonnes from Belgium in the same period. Belgium has no official data with which to check this. However, the traders aver that they do ship considerable quantities to Japan and have done so for some years; in 1978 they shipped not less than 83 tonnes. Explanation of the apparent deficits lies in Japanese insistence that the African origin of their ivory imports is stated on invoices. Thus virtually all received from Belgium and Hong Kong is not attributed to these countries, but to the original African sources of origin. This complicates comparison of African export records with Japanese import data for, in many instances
the ivory will not have been originally consigned to Japan.

In making comparison between Africa's exports with corresponding imports, Japan has to be discarded. This notwithstanding, a sample of 5 African countries' (Tanzania, Kenya, Uganda, Sudan and Zambia) is contrasted with up to 10 overseas importers' records during the 1970s. As many years as possible are included to tone down annual variations. The 1970s are considered on their own because they present the modern picture and also cover its era in which ivory transport has speeded up. Recall the points made at the outset of this chapter — that exact agreement between the import/export data should not be expected, and that I have arbitrarily accepted that differences of up to 15% are of no consequence. The comparisons are made in Tables 95-100.

In Table 95 the sum of Tanzania's exports is within 13% of the corresponding annual imports received. As 82% of the total exports were to Hong Kong and within 9% of its official receipts, this reinforces the generalisation that during the 1970s, Tanzania's Trade Statistics are verified by the corresponding imports. However, there are anomalies and all is not 'straight'. For example Tanzania exported 65 and not 37 tonnes in 1976 (Table 101) and the apparent agreement between exports and imports could be through coincidence.

In Table 96 not one of Kenya's exports comes within acceptable limits of the import statements. Overall, Kenya appears to have exported 2.6 times as much ivory as its official records admit to.

Uganda's records of inconsistency (Table 97) outdoes Kenya's, as it would seem that 3.4 times more ivory went out than was recorded by Uganda.

In Table 98 the Sudanese record of official exports corresponds at a general level with receivers' statements.
Again it is Hong Kong's dominant position which has the overriding influence. The lesser amounts to other countries are erratic. The Sudanese traders do go to considerable lengths to conceal their ivory's origin, not to avoid legalities, but because their country's ivory has a tendency to crack, and fetch lower prices.

From Table 99 it is apparent that Zambia's export records do not tally with the importers' statements, which are greater by 57%.

All countries are combined to give an African sample in Table 100. The evidence is impressive. The receiving countries brought in nearly twice as much as was said to have been sent. It remains to be determined which side is 'right'. In the ivory trade there is no advantage to overstate exports or imports. All the incentives are the other way, to conceal them! This is particularly so in Africa where there are laws to be avoided, where there is criticism over not conserving fauna and where there is considerable incentive to move capital illegally. At this level alone, I accept that the African exports are likely to be deflated. The abundance of supporting data need not be gone into here. Therefore in moving towards an estimate of overall exports of ivory the importers' data provide a more acceptable base than the exporters'.

There are two exceptions to the evidence that the importers' records give greater volumes than the exporters' statements: Italy and the U.S.A. Table 100 shows that both receive less ivory than is consigned to them: 70% and 77% less respectively. Both are 'terminal' links on the raw ivory chain and there is little evidence that this situation could have arisen from ivory consigned through, rather than to them, and thereby caused a wrong entry on the dispatching countries' records. The weight of evidence is that the Italian and U.S. Customs records give understatement and have failed to record
THE VOLUME OF AFRICAN EXPORTS

A compendium of importers' statements of volumes received from Africa in 1976, 77 and 78 is presented in Table 101. It is augmented by inclusion of imports from Belgium as a) that country's bonded trade is all but exclusively ex-African, and b) it does not publish data on volumes taken into bond. Such amounts as do enter Belgian bond from non-African territories will inflate the overall total, but I believe such inflation to be small. The figures which emerge are 1976: 1123 tonnes; 1977: 849 tonnes and 1978: 808 tonnes. The last of these is not strictly comparable with the others, as it has no European data. All indications are that 1978 was, overall, a bigger year than 1977. Traders in France, Belgium, Spain and Germany were active and reported good business, and it does not seem unreasonable in these circumstances to augment the 1978 imports from Africa by the average internal requirements of Britain, France, Germany, Italy and Spain e 50 tonnes, which brings it close to the preceding year.

The totals given include the element of Japanese double counting referred to earlier. Thus the difference between what Hong Kong sent to Japan and what the Japanese acknowledge receiving must be deducted from the totals, as it has been accounted for by Japan giving it as ex-Africa. These deductions are 191, 81 and 151 tonnes for 1976, 77 and 78 respectively (Table 94), which reduce our estimated imports ex-Africa to 932, 768 and 707 tonnes for the three years. These are of course absolute minima for they exclude imports by many lesser 'ivory' countries.

There is, however, one country of considerable importance in the ivory trade — China — that is missing, and must be taken into account if only by inference, in any overview of the world situation. By instruction, this country was excluded from the survey, as IUCN was to handle the matter through diplomatic
channels. No results have been communicated to me and I assume, as of the time of writing, that this endeavour has failed. Nonetheless the data already presented in the tables do give some indication of past consumption and a clue to what it might be now. These are concentrated in Table 102 to give an erratic picture, which varies from 0 to 240 tonnes a year during 1962-78, averaging 59 tonnes.

Rumour is rife that Tanzania is making part payment of its debt to China for the TANZAM railway, in ivory. I have come across no concrete evidence to support this, though such an arrangement would make sense. It is of note that whereas the Zanzibar ivory trade officially 'died' in 1964, in that and the following three years, Tanganyika sent no less than 122 tonnes of ivory to Zanzibar. This does not appear as an import on any of the records to hand. It is possible that it went to China which had an active presence on the island at that time.

Chinese purchases from African exporters appear to have been low since 1975. However, up to 60 tonnes of raw ivory were bought from European traders in 1978 (Trade sources). While China may also have bought from countries for which have no data or which do not publish all their information, the most recent evidence of 60 tonnes is close to the 1962-78 average. Cautiously, I accept this average as the amount by which to increase the estimate of modern African ivory production. In consequence the estimates for 1976, 77 and 78 rise to 991, 827 and 766 tonnes respectively.

The estimates are still minima. They take no account of India's illegal imports which may be substantial (Chapter 6). Nevertheless, treated with the caution that should be accorded any generalised estimates, it seems that after a depression of 6 decades, the volume of ivory leaving Africa is once again of the same order as it was between 1900 and 1914; and perhaps a little higher.
VALUES

Between 1925 and 1952 the value of ivory is deduced from the combined East African and Zanzibar exports as in Table 103.

The average value of raw ivory imported by major ivory nations is illustrated in Figure 26 and Table 104. On the basis of the prevailing price i.e. $74.42/kg, Africa should have received $60,056,940 in 1978. However, in view of the evidence that nearly half the continent's exports go undeclared, the actual value accruing to it may have been more of the order of $30,382,292, with the balance having been "extracted".

In the same table (104) the sum of recorded imports (which includes ivory moving between the temperate zone non—producers as well as Africa's exports) was 993 tonnes in 1978 worth nearly $74,000,000. To this we may add 50 tonnes as an approximation for European internal consumption and a further 59 tonnes for absent China, bringing the volumetric turnover in raw ivory to about 1102 tonnes with a value of c.$82,000,000. The dimensions of the worked ivory business will augment this as shown in the following chapter.

It is also of note that in 1978, the difference between estimated total imports, 1102 tonnes and imports ex-Africa, 766 tonnes, is 336 tonnes or 44% of the ex-African figure. This amount is representative of the raw ivory traded between Non-African countries. As in the trade pre-1914, it is still a very substantial element of the business.
Data on the international trade in worked ivory are presented in 43 tables, as listed:

- Hong Kong: 105–107
- Japan: 108–110
- Singapore: 111–112
- India: 113–115
- Britain: 116–119
- France: 120–123
- Germany: 124–137
- Holland: 138–139
- Italy: 140–141
- Spain: 142–145
- Switzerland: 146–147

The information is of limited value as they do not give a complete picture of the international trade in worked ivory. This is for a variety of reasons. Much raw ivory imported into Germany, Italy, Spain and Switzerland, for example, is 'consumed' internally and its worked volume and value never appear in trade statistics. At some point in processing much ivory becomes another product. Thus pianos with keys veneered in ivory, cross borders and enter trade records as pianos — not ivory. Tables inlaid with ivory are furniture, and ivory ear-rings are jewelry etc. On departure from a country tourists need not declare ivory purchases made. The volume is substantial and fully one—fifth of Hong Kong's worked ivory leaves in this way, undocumented in the trade records. For these reasons alone, the data in tables 105-147 are at best minimum indications of the size of the worked ivory industry.

Table 148 sums international exports from as many sources as I have been able to accumulate information. Despite this incompleteness, they do encompass all the major ivory-working countries' international commerce. They may contain an element
of re-exporting whose magnitude cannot be obtained. Disregarding this and taking 1977 as the most recent year for which we have European records, Africa supplied 1% of the worked ivory exports, Europe 10% and Asia 98%. The given data form a large enough sample for these proportions to be representative of the international wholesale trade in worked ivory.

In 1977 the European countries contributed 13 tonnes to world exports of worked ivory. Trade sources confirm that 1978 was at least as good a year. If this is so, the 1977 volumes (less Holland’s — for which we have a 1978 statement) multiplied by the average 1978 worked ivory price (Table 149) will give grounds for estimating what the missing European contribution may have been to 1978’s overall worked ivory export value ($1,582,747.40). Combining this to the Far Eastern exports in Table 148, the minimum turnover of the international wholesale export trade in worked ivory will have been c.$35,402,452.74.

The most striking feature of this figure is that while we know it to be deficient to an unquantifiable degree, it is less than half the amount of the world’s estimated turnover value for raw ivory in the same year (Chapter 4: $82,000,000). If the working of ivory into artefacts was the primary reason for acquiring raw ivory, one would expect annual intake of raw A material to be converted into a finished product within the same or subsequent year. The value of wholesale exports of worked ivory should be the raw value plus the cost of processing, wholesaling and profit. The Chinese carvers have a rule of thumb (Chapter 6) which is that the wholesale price is made of 3 equal parts: 1) the cost of the raw material, 2) the cost of processing and selling, and 3) profit. This finds close agreement with data in Table 150 in which the price of worked ivory over 17 years averaged 3.4 times that of raw ivory (an average mark-up of 239%). Thus it is reasonable to have assumed that the value of the wholesale trade would be of the order of
3 times the material's raw worth, i.e. 3 x $82,000,000 \\
$ = $ 246,000,000. It is difficult to believe that our estimate \\
of c.$ 35,000,000 is low to the tune of $211,000,000 or 86%. \\
That amount of worked ivory could not have been missed or \\
consumed internally!

Ivory exporters do mark invoice values down, to relieve 
their customers of import duties and taxes. Trade sources 
suggest that this artificial depreciation occurs regularly 
and averages perhaps as much as 20%. If this has happened to 
our estimate of $35,000,000, the true value would be nearer 
$44,000,000 which is still far below the expected $246,000,000. 
The most logical explanation is that not all raw ivory is made 
available for working.

The idea receives further support from examination of 
Table 149, which shows clearly that over the past 17 years 
the difference between raw ivory prices and wholesale worked 
ivory values have steadily diminished from 355% in 1962-1965 
to 156% in 1974-1978. It gives substance to the ivory carvers' 
repeated plaint in Germany, India, Hong Kong and Malawi, that 
ivory is becoming too expensive to carve. Neither they nor 
their customers will be able to afford it. Such a situation 
would never have been the case if straightforward customer 
demand for worked ivory had been the reason for the pattern of 
price increases shown in Figures 26 and 27 and in Tables 104, 
149 and 150. This subject will receive further attention in 
the following chapter.

On the basis of the incomplete data available, it would 
seem that the turnover of the wholesale worked ivory trade is 
of the order of $44,000,000. Taking this as a base it is also 
possible to make a crude and modest estimate of the retail 
worked ivory trade. Mark-up between the wholesale and retail 
prices for ivory are usually large: of the order of several 
hundred percent. However if we take 100% as a working figure, 
the world retail trade will turn over $88,000,000 a year.
FIG. 27 COMPARISON OF WORLD RAW AND WORKED IVORY AVERAGE VALUES 1962-1978

- Average value of world imported worked ivory
- Average value of world imported raw ivory
To this can be added Hong Kong’s sales to tourists (25% of Worked ivory exported) which in 1978 will have been $7,744,500 = $95,744,500.

World turnover in the ivory trade can thus be summed:

- Raw ivory $82,000,000
- Wholesale worked $44,000,000
- Retail worked 95,000,000

$221,744,500
say $222,000,000

Many analysis could be made from the data in Tables 105–147. However, I will confine myself to three which I consider particularly pertinent to the ivory survey.

The first is to illustrate the Beilenson effect on the wholesale trade in worked ivory. The U.S.A.’s role as a customer for Hong Kong’s ivory wares is illustrated in Figure 28 and Table 15. From these it is apparent that the U.S. was taking a diminishing role in Hong Kong’s trade between 1970 and 1975. When the California law was enacted, the Beilenson effect is immediately apparent in 1976, 1977 and 1978 and traders confirm that there was a dramatic rush to stockpile worked ivory, which persists into the present.

The second point worthy of examination is whether India’s low imports are in keeping with her exports between 1970 and 1977. The data are assembled in Table 152 where exported worked ivory values are converted to Kg, then to equivalent weight of raw ivory needed to make the given weight of worked ivory. Thus between 1970 and 1976 India exported the equivalent of 75 tonnes raw ivory in worked from. During the same period she imported 156 tonnes of raw ivory. The surplus of 81 tonnes may have been taken internally by tourists. However, it is of note that during the 5 years 1972–76 the carved ivory equivalent exceeded the imported ivory by 60.3%. Thus the picture of inconsistency prevails.
The third and final issue is what can be gained regarding China's worked ivory trade, from buying countries’ import records. The sum of exports are presented in Table 153. Over the past 9 years China has averaged annual exports of worked ivory equivalent to 43 tonnes of raw ivory. As the list is incomplete, but likely to encompass the bulk of exports, this figure is in concert with the estimate that China may import 59 tonnes of raw ivory per annum.
Fig. 28 U.S.A.'s Imports of Specially Manufactured Ivory as % of Hong Kong's Exports 1970-1978
A. HONG KONG

Introduction — the background

The Hong Kong ivory trade evolved from traditions which reach back at least three thousand, five hundred years to the roots of Chinese culture. More than any other people, they have appreciated ivory as a medium for art. With it they enriched religion and illustrated their mythology and historical legend. In consequence, ivory and those who work with it have a place in Chinese society that has no ready Western counterpart.

From the Shang Dynasty of c.1600 B.C. until the nineteenth century, Chinese demand for ivory was predominantly internal. Its main use was, probably, the illustration of religious figures. Consumption was nonetheless substantial for by the ninth century it was an important trade item for the southern port of Canton. The Arab Soleiman observed that traders were forced to pay high import dues and that all tusks over 30 catties (c.18 kg) in weight had to be sold in an official market where undervaluation was common. To evade this, large tusks were cut into sections weighing less than the stipulated minimum. The extensive contact between China and Arabia between the 7th and 10th centuries suggests that many of the tusks brought to Canton would have had African origin, as "Arab" ivory is more likely to have been African than Asian.

In the wake of the opium wars of the last century, Western trade forced itself upon China in an unprecedented manner and in the process Britain acquired its tenure on Hong Kong. The same era saw Victorian Europe and America develop a fashion for Chinese ivory work. Exports to meet this rapidly overtook internal demand. It also brought about an increase in the number of people working with ivory, particularly in the vicinity of the ports of Canton, Amoy, Shanghai, Tientsin and Hankow, the largest increase occurring in Kwangtung Province around Canton.
Hong Kong's close proximity to Canton, combined with Britain's African and Indian interests, made it an inevitable entrepot in the flow of ivory into China. In appreciation of its strategic position some ivory craftsmen moved into the — British Colony, the better to pursue their trade. However, it was not until around the middle of the present century that Hong Kong became anything other than an appendage to, and staging post for, the larger ivory businesses on mainland China.

The Sino-Japanese war of the late thirties and early forties caused an inflow of ivory craftsmen to Hong Kong. This was greatly accelerated by the subsequent Communist/ Nationalist civil war and raised the number of ivory workers from c.100 who had existed pre-war, by an unspecified but very large amount (certainly by a proportion of several hundred percent). This massive immigration and concentration of talent in Hong Kong's free enterprise economy provided the foundations for the territory's modern position in the world ivory trade.

Institutions controlling the trade

1) The Hong Kong Ivory Manufacturing Workers General Union.

In 1947 some 200-300 ivory craftsmen banded together to form the Hong Kong Ivory Manufacturing Workers General Union. Its primary purpose was (and still is) to preserve the traditions of the trade and to look after the welfare of its members. An early aim was to ensure that they received fair returns for their work. To achieve this the Union established a schedule of piece—work rates for the range of tasks and items produced, giving craftsmen freedom to work as and how they liked and relieving employers of the liability of fixed salary payments.
As might be expected in a craft of great age, Chinese ivory workers are conservative and proud. Each aspect of production has its specialists. By custom a craftsman should concentrate on one process and seek fulfilment through attaining perfection in that field. Thus cutters (sawyers), on whom division of tusks into their most economical cuts depends, do not carve. Jewelry makers should not carve figures. Those making human figures would not make dragons, and an expert on ivory balls should not engrave. This compartmentalisation produced a co-operative, integrated trade in which specialists relied upon specialists. Sons tended to follow their fathers' footsteps and a five year apprenticeship had to be served to be accepted among one's peers as an ivory craftsman. A craftsman's family was very much part of a production unit with wives, daughters and sons all helping him in some way. It is this system that the Union seeks to safeguard and perpetuate. In this sense it is more a craftsmen's guild than a trade union.

Over the years the Union has grown and now numbers c.2000 members of whom c.1700 are of Cantonese origin and c.300 from Fukien. Members are aware that supplies are finite and that there is a limit to the number of workers who can make a livelihood from ivory. This and the wish to preserve their craft's traditions has led to a policy of restricting Union membership. Only those who have served an appropriate apprenticeship are admitted. Attitudes favour sons following their fathers into the body and are against outsiders.

Despite restriction of the Union's size, many elder members are concerned that their sons are failing to show interest in ivory craftsmanship as the long apprenticeship is unattractive when equally well paid jobs in other spheres need no comparable training. The number of apprentices coming forward indicates that a decline in Union membership is inevitable. There is thus an ambivalent situation in which the desire to keep the Union limited and exclusive is
counterbalanced by distress that the long-term welfare of the institution and its traditions are at risk through a fall-off in youth interest.

2) The Hong Kong and Kowloon Ivory Manufacturers Association.

As outlined earlier the 1940s saw large numbers of ivory craftsmen arrive in Hong Kong. They came from a society in which protocol and conforming to precedent were important, into a free-trade, Western influenced atmosphere. It permitted expansion of the craftsmen's horizons and some soon extended themselves beyond the limits set by their apprenticeships. The ambitious were able to purchase and sell others' work, take on employees, buy, import and deal in raw ivory and to wholesale and retail finished carvings locally and overseas. These activities went outside the original scope of the Ivory Manufacturing Workers General Union. Indeed they contained potential for conflict with the interests of less ambitious workers.

Realising this the new entrepreneurs acted to protect their widening interests. In 1966, they established the Hong Kong and Kowloon Ivory Manufacturers Association. (At the same time, it is worth noting that they retained membership in the Workers Union.)

The Association’s purpose is to guard the welfare of the ivory trade as a whole, as well as attend to the particular interests of its 50 or so members. These represent a cross-section of craftsmen, manufacturers, importers, exporters, and general ivory traders. In principle, it is open to anyone with a bona fide interest in the ivory trade in Hong Kong and upon payment of $21.5 entry fee and dues. In practice it has no non-Chinese members, and the majority of the Association’s members are men of long standing in the traditional ivory business. Only in very recent times have some younger men joined without the benefit of an apprenticeship in ivory craftsmanship. These tend to be the sons of the Association’s
founders, who have trained in running the family businesses rather than actually working with ivory. Their education and business experience has given them a broader knowledge of the modern world and its problems than has hitherto characterised ivory workers, making them a considerable asset to the Association.

Relations between the workers Union and the Manufacturers Association are somewhat strained. Reasons for this are several. The most severe problem facing the Union arises from instability in the price of raw ivory which has been a growing A trend since the late 1960s. During 1978 the cost per kilo rose by as much as 150%. The unpredictability of these trends has placed the traditionally independent craftsman in a difficult position. Overnight he finds that he must outlay three times as much to obtain his raw material, with no certainty that he can sell a finished produce at a similarly marked-up rate, or that prices may not have fallen by the time he has a product for sale. This compromises both his financial and artistic independence. To hedge against financial embarrassment he has to accept assignments on commission or employment from dealers sufficiently affluent to take risks. In consequence 30% of the Union's members are out of work, under—employed or forced into aspects of the trade they do not like. Incorrectly the Union believes that the Association's members are responsible for the increases in the price of ivory. Further friction arises from the Association's employment of unskilled workers in the production of 'junk' jewelry for an indiscriminate, unartistic market in the U.S.A. and Europe.

The Association is well aware of the problems facing the members of the Union. With their backgrounds there is still a great deal in common between the two organisations; indeed on some issues it is impossible to draw distinction between them. The Association's members are equally proud of the trade's long traditions and just as keen to see them perpetuated. Where they differ is on adapting the old system to the modern
world. The Association recognises that there has been polarisation between itself and the Union along employer-employee lines. While this was never planned, it is probably an inevitable consequence of operation in a free-enterprise system. However, polarisation received a powerful boost from attitudes between the U.S.A. and China after the Communist victory in 1949.

It was American policy to ban all trade with China. To ensure that Hong Kong could not act as cover for Chinese carved ivory to enter the U.S.A. their Government decreed that all Hong Kong produced carvings destined for U.S. sale had to have a comprehensive certificate of origin. To acquire this the carvings had to be made in U.S. Government approved premises. As the U.S.A. comprised the largest single ivory market for Hong Kong at that time, many craftsmen had little option but to comply. However, having to work under specified roods removed much of the individual's freedom and even more of his family's help. Unavoidably in these circumstances an employer/employee relationship developed between the owner of the premises (factory) and the concerned craftsmen. Though the need for ivory to be of certified non—mainland Chinese manufacture has now gone and there has been a reversion toward the older pattern of independence, the imposition had a lasting effect on the outlooks of those concerned. It is in the interests of the industry as a whole that some rapprochement is made between the parties.

3) The Hong Kong Government.

There are two Government Departments with specific responsibilities toward Hong Kong's ivory trade. The primary role is held by the Agriculture & Fisheries Department which controls the import and export of raw unworked ivory. The main purpose of this control is as an international measure to conserve elephants through the application of CITES formulae. To this end no raw ivory may be imported or exported into Hong Kong without a licence issued by the Department.
Contravention of these laws may result in prosecution, a fine and forfeiture of the ivory concerned. The Director of the Department may, without stating any reason, refuse to issue a licence to either import or export raw ivory.

Currently, and as a general rule, any application for a permit to import raw ivory will be granted. However, it is a condition of the permit that at the time the import is made the ivory is accompanied by an original, legal export permit from the Government of the exporting country. This permit is surrendered to the Hong Kong authorities at the point of import. The absence of a permit to export constitutes an offence rendering the consignment subject to automatic confiscation.

The second Government Department concerned with the ivory trade is that of Trade, Industry and Customs. Here, the responsibility is to ensure that worked ivory exported from Hong Kong conforms to CITES formulae through adherence to the Hong Kong Certificate of Origin system. Under the strictest interpretation of CITES requirements, every item made from ivory should have a certificate confirming its lawful origin. However, as such items number million, and as a single tusk can produce hundreds, such a requirement was clearly impractical. Instead manufacturers of ivorywares who wish to export under Hong Kong Certificates of Origin have to comply with the strict procedures to guarantee that their wares do not derive from unlawful ivory. These conditions include maintaining accurate and up to date books and records to show stocks, intake of raw material, production, wages paid, etc. Registered factories are subject to periodic detailed inspections by Government Officers. Contravention of the terms renders the guilty party liable to imprisonment for one year and a fine of c. $20,000.
Steps and structure of the trade

1) Volumes and values.

The Hong Kong Commissioner for Census and Statistics publishes a monthly bulletin giving details of the Colony's imports and exports. This contains data on the ivory trade which show

i) volume, value and origin of all raw unworked ivory imported into Hong Kong, 1952-1978

ii) volume, value and destination of all raw unworked ivory re-exported from Hong Kong, 1962-1978

iii) value and origin of all worked ivory entering Hong Kong, 1962-1978

iv) value and destination of all worked ivory imported then re-exported from Hong Kong, 1962-1978 and

v) value and destination of all ivory worked in and exported from Hong Kong, 1962-1978.

These records derive from import and export declarations made to the Hong Kong authorities at the time of import/export. Values and volumes are from data stated on the relevant invoices. These records cover the periods shown and are presented in toto in Tables 86, 87, 105, 106 and 107.

2) Importing.

According to the Agriculture and Fisheries Department records, 50 Hong Kong companies applied for permits to import raw, unworked ivory into Hong Kong in the period 23rd June (when the licensing system commenced) to 30th November 1978. It is believed that while this may not be a complete list of ivory importers, it is at least indicative of its order. Of the 50 firms, 1 was Japanese, 1 European, 12 Indian or Pakistani, and 36 Chinese.

The Japanese importer is mainly concerned with acquiring ivory for a parent concern in Japan and does not normally import into Hong Kong. The European was seeking ivory for use in jewelry manufacture and does not import regularly.
The Indian and Pakistani firms are among the oldest ivory importers in Hong Kong. Until the mid 1960s they dominated this aspect of the trade. Their sources of supply were from people of similar race and creeds (sometimes linked by family connections) who controlled the ivory export trade out of Eastern Africa through the ports of Zanzibar, Mombasa and Dar es Salaam. The Indo/Pakistanis lack the Chinese cultural connections with ivory, and trade in tusks because they have attractive commercial qualities. Most of them buy and sell ivory as a sideline or addition to other businesses. Though they follow closely the deliberations of the Association, none are members.

Since the mid 1960s, Chinese firms have progressively reduced the Indo/Pakistani command of ivory importing. This is a logical extension of the growth which led to the founding of the Ivory Manufacturers Association.

Traditionally the Indo/Pakistani importers sold their ivory to Chinese dealers, to factories or re-exported it. They did not involve themselves further in the trade. On the other hand many Chinese importers have close links with successive stages in the trade. Thus of the 36 recorded as having applied for permits to import ivory, 9 (25%) were also registered as manufacturers of ivory with the Trade, Industry and Custom Department's ivory control scheme under the Certificate of Origin system.

3) Dealers.

Ivory passes from importers to dealers. These are an unspecified number of Chinese firms who do not themselves import, but buy raw ivory on its arrival in Hong Kong. It is then resold to factories. The dealers do not stand out as a clear category in the business. Much dealing is in fact done as a "sub-department" of other involvements in ivory (e.g. manufacturing).
4) Factories.

The term factory is slightly misleading as it suggests a large institution. Many ivory factories are not much more than family affairs. According to the Trade, Industry and Customs Department (TICD) in 1976 there were 121 factories working ivory. In 1978, 156 were registered with the TICD. This increase may include some missed out of the 1976 estimate and is not wholly representative of new factories.

Factories obtain their ivory through direct import, buying from importers or buying from dealers. In 1976 one out of 121 imported all its ivory from overseas, 7 purchased both overseas and locally, while 113 purchased from dealers and importers. In 1978 the number engaged in direct importing on their own account had risen to c.34 (an increase of 425% over 1976).

Once ivory has been acquired by a factory it is either worked by craftsmen on the premises or farmed out to an independent craftsman to be made into the required articles, for a fee. In some cases craftsmen are permitted to sub-contract their commitments to other workers.

Data obtained from the Trade, Industry and Customs Department show that the ratio of work carried out on the factory premises had an inverse relationship to the size of the factory. This is illustrated in the following table:

<table>
<thead>
<tr>
<th>1 Employment Group Size</th>
<th>1-9</th>
<th>10-19</th>
<th>20-49</th>
<th>50-99</th>
<th>100-199</th>
<th>200+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Craftsmen working on premises %</td>
<td>74.0</td>
<td>52.8</td>
<td>19.1</td>
<td>10.8</td>
<td>5.9</td>
<td>2.8</td>
<td>17.8</td>
</tr>
<tr>
<td>3 Craftsmen working off premises %</td>
<td>26.0</td>
<td>47.2</td>
<td>80.9</td>
<td>89.2</td>
<td>94.1</td>
<td>97.2</td>
<td>82.2</td>
</tr>
<tr>
<td>4 Median of employment group size (1)</td>
<td>4.5</td>
<td>14.5</td>
<td>29.5</td>
<td>74.5</td>
<td>149.5</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>5 No. of people indicated by calculating what (2) is of (4)</td>
<td>3.0</td>
<td>7.7</td>
<td>5.6</td>
<td>8.0</td>
<td>8.8</td>
<td>5.6</td>
<td>6.5</td>
</tr>
<tr>
<td>6 % (1) is of total 121 factories</td>
<td>24</td>
<td>23</td>
<td>33</td>
<td>14</td>
<td>5</td>
<td>1</td>
<td>100</td>
</tr>
</tbody>
</table>
It illustrates that irrespective of the size of the factory it is unlikely that there will be more than 9 craftsmen working on the premises and that the average is between 6 and 7. This pattern has its roots in the traditional independence of the Chinese ivory men. It is based on a family 'core' of father and 5-6 direct family or close relatives. After this, size of the 'family' is related to the amount of work which can be 'farmed out' on contract or commission to others. This pattern is apparent on any visit to factory premises. Clerical, administrative and other staff have a conventional linear relationship to the size of the factory: the larger the factory the greater the proportion of such staff employed. This is illustrated below:

<table>
<thead>
<tr>
<th>Employment</th>
<th>Average staff (Clerical, Admin. porters etc.) excl. Craftsmen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Size</td>
<td></td>
</tr>
<tr>
<td>1–9</td>
<td>0.9</td>
</tr>
<tr>
<td>10–19</td>
<td>3.2</td>
</tr>
<tr>
<td>20–49</td>
<td>3.7</td>
</tr>
<tr>
<td>50–99</td>
<td>6.3</td>
</tr>
<tr>
<td>100–199</td>
<td>19.8</td>
</tr>
<tr>
<td>200+</td>
<td>14.0</td>
</tr>
</tbody>
</table>

Disposal of completed ivoryware is usually related to a factory's size. Small units may sell to larger concerns with export orders, or to the many small ivory retailers that abound in Hong Kong. Large concerns retail and wholesale locally and overseas. The bigger traders often have several ivory shops in Hong Kong and some have their own retail premises in the U.S.A. and elsewhere.

