Ancient and Modern Bone Artefacts from America to Russia

Cultural, technological and functional signature

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BAR International Series 2136
2010

Published by

Archaeopress
Publishers of British Archaeological Reports
Gordon House
276 Banbury Road
Oxford OX2 7ED
England
bar@archaeopress.com
www.archaeopress.com

BAR S2136

Ancient and Modern Bone Artefacts from America to Russia: Cultural, technological and functional signature

ISBN 978 1 4073 0677 3

Printed in England by Blenheim Colour Ltd

All BAR titles are available from:

Hadrian Books Ltd
122 Banbury Road
Oxford
OX2 7BP
England
bar@hadrianbooks.co.uk

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Tortoiseshell in the 17th and 18th Century Dutch Republic

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Abstract

Tortoiseshell was an expensive raw material used for luxury items. Tortoiseshell objects are not only present in museum collections, but were also found in archaeological excavations. This article discusses the provenance and import of this raw material and the production and use of tortoiseshell objects in the Dutch Republic in the 17th and 18th centuries.

Introduction

Tortoiseshell objects are to be seen in many museum collections. Dutch collections often hold beautiful tortoiseshell objects dated in the 17th and 18th century. The perfect conservation of many of these objects is remarkable and they still display the lustre as they did in olden times. But tortoiseshell can also be found in archaeological collections; sometimes still easily recognized and showing original colour and patterns, sometimes weathered and hard to identify as tortoiseshell. To reveal the history of this extraordinary material, historical and archaeological sources were researched, together with museum objects. This article discusses the import of tortoiseshell to the Dutch Republic and craft in the Republic in the 17th and 18th century, with an emphasis on the city of Amsterdam.

Tortoiseshell

Exploitation

Like many animals, turtles and tortoises were exploited for different purposes. In areas that are the natural habitat of these animals, humans have used them for centuries. They were used for necessities such as food; the flesh and eggs were consumed. Furthermore, oils were derived from their bodies and several parts could be used for medicines (Lehrer 1998). Another purpose for which turtles were caught was tortoiseshell. Tortoiseshell was used for the manufacture of objects, which was the main reason why some species almost became extinct. For economic reasons tortoiseshell, a prized material, was exported to many regions in different parts of the world. This material became a sign of extreme luxury in Northwestern Europe. A disadvantage for the turtles was that they could easily be caught. They were turned on their backs when they went on land to lay their eggs. The turtles couldn't get out of this position and one could come back later to collect the animals. Turtles were also caught by using nets (Benjamins and Snelleman 1914-1917; De Schmidt and Van der Lee 1979). As a result of the pursuit of profit for many years, the numbers of turtles declined (Van Dijk and Shepherd 2004). Turtles used to be abundant, but are nowadays highly endangered and also smaller in size, because of human selection for bigger animals.

Species

Tortoiseshell is derived from sea turtles and not, as the name suggests, from tortoises who live on land. Three species of turtles could be used for the harvest of tortoiseshell: the green turtle (*Chelonia mydas*), the loggerhead turtle (*Caretta caretta*) and, most important, the hawksbill turtle (*Eretmycholys imbricata*). Tortoiseshell of hawksbill turtles was used most frequently, because it is the thickest tortoiseshell of all and it has a beautiful pattern (Vuillemier 1979). Hawksbill is usually not eaten and considered to be poisonous in some areas. The hawksbill turtle used to have a large area of distribution in tropical waters around the whole equator and could be seen very frequently. It is smaller in size than the green turtle and loggerhead turtle (Lehrer 1998).

Anatomy of turtles

The skeleton of a turtle is very different from that of mammals or even any other order of animals. Their exoskeleton comprises of several fused bones which form the shell. The shell covers and protects the rest of the body; it could also function as a reservoir for water and fats. The shell of a turtle consists of a solid bone structure covered with a epidermal layer of keratinous scutes. The upper, dorsal part of the shell is called the carapace, the ventral part is called the plastron. The two parts are connected, but not where head, tail and limbs are pretruding. The carapace consists of fused ribs, vertebrae and dermal bones. Thus spinal cord and ribs are connected to the shell and the animal can not escape his shell. The sutures of the bones of the shell and the sutures of the keratinous scutes do not overlap each other, which enhances the strength of the shell (Gilbert *et al*. 2001; Romer 1962, 159).

The carapace is strongly curved, while the plastron is flat. Since the hawksbill turtle was primarily used for the harvest of tortoiseshell, this species will be discussed in

particular. The size of this species depends on the habitat. A Caribbean hawksbill can reach a size between 76 and 91cm, and weights 45 to 75kg. An Asian hawskbill has a length between 61 and 76cm, with a weight of 28 to 41kg (Lehrer 1998, 97). According to Vuillemier a turtle of 75kg supplies 2.5kg of tortoiseshell (Vuillemier 1979). The maximum amount of tortoiseshell that can be harvested from one turtle is probably 4kg (Lehrer 1998; Andes 1911).

The carapace of the hawskbill turtle has thirteen scutes. Five scutes in the middle are slightly arched and cover the neurals (neuralia). On both side of these five arched scutes, four more scutes are present which cover the costalia. These eight scutes are flatter and thinner. On the outer edge of the carapace, twenty five small outer scutes are present; these are not suitable for object manufacture (Vuillemier 1979). The size of thirteen scutes can be 17cm wide and 30cm long (Andes 1911; Vuillemier 1979), although the real useable size is probably smaller (see further). The scutes of the hawskbill can be 1.5 to 3.5mm thick (Vuillemier 1979). As a result of manufacture processes, the thickness of tortoiseshell objects is thinner than the scutes and usually measures between 1 and 3mm (see further).

