



5

Elephant Ivory and Rhino Horn

5.1 Understanding the Problem

We must recognize the fact that elephant ivory and rhino horn are ‘commodities’ that can be and are bought and sold. Goods whose value continues to skyrocket up into the stratosphere. Goods that can only further increase in value as their ‘origins’ continue to almost free-fall into extinction.

Elephant Ivory: Here it is important to realize that tusks are not the only part of an elephant that can be sold. Elephant hide can be fashioned into objects tourists will buy, their flesh can be eaten as bushmeat and in Myanmar, for example, wild elephants are captured then smuggled into Thailand where they are used to give rides to tourists. Our story, however, is about the illegal trade in ivory.

People’s love affair with ivory and carving it goes back to the dawn of time. There are so many beautiful artefacts made of ivory, some of them very important, some simply objects to delight the eye and some of deep religious significance. Some are modern, some are antique. All of it is very valuable not just in financial terms.

Ivory was high on the list of ‘must have’ items favoured by the rising middle class in China. This should have come as no surprise, since the love affair of the Chinese people with ivory is deeply embedded in their culture and many of them were unaware of its origin. That most modern ivory came from elephants that had been cruelly poached. That elephant numbers might be approaching a tipping point towards extinction. But ivory is bought by people from all over the world. This is a truly global trade.

Rhino Horn: So is the trade in rhino horn. We shall see how battles rage between the ‘good guys’, which is most people in the world, and the ‘bad guys’, those who care nothing for the animals except in so far as they can be exploited to make fortunes for them, despite the best efforts of governments and the rest of us.

Like elephant ivory, rhino horn has been prized for thousands of years. However, there is a tendency to believe that only the peoples of southeast Asia are interested in its supposed medicinal properties. Not so. Our story now moves to Europe, to ancient Greece and to Iran or to be precise to ancient Persia. Rhino horn was used by the ancient Greeks to purify water. Even more important was the widespread belief in its power to detect poison. Originating at some time in 500 BC, the Persians used to pour suspected liquids into rhino horn drinking cups, to see whether they would start to bubble. Bubbling indicated the presence of poison. In fact, this belief may be well founded, for modern-day chemists have concluded that such a reaction is possible provided that the poison is an alkaloid.¹ Hindus, Muslims Buddhists and Christians have all believed in the power, though only from time to time. Indeed, until comparatively recently (namely, up to and through the eighteenth and nineteenth centuries), it was even believed to be true by the crowned heads of Europe.

Now to a mystery. What is the representation of Durer’s rhinoceros doing on top of the coat of arms of the Worshipful Society of Apothecaries, one of the craft guilds or livery companies of the City of London, in the UK? The shield is supported by two unicorns, one on either side of it and on top is the crest, in which is the rhino. Hubert Chesshyre, Clarenceux King of Arms, who researched the matter, concluded in an excellent article that all three beasts were probably there because of the medicinal properties attributed to their horns, mediaeval druggists deeming powdered unicorn horn to have prophylactic powers as well.²

But rhino horn has another use. Like ivory, it can be carved. And it makes beautiful objects which are found in museum collections all over the world. Although most of them are of high value, such as the libation cups that, for centuries, Chinese noblemen gave their emperors as birthday gifts, there have also been fripperies. This happened in Europe, particularly during the 1920s, when rhino horn could be found as door handles, pistol grips and sometimes walking sticks. It was even used as decoration in some expensive cars. In Yemen, it was traditional to present adolescent boys with special curved daggers with rhino horn handles, *as a sign of their manhood and devotion to Islam.*³

¹ US Fish and Wildlife Service *Facts about Rhino Horn* Office of Law Enforcement. See <https://www.fws.gov/le/pdf/rhino-horn-factsheet.pdf> Accessed 22/09/2015.

² Hubert Chesshyre Chester Herald of Arms *The Worshipful Society of Apothecaries* British Heritage Decl Jan 1981/82.

³ See US Fish and Wildlife Service (n.45).



Fig. 5.1 The Coat of Arms of the Worshipful Society of Apothecaries. Copyright the Worshipful Society of Apothecaries

In other words, like elephant ivory, rhino horn has been treasured for centuries by the peoples of the world.