5) Craftsmen or Outworkers. These are the people represented by the Hong Kong Ivory Manufacturing Workers General Union. Over 70% are independent or semi-independent, working on their own premises. They produce ivoryware on commission for factories, or independently for sale on their own account. It is not unusual for a craftsman to work for several factories simultaneously. The manner in which craftsmen acquire ivory is related to their reputation and standing with the factories with whom they do
business. A factory will give a man of high standing and proven industry such ivory as is necessary for him to meet their requirements. In other instances the craftsman may have to buy the ivory from a factory with an understanding that if he produces the required items within a stipulated period and to an acceptable standard, it will be bought back from him at a predetermined price. If he defaults he is at liberty to sell his product elsewhere, for the factory will have been covered from loss by his original purchase of the ivory. If a craftsman has capital and the will to buy ivory on his own account, he docs so and sells his products as he chooses.

6) Employment.
The Ivory Workers Union believed that there were 200 non-member craftsmen in addition to their membership of 2,000. The total of c.2,200 craftsmen was considered reasonable by both Government and the Association. The Union also believed that the average man would have between 3 and 5 dependants which, if it is so, means that between 8,800 and 13,200 people were wholly or partially reliant on ivory crafting in 1978.

The Union and the Association believed the average ivory carver earned about $430a month or $ 5,160 per annum, making an annual payroll of c.$11,352,000. In addition to the craftsmen there were c.500 administrative, clerical and other staff supported by the trade, each earning on average $2,780 per annum, making an additional $1,390,000 to bring the trade's gross annual payroll to slightly under; $33,000,000 (HK$ 60,502,000).

7) Demand for ivory in the carving industry.
Ideas vary on how much ivory is required to keep Hong Kong's ivory craftsmen fully occupied and the industry healthy. The Manufacturers Association ventured a figure of 240 tonnes per annum.
The Workers General Union estimated that a supply of 0.5-1.0 kg was needed per craftsman per working day. On a 250 working day year to allow for public holidays and weekends, this would call for between 275 and 550 tonnes of raw ivory annually. These beliefs can be tested against the following information derived from data given to me by the Trade, Industry and Customs Department, which was in turn obtained from 121 factories in 1975.

<table>
<thead>
<tr>
<th>Employment Group Size</th>
<th>1-9</th>
<th>10-19</th>
<th>20-49</th>
<th>50-99</th>
<th>100-199</th>
<th>200+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kg consumed</td>
<td>9,320</td>
<td>27,555</td>
<td>70,936</td>
<td>68,157</td>
<td>72,714</td>
<td>6,499</td>
</tr>
<tr>
<td>No of craftsmen</td>
<td>127</td>
<td>290</td>
<td>1,173</td>
<td>1,110</td>
<td>659</td>
<td>216</td>
</tr>
<tr>
<td>Kg/craftsmen</td>
<td>73.99</td>
<td>95.02</td>
<td>60.47</td>
<td>61.40</td>
<td>110.34</td>
<td>30.09</td>
</tr>
<tr>
<td>Kg/craftsmen per working day</td>
<td>0.29</td>
<td>0.38</td>
<td>0.24</td>
<td>0.25</td>
<td>0.44</td>
<td>0.12</td>
</tr>
</tbody>
</table>

From this data it is obvious that no factory in any employment group category provided its workmen with more than 0.44 kg of ivory per day. This x 2,200 workers x 250 working days per annum = 240 tonnes a year consumption. That this is the figure quoted by the Association is probably no coincidence, for the data must have come from its members in the first instance.

Another form of analysis is given in Table 154 in which Hong Kong's exports of worked ivory are converted back to their equivalent of raw ivory. This is not a straightforward procedure for the worked exports are only published in value and not volume. Fortunately some of the importing countries for which we have data publish both the volume and value they receive from Hong Kong. Summed separately for the years 1975, 76 and 77, the values of their Hong Kong imports in each case are 50% or more of Hong Kong's exported value (73%, 53% and 50% respectively). It seems reasonable to assume that the corresponding import volumes will represent similar proportions of Hong Kong's volume of worked ivory exports, which permits an estimate of the overall export weights.
While Hong Kong distinguishes between exports of ivory carved locally and worked ivory imported and then re-exported, no such distinction is apparent in the receivers' import statistics. All Hong Kong imports fall into the same category, thus the exported volume calculated in the previous paragraph will contain a certain amount of ivory worked outside Hong Kong. This can be accounted for by subtracting a proportion from the exported volume, which is similar to the fraction worked ivory imports are of home-produced exports.

To this modified figure must be added 25% to account for in what tourists take undocumented, and the whole increased by a further 20% to represent wastage during the carving process.

From this rather laborious calculation we get estimates that 188 tonnes of raw ivory were used in carving in 1975, 261 tonnes in 1976 and 315 tonnes in 1977 — an annual average of 255 tonnes over the three years. This is within 6% of the 240 tonnes estimated by the Association, giving credence to their claim. However, the 3 years do suggest a rapidly rising requirement - as much as 68% over 3 years. The 1977 estimate of 315 tonnes would represent 0.57 kg per worker per working day. This is within the requirements claimed by the Workers General Union. In 1978 the figure could have been slightly higher. However the upper limit of 1 kg per man per working day suggested by the Union would entail an annual consumption of 550 tonnes of raw ivory per annum. This does not seem realistic in the light of the available evidence. From the information to hand I believe that in 1978 Hong Kong's carvers consumed more than 300 tonnes of raw ivory, but this figure is not representative of the 11 years 1968-1978. Indeed the average is likely to have been less than 200 tonnes.

8) Mechanisation.

Traditionally Chinese carvers used hand or foot powered drills and lathes and polished ivory manually. Now the majority use electrically driven systems. This has speeded up
the carving process considerably. It used to take a craftsman 2 weeks to make a matched pair of medium sized Emperor and Empress figures. Mechanisation has reduced it to one week. A set of 6 concentric balls — the outer little bigger than an orange — took 5 days to make. Now it takes 2. Modern techniques have therefore halved the time taken to make articles. In theory therefore, the same work force can handle twice the amount of ivory processed in a given time. Further mechanisation and technical improvements may take the workman's capacity well above present limits.

9) Stocks or Hoards.
The 1976 Trade, Industry and Customs Department believed that 121 factories examined carried the following stocks:

3 (2.5%) had none
48 (39.7%) sufficient for 2 months work
31 (25.6%) sufficient for 4 months work
19 (15.7%) sufficient for 6 months work
20 (16.5%) sufficient for 9 months work or more.

During the current survey one informant believed that stocks held in 1978 were greater than in 1976, with many factories holding a 6 month stock and quite a few having up to 2 years' supply.

On the 31st October 1978 stocks registered with the Trade, Industry and Customs Department under the ivory control scheme for Certificates of Origin for exports to the U.S.A., were recorded as:

Raw ivory 107,818.09 Kg
Semi-finished products 4,066.23 Kg
Finished products 12,481.29 Kg
Total 124,365.61 Kg

In the opinion of the Manufacturers Association the value of all stocks of ivory in Hong Kong were thought to be $30,864,000 (HK$ 150,000,000).
Referring to import and re-export of raw ivory records for the period 1962-1978 issued by the Commissioner for Census and statistics, Table 88 shows a total of 6,131 tonnes was imported while 1,740 tonnes (28%) were re-exported. The balance of 4,391 tonnes have either been rendered into worked ivory, re-exported in the ignorance of the Commissioner for Census and Statistics, or are still in Hong Kong. The most likely answer is an amalgam of all three possibilities. While the carving industry of 1978 might take over 300 tonnes a year, it is most unlikely that even 200 tonnes per annum were carved in the first half of the 18 years 1962-1978. However, if 200 tonnes is taken as the average, then there is still a large deficit of c.991 tonnes to account for. From what I saw in Hong Kong one point is clear: if the bulk of this "missing" ivory is held as stock, it is well dispersed and not in the hands of one or few individuals.

The only evidence of a single firm ostentatiously hoarding was owned by a group of Indians from Kenya. In an attempt to dominate the world market in c.1973, they accumulated between 100 and 200 tonnes, but failed in their endeavour. They have left Hong Kong.

10) Conversion Raw to Worked Ivory.
Of tusks carved the proportion lost as irrecoverable waste varied from 15-50% of the original piece of ivory. The more usual range within these limits was 20-25%. Mechanical carving in which pieces can be ground down to the required shape is far more wasteful of ivory than older, manual methods. However this notwithstanding, every effort is made to turn all ivory waste to some good use. Indeed two factories in Hong Kong specialise in importing ivory waste from Japan for the manufacture of small articles (e.g. beads).

11) Pricing Worked ivory.
As a very crude rule of thumb the price of an article of worked ivory can be divided into three equal components:
a) the cost of the raw material ·
b) the cost of labour
c) profit.

However it must be emphasised that this is a very general approach. Mass produced jewelry items such as beads might wholesale for as little as 15% over the price of raw material (that is sound ivory and not the cost of waste from which they are made, which is far cheaper!). On the other hand items of artistic merit might sell for several thousand times the cost of the material and labour.

12) Internal purchases.
Hong Kong residents buy little ivoryware. However according to dealers, tourists purchase a quantity equivalent to 25% of the worked ivory exported annually. This estimate is close to the 28% claimed in 1977 by the Trade, Industry and Customs Department.

A certain amount of imitation ivory — a plastic/bonemeal compound — is also sold to tourists, who unwittingly think it genuine.

13) Illicit trade.
While the international news media and conservation lobbies have created a widespread impression that Hong Kong is the centre of massive illegal ivory trafficking, hard data on the subject are remarkably few. The main reason for this is, of course, that until June 1978, trade in tusks was virtually unrestricted. It was a case of where no laws exist, no laws can be broken!

Since June 23rd 1978, Hong Kong has implemented CITES procedures to regulate the import of elephant ivory. In the 5 months June 23—November 30 1978, there were only four unequivocal instances of attempts to evade the law. Two entailed forged documents, and two concerned the same man in Zaire sending a box of ivory labelled "personal effects" to a Hong Kong ivory
dealer. Both consignments (of c.200 kg) were detected and confiscated.

Occasionally in the past ivory has been detected coming into Hong Kong in the guise of some other commodity but such instances have been rare. In all attempts the concealment has been made to hide the commodity from the African authorities and not to dupe the importing country's officials. However, despite the incentive in Africa, the dealers believed that "concealed" ivory was uncommon. The reasons for this seem straightforward.

While an occasional tusk, or small batches, would be easy to smuggle out of Africa, the trade of consequence concerns ivory by the tonne. This and a tusk's shape make large quantities difficult to conceal. In the circumstances it is far easier to acquire corruptly issued documents and export ivory as "legal" from Africa, than to run the risks of having a concealed consignment intercepted. Thus, while there can be no doubt that much ivory traded has illegal origins, this is blurred and hazy, or often undetectable by the time it has reached the overseas importer.

The foregoing notwithstanding, some of the importers with close African connections are not only aware of the illicit A status of ivory they import, but assist actively in getting illegal tusks out of Africa. The presentation of clearly forged documents (one company) and attempts to hide ivory from me (another company) left no doubt about their complicity in and knowledge of illegal ivory ex-Africa. However this evidence pertained to 2 firms out of 50. There are undoubtedly more, but the salient fact is that they are the minority, not majority of Hong Kong's ivory importers.

Many more of the importers bringing ivory directly from Africa, make payments to their suppliers through deposits in 3 banks elsewhere than Africa. There are those who are incensed
by this, claiming that it deprives under-developed Africa of its just dues - which is true. Conservationists hold up this reasoning as an element in the case against any trade in ivory. However a larger, if less vocal body of opinion (international traders) believes payment into foreign accounts to be a just and inevitable consequence of inequitable economic laws in Africa. The facts, where Hong Kong and ivory are concerned, are that no Hong Kong law prevents payment where payment is requested, and that irrespective of opinion on banking payments outside Africa, the practice is a feature of international trade, to which ivory is no exception.

**Elephant conservation**

The Hong Kong Government is committed through CITES to regulating the trade in elephant ivory. An import/export licensing system for raw ivory has been established. Licensing of worked ivory was considered but in view of the impractically large volume of paper work this would entail (each item produced would require a separate document), the idea was abandoned. Nevertheless a system of issuing certificates of origin under Hong Kong’s stringent Certificate of Origin system has been set up. This means that companies exporting to countries which abide by CITES rules (and which form the bulk of Hong Kong's worked ivory market) may only use African elephant ivory of proven lawful origin.

As the law stands, Hong Kong’s as well off to control its trade in ivory, as any other country. Indeed its position is better than most. As yet, and in view of its very large wildlife products trade, it has inadequate staff in the Department of Agriculture and Fisheries to enforce the laws if there were widespread efforts to break them. However, more personnel are to be provided and at this point in time there do not appear to be concerted efforts to by-pass the laws.

The ivory traders and craftsmen, as represented by the Association and the Union, are well aware that growth in the
industry cannot continue as it has over the past 30 years. All parties appreciated that there is a point at which supplies must level out or start to decline. Not only was it sound business sense to contain trade to sustainable or legally unavoidable offtakes, but it was contrary to many elements of Chinese culture to condone wanton destruction of animal life. _A Traders and craftsmen were keen to know what a sustainable output of ivory ex-Africa might be. Both Association and Union affirmed that they would support all sensible (with strong emphasis on sensible) measures to conserve elephants.

The Ivory Manufacturing Workers General Union put forward several suggestions for bringing some stability to the trade. These were that:

1) The Hong Kong Government should make the Union the sole legal importer of ivory. In turn the Union would distribute the material among craftsmen on a co-operative basis.

2) If the foregoing was not possible, the Government should ban the re-export trade in raw ivory (on the theory that because merchants could sell raw material outside Hong Kong they had greater scope for driving prices upward).

3) The Government should peg profits on the sale of raw ivory (but not the finished product!) to a maximum of 20%.

Central to these proposals was the belief that the Association members were responsible for putting up the price of raw ivory, which was incorrect (as will be shown elsewhere in this report). However, it is of consequence to note that if the Union hasn't quite got the issue in focus, it nonetheless appreciates what the issue is: the price of ivory. Lower the price and the elephant hunting rate would decline.

Presenting a rather broader viewpoint, the Ivory Manufacturers Association held that the key to the problem was in African hands. If the Africans were unable to enforce their own laws, then no amount of action overseas would resolve
their problem. Countries might refuse to allow import of ivory without valid export permits from the land of origin, but the Association pointed out that most ivory already was covered by permits. Who could determine whether these were corruptly issued, other than those in the issuing country?

Accepting that internal African control was unlikely to be effective, or that whatever actions were taken on the continent would need international support, the Association expressed willingness to try any sensible measure to help. It was agreed that output does seem to respond to price changes and that if these drop, production would dip. However members were pessimistic about achieving control over the price of ivory.

The idea of an international ivory cartel was debated. Indeed the Association had independently considered the idea. Any unified attempt to lower the price of ivory would fail completely if it was not adhered to by all traders. Further, the one or few who broke the unified approach would stand to make immense gains. The Hong Kong traders were very dubious as to whether their Japanese counterparts would enter into a cartel agreement.

If a cartel was to be established, it should be developed in two stages. The first would seek to get a unified buying policy established in Hong Kong. If this was successful the system could be extended to take in foreign ivory dealers.

Related to this first step was the idea that all ivory imports into Hong Kong were placed in the hands of a single organisation. If this was structured as a Company in which all parties, Government and Union included, could buy shares, and protect their interests, it could then auction its wares periodically in Hong Kong, to both local and international traders.

It was held that the idea had possibilities, but would need further discussion with Government and the international trade.
Throughout my contacts, the Association retained its pessimism over controlling ivory production from outside Africa. I must emphasise that this was clearly rooted in the problems involved and through no desire to put a brake on attempts to stabilise ivory production.

The possibility of holding an international conference of ivory traders in Hong Kong to which selected specialists from other fields (such as law, international trade and biology) might be invited, was consideration.

A point made independently by both union and Association members was that price increases in ivory were directly stimulated by anti-trade activities in the U.S.A.
B. INDIA

This chapter is based on research and a report prepared for the ivory survey in March 1979 by Dr. E.B. Martin. His results have been added to and re-arranged slightly to integrate them into the matrix of the study.

Although we are not certain when Indians started carving `ivory, it has played an important part in the culture for centuries. Archaeologists in Rajasthan have found evidence of its use at least as early as the 1st century BC. Hindu brides required ivory bangles much as western women demand wedding rings. These bangles were made in the Cutch - hence the term Cutchi for bangle ivory (see Chapter 2). By the 18th century, when many maharajahs and other princes had consolidated their political and economic control of the sub-continent, Indian use of ivory had gained world renown in carvings, paintings and furniture inlays.

Asian elephants have of course supplied some of India’s demand for ivory. In 1875-77 annual supplies from this source were between 4.1 and 7.7 tonnes (Holder 1886). A certain amount of this did not necessitate the death of an animal. Tusks grow throughout life and the Indians periodically sawed sections off those on their tame elephants. The stub was bound with a brass ring to prevent splitting, and the process repeated every 8-10 years (Holder op. cit.) In 1978 the Indian Forest Department recovered 3 tonnes of Asian elephant ivory. It is clear that today and in the past Asian ivory has met only a small proportion of Indian demand; in the last 150 years, perhaps as little as 3-5%. The bulk must therefore have come from Africa. An influence in this direction is the Indian carvers’ preference for African ivory as they believe that it does not split so easily as Asian elephant tusks. Today all ivory imported into and exported from India must, by law, be from African elephants. No international trade in Asian elephant ivory is permitted under CITES.
From Chapters 1, 3 and 4 and Tables 35 and 82, it is clear that India has until very recent time been one of the world's major ivory markets. In the mid-late 19th century it was importing up to 250 tonnes a year, and may have approached this mark in previous centuries. Imports declined early in this century to average c.72 tonnes a year in the 1930s. However, they regained their former 19th century peak during and immediately after World War 2. Since 1948 ivory imports have declined. From 1960-61 to 1976-77 the annual average was 37 tonnes and since 1973 has not exceeded 10 tonnes.

From at least the 1830s until 1964, Zanzibar was India's main ivory supplier. The political revolution on Zanzibar in 1964 brought the association to an end and the suppliers between 1964 and 1973-74 became Kenya, Uganda and Tanzania (combined they provided 99% of India's demand). Since 1973-74 middlemen in Europe, Dubai and Hong Kong have supplied proportionately more, about 47% of the total.

The reasons for India's apparent decline in the ivory trade are several. Firstly, since independence the Indian Government has sought to conserve foreign exchange by limiting the import of luxury goods including ivory. To do this it has not only enforced stringent exchange controls but demanded a high import duty on raw ivory - in 1978 this was levied at 120% of value. In contrast other ivory importing countries levy no A (or very slight) import duties on raw ivory. Secondly, merchants elsewhere — e.g. Hong Kong — have been prepared to pay higher prices. Thirdly, India's ratification of the Washington Convention calls for both imports and exports to be covered by special permits. These can only be obtained from New Delhi and constitute a strong bureaucratic disincentive to trade in ivory.

The importation of raw ivory into India is handled mainly by 10 companies who specialise in the business. More than half of them are in Bombay, the balance in New Delhi. At least two
have operated for more than 50 years. Dr. Martin visited one in Bombay that was established in 1901 which, typically, has subsidiary operations, i.e. small factories where ivory is worked and shops around the country retailing numerous ivory items.

Ivory objects are sold in every part of India with the largest concentrations in the main tourist centres: Bombay, Madras, Jaipur, Delhi, Bangalore and Calcutta. In almost every deluxe and first class hotel in India there is a shop selling tourists ivory trinkets. There are, as one would expect, tremendous variations in prices for similar items sold in hotel shops, airports and state handicraft establishments. On average, however, one would pay $15 for a plain bracelet, $35 for a carved bangle, $175 for a 12 inch Hindu statue, $350 for a 12-inch nude female figure, $110 for a magic ball (set of concentrics), $1,250 for a medium—sized rosewood table inlaid with ivory and $45 for a modern pornographic painting on ivory. The most expensive item Dr. Martin saw in December 1978 was a 40 x 27 inch sculpture of a chariot pulled by 6 bullocks. Its price was $18,750. These prices reflect the cost of raw ivory in India which in December was $187 (Rupees 1,500) per kg, the difference between this and the world market price of $74.42 being mainly due to the high 120% Indian import duty.

85-90% of Indian ivory work is destined for export or the tourist trade. Tourists need no permits for ivory items acquired in India and taken out with them.

Despite the restrictions and taxes on ivory, India still has more ivory carvers than any other country including Hong Kong. Dr. Martin estimated that in December 1978 there were 7,200 carvers (craftsmen who spend at least 50% of their working time on ivory). However, he gathered that this is probably half the number who worked in ivory a decade ago. Decline notwithstanding, it is difficult to see how current imports can keep 7,200 men occupied for even 50% of their time.
It is also difficult to accept that in the years 1972-77, more worked ivory was exported, than legal raw ivory imported.

Table 152 gives the value of India’s worked ivory exports divided by prevailing average worked ivory price to give volumes of raw ivory equivalent, for the years 1970-76; these are then compared with recorded imports or raw ivory during the same period.

Referring to Table 82, the last 4 years of import records give an average of 5,600 kg raw ivory per annum. This would in turn average 0.78 kg per carver per annum. Even if each man only devoted half his working days (125) in each year to ivory, his consumption would be 0.006 kg per day. With a wastage of between 0.12 kg (15%) and 0.39 kg (50%) based on Hong Kong data, the average workman would annually produce a result weighing between 0.39 kg and 0.66 kg - the weight of a medium sized statuette, worth between $175-350 when retailed to a tourist. On the basis of official import figures it is hard to accept that the industry would continue at all on such marginal imports. The implication is that imports of raw ivory are in fact very much larger than indicated in the trade statistics.

All carvers are men, the majority Hindu. Most of them work out of their own homes and few receive a salary. Since ivory is so expensive, few craftsmen can buy it to work on their own account. Instead they are supplied by merchants who pay for the finished carvings on a piece-work basis. A few craftsmen working for the larger companies are provided with a place to work, tools and food, but they are exceptions. A Hindu god carving seven inches in height, will take one man 10-14 days to complete, for which he would be paid $36. Craftsmen’s earnings range from $24-242 per month.

In northern India modern ivory workers use electric lathe machines (which were gradually introduced after World War 2), and only put on the finishing touches to their carvings by hand.
Furthermore, the items from these northern areas — Delhi, the Punjab, Rajasthan and Bengal — consist of the more mundane types of bangles, lamps, chess sets, paintings, miniature Taj Mahal replicas, letter openers, necklaces, magic balls, ear-rings and salt and pepper shakers.

In the south, ivory carvers shun machines and only use hand tools (chisels, rasps, drills, files etc.) Their workmanship is of a comparatively higher quality and more individualised. Of course it takes longer to produce an ivory carving by hand, so despite the fact that there are more craftsmen than in the north of India, considerably less ivory is worked there.

The main centre for ivory carving in the south is Trivandrum, the capital of Kerala. Religious sculptures are the most common items and include not only Hindu gods, but Christian saints and Crucifixion scenes. The Trivandrum craftsmen are, moreover, well known for carving intricate figures on whole tusks.

Notwithstanding the inaccuracies which undoubtedly exist in the records the ivory traders of India are pessimistic about their future. They do not have enough raw ivory to supply the 7,200 carvers and feel that they cannot afford the present prices of legally imported ivory.

The craftsmen can be re—trained to work in other media. Their apprenticeship requires some 8 years, but after this, they can pick up wood carving in a matter of 3 months. Many of them are now carving in sandalwood, and earn approximately the same amount of money as they could in working ivory.

The local market shows little Indian demand for ivory pieces, although prior to World War 2 it was considerable and in particular catered for Hindu brides' bangles. This has now changed as, except in Gujerat and Rajasthan, Indian women have become 'modern', preferring jewelry of plastic, gold and silver.
Raw ivory has never been stored for investment purposes or as a hedge against inflation, nor do ivory traders hold more than a 6 month supply at any one time in India, though one might be forgiven for assuming that they did through consideration of Table 152 which shows imports of 120 tonnes in 1970 and 1971, while the equivalent of only 17 tonnes was exported.

The Indian Muslims do not care for ivory at all, as they consider it dead animal matter.

In conclusion, the trade has fallen to a relatively low ebb due to sharp price rises, heavy government taxation and the fear of further impending restrictions. Carvers are turning their skills to other media. What they still produce panders to foreign buyers, often without taste, who accept vulgar copies of masterpieces and who — Spaniards in particular — encourage and demand pornography on ivory plaques, instead of supporting creative artistry. What a travesty of one of India's finest traditions!
D. MALAWI

Malawi is perhaps unique amongst African countries in that it does not permit the export of its own raw ivory, but insists that it be manufactured internally. This policy which only became official in 1973, was possible because there was a body of indigenous ivory carvers already at work.

These carvers have featured in Malawi for most of this century. However their style and choice of subjects is strongly Asian, and I believe that the craft developed under the supervision of one or several Sinhalese carvers who came to Malawi many decades ago.

As in Hong Kong, India and Germany, the Malawi carvers are distressed by current soaring prices for their raw material.
In the United States ivory has been imported for over 200 years for a variety of uses. Initially, as the north-eastern seaboard states became industrialised, its use was largely utilitarian — for combs, billiard balls, piano—keys, pistol grips and knife handles. In 1843 J.P. Waters, U.S. Consul to Zanzibar, commented that two Connecticut comb factories buying ivory from the Salem merchants, cut over 454 kg a week apiece, without meeting all their orders. In this respect its use was similar to the evolution of the British industry. However, after 1914, it shifted to aesthetic uses in artworks. The utilitarian functions of ivory have been supplanted by plastics. However, these cannot usurp its role in scrimshaw, jewelry and other art which depend on the inherent value of ivory, much as gold jewelry depends on the value of gold.

Scrimshaw is a unique American art form dependent on ivory, which evolved in the 18th and 19th centuries as a pastime for whalers spending months or years on the high seas. The working definition of scrimshaw has changed over the years. Originally it was considered a carving of whale bone or teeth. In the early 1900s the definition shifted to indicate a work of art from a sperm whale tooth, whale bone being excluded. Today, in scrimshaw includes works from either sperm whale teeth or elephant ivory and those who practise the art are scrimshanders.

The introduction of elephant ivory into scrimshaw has come about through the decline in availability of sperm whale teeth. Thus today most scrimshaw is of elephant ivory. A distinct form of scrimshaw is traditional in Alaska with the use of walrus teeth. Here too, the original material is diminished in supply, and being substituted with elephant tusks. The demand here is for small tusks of 1-3 kg which resemble walrus teeth.
On 1st July 1975 the United States ratified accession to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The main source of ivory, the African elephant, was listed as an Appendix II species, thereby requiring party nations to adhere to a permit system in which elephant ivory had to be accompanied by a permit issued by the country of origin. However CITES did not prohibit imports from any country. In 1976, at the instigation of A. Beilenson, the State of California instituted a ban on all ivory imports. This action caused a wave of speculative buying in which one Californian brought in more than 18 tonnes of raw ivory. It was widely felt in the ivory trade that the ban would become nationwide.

In 1978, under pressure to create a national ban, the U.S. Department of the Interior’s Fish and Wildlife Service listed the African elephant as a threatened species and placed special restrictions on the ivory trade in the United States. After June 11th 1978, American firms could only import ivory (and other elephant products) from nations that were signatory to CITES. In addition, all ivory must have originated in a CITES party nation which in effect limited imports to those from Botswana, Zaire and South Africa.

The attempt to totally prevent the importation of ivory continues with Representative Beilenson having introduced a Bill (H.R. 2826) to prohibit the importation or exportation and certain other transactions involving elephant products.

Motivations behind efforts to eliminate the United States from the world ivory trade are dubious at best. Many Americans are philosophically opposed to the utilisation of wildlife species for any purpose and unfortunately try to force this belief upon others. The belief stems from a number of misconceptions cultivated by the American news media.
With the historical background and assembled data we can now consider some wider aspects of the ivory trade.

No one has successfully explained our attraction to ivory. It seems revered wherever it occurs, whether from walrus in the Arctic or whales in the South Pacific. The attraction is too widespread to have been the product of cultural contagion. In this it is like gold. Things are of value if made of ivory; ivory is not valued because things are made from it. Thus it has survived industrial replacement for 19th century uses and demand for it is perhaps greater than ever. Whatever the primordial reason for our fascination with ivory, it is this which underlies its many roles in human affairs. This is so spontaneous that it is virtually impervious to changes in fashion, mores and politics, convincingly borne out by the historical record.

I have held for some time that ivory was sought for more than conversion into objects of art or adornment. The case has yet to be conclusively proved. However, the observations in Chapter 5 that the international transactions in worked ivory are very much less than the expected turnover; that those accountable are even less than the turnover in raw ivory and that the price of worked ivory is not keeping pace with the increases in raw ivory value, strongly support the contention. The situation would appear to be analagous to the role of Gold-smiths and jewellers in the gold trade. They do not set the price of gold. They have to go along with values dictated by much broader economic forces, over which they have no control whatsoever. If art and adornment were the sole or major uses of ivory, the carvers and their customers would determine prices in a simple supply and demand relationship. That the ivory workers feel jeopardised to the point where many believe they can no longer continue in business because prices are too high, is convincing evidence that demand for art and adornment does
not set the price of ivory. In the absence of any industrial use the only logical alternative is as a medium of 'investment'.

With its very long history of value, which has survived centuries of political and economic change, ivory is a logical commodity to hoard. While difficult and costly to obtain, it has always been available in vast supply for those with the means to get it. However belief that supplies were at last giving out would exacerbate the incentive to invest in it. Of all animal commodities it is particularly susceptible to an upward Beilenson effect on price. In view of the crescendo of "concern" over the status of the African elephant that has built up during the past 15 years, the incentive to invest in a precious commodity which can only become more precious (not only in proportion to economic inflation, but beyond this through rising scarcity) will have been severe.

Thus throughout this survey I have sought the hoards. Evidence has been hard to come by for good reason. A hoard would represent a substantial accumulation of personal wealth and in the same manner of bank accounts, be private. Taking my own case, I would never divulge my personal wealth let alone throw it open to inspection, to some nosey Parker enquiring on behalf of a vociferous, hostile conservation public. This understandable attitude to the privacy of wealth notwithstanding, I did identify one stock of 35 tonnes of ivory held purely and simply as an investment. I saw 20 others in Hong Kong and Europe which grossed over 60 tonnes — ranging from 0.4 - 15 tonnes in size. However, these were held as large buffer stocks for manufacturing enterprises as well as speculative investments. Some of the ivory had been held over long periods for not only did I see a tusk which I had personally sold in Uganda in 1966, but also some of the same era from Tanzania. One tusk had been in the holder's possession for 23 years.
It was generally accepted that stocks were higher in 1978 than at any time previously. The reasons given varied, but were obviously influenced by the belief that the prices of ivory must, in the long run, continue to rise. The primary stimulus to this seemed to be unease over general economic conditions. However, a strong secondary influence was that CITES would have a pronounced Beilenson effect in driving prices downwards.

