

# Further insight into

I.S.C. Parker and Esmond Bradley Martin

In 1981 the authors reviewed all the information then available to them on the world ivory trade to determine the number of elephants represented by Africa's raw ivory exports. Their findings were published in *Oryx* in February 1982. Since then they have been able to collect and analyse more data, which has permitted a more accurate assessment of the situation up to the end of 1982. Contrary to their earlier conclusions, they expect the output in ivory to remain high throughout the coming decade.

## New material

Between October and December 1982 one of us (E.B.M.) revisited Hong Kong and Japan and was able to obtain the most recent official Customs and Excise statistics on ivory imports from both countries. In addition we obtained more precise information on average tusk weights and throughout we followed developments in the field in Africa.

## The volume of Hong Kong and Japanese imports

The weight of raw ivory imported into Hong Kong and Japan in 1979–1982 is presented in Table 1. As pointed out in Parker (1979), there is an element of 'double' counting in such data. Japan is Hong Kong's largest customer for raw ivory; according to Hong Kong's export statistics the amounts exported to Japan were: 1979, 75 tonnes; 1980, 72 tonnes; 1981, 114 tonnes and 1982, 107 tonnes. However, in not one of the

years listed above do the Japanese import statistics acknowledge receiving more than three tonnes from Hong Kong. Instead, it would seem that the Japanese prefer to list the original source of the ivory in Africa. To get a realistic ex-Africa estimate of annual ivory exports we have had to extract the ivory exported from Hong Kong to Japan, and subtract what Japan actually lists as having originated in Hong Kong, in order to avoid double counting.

Table 1. Imports of raw ivory into Hong Kong and Japan for 1979–1982, adjusted to eliminate double counting (kg).

Year	Hong Kong's imports	Japan's imports	Hong Kong and Japan's unadjusted imports	The adjusted totals
1979	449,438	296,864	746,302	672,104
1980	472,639	274,019	746,658	676,755
1981	543,520	308,231	851,751	737,659
1982	467,000	284,846	751,846	574,880

(Note: these data still contain an undetermined element of double counting because some of Hong Kong's imports come from Japan and a part of these originated in Hong Kong. Such flow and counter-flow is very much a feature of ivory trading.)

Regrettably the countries of Europe no longer publish separate ivory trade data in their Customs and Excise statistics, and we do not have confidence in most countries' annual CITES reports (e.g. it was brought to our attention by a leading ivory trader that in one year Britain's stated exports to Germany did not accord with Germany's stated imports from Britain, and that both sets of data were less than the amounts that the trader had himself shipped from Britain to Germany on export permits granted by Britain and corresponding import permits issued by

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# the international ivory trade



*An old master Japanese ivory carver is applying his hallmark to an ivory sculpture (Esmond Bradley Martin).*

Germany!). Thus in calculating overall African exports of raw ivory we have to use Parker's (1979) estimates (which may, by now, be outdated) as a basis for guessing what countries, other than Hong Kong and Japan, have been taking. Realising that many countries may import small amounts of ivory that we cannot encompass, we present estimates for known ivory consumers to add to the Hong Kong and Japanese data to give the order of annual exports in Table 2.

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Table 2. Estimates of the total amount of Africa's raw ivory exports for 1979–1982 (metric tonnes).

Year	Hong Kong and Japan	China	Europe	Others	Total
1979	672	60	50	15	797
1980	677	60	50	15	802
1981	738	60	50	15	863
1982	575	60	50	15	700

Table 3. The values of Hong Kong's and Japan's raw ivory imports for 1979–1982 (unit = US\$).