5.2 What Is Ivory?

*Ivory on sale in Vietnam is commonly mixed in with pig teeth and carved bone, perhaps in an attempt to dupe government inspectors.*⁴

So how do we know which artefacts are made out of or contain elephant ivory when there are so many kinds and they can be difficult to identify? There is a book an *Identification Guide for Ivory and Ivory Substitutes*, a handbook for enforcers and for the wildlife law enforcement officers, scientists and managers who are involved in stamping out the illegal trade. However, the book is for guidance only, to provide a first step, sufficient information to

⁴Daniel Stiles (2009). *The elephant and ivory trade in Thailand* TRAFFIC Southeast Asia, Petaling Jaya, Selangor, Malaysia.

judge whether or not the ivory comes from an elephant. Then, if there is doubt about its legality, it can be seized. A trained scientist must positively identify the source of the species.⁵

Other people concerned to ensure their ivory is legal are antique dealers and dealers in collectibles, consumers as opposed to producers. In this case, in addition to publishing literature to help with identification of different ivories, there are also books full of pictures of artefacts which provide an important insight into potential end products.⁶

5.3 Some Different Ivories

Ivory comes in many forms and from a number of sources. Although the most common source is teeth or tusks, one ivory surprisingly is vegetable, and others are purely synthetic. Ivory artefacts must also be distinguished from those made of bone or even shell, so it is essential to be able to distinguish both elephant and mammoth ivory.

Elephant Ivory: Coming from its tusks or upper incisors, it is a dense substance, chemically similar to bone and antler. It has a fine, even grain and lines of Retzius which make it unique and give it its great desirability as a substance to be carved. These are growth rings and they are only found in teeth. They are the tooth equivalent of tree rings and they give the age of the tooth's owner. When the tusk is carved, they produce an *engine-turned effect* (*intersecting lines with a diamond shape between them*).⁷ For identification purposes, this is the equivalent of seeing a hallmark on gold or silver. But elephant ivory can also be identified by the presence of Schreger lines, which show up as a *chequer board* or *diamond* pattern when the tusk is seen in cross-section.⁸

As we saw earlier, although mammoths have been extinct for over 10,000 years, the bodies and tusks of one species, the woolly mammoth (*Mammuthus primigenius*), continue to be found, often in such good condition

⁵Edgard O. Espinoza & Mary-Jacque Mann *Identification Guide for Ivory and Ivory Substitutes* WWF TRAFFIC in cooperation with the CITES Secretariat. This online version was published in 1999. See <http://www.cites.org/sites/default/files/eng/resources/pub/E-ivory-guides.pdf> Accessed 9/06/2014.

⁶*Identifying Different Types of Ivory* Part of the Uniclectica Antiques and Collectibles Online Series *Caring for your Antiques and Collectibles*. See <http://www.uniclectica.com/conserva/ivory1.html> Accessed 9/06/2014.

⁷Ibid.

⁸Jacqueline Codron *Annals of Ivory: Perspectives on African Elephant *Loxodonta africana** (Blumenbach 1797) *Feeding Ecology from a Multi-Decadal Record* 2008 (Ph.D. Thesis). See http://uctscholar.uct.ac.za/PDF/91348_Codron.J.pdf Accessed 17/06/2014.

that the tusks provide high-quality carvable ivory. Sometimes they can be over 13 ft. long and thick as tree trunks. And they can fetch large sums of money as the ivory is highly desirable.⁹

Mammoth Ivory: While the outer layer of the tusk may be coloured by minerals found in the soil, inside, it is a light cream colour, and it polishes to a bright shine.¹⁰

Other ivories include:

- **Hippopotamus ivory**, the second most commonly used ivory. It is found in inlays or as small items like buttons.
- **Walrus ivory**, which comes in three forms. Its teeth are normally carved into small objects like jewellery, inlay or even small scrimshaw, while Oosik is used for knife handles.¹¹
- **Sperm whale and orca ivories**, which are hard to distinguish from walrus ivory. They also have a long history of carving, particularly into scrimshaws.
- **Narwhal ivory**, which comes from its single tusk or horn which has ancient historical significance. It was thought to possess mystical powers and is associated with unicorns, and the Vikings believed that *a cup made from the tusk of a narwhal would save the owner from poisoning by his enemies.*¹² Rather like rhino horn cups.
- **Warthog ivory.**
- **Hornbill ivory** (from the bird, the helmeted hornbill which is now under threat)
- **Vegetable ivory** (from the Tagua palm tree nut)
- **Synthetic ivory**, of which there are a number. Some are so realistic that chemical tests are needed to spot the fakes. Netsukes, or Japanese perfume bottles, are normally carved from elephant ivory and are very decorative, are highly collectible and fetch high prices, but during the latter part of the twentieth century, there were so many excellent fakes, most made of synthetic ivory and so hard to detect that the bottom fell out of the market.

⁹ Brook Larmer *Of Mammoths and Men* National Geographic, April 2013. See <http://ngm.nationalgeographic.com/2013/04/125-mammoth-tusks/larmertext> Accessed 17/06/2014.

¹⁰ Canadian Ivory Inc. See <http://www.canadianivory.com/> Accessed 12/06/2014.

¹¹ Ibid.

¹² Ibid.

5.4 The CITES Ivory and Elephant Seizure Data Collection Form

Elephant ivory has been divided into categories for evidential purposes. In the form there are five:

Raw Ivory: includes tusks from various sources. They may be whole, mounted or polished or broken or cut into pieces, but not otherwise shaped or processed.