Like size, the colour and pattern of the keratinous scutes, depend on natural habitat (Vuillemier 1979). The scutes of the plastron are, according to Williams, not mottled and are translucent (Williams 2002). Almost all tortoiseshell, however, was harvested from the carapace of the turtles.

Manufacture techniques

The first step in object manufacture is the removal of the scutes from the bony shell. In order to detach the scutes it was necessary to use heat. For this purpose the living animal was held over a fire or boiled in water. In the belief the tortoiseshell would grow back, the turtles were thrown back into the sea. Although this is in fact true, the animal would not survive this brutal attack (Benjamins and Snelleman 1914-1917; Vuillemier 1979, 41; Williams 2002, 34-35).

Tortoiseshell is, like other keratinous tissues, thermoplastic. This means that it can be formed by using heat. As a result the tortoiseshell can obtain a different form than the original scute, and it can be melted together. However, applying too much heat could make the tortoiseshell brittle (Shenton 1992). Scraps of tortoiseshell can even be melted and moulded, although it then loses its transparency. The raw material was usually flattened, pressed, filed and polished (O'Connor 1987; Williams 2002). Moulds of wood and copper could be used to reshape the tortoiseshell. Techniques that were used for horn could also be used for tortoiseshell (for horn working see for example Hardwick 1981). Vuillemier suggests that the manufacture techniques of tortoiseshell were kept a secret or were too simple to write down, and she leans toward the first explanation (Shenton 1992, 176; Vuillemier 1979, 40). Because the working of tortoiseshell was probably similar to the working of horn (Grall 2002) and such processes were not easily kept a secret, the second option seems more probable. New methods of working of baleen, for example, were not easily kept secret. This can be seen in many historical sources in which several people try to dispute a patent of John Osborne, who invented new ways to process baleen.

When tortoiseshell was used for inlay of veneer, an underlay is often present. Red paper, gold foil or a white chalk substance prevent that the glue or wood from being seen through the toirtoiseshell and enhance the colour of the tortoiseshell (Vuillemier 1979). This was standard practice in different parts of north-western Europe, which also shows that techniques were not at all a secret.

Expensive materials were often replaced by cheaper imitations. For example, tortoiseshell was imitated by stained horn and there are even recipies for imitating tortoiseshell in ivory (Andes 1911; Vuillemier 1979). In a later period tortoiseshell was replaced by various kinds of synthetics that imitate the colour and pattern of genuine tortoiseshell.

Identification of tortoiseshell

The most distinctive feature of tortoiseshell is probably its colour. The tortoiseshell from the hawksbill turtle in particular displays a bright yellow translucent colour with red-brown spots. As stated above, the patterns differ depending on species and provenance. The coloured spots are made up of small dots of pigment. The spots differ only slightly on either side of the tortoiseshell, in contrast with horn which has different coloured layers and is therefore not as translucent as tortoiseshell. So called 'blond' horn can be translucent, but tortoiseshell can even then still be easily recognized. Horn shows corrugations in the longitudinal direction which are absent in tortoiseshell. Both horn and tortoiseshell consist of growth layers, but the layers of horn split much more easily. The weathering of tortoiseshell is very characteristic; it shows the layers peeling off at the edges of the layers. This process is preceded by a wavy pattern of small white dots. When the edges of the layers are beginning to detach, the translucency of the tortoiseshell disappears (O'Connor 1987; Vuillemier 1979).

Trade

VOC and WIC

Two important Dutch trading companies were the East India Company (Verenigde Oostindische Compagnie, hereafter VOC) for trade in the east and the West India

Company (Westindische Compagnie, hereafter WIC) for trade in the Atlantic. The East India Company was founded in 1602. The activities and government of the VOC were divided into six 'kamers', of which Amsterdam was the largest, followed by Zeeland. The four smaller 'kamers' were Rotterdam, Delft, Hoorn and Enkhuizen. The VOC existed until the end of the 18th century (Gaastra 2002). The first WIC (WIC I) was founded in 1621 and the second WIC (WIC II) succeeded the first in 1674 and existed until 1791. Like the VOC the WIC was divided into 'kamers'; the five 'kamers' of the WIC were Amsterdam, the largest, Zeeland, the second in size and the three smaller ones, Maze, Stadt en Lande, and Noorderkwartier (Den Heijer 2002). But as we will see, neither of these companies initiated the import of tortoiseshell to the Dutch Republic.

Asian trade in tortoiseshell

Asian waters are the natural habitat of the hawksbill turtle and the VOC had a strong grip on trade in Asia. Therefore one would expect the export of tortoiseshell to the Dutch Republic. The VOC was indeed involved in the tortoiseshell trade in Indonesia, but this was a part of the inter-Asian trade and (almost) none of the Asian tortoiseshell reached the Dutch Republic (Coolhaas and Van Goor 1960-2007). A lively trade in tortoiseshell already existed in Indonesia, and the Dutch stepped into this existing trade (Noorduyn 1983). Probable reasons for the fact that tortoiseseshell was not exported from Asia to the Dutch Republic are that the trade of tortoiseshell between Asian countries was more profitable than export to the Dutch Republic. However, more research must be done to look into this trade, and many uncertainties still remain.