Year	Hong Kong		Japan		Combined	
	Total value	Value/kg	Total value	Value/kg	Total value	Value/kg
1979	30,929,554	68.82	25,143,345	84.70	56,072,899	75.13
1980	29,669,678	62.77	20,726,425	75.64	50,396,103	67.50
1981	25,165,229	46.30	24,390,115	79.13	49,555,344	58.18
1982	18,318,181	39.23	21,379,889	75.06	39,698,070	52.80

(Conversion rates: the US\$1.00 = HK\$5.003 in 1979, 4.976 in 1980, 5.593 in 1981 and 6.66 in 1982. The US\$1.00 = J.yen 217.46 in 1979, 227.85 in 1980, 219.94 in 1981 and 249.36 in 1982.)

## The value of Hong Kong and Japanese raw ivory imports

The value of imports is given in both Hong Kong and Japan's trade statistics in local currencies (the Hong Kong dollar and the Japanese yen). We have converted these to United States dollars and present the data on ivory values in Table 3.

Overall the data indicate that, not only did the price of ivory fail to keep up with inflation, but in absolute terms it lost 29.7 per cent over the four years 1979–1982. In view of the large proportion both Hong Kong and Japan represent in the world ivory trade, we believe that these figures can be taken as representative of the general international situation during this period. The loss of price could be due to either the prevailing economic climate, or to a substantial decrease in average tusk size over the four year period (Parker, 1979, points out that ivory value is related to tusk size), or to a combination of both factors. The issue will be considered at greater length under the discussion section.

## Average tusk weights

Knowledge of average tusk weights permits some estimation of the number of elephants involved in Africa's ivory exports, an issue central to the interest of conservationists. We have two sources for obtaining average tusk weights. In Hong Kong the Department of Agriculture and Fisheries (as the CITES Management Authority) has kept records, not only of the total weight of each ivory consignment entering the Colony, but also the number of tusks. Such data are not yet kept in Japan, though we believe that this will be done in the future. However the five largest importers of ivory, who between them account for 50–75 per

cent of Japan's raw ivory imports, threw open their books for our analysis. The results are presented in Table 4.

Table 4. Average tusk weights from Hong Kong and Japan for 1978–1982 (kg).

Year	Hong Kong	Japan	
	Av. wt	Av. wt	Sample size in tonnes
1978	9.65*	15.50	190
1979	7.64†	14.47	144
1980	5.62‡	16.82	175
1981	6.02‡	15.28	216
1982	5.39‡	15.10	214

\*From Parker (1979).

†The mid-point between 1978 and 1980, no other data being available.

‡From Hong Kong's CITES records.

The data indicate a substantial decline in the average tusk weight entering Hong Kong's trade, but no change in the size of tusk taken by Japan. Combining the two sets of data we have taken the average tusk weight of both the Hong Kong and Japanese imports as the international average and, on the basis of this assumption, applied it to the estimated total volume of ivory (Table 2) to make an estimate of the number of elephants represented by the exports between 1979 and 1982. The number of elephants is calculated by dividing the estimated number of tusks by 1.88 (Parker and Martin, 1982). The results are set out in Table 5.

## Discussion

There are several striking features from the latest data. We were wrong in suggesting in our first paper (Parker and Martin, 1982) that the volume of ivory leaving Africa would decline in 1979 and

Table 5. Estimates of the numbers of elephants represented by the annual exports of ivory from Africa, 1979–1982.

Year	Volume of ivory (tonnes)	International av. tusk wt (kg)	No. of tusks	Estimated no. of elephants
1979	797	9.57*	83,281	44,298
1980	802	7.25	110,621	58,841
1981	863	7.84	110,077	58,552
1982	700	7.22	96,953	51,571

\*Calculated using the figure of 7.64 kg as the Hong Kong average as shown in Table 4.

1980. The confirmed Customs and Excise statistics indicate that output remained at a relatively high level. This is noteworthy as it stayed high despite a substantial fall in value. The price of ivory not only failed to keep pace with inflation but fell, overall, in absolute value.

Japan's data illustrate a loss in ivory value of 11 per cent in absolute terms between 1979 and 1982. The size of tusk and the quality of ivory received remained constant through this period and cannot be the cause of the loss in value. We thus believe that the downward trend is attributable purely to the general economic recession.