Semi-Worked Ivory: has only undergone some processing. A good example is ivory blocks made into name seal blanks.

Worked Ivory: has been made into finished products such as piano keys, chopsticks, game pieces, carvings and composite sculptures.

Fresh Ivory: is ivory that has been recently poached. It can be identified in a number of ways. Blood or particles of flesh may still be attached to it, and sometimes there are signs of an axe or machete used to hack it from the elephant. It will not be discoloured or cracked from ageing.

Old Ivory: looks weathered and discoloured. It is also cracked and brittle.¹³

Unfortunately, as yet, there is no on-the-spot test to determine whether or not the ivory is old or comes from a lawful source so can be legally sold, although some antiques come with provenance and some artefacts have 'a passport'.

5.5 Mammoth Ivory, Other Ivory, Bones and Synthetic Substitutes

Because mammoth ivory in any form can be legally exported, imported and sold and there are no restrictions on other ivories or bones, as the price of ivory has risen, the temptation to use substitutes for elephant ivory has increased and with it the temptation to pass them off as elephant ivory.

¹³Milliken, T., Pole, A., and Huongo, A. (2006) *No Peace for Elephants: Unregulated Domestic Ivory Markets in Angola and Mozambique*. TRAFFIC International, Cambridge, UK, p.6. See also Conf. 10.10 (Rev. CoP14), *Regarding marking*.

It is mainly Chinese craftsmen who carve these substitutes, and although some artefacts were produced before the total ban on international sales of elephant ivory, it was the ban that really caused this industry to take off. Particularly items carved from mammoth ivory. And to such an extent that the State Forestry Administration in China produced a leaflet setting out the differences between elephant and mammoth ivory, explaining how to distinguish the two.

Siberia exports mammoth ivory, and China imports it, often via Hong Kong where there is no import tax. Some factory owners even go to Russia to buy mammoth tusks. All the ivory is graded and it fetches good prices. Furthermore, it can be exported legally.

So what is happening in China? Researchers found that mammoth tusks were being carved in factories in Guangzhou and Fuzhou, where elephant ivory is also carved. In one of the three factories in Guangzhou, almost half of the items were carved from mammoth ivory, while in the other, most were carved from cow bone and consisted of elaborate landscape scenes, magic balls and some composite pieces similar to those carved from elephant ivory. In 2007, this factory bought a supply of mammoth ivory and, in 2010, hippo teeth. Although the researchers didn't see any mammoth ivory in the third factory, the manager told them that it was used.

Mammoth tusks were also being carved in the three factories in Fuzhou. All three factories exported this ivory, and although it only amounted to about 10% of the sales in one factory and 40% in another, the third factory exported most of its output. Its ivory carvings, of human and animal figures, were particularly fine. Some of the tusks were merely polished.¹⁴

The use of ivory substitutes seems to be increasing in Thailand as well, although no substantive data is available at present. Worked mammoth ivory is being imported from China, and mammoth ivory, bone and resin pieces are being painted to resemble ivory, which can then be offered for sale mixed in with authentic elephant ivory.

5.6 What Is Rhino Horn?

The most important fact we need to recognize about rhino horn is that it is composed of hard keratin proteins, alpha keratins, which are common to most mammals. Indeed, our hair and finger nails are made of these same proteins.

¹⁴ Esmond Martin and Lucy Vigne (2011) *The Ivory Dynasty: A report on the soaring demand for elephant and mammoth ivory in southern China* Published by Elephant Family, the Aspinal Foundation and Columbus Zoo and Aquarium 2011.

There are no magic ingredients. Yet down the ages, it has been imbued with more and more magical properties, the latest being its ability to cure cancer. And it is these allegedly healing properties that are mainly responsible for the near extinction of these beautiful animals.

5.7 Distinguishing Rhino Horn from Fakes

Unlike elephant ivory, distinguishing between fake and real rhino horn can be dealt with relatively briefly. The most realistic false rhino horns are apparently cow or buffalo horns, which are a deep black in colour. At least these are harmless if they are used in medication, unlike other fake horns made from hair and plastic pressed together or with plastic playing some part in their making. And with the high demand for rhino horn in Viet Nam, there is no way it can be ever be met with the real thing, so a ‘cottage industry’ making fake horn is beginning to develop in villages in some parts of Viet Nam.¹⁵ When researchers visited a factory where fake horns were manufactured, they were able to film the production process with a hidden camera.