The Netherlands Antilles

The second area where tortoiseshell was a traded is the Caribbean area. In this area, the hawksbill turtle lives and breeds as well. In the 16th century the Spanish crown already had a strong influence in the Caribbean area and occupied many islands. Soon the English, French and Dutch also were interested in the Caribbean islands. The several European nations fought repeatedly, and the superior powers on the islands changed continously. Many of the original inhabitants, the Indians, were enslaved or more often driven away by Europeans, who replaced them with African slaves who had to work on the plantations and salt pans. Most of the Indians, however, died of European diseases. Several of the islands were for longer or shorter periods of time, ruled by the Dutch. The Netherlands Antilles consisted of the islands Curaçao, Bonaire, Aruba, Saint Eustatius, Saint Martin and Saba (Figure 1). Aruba has a status aparte since 1986, and other islands are in discussion of becoming Dutch municipalities or receiving a status aparte as well.

The Lesser Antilles can be divided into the windward (from Martinique to Aruba) and the leeward (from Saint Martin to Dominica) islands. Curaçao, Aruba and Bonaire are part of the windward islands (in Dutch: benedenwindse eilanden). Curaçao was claimed by the Dutch in 1634, and a few years later Aruba and Bonaire. Aruba and Bonaire were placed under the government of Curaçao. Aruba has some salt pans, but Bonaire was of little economic value (Den Heijer 2002, 93). Curaçao became the centre of the slave trade in the Caribbean in the second half of the 17th century. Slaves were shipped by the WIC from Africa to Curaçao and from Curaçao delivered to the Spanish colony of Venezuela (Den Heijer 2002).

Of the leeward island (in Dutch: bovenwindse eilanden), Saint Martin, Saint Eustatius, Saba and Tobago were in Dutch hands for shorter or longer periods of time. Saint Martin and Saba were placed under the government of Saint Eustatius. Saint Martin merely delivered salt, but Saint Eustatius became an important centre for the slave trade for a decade, between 1720 and 1730 (Den Heijer 2002, 93, 150; Spruit 1988). The Dutch first conquered Saint Eustatius in 1636. The islands alternated between Dutch, English and/or French hands. The American war of independence (1775-1783) provided an important economic stimulant for Saint Eustatius (Den Heijer 2002, 150). This ended with the beginning of the fourth Dutch-English war in 1780. During this war from 1780 until 1784 Saint Eustatius fell to English and later French hands (for a full history of the Dutch in the Caribbean see Goslinga 1971-1990).

Trade in the Caribbean

The slave trade was monopolized by the WIC until 1730. Slaves were shipped from western Africa to the Caribbean to work on plantations or salt pans. The products that were cultivated on the plantations were mainly sugar, tobacco and cotton. The Caribbean Sea was considered to be a free trading area. On the leeward islands private trade was allowed and in 1675 trade with Curacao was officially permitted for private traders and foreign ships. In practice the latter was already the case even before it was officially allowed. Private traders had to pay taxes to the WIC for the products that were shipped (Den Heijer 2002, 93, 137, 147).

The products were weighed at the weigh-house; all goods that changed owners or were unloaded needed to be reported and weighed. Half of the bill was paid by the seller and half by the purchaser of the goods. Unloaded cargo that wasn't traded at the islands was free of charge (De Schmidt, van der Lee and Schiltkamp 1978). As a guarantee, usually a merchant in the Republic paid a bill of exchange (communication Den Heijer), but sometimes this was done by the governor himself. In this private trade the products were often shipped by members of the government, to earn some extra money in addition to

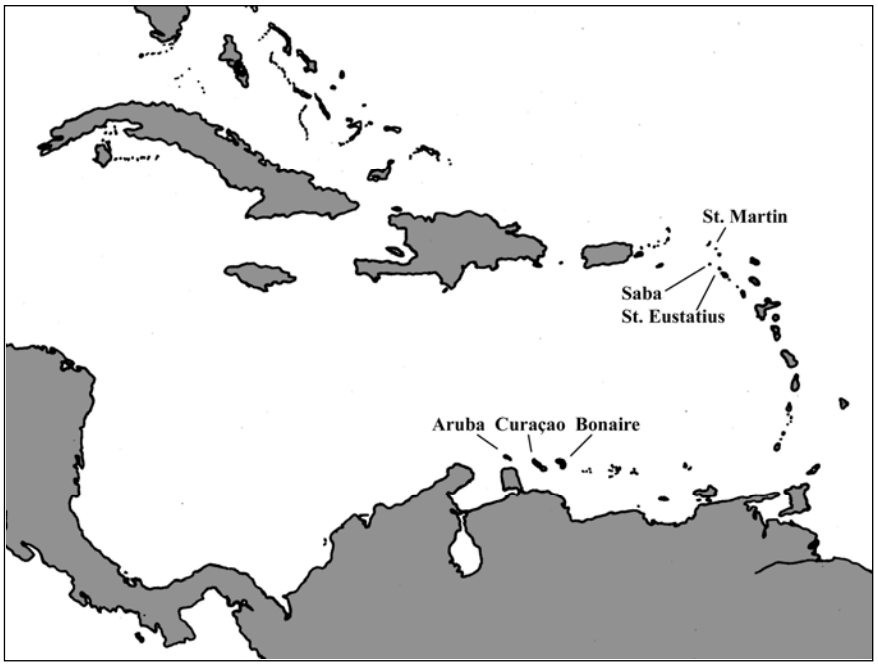

Figure 1: Map of Antilles.

their salary (Spruit 1988, 118). Products that were shipped in the private trade were, for example, sugar, coffee, cotton, tobacco, cacao, ginger, wood, indigo, hides, and tortoiseshell.