This evidence of investing in ivory was unequivocal, though the overall quantities of raw ivory held for this purpose could not be determined. I was informed that stock-piles of worked ivory also existed — particularly in the U.S.A. which is confirmed by Hallagan — but these were not considered as long-term investments. The reasoning seemed sound: once ivory is carved into an artefact its sales outlets become limited to demand for that item. The aw tusk, however, retains the full spectrum of ivory uses and is thereby a safer investment.

In Chapter 6 it was recorded that the Hong Kong merchants believed that the combined stock of raw, semi-finished and finished ivory had a value of $30,864,000. This is a minimum figure for, as in all business everywhere, privacy is treasured. When figures have to be revealed to Government it is a tendency to only show what has to be shown. Hoards representing private wealth would be concealed, not only from Government, but even from fellow merchants for a variety of Personal and business reasons. On these grounds alone I believe that the investment in ivory in all its forms must be higher than $30,864,000.

The strongest element in favour of this assumption is the shortfall of 991 tonnes of ivory in the 1962-1978 import/export record. At 1978 values of $74.42 per kg this would now be worth c.$74,000,000. As said in Chapter 6, I do not believe that all this shortfall is held as raw ivory today. Nevertheless
from the sample of stocks I saw, I believe that several hundred tonnes are distributed through Hong Kong in predominantly small, personal caches, with a minority surpassing 15 tonnes. I believe that the value of all raw ivory stocks will certainly be above $50,000,000 and is perhaps substantially higher.

Other stocks of raw ivory may be held in a variety of countries. There are some in Europe (personal observation) and there is widespread but unconfirmed feeling that large amounts exist in Japan. The rapid growth in Japan's imports of raw ivory favour this view somewhat, for they are not matched by rises in worked exports to indicate that there has been a corresponding growth in either the number or output of Japan's ivory carvers.

The concept of raw ivory being held for its own worth also gains some support from the observation in Chapter 4 that 44% of what was traded in 1978 was not ex-Africa, but between industrialised countries.

Suffice it that if the rest of the world's holdings combined equalled Hong Kong's, raw ivory held as an investment may be worth $100,000,000 – $200,000,000 at today's prices. Since 1970 the price of raw ivory has risen x 10 from $7.44/kg to $74.42/kg in 1978, i.e. on average 112% of the 1970 price per annum. One need be neither clairvoyant nor a mathematician to appreciate what the value of the investment will be a decade hence.

In Chapter 3, I estimated that ivory production between 1800 and 1849 had been of the order of 400 tonnes a year, between 1850-1899 it had risen to 700 tonnes, and from 1900-1914 to 800 tonnes. Thus in that span of 115 years, the volume of raw ivory may have totalled 67,000 tonnes. From 1915 to the present (estimating for the trough between 1915 and 1946) it is not unreasonable to postulate an average of around 400 tonnes a year = 0.25,600 tonnes. The production of raw ivory
over the past 179 years could thus have reached 92,600 tonnes. What has happened to it?

A crude approach to the potential value of this ivory might be

\[
\text{average modern processed } \times (179 \text{ years production} - \text{20% waste factor})
\]

\[
$122.39 \times (92,600 - 18,520) = $9,066,651,200
\]

Obviously much, if not most of this potential would no longer be around. Most of the combs, backs of hair brushes, inlaid furniture, ear-rings, brooches, billiard balls and bracelets will have reached the garbage heap long ago. Yet if even 5% of this value is extant today, we are still talking of a substantial sum, c.$450,000,000. However, this is speculation: the purpose is merely to establish an order for the possible value of ivory held.

Determination of the value of ivory in circulation as personal possessions was beyond the limits of this survey. However, the Hon. Julian Guest, a valuer in London, kept record of ivory artefacts in 115 Property and Content valuations made between 13th March 1978 and 1st March 1979. Items such as ivory-backed hairbrushes were not included. Of the 115 households, 10 held items of ivory worth $357,892 ($35,789 per household average). He has further suggested — with considerable caution be it noted — that there may be up to 600,000 British households with ivory of a similar value. If this is so, it indicates ivory holdings of $21,473,400,000. In these estimates there is also an intrinsic antique value.

Britain is not particularly ivory conscious, and the value of holdings in Europe will be far higher. Efforts to obtain an index of ivory in the U.S.A. failed. Again the very limited evidence to hand must be treated with caution, but it makes the point that ivory held is worth very large sums of money.
A further illustration of this fact can be derived somewhat more firmly from the value of Hong Kong's worked ivory exports from 1962 to 1978, upgraded to 1978 prices. This is a legitimate approach for the quality of the material remains constant and can be measured according to prevailing prices. This process denies any antique value which might accrue. The upgrading is presented in Table 155. The retail value of Hong Kong’s worked ivory exports of the past 17 years is slightly under $500,000,000, without making any allowances for the various discounting processes that are involved in diminishing trade values for evasion of duties, etc.

Most of this ivory is not consciously owned as an 'investment'. Nevertheless it represents substantial wealth which can readily be converted into money. This potential is constant and is the backing which indirectly serves the lesser, but still potent, deliberate investment in the raw material. The point must be made forcefully that injudicious publicity could bring about a rekindled consciousness of the potential of owned ivory artefacts, and stimulate an upward Beilenson effect of far greater magnitude than has occurred with ivory previously. The salient issue is that, for all my inability to describe the investment in ivory precisely, it is perfectly clear that it is a de facto investment of very substantial measure: its values are likely to be billions, rather than hundreds of millions of dollars.

Evidence of ivory’s use as a straightforward currency (i.e. a commodity used as a medium of exchange) is fairly commonplace in Africa at many levels. It is effective for trans-border trade between two countries which will not accept each other’s national money (the rule in Africa rather than the exception). It enters a higher plane when used to move money out of Africa. Depending on urgency, this is frequently done at apparent par-losses. Evidence of other aspects can be seen in comparison of Zambia’s ivory values (Table 51) with prevailing values (Table 104).
At a level of yet higher finance it is used as a medium like gold to go into and out of according to general economic conditions. Thus I observed a telex from one trading company (not normally in ivory) to a similar trading-house in another country offering 15 tonnes of mixed ivory at $100 per kg — unseen — with four hours for acceptance. The prevailing price at this time was c.$55 per kg. The offer was accepted. A month later there was a reverse transaction between them at the same price. For reasons best known to themselves they wished to be out of money and into ivory and vice versa in a typical 'futures' move.

For further evidence of an incomprehensible (to me) financial manipulation of ivory, examine the transactions between Singapore and Hong Kong in Tables 8–87. No one could (or would) explain this to me.

To give an overall appreciation of ivory's economic history relative to other economic trends, I present a comparison of indices for ivory, gold, wholesale commodity prices and the Sterling from c.1870—1977 (Figure 29). The ivory price index (Table 156) takes 1914 as 100 for no other reason that it came at the end of a period of stability. The gold and commodity indices are taken from Jastram's (1977) tables 1 and 2 and chart 1. The index of the E Sterling was provided by Barclays Ag Bank Ltd through the courtesy of Robert Whyte Esq.

The occasional sharp peaks or depressions in the ivory index may be the consequence of insufficient data. These notwithstanding, the general pattern indicates that ivory is the currency or commodity "that got left behind". The recent large price rises have in fact merely made up lost ground.

A final observation to conclude this chapter concerns the effect price has had on ivory production. This is necessary because it is frequently asserted that elephants are killed at increased rates because of rises in the price of ivory.
FIG. 29 AN ILLUSTRATION OF TRENDS IN 4 INDICES: (i) THE PRICE OF GOLD, (ii) THE PRICE OF IVORY, (iii) THE £ STERLING, AND (iv) GENERAL COMMODITY PRICES. 1914 = 100
If this is true any substantial drop in the price of raw ivory should produce a corresponding dip in the level of production. The only major fall in ivory prices happened in the depression of the late 1920s and early 1930s. If we examine the Tanganyika and Kenya data for that era it is quite obvious that basic production did not fall back substantially. While we do not have total Uganda ivory production prior to 1939, we do have the number of elephants killed on crop—protection work (Uganda's major source of ivory) from 1925-1946 and these, presented in Table 157 show that no fall-off in elephant killed occurred during the depression. It is clear illustration that elephants will be killed and ivory produced for reasons outside the ivory trade. A drop in ivory price will not stop elephants competing with humans.

At a different level the fall in ivory prices did have a retarding effect. It stopped many sportsmen from hunting as they could no longer be sure that receipts from ivory would cover costs or show profit. This is evident in the number of licences taken out in Uganda over the depression period (Table 158). The effect on the volume of ivory traded, as against the rate at which elephant were killed, can be seen in Zanzibar's export figures for this period. As with the elephants killed by sportsmen, exports were reduced. The lowered prices caused merchants to stop buying, or to hang onto stocks by in hopes of better times. (Quite a few went bankrupt in consequence.) The lesson from the depression is that lowered price will remove some, but not all incentives to kill elephants.

This is reiterated in review of the exports (production) of East Africa from 1929-1962. Data on volume and local prices are presented in Figure 30 and Table 159. In the construction of both volume and price indices, 1929 was taken as 100 and subsequent variations are expressed as proportions of that year's volume or value and added or subtracted from 100 to give index values. Years after 1962 are not comparable to those preceding it, as the entrepot trade was banned and greatly reduced volumes.
FIG. 30  EAST AFRICAN IVORY EXPORT INDEX AND EAST AFRICAN IVORY PRICE INDEX 1929-1962
1929 = 100
In the 1970s the irregularities commented on in Chapter 4 became so gross as to render examination pointless.

To reduce the influence of annual variation — an inherent feature of ivory production — the volume indices from the first 5 years (1929-1933) are averaged and compared with that from the last 5 years (1958-1962). Thus over this span of 34 years, volume rose from an average index of 85 to 295 or 6 index points a year. The same comparison with the price index gives an increase of only 0.2 points a year. These very different rates of increase support the hypothesis that forces other than price change brought about the growth in ivory production. This is made abundantly clear when the ivory prices are considered against general inflation. During this period East Africa’s was a Sterling currency with an inflation rate of c.4% p.a. between 1930 and 1962. Thus the average price of $3.99/kg ivory for the 5 years 1929-1933 should have reached $8.78/kg thirty years later merely to have retained relative value. Thus through 30 years of a de facto declining monetary value, ivory production increased.

A similar picture emerges from examination of Hong Kong’s raw ivory import trade for 1952-1978. The data are laid out in Figure 31 and Table 160. Over the 21 year span 1952-1972 the average volume index of the first 5 years rose an average of 12 index points a year to an average of 399 in the last 5 years, 1968-1972. The comparable value index rose at 11 points a year. In 1952-57 the Hong Kong import price averaged $4.42/kg and rose to $7.54/kg. The inflation rate in this era was running at c.7.3% p.a. and to have maintained relative value the price of ivory should have risen to $11.52/kg. Thus we have increasing imports through yet another period of decline in relative value.

To this stage, neither the East African data, nor the Hong Kong material give any support at all for the hypothesis that a rise in price was responsible for raised production. Indeed
volumes of ivory increased as relative price decreased. Even at the annual level there does not appear to be any striking correlation between volume/value fluctuations.

After 1972 the situation alters dramatically: ivory value rose at a far faster rate than volume. Thus between 1972 and 1978 the value index rose 1891 points, while the volume index rose 644 points by 1976, but fell back to a final increase of 480 in 1978. In these circumstances it is obvious that the rising price could have acted as a very strong incentive to raise ivory production. Its increase in relative value outstripped prevailing inflation rates to make it a very sought-after commodity.

Today the value incentive is additional to the other forces which brought about raised production in the decades before 1972. Ivory has regained its relative value from the last century to give us some understanding of its immense power in the past.
Having established the nature of the modern trade, I shall try to regain a historical perspective of endeavours to control it. These attempts have, in the main, been confined to Africa. They have had two separate roots:
(1) the material — for economic and commercial advantage;
(2) the immaterial or aesthetic - as a measure to ensure the survival of elephants.

In application they have overlapped to confuse their separate evolutions. It is thus worth reviewing the record, trying to keep them separate for as long as possible.

**The Material**
For social and economic advantage, many African peoples had rules which determined who could kill elephants and how they might do so. For example:

"The Bari and Bari speakers have — or had — a professional caste of elephant hunters known as 'Liggo' (sing. Ligitot) whose craft was hereditary, but if the male line dies out can be acquired from the family by purchase" (Nalder 1937).

These social permissions and inhibitions worked (any Bari who was not a Ligitot would have the Liggo to look out for if he went killing elephants!) The widespread rule that one tusk of every elephant killed belonging to the Chief is another example of a rule that worked. This particular law had society's support in the same way that westerners pay rates and taxes: even though tusks went to the Chief, his wealth was in many respects the communal treasury. Such customs worked particularly well when there was solidarity and cohesion within the tribe, and even better when internecine strife and tribal isolation made it difficult for the erring individual to trade with hostile neighbours. These circumstances have largely disappeared.
The Portuguese tried to regulate the Mozambique ivory trade to their advantage by eliminating Indian competition. By right of might they penalised their competitors with restrictions on movement, the imposition of licences, taxes and duties (Alpers, 1975, goes into this at length). They failed, and merely illustrated that other than in the short run, physical strength is no substitute for business acumen and capital and seldom overcomes basic economic forces. On the other hand the Indians, who had both capital and trade wisdom obtained what they wanted by enmeshing greater Portuguese interests in Goa in a net of credit and capital loans. At the same time they were willing to tolerate all manner of degradation and humiliation in the pursuit of their goal. Where ivory is concerned, the Mozambique lesson is that internal legislation, on its own, cannot counter external economic influence.

The Sultan of Zanzibar — Sayyed Said bin Sultan — taxed the ivory trade heavily, a tradition his successors pursued throughout the 19th century. In 1848 Customs duties ranged from 15-50% of prevailing international prices and in 1864 these were between 4-25% depending on the origins of the tusks (Bennett and Brooks, 1965). Each tusk over 2.7 kg was registered with an individual number, and, at least on Zanzibar, the system worked efficiently. What we do not know is how much ivory from the Sultan's African dominions by-passed Zanzibar. There are few records to indicate that evasion was commonplace though the incentive must have been strong. The size of the ivory flow through Zanzibar was so large as to suggest that the taxation was not a major deterrent to trade. It gained strength in that the major buyers - Indian, American and European — were based on the island.

The Emperor of Ethiopia not only claimed the first tusk to touch the ground of every elephant killed, but also levied a duty of 10% ad valorem on ivory traded through Addis Ababa or 8% on that passing through Harrar (Powell Cotton 1902). The general lawlessness of the region and the high reward for
avoiding the Emperor's levies and rights, made evasion likely though there are no data available to me which support or disprove this.

In review it seems that the regulations imposed on the ivory trade prior to the 20th century worked — particularly the Zanzibari registration and taxation. The ease of moving ivory was far less than today, and there were fewer markets. It appears that a free trade in ivory was prepared to pay for the privilege by accepting taxation. However the data are too few and incomplete for worthwhile comparisons to be made between the 19th century attempts at regulation and anything that has happened in the 20th century.

Once Africa was divided between the European powers, the new landlords laid claim to ivory. In some cases they permitted free trade to continue for a while as in the first few years of the British East Africa Protectorate (to become Kenya in 1923), or claimed as a Government monopoly as in the Sudan, or a company monopoly as was the case of the Imperial British East Africa Company in Uganda (Lugard 1893). In commercial terms it paid for many of the early administrations. Extending the same point made in Chapter 1, Gessi (1892) copied a letter from his colleague Casati to the editor of the journal 'Esploratore':

"The whole expense of the administration of Bahr-el-Ghazal and the countries of Niam-niam...do not exceed £7,800 sterling. The ivory sent to Khartoum from time to time (all of which belonged to the Government) exceeded three thousand hundred weights, representing the value of about £90,000."

Nalder (1936) confirmed this and, quoting Emin Pasha, wrote:

"Ivory was the main article of which an average of 148 tons reached Khartoum every year".

Nalder then went on to comment that

"At only Sh 5.00 a lb (EO.55 per kg) this would have been worth £E 75,001, more than the combined revenues of Mongalla and the Bahr-el-Ghazal today" (i.e. 1936, after 38 years of British Administration.)
Stigand in 1914 wrote:

"On the first occupation of any part of Africa, unless mineral wealth can be discovered, there is actually nothing to hand that we want but ivory and wild rubber"

The references are numerous. Little wonder that the Governments were immediately interested in the status of elephants. Ivory arrived in Government coffers through confiscation, through offering rewards to the natives to bring in ivory they had hidden, and readily accepting it as cash whenever payment to Government was necessary (e.g. Stone 1972 p.443 — Kamba payment of hut-tax in 1902). However it was in this era that the immaterial reasons to preserve elephants were aired vigorously and the two roots of modern policy became entwined.

The Immaterial
The immaterial — the aesthetic — are, as in other attitudes towards elephants and ivory, shared with us by Negroes. The process of hunting, the taking of life, was widely involved in metaphysical ritual and sanction. Thus the Kamba who were elephant hunters of repute, had social controls by which this activity was carried out:

"Hunting, like other aspects of life, was governed by religious rules and ceremonies. Activities before hunts were often identical to those preceding raids, and successful hunters were afforded the same respect given to successful mar leaders" (Lindblom 1920).

I could continue to dredge the archives for evidence of African aesthetic perceptions, but prefer to give two instances from personal experience.

The Watta (Walangulu, Wasanye) of eastern Kenya are elephant hunters and ivory collectors by heritage. They admire the successful hunter — regardless of race. Dropping an elephant with a shot brings forth their congratulations. Witnessing elephant culling in Uganda, Kenya and Tanzania, when every day a complete herd was destroyed, with no survivors and
done coldly, mechanically, with no esprit de chasse, they were impressed. However it was more with a sense of foreboding and unease and they offered no congratulations. "This" said one, "is something else..."

In Rwanda the last bush elephants (140) were engulfed by expanding humanity. Nightly they destroyed surrounding crops and on occasion killed people. The instances were increasing, leaving one practical solution — their extermination. The Government made arrangements for this to be done. While being relieved at the news that the elephant menace was to go, there was also disquiet among the locals. It was one thing to kill a raiding elephant. It was even all right to kill a lot of them, but total elimination was frightening. "It will" some said "be a provocation to God. There will be retribution."

Well there was — at least in their eyes. Within the hour of the relevant high official placing his signature on the contract of destruction, his son died. At the end of the operation, when all that survived were a few captive elephant calves, one killed a lady filming them.

Such aesthetic perceptions placed some limits upon what was killed, when and where, and no African I have ever talked to has advocated the extermination of all elephants. The positive side of this coin is that now and in the past, Africans as well as white or brown men want some elephants to be.

Laments that elephants were doomed have been a regular historical feature. They were certainly voiced when the supply of ivory almost gave out in Pliny’s day. It is not surprising that the volume of the ivory trade in the last century led many to assume that it would not last, just as the same applies today.
Schweinfurth (1872) wrote:

"It would be no unfortunate event in Africa if some of the European philanthropists who now squander their homoeopathic charities on the welfare of the HEQPOQS, were to turn their sympathy a little to the pitiable lot which has befallen the elephant...its indiscriminate slaughter...compels us sorrowfully to ask and answer the question ‘Cui bono’...No wonder therefore, if this noble creature...should...perhaps sometime during our own generation, be permitted to rank in the category of the things that have been, and to be extinct as the ure-ox, the sea—cow or the dodo."

R.B. Woosnam, Game warden of the British East Africa Protectorate wrote in 1912 (Anon. 1913):

"I have only recently heard, on the very best authority, that in German East Africa (Tanzania) the elephant is almost exterminated, the same may be said of Italian Somaliland and Abyssinia, while the Congo, both French and Belgian territory, will shortly be in the same condition if it is not so already."

Such statements have an uncanny resemblance to many modern attitudes!

Stigand (1914) in a continuation of the quote from him given earlier in this chapter, said:

"The collection of these latter (ivory and rubber) is a decreasing trade which exhausts the country, but does not develop it."

And so it was in the era of the 1880-1914, that the aesthetic drive to preserve elephants became an issue, was vigorously expressed and engendered considerable debate. It was at this time that the two forces for elephant preservation— the material and the immaterial — became entwined, supporting one another, conflicting with each other and providing a confused basis for the evolution of policy on the matter. From now on it is difficult to separate the two influences clearly and they must be considered together.

**The Twisted Strands**

The situation of confusion which prevailed widely in Africa between 1900 and 1914 is synthesised in the following comments
published in the Annual Report of the Game Warden of the British East Africa Protectorate for the years 1910-11 and 1911-12


"This is the most difficult problem to deal with of all game preservation questions, because of the value of ivory and on this account it is almost impossible to obtain unbiased opinions on the subject. (There are three points of view from which the subject may be surveyed: I) The Customs Officers: — who necessarily look at it mainly from the immediate revenue point of view. II) The Sportsman: — and advocate of game-preservation, who of course looks at it from that point of view."

The writer then submitted his own view that the solution lay in a combination of I) and III). He then quoted from a report written on the ivory trade by the Lt. Governor of the Protectorate — F.J. Jackson in 1909. This is of great relevance:

"The original Game Ordinance was passed in 1900. (Note that legislation had been enacted prior to this in 1897, 1899 and 1900, but probably not as a composite Ordinance.) This prohibited free trade in ivory, but little notice was taken of the Law, except that it gave birth to the ivory smuggling trade. Towards the end of 1902 traders, particularly Indian merchants, alleged that there were large quantities of female and old ivory still in the hands of natives, and on the representations of the Chief of Customs, a notice was published in the 'Official Gazette' authorising the purchase of small and female ivory by Government Officers at 50 per cent of its value up to June 1903. On June 15th a further extension was granted on the same terms until March 31st 1904, again on December 1st 1904, the purchase was allowed to continue, but at 25 per cent of its value. Finally an Ordinance was enacted ('Official Gazette' of April 15th, 1905) prohibiting the possession of ivory under 11 lbs (5 kg) but it was not until the present ordinance was enacted that trading in ivory was altogether prohibited. By that time most of, if not all, the old and buried hoards of female and small ivory had been brought in. But there is little doubt that the natives, encouraged by the traders, continued to kill the elephants for the ivory alone, for in December 1907, the District Commissioners reported that there was a considerable quantity of ivory in the possession of natives. Instructions were accordingly issued to buy up this ivory at 50 per cent of its value, after it had been sent to Mombasa for valuation, This was found unsatisfactory as the natives took the inevitable delay for a breach of faith on the part of
Government and thought that their ivory had been confiscated. Orders were, therefore, issued in August 1908, to pay natives on the spot for ivory at the rate of Rs 4 per lb " (£0.57 per kg which was about 50% of prevailing market value).

The writer then takes up the tale in his own words:
"In August 1908, at a meeting of the Executive Council the ivory question was again brought up by the Honourable Treasurer who recommended free trade in ivory, supported by a memo from the Chief of Customs."

The recommendation was not accepted as it was held that it would lead to excessive elephant killing. However the Government purchase of ivory continued and the volume bought increased annually.

And so debate raged. To buy ivory was to encourage the natives to kill elephants; not to, was to waste enormous wealth. Needless to say the natives were confused. when told not to kill elephants they asked "Then why does the Government give us Rs 4 per pound for ivory?"

If the natives had produced only adult male tusks, the preservationists would have been less alarmed than they were by the continued appearance of female and immature ivory. To kill young and females was against all the tenets of good game-keeping as it was then practised in Europe, Britain and America.

A point of particular interest was that the early Game preservationist — the immaterialist or aesthete — did not advocate preserving all elephant everywhere. Again quoting from the 1910-11, 1911-12 report (Anon. 1913):
"At the outset I think it will be generally recognised that it is neither possible nor desirable to attempt to preserve elephants or any other game where it is inimicable to the interest and development of the Protectorate. But we have in this Protectorate and in Uganda many places where elephants can be preserved without their doing damage to any one, and it is only under these conditions that I advocate their preservation."
Stigand (1914) - a man well known in his time for his interest in what we now call conservation — wrote:

"It is not compatible for elephant and civilisation and progress to live alongside each other."

We now know that by the erection of physical barriers of suitable design, e.g. ditches, fences, etc., they can live beside (but not amongst) each other. The point made, and made repeatedly, was that elephant should be preserved (conserved in modern idiom) in areas set aside for that purpose. It is fashionable to see national parks as new developments in Africa, yet the concept — if not the terminology — was much in vogue from the outset of colonialism in Africa. Indeed the records convince me that the early administrators were, with the exception of parties in the United States, well ahead of their times on the matter. The establishment of what is now the Kruger National Park in 1898 is a case in point. The pragmatism of the first administrators' approaches was related to their breadth of outlook and lack of specialisation. In having responsibility for all affairs in their domain — law, politics, social welfare, land tenure, agriculture etc. as well as the game laws - they had to achieve balance between interests. But this is digression: the issue of consequence in relation to the ivory trade is that the aesthetes, the immaterialists, saw the issue of preservation in fairly clear-cut terms. The elephants needed reserved space. In essence they foresaw that policy on this particular issue must move from the general to the particular. It never did. The material outlook which, equally correctly, saw ivory as a general resource, could not come to terms with the idea of not husbanding it everywhere. Policy fell between two stools: it drew its form from the value of ivory as a revenue resource, and its drive from an aesthetic desire to preserve elephants.

The regulations reflect the situation. Most African territories introduced legislation which set a tusk size limit below which elephants were not to be shot. However, depending on a number of considerations, this limit varied from place to
place. The prohibition of taking tusks of less than 5 kg (11 lbs) was a widespread law, though in some countries it was higher. The absence of uniformities encouraged the movement of under-limit ivory from high-limit countries to the nearest neighbour with a suitably low limit. It established the point that with an international currency such as ivory, the regulation of its movement calls for common laws and an equality of enforcement between nations.

As African economies expanded, became more complex and capitalised and integrated with those of the owning powers, so did the relative importance of ivory recede. It always remained a commodity of value but, as an element of, for example, the British Empire's economy, it was insignificant. The inevitable outcome of the complication and expansion of imperial economies was that ivory was no longer something that featured in the environment of those who, at the highest levels, made economic policy. Thus as early as 1914 in British Africa the dominant influence in legislating on the ivory trade had become the immaterial. It gained ground across the continent, but nowhere, at any time, has policy towards elephants been able to disconnect itself entirely from the value of ivory. Indeed early on, the immaterialists clouded their case through the introduction of a new material issue — tourism. Already by 1910-1912 licence revenue from sportsmen was of the order of £10,000 p.a. (Anon. 1913). To put this into a modern perspective £1 of 1900 would be worth more than £15 today and the £10,000 was in relative terms worth more than £150,000 (c.$300,000) today. This was presented as an alternative to ivory revenue:

"By making stringent regulations restricting the shooting of elephant, and making elephant—shooting licenses (and photographic permits, and permits to enter parks etc.) rather than the actual collection and sale of ivory, the source of revenue, it will be possible to draw a limited profit out of elephant and ivory for a number of years" (Stigand 1914).

Thus as early as the first decade of the 20th century commercial tourism was being presented as a material reason for
wildlife preservation and, ipso facto, was cause for regulating the ivory trade.

Each Colonial power legislated on ivory in accordance with its individual system of law, but the common European background produced certain similarities. These were augmented through informal contacts. For the greater part the ivory laws have become integral to general Acts and Ordinances for the preservation of wildlife. Their essence in regard to ivory rests on 3 points:

1. elephants are made to appear state property,
2. ivory is state property and may only be possessed if it is acquired in accordance with the law through purchase of a game licence to shoot elephants, or through a legally authorised channel of trade.

Generalising, the British and Belgian territories were more strict than their French and Portuguese counterparts.

A legal nicety makes me claim that elephants are made to appear state property. At least under the British or ex-British laws, no actual claim of ownership was ever made - for good reason. If ownership could be proved, then the owner could be sued in the event of the owned inflicting damage or injury to person or property. Elephants do immense damage to peasant agriculture in many parts of Africa, e.g. in Tanzania it is sufficient to induce the Government to shoot, on average, 7 2,000-3,000 a year. Thus the laws merely bar people from killing or disturbing elephants. They only become state property when dead — except in the case of those killed legally under the law. The effect is of course that elephants are de facto state property.

In 1933 an attempt was made to unify conservation law throughout Africa. A convention was held in Brussels to consider the best means of preserving the natural fauna and flora of Africa which were in danger of extinction or permanent injury. There was consensus that animals which were particularly rare or
to coin the modern phrase - "endangered" were to be listed under Class A, whose conditions were that such animals should not be hunted, killed or captured without special permission from the highest authority in the territory. This should only be given under special circumstances, solely in order to further important scientific purposes or when essential for the administration of the territory. A second Class B was designated for animals which, while not requiring such rigorous protection as those in Class A — the "threatened" of today — should not be hunted, killed or captured; even by natives, except under special licence granted by the competent authorities. All countries listed elephant in Class B and some placed elephants with tusks of less than a certain size in Class A. However, other than to go on record as the first major attempt to unify African conservation policy, the Brussels Convention introduced little that was new and not already practised. It brought about few, if any, changes in the field.

Where ivory was concerned, the natives continued to bring in immature and female tusks, and mutter as they might, Governments continued to pay rewards for them. The collision of interests - leave it and lose revenue versus take it and encourage elephant killing - has never been resolved. All that happened was that rewards for recovery failed to keep pace with increase in prices. From c.50% of value early in the century they regressed to c.10%. The hope was that this was sufficiently attractive to encourage natives to hand in such ivory as they happened upon, but insufficient incentive to them to hunt live elephants. In synthesis the issue was left to hope. And so things muddled along until the era of independence.

Independence disconnected many economies from imperial systems, to reform at the lesser national level. Their strength now rested upon the resources within the new state boundaries. Once more ivory’s status reverted from relative insignificance to an obvious prominence. It 'came home' (see Figure 29). It was so enmeshed in conservation law and subtle international
pressure, that overt attempts to expand official use of ivory for revenue were few. One exception took place in Kenya. Certain persons were awarded "Collector's" Permits which authorised them to seek ivory from natural mortality and among the rural people who might already be in possession of it. Instead of waiting for 'the natives' to bring ivory in for reward, Government authorised private individuals to go to them. The idea was that having recovered such ivory as they could, the collectors would bring it to Government to arrange its sale and make some division of proceeds between the two parties. The origin of this policy was as political as it was economic. Suffice it that it was flagrantly abused and fulfilled all earlier premonitions in inciting widespread elephant hunting. The permits were rescinded in 1973.