In Hong Kong the situation is rather more complicated. The price of ivory fell 43 per cent between 1979 and 1982. Here the international recession has had a more severe influence upon the ivory trade than in Japan. Whereas the latter country is its own primary consumer, with very little ivory being re-exported in either raw or worked form, Hong Kong is almost totally dependent on external markets. Of the industrialised powers, Japan has weathered the recession best and thus been able to maintain ivory prices at relatively high levels. The other industrialised nations that buy from Hong Kong have been less able to afford the luxury of ivory. In consequence the loss of business has led to 33 per cent of Hong Kong's ivory craftsmen having to take up other employment since 1979 (estimated by the Hong Kong ivory importers). In contrast, there has been no decline in ivory-based employment in Japan.

In addition to the influence of the economic climate, Hong Kong also experienced a substantial loss in the quality of ivory imports between 1978 and 1982. The decline of average tusk weight in this period, of the order of 44 per cent, would of its own accord reduce the value of *International ivory trade*

imports by a considerable margin. Hong Kong's ivory industry is thus not only under severe stress from the financial recession, but also through the events in Africa that result in the production of small tusks.

The drop in average tusk weight recorded in Hong Kong is important for any biological understanding of what is happening to the African elephant. At its most simple level, more elephants are dying to produce the same volume of ivory. Why is this happening and from where do the small tusks come? Overall, human displacement of elephants can be expected to reduce the average elephant's life expectation and thus the size of tusk coming on to the market. A gradual drift in this direction is probably inevitable. However, sudden downward shifts in tusk size indicate additional factors coming into play. Examination of the average tusk weight from different countries in the Hong Kong records implicates one country above all others in the overall downward trend: the Democratic Republic of the Sudan.

The Sudan is held to have sizeable elephant populations (Watson, pers. comm.) and thus an automatic supply of ivory. Its ivory exports between 1960 and 1976 indicate low and somewhat erratic amounts (Parker, 1979), generally of less than 20 tonnes a year. Where this was exceeded in 1973 with 55 tonnes, there was a ready explanation: the cessation of the 17 years of civil war in 1972 permitted easy movement of tusks and the marketing of hoards that had accumulated through the years of strife. After 1977 the pattern changed.

Table 6 shows Sudan's ivory exports to seven countries between 1970 and 1982.

The large amount exported in 1977 comprised 315 tonnes shipped to Saudi Arabia, which is neither a major ivory importer nor an entrepôt. This amount did not appear in the Sudan's own export records which indicated that a total volume of only 20 tonnes left the country in that year. Looked at simply, the ivory was shipped to Saudi Arabia illicitly pending arrangements for its later sale elsewhere. Hong Kong's import records show that prior to 1977 Saudi Arabia exported no significant amounts of ivory. In 1978 it sent nine

Table 6. Sudan's exports of ivory, 1970–1982, as determined from the import records of Hong Kong, Japan, the UK, West Germany, Spain, India and Saudi Arabia.