Import of tortoiseshell to the Dutch Republic

Tortoiseshell was imported from the Antilles by private traders. Because their cargo was charged taxes by the WIC, the amounts of tortoiseshell and other products that were imported to the Dutch Republic were recorded in the archives of the WIC. These archives are kept in the National Archives of the Netherlands (Nationaal Archief) in The Hague. Many parts of the archive of the WIC have not been preserved and therefore the information is limited (Den Heijer 2002). To look into this trade, lettres and papers that were sent from Saint Eustatius to the largest 'kamers' Amsterdam and Zeeland were studied (Nationaal Archief, WIC, 617-637, 246-252, 1180-1196). These documents were searched for lists of outgoing ships and cargo manifests. These date in the second half of the 18th century. For this period, the import of tortoiseshell was reconstructed (Figure 2). This reconstruction is based on data that were recorded by the WIC and that have been preserved until the present day. These data may therefore be not complete. For some years numbers are partly estimated because quantities are not mentioned in pounds. The lack of data between 1780 and 1783 coincides with the fourth Dutch-English war. Amounts of tortoiseshell that have been imported in the 17th and beginning of 18th century are unknown.

Between the years 1738 and 1790 records indicate that 26,875 1/2 (Dutch) pounds (1 pound is circa 0.5kg) of tortoiseshell were exported to the Dutch Republic. This means an average of 507 pounds per year. When we calculate 5 pounds of tortoiseshell per turtle, this means an average of 101 turtles a year. These can be easily caught during the season when the turtles lay their eggs. This shows that tortoiseshell was not imported in large amounts and that it remained an expensive material. Importation depended on private traders and was not very regular, although 1755, 1762 and 1764 can be seen as a peak years.

Prices that were paid for exported tortoiseshell were high. In 1751, the price of the weighed tortoiseshell was 8 to 12 reals per pound (approximately 28.8 guilders). In comparison, 0.5 to 2 reals per pound (approximately 1.2 to 4.8 guilders) was paid for ivory (De Schmidt, Van der Lee and Schiltkamp 1978).

In some cases the lists of cargo also mention who was shipping the goods and to whom the goods were shipped. The persons who were shipping the goods were often members of the government of the island. Sometimes the governors themselves were involved in this trade. On the leeward islands the income came merely from these kinds of extras. Johannes de Graaf, especially, governor who resided on Sint Eustatius, was famous for his good pickings (Spruit 1988, 118). Governors who exported tortoiseshell were, for example, Hendrik Coesvelt, Johannes Heijliger, Johannis de Graaf and Jan de Windt. But skippers also sometimes shipped tortoiseshell, as, for example, skipper Jacob Bosch who shipped 70 pounds of tortoiseshell on his ship to himself. The persons to whom the products were shipped were probably often Dutch merchants.