While governments may have refrained from changing official policy toward ivory on conservation grounds, the revenue men's eyes were drawn to it sharply from another direction — that of the need for exchange control. The rapid onset of independence trapped many investments originally made in a climate of free currency movement. Equally many investments made in the belief that a particular fiscal policy would be pursued were embarrassed when programmes changed (e.g. from capitalistic to socialist). The incentives to remove capital from independent Africa have been considerable and many devices have been used. Ivory was a prime vehicle for this purpose. In this respect one is drawn back to Nalder's (1936) comment quoted earlier:

"In this undeveloped Zand money, except for ivory, is not to be had for nothing."

While situations at independence were never quite so stark, the fact remains that in many African countries, their only genuine "international" currency was ivory. It is hardly surprising that in many, if not most African countries which produce ivory, ultimate control of its exports is now firmly back under the revenue authorities.
To summarise: regulations toward ivory through this century have been influenced by aesthetic pressures and have sought to at least stabilise elephant exploitation. The data in Chapters 4 and 5 illustrate unequivocally that they failed. Excepting the periods of the two World Wars and the Great Depression, trends have been consistently upward, with a sharp acceleration in the independence era. At all stages official statistics are minima, for they do not include illicit exports. It is as though we are beside Sir Frederick Jackson in 1909 writing that "the law ... gave birth to the smuggling trade" (Anon. 1913) and achieved little else.

Somehow perspectives were lost. Conservation literature from the past eighty years is marked for its repetitiveness and the absence of new idea. The Brussels Convention of 1933 only reiterated concepts three decades old.

African ivory exports reached a peak slightly under 1,000 tonnes a year between 1900 and 1914 after a gradual climb over the previous 4 centuries (Chapter 3). After 1914 exports fell back and remained below the earlier high point until the late 1970s when they again reached the 1900-1914 levels. It might be argued that the intervening decades of lowered exports are evidence of some effectiveness of law to control the ivory trade. I would not argue that they had no influence, but it was minimal. This was least during the World Wars and the Depression when A enforcement staff were at a minimum and conservation issues of least importance. When prosperity and peace permitted attention to elephants and ivory; when the regulations should have had greatest effect, the ivory commerce recovered ground and expanded. The French territories which did not attempt to enforce ivory law very rigorously and permitted considerable trade, still had numerous elephants. From this it is clear that the major influences upon the restriction of trade were essentially fortuitous and, as always with ivory, directly connected with its transport. War and penury inhibited movement, prosperity facilitated it.
It is worth considering the failure of regulation in the African ivory trade a bit further under specific headings.

1) The Number of Elephants
Elephant numbers have been consistently under—estimated throughout this and the last century. As late as 1969 (Laws, 1970) it was thought probable that there were less than half a million bush elephant left in Africa. Earlier regional estimates were far more pessimistic. Laws, Parker and Johnstone (1975) illustrate this for Uganda and in 1934 Kenya's population was believed to be 13,000 (Anon 1935) when real numbers must have been more than 200,000 (Parker, unpublished data).

At all times ivory trade statistics should have caused those who believed in the fewness of elephants, to pause. That tens of thousands were represented in each year of Africa's ivory exports, and that such exports had been sustained over decades, was never seen in its most straightforward light— that elephants must be numerous. The perspective was never the production of ivory over time, but production at any one time, this being so much larger than expected that it has always been seen as the apogee of a crisis. This is as true today as it was nearly one hundred years ago. Thus a great deal of legislation has been made under the influence of an immediate but spurious calamity.

The results of the IUCN survey into the status of the African elephant should rectify the misapprehension over numbers, and should eliminate this as a cause for unrealistic legislation.

2) Natural Mortality
Elephants are mortal. Yet read literature on the ivory trade, particularly that relevant to law enforcement (e.g. Game Department reports for what is now Kenya and Uganda 1910-1965, and 1925-1960 respectively) and one has grounds for doubting
that this was accepted! When elephants die, they leave ivory, — freely available for collection by the first person who happens upon it. Natural mortality produces much immature ivory, as death rates are highest among the very young (and very old), and also produces female tusks as that sex also dies! It is and always has been a large potential source of ivory. Thus while I do not hold that natives didn't kill young and female elephants, for they did, an acceptance of natural mortality would have gone a long way towards ameliorating the administrators' disquiet over the continual appearance of young and female ivory.

3) Africans and Ivory
Believing elephants to be a small fraction of their real number, automatically confounded understanding of both the interaction between elephants and humans, and the role ivory played in some rural economies. All accounts of the true situation must have seemed exaggerations. This ignorance was exacerbated even further by a gross lack of knowledge of African custom and outlook. The overall misunderstandings will have been worsened by a deliberate African secrecy about ivory once a government pronounced its monopoly of ownership.

The game laws established on European formulae and in ignorance of local conditions were not only unrealistic but, in many cases, manifestly unjust. With a stroke of a bureaucratic pen the whole Watta tribe was dispossessed of its mode of life — elephant hunting and collection of ivory. It is ironic that the law was made without knowledge of such dependence. At a lesser, but nonetheless severe level, Lindblom (1920) (quoted in Stone, 1972) writing of the Kamba people, said

"When the first game laws MWPU passed in 1897, the ivory [wade and most hunting activities were made illegal. The advent of British Authority not only affected the Kamba business community, but the social structure of the people as well."
It was noted that in times of famine and drought, the ivory handed over to government invariably rose (Stone 1972). However this did not establish the obvious — that there was an element of necessity in it. It merely brought official dismay at the increased poaching.

The low price offered as reward for ivory handed in acted as a guaranteed minimum. From this base the possessor of ivory could negotiate better bargains with illicit dealers. Being as low as 10% of prevailing market value it also favoured the traders, for they did not have to offer a great deal more to secure tusks. This policy guaranteed that a minimum of 'native' ivory came to government and at the same time provided an 'alibi' for poaching. Where it was tried, the alternative of not paying anything merely aggravated the situation. It was a vain supposition to believe tusks would be left alone. With their traditional knowledge of ivory, its wide availability and Africa's prevailing poverty, the local people took (as would all in similar circumstances) and still take advantage of it. The absence of a government reward system certainly wouldn't have inhibited the movement of ivory in the past, nor does it do so today. Illustration of the incentives which prevailed and prevail is simple.

In the pre-1914 era when Government paid a reward of £0.58 per kg of ivory surrendered by natives, one 10 kg tusk would bring more than a man could expect as a labourer in a year's work. When I started the Galana Game Management Scheme for the Kenya Government in 1960, employees (who were all elephant hunters by tradition) were paid cash $7.7 (Shs 55.00) per month i.e. $0.26 per day, all found. At the same time Government was rewarding these same people $0.62 per kg of ivory they might turn in. A pair of 10 kg tusks would thus return them $12.4 which was better than a month's wage. Frequently far larger tusks were handed in and pairs grossing 50 kg were quite common. Even at Government's stingy rates, these would earn the equivalent of 4 months' wages. The possessor could get up to
3 times the Government rate on the illegal market. Today the Kenya poacher can obtain c.25-33% of current market value for ivory ($74/kg). A pair of 10 kg tusks will raise $370-444. The minimum urban wage (Nairobi and Mombasa) is $45 per month and rural wages are $26 per month (Anon, 1977). Thus in a week's work to get (kill or find) a pair of 10 kg elephant tusks, a man stands to make the equivalent of between 8 and 17 months' wages. Added to this incentive is the chronic unemployment which plagues Kenya. The scale of benefits is similar across Africa. It defies the common misconception that poachers sell their ivory for pittances. The tusks from one elephant killed or found dead give the poacher far greater relative benefit than is obtained at all subsequent stages in trading them in their raw state. Understandably then, any injunction depriving those who benefit from this resource, has caused resentment.

"There is a curious belief extant that although laws are normally framed in order to be observed, the Game Laws can be broken with impunity, and there is often a feeling of intense resentment when eases of breaches of the Game Laws are brought into Court" (Anon. 1925).

This was written in Uganda in 1925 and was claimed to apply equally in 1950 (Anon 1950). It is yet another shard of evidence that the law was unacceptable to society.

The leniency of sentences for poaching in Africa is a frequent source of conservationist complaint. In 1978 a Zambian poacher killed 5 elephants which produced ivory worth several thousand dollars, and was fined $154. This was typical of sentences in eastern Zambia (Towers, pers. comm.) In 1978 the Kenya newspaper Daily Nation recorded at least 3 cases which concerned 208 tusks, where those convicted were fined substantially less than the value of their ivory. What is not taken into account in the complaints is that the fines are low through a general sympathy with the poacher. The law is applied in the interests of society and not any particular group!
Failure to understand the background of both necessity and tradition, coupled with a great misapprehension of elephant numbers, are further elements in the overall failure of the expatriate law relating to ivory. The history of the trade bears this out. Yet, if further evidence is required, ethnological and historical investigations by Marks (1975) and Stone (1972) give it convincingly.

4. Manpower
In its wisdom, the IUCN has laid down certain criteria for the admission of national parks and nature reserves to the UN List of National Parks and Related Reserves or the UN list of National Nature Reserves. Among these are certain manpower requirements. In regions of population density of less than 50/km², parks and nature reserves must have at least one person working full time at the management and supervision of each 100 km². In regions of population density or more than 50/km² there must be one full time worker per 40 km². These criteria should (but do not) bar most African national parks from UN listing. However, disregarding whatever rationale was used to arrive at these figures, let us for the moment accept them as necessary for the successful enforcement of game law.

In 1910, the complement of the British East Africa Protectorate’s game law enforcers was less than 100 men, i.e. area per member of staff was in excess of 5,800 km². In 1955 the staff, of what was now Kenya’s Game Department, had risen to 243 and some 30,000 km² of their jurisdiction taken over by the new National Parks Trustees. Nevertheless that still left more than 2,200 km²/man over which the law was to be administered. The National Park authorities were better off having 117 men over c. 30,000 km² which reduced the area per man to 256 km².

In 1925, the Uganda Game Department had 18 men to cover 197,058 km², i.e. 10,948 km²/man. By 1951 those responsible for law enforcement had risen to 25, i.e. 7,882 km² per man. These Kenya and Uganda figures are representative of the better
staffed of the African conservation bodies for the era 1900-1960. The position was not quite as bad as it would appear, for other general law enforcement bodies — the Police and Administration aided the Game Department. In addition, there were part-time helpers — honorary game wardens — at least in the British African territories. Even so, there were too few people to enforce unpopular laws which prevented the use of a widespread and basic resource, the length and breadth of the land. The support they received from other bodies was subject to a major constraint. Administrators and Police are mainly occupied within society; their work is where people are and, ipso facto, where animals are not. Policemen patrol streets, not wildernesses and, with much of their job are actively assisted by the public. In 23 years of work closely connected with conservation, I have never come across a case where an African poacher has been arrested and brought to justice by his fellow peasants.

At a continental level the manpower available to enforce conservation law is only fractionally more today than it was before 1960. In a sample of 15 countries (Table 161) the area per conservation man ranges between 187 km$^2$ and 27,500 km$^2$. The average is 1,106 km$^2$. The national parks which comprise c.5% of the 15 countries' area (Appendix 5) are far better off, for a substantial proportion of available manpower is concentrated on this relatively small fraction. From 10 countries which provided data, a park area of 174,056 km$^2$ has 3,276 personnel assigned to it; i.e. 1 man to 53 km$^2$. However, the distribution is not even and made to look far better than it is by one country — Tanzania. With a Park staff of 1,890 and parks of 32,276 km$^2$, they have 1 man per 17 km$^2$. Removing this exception, Ethiopia, Gabon, Ghana, Ivory Coast, Malawi, Niger, Rhodesia, Senegal and Upper Volta have 141,780 km$^2$ of parks, with 1,386 men : 102 km$^2$ per man.

Outside the national parks — which is where 75% of Africa's elephants are —the ratio of men to area is much lower and
varies from 2,200 km² to 153,000 km² per man. However both this and the preceding parks' figures are optimistically misleading. Substantially more than half the manpower available is not committed to law enforcement, but to ancillary services, i.e. administrative, clerical, accounting, welfare and research works. Thus Kenya, which has the biggest conservation staff in the sample — 3,107 persons — has an anti-poaching force for the two Tsavo Parks of c.150 men (F.W. Woodley, pers. comm.) which gives c.139 km² per man.

If the manpower in the parks is marginal or insufficient, then the situation outside them is hopeless. As the law-enforcement requirement is held to be related to human density i.e. the presence or absence of people, it follows that the preservation of animals outside parks calls for more rather than less law enforcers than the parks. In a nutshell, manpower for conservation (= 0.07% of 132,002,038 people in the sample) is too sparse to have had anything but a very local effect. In only one country in Africa — Malawi — has this issue been accepted and approached in a rational manner (Appendix 6). Elsewhere the contention has been denied.

Where it has been sought impartially, the evidence is easily come by as borne out by the ethnological and historical work of Marks (1975) and Stone (1972). Botswana and The Gambia are two examples where animals existed without the presence of a conservation authority. Until 1966 Botswana had so small a Game Department as to be of no consequence and even now has 5,221 km² per man. For most of this century, The Gambia had no organisation actively responsible for fauna conservation. Despite this it still has an abundant and varied fauna albeit deficient in the largest species (Parker 1973). Both cases show that the ineffectiveness or absence of a game department has not, of its own, meant that animals would not survive. The corollary is that the presence of game departments does not necessarily ensure there is game in many countries.
Perhaps the most telling evidence of all is the African record of ivory exports — nearly 50% short of the true figure. Many factors obviously have bearing on the success or failure of conservation law enforcement. However the most fundamental of all is adequate manpower. Lack of this, as has been and still the case, is a cornerstone in the failure of regulation of the ivory trade.

This topic will appear again in Volumes 2 and 3.

5) Economic and Political
Today many African countries face similar problems to those which afflicted the Portuguese. The ubiquity of exchange control regulations is a comment on the confidence "capital" has in governments. Through its negotiability, ivory is particularly sensitive to changes in political and economic climates. It has an inverse relationship with political and economic stability. In times of trouble it is at a premium; when things go well, it is not so after.

In its most extreme form this is apparent in war. In earlier research I came across it being hoarded and traded by the Anyanya of the southern Sudan. They confirmed that they used it to acquire provisions and arms. On this survey I obtained first hand evidence of its use by UNITA and FNLA guerillas in Angola to get ammunition. Somali poaching in Kenya has some similarities (Appendix 7).

Only slightly less extreme are the situations where disparate economies are adjacent. Both Mozambique and Zambia are in chronic economic ill-health. Basic commodities, rice, soap, salt, sugar, matches — to name but few — are unobtainable in most rural areas. All are available in the relative affluence and stability of Malawi. However both Mozambique's and Zambia's currencies are worthless in Malawi and commodities can only be obtained through barter of home grown products and ivory. Thus through no cause of its own, other than to possess a stable
political and economic climate, Malawi is faced with an ivory traffic from its neighbours. This comes across the borders in dribs and drabs in payment for goods unobtainable in its country of origin. The source of much of this ivory is from an even more fundamental need — food. In Angola, Mozambique, Zambia, Zaire and the Sudan, many tusks are a secondary product of elephants killed for meat.

For similar reasons ivory has flowed into Kenya, the Ivory Coast and South Africa is a currency of commerce. It moves from impoverished zones towards the stronger economies, usually because it is a "hard" currency for the trade between them. The system does not stop in Africa. A general merchant in Hong Kong agreed that on many occasions he had supplied textiles to Africans from eastern Zaire and Uganda and taken payment in tusks because they had nothing else to offer.

In these situations, ivory trade regulations fail because they are superficial to the far more fundamental issues at stake. The causes of failure are both apparent, unavoidable and far beyond the resolution of specific conservation laws.

6) The Trade
Perhaps the greatest cause of all misapprehensions about the trade in ivory concerns the traders themselves. Reiterating from Chapter 8: the Game Warden of the British East Africa Protectorate said in 1913 that there were 3 points from which the ivory trade may be surveyed;

1) the Customs Officers: from the revenue point of view,
2) the Trader: for the profit he can make, and
3) the Sportsman: from the preservationist view.

He then submitted that resolution lay in 1) and 3), a view that has been widely held ever since and is apparent in the most modern endeavour: CITES. The trader has been left out; not only left out, but generally reviled since 1914. Suffice it that I know of no other instance where attempts have been made to regulate a trade, without reference to the traders concerned.
Such obtuseness is indefensible and, on its own, is ground for wondering what real psychological motivation is behind the modern outcry on ivory. Had any attempt been made to understand the trade; had the traders themselves been approached for information, much of what is laid out in this report would have been obvious decades ago. That these steps were never even attempted is the reason why so many regulations were made in ignorance, and failed!
The Washington Convention on Trade in Endangered Species of Fauna and Flora (CITES) updates and expands the 1933 Brussels Convention. It extends the earlier concept from an African to a global context and switches emphasis from sanction of hunting — which is impossible to control other than at the national level — to trading which is, theoretically, more vulnerable to international regulation. However it shows no fundamental changes in principle and its strength relies on the issuance of permits at a national level. Animals listed as "Endangered" (the old Class A) may not be traded (hunted) at all, others listed as "Threatened" (the old Class B) may not be traded (hunted) other than under permits.

The list of animals endangered or threatened covers at least 527. Each is supposed to be identified by its scientific name. As with most law concerning trade, the enforcing authorities are Customs and Excise officials. Meticulous enforcement of CITES relies on the ability of these officers i) to know the scientific classification of plants and animals listed, and ii) to be able to recognise them when they see them. This calls for botanical and Zoological knowledge far beyond the interest or competence of average laymen. Not only does enforcement of CITES call for an ability to recognise the 'whole' animal, but parts thereof, i.e. when incorporated into a watchstrap, as a panel in a handbag, etc. At all levels these requirements need expertise that is not only beyond the layman, but well beyond most specialists as well. The observation has been met in some countries by restricting the points through which "wildlife products" might enter them (e.g. the U.S.A. limits entry to New York, Miami, New Orleans, Chicago, Seattle, Los Angeles, San Francisco, Honolulu, Anchorage, Fairbanks and Juneau). At these points, it is held, there is access to specialists who can make correct identification.
The ability to enforce CITES may exist in some of the western, technical societies. However, it certainly does not apply elsewhere. In many Third World countries there is difficulty enough in understanding the modern international languages, let alone the Latin scientific system of classification. In a circular explaining CITES to the public the U.S. Government has written

"Common names vary from place to place and are often colloquial or imprecise. Scientific names are unique and make it very clear exactly what species or sub-species you plan to work with."

This is a mis-statement of fact. Scientific names are not unique and some taxonomists do not recognise the validity of sub-species. Many ornithological works illustrate the extreme diversity in scientific nomenclature. For example a small African bird — in English the Tawny Flanked Prinia or Wren Warbler — has been known under the following names:

- **Drymoica affinis**
- **Cisticola tenella**
- **Prinia mystacea**
- **Prinia subflava**

The African Fish Eagle is either

- **Cuncuma uocifer**
- **Haliadmms vocifer**

While these variations may be resolved among the esotericists who make them up in the first place, they mean nothing at the Customs post between Botswana and South Africa — both signatory to CITES.

As more countries accede to CITES and as animals and plants are added to its lists, it will become yet more unwieldly. At best it is only partially enforceable and is in danger of becoming totally unenforceable; a state which is worse than no law at all. While the motivation behind it is straightforward enough, it is too ponderous and impractical to succeed as it is.

Ivory reflects this pessimistic view. Full enforcement of the CITES laws calls for the identification of all worked ivory's origin. It is beyond the laymen to differentiate between the
various types of ivory (note "ivory" is a trade term for dentine): African elephant, Asian elephant, hippo, warthog, bushpig, forest hog, babirusa, walrus, narwhal, sperm whale and many assorted species' canine teeth. Williamson (1938) and Ritchie (1969) both indicate that under ultra-violet light the origin of ivory can be determined, and confirmation was hoped for during the survey. This failed from bureaucratic impediment. Nevertheless such examination of ivory artefacts in any quantity is beyond all but limited application. The situation is further confounded by the immense volume of ivory artefacts that have accumulated down the years. It is difficult to tell the age of ivory merely by appearance.

A case in illustration of the reluctance behind enforcement of CITES concerns India. The Asian elephant is listed as "Endangered" and its ivory is not supposed to be traded internationally. However, Customs officials are not to know whether an ivory chessman is of African or Indian elephant in origin. That the Indian Forestry authorities made 3 tonnes of Asian elephant ivory available to carvers in 1978, makes it almost certain that this will find its way across borders: much has probably already done so. If India really wished to forego the c.$222,000 this material was worth, all Asian elephant ivory should be removed from trade by incineration. In like manner, and as an aside, African Governments should calcine all rhino horn coming into their hands, rather than offer it for sale as 'legitimate', i.e. as Government sanctioned.

In a nutshell, the control of worked ivory through CITES is too difficult to effect. Each bangle, each ivory bead, cabochon or pendant should have its document of authority. The sheer volume of paper required makes this totally impractical. And so the major ivory working countries, for all their ratification of CITES do not meet the requirement. Finally, small items of worked ivory can be passed through postal systems with no Customs and Excise examination.
Raw ivory is a different issue altogether and an anomalous wildlife product for the ease of its identification. It may be hard to separate African from Indian tusks (all of the latter I have ever examined I suspect to have been of African origin and mistakenly ascribed to India), but there is little else similar to a raw elephant incisor. Not only are tusks easily recognisable, but they are also difficult to conceal if in quantity. Ivory in its raw state is a commodity which can be policed in trade more readily than almost any other item covered by CITES. Thus the convention has influenced trade to a considerable degree in the importing countries which have ratified it. Again, all the influence has not been positive.

As all countries which import ivory have not become parties to the Convention, CITES created a competitive imbalance between them; the trade disadvantage being against those which have signed. It also created a Beilenson effect that the merchants hold to have driven prices upwards. Its immediate influence was, de facto, to make ivory a rarer commodity than it actually is. A further careless outcome was 'trapping' considerable quantities of 'innocent' ivory. A classic case I observed in Germany.

Carvers often buy stock to last them a year or more. During that period the raw ivory represents a substantial aspect of the individual's capital. Thus I made the acquaintance of an elderly carver whose business was largely in exports of the traditional Erbach art to Switzerland. Switzerland acceded to the Convention and this man was faced with the prospect of losing his trade with that country, or finding permits to prove the legality of what had been perfectly legitimate but permitless ivory. Without such documents his income and investments were imperilled. He obtained 'permits' with considerable reluctance, for he was forced across the psychological threshold between the legal and the illegal.
This happened on a far grander scale in Hong Kong. Fortunately the Government there took a pragmatic view and introduced the law gently and with warning. Even so there is much ivory which is compromised as, though it was legitimately permitless when acquired, when the point comes to re-export it in whatever form, someone is going to have to fiddle some document somehow.

Yet another related instance of the manner of CITES imposition and its production of a Beilenson effect concerns the U.S. action to limit import of elephant products to those African countries which had acceded to CITES. At the time this effectively barred all African countries save Zaire, Botswana and South Africa, from exporting ivory to the U.S. which, not unnaturally, placed a premium on Botswana permits and Botswana ivory. It led to the forgery of Botswana export permits and an incentive to get ivory from Botswana. Both the developments were unwanted!

It is in this matter of permits that CITES greatest weakness lies. It is as though the act of conservation is obtaining the document, rather than the document being no more than an affirmation that conservation has been done. As an African trader said "Well, after all, a permit is a piece of paper..."

The salient point is that permits are nothing new in Africa's ivory trade. They have been necessary in most countries for most of this century. True, they come in all manner of shapes and guises - as the few figures in Chapter 4 show clearly. Their variety alone compromises their purpose. It was planned to include a compendium of African game laws as an appendix to this report. A request made on 4th August 1978 to the U.S. Fish and Wildlife Service to obtain these through the U.S. Embassies in Africa, has failed. Their absence notwithstanding, most countries on the continent with elephant populations have laws for the control of the ivory trade. None were as "fool-proof"
as Kenya's. Yet the laws and the permits failed. Replacement with another set of documents is no advance upon the previous position.
The following comments on tusks start with a synopsis of a paper in preparation by Laws and Parker. As this will be published shortly with data and detail, I shall forego repetition here. Suffice it that the material was obtained from the tusks of 2,900 elephant culled in Uganda, Kenya and Tanzania during the years 1965-1969. Information on this culling and analysis of other relevant data obtained have been published (e.g. Laws 1966, 1967a,b, 1969a,b, Laws and Parker 1968, Laws, Parker and Johnstone 1975, Parker and Archer 1970) and further papers will be forthcoming over the next decade (e.g. Laws - Development, growth and wear of mandibular teeth in the African elephant *Loxodonta africana* — is already written).

Elephant tusks are modified incisors which, in the African, species, are present in both males and females. A 'milk' tusk is present in the late-term foetus and at birth which seems to be resorbed internally and never features as an externally visible tooth. The permanent tusk which replaces it erupts at an average age of 16 months, but may not be visible beyond the lip until several months later. The age at tusk eruption is variable, in some cases it may not take place until the animal's third year. Tusks grow continuously throughout life, albeit at declining rates from the middle of the 3rd decade, in the form of a logarithmic spiral or helix. Both tusks and molars exhibit pronounced 'layering' in their structure, which correspond to seasonal changes in the environment, and which (presumably) are related to nutrition. These act as an indicator of growth rates. In the main they confirm the validity of Laws' (1966) earlier age criteria.

Aspects of tusk growth are illustrated in Figures 32-35 in which total tusk length, length of that portion lodged in the head, circumference at the lip and weight are respectively plotted against age. Male and female tusks show markedly different growth patterns, though with both, size increase...
FIG. 33 SCATTERS RELATING LENGTH OF MALE AND FEMALE TUSKS IN THE ALVEOLUS TO AGE. (n = male 147; female 170)
FIG. 34 SCATTERS RELATING MALE AND FEMALE TUSK CIRCUMFERENCE AT LIP TO AGE.
(n = male 701; female 824)
FIG. 35 SCATTERS RELATING MALE AND FEMALE TUSK WEIGHTS TO AGE.
(n = male 1862; female 2733)
with age until the last decade of life when — in some individuals at least - wear and breakage exceeds replacement through growth.

The incremental layers have permitted calculation of potential cumulative increment in length and weight. These are 555 cm (c.18 ft) and 80.8 kg (178 lbs), and 521 cm (c.17 ft) and 21.7 kg (47.8 lbs) at 60 years in males and females respectively. Actual lengths and weights at 60 years average 250 cm (c.8 ft) and 61.0 kg (134 lbs) in the male and 160 cm (c.5 ft) and 7.5 kg (165 lbs) in the female. Thus male elephant in East Africa attain only 75.5% of their tusk weight potential, and females only 34.6%. The loss is caused by breakage and wear throughout the elephants' lives. The differential loss between the sexes is almost certainly the consequence of the female tusk being a smaller tool, relative to the size of the animal. The potential weight of the male tusk (80.8 kg) is 1.5% of the male's potential total body weight at 60 (5314 kg — Laws et al. 1975), whereas the potential of the female tusk is 0.7% of the female potential total body weight (2986 kg - Laws et al. 1975). While the mechanics can no doubt be described elegantly in engineering terms, the female can at all times exert a proportionately greater stress (body weight : potential tusk weight) than males upon tusks of similar lengths (greater weight on a thinner lever).

The differences between tusks of the sexes that are so marked in Figs. 32-35 are easily discernible at a glance, for the tusks also differ in overall shape. Almost all male tusks within the normal range of female tusk weights are pronouncedly conical from the base. Even if the tooth beyond the lip is broken, the taper is still noticeable in that section of the tusk that was within the elephant's head (the alveolus). Female tusks appear cylindrical — their taper in the first half of the tusk being too gradual to perceive easily. Male tusks only become cylindrical when well beyond the limits of female growth. The relationship of circumference, length, weight and shape permit male tusks to be separated from females' with ease:
a fact of which both hunter and trader have been aware for centuries.

The dynamics of elephant tusk growth are such that given tusks' weights alone, it is possible to determine those which are unlikely to be female, i.e. all over 7.5 kg. Of those over 7.5 kg it is possible to ascribe ages to the bearing elephants at the time of death. If, in addition to the weight, tusks can be seen, their shape and weight at any size permit both sexing and aging of the elephants which bore them. Similarly, on their own, total lengths, circumferences and or the length of tusk in the alveolus, are all useful indices of age. With shape or in combination with any one other of the parameters illustrated, they will determine sex and age. Precision increases if combinations are made with two or more of the other parameters. A fifth measurement on which Laws and Parker will publish data in due course is the volume of the tooth pulp (hollow' to the trade and 'nerve' to the hunter). Up to 35 years of age this increases in volume up to 5.85 litres in the male, and 0.82 litres in the female tusk. After this it regresses down to 0.3 litres in very old females, being replaced with ivory. The degree of male regression is not yet confirmed in view of limited records. The replacement of pulp with ivory must partially compensate for any slowing down in incremental length growth, and for external wear and breakage.

The salient point is that tusk measurement can provide an objective record of human/elephant interactions. If data on weight, lengths and circumferences and can be collected they will impart a great deal about the manner in which hunting is affecting populations, and also considerable detail on elephant status.

The data from which our descriptions derive are exclusively East African. It has yet to be shown that they are valid for other African regions. Subjectively, I can recognise 4 types of ivory: East African, South-Western, Sahelian and Cyclotiform.
Throughout this survey, when seeing ivory in Europe or Hong Kong, I estimated its origin before asking the owner from whence he obtained it. In all cases I ascribed it to the correct region. Experienced traders are also able to make similar distinctions as to ivory's origin, particularly when it is in large lots so that common features stand out.

East African ivory occurs the whole length of the Indian Ocean seaboard and inland to include Somalia, southern Ethiopia, southern Sudan east of the Nile, Uganda east of the western rift, Kenya, Tanzania, eastern Zambia, Malawi (with reservations), eastern Rhodesia, Mozambique and the Kruger Park of South Africa. In trade terms this region produces East African "Soft" or "white" ivory. In older animals it is long, and the tusks generally bow and curve in several planes: it is this ivory which grows in a noticeably logarithmic helix. The twist on a large male tusk is very obvious.