The level of ignorance about a rhinoceros is staggering. Some traditional medicine practitioners appear to believe that rhinos *have two kinds of horn: one on the top of the head and one under the jaw*, and one market seller claimed to his prospective buyer that the horn he was trying to sell him was *the one on the top of his head*.¹⁶ Perhaps this is one reason why, according to Milliken and Shaw, fraud *characterises a major part of the trade itself*.¹⁷

5.8 Rhino Horn as a Medicine

Now we must consider rhino horn as a medicine, and this must be carefully done for it is always important not to dismiss potential medicinal benefits out of hand. The people who use these remedies deserve respect. Take bear bile, for example, another ingredient of traditional Chinese medicine. When this was investigated, it was found to contain ursodeoxycholic acid, an active ingredient that can help some liver conditions. In other words, it did have some medicinal use. Even more important was the fact that, once this

¹⁵ Milliken, T. and Shaw, J. (2012) The South Africa – Vietnam Rhino Trade Nexus: *A deadly combination of institutional lapses, corrupt wildlife industry professionals and Asian crime syndicates*. TRAFFIC, Johannesburg, South Africa; see Anon, 2011c p.129.

¹⁶ Ibid, p.129.

¹⁷ Ibid.

capacity was known about, work was done and now this substance can be produced synthetically. No need for any more bears to be killed (or farmed) to get this product!

Rhino horn is normally used medicinally in its powdered form, and in fact very little research has been carried out as to exactly what, if any, healing properties the horn might have. However, it is supposed to be able to chill and detoxify. These properties, first described in the Han dynasty's *Divine Peasants Herbal*, were re-empathized as recently as 2012 by none other than the President of the UK Association of Traditional Chinese Medicine. In other words, they deserve serious consideration.

By 2012, with the illegal killing of rhinos reaching ever more alarming proportions, and with seemingly wilder and wilder claims being made for their horns' apparently magical healing powers, it was obvious something had to be done. A report was produced by TRAFFIC for the CITES Secretariat. It was an overview of the current uses of the horn in five countries/territories, namely, China, Taiwan (Province of China), Japan, the Republic of Korea and Viet Nam. All of them had a strong tradition of using the horn as a form of medicine, and all had historic consumer markets. Even more important was the fact that all the countries had banned international trade in the horn by 1994 and all domestic trade by 1995. Despite this, the trade continued, the belief in its healing powers seemingly as strong as ever.

But we already know that rhino horn is made up entirely of alpha keratins, just like our hair or finger nails. Furthermore, there are no significant differences in composition between it and water buffalo horn.¹⁸ So does it have a medicinal use? Unlike bear bile and its ursodeoxycholic acid, few attempts have been made either to isolate or identify any active components the horn may contain, and those that have been undertaken have not yielded any results.¹⁹

Fortunately, the only trial involving humans did apply best practice, being randomized and double-blind. The results showed *a short-lived significant effect on fever in children*, but its use was not recommended because another drug, a common non-steroidal anti-inflammatory drug, performed better.²⁰

In order to identify viable substitutes, China allowed research to be carried out using actual rhino horn. The tests, which used in vitro techniques as well as laboratory animals, produced some interesting results. All of them found *statistically significant pharmacological effects* when the horn was used, among

¹⁸Kristin Nowell *Species Trade and Conservation, Rhinoceroses: Assessment of Rhino Horn as a Traditional Medicine* A report prepared for the CITES Secretariat on behalf of TRAFFIC, April 2012, SC62 Doc.47.2, see Lee and Kim, 1974, pp. 6–9.

¹⁹Ibid, p. 2.

²⁰Ibid, p. 1.

other things, to reduce fever, as an anti-inflammatory, an analgesic and a procoagulant. Far more important was the fact that these results were replicated when using animal horn substitutes.

So has there been any research outside southeast Asia? In fact, two studies have been carried out, one in the UK and one in South Africa, and their results were rather different. They *found no pharmacological effects* for any of the animal horns, while *some traditional medicinal plants that were tested as possible substitutes for the rhino horn did produce some significant results.*²¹

The most recent and most extravagant claims that rhino horn offers a potential treatment for both cancer and strokes remain to be substantiated.

Japan included rhino horn in its traditional medicine system 300 years ago during the Edo period, and, more recently, in its national pharmacopoeia between 1962 and 1980. It was used in two forms. As rhino horn slices, its main use was for treating children with colds, fevers and measles, but it was also included in well-known manufactured household medicines, one of many ingredients. Parents used these medicines to sedate their children, while adults used them as a cardi tonic. When the sale of rhino horn was banned in 1980, the Japanese started using saiga antelope horn instead and found it was just as efficacious.²² As a result, now these animals are becoming threatened as well.

Perhaps we can derive a kernel of hope from the fact that China has carried out a series of properly controlled experiments and found that both rhino horn and animal horn substitutes produce the same results. And Japan has managed to remove virtually all rhino horn from its traditional medicines.

²¹ Ibid, pp. 1–2 and 9–18.

²² Kitade and Toko 2016.