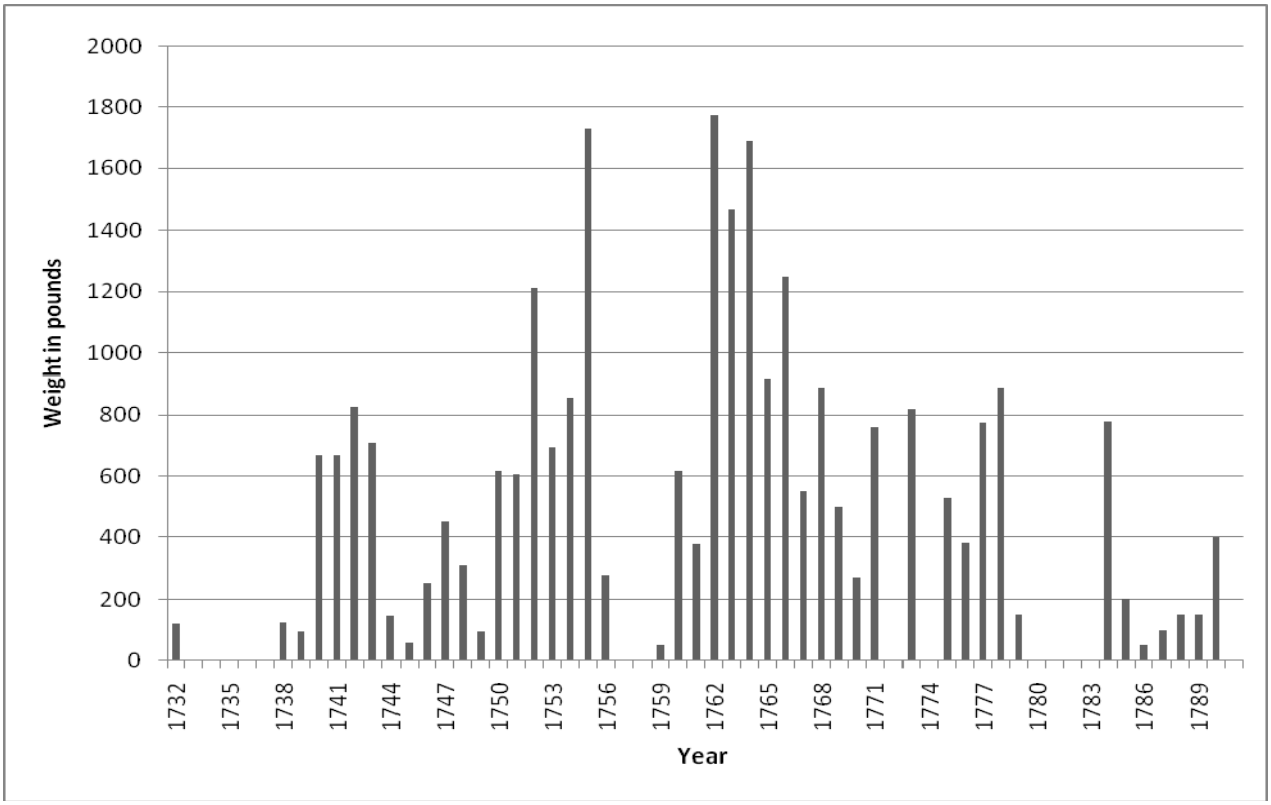

Figure 2: Export of tortoiseshell from Saint Eustatius to the Dutch Republic.

It is unknown by whom and where the turtles were caught and who removed the scutes from the shell. The tortoiseshell that was shipped from Saint Eustatius did not necessarily originate from that island; undoubtedly the tortoiseshell was also coming from other islands. Turtles were, for example, shipped from Blanko, Saint Martin, Saba and Saint Croix and Saint Christopher (Saint Kitts) to Saint Eustatius. It is, however, unknown which species of turtles were shipped and if they were imported for the purpose of harvesting the tortoiseshell. It is also possible that small expeditions to other islands were made to catch turtles or that they were caught with nets at sea. Turtles or possibly the tortoiseshell could also be bought at local markets.

Almost all the tortoiseshell that was recorded in the papers that were sent from Saint Eustatius to the 'kamers' Amsterdam and Zeeland was destined for Amsterdam. Of the total of 27.411½ pounds of tortoiseshell only 18 pounds was shipped to Middelburg (Zeeland), 672 pounds to Vlissingen (Zeeland) and 72 pounds to Rotterdam; 50 pounds was destined for Saint Martin. Amsterdam was not only an important port of trade, but also a centre of craft. The tortoiseshell was crafted in Amsterdam by different artisans into many objects.

Craft

Artisans and products

The products that were made of tortoiseshell can be seen in historical sources, archaeological and museum collections. The various sources show the expensive nature of the material and that it was only reserved for the rich. Tortoiseshell objects can be found in the inventories of the Dutch Oranje family (Drossaers and Scheurleer 1976). Archaeological evidence for the wealth of the owners of tortoiseshell objects includes the find of combs in church graves (Alkmaar: Berendse, Bitter and Scharff 1999; Leiden: Mulder 1981). Only the very rich were buried within the church.

Not only their products, but also the artisans themselves have left their traces. Tortoiseshell was used by many different artisans. Proof of the use of tortoiseshell by artisans in Amsterdam can be found in historical sources from that time. We see combmakers, knife makers, fan makers and other craftsmen who all used tortoiseshell in small amounts. Apparently specialised tortoiseshell buyers and workers also existed (Glasbergen 2004), although they must have been few in number. No waste products or waste fragments of tortoiseshell have been found in excavations yet. This is probably because of the high prices of the material and waste fragments were probably also used.

The artisans and their products will be discussed below in detail. Historical sources which were used include inventories of two knife makers in Amsterdam (Amsterdam City Archives, notarial archives), data from Amsterdam published by Van Dillen (Van Dillen 1974) and inventories of houses in Alkmaar dated from the 18th century (data received by J. Klinkert). Inventories reveal the presence of tortoiseshell products in people's homes. The bookbindings of the National Library of the Netherlands (Koninklijke Bibliotheek) in The Hague were studied. Many tortoiseshell objects are present in the collection of the Rijksmuseum (see website of Rijksmuseum). The main archaeological collection used is that of the city of Amsterdam (Rijkelijkhuizen 2004). This collection contains ten objects of tortoiseshell: four combs, five boxes and one fan. The archaeological collection of Alkmaar was studied; it holds three combs made of tortoiseshell. Some tortoiseshell combs in other Dutch cities were reported, although these were not always identified as tortoiseshell (Vlissingen, Buitenhuis 2003; Leiden, Mulder 1981). Collections from other cities are yet to be researched.

Combs

The tortoiseshell objects that have been found most frequently in excavations are combs (Figure 3). These are mainly large, one sided combs. These large combs were fashionable combs and not really used for combing the hair. The comb found in a church in Alkmaar (Berendse, Bitter and Scharff 1999) was put in the hair and was therefore decorative, not functional. In Amsterdam one comb was found that could have been used for combing the hair. It looks exactly like the ivory two sided combs, which were used for combing and removing lice. This example has one coarse and one fine side. One comb from Amsterdam is a small comb with a handle, made out of one piece of tortoiseshell and could be a moustache or eyebrow comb. Moustache- and eyebrow combs were not unusual in those days (Glasbergen 2004; inventories Alkmaar). Tortoiseshell combs can be dated to the 17th and 18th century.