South-Western ivory is from southern Angola, western Zambia, Namibia, Botswana and western Rhodesia. In trade terms this is South African "Soft" or "white" (and not so highly prized as East African white). Subjectively I believe these elephants to be substantially bigger than the East African form. However their tusks seem much shorter, with a bigger proportion in the alveolus, and seldom attain the same weight. It is far more heavily "shaked" than most East African ivory. Their bluntness and lack of length suggest very much higher breakage rates. South-Western tusks seldom attain sufficient length to show curvature in more than one plane which, however, is very pronounced. The absence of an obvious twist in the grain suggests that these tusks grow more in a logarithmic spiral within one plane and less in helical form.

As the name implies, Sahelian ivory derives from the sub-Saharan zone from Senegal to the Nile. It is more similar to the South-Western, than East African, but it does get much larger that the former. Again there appears to be a very much higher
breakage rate than in East Africa - particularly in the female. A common phenomena in Sahelian ivory is a very fine 'herring-Bone' shake, which is so dense as to impart a grey appearance to the tusk. This does occur in South-Western tusks, but not to the same degree.

The East African, South-Western and Sahelian elephants are all "bush" or "savanna" types, i.e. *Loxodonta a. africana*. The fourth is the forest elephant of the equatorial forests in the Zaire basin the West Africa: *Loxodonta a. cyclotis*. It is the least known of all the African elephant forms. Suffice it that it is much smaller than any of the savanna elephants. The tusks are equally distinct, being slender (particularly in the female), very straight with no twist; if there is curvature it is slight and in one plane only. The proportion of a cyclotis tusk in the alveolus is far less than an africana tusk of similar weight (Fig. 36). In both sexes the tusks point downwards rather than forwards as in the case of africana. Further, the male tusks show far less taper than in the savanna forms, although it is still quite discernible. Cyclotis tusks have very few "shakes", are often black or deep mahogany in colour (presumably from vegetable staining) and where use removes the staining, show a characteristic yellow patina. To the trade they are "hard" or "yellow" ivory.

No clear—cut division separates the small forest cyclotis from savanna forms of elephant. Rather, all around the periphery of the rain forests there are clines in which elephants are intermediate, showing features of both forest and bush types. It is in this "hybrid" zone that large individuals occur, carrying cyclotiform ivory in all aspects but its large size. Many of the biggest tusks I have seen, have been straight, without shakes, and with the characteristic black colouration of the forests, or forest edges. Traders refer to it as "semi-hard" or "semi-soft".
FIG. 36 TRACINGS FROM A PHOTOGRAPH TO ILLUSTRATE THE DIFFERENCE IN SHAPE AND DEPTH OF TUSK IN THE ALVEOLUS BETWEEN TWO 20 KG MALE TUSKS
A. FROM Loxodonta africana africana AND
B. FROM L. a. cyclotis. THE UNSHADED AREA IS THAT WITHIN THE ALVEOLUS.
Figure 37 illustrates the distribution of the four gross geographical forms of ivory. It must be stressed that they are based on broad generalisation. The characteristics are more apparent when a number of tusks from one region are assembled in proximity to a group from another. The individual tusks can show wide variation. An example of intra-family similarities and inter-family differences is given in Figure 38 from two herds taken within the same East African population.

Objective data to support the contention of four ivory regions are few. Elder (1970) examined some aspects of tusk morphometry from South-Western, East African and Cyclotiform ivory. He found no difference in the specific gravity of the three forms either between sexes or between regions. He did comment on the greater depth of tusk in the alveolus of the South—Western elephant which suggests a bigger animal. He mentioned a greater circumference at lip than in either East African or Cyclotiform tusks, but this was not allied to age. If his Botswana sample derived from older elephants, the apparently greater circumference would be explained. I have seen a great deal of Botswana ivory and, albeit subjectively, have never gained the impression that it was noticeably thicker than East African tusks. Extensive data have been collected on western Rhodesia ivory which were not available to this study and in due course their analysis will settle the matter.

The records of William Finaughty who hunted the South-Western elephants extensively between 1864 and 1875, indicate the heaviest tusks he got were two which weighed 56.7 kg each. While these are big, they are not outstanding by East African standards, but they were obviously exceptional to him.

Stevenson—Hamilton (1947), an accurate observer, wrote:

"I am inclined to think that South African ivory can never have equaled that carried by elephants in equatorial Africa, where even to—day tusks of well over 100 lbs (45 kg) are not uncommon."
FIG. 37 DIAGRAMMATIC ILLUSTRATION OF THE DISTRIBUTION OF FOUR IVORY TYPES IN AFRICA.
FIG. 38 TUSKS FROM TWO FAMILY UNITS IN THE SAME EAST AFRICAN POPULATION TO ILLUSTRATE (i) INTRA-FAMILY SIMILARITY AND (ii) INTER-FAMILY DIFFERENCES.

(Photos : R.M. Laws)
On such as this and my own observations I am inclined to believe that weight in the South-Western elephant tusk is lower at age than in East Africa, and that if we apply criteria developed from the Laws and Parker material, we would under-rather than over-age these elephants.

Sherry (1978) indicated asymptotic weights of 5.6 kg and 6.9 kg for female tusks at 60 years of age in two south-east Rhodesian elephant populations. These are substantially less than the 7.5 kg we have postulated from East African data. However, we have evidence of differential breakage and wear between our 5 East African populations, and these low Rhodesian estimates may be rather more extreme expressions of the same phenomenon.

I have many reservations about applying East African tusk criteria on a pan—African scale. However they are the only yardsticks available to this survey. In the following chapters I shall apply them to material from the ivory trade with the caution that the results may need some re-adjustment (particularly those relating to Cyclotiform ivory) in the light of future, more precise data.
VOLUME 2 (2) IVORY — THE STANDING CROP

An elephant population’s standing crop of ivory (the total weight of ivory carried) is obviously the product of its age and sex structure. Such structures vary widely, and appreciation of this is necessary before ivory entering the trade can be analysed.

The elephant culling recorded by Laws et al. 1975 took random samples that were representative of population age and sex structure. Five populations — 2 in Uganda, 1 in Kenya and 2 in Tanzania — were sampled in the manner described. Below I present 3 examples: 1) from Uganda (MFPS) which is representative of an ‘old’ population, 2) from Tanzania (MKE) representative of a 'young' unprotected population and 3) being the sum of 1 and 2 and the 3 other populations intermediate between them to give a 'generalised' population.

The age structures of the MFPS population are presented as 5 year classes in Figure 39 and Table 162, males and females separately and combined. The sex ratio of the sample was 42:58 males to females. In the same figure and table are the distributions of ivory weight in 5 year age classes to produce 'ivory shadows' of male, female and combined sectors of the population. Of the gross ivory crop, 64.8% was held by males and 35.2% by females - an exaggerated reversal of the sex ratio. The average male tusk was 10.08 kg and 68.7% of male ivory was in animals of 26 years or older. The average female tusk weight was 3.94 kg and 72.7% of female ivory was in elephants of 26 years or older. The population’s average tusk weight was 6.51 kg and 70% of its ivory held by animals of 26 years or older.

The MFPS population had a very low recruitment rate (insufficient to maintain the population) with correspondingly few young animals. Its range at the time of the culling had been a sanctuary for 52 years which reduced human inflicted mortality and permitted many individuals to approach their
FIG. 39 AN ILLUSTRATION OF THE DISTRIBUTION OF AGES IN 5 YR CLASSES AND THEIR CORRESPONDING PROPORTIONS OF THE STANDING IVORY CROP IN AN OLD ELEPHANT POPULATION, MFPs.

A = MALES, B = MALE IVORY, C = FEMALES, D = FEMALE IVORY, E = SEXES COMBINED.
maximum potential longevity. These factors produced a very 'old' population that is unlikely to have many (if any) counterparts elsewhere in Africa.

The age structures of the MKE population are presented in Fig. 40 and Table 163, males and females both separately and combined. The sex ratio of the sample was 49:51 males to females. The corresponding ivory shadows for both sexes separately and combined are also illustrated. Of the gross standing crop of ivory, 59.9% was held by males and 40.1% by females. The average male tusk weight was 4.63 kg and 25.7% of male ivory was held in animals of 26 years or over. The average female tusk weight was 2.99 kg and 47.2% of female ivory held in elephants of 26 years or more. The population's average tusk weight was 3.81 kg and only 34.4% of the population's ivory was held in animals of 26 years or over.

N.B This was a non-random sample in which independent bulls are under-represented (Parker pers.comm).

The MKE population was characterised by very few old elephants — none at all in the last decade of life and only 2.6% over 41 years (cf. 11.8% in MFPS). Constant hunting and harassment were the cause of this (Parker and Archer 1970) and mortality was such that only 5.4% of males were 26 or older and none reached 41. Recruitment was high, producing a correspondingly large segment of immatures. As such MKE was a particularly 'young' population and it is doubtful whether there would be younger groups elsewhere, other than in artificial circumstances the Akagera National Park of Rwanda (e.g. as in where the whole population is of translocated immatures).

The combined age structures and ivory shadows of all 5 East African samples are presented in Figure 41 and Table 164. The sex ratio in this sample is 45:55 males to females. Of the standing crop of ivory 63.4% was held by males and 36.6% by females. The average male tusk weighed 7.26 kg and 55.1% of male ivory was in elephants of 26 years or older. The average female tusk weighed 3.36 kg with 65.4% being held in animals of 26 years or more. The population tusk averaged 5.09 kg and
FIG. 40 AN ILLUSTRATION OF THE DISTRIBUTION OF AGES IN 5 YEAR CLASSES AND THEIR CORRESPONDING PROPORTIONS OF THE STANDING IVORY CROP IN A YOUNG ELEPHANT POPULATION, MAE. A = MALES. B = MALE IVORY. C = FEMALES. D = FEMALE IVORY. E = SEXES COMBINED. F = IVORY SEXES COMBINED.
FIG. 41 AN ILLUSTRATION OF THE DISTRIBUTION OF AGES IN 5 YEAR CLASSES AND THEIR CORRESPONDING PROPORTIONS OF THE STANDING IVORY CROP IN A GENERAL POPULATION, COMBINED EAST AFRICAN DATA FROM 5 POPULATIONS. A = MALES, B = MALE IVORY, C = FEMALES, D = FEMALE IVORY, E = SEXES COMBINED, F = IVORY SEXES COMBINED.
58.9% of its ivory is held in animals of 26 or older. The distribution of ivory within the population is illustrated in Figure 42 and Table 165.

The pattern presented in Figure 41 is the standard against which I shall compare data obtained from the ivory trade in subsequent chapters.
7 VOLUME 2 (3) HUNTING EFFECTS

Elephants are killed for a variety of reasons which involve different techniques and have different influences upon populations.

Perhaps the most widespread reason for hunting elephants is still for meat. Even if tuskless they would still be taken. Thus in Malawi (Bell 1979), Zambia, Mozambique, Zaire and parts of the Sudan, there are usually meat smoking racks and other evidence of their use as food, in close proximity to carcasses of hunted elephants. Even in Angola where ivory buys ammunition, elephants are equally important for the meat that they provide for guerilla troops (N. Steyn, pers. comm).

In most subsistence situations there is insufficient manpower available to make optimum use of all the meat an elephant provides. Cutting it up for smoking and drying is time consuming and laborious. Even an adolescent specimen provides a surplus, and only animals killed relatively close to large settlements can be fully utilised. Thus with subsistence hunting for meat there is little incentive to select particularly big elephants. If there is a bias in what is hunted, it probably arises more from the elephant's social organisation than any other factor. Females and young in family units show considerable cohesion and are more dangerous to the lone hunter with a primitive weapon. Lone males, in contrast, are among the easiest to approach of all game.

However while this bias will possibly result in more adult males being selected and hunted when using spears, bows and arrows, muskets and rifles, it would not apply where the more economic and less dangerous techniques of trapping are employed. Indeed here the bias would work the other way, for it will be the weaker, less experienced young individuals who would be more likely to succumb to a drop spear wound or less able to break snares. Overall, the effect of subsistence hunting is likely
to affect all ages and sexes of the population. To my knowledge it has not been seriously suggested as a cause of elephant extermination.

At an elementary level it is difficult to separate subsistence from commercial hunting. For centuries the Watta of eastern Kenya have taken elephants for both meat and ivory. Ivory was the key to their social bond with the Galla pastoralists, who provided protection in a somewhat overlord/serf relationship. At this level they were in truth subsistence ivory traders and in having a special use for ivory, were appreciative of big tusks. A great deal of their hunting, however, was opportunist; lying in wait at a waterhole, they would ambush any elephants which came to drink. The volley of arrows loosed would be aimed at the nearest to the bowmen and this technique would probably have swamped the better hunters' efforts to be selective of large male elephant.

As the 20th century unfolded, so pressures to enter the monetary economy will have influenced the traditional 'subsistence' ivory hunter, killing for; meat will have receded in importance and for ivory have made corresponding gains. With the decline in the value of ivory relative to rising commodity prices (Volume I Chapter 7) the need to kill more for the same return would have been augmented by human population growth and further demand upon elephants. Selectivity will almost certainly have declined. Overall the commercial hunting will have reduced life expectancies of elephants, the degree depending on hunting intensity. The direction will have been toward an MKE population of low age and high fecundity. The most extreme expression will have been that of the Somalis in Kenya in the present decade.

'Control' shooting is a widely used misnomer applied to the destruction of elephants in defense of human interests. At its more simple level it entails shooting those which venture out of sanctuaries and damage crops (usually males in their late teens and twenties). This is the most common form of control where
there is a stable — in area — sanctuary surrounded by human settlement.

A different complexion is taken on by control work where humans occur as islands in a sea of elephants. In view of human population increase, politics and economics the boundaries of these islands are seldom constant. In this century they have, for the most part, been expanding, but on occasion have contracted — e.g. with the 'villagisation' of peasants in Tanzania (Rodgers, Lobo and Mupunda, 1978). However, whether expanding or contracting, there is almost constant elephant attrition about their edges. Thus in south—eastern Tanzania over 100,000 elephants have been shot since 1930, and c.2,500 are still shot annually (Rodgers et al. 1978). Solutions have ranged from a limited policy of shooting one or two members of a herd in the vicinity of cultivation to 'teach' the survivors to leave it alone, to grandiose quasi-military strategies to drive the elephants 'back' and to establish frontiers which they should not cross.

"In other words a system of defensive fronts has been instituted to ward off the encroachments of elephants" (Anon 1925).

This involved shooting virtually every elephant on the wrong side of the 'frontiers'. At the same time there was a persistent desire to leave big tuskers for sportsmen.

"Rangers were told to spare all bulls with warrantable tusks (Anon 1926)."

The records of the Uganda Game Department from 1925-1959 provide the most cohesive documentation of the effect intense and prolonged human activity had upon elephants. A synopsis of the relevant data is presented in Table 166. It includes the yearly number of elephants shot on 'control' (males and females); their average tusk weight; the number of elephants shot on licence and their average tusk weight; the number of tusks found — both in the battle grounds and elsewhere, with their average weights; the total weight of ivory produced and overall Uganda average tusk weight; the contribution tusks of less than 4.5 kg made to
the overall number of tusks; the weight of ivory claimed by the Game Department to have been produced compared with Customs records of export; and lastly a comparison of the number of rifle permits and game licences issued over a 9 year period.

To gain confidence in the record let us first compare Game Department stated production with Customs records of export for the 19 years 1939-1957. They should marry approximately as Uganda had no internal ivory uses of consequence. The Game Department 'produced' 434.5 tons when Customs claimed exports of 434.9 tons: an insignificant difference of 0.09%! With this backing it is reasonable to accept Game Department volumes of ivory as accurate.

The first set of columns in Table 166 concerns elephants killed on control. These rose from an average of 705 a year 1925-1929, to a peak of 1351 a year 1935-1939. From this high point the 5 year average declined to 667 annually between 1950 and 1954. From then it rose steeply back past 1027 a year in 1955-1959 and, though there is a gap in the record as the Game Department stopped publishing reliable data after 1959, the trend proceeded to the large-scale cropping described by Laws et al. 1975 and culminated in the wholesale slaughter of survivors under the dictatorship of Idi Amin.

It was all very well to decree from behind a desk that control shooting should concentrate on 'unwarrantable bulls'. It was quite another matter putting it into practice. Shooting elephants in dense *Pennisetum* c.4 metres (12 ft) high was unhealthy for the hunter. Grass this tall hides elephants as effectively as a stand of wheat conceals rats. Invariably they remain invisible until at very close quarters. Much shooting was also done in thick forest — which was equally uncomfortable. It was extremely difficult to determine the sharp from the blunt end of an elephant, let alone whether it was an 'unwarrantable male'. The de facto system was shoot what you can. Thus control kills were virtually random - except that small immatures tended
to be under-represented. They were more concealed by the vegetation and bodies of other elephants.

In the circumstances, the offtake should have been similar to a cross section as illustrated in the preceding chapter minus most animals under c.5 years of age. Consequently the expected tusk weight should have been slightly above the mean population weight of 5.09 kg (Table 164). At first glance this is indeed the case - average control tusk weight remained remarkably constant between 5.14 and 7.61 kg over the 35 years. However this constancy is at complete variance with the sex ratios given. The average tusk weights are reasonable given an expected 45:55 male to female sex ratio, minus the youngest classes of tusk bearers. They are not reasonable if the sex ratio is reversed and exaggerated to an average of 65:35 males to females as in the case in Table 166. Further examination shows that the claimed sex ratios varied very widely — between 52:48 and 84:16 - always in favour of the male. Such variation clashes with the constancy of average tusk weights. Either the sex ratios or the average tusk weights are wrong. The manner of control hunting, the known range of sex ratios in elephant populations, and the independent agreement with Customs statistics indicate that the weights are right and the sex ratios wrong. From my own experience I know that many game scouts and not a few game wardens cannot sex an elephant accurately. The myth of the dominant "herd bull" dies hard and family unit matriarchs, which are often substantially bigger than other members are claimed as "lords" of the herds. This misidentification of sex has also been reported from Tanzania (Nicholson pers. comm. and Rodgers at al. 1978). Added to these genuine misidentifications, was a desire to claim males shot. In those days it was the epitomy of bad game-keeping to shoot females!

The constancy of average weights in animals shot on control run somewhat contrary to expectations. Theoretically continuous harrying should have reduced life expectancy towards an MKE level (Table 163); 35 years of control should surely have
produced a declining tusk weight? In fact the reverse is true, for it only rose to over 7 kg at the end of the period.

The elephant shot on licence bear out the expectation of a declining tusk size. This was the subject of concern in the Game Department shortly after the second World War (Pitman pers. comm.), The records were analysed by Brooks and Buss (1962) who documented that there had been a decline in tusk weight. This was inversely related to the number of elephants taken on licence: the more elephants taken, the lower the average weight of tusk. The assumption is that the hunting demand exceeded the population's supply of 'warrantable' bulls. (Note: at the time it was not appreciated that control shooting the 'unwarrantable' males today, removed the prospect of 'warrantable' males tomorrow.) The assumption of over—hunting was tackled in 1952 by raising the price of elephant licences. This produced a sharp drop in the number bought and, as expected, a rise in the average weight of tusk taken on licence. However, even though the number of male elephant taken on licence dropped to below the 1938, 39, 40 and 41 figures, the average tusk weight taken did not return to the previous level. From this one might deduce that the consequence of all forms of hunting had so reduced male life expectancy that the average tusk weights of the 1930s were no longer attainable: the population had become 'younger'.

The average weights of 'found' tusks were slightly higher than those obtained on control. However they show no obvious trends. The combined Uganda average tusk weights are, from the contribution of sport hunters, higher than those of either control or found tusks. In view of this contribution, and the constancy of control weights it would have seemed reasonable if the overall tusk average had declined in sympathy with the fall in sportsmen's tusk size. In fact this didn't happen. Overall average weights increased. This could have come about if the contribution of the lightest tusk classes declined at a greater rate than the contribution of sportsmen's results. This in fact occurred. In the mid 1930s tusks of less than 4.5 kg constituted
over 40% (over 51% in 1934) of all tusks recorded. After 1948 the proportion never rose above 31%. A logical assumption would be that the control officers became more selective. The truth is more likely that there were fewer small elephants to shoot, and I offer the following rationale.

Figure 43 presents graphs of 4 indices: 1) average tusk weight taken on licence, 2) number of elephants killed on licence, 3) average tusk weight from all sources and 4) the contribution that all tusks under 4.54 kg made to the total number of tusks. The year 1939 is taken as 100 for all 4 indices (see also Table 167).

These illustrate graphically what was stated in the preceding paragraphs. Tusk weights from licensed hunting declined as the number of elephants taken went up. The big drop in such elephants killed after 1952 produced a rise in average tusk weight, but it never rose above an index level of 98. In the 1930s the index had reached 122.

The overall average tusk weight rose more or less continuously from 1933 to 1957 in a reverse trend to the decline in licensed tusk weight. The cause of this is clear in the diminishing contribution made by tusks of less than 4.54 kg.

The decline in licensed tusk size is easy to understand: hunting exceeded the rate of replacement in the older age classes. However, added to the control killing this might have brought compensating mechanisms into play. Natural mortality should have declined, and faster growth, increased fecundity and earlier puberty should have tilted Uganda's elephant toward a MKE situation. If this happened, the contribution of under 4.54 kg tusks should have increased. It didn't because throughout the period 1925-1959, the elephants were losing not only numbers but range. Brooks and Buss (1962) documented the fact that at the outset of this span, elephants occurred over 70% of Uganda's land area. By 1959 they occurred in only 11%. At the same time as
FIG. 43 TRENDS IN ELEPHANT POPULATION PARAMETERS IN UGANDA 1926-1957. 1919 = 100

INDEX OF:
- Average tusk weight of elephant shot on licence.
- No. elephant shot on licence.
- Average tusk weight all sources.
- Tusks under 4.54 kg as proportion of annual total number of tusks.
the shooting, elephants were being displaced by expanding humans. The situation changed from one in which humans were islands in a sea of elephants, to its converse. As the humans increased and their islands coalesced, elephant distribution became discontinuous and fragmented — islands constantly diminishing in size. It is here that Laws et al. (1975) work on MFPS elephants is of particular relevance for it took place in one of the declining islands. They described the progressive retraction of the North Bunyoro elephant range from 1946-1968 at the rate of a mile inwards a year (Laws et al. op. cit. p.18). They summarised the situation thus (p.260):

"Models for the MFPS population have been constructed for 1946 (or earlier), 1966, and 1971. The adult mortality rates appear not to have altered significantly, but calf mortality has apparently increased by more than 50 per cent (perhaps as much as 100 per cent) since 1946. Together with deferred maturity and reduced fecundity (through overcrowding), this has led to a massive decline in recruitment. It is estimated that relative natality may have fallen to 34 per cent of the 1946 level and relative recruitment at four years to 25 per cent of the earlier level. Population size is estimated to have decreased from 22 000 in 1946 to 9400 in 1966 and to 7900 in 1971, that is by 64 per cent. Less than half of this decrease was due to control shooting and sport hunting. Natural regulatory mechanisms alone were apparently responsible for a decrease in the residual population of about 51 per cent up to 1971."

I suggest that this is what happened wherever elephants became diminishing islands in Uganda. The severity of effect would of course have been related to the pace at which range was depleted. A further factor worthy of note is that a declining area in which to live would have caused an apparently constant hunting effort to become progressively more severe in effect. The rate of range loss was c.2% per annum. In the years 1950-54 an annual average of 1,110 elephants were being taken, as against an average of 1,540 p.a. in 1930-34. However while the later elephant crop was 72% of the earlier, it was being taken on only 60% of the former range. The actual hunting intensity had risen — not declined.
The figures in Table 166 are of course minimal, for they do not take note of the tusks poached successfully, nor account of all the deaths by wounding which were considerable (Laws et al. 1975). The discrepancy between the number of game licences and firearms permits issued (Table 166) may be an indication of the extent to which unlawful hunting took place. The Game Department knew that a minimum of 45,583 elephants died in the 34 years and the real figure may well be double this amount. The Game Department record is no more than an index of what happened, yet it illustrates several important points. The first is that the tusk weights of elephant taken on licence are useful indices of declines in average age — for as long as the licensees seek the biggest elephants. The second is that an increase in overall tusk weight may herald a worsening situation for the elephants rather than an improvement. This is likely to be the case if the elephants occupy a rapidly contracting range.

One Uganda experience deserves some prominence. In the Budongo Forest the removal of elephants was decreed in the interests of forestry (Laws et al. 1975). It was never achieved despite intense effort and illustrates that in thick vegetation elephants are difficult to exterminate.

In contrast to Uganda, the position reported by Rogers et al. (1978) in Tanzania accords with the expected situation of a stable or slightly declining tusk size. Here the elephants have not been deprived of range; indeed they may have temporarily gained ground. The attrition around the peripheries of the human islands has produced an MKE effect and not an MFPS situation. The large scale control shooting reduces numbers in the vicinity of human settlement; biological compensating mechanisms come into play, more food is available to the individual through reduced density; there is lowered natural mortality, faster growth, earlier puberty and increased fecundity. In short young, highly productive populations have been induced.
There have been a number of competent African elephant studies in the past 3 decades — e.g. Caughley 1973, Douglas-Hamilton 1972, Laws 1969a, Perry 1953, Sherry 1978 and Smuts 1975. They have produced a broad comprehension of the species' biology. However through expense, the time necessary to undertake them and a wide variety of human factors, studies of this quality are of necessity local. They do not reveal much about the continental status of elephant. What they have shown is that, short of disciplined study, reliance on local lore and guesses about the abundance of elephants is generally not worthwhile. Efforts to overcome this through aerial counting have been made, but on the basis of expanse and consequent expense, the technique has limited application. Added to this it is notoriously crude. To census elephants in the 7,000,000 km^2 (2.7 million square miles) (IUCN Elephant Study Interim Report) of Africa where they still occur is, on the basis of logistics alone, an impossible task.

In theory, tusk parameters should provide a relatively cheap, practical and precise index of overall population trends. The idea was approached by Quick (1963) and the principle determining changes in age structure from characteristics of trophies secured by hunting (e.g. the number of tines on deer antlers etc.) is not new. The question at the outset of this survey was merely whether access to large samples of tusks could be obtained. Ideally, examination should be at the points of the trade’s greatest constriction — the marts of Hong Kong and Belgium. Of the two, Hong Kong was the obvious choice as it receives ivory from a far wider base than Antwerp (refer Fig. 5 Volume 1).

The Hong Kong traders were approached and, with one exception, gave me access to their stocks of tusks. The only stipulation was that I maintained normal business confidences — a courtesy I was happy to comply with. A sample of 18,453
tusks weighing gross 185,942.81 kg, averaging 10.08 kg and related to countries of origin (Table 168) was obtained through examination of invoices. A separate and probably at least partially overlapping sample of 22,260 tusk weights, grossing 214,829.79 kg and averaging 9.65 kg was obtained from official import documents covering the period June–November 1978.

Examination of all or part of the stocks of 10 traders selected at random provided data on 5,132 tusks. The following information from each tusk was recorded: circumference at lip, sex, ivory-type region or, if possible, country of origin and an estimate of whether it was from elephants killed by man or which had died from natural cause. The sheer volume of ivory to be examined and the disruption of business entailed in moving it about, limited me to measuring one parameter. I chose circumference at lip because it was a) easy, b) uninfluenced by individual and regional patterns of wear and c) uninfluenced by breakage in trade — which often affects the first part of the tusk's hollow section. Judgment as to whether a tusk had come from man—induced or natural mortality derived from personal experience in collecting ivory from a wide variety of sources. My decisions were not entirely subjective however.

An elephant tusk is fixed in the alveolus by a mass of fibrous connective tissue. To remove it from a freshly killed elephant, the surrounding maxillary bone has to be chopped away with an axe. It is virtually impossible to do this without leaving some slight evidence on the alveolar section of the tusk. After the bone has been removed and the tooth pulp extracted, it is normal to try and remove such tissue as is connected to the tusk. This adheres strongly and can only be removed by scraping with a knife. Again, this leaves minute but tell-tale marks on the tusk, which are easy to perceive. The alveolar section of a tusk is longitudinally fluted and very thin layers of tissue remain in the grooves of the fluting, which dries quickly, remains tightly bonded to the tusk and is easily seen.
It is of course possible to leave the tusks in situ until
decomposition has broken down the connective tissue which holds
them. Complete dissolution of the tissues takes at least ten
days and often longer. Usually they have broken down sufficiently
within 4-7 days for the tusk to be loose. If it is wrenched at
and turned from side to side, the remaining fibres break and the
ivory can be drawn. However there is usually still some tissue
adhering and which dries onto the tusk if left. It is rather
noisome and commonly the hunter will endeavour to scrape away
the offensive material, again leaving tell-tale marks. Whether
a hunter waits till decomposition allows him to draw tusks or
not depends on a number of factors - the most important being
whether he can afford the 4 day wait. Throughout this time he is at
some risk of losing his ivory to rivals or, to a lesser degree, to
officials. However much also depends on how far from his base the
kill was made - the greater the distance, the less likely he is
to want to wait around. This is countered if the elephant was
killed for meat, which often takes a week or more to smoke. The
point is that whether tusks are cut out or drawn after 4-7 days,
the evidence of tissue still remains.

A third technique for extraction is to build a fire under
the fresh elephant head and literally cook the tusks out. I have
only heard of this being done in parts of Zaire. Again the
process seldom removes all tissue and the tusks often show signs
of over-heating — characteristic lateral cracking and flaking.

When an elephant dies and is left to decompose without
human interference, all tissue ultimately disappears. Tusks then
fall out of their sockets when a scavenger (or other elephants)
move the skull about. Such tusks have a distinctive greenish-
khaki stain on the alveolar section — the product of advanced
decomposition. Rain and weathering will remove this, but replace
it with very fine hair-line shakes — which never occur in a drawn
or hacked out tusk. Still later in time the tusk becomes cracked,
chalky and the surface flakes away — seasonal fires, rain and
sunlight all combine in the process of weathering. Another
indication that tusks have lain unowned are the gnawings of porcupines \((Hystrix\ spp.)\), This occurs all over Africa but is particularly common in the Cyclotiform ivory region. Moreover porcupines don't just nibble ivory, they eat it. I have seen many tusks of over 40 cms in circumference gnawed clean through.