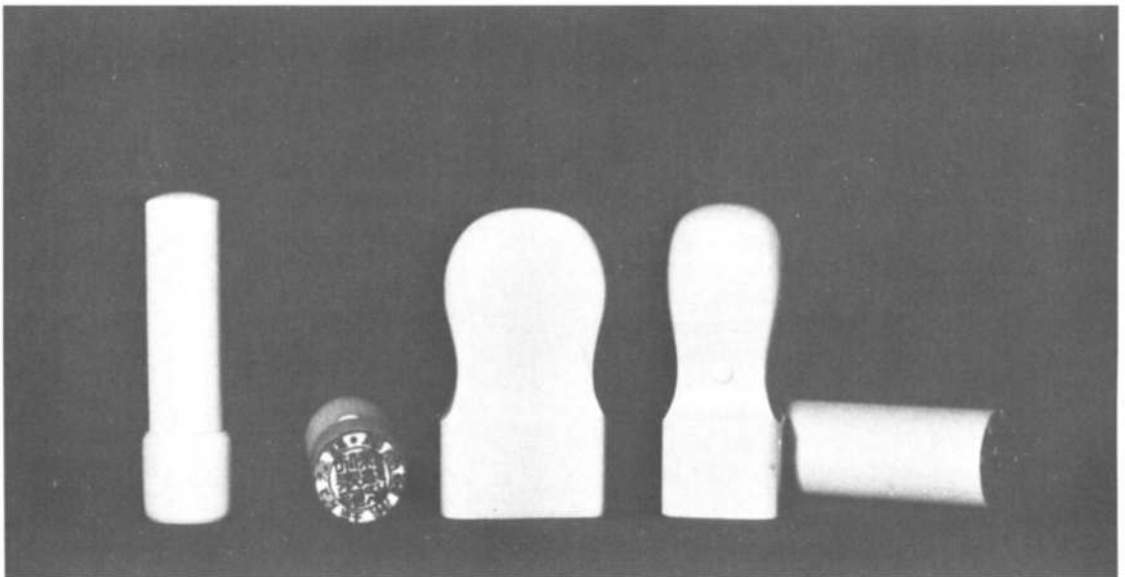
Year	Quantity (tonnes)
1970	10
1971	9
1972	22
1973	55
1974	7
1975	<1
1976	24
1977	348
1978	37
1979	53
1980	96
1981	184
1982	187

At that date there was nothing to suggest any elephant 'massacres' taking place in the Sudan, though poaching was widespread. The 315 tonnes are likely to represent an accumulation of ivory over an indeterminate time prior to 1977. If this was the case, then it may be of relatively minor significance in a biological context. However, its sudden release in whole or large parts on to the world market could have considerable commercial impact. This is particularly the case with Sudanese ivory for in trade circles it has a reputation for cracking badly after the tusks are cut, so much so that it generally sells at only two-thirds of the prevailing international prices. Thus a large release of Sudanese ivory could, in itself, depress prevailing average prices. We believe that this will have played some role in the present low prices in Hong Kong.

tonnes to Hong Kong, in 1979 59 tonnes, in 1981 114 tonnes and in 1982 44 tonnes: a total of 226 tonnes. Again taking the most simple line of reasoning, this ivory is from the 315 tonnes which entered Saudi Arabia from the Sudan in 1977 and there are still 89 tonnes to come.

As far as we have been able to determine, the Saudi Arabian import of 315 tonnes was the work of one organisation, possibly of a single person.

Excluding the large and highly anomalous Sudanese ivory import by Saudi Arabia in 1977, it is evident that new trends commenced in the Sudan in 1980. As can be seen in Table 6, ivory production rose to 96 tonnes in 1980, 184 tonnes in 1981 and 187 tonnes in 1982. Last year it provided 26 per cent of Africa's estimated total production and became the single largest exporter.



*In Japan seals are a necessity because personal signatures are not used; approximately two million seals are made out of ivory each year in Japan (Esmond Bradley Martin).*





These Chinese ivory carvers in Hong Kong are using steel hand tools, but usually today electrically powered drills are more popular (*Esmond Bradley Martin*).

In the context of a continental overview, the rise of the Sudan was not altogether unexpected. The main exporter has tended to be influenced by regional politics and economics. For example, in the early 1970s Africa's ivory 'capital' was Nairobi, where trade was controlled by a very small coterie. In the mid-1970s this group's attempts to 'invade' the Central African Republic stimulated local interest to the point where the 'invaders' failed, but a new local group under the aegis of the Emperor arose. Bangui became the 'capital'. When Bokassa was deposed, the flow of ivory was diverted to a new capital, Khartoum. In all instances these developments have involved *International ivory trade*

few individuals in positions far up the corridors of power and, in that environment, they are very vulnerable to the vagaries of modern African politics. In all instances, too, the ivory capital of the moment has attracted substantial quantities of ivory from beyond its own borders. Thus ivory from all of eastern Africa moved through Nairobi, much of Bangui's flow came from Zaïre and much of Zaïre's ivory probably now goes to the Sudan. If this is so, and given that the overall volume of ivory leaving Africa is holding relatively steady, then the import of the Sudan's situation is more political and economic, rather than biological. That there is a large flow of ivory from Zaïre to the