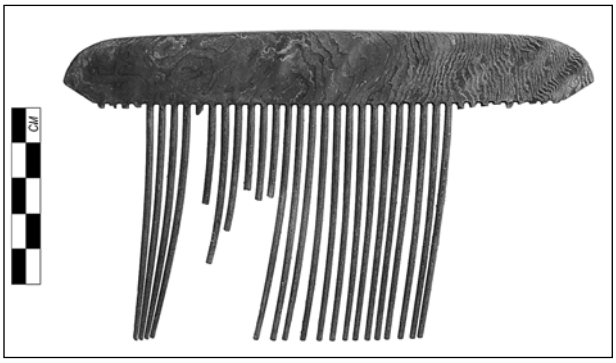

Figure 3: Comb of tortoiseshell, excavated in Amsterdam. Photo: Anneke Dekker, AAC (collection: Municipal Archaeological Department).

Comb makers also used tortoiseshell as a raw material. The majority of the combs excavated in Amsterdam were made of elephant ivory (Rijkelijkhuizen 2004). Some combmakers only used ivory, but others also used horn or tortoiseshell. In 1638 a combmaker is mentioned who taught a 15 year old boy to make combs of ivory, horn and tortoiseshell (Van Dillen 1974, 378). Other shops also sold tortoiseshell combs, for example knife makers. The inventory of the shop of Pieter Meijerick shows that small tortoiseshell combs were worth 30 1/2 cents apiece and large combs 87 1/2 cents. In comparison, a comb of horn, wood or ivory was worth 0.1 to 0.17 cents a piece (Amsterdam City Archives, Notarial archives, 4711).

Fans

Fans were manufactured in Amsterdam (Van Nierop 1933), but many artisans were involved in the making of fans (Catalani 1973; Payen-Appenzeller 2000), or (part of) fans could be imported. Fans were in fashion for a period of time, especially in the 18th century. They were luxury items and could be made of many materials. These fans were folding fans, and small pieces of the fans often are found in excavations. In rare cases an almost complete fan is excavated. The fan excavated in Amsterdam is made of tortoiseshell and ivory and is dated to the 17th century (Figure 4).

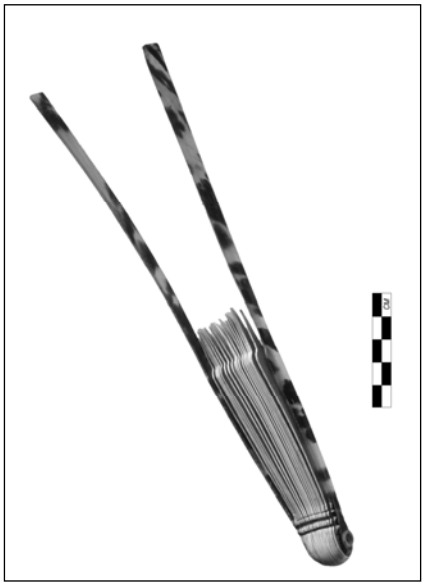

Figure 4: Fan of tortoiseshell and ivory, excavated in Amsterdam. Photo: Anneke Dekker, AAC (collection: Municipal Archaeological Department).

Boxes

A very general term for all sort of containers and cases is the term box. These boxes held spoons, tobacco, snuff, tea and many other items. It is unknown who made these boxes. And although a tobaccobox maker was registered

in Amsterdam in the 17th century (Glasbergen 2004), it is likely that many other artisans also made boxes of various sizes and of various materials. Boxes of tortoiseshell mentioned in inventories in Alkmaar are, for example, used for storage of tobacco, snuff, pins or earspoons. In Amsterdam five small boxes have been excavated (Figure 5); one is made of tortoiseshell combined with ivory. The boxes are dated to the 18th century.

Figure 5: Box of tortoiseshell, excavated in Amsterdam. Photo: Anneke Dekker, AAC (collection: Municipal Archaeological Department).

Knife handles

Although no knife handles of tortoiseshell have been reported to have been found in archaeological excavations in the Netherlands, their presence is mentioned in the inventories of Alkmaar. The inventories also list forks with tortoiseshell handles and tortoiseshell spoons. The reason that no tortoiseshell knife handles were found could be that only a small layer of tortoiseshell was applied to the knife handles, which detach easily when the knife handles were discarded (for knife handles with tortoiseshell, see Moore 1999). Horn knife handles, for example, are more likely to be preserved because they are made of a solid piece of horn. Another reason why tortoiseshell knife handles have not been found in excavations is that they were indeed rare and expensive.

Tortoiseshell knife handles were produced in Amsterdam. An inventory of a knife maker in the year 1708 in Amsterdam shows 154½ pounds of tortoiseshell as a raw material present in the shop, and also many tortoiseshell knife handles and tortoiseshell combs (Amsterdam City Archives, Notarial archives, 5075, Menso Sadelaer, 1708). Tortoiseshell was only used in small amounts by knife makers; the main materials were ivory, bone, wood, and horn in smaller quantities. Another inventory of a knife maker in Amsterdam, in the year 1691, shows the use of tortoiseshell for the manufacture of knife handles. The price of the knife handles depended very much on material and time of effort (Amsterdam City Archives, Notarial archives, 4711, Pieter Meijerick).