The objective criteria for man—induced/natural mortality with tusks were thus:

<table>
<thead>
<tr>
<th>Killed by man</th>
<th>Natural Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>The presence of:</td>
<td>The absence of:</td>
</tr>
<tr>
<td>1) Any axe, knife or scrape mark – irrespective of how triffling</td>
<td>1) Axe, knife or scrape marks</td>
</tr>
<tr>
<td>2) Any tissue no matter how little</td>
<td>2) All tissue</td>
</tr>
<tr>
<td>3) any blood stain</td>
<td>3) blood stains</td>
</tr>
<tr>
<td>4) Any sign of burning without other form of weathering</td>
<td>The presence of:</td>
</tr>
<tr>
<td></td>
<td>4) the characteristic stain of putrescence</td>
</tr>
<tr>
<td></td>
<td>5) hair line shakes in the alveolar section</td>
</tr>
<tr>
<td></td>
<td>6) Weathering</td>
</tr>
<tr>
<td></td>
<td>7) Burns and porcupine gnawings in the absence of 1), 2) and 3) in the opposite column</td>
</tr>
</tbody>
</table>

Tusks drawn and buried in moist earth would lose tissue through bacterial action and, if they had not been scraped, would appear to have been from natural mortality. Conversely, tusks from natural mortality which were found before the carcass had advanced in decay would appear to have come from killed elephants. Despite such obvious sources of misidentification I feel that the criteria provide a workable basis for separating killed from found ivory.

Most of the 5,132 tusks examined and measured had been acquired in the preceding 18 months. A minority were much older dating back to the previous decade. Where possible my estimates
for region of origin were checked with the tusks' owners. In no case was an estimate of region incorrect and in several cases country of origin was established. Thus all Sahelian ivory examined was tied either to the Sudan or to the Central African Empire. Identifications were aided in a number of cases by characteristic markings made upon tusks by African Governments: e.g. much ivory from Angola bore a South African stamp with 'Rundu' on it (a post on the Angola/Namibia border). The Sudanese either brand tusks with a hot iron or stamp them with metal punches in a characteristic manner.

The raw data on circumference, sex, origin and mortality are presented in Tables 169-178. Where individual weights of tusks were available an masse, they were collected and tabulated. The following data were acquired:

*1. A sample of Botswana Government 'found' ivory. (Table 179)
*2. A sample of tusks taken on licence by Botswana hunters. (Table 180)
*3. A sample of tusks taken on licence by expatriate residents in Botswana. (Table 181)
*4. A sample of tusks taken on licence by tourists from the U.S.A. (Table 182)
*5. The number of tusks and their weights from the Kruger National Park, 1972. (Table 183)
6. The number of tusks and their weights from the Kruger National Park, 1973. (Table 184)
7. The number of tusks and their weights from the Kruger National Park, 1974. (Table 185)
8. The number of tusks and their weights from the Kruger National Park, 1975. (Table 186)
9. The number of tusks and their weights from the Kruger National Park, 1976. (Table 187)
10. The number of tusks and their weights from the Kruger National Park, 1977. (Table 188)
11. The number of tusks and their weights from the Kruger National Park, 1978. (Table 189)
*12. A sample of tusks and weights from the Transvaal Nature Conservation Authority. (Table 190)
13. A sample of tusks and weights from the Angolan/Namibian border. (Table 191)
*14. A sample of tusks and weights from Angola/Namibia recorded in Johannesburg. (Table 192)

*15. A sample of tusks and weights from Mozambique recorded in Johannesburg. (Table 193)

*16. A sample of tusks and weights auctioned in Rhodesia 1977—78. (Table 194)

17. A sample of tusks and weights from Kasungu V National Park, Malawi. (Table 195)

18. A sample of tusks and weights from Lilongwe, Malawi. (Table 196)

19. A sample of tusks and weights from northern Malawi. (Table 197)

20. A sample of tusks and weights from southern Malawi. (Table 198)

*Indicates data supplied from company records;
‡Provided by hunters;
The rest are supplied by Government authorities.

Both tusk circumferences and weights can be presented as ivory 'shadows' of the elephants they came from. Even if the sex of the elephants is unknown they can be compared to a combined male + female distribution of tusk weights from known populations to give some idea of the sectors which they represent. When it is possible to determine sex as well as circumference or weight, the picture becomes much clearer.

Conversion of tusk circumference and weight distributions into sex and age distributions are based entirely on data obtained from the elephant cropped in Uganda, Kenya and Tanzania. In the first instance age was determined in the original collections by the method described by Laws (1966). Various mathematical expressions were examined with the aid of a Wang2200 computer and the following were selected as best fits for male tusks.

Circumference:

\[
\text{age}(y) = 13.0439 + 0.81268 \times (\text{tusk circumference})
\]

which explained 90% of variance between ages 0-49 (Figure 44).
FIG. 44 MALE TUSK CIRCUMFERENCE RELATED TO AGE FROM 5 EAST AFRICAN POPULATIONS COMBINED. (n = 701)
Weight:
\[ \log \text{age}(y) = \log -2.5312 + 1.5193 \log x \text{ (tusk weight)} \]
for ages 1-23 which explained 91% of variance (Figure 45), then
\[ \text{age}(y) = -16.5286 + 1.1318 x \text{ (tusk weight)} \]
for ages 24-52 which explained 63% of variance (Figure 46).

Data for males in their last decade of potential life (50-60 years) are too few to make estimates of worth on either tusk circumference or weight. However I would expect them to call for different treatment to cater for senescent slow-down.

Within the limits of time and available funds it was not possible to establish a satisfactory mathematical expression relating either female tusk circumference or weight to age and growth curves were drawn by eye to relate age from dentition to mean tusk circumference and weight (Figures 47 and 48). This produced adequate results for the purposes of this report, but the deflection will be rectified in the pending Laws and Parker paper on tusk growth.

Attribution of each tusk circumference or weight to an age class seems adequate for present requirements - viz. 0-5, 6-10, 11-15 etc. Accordingly the pivotal circumferences and weights for each age class were calculated from the male regressions or read by eye for females, both of which are presented in Table 199. These pivotal measurements are rounded to the nearest 0.5 cm for circumferences and 1.0 kg for weights.

If these relationships have retained their value as aging criteria through the lumping into 5 year classes and rounding into 0.5 cm or 1.0 kg classes, an elephant should still be assigned to the same age class using dentition, tusk circumference or weight. Further, if any two of these parameters are plotted against each other, the slope should be 1.0. Samples are given in Figures 49 a-c. The scatter along the diagonal is small enough to have confidence in aging from either tusk circumference or weight and that the treatment they have been subjected to has
FIG. 45 MALE TUSK WEIGHT RELATED TO AGE (1-23 YRS) FROM 5 EAST AFRICAN POPULATIONS COMBINED. (n=1862)
FIG. 46 MALE TUSK WEIGHT RELATED TO AGE (24-52 YRS) FROM
5 EAST AFRICAN POPULATIONS COMBINED. (n=577)
(See Fig. 45 for Ages 1-23 Yrs)
FIG. 48  A CURVE RELATING FEMALE WEIGH TO AGE, DETERMINED BY EYEL, BASED ON MEASUREMENTS AT AGE FROM A SAMPLE OF 2734.
FIG. 49a AGES DERIVED FROM TUSK WEIGHT, DENTITION AND TUSK CIRCUMFERENCE PLOTTED AGAINST ONE ANOTHER TO SEE IF THEY FALL ABOUT A SLOPE OF 1.0 AS A CHECK THAT LUMPING INTO 5 YR CLASSES HAS NOT DISTORTED THEIR VALUES.

A = MFFS FEMALES (Tusk wt/Dent n=141; Circ./dent n=137). B = MRE FEMALES (Tusk wt/Dent n=212; Circ./dent n=203).
FIG. 49b AGES DERIVED FROM TUSK WEIGHT, DENTITION AND TUSK CIRCUMFERENCE PLOTTED AGAINST ONE ANOTHER TO SEE IF THEY FALL ABOUT A SLOPE OF 1.0 AS A CHECK THAT LUMPING INTO 5 YR CLASSES HAS NOT DISTORTED THEIR VALUES. MPPS MALES.
FIG. 49c AGES DERIVED FROM TUSK WEIGHT, DENTITION AND TUSK CIRCUMFERENCE PLOTTED AGAINST ONE ANOTHER TO SEE IF THEY FALL ABOUT A SLOPE OF 1.0 AS A CHECK THAT LUMPING INTO 5 YEAR CLASSES HAS NOT DISTORTED THEIR VALUES. MEE MALES.
not seriously distorted the original direct relationship between age by dentition/circumference or weight at age.

As male tusks were separated from females' at the time circumference data were collected in Hong Kong, conversion to appropriate age distributions is merely a matter of referring to Table 199.

Table 200 presents average female tusk weight for each year class, sample size and the size of that class as a percentage of the total sample (2,734), average tusk weight being read from the graph in Figure 48. These data are also presented in Table 200 as 5 year running averages for female tusk weight to smooth out fluctuations in simple year to year averages due to small samples etc. In Figure 50 the running averages are presented as cumulative percentages of the population, which illustrate that tusks of 7.5 kg have a 94% chance of being male, a proportion which rises steeply to 100% thereafter. For practical purposes I take this weight as the arbitrary point above which all tusks will be classified as male.

If we know, or can assume a sex ratio in our ivory populations we can estimate what the male component of the under 7.5 kg tusks might be through the formula in the following example:

All tusks over 7.5 kg are male.
The assumed sex ratio is 40% male : 60% female.
The sample is 1,000 tusks.
\[ m^I = 100 \text{ tusks} >7.5 \text{ kg and therefore male} \]
\[ m = \text{male tusks} <7.5 \text{ kg} \]
\[ f = \text{total female tusks, all} <7.5 \text{ kg} \]
FIG. 56  FIVE YEAR RUNNING AVERAGES OF MEAN FEMALE TUSK WEIGHTS RELATED TO AGE (A), AND SAME DATA EXPRESSED AS CUMULATIVE PERCENTAGE TO ESTABLISH 7.5 KG AS CUT-OFF POINT BEYOND WHICH ALL TUSKS HAVE BEEN ARBITRARILY CONSIDERED MALE (B). (n = 2734)
then
\[(m^1 + m) = 400\] and \[f = 600\]
therefore \[100 + m = 400\]
\[m = 300,\] which can be presented as a single
<7.5 kg class or broken down into 1 kg classes in proportion to
the distribution of tusk weight <7.5 kg.

The structure of the female segment of the population could
be calculated by yet further assumption, which in this report
will not be attempted. In the analyses which follow, the actual
(>7.5 kg) + hypothetical (<7.5 kg) males will be combined to
provide comparative population indices.

To provide pause, analysis of the circumference and weight
data presented in tables of this chapter, form the basis of the
following section.
In this Chapter tusk circumference data obtained in Hong Kong (summed in Table 201) and weights collected in southern Africa, have been transformed from ‘ivory populations’ to elephant populations. The pictures derived are presented as cumulative percentage curves and — as an indulgence - as histograms, for some find one easier to follow than the other.

Presentation of these population pictures is more to demonstrate what could be achieved with the type of information the ivory trade could provide, than to give definitive statements on the status of any elephant population. The data could be subjected to more penetrating analysis, but as they stand should not be stretched beyond their worth. This caution notwithstanding, the information provided by ivory in the trade can give a more objective insight into general trends in Africa's elephants, than any other presented to date.

The circumference data have been transcribed into male and female population structures of 5 year age classes, for man-induced and natural mortality. The patterns from the man—induced deaths should illustrate what humans in a particular region are doing to their elephants. A cropping programme as that already described in Chapter 1 of this volume, should represent all age classes in the proportions in which they occur in a population; the highest number being in the youngest categories, diminishing progressively with age. Hunting for meat will produce a broad spectrum of ivory from across the population, with only immatures being under—represented. Hunting for ivory will show selection of older classes of both sexes. Trophy hunting will provide the most extreme expression of this selectivity — concentrating on old males. Defence of property will tend to emulate sport-hunting when it is largely concerned with destroying male venturers from elephant islands (national parks) in the midst of humans, though somewhat younger classes of males would be taken. In situations such as occur in southern Tanzania, where humans
form islands in an ocean of elephants, killing will be unselective and approach a random cross-section of the population - minus the youngest age classes.

The picture from natural mortality in a population not subjected to human interference should approximate to the structure of the living population — mortality curves being more or less reciprocals of survival curves. Laws 1969a and Laws at al. 1975 have described the pattern of natural mortality in elephants. In brief it is one of a high death rate in the first year of life which declines steeply to a low and constant rate by adolescence. In the female this trend of low mortality persists through adulthood until the onset of senescence late in the fifth decade, when it accelerates to achieve 100% at the end of the sixth decade. In males the pattern is similar to the females until the mid-20s when there is a pronounced increase in deaths. This appears to slow down slightly in the fourth and early fifth decade, then accelerate to 100% by the end of the sixth decade. The differential mortality between the sexes in their third decade is such that it reduces the chances of any significant number of males reaching the potential of 60 years. Indeed very few ever pass 50. The tusk data should reflect the expected mortality curve with a high proportion of young animals, a descending but even distribution of adult female tusks over the age span 15-45, then an upswing with rather more old females in the last decade of life. The males should show a marked bulge in the 20-30 year range, a slackening in the 30-40 class and then a secondary bulge at the end of life, 45-55 years.

In areas of heavy hunting with muzzle-loading guns, bows and arrows, cable-snares and wholesale 'control' work, wounding rates are usually very high (Laws et al. 1975, Rodgers et al. 1978). It is unfortunate that the provision of heavy calibre rifles does not as a rule, reduce wounding rates. In many cases it increases them, for the timorous hunter can shoot at greater distance but correspondingly lower accuracy. Elephants dying
of bullet wounds may take months to succumb and when they do, there will be no way to differentiate their tusks from those available from genuine 'natural' mortality. Such deaths will cause the two mortality sources to produce similar pictures

Tusk circumference
Sahelian ivory from the Central African Empire:

The data are illustrated in Fig. 51 and Tables 169, 170 and 202. The sex ratio of 69.3% males and 30.7% females is a strong reversal of natural sex ratios and evidence of deliberate selection for males. The proportion of males taken in each age class between 11-15 and 31-35 is similar. In the natural population the 11-15 class would be far more abundant than 31-35 year olds. This too is evidence of a strong selection of larger males, for they form a greater proportion of the kill than they are of the population.

The female picture is based on only 130 tusks, but it suggests positive selection for animals over the age of 21.

The data from natural mortality are too few for speculative analysis, other than to observe that they are in sympathy with the hunting kills and lack the expected proportion of many young elephants.

The average male tusk circumference of elephants killed is 32.28 cm (Table 169) which would convert to an age of c.23 years and a tusk weight of 9.3 kg.

The average female tusk circumference was 19.5 cm which converts to an age of c.19.5 years and weight of 2.75 kg. With the sex ratio of 69.3% and 30.7% the average tusk weight of the hunted elephants would be 7.29 kg.
FIG. 53 - SABERHA: DATA FROM CENTRAL AFRICAN EMPIRE. MAN-INDUCED MORTALITY AND NATURAL MORTALITY AS COMPARATIVE FREQUENCY GRAPHS AND HISTOGRAMS, FOR EACH SEX, DERIVED FROM SOME EUROPEAN SOURCES.
This is substantially less than the average of 17.75 from 1,050 tusks from the Central African Empire shown in Table 168. However the two sources are not directly comparable as the data in Table 168 will have included both Sahelian and Cyclotiform ivory, both of which are exported from that country.

The small samples from male and female natural mortality (Table 170) suggest older animals: a male average circumference of 34.76 cm = 27 years = 14 kg tusk weight. The female average circumference was 22 cm = 26 years = 4.3 kg tusk weight. Combining these with the killed sample raises the average circumference only slightly: males = 32.74 cm = 24 years = 9.9 kg, while females stay the same.

The overall sex ratios change to 72.5% male : 27.5% female which, with the slight increase in male tusk size raises the average tusk weight to 7.93 kg.

Sahelian ivory from the Sudan:

The data are illustrated in Figure 52 and presented in Tables 171, 172 and 203. The sex ratios of 47.6% male : 52.4% female in the hunted elephants and 48.5% male : 51.5% female in natural mortality are both close to what might be expected in the population, and suggest only slight bias in selecting males. In all sets of data, both male and female, man—induced and natural mortality show proportionately far more immatures than in the C.A.R. sample. The inference is that the hunting is relatively indiscriminate and that tusks from natural mortality are recovered with greater efficiency than in the C.A.E.

The average male tusk circumference in those taken by man is 27.22 cm = 18 years = 6.4 kg. The corresponding female tusk circumference was 19.37 cm = 19 years = 2.3 kg. The average tusk weight of both sexes combined is 4.25 kg.
FIG. 52. SAMBALU IVORY FROM SUDAN: MAN-INDUCED MORTALITY AND NATURAL MORTALITY AS CUMULATIVE FREQUENCY GRAPHS AND HISTOGRAMS, FOR EACH SEX, DERIVED FROM HONG KONG CIRCUMFERENCES.
The average male tusk circumference from natural mortality (Table 172) was 25.84 cm = 16 years = 5.37 kg. The corresponding female circumference was 19.45 cm = 19.5 years = 2.75 kg. The combined tusk weight from natural mortality would average 4.02 kg. Again this and the average from hunted elephants is substantially lower than the average of 11.17 from 3,405 tusks in Table 168.

Cyclotiform ivory:

The data are presented in Figure 53 and Tables 173, 174 and 204. The most striking feature of the illustrations in the cumulative percentage curves and histograms in Figure 53 are the markedly different patterns between the sexes. Both hunted and natural mortality show similar patterns of selection for mature males. Both female illustrations give a much broader spectrum of age classes with far greater weight being placed upon young animals. There may be some valid reason for differential hunting of the sexes, but one would not expect it to be reflected in the natural mortality. A more plausible explanation is that in *Loxodonta c. cyclotis* female tusks are relatively more slender at age (which subjectively I believe to be the case) than in *L. a. africana* and that my circumference interpretations are inappropriate in female cyclotiform ivory. If this is so, it would explain the apparent abundance of younger female classes and believing this to be likely, I am unable to use the material for general comparisons.

The male data suggest marked selection for the large adults: a point that is borne out by the sex ratio of 77.5% males: 22.5% females in hunter kills. That the pattern is reflected closely in the natural mortality suggests a very high wounding rate producing deaths to mask the population's intrinsic rates. As in the two preceding cases the expected high proportions of immatures are absent.
FIG. 53 CYCLOTRIUM TROXY FROM CENTRAL AFRICAN EMPIRE, CONGO, CAMEROON, SOUTHERN RIFT BASIN AND SUDAN. MAN-INDUCED MORTALITY AND NATURAL MORTALITY AS PERCENTAGE FREQUENCY GRAPHS AND HISTOGRAMS, FOR EACH SEX, DERIVED FROM USING RING CIRCUMFERENCE.
The average male tusk circumference from hunted animals (Table 173) is 31.99 cm = 23 years = 9.3 kg of ivory. The average from male natural mortality (Table 174) is 30.58 cm = 22 years = 8.7 kg. Obviously the inclusion of female ivory would drag these down yet further and widen the difference between the average of 10.83 from 6,276 tusks shown in Table 168.

East African ivory:

The circumference data are presented in Figure 54 and Tables 175, 176 and 205. The patterns of man-induced mortality show larger proportions of animals under 20 years than in any of the preceding figures, suggestive of more intense and general hunting. This gains support from the hunting sex ratios of 53.4% males : 46.6% females which indicates relatively slight male selectivity. For the first time in the natural mortality patterns, we have a pattern approaching the expected high proportion of immatures. The suggestion is that they are sought more diligently and successfully.

At this point it is perhaps apposite to comment on the more or less consistent secondary (or in East Africa’s case, primary) peak in male mortality that occurs in the 11-15 year old class. It is in this age group that young males reach a height that renders them among the bigger animals in a family unit. This relative size makes them a target for anyone hunting animals from family units. At this age they are expelled from family units (Douglas-Hamilton, 1972), the process of which is protracted. During this period they tend to hang about the outskirts of the herds, frequently tagging along some distance behind, making them the most vulnerable members of family units and many are shot. Once the break with the maternal unit has been made, and the adolescent male is in the company of other males, his (then) relatively smaller size switches selectivity in favour of the larger males. At the same time the young male is no longer such a herd-fringe animal and consequently less vulnerable.
FIG. 53 CYCLOPTERIUM INGOU FROM CENTRAL AFRICAN EMPIRE, CONGO, CAMEROON, EQUATORIAL GUINEA AND ZAIRE: MAN-INDUCED MORTALITY AND NATURAL MORTALITY AS CONSECUTIVE FREQUENCY GRAPHS AND HISTOGRAMS, FOR EACH GENDER DERIVED FROM HUNGRY CONDITIONS.
The carryover of the 11–15 year age class in the natural mortality record is likely to be an indicator of fatal woundings which are not recovered by hunters.

The average male East African tusk circumference from human kills (Table 175) is 28.66 cm = 19 years = 7 kg tusk weight. The average hunted female tusk circumference is 19.07 cm = 18.5 years = 2.35 kg. The sexes combined in the ratio of their occurrence in the sample would give an average tusk weight of 4.83 kg.

The corresponding data from natural mortality (Table 176) are: male tusk circumference 24.80 cm = 14 years = 4.34 kg; female tusk circumference 16.81 cm = 13.2 years = 2.0 kg. The average tusk weight of the sexes combined in the ratio of their occurrence (male 57.4% : female 42.6%) is 3.34 kg.

A sample of 574 sexed and weighed tusks was obtained in June 1979 in Kenya. This is worth inclusion here for comparison with the sexed circumference data. Details are presented in Figure 55 and in Table 206. The average male tusk weight was 7.79 kg = 20 years = 29.30 cm circumference; the average female tusk weight was 3.19 kg = 21.5 years = 20.5 cm circumference. The sex ratio was 42.9% male, 57.1% female and this gave a combined sample tusk weight of 5.16 kg. The sample was predominantly from poached elephants and the hunting was indiscriminate (Somali). It illustrates a preponderance of young animals.

The range of average tusk weights derived from circumferences are close to, but still lower than the weights from the weighed and sexed sample or the average of 5.36 kg for Kenya or 7.08 kg for Tanzania in Table 168.

South-Western ivory:

Tusk circumference data are presented in Figure 56 and Tables 177, 178 and 207. The kills illustrate that both family
FIG. 55 DISTRIBUTION OF AGES OF 246 MALES AND 328 FEMALES FROM A SAMPLE OF 574 TUSKS OBTAINED IN KENYA IN 1979, MAINLY FROM POACHERS.
FIG. 56. SOUTHWESTERN IVORY FROM ANGOLA AND SOUTH AFRICA. MAN-INDUCED MORTALITY AND NATURAL MORTALITY AS CUMULATIVE FREQUENCY GRAPHS AND HISTOGRAMS, FOR EACH SEX, DERIVED FROM HONG KONG CIRCUMFERENCES.
units and independent males are hunted, selection in both cases being for the bigger animals in these social components of the population. The sex ratio of 60.4% males : 39.6% females bespeaks a positive selection of males. The data on natural mortality (Table 178) are few, but suggest a moderately effective recovery of what should be available, overlain with the consequence of a high fatal wounding rate.

The average hunted male tusk circumference (Table 177) is 28.08 cm = 19 years = 7.0 kg tusk weight. The average female circumference is 19.5 cm = 19.5 years = 2.75 kg tusk weight. In the sex ratio of the sample, the average tusk weight from this South-Western ivory would be 5.32 kg. This has no likeness in Table 168 as the Botswana ivory though South-Western, is not comparable (see later).

Before proceeding to examination of the unsexed weight data, let me summarise the salient points from the circumference material. That there are differences in hunting effect is plain. In the Sahelian C.A.E. and Cyclotiform ivory there is heavy selectivity of males. In East and South-Western Africa, selectivity for males persists but at a lower level. The hunters of the Sudan are the least discriminating in what they take. A major inconsistency is apparent between the derived average weights from circumference and those obtained from the bigger samples in Table 168. The Hong Kong dealers were asked why this should be. They pointed out that as a general rule tusks of 14 kg or more were not held in Hong Kong. The majority were extracted from each consignment shortly after arrival and re-exported to Japan. The tusks I examined were influenced by this selection process. Recourse to official export documents confirmed this: a sample of 38 export shipments to Japan grossed 19,641.41 kg consisting of 1,357 tusks. The average exported tusk weighed 14.47 kg. It did include a number of less than 14.0 kgs, but I accept the contention that stocks held in Hong Kong will have been biased by the extraction of large ivory. In consequence the male : female ratio will have been
biased toward an over-representation of females, and the patterns of male mortality in particular will have been biased towards a far younger structure than was the actual case.

Tusk weight
The tusk weight data which follow were obtained inside Africa at concentration points in the ivory flow, i.e. the records of general ivory buyers and official conservation authorities. In view of the several assumptions which would have to be made I have not tried to extrapolate female population structures from the data. Instead male populations are presented as comparative indices; their under 7.5 kg structure being devised by the formula outlined in the preceding Chapter, and in which one of three sex ratios was applied.

(1) 44.6% males when there were grounds to believe that a general cross-section of the population was likely to be represented in the ivory (e.g. when it derived from cropping in national parks or generalised 'control' work); this male proportion being derived from the East African cropping material of Laws at al. (1975) combined with Smuts' (1975) South African records from Kruger culling;

(2) 62.95% males when tusk weights were from general hunting; the proportion being derived from a combination of sex ratios from the examined Hong Kong circumference-measured tusks;

(3) 100% males when the tusks were from sportsmen or 'peripheral' control shooting.

The first example is of Botswana found ivory - that is tusks handed in to Government from natural mortality. The data are presented in Figure 57 and Tables 179 and 208. The sample size is small (150) but the pattern is the converse of the expected in natural mortality, i.e. numerous immatures, few matures and rather more senescent animals.
FIG. 57 Botswana. Male ivory from natural mortality expressed as cumulative frequency curve and histogram related to age classes. (n = 150)
FIGURE 58. BOTSWANA MALE IVORY FROM THREE HUNTING CLASSES EXPRESSED AS CUMULATIVE FREQUENCY CURVES AND HISTOGRAMS RELATED TO AGE CLASSES

BOTSWANA HUNTERS n = 477

RESIDENT EXPATRIATE HUNTERS n = 235

U.S. TOURIST HUNTERS n = 65
FIG. 59 AGE STRUCTURE OF MALE ELEPHANT POPULATION IN KUUGUR
NATIONAL PARK-derived from crested material and an
overall sex ratio of 44.6:1 male : 55.4:1 female,
FIG. 59 AGE STRUCTURE OF MALE ELEPHANT POPULATION IN KRUGER
NATIONAL PARK DERIVED FROM CHOPPED MATERIAL AND AN
OVERALL SEX RATIO OF 44.6:1 MALE : 55.4:1 FEMALE.
FIG. 61  KRUGER NATIONAL PARK.  CUMULATIVE PERCENTAGE CURVES USING SAME DATA AS IN FIGS. 59 AND 60.
FIG. 62 KRUGER NATIONAL PARK. CUMULATIVE PERCENTAGE CURVES USING SAME DATA AS IN FIGS. 59 AND 61.
The second example is of 3 Botswana hunting results:

I) from Batswana hunters,

II) from expatriate resident in Botswana, and

III) from visiting U.S. sportsmen

In these cases the weights were treated as 100% male, although the Batswana hunters do take a few females. The results are presented in Figure 58 and Tables 180–182 and 209. They clearly illustrate three levels of selective hunting for male elephants. The Batswana shoot elephant to make more from both tusks and hide. They select the largest animals they can in available time, but having a modest standard of living do not seek such high rewards as the next group – white expatriate residents. Consequently they accept a slightly smaller trophies and their average tusk weight is c.14.4 kg (period 1974–1978).

The white expatriate residents also shoot elephants to make money, but being much keener to get the most out of ivory, they are more selective and take an average tusk weight of 16.5 kg (period 1974–1978). The constraints upon the two local groups of Botswana hunters is that they have to rely on their own resources and limited time away from work. The third group —the U.S. sportsmen — do not seek ivory to sell, but as trophies. The want the biggest tusks available, have more time than the other two classes, and more important, through their professional guides are able to deploy more people searching for elephants. Expense is less limiting to them. Consequently their average tusk weight is 22.5 kg (period 1968–1978); taking substantially larger and older animals than the country’s residents.

The third example of weights is from cropping operations in the Kruger National Par of South Africa (1972–1978). An annual cull is made to keep the population at a desired level (Smuts 1975). The data are presented in Figures 59–62 and in Tables 183–189 and 210. The assumed sex ratio of the overall population was 44.6% male; 55.4 % female, and it was on this basis that the under 7.5 kg segment was estimated.
As the Kruger population is believed to be young and fertile (Joubert pers. comm.) the pattern of the male index should be in the range between the MKE and combined East African data. The data from 1972 meet this expectancy and the population resembles MKE. Subsequent years produce rather more adult males and one is left with the impression that in 1972 mature males were not sampled at a level commensurate with their true position in the population.

A striking feature of the histograms for Kruger 1973-1978 (Figures 59 and 60) is the consistent depression in the 16-20 year old age class. The cumulative percentage curves (Figures 61 and 62) also emphasise its position persistently below a (curve which joins the other pivotal points. This is largely an artefact of the process of determining the number of males below 7.5 kg tusk weight. The division 44.6% male : 55.4% female is made arbitrarily across all tusk size/age classes for convenience. In reality it is unlikely that the male 16-20 year class would be in this relationship with the 31 - >40 female age classes it corresponds to in tusk weight.

The artefact notwithstanding, its application is uniform from year to year, and the differences in male population structure must represent some variance in cropping focus or in population structure, or both. This is particularly noticeable in the first two age classes : 0-5 and 6-10. There also seems to be a variation of approach toward males in the year classes 21-25, 26-30 and 31-35, over the period covered. with further time at my disposal satisfactory explanations would undoubtedly have been obtained. The issue of consequence here is not so much what is happening in Kruger, but in the demonstration that the ivory crop reveals the form of offtake and that it has not been even from one year to the next.

Earlier it was pointed out that males in their 20s are marauders around the edge of stable elephant sanctuaries. The Kruger National Park is one such area and male elephants
persistently break out into surrounding lands (Joubert, pers. comm.) In consequence they are shot. In the Transvaal, responsibility for this is with the Nature Conservation Authorities. Figure 63 and Tables 190 and 211 provide evidence of the age of bulls involved.

Two sets of data on tusk weights from southern Angola and northernmost Namibia were obtained; one at the border post of Rundu, the other from a trader in Johannesburg. They are completely separate, and presented in Figures 64 and 65, and Tables 191, 192, 212 and 213. The overall proportion of males in the sample was assumed to be 62.95% male. The two samples are similar in form and indicate generalised hunting with selection for males in the 20-30 year classes. In origin this ivory is comparable with the South-Western circumference data. The circumferences suggest greater emphasis on younger males which would be the case if larger tusks had been extracted on arrival in Hong Kong as suspected. The average weights (males combined with females) are in accordance with this supposition, being 8.89 and 8.84 kgs vs. the circumference derived 5.32 kg. The data in Figures 64 and 65 illustrate not only the selection of larger males, but the corollary: that such animals exist.