Sudan is suggested by the large quantities purchased from the Sudan by Japan in 1980 and 1981—43 and 60 tonnes respectively. Japan has a predilection for hard ivory (Martin, 1981) which is not abundant in the Sudan, but is the major type in Zaïre. Add to this the legal position in Zaïre which mitigates against large exports of ivory, despite the country being the continent's largest reservoir of elephants (Parker, 1983), and it is not an unreasonable assumption that much of the Sudanese ivory reaching Japan will have been of Zaïrois origins. However, the volumes taken by Japan do not account for the rise in Sudanese exports to Hong Kong nor their small tusk size.

Numerous rumours and unsubstantiated reports about highly organised illegal elephant hunting in the Sudan have been current over the past three years. They have wide origins in field reports from professional hunters and their clients as well as others involved in wildlife research (D. Western, pers. comm.). The poaching is apparently undertaken by large gangs of northern Sudanese who travel hundreds of miles into the elephant areas of the south. The distances are so great and the elephant grounds so remote, that these ventures call for logistical support and planning of a high order—so much so that they could only be undertaken with a high degree of certainty of success. On its own, this suggests official connivance at a high level. Concrete proof that this is forthcoming lies in the permits which accompany the consignments of tusks that arrive, quite legally, on the international markets.

If we extract the ivory supposed to be of Zaïrois origin from the Sudanese records (say 60 tonnes annually) and extract a further 35 tonnes to account for ivory from the sources that gave the Sudan its form of ivory production between 1960 and 1976, there is a surplus of the order of 90 tonnes in the Sudanese exports for 1982 that has no ready explanation. Population increase will account for a rising level of production, but not a jump of from 20–30 tonnes a year to over 100 tonnes in the space of three years. Again taking the line of easiest reasoning, the surplus 90 tonnes is likely to be the outcome of the hunting by the gangs of Sudanese northerners. From the Hong Kong CITES reports the average tusk weight from the Sudan in 1980 was 4.73 kg and 5.16 kg in 1981. With these as upper and lower

limits, and assuming the 90 tonnes to be the product of anomalous hunting, it would appear that the hunting gangs have been accounting for 9300–10,100 elephants a year in 1981 and 1982.

International conservationists can, of course, bring the foregoing assumptions to the notice of the Sudanese authorities. What happens then is wholly the prerogative of the Sudanese themselves. However, from the international trade point of view, the fall in ivory prices may bring the Sudanese ventures to a halt. A greatly reduced price may have already embarrassed the 'Khartoum Connection' for, when organising the commitment to underwrite hunting ventures in the southern Sudan, it is unlikely that the fall in values that has taken place was foreseen.

It may appear surprising that the volume of ivory has not responded to the downward trend in prices, but it repeats the observation made by Parker (1979) that between 1929 and 1962 East African ivory production rose 246 per cent while the relative price of ivory declined. The salient point from these two examples is that some reason other than price must be the primary cause of rising ivory production. It is human increase. Given the present continental rate of human population growth, which is of the order of three per cent annually, and that this will be at the expense of elephant range (Parker, 1983), we expect the output of ivory to remain high throughout the coming decade. Indeed it would not surprise us if the amounts exceeded the requirements of trade. We are convinced that, sensible as the careful regulation of the ivory trade may be, both from the view of seeing elephants as valuable resources and for their own intrinsic merits, their future depends upon a series of well-structured and managed national parks.

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- I.S.C. Parker, PO Box 30678, Nairobi, Kenya.  
Esmond Bradley Martin, PO Box 15510, Mbagathi, Nairobi, Kenya.