Veneering

Like ivory and other materials, tortoiseshell could also be used as veneering for cabinets, clocks and other furniture. This kind of furniture was only for the rich and is mentioned in the inventories of the Oranje family. Often different materials were combined in marquetry. Little is known about the cabinet makers. Many of the skilfully made cabinets were thought to have been made in France, but a cabinet present in the collection of the Rijksmuseum proves that such cabinets were also made in the Dutch Republic. This masterpiece was made between 1650 and 1660 by Willem de Rots for Amalia van Solms (wife of Frederik Hendrik van Oranje Nassau, stadtholder of the Dutch Republic 1625-1647). It is an excellent example of furniture decorated with marquetry of several materials (Figures 6 and 7). For decoration a pattern was sawn in a double layer of material, in this case an ivory layer and a tortoiseshell layer. The front and sides of the cabinet are decorated in première partie, ivory in tortoiseshell. The upper side and inner sides are in contre partie, tortoiseshell in ivory. Red paper was probably used as underlay (Baarsen 2006).

Figure 6: Cabinet of Amalia van Solms with marquetry of tortoiseshell and ivory (photo and collection: Rijksmuseum, Amsterdam).

Figure 7: Close up of the marquetry of the cabinet of Amalia van Solms (photo and collection: Rijksmuseum, Amsterdam).

Bookbindings

In the past, people would buy a book without the binding. The book was brought to the bookbinder who would put a bookbinding on the book at the will of the customer. Tortoiseshell was used for bookbindings from the second half of the 17th century until the 18th century, and sometimes in the 19th century. It was often used in Holland, France and England. It is not a coincidence that these three nations were all active in the Caribbean area.

The tortoiseshell bookbindings mainly covered religious books, such as bibles and psalterbooks (Shenton 1988; 1992).

Tortoiseshell bookbindings are mentioned in the inventories of houses in Alkmaar. In the beautiful collection of the National Library of the Netherlands (Koninklijke Bibliotheek, hereafter KB) thirteen tortoiseshell bookbindings are present (Figures 8 and 10), which are dated in the 17th and 18th century; two are dated in the 19th century (For other tortoiseshell bookbindings, see, for example Van Noordwijk 2006). The bookbindings of tortoiseshell are made up of three parts: the upper board, the lower board and the spine piece. The spine piece is usually rounded and has two headcaps. The rounded spine piece with headcaps was made of one piece of tortoiseshell and was made by pressing the tortoiseshell into shape when it was heated (Figure 9). The headcaps tend to break easily. It was necessary to make the bookbinding in three parts, or else the book could not be opened at all, because tortoiseshell is a rigid material. The metalwork consists of hinges, clasp, corner pieces and sometimes a metal chain. The metal that was used was silver or guilded silver. The two bookbindings from the 19th century have golden metalwork. The bookbinding could be decorated with inlay of various materials, such as metal or mother of pearl. The metalwork and book itself were also often decorated. A tortoiseshell binding was merely decorative, because it could hardly be opened.
The bookbindings from the KB show no indications that several pieces of tortoiseshell were welded together, and high quality tortoiseshell was used. The upper and lower board are always flat. The smallest book has an upper and lower board with a length of 72mm and a width of 43mm. The biggest two books are 168 to 100mm and 165 to 113mm. This is smaller than the largest size that Andes and Vuillemier gave for the size of the scutes of the carapace (300 x 170mm), but the size and thickness of the scutes do not equal the largest size that can actually be used.

Figure 8: Bookbinding of tortoiseshell (photo: M. Rijkelijkhuizen, collection: KB, The Hague).

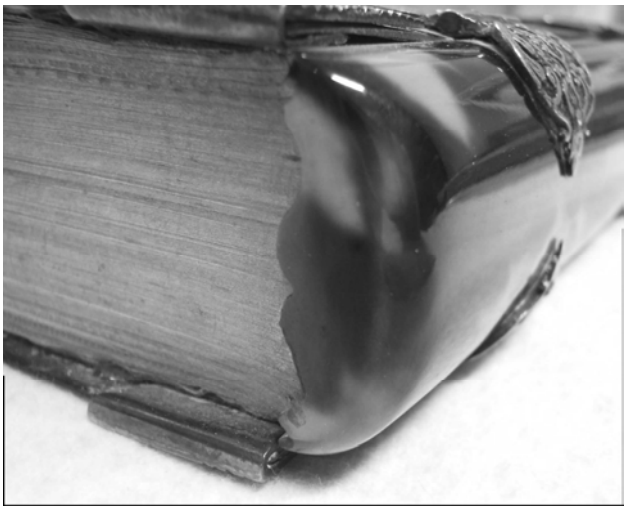

Figure 9: Spine piece of a tortoiseshell bookbinding (photo: M. Rijkelijkhuizen, collection: KB, The Hague).

The manufacture of a bookbinding requires that rectangular plates be made from the scutes. The plates must also be abraded to make them equally thick and even. These two bookbindings seem to be the largest size possible. The thickness of the tortoiseshell bindings is 1 to 3mm. All but one bookbinding are made of a solid layer of tortoiseshell only. The tortoiseshell binding was directly glued onto the endpapers of the book. Between the endpapers and the bookbinding a white substance probably was applied to avoid glue being seen through the tortoiseshell and to enhance the colour of the tortoiseshell (communication KB).

One exception in the collection of the KB is a bookbinding that is larger than the examples mentioned above (Figure 10). It is 290mm long and 154mm wide.