Mozambique on the other side of southern Africa to Angola, provided data which is nearly contemporaneous and presented in Figure 66 and Tables 193 and 214. Using the same sex ratio in estimation of the male component of the sample, it is clear that a different situation existed in Mozambique. The type of hunting — general for meat and ivory — was similar. However, the results indicate a far younger kill with considerable emphasis on the males still in family units. The most likely explanation for this is that available mature males formed a smaller proportion of the elephant population than occurred in Angola/Namibia: in other words they were insufficient to meet hunt demand. The average tusk weight of the whole sample was 6.95 kg.
FIG. 63 TRANSVAAL NATURE CONSERVATION AUTHORITIES. MALE IVORY EXPRESSED A CUMULATIVE FREQUENCY CURVE AND HISTOGRAM RELATED TO AGE CLASSES. (n = 125)
FIG. 64 ANGOLA/NAMIBIA. MALE IVORY EXPRESSED AS CUMULATIVE FREQUENCY CURVE AND HISTOGRAM RELATED TO AGE CLASSES. (n = 729)
FIG. 65 ANGOLA/NAMIBIA BORDER. MALE IVORY EXPRESSED AS CUMULATIVE FREQUENCY CURVE AND HISTOGRAM RELATED TO AGE CLASSES. (n = 269)
FIG. 66  MOZAMBIQUE.  MALE IVORY EXPRESSED AS CUMULATIVE FREQUENCY CURVE AND HISTOGRAM RELATED TO AGE CLASSES.  (n = 535)
In Rhodesia elephants are very largely confined to national parks or reserves. The major source of ivory is from the regulation of populations within these areas: cropping. This is done in similar manner to that described from East Africa by Laws at al. 1975. The cropped ivory is augmented by that from control work about the periphery of the elephant areas, and limited sport hunting. This picture is borne out by the data from 3,604 tusks illustrated in Figure 67 and Tables 194 and 215. The data are interpreted on a cropping ratio of 44.6% males to 55.4% females. The preponderance of very young, and decline in subsequent age classes is in accordance with East African cropping data. The artefact of a lowered 16-20 age class is apparent as in the Kruger data. The exaggerated 21-25 year class is likely to be the product of peripheral control shooting.

As in South Africa and Rhodesia, Malawi's elephants occur in national parks, game or forest reserves (Bell 1979). There is as yet, no case for reducing or stabilising numbers in any of these sanctuaries. However, as is to be expected, elephants sally forth from their preserves and damage crops. For this they are shot. As usual, the majority are males in the 21-30 year classes. Malawi's data are given in Figures 68 and 69 and Tables 195-198, 216 and 217. The estimates of males less than 7.5 kg tusk weight have been based on an assumed population sex ratio of 44.6% males : 55.4% females (except in north Malawi where the whole sample has been treated as male).

In Figure 68 two collections of data were made; one being tusks registered under a Kasungu National Park code, the other registered under a Lilongwe code.- The sources are, however, essentially the same, namely ivory predominantly from the Kasungu National Park and its environs and, to a much lesser degree, the Nkotakota Game Reserve. The patterns illustrate the effect of control shooting on raiding males superimposed upon younger classes from natural mortality in the national park.
FIG. 67 RHODESIAN AUCTION IVORY. MALE IVORY EXPRESSED AS CUMULATIVE FREQUENCY CURVE AND HISTOGRAM RELATED TO AGE CLASSES. (n = 3604)
FIG. 68 MALAWI - LILONGWE AND KASUNGU NATIONAL PARK. MALE IVORY EXPRESSED AS CUMULATIVE FREQUENCY CURVES AND HISTOGRAMS RELATED TO AGE CLASSES. Lilongwe n = 322; Kasungu National Park n = 235.
FIG. 69 MALAMI - NORTH AND SOUTH. MALE IVORY EXPRESSED AS CUMULATIVE FREQUENCY CURVES AND HISTOGRAMS RELATED TO AGE CLASSES. North n = 192; South n = 116.
In Fig. 69 two further collections are illustrated. The first again is evidence of male mortality about the edge of a sanctuary — the Vwaza Marshes. The second stems from the Liwonde National Park, the Mangochi and other southern forest reserves. It presents an entirely different picture of heavy juvenile mortality. The reasons for so different a situation around the southern sanctuaries is not clear. Nevertheless it provides a good example of how an ivory shadow can draw attention to anomalies. The observation has been relayed to the Malawi authorities for such attention as they may think necessary.

A final analysis of African tusk weights broken down to a male population index concerns data from Tanzania. These were obtained by Douglas-Hamilton and Davitz from the Tanzania Ivory Room in Dar es Salaam and are the individual weights of 44,074 tusks recorded between 1971 and 1977. They have been analysed by Davitz (1978) and are of some notoriety, for it was the average weight (4.8 kg) of this large collection of tusks that led to the belief that each tonne of ivory exported from Africa represented the deaths of 100 elephants.

The Tanzania Ivory Room tusks (illustrated in Figure 70 and given in Table 218) derive mainly from elephant control, most of which takes place in the south-east of the country (Rodgers et al. 1978). This is so intensive that it must approach random sampling — at least in all but the very smallest elephants and, perhaps, largest males. On this basis the separation of males with tusks under 7.5 kg from females has been made on an assumed sex ratio of 44.6% males : 55.4% females. The resulting male population kill illustrates concentration on young elephants. However it fails to show the slope one expects in normal (populations - falling progressively with increased age. This could be the consequence of such selection for size as may occur, counteracting the natural age distributions. What is rather more difficult to accept is the small representation of males over 25 years in a sample of 19,658. It is not as though males of this age are absent from the control areas. Along the eastern
FIG. 70 TANZANIA. MALE IVORY EXPRESSED AS CUMULATIVE FREQUENCY CURVE AND HISTOGRAM RELATED TO AGE CLASSES, n = 19,658.
borders of the Selous Game Reserve many elephants are shot on control (Rodgers et al. 1978) and in this area there are many males older than 25. For this the Selous Reserve is much esteemed by sportsmen as a hunting ground. The prospect is thus raised that the Ivory Room data represent ‘filtered’ tusks, the larger specimens having gone elsewhere. Such a possibility has some support from the evidence of inconsistency in Tanzania’s internal ivory records (e.g. the manner in which national park ivory is sold; or the discrepancies between Ivory Room data and Customs figures — see Chapter 4 Volume 1). The trade also recognises quite substantial amounts of Tanzania ivory coming out clandestinely through Burundi. Finally the Tanzania data in Table 168 also suggest a higher average tusk weight for the country.

The diverse data in this chapter provide a variety of insights into elephant/human interactions, and the potential that ivory has for revealing information on conservation practice or non-practice. However one which calls for particular consideration concerns natural mortality. The Hong Kong data indicate that 21% of tusks arriving there come from natural mortality. Examination of this is the basis of the next chapter.
VOLUME 2 (5) NATURAL MORTALITY

The only certainty in an elephant's life is that it will die. If that happens after 2 years of age, it will leave tusks. Irrespective of all other factors, natural mortality is a substantial source of ivory.

How much of a population dies each year will vary widely according to local conditions. However as a general index to use on a continental level, I believe 7% to be sufficient for the purpose of discussion. Laws 1969a has demonstrated the mode of mortality and I have used his approach to construct my own mortality Table (Table 219). From this I have postulated that 42.5% of annual deaths will be under 2 years of age and therefore tuskless. The balance will leave tusks varying from 0.23 kg to c.50 kg in weight. The distribution of these is also included in Table 219. From the age range of deaths and combining both sexes, the average tusk weight should be 8.06 kg.

Douglas-Hamilton (IUCN Elephant Provisional Estimate 1978) has estimated that the minimum elephant population of Africa is 1.3 million. If this be true, and a 7% annual death rate prevails, then 91,000 elephants will die every year on average. If, of these 42.5% are tuskless, then 52,325 will leave tusks. Not all elephant carry two tusks. Some females are tuskless and others are congenitally single tusked or become so through accident. In view of this it would be incorrect to multiply the number of tusked deaths by 2 to obtain the number potentially available. I shall thus follow Rodgers at al. (1978) and use a factor of 1.88. The 52,325 deaths should therefore produce 98,371 tusks which, at an average of 8.06 kg each would weigh 792,870 kg.

The foregoing figures may not be precise, but they indicate the order of what is potentially available through natural mortality. were all the tusks collected, they alone would come close to meeting world ivory demand as it was in 1978.
The crux of the matter is finding and collecting the tusks before they, too, decompose and disappear. The only methodical attempt to analyse this problem of which I am aware, was that of Graham and Laws (1971). They describe searching for ivory from natural mortality in the Murchison (now Kabalega) Falls National Park, Uganda. They ascertained that only 27.6% of carcasses from elephants dying annually were being found. As will be seen later the recovery rates in Uganda were exceptionally high. A further unspecified amount was believed to have been found illicitly and the balance decomposed.

Found ivory is a source of revenue to many national parks in Africa. Since one of the major constraints upon their development is shortage of funds, tusks are collected as and where possible. Rewards are offered for those handed in by staff, and few if any rangers would leave tusks if they found them. Thus the proportion of ivory recovered from natural mortality is an indicator of the efficiency with which they cover the area under their control. In addition, mortality being a reciprocal of survival, efficient recovery of ivory would provide an accurate measure of the age structure of the extant population.

Some ivory recovery rates are presented in Table 220 for a sample of 9 parks and reserves. Other than in Tanzania's Manyara National Park, and Kenya's Marsabit National Reserve, recovery rates are low: below 6% of what becomes available annually. The two with higher recovery rates are also exceptions in being of very small size — Manyara 80 km², and that part of Marsabit frequented by elephant (other than in wet periods) being less than 80 km². Two of the 9 are montane forest zones — Mt. Elgon and the Aberdares/Mt. Kenya — the rest are 'savanna woodlands'. That the montane forest recovery rates are similar to the savanna's is somewhat surprising, as in these at least, the dense vegetation could be expected to conceal carcasses far more effectively than in the more open areas.
An individual case of considerable detail is available from the Tsavo East National Park's record of found ivory from 1950-1978 (Table 221). At the outset of this period, through to c.1970, I believe that Tsavo East contained at least 12,000 elephants - a figure not out of keeping with the estimates that have been made between 1968 and 1978 (e.g. Laws 1969a to quote the earliest in this period). If there were 12,000 elephants and they had an annual mortality rate of 0.7%, 57.5% of which bore ivory, 869 tusks should have become available annually for collection. The data in Table 221 show that until 1970, substantially less than this number were recovered. From 1970 onwards overcrowding, drought and subsequently poaching, brought about a population crash and a complete departure from the previous mortality patterns.

In Table 222 I have re-presented tusks found, against an assumed constant annual output of 869 becoming available for the 'stable' period of 1950-1970 in Tsavo East. On the assumption that a tusk remains recoverable — albeit somewhat weathered — for 3 years, I have presented the uncollected surpluses annually and as running 3 year accumulations. At any one time ivory available for collection would have been annual production from natural mortality plus the running cumulative surplus. Thus the success of recovery is not measurement of a simple proportion of what becomes available in any one year, but must also take into account the accumulated component. On this basis I estimated Tsavo's annual success in recovering ivory from natural mortality at an average of 7.72% of what lay on the ground.

The approach is of course somewhat academic. It takes no account of the possibility that some tusks may have been recovered by unauthorised people. However between 1957 when a successful anti-poaching programme was launched and 1970, there was very little evidence of poaching in Tsavo East. It is also for convenience of demonstration that I have assumed both a constant population and a constant mortality. The population was definitely not stable during this period. It "acquired" new
FIG. 71 THE EXPECTED PATTERN OF TUSK SIZES AVAILABLE FROM NATURAL MORTALITY. (AVERAGE WEIGHT OVERALL 8.06 KG).
FIG. 71 OUTLINE AS OVERLAY FOR
FIGS. 72 & 73, AND COMPARISON
FOR FIG. 74.
FIG. 72 FOUND TUSKS BY WEIGHT IN KG FROM ABERDARE AND MT. KENYA (1959-1978); MARSABIT (1962-1969); MANYARA (1972-1978).
components of between 2,000 and 4,000 elephants from across the southern and eastern borders south of the Sabaki river during my tenure as a Game Warden in the area between 1957 and 1964. (Advancing human settlement drove them back - mainly by monopolising very local and limited water resources.) In addition the middle of the period c.1960—1961 was assailed by a severe drought in which it would be ecologically unlikely that there was no rise in mortality. Further the period 1957-1970 was characterised by a progressive depletion of woodland (described by among others, Glover 1963, Laws 1969a) which is likely to have had influence on elephant survival, even if it was not immediately apparent.

The Tsavo data are ground for believing that the recovery rates in Table 220 are optimistic. The collections from what becomes available and stays on offer for 3 years or more reduces actual recoveries to a still lower index of success. It is worth comparing the structure in tusk size classes of what should become available from natural mortality, with what was found, for it may convey reasons for the poor recovery rates.

Using Table 219 as a base, the number of tusks per 1,000 males and 1,000 females dying are synthesised into a histogram in Figure 71 and into a Table 223 to illustrate the distribution of tusk size classes from my postulated natural mortality. The resulting pattern provides a comparison for the distribution of found tusk weights in Kenya's Aberdares and Mt. Kenya Park, Marsabit National Reserve, Tanzania's Manyara Park and finally in more detail K0ynyn's Tsavo East Park. A loose overlay of the outline of Figure 71 is provided to facilitate comparison with the other patterns.

Figure 72 and Table 224 present the data from the mountain parks of Kenya - Aberdares and Mt. Kenya for 1959 to 1978. The pattern deviates from the expected in a dearth in the first tusk size class and an unexpectedly high proportion in the intermediate tusk sizes. The classes 7-14.99 kg and 15-29.99 kg are smaller
than expected — probably because of the earlier intermediate deaths. The average tusk weight of 7.11 is in keeping with early mortality and a younger than projected population (i.e. it is less than 8.06 kg.)

Figure 72 and Table 225 present Kenya’s Marsabit found ivory, 1962 - 1969. The pattern in this case is anomalous with a very high proportion in the large tusk classes, none at all in the first weight category and erratic results in the intermediate ranges. The sample size is small, but nonetheless represents a high recovery rate — 33.5% of the expected (Table 220). The average tusk weight is 2.29 times higher than the expected. The pattern for tusks shot on 'control' (Figure 73) over the same period produces the same picture — a population of old animals — predominantly males. It was this community which produced the publicised "Mohamed", "Ahmed" and "Abdul" and which has been known as the haunt of very large (old) tuskers for the past 40 years or so. It would seem to have been a relict population, but quite how much of an anomaly or oddity has not been apparent until the evidence of these ivory 'shadows'.

Figure 72 and Table 226 present Tanzania's Manyara elephant among the best known populations in Africa (Douglas-Hamilton 1972). Once more the absence of the smallest weight class stands out. The larger than expected intermediate classes represents a major die off of the population which will receive more detailed description from Douglas—Hamilton. The absence of old males is in accordance with what is known of the population, i.e. they are absent.

Figure 74 and Tables 227 — 234 present the Tsavo East story in 8 segments. The first is in the early years of the park when development was impeded through Kenya's turmoil in the Mau Mau rebellion. The mortality shadow has a form fairly similar to the predicted. However the smallest tusk class does not reach expectations, and the 7-14.99 kg unit is larger than expected. The average tusk weight is 9.68 kg which is high. There was
FIG. 73 MARSABIT NATIONAL RESERVE - KENYA.
FROM A SAMPLE OF 49 ELEPHANTS SHOT 'ON CONTROL' BETWEEN 1962 AND 1966. AVERAGE TUSK WEIGHT 20.99 KG.
FIG. 74 IVORY FROM TSAVO EAST NATIONAL PARK IN WEIGHT CLASSES FOR 8 PERIODS BETWEEN 1950 AND 1978.
substantial poaching at this time (1950-1955) by Watta and Kamba bowmen. The histogram's slightly thicker 'waist' than expected may well be a reflection of their influence.

In 1956 and 1957 a vigorous anti-poaching campaign was waged and in the process substantial quantities of ivory were recovered. This raised the average tusk weight to 10.5 kg and the picture is not one of true natural mortality. Concentration upon the poachers produced the histogram's greatly thickened waist where mortality should be least.

From 1958 until 1960, there was virtually no poaching in Tsavo East. The number of tusks recovered fell back to pre-anti-poaching campaign levels. Immatures in the lowest age class are totally absent, the waist of the histogram is inexplicably thickest where it should be thinnest, the peak of 7-14.99 kg class is twice as tall as anticipated. The average tusk weight remained up - no doubt due to the higher than expected contribution of the intermediate classes and the absence of the smallest class. No ready explanation arises from the circumstances of the time.

The period 1960-1963 was characterised by a drought of unusual severity, unprecedented heavy rain and floods and finally extensive fires. In this period widespread rhino mortality occurred and elephant removal of woodland became general. In these circumstances a rise in elephant mortality would not have been unexpected - but was not reported. The mortality pattern approaches the expected with a return of the smallest size class, though still not up to expectation. The 7-14.99 kg class 'stack' is perceptibly shorter than in preceding years, the mortality represented by the thicker preceding 'waists' perhaps beginning to tell on older classes? Their recruitment is failing. Mortality in the intermediate classes is still slightly higher than it should be. The drop in average tusk weight (8.73 kg) attests to a decline in average age.
Between 1964 and 1969 there is little change in pattern. The average tusk weight remains similar - 8.67 kg. A period of reasonable rains retard but do not stop the elephant clearing away woodlands.

In 1970 there is a sharp rise in elephant mortality, which is followed by a spectacular population crash in 1971 with the onset of a prolonged drought (which was also the trigger to Somali problems, see Appendix No. 7). The sample from which the pattern for this period derives comprised 8,572 tusks. For the last time, the pattern resembles the expected to some degree. As usual juveniles with tusks 0-0.99 kg are under represented. The shortening of the 7-14.99 kg stack first observed a decade earlier has moved forward and is apparent in the diminished last two classes. The average tusk weight has fallen nearly 2 kg to 6.86. The population has become very much 'younger'.

Hard on the heels of the drought in 1974 a wave of poaching develops. This soon rises to unprecedented proportions with the arrival of the Somalis. The pattern of mortality is no longer 'natural'. The smallest class has again receded, and the intermediate waist has a pronounced bulge - similar to, but exceeding that in the 1956-57 anti-poaching drive; this time the histogram has greatly receded older age classes.

The eighth and final shadow has the characters of an accentuated die off as happened in Manyara (Figure 72). Recruitment into the smallest class appears to have failed and the oldest class has gone entirely. The average tusk weight has fallen to a meagre 4.17 kg.

The foregoing description is deliberately anecdotal and I have avoided all attempts to be technical. The evidence largely speaks for itself. With the wisdom of hindsight the ivory record provided early warning of the population trends. They are summarised in Figure 75 and Table 235 as 2 indices: (i) the average annual weight of found ivory (8 kg = 100), and
FIG. 75  THE ANNUAL NUMBER OF TUSKS RECOVERED IN TSAMO EAST NATIONAL PARK AND THEIR AVERAGE WEIGHTS, EXpressed AS INDICES TO SHOW TREND, BETWEEN 1950 AND 1978.
(ii) the number of tusks recovered (1700 = 100) each year. From the anti-poaching days of 0.1958 until 1970, the manpower available to find ivory remained of the same order (0.50 men). Yet there was a progressive increase in the amount of ivory recovered. The suggestion is that mortality was rising. An aircraft was added to the 'ivory-finding equipment' (not deliberately as such) in c.1964, but does not seem to have changed the rate of finding beyond the trend already apparent.

The rise in ivory finding rates was matched by a counter trend in the weight of tusk. Again with hindsight and a 29 year span of data to dwell on, the trend is obvious. However, in 1962 it would not have been so apparent — even with mathematical insights. With the evidence now before us, there can be no doubt that careful recorded ivory data is a simple and sensitive tool for analysing elephant population trends.

It has, however, certain weaknesses. Tusks in the youngest age classes are almost invariably under—represented. They are so small and light that even at today's prices they are hardly worth the trouble of collecting. They are easily broken up by scavengers such as hyaenas, and having so little body, they must decompose and disintegrate rapidly — though no rates have yet been established. The corollary to this is that large tusks must take longer to rot and disappear and therefore be on offer for collection for much longer than small tusks. The argument has logic and while I am certain that it does apply, the question is to what degree? From the absence of large tusk weight classes outside the expected range it would appear that this persistence is not of such great consequence as might be expected.

Vultures are a prime locator of dead elephants and indiscriminate where tusk sizes are concerned. Thus fresh carcasses to which vultures draw the ivory seeker should be a random sample of the available. Where they are absent — such as in montane forest — one would expect a large tusk's greater durability to bias finds strongly toward their recovery. The
Aberdares and Mt. Kenya records do not reflect this expectation. Indeed they suggest that random chance may be the most important element in ivory recovery. That this is indeed the case is borne out by Laws' 1966 and 1969a calculations on survival and mortality, which were based on 'found' jaws (located only in the search for ivory). Had Laws' samples been biased toward large (old) animals his postulated mortality rates would not have been as accurate as they have been demonstrated to be by extant population structures.

However these are points of tangential consequence for this report. The issue of greatest pertinence from found ivory in the national parks of Africa is how little is recovered. It is strong support for the contention that staffing in these reserves is inadequate. That on average much less than 6% of what is on offer at any time is collected is a clear indication that the ground is covered inefficiently. The ivory remains as an attraction to others to find it — and enter the areas illegally — or is lost.

Outside the parks, where men may wander and search unhindered, recovery of ivory from natural mortality may be more efficient. That this is almost certainly true — at least locally — is borne out by the high proportion of found ivory, 21% in the Hong Kong samples I measured.

Suffice it that the issue needs to be researched more thoroughly from the conservation and economic points of view, but that the contention of under—staffing stands out yet more clearly.
VOLUME 2 (6) IVORY WEIGHT

Being the standard measure of ivory, weight is the most widely available statistic on elephant populations. Changes in average weights, regionally and generally, are useful indicators of either population trends or the manner of human/elephant interactions (or both). In this chapter I shall assemble and comment on a miscellany of 'average' tusk weights.

The Uganda data (Volume 2 Chapter 3) illustrate that a decline in male elephant life expectancy is apparent at an early stage from the size of sportsmen's trophies. The Botswana data (Volume 2 Chapter 5) show that this can be refined by categorising sportsmen: the more demanding they are, the more precise their selection and more accurate the information will be.

The Uganda material also indicate that an overall average tusk weight can rise while a population declines in size, though this is only likely on an extended scale when elephants are faced with progressive displacement and loss of range. Another illustration from the same set of data is that one should know of which 'average' one speaks — for there may be several within a population, i.e. from sport-hunting, control shooting, poaching and natural mortality. Further, as shown by Uganda's falling weight of sportsmen's tusks and rising overall average weight, these different components can run contrary to one another.

These cautions notwithstanding, downward trends in tusk size can be taken as general indicators of lowered life expectancy — usually from hunting at rates which exceed replacement into given age classes. Obviously there is a threshold below which either reproduction is impossible (sexually immature) or the species is not viable socially. In view of the complex social organisation of elephants (Douglas-Hamilton 1972) it is not unreasonable to assume that a viable population has a threshold ratio of immatures to adults, below which it may survive. However this has yet to be demonstrated.
Unfortunately I have been unable to locate any other records which are either as detailed or sound as the Uganda data in Table 166. The nearest to it is that compiled by Rodgers et al. 1978 — a synopsis of which is presented with other miscellaneous data in Table 236. These cover a span 1920-1977 (58 years). Between 1920 and 1970 the data show no obvious trends, other than that the average weight of control tusk may have been declining. The average weights of tusk on licence, found and overall showed no particular trends. Between 1971 and 1977 control tusks, those taken on licence and found, all dipped by between c.19-25%. Only Rodgers et al. (1978) overall tusk weight remained within the previous 51 year range. This overall tusk average weight should be what is detectable on arrival in Hong Kong. From Table 168 the 1978 average for 2,248 tusks arriving in Hong Kong from Tanzania was 7.08 kg. If this is substituted for Rodgers et al. (1978) overall average weight post-1970, the drop is within the range recorded under the other categories. I disregard the U.S. hunters' apparent increase in tusk weight, for this is largely the product of specialised hunting in the Selous Reserve - formerly a sanctuary - and concerns very few elephant. The average tusk data from Tanzania 1971-1977 indicate a general decline in tusk size. This complements the picture in Figure 7 and Table 40 of greatly expanded ivory exports in this period.

Information on Kenya's average tusk weights are given in Table 237. The record is incomplete. Nevertheless trends are apparent. The limited U.S. sportsmen's data illustrates gradual decline from 1952-1975 (it also illustrates that some hunting was condoned after 1974 when all sport—hunting was "banned"!) Returns from elephants taken on licence from 1927-1973 also show a decline in average weight. Control data are inadequate for any conclusion. Poached ivory shows consistent decline, although only represented by 4 figures. The two of particular consequence are that of 1957 - 9.04 kg - and that of 1979 - 5.16 kg. Both stem from anti-poaching work in the same region of Kenya (coastal hinterland — Tsavo) largely carried out by the same man F.W. Woodley.
General found ivory data is too sparse for speculation, but the local Tsavo data already referred to in the preceding chapter is in keeping with overall decline in tusk size. A sample of auction records from 1959 to 1976 again establish a pattern of decline which would appear to have accelerated post 1970.

The one figure from Kenya's exports to the Ivory Coast of 3.16 kg should be treated with caution as that market is selective of small ivory. Nonetheless the low average weight apparent in the Hong Kong record (Table 168) is in keeping with the overall pattern. The trade data in Figure 9 and Table 43 which illustrate steep rises in exports post 1970 are consistent with a decline in tusk weights.

Information on Zambia's average tusk weights were obtained for 1968-1978 only. These were provided by the Zambian National Parks and Wildlife Service. Their data which incorporate all sources, show an overwhelmingly adult male offtake. The only exception in the material presented in Table 238 is the average of 6.76 kg for 1971. This included much immature and female ivory from the Luangwa Valley elephant cropping. The other contrasting figure is the 1978 Hong Kong record of 8.04 kg (see Table 168) which - as a source ex—trade as in apposition to sport hunting — is from a small sample of 130 tusks. The U.S. hunters' data (which, due to its selectivity may be the most sensitive to the onset of trends) suggest the start of a downward trend in male tusk size. They have some support from the last figure in the Zambian safari clients' returns (1976), of which they must be part. However, overall, the average tusk weights from Zambia do not give clear indication of any upward or downward trend.

Botswana's average tusk weights are presented in Table 239. They are obviously predominantly adult male and — of note — are larger on average today than 110 years ago when William Finaughty hunted elephants there for a living.
Data from Zaire are difficult to obtain and often inaccurate (Volume 1 Chapter 4). As ivory production is disorganised and much leaves through neighbouring states, it is to the latter one must look for evidence on Zaire tusk weights. From 1936-1959, with omissions of 5 years, the Uganda Game Department kept records of the number and weight of tusks shipped from Zaire through Uganda, to the Kenya coast. Their average weights are presented in Table 240, together with the tonnes they derived from A single 1963 Kenya figure complements the set of data. Their outstanding feature is that for such large consignments (average 42.7 tonnes per annum) they present a high average tusk weight. Further, over this span 1936-1963 (28 years) there is — if anything — an increase rather than a decrease in tusk size. What has happened since 1963 is difficult to establish. Odd intra—African records such as that for c.100 tusks passing through Zambia 1973, or 227 entering the Ivory Coast in 1977-78 do little to help understand the present position. The Hong Kong data indicate that in 1978 the average weight of tusk from Zaire was 10.83 kg, which is substantially lower than the 1936-63 figure. However this could well be a reflection of the larger tusks having been exported through neighbouring states.

That substantial quantities of Zairoise ivory leaves Africa from the Central African Empire is widely known in the trade, and I have seen invoice evidence of Zaire ivory moving on C.A.E. permits. The process has been confirmed independently by Dr. Douglas-Hamilton (pers. comm.) Table 241 illustrates that the Central African Empire does indeed have a high average tusk weight: currently the highest in Africa. Further these weights derive from large samples (Table 61). If the C.A.E. and Zaire records are combined, their average tusk weight is 14.29 and within the range of the earlier 1936-63 data from Zaire. The salient feature is that while the data are too few to determine trends, there is evidence that the average tusk weights from Zaire/C.A.E. are heavily biased toward large males and on these grounds alone, the situation is not critical.
Miscellaneous average tusk weights from some other countries are given in Table 242. For interpretation these call for some knowledge of their background and in particular whether they have been subject to any selective process. This is likely, but not confirmed, for all imports recorded from the Ivory Coast which has a tendency to buy smaller - less favoured - sizes than the extra—continental buyers. Figures from the Ivory Coast sources should be considered as minima — where they are sufficient in number to be considered representative. Thus data from Liberia and Nigeria serve only to show that they produce some ivory.

The Angolan/Namibian data establish points from which future trends can be judged. On their own they only indicate there are elephants old enough to produce this average weight of tusk. The prospect that South—Western ivory is genetically smaller at age than East African would substantially raise the "awarded" age of animals concerned.

During this survey I have seen or obtained weights of 1910 southern Angolan/Namibian tusks, representative of 1016 elephants (1910 : 1.88). In the IUCN provisional estimates for 1978 it is believed that southern Angola has only c.2,400 elephants and adjacent Namibia outside of the Etosha Park (where poaching is not serious) has 1640. The data upon which these estimates were made were obtained prior to my seeing or measuring the 1910 tusks from the region. The suggestion thus arises that since the estimate of numbers was made, 1016 (25%) of the 4040 southern Angolan/Namibian elephants have died. At the same time as estimating that there are only 4040 elephants in the region, the IUCN estimates a range of 404,042 km² (156,000 square miles) in which the 3024 survivors roam; i.e. 1136 km² per elephant — or if in herds of 10, 1360 km² per herd. At these densities they would be too rare for UNITA guerillas to hunt for meat or ivory; nor would they support the flow of tusks still coming out of the region. While the tusks leaving the area do not yet allow us to say how many elephants there may be, they are strong ground for believing that elephants are
substantially more abundant than represented in the preliminary estimates.

The data from Gabon — 386 tusks averaging 10.43 kg exported to the Ivory Coast — allow little discussion.

The Malawi information shows a national average of 10.07 kg per tusk, with variation between the different regional sources.

Mozambique's average from 1975-76 of 6.95 kg may be somewhat dated.

The low Rhodesian and South African averages are explained by the elephant management policies of those countries.

The Sudanese average of 11.17 kgs from a fairly large sample of 3,405 tusks is indicative of male selection and the reputation the country has among sportsmen as being a good place for 'big' elephants bespeaks some abundance of older males. However, even allowing for extraction of large tusks, the circumference data inject a contrasting sense. Further more complete data are needed to interpret the situation.

The data in Tables 236 - 242 show heterogeneous situations across the continent as one would expect. Comparison with pre-1914 tusk weights in Table 243 show a correspondingly wide selection of weights in the trade of the past. Selecting one group of averages for extrapolation beyond that group's base is unlikely to give a worthwhile estimate of trade at large. Thus taking the average weight of Bombay's imports of ivory between 1848 and 1855 as evidence of some biological function (e.g. reduced elephant ages) would be to chase a hare. The reason was no more than reflection of American and European entry into Zanzibar's mart, and deflection of large ivory direct to their countries. Similarly, taking such as one of the modern Tanzanian control estimates of 4.8 kg as a basis for Africa-wide application would be wrong.
The only figures which will provide a reasonable basis for Africa's average tusk weight must come from the point at which all aspects of the trade are represented in proportion to their true abundance. Hong Kong is the premier location and it is from here that I accept 9.65 kg from 22,260 tusks as closest to the real average ex-Africa figure. I use it with the caution that it may in fact be higher if direct >14 kg tusk imports by Japan are taken into account.

Using this average we can now contemplate the number of elephant represented by the total ex-Africa flow of ivory. The estimates of trade were 1976 991 tonnes, 1977 827 tonnes and 1978 766 tonnes. In turn these devolve into 102,694, 85,699 and 79,378 tusks respectively. At an arbitrary 1.88 tusks per animal, the estimates for the number of elephants represented over the three years are 54,624, 45,585 and 42,222. Of these a proportion died naturally. The only guide we have to go on stems from my Hong Kong analysis of 5,132 tusks of which 21% were judged from natural deaths. This reduces the estimates of direct elephant kills to 43,153 in 1976, 36,012 in 1977 and 33,355 in 1978.

As outlined in the previous chapter, 98,371 tusks should become available through natural mortality each year. If their life 'on offer' is 3 years the total available should be of the order of 295,113. If this be so, 21% of ivory recovered from this source over the past 3 years (21,556, 17,996 and 16,669 tusks respectively) are 7.3%, 6.1% and 5.6% of what is available. These are basically higher rates than in the national parks, but are not unreasonable given the far greater manpower and incentive to find them outside the parks.

The postulated kills of 43,153, 36,012 and 33,355 elephants are 3.3%, 2.8% and 2.6% of the estimated 1,300,000 elephants extant (IUCN Provisional Estimate 1978). Even if all tusks entering trade are credited as kills, and natural mortality is discounted, elephant deaths accounted for in the ivory trade are
4.2%, 3.5% and 3.2% of extant elephant.

Throughout this report I have advised against taking the data presented as precise. I reiterate this here. The data and findings are indicators of the order of things and will be exact only by coincidence. As pointed out in Volume 1 Chapter 4 there are elements of the trade — imports by minor ivory countries — which have not been covered. All these factors notwithstanding, the biological evidence from the ivory trade does not support the contention that the trade as such, is responsible for the decline of Africa's elephants. The sum of the offtakes is well within what most biologists would accept as a "sustainable yield". This is, of course, a continental overview.

At a regional level - specifically East Africa - there is evidence of accelerated population decline in the 1970s. The declines are not new. There was evidence of them in Kenya and Uganda decades ago. Their change of speed has undoubtedly a strong connection with the returned value of ivory; but quite what this is and whether it was a primary or secondary stimulus is a matter for discussion.
THE IVORY TRADE

Volume 3

Discussion & Recommendations

JUNE '79

Parker
In the preceding volumes the world trade has been rudely quantified and the tables in Volume 4 are a base for further refinement. Some idea — albeit hazy — has been gained of the investment in ivory. Despite its vagueness it is quite clear that the value of both raw and worked elephant tusks about the world is of the order of billions of dollars. The role of ivory as a currency — i.e. as a medium of exchange — has not been defined in exact terms. It was not possible to even consider the textiles and comestibles which it paid for across Zambia’s or Mozambique’s borders; neither was it prudent to try and find out how many rounds of .762 ammunition may have been bartered for ivory by UNITA guerillas. Through false accounting and documentation, twice as much ivory has left the continent as appear on African records. Considerable capital transfers out of Africa were made by under-invoicing ivory so that part payment remains overseas. Through such devices the continent loses more than half the value of its ivory production. The component links in the economic chain of the ivory trade have been described sufficiently to give broad understanding of its structure. Biological evidence from tusks traded has been examined and, while it gave more idea of what could be done with the type of material coming forward, it also does not support some of the contentions made previously — particularly on the average size of tusk and the number of elephants involved in the trade. Other than at a local level, the allegation that the ivory trade has brought about widespread elephant declines is not substantiated.

In fear that the African elephant was on the brink of extinction, conservationists in a number of countries agitated for remedial measures - of which this survey is one. The most extreme expression of their sentiment is illustrated in the Bill — HR 10083 — which was presented to the 1st session of the 95th Congress of the U.S. House of Representatives. As it encompasses many issues which are germaine to the evolution of future policy and as it synthesises points which are widely but incorrectly
believed, it is worth examining.

Bill HR 10083 was introduced by Congressman A. Beilenson in the process of which he stated:

"elephants...are now severely threatened with extinction"
"more than one hundred thousand elephants are slaughtered annually"
"the deliberate slaughter of elephants for their valuable ivory tusks is the greatest present threat to Africa’s 1 remaining elephants"
"Hong Kong... imported 710 tons of ivory taken from 71,000 elephants in 1976"

All these assertions are untrue. He also stated that

"as long as the elephant herds flourish, tourists, for whom the elephant herd are a prime attraction, will continue to supply a substantial flow of foreign currency to the developing African nations where the benefits may be felt more widely by the poor as well as the rich"

This was naive. The bulk of elephants are inaccessible to tourists. Most African countries with elephants (e.g. Chad, Central African Empire, Congo, Cameroun, Gabon, Zaire, Zambia) have negligible tourism. Those with greater volume - Kenya and Tanzania — are at best, only able to 'present' a very small fraction of their elephants to tourists. The benefits of tourism seldom touch the rural peasant directly and, most important, tourists are fickle and unownable.

Beilenson claimed that

"the decreasing size of the tusks being exported from Africa is an early warning sign that the species is diminishing faster than it can sustain itself"

This is not generally true and only applies locally. One could continue to comb through the pronouncement and bring out yet further mis-statements of fact. To do so however would be to miss the underlying principles which HR 10083 violates: And to miss these would be to miss the same points as were overlooked
earlier in the century when a different group of white men endeavoured to impose their will upon Africa.

Conservation is a dear cause to many in America and Europe, yet for all the passion its disciples obviously feel, its progress and implementation cannot come about outside the scope of our political principles. Democracy is a belief by which the United States claims to abide. Within democracy, leadership is elected. At this fundamental level let us look to HR 10083 and its background once more.

The elephants of the world live in Africa or Asia and are de facto - resources which belong to sundry African and Asian peoples. They have a sovereign right to use or not to use their resources according to their particular requirements. Where Africa is concerned the resource is distributed across 7,000,000 km² and as a standing crop of ivory alone the 1.3 million elephants are worth $984,874,280 (5.09 kg per tusk x $74.42). Yet the intent of the Bill and the hope of its supporters was to render this enormous asset (and by African economies it is enormous) valueless. The goal strains credulity on two counts, The first is the act of imagination called for in believing Africa should accept that its near billion dollar renewable resource be devalued to zero. The second is how so large and widespread a resource can really be regarded as on the verge of extinction.

The international leadership the Bill is supposed to provide has not been approved or even asked for by the ivory resource's owners. This negation of a democratic approach was magnified by Beilenson's inference that African Governments did not have wildlife management programmes (to which he was not opposed!) and that they were currently "in haste to make a quick profit".

It was just this arrogant 'we know what is best for you' approach and blindness to the facts of the situation which ensured that the earlier game laws failed.
The concerns for elephants which find expression in HR 10083 are understandable, given the general ignorance which prevailed at the time of its inception. The inaccuracies in the statements of, for example, Glieber, Merchant, Murphy, Newman and van Note, before the Merchant Marine and Fisheries Committee of the U.S. House of Representatives, December 13, 1977, can be corrected. The present position vis-a-vis elephant can be regarded a little more objectively.

Before proceeding further it must be clear that I speak of Africa's needs and capacities as an observer and not a representative. The great default in this report is its absence of representative African opinion and outlook.

The first necessity is to regain some sense of proportion and unscramble distinctions between the calls of conservation and the material potentials of elephants as a natural resource. International concern is clearly over the prospect of elephant extinction. To approach this matter from its most basic aspect I pose the question — how many elephants are necessary for the survival of the species? From the example of the Addo elephants in South Africa which are said to have increased from c.20 in 1954 to 90 in 1977 (Douglas-Hamilton 1977) we know that — recoveries can be made from very low levels. In extreme terms Africa's elephants could be reduced to 20 and still recover to far greater numbers. In view of this and the current abundance of elephants, the question of how many are necessary for survival is somewhat semantic. It can be replaced by how many are wanted? In as far as national priorities permit international influence, the answer may well be an area in which the world at large wishes to have say. Fundamentally however each nation having elephants must make its own decision. Until this is done the logistics of conserving cannot be adequately catered for. Not only is it impossible to plan conservation programmes without this type of information, but it is equally difficult to gauge success or failure. Currently we see the use of terms such as 'endangered', 'threatened', 'vulnerable' and 'safe' (IUCN Elephant Survey
Provisional Estimates 1978) — but what do they mean? They are really only of use when applied to the status of animals in conjunction with what is wanted of them.

At a somewhat involuntary level decisions have been made on how many elephants Africans want through the creation of national parks. According to the provisional estimates in 1978 of IUCN Elephant Survey, elephant occur in more than 60 parks across Africa which encompass 261,871 km² (over 100,000 square miles) and hold more than 175,000 elephants (perhaps 5 times the number of bison that are in the U.S.A.). Is this number adequate to ensure the survival of the species? I believe that it is - providing that the parks are adequately staffed and the elephants managed, should this be necessary. Indeed it would be continued waste of time and effort to deploy inadequate conservation forces widely over the whole resource until parks are running as planned.

The presence of elephants outside parks is obviously of interest from many points of view; not least of which is their economic potential. If there is a rule which should govern their use it would be for the greatest good of the greatest number of people. However the greatest good will always be a subjective measure. It will be the prerogative of the elephants owners to make such decisions, which could vary from 'cashing them in' over the short term to raise capital for development, to keeping them going for as long as possible. However, these outside 'resource' elephant are those that are constantly giving way to expanding man. They will continue to do so until Africans attain stable populations. This is of no consequence to the survival of the species providing the national parks become truly effective.

It has been alleged that the ivory trade has undermined Law-enforcement within national parks, and that since the rise in prices illegal hunting pressures have become irresistible. If this is the case we could expect a general rise in ivory
poaching in all countries. This is not the case. No wholesale
or commercial slaughter has been reported from Malawi. The same
is true of Botswana, though CITES focused attention on it and
there has been use of its permits. Somalia, from whence the most
vigorous of Kenya's poachers come has, paradoxically, little
illicit hunting — as apparent from the lack of exports on the
international market. In contrast the most severe illegal
hunting has occurred in Kenya and Uganda in which corruption and
disregard for commercial law was widespread. In both instances
the illegalities were general and involved ivory incidentally.
Smuggling of cloves, coffee, wheat, livestock and many other
commodities was general. Indeed the most conspicuous illicit
ivory buyers in Eastern Africa 'switched horses' in mid-stream,
going out of ivory and into illegal coffee. The role of the
ivory trade was thus not a primary, isolated stimulus to
corruption, but more that of a scavenger, taking advantage of
a general disrespect for law.

The illegal trade is also subject to ivory's perennial
difficulty — that of transport. Only where there are well
developed transport infrastructures is it possible to move ivory
en masse. This is one of the aspects which permitted such
wholesale slaughter in Kenya and Uganda — they have better road
systems than almost any other country north of the Zambezi. It
is this aspect of a well developed national park which renders
it more vulnerable to large-scale ivory extraction. The
wilderness, of its own is a barrier to mechanised exploitation.
Its penetration and intersection by a system of roads 'to enforce
the law', will render it that much more vulnerable in the event
of a regression in adherence to law.

Illegal ivory hunting on the scale witnessed in Kenya and
Uganda was primarily the product of a general disrespect for
law. Secondarily the high price of ivory has been a magnet,
attracting many people to poach. The high price, in turn, is
not the consequence of 'frivolous' desires, but the product of
general economic instability in just the same manner as the flight
of the price of gold. Blaming the ivory trade for all that has happened is in truth a frivolous view of a complicated chain of events which no politician has understood - let alone mastered! If someone had, there would be fewer spectres of gloom and a decline in the use of tranquillisers among the world's captains of industry!

All the foregoing notwithstanding, I am committed to make recommendations for the regulation of the trade to lessen adverse effects that it may have upon elephant survival.

Total prohibition of the ivory trade would not be regulation of trade but its destruction. However it has been proposed and must be considered. The proposers are a group of U.S. citizens who have based some of their belief upon a number of errors. These notwithstanding, if their aim was against the U.S. trade only, it would be an issue of their concern alone. However, as their object is international in intent, namely to devalue the ivory assets of Africa, it warrants comment. The salient features of the issue are that African Governments have made no request to the citizens of the U.S.A. for assistance in devaluing the asset. Only one ivory producer of consequence — and it is of past not present consequence — Kenya, has supported a ban. Another, Liberia, which is of no ivory consequence at all, also supported the ban. All others who have responded to the U.S. proposal have opposed it (Hallagan 1979). In these circumstances further attempts to ban all trade in ivory would constitute unwarranted meddling in the affairs of other nations and is insupportable.

A prohibition of the trade would deprive more than 30,000 workers and dependants of their livelihood. As the volume of ivory involved in the trade does not appear excessive, relative to the number of elephants extant, there is no moral justification for depriving them of their way of life. On this ground too, I find the proposal to ban trade in ivory insupportable.
A third and practical ground for rejecting a ban on trade as a viable solution to poaching, concerns the volume and value of that already owned. For a ban to be effective people would have to be dispossessed of it and this would call for impossible compensation. If retention of ivory already owned was permitted, there would be no way to differentiate it from new. An artificial constriction of supply would drive the value of that already owned yet higher. In turn this would raise, not lower, the incentive to poach. There would be a Beilenson effect of yet greater proportions. Further, in view of the evidence now available, it is extremely unlikely that many nations would follow the lead of the U.S.A. On such practical grounds the proposal for a ban is unlikely to work. If it is attempted I foresee a repeat of an earlier American prohibition at which the world stood back and marvelled! Then too, of more recent example is gold which the U.S. attempted to demonetise and failed. The flight to gold, ivory and the like is precisely because history has shown that these are the hardest things to demonetise. A ban in the U.S.A. would hurt a number of traders and artisans, but would not devalue the commodity internationally.

The main point overall is that a ban is unnecessary.

Throughout my contacts with the trade, I endeavoured to determine whether it had the will to regulate itself. This report is the strongest evidence that such a will exists. If it didn’t, I would never have been given access to the records and stocks that I was. That the recommendation of one set of traders was sufficient to obtain the goodwill and trust of others in different countries is evidence that there is a basis for co-operation between them. Currently, however, there is no international institution for ivory traders. There is also a conservative suspicion between groups — e.g. as between Hong Kong and Japan. However, this was at a peak when I was in Hong Kong, for as CITES made its impositions there, it gave differential advantage to Japan, which was able to continue purchasing without permits. While it would take some organisation to establish an
international ivory traders’ association, I am in no doubt that such a body could be brought into being and that it would be joined by bona fide traders from all ivory trading nations of consequence. It would serve a useful function and provide a channel for communication with producers, law enforcement agencies and conservation people as well as see to the interests of the traders themselves.

As a group the traders were reluctant to surrender independence (an attitude I cordially share) and would obviously prefer to continue as they have done in the past. This in no way meant that they were callous to the future of elephants. While they were obviously not as emotionally riven as those who have made conservation their business or hobby, they exhibited a deep interest in all matters pertaining to the foundations of their trade. All accepted that stability in the business would be of benefit not only to elephants, but to themselves. However how such stability could be brought about was an issue over which most were rather pessimistic. The general feeling was that there was no substitute whatsoever for integrity and sound law-enforcement in Africa. Permits and licences were all very well as supports to well-administered law, but they were not ends in themselves. They were only as good as the man who issued them and, as a generalisation, it was said that if you produce money in most parts of Africa, you can get permits.

The greatest hesitation over any enthusiastic acceptance of CITES and permits was the knowledge that while a majority might accept them and endeavour to abide by them, the effort would be jeopardised by a minority who used the situation to competitive advantage. That such a minority exists I have no doubt at all. It does in any aspect of human enterprise.

A second base for suspicion concerns conservationists. The attitude is very understandable, for with little factual base the trade has been slandered from pillar to post. Firms of honourable men — merchants and artisans — have been deeply offended
by sweeping assertions such as those which equate them with criminals in the international drug scene. What is ironic is that few conservationists have ever tried to contact ivory dealers - most of whom are easy enough to find. Personal evidence of this irony came when the IUCN "Traffic" Group's representative in Hong Kong - one Michael Webster Esq — the one man who should have been able to introduce me to the iniquities of Hong Kong's ivory trade, declined to meet me or give evidence for this survey! It was the only refusal in a project which encompassed several hundred contacts.

More serious than the gratuitous alienation of the trade by slanderous and ill-informed press comment is apprehension over IUCN. Perhaps this is best illustrated by a series of questions which I heard during the survey:

'What is IUCN ?
To whom is it accountable ?
How does it get its funds ?
If it is a public body where are its accounts published ?
How does IUCN recruit its staff ? If by public advertisement, where ?
By what concessions and instruments do Governments ally themselves to it ?
Is it subject to any public control ?

One can see the grounds for this attitude. On the one hand IUCN has the prestige of a full UN body, on the other it seems to function as a rather mysterious private organisation. Obviously, there is need here for some explanation, if only to establish a base for co—operation. There is no such apprehension over the operation of CITES, for here opinion can be expressed and policy influenced through one's Government.

A further grouse with some founding is that summed in the question "What do zoologists know about business and enforcing the law?"
This incidentally, was not only heard from traders, but also from customs officials, and civil servants in several countries. The truth is that whereas 'pressure groups' may be a necessary element in the law-making processes of some countries, as with all do-gooders and those with causes to foist upon society - they are seldom popular. Righteousness is a bore to those who don't share it! While zeal in their field of interest automatically places zoologists in the van of conservation drives, it does not necessarily equip them to cope with the administrative routines or capacities to turn zeal into effective law or to obtain co-operation from society at large. The little (very bushy) tree of conservation too easily conceals the amorphous wood of human affairs in which it belongs!

These points are precisely what might be expected in circumstances where a free trade is suddenly overtaken by a welter of red tape and bureaucracy. The scepticism expressed by the traders contrasts strongly with the conservationists' crusading zeal, yet this is natural. From now on it is the traders and law enforcers who have to put rules into effect and modify their ways, while the crusaders sit back in the euphoria of self—congratulation! The hard work is ahead, not behind, and the discussion of problems shows that the issues are being taken seriously. In the circumstances, had I been met with affirmations of enthusiasm, claims that rules were just what was needed, I would have been suspicious. Had I received complaint only, I would have been pessimistic. However, the wholehearted co-operation I received demonstrated that there was a will in the trade to work toward sensible regulation of the ivory business. It will take time and diplomacy to obtain results from it and part of the process calls for the conservation groups to look to their own eyes for motes.

CITES is, de facto, the organ upon which control of the international trade in ivory devolves. It goes without saying that if it is inefficiently administered it will fail. If it can be demonstrated to Governments that the Convention is an
unreasonable hindrance to reasonable, legitimate trade without being of conservation value, it will only be a matter of time before it follows its precursor - the 1933 Brussels Convention.

I would like to draw attention to two cases: one of a failure in CITES and another of ineptitude. The first concerns the U.S.A. and is documented in the Department of the Interior's Fish and Wildlife Service circular FWS/WPO PRT 1-0 1978. Its crucial sections read:

"As you may know, funding authorization for the Endangered Species Act and the Convention on International Trade in Endangered Species of Wild Fauna and Flora expired on September 30, 1978, and was not renewed by action of the Congress and President until November 10, 1978. The effect of this was that although the prohibition of the Act remained in effect, we could not administer the permit system."

For five weeks the world's wealthiest nation was unable to administer the CITES permits. Such bureaucratic interruptions of international trade contain the seeds of failure. If this sort of thing becomes a feature of the Convention, there will be good cause for Governments to withdraw from it.

The second case concerns the CITES secretariat in Morge Switzerland. Parties to the Convention submit annual reports on their trade in listed animal and plant species. One of these concerned the United Kingdom and was forwarded to me through the IUCN African Elephant Survey. I was unable to determine whether a set of figures pertaining to ivory referred to weights or numbers of pieces. The Secretary General's reply relative to the question was:

"The U.K. headings are, frankly, a mystery to me."

I was referred to U.K. sources for enlightenment — but this is not the point. What is of concern is the CITES Secretariat — the body which should be au fait with all pertaining to CITES — circulated reports the contents of which it doesn't understand. This is bureaucracy at its worst — paper for paper's sake. I hope that this is an isolated case, for to find such laxity so early in the life of a bureaucratic institution gives no ground
for confidence in it achieving its objectives.

These two points bear on the need for CITES to be administered with at least the same efficiency as the trade it is set to regulate. With ivory in particular, the need for fast responses is imperative. Deals worth hundreds of thousands or millions of dollars cannot float in limbo at the mercy of a mal-administered permit office. And it is not a question of — well, that's tough — for wealth of this order will bypass the system if it has to. The administration of CITES should not, of its own, become an inducement to circumvent the law.

During the survey only Hong Kong showed an awareness of the need for its administration of CITES to keep pace with business. Even there the situation was not ideal, though applications for permits were processed in 4 days.

A final criticism of the functioning of CITES in relation to ivory relates to the manner in which the trade is recorded. Volume 4 of this report is eloquent testimony to the efficiency of the international Customs and Excise system of recording imports and exports in ivory. Now that the EEC countries no longer record ivory imports as a specific item, CITES must take up this role to at least the same efficiency if not greater. With special permit and licensing sections established to administer the convention there is no reason at all why far greater efficiency should not be achieved. This has not yet happened.

Some reconstruction is now in order. The hallmark of efficiency is simplicity: the more simple permit systems are, the easier to administer and the more difficult to adjust they become. From observing some Indian traders, I learned to what confusing use duplicates, triplicates and photostats can be put. This is spectacularly successful when melded to several permit applications for the same amount of ivory on the same day! Within weeks of the commencement of treatment a permit issuing office can
be reduced to irreconcilable chaos. The message is — keep it simple — an original for the applicant and a duplicate for the issuer. No more.

The next step is keep it uniform. An international ivory permit system calls for an internationally uniform document. Currently permits come in so bewildering a variety that it is difficult to tell the genuine from the bogus. The classic illustration of this occurred in Hong Kong when the first permit for ivory issued by the Sudan which was worded to conform to CITES criteria resulted in the ivory being seized because the document did not resemble previous documents!

There must be uniformity in the manner in which documents are handled. It is logical that the original of a permit for international movement should move internationally. Thus Hong Kong and many other countries do not want duplicates or photocopies, but the genuine original to accompany incoming ivory. The U.S.A. confounds this requirement by retaining the original at the point of exit; from then on the ivory moves on duplicates which are always easier to 'fudge'.

Permits for so valuable a commodity as ivory must be more than a mere bit of paper. They must be a bit of paper which is difficult to forge. The matter of producing permits which are 'security' documents has been discussed at length with Sir Arthur Norman of London — an authority on the subject — and it is confirmed that the production of such documents is practical. For obvious reasons there is no call to go into the detail of what can and should be incorporated in these permits in a general report such as this. Suffice it they would contain an element requiring verification by financial authority (where exchange control laws exist) and have to bear a 'gazetted' signature.

Presently, signatures on permits complying with CITES, mean little, if anything, outside the country of origin. However if
each country complying with the Convention was to register a
maximum of 3 authorised signatures with CITES - copies of which
could be lodged with the ivory importing countries’ Customs
authorities, it would much reduce scope for false issuance of
permits. By Government notification to CITES, signatures could
be de-registered, and others substituted.

In the essence of simplicity the permit system should be
confined to raw ivory. As pointed out in Volume I the sheer
abundance of ivory artefacts would make permits for everything
produced, a monstrous consumer of paper and little else.

To summarise permit requirements: they should be simple,
internationally uniform, be security documents, signed by
'gazetted' signatures only and applied to the international
movement of raw ivory. These measures would reduce abuse of
permits, but not abolish it altogether.

As pointed out earlier in this chapter, traders were
sceptical about the value of a permit system which, while the
majority adhered to it, could be undermined by a minority who
didn't. The sources of principal concern were speculators who
did not regularly trade in ivory. Again this situation could
be considerably ameliorated (but not rendered foolproof) by
limiting the number of persons or firms allowed to import or
export raw ivory from a country. The rationale behind such a
procedure would be the undesirability of having too many people
competing for a finite resource. It has parallel in the
regulation of many civil aviation businesses in which it is
reasoned that free-for-all competition for a finite market would
jeopardise safety standards. In both cases any new operator
entering the field has to (or with ivory would have to) show
clearly that the supply of potential passengers or ivory
warranted additional operators.

This sort of regulation would have to be operated at a
national level. However there is no reason why it shouldn't
prove viable. The body responsible for authorising the number of licensed importers/exporters of raw ivory should incorporate elements of the trade, law enforcement (Customs?) as well as a conservation interest. By limiting the number of importers/exporters, speculators will be eliminated (at least in direct access) from this aspect of the trade. It would also have a stabilising effect on the business overall and give a base for a common influence on raw ivory prices.

In 1968 I enjoined a series of private discussions on the formation of an international ivory 'cartel' in the belief that if prices could be controlled, production could be manipulated. The idea has been discussed intermittently since then and has most recently surfaced as the subject of detailed academic study by the International Institute for Environment and Development. I believe the concept to be unworkable despite having been attracted by it in the past. The growth of cartels has invariably come about through business developments, and not through outside imposition. The traders themselves do not like the idea and successfully broke up an attempt by a firm of Indians to dominate the world price from Hong Kong. The ivory producer nations object to any cartel of external parties trying to control the price of their billion dollar resource. A producer cartel on the other hand would probably prove feasible to form on paper, but the heterogeneous circumstances of Africa give few grounds to believe it would work in practice.

The identification of ivory is of course a matter of some interest. Currently numbers are painted on, branded in with a hot iron, or hammered in with metal punches. All these markings can be removed with relative ease. However a less easily removed system which seemed appropriate for general adoption is that developed in the Kruger National Park. A hole is drilled through the tusk hollow on the inner side of the curve, some 10 cms from the tusk base. A metal disc with serial markings is then rivetted through the hole with a standard 'pop riveter'. It is difficult to remove and even when it is,
the hole remains. The discs can be designed to predetermined and changeable patterns to thwart forgery.

A further instrument to discourage corruption in Africa would be the sale of all Government ivory by open auction as in Malawi, and not through clandestine, secretive deals as are presently common.

Not one of these suggestions is foolproof and there is no panacea to poaching in Africa. Singly or in conjunction with one another the ideas put forward would make illicit trade just that much more difficult. They would be greatly enhanced if ivory traders cease to be vilified and legislated against, and are brought into the process of stabilising the flow of ivory. After all, there is no other legitimate business which is excluded from discussion and influence on its destiny. Attempts to regulate the trade so far have been as balanced as discussing sales of wheat in the absence of farmers.

One point overrides all and that is no international action on trade and no legislative process in the temperate zones can substitute for failure in the management of African Parks. The survival of elephants depends entirely on how Africans enforce their laws in their lands. The critical issue of today in this field is simple law enforcement on the spot.

To close this dissertation I shall take a brief look at the future. The dominant ecological trend in Africa in the present is human increase. Its end is nowhere in sight. In concert with this elephants will decline and, eventually, the continent's ivory production will be that from the national parks. If these contain 175,000 elephants, the eventual sustainable production will be about 57 tonnes a year from natural mortality. If the present game reserves become permanent sanctuaries and are added to the parks, this amount may double. If a balanced trade develops now the process of decline is likely to take decades, with traders leaving it one by one as the competition stiffens.
and profits fall. Providing that the parks gain real sanctity this progressive decline is not critical to the survival of elephant as a species.

While there is general economic and political instability the price of ivory is likely to continue its upward climb. With the turmoil of the Middle East and prospect that OPEC will drive oil prices yet higher, monetary calm seems a long way off. The immediate calls on ivory are likely to rise and there is every prospect that the gradual trends hoped for in the preceding paragraphs will accelerate. These will be symptoms of the wider malaise from which "conservation" can obtain no independent solutions. Thus the survival of elephants does not depend upon trade and traders, but human affairs in a far broader sense. What we need is stability in man. With that the rest will come automatically.
VOLUME 3 (2) RECOMMENDATIONS

Deriving from the material and ideas presented in this report, I recommend that:

1. The focus of all external aid for fauna and flora conservation in Africa should be directed toward securing viable management of national parks.

2. The importance of recommendation 1. is such that aid outside the parks should not be considered until the national parks are viable management entities.

3. The most obvious necessity is for manpower to be raised to a level sufficient to achieve objectives and, in as far as manpower requirements are not understood, their determination should be the continent's overriding conservation research need, to the temporary exclusion if necessary of all other research.

4. A ban of the ivory trade would be impractical, unethical and should not be entertained.

5. The application of CITES should be restrained to what is practical and that the opinion of the law enforcement agencies responsible (namely Customs officials) should always be sought in determining what is practical.

6. Focus of control of the international movement of ivory should be, for practical reasons, on raw and not worked ivory.

7. A uniform permit system be developed for all CITES countries and that the quality of permits be that of security documents (e.g. bank cheques).

8. The signatures for any CITES country permits should be limited to 3 and that these be circulated among member countries.
9. The trade be consulted and invited to contribute to all future discussion concerning it, and to form a body to represent it.

10. Traders wishing to import or export raw ivory should be licensed to do so, that such licences be limited in any one country, that any move to increase this number must show how the trade and elephant conservation would benefit or not be harmed, and that existing licensees be given opportunity to lodge objection to further increase of licences.

11. Raw tusks leaving Africa should be identifiable through identification tags affixed by rivets.

12. Ivory sales by African Governments would, in their own interests, be best conducted through public auctions.

This dozen of recommendations may seem few upon the volume of this report, and the money and time which has been spent on it. Yet if these simple steps cannot be implemented there is no purpose in discussing other issues. If they are, leagues will have been gained. Many further recommendations could then be worth making.
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