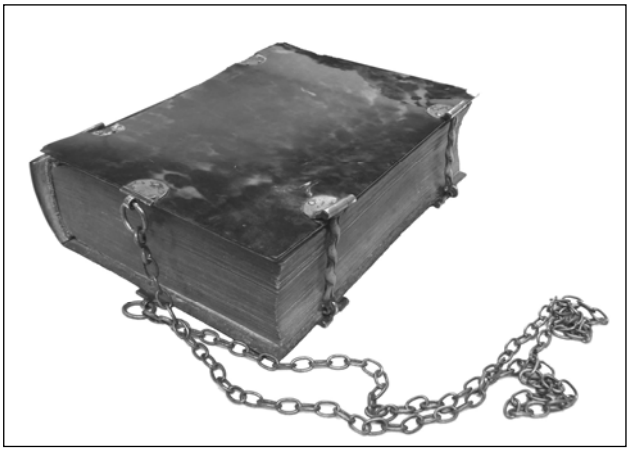

Figure 10: Bookbinding, made of tortoiseshell of the green turtle or the loggerhead turtle (photo: M. Rijkelijkhuizen, collection: KB, The Hague).

The tortoiseshell layer is also much thinner than the other bookbindings and is therefore the only one where the tortoiseshell is placed on a layer of wood. The pattern and colour of the tortoiseshell is also different from all the other bindings. This suggests it is harvested from a larger turtle than the hawksbill, such as the green turtle or the loggerhead turtle. These turtles are larger and have a thinner layer of tortoiseshell with a different pattern.

Shenton (1988, 1992) suggests that the tortoiseshell bookbinding was not made by the bookbinder himself, but it was contracted out. This is very probable; for example, a tortoiseshell maker could make the bindings. It would require very different techniques to make a tortoiseshell binding than a leather one. Silver pieces were made by a silversmith (Van Noordwijk 2006) or by clasp makers (Glasbergen 2004). This indicates that many artisans were involved in the manufacture of a tortoiseshell bookbinding.

Conclusions

The export of tortoiseshell from the Caribbean to the Dutch Republic was a small scale trade initiated by private traders. Tortoiseshell was shipped in small amounts from Saint Eustatius. Where the turtles originally were caught is unknown. Importation from this area probably dates back to the second half of the 17th century and continued until the end of the 18th century. The amounts of tortoiseshell that were shipped from Saint Eustatius in the second half of the 18th century were reconstructed from the available sources. Almost all tortoiseshell was destined for Amsterdam.

In the 17th and 18th century, Dutch Republic tortoiseshell was crafted into all sorts of objects. Amsterdam was in this period a centre of trade and craft, and tortoiseshell was used by many artisans in this city, such as comb makers and knife makers. Artisans who were familiar with the working of horn were able to process this 'new' material the same way as they did with horn. Their products can be seen in museum and archaeological collections and are mentioned in historical sources.

The scutes of the carapace of the hawksbill turtle were used as tortoiseshell; only one bookbinding was made of a different species, probably the green turtle or the loggerhead turtle. Tortoiseshell objects remained expensive and a sign of extreme luxury; these objects were often used for decorative purposes only. They were luxury items, to be found in the richest households.

Acknowledgements

I would like to thank Louise van Wijngaarden-Bakker, Amsterdam Archaeological Centre, University of Amsterdam (AAC); Anneke Dekker (AAC), Jerzy Gawronski & Wiard Krook, Municipial Archaeological Department of Amsterdam; Peter Bitter and Sjaak Waterlander, Municipial Archaeological Department of Alkmaar; Henk den Heijer, Leiden University; Rens Top, KB The Hague; Rijksmuseum Amsterdam; J. Klinkert.

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References cited

Andes, L.E. 1911. *Verarbeitung des Hornes, Elfenbeins, Schildpatts, der Knochen und der Perlmutter.* Wenen, Leipzig.

Baarsen, R. 2006. Kabinet. *Vereniging Rembrandt*, 20-23.

Benjamins, H.D. and Snelleman, J. F. 1914-1917. *Encyclopaedie van Nederlandsch West-Indië*. Den Haag/Leiden, Martinus Nijhoff/E.J. Brill.

Berendse, F., Bitter, P. and Scharff, H. 1999. Overzicht van kleding en sieraden, in P. Bitter *et al*. (eds.), *Goed gevonden. Textielvondsten uit archeologische opgravingen in de Grote of St. Laurenskerk te Alkmaar*. Gemeente Alkmaar.

Buitenhuis, H. 2003. Faunaresten, in A. Ufkes (ed.), *Een archeologische onderzoek op het terrein 'Alhambra' te Vlissingen*. ARC-publicatie 85, 135-143.

Catalani, C. 1973. *Waaiers* (second edition). Bussum, Van Dishoeck.

O'Connor, S. 1987. The identification of osseous and keratinaceous materials at York, in K. Starling and D. Watkinson (eds.), *Archaeological bone, antler and ivory*. London, United Kingdom Institute for Conservation, 9-21.

Coolhaas, W.P. and Goor, J. van 1960-2007. *Generale missiven van gouverneurs-genraal en raden aan Heren XVII der Verenigde Oostindische Compagnie.* 's Gravenhage, Nijhoff, Rijksgeschiedkundige Publicatiën.

Dijk, P.P. van and Shepherd, C.R. 2004. *Shelled out? A snapshot of bekko trade in selected locations in South-east Asia*. TRAFFIC Southeast Asia.

Dillen, J.G. van 1974. *Bronnen tot de geschiedenis van het bedrijfsleven en het gildewezen van Amsterdam, part*

III, 1633-1672. 's Gravenhage, Rijksgeschiedkundige Publicatiën 144.

Drossaers, S.W.A. and Lunsingh Scheurleer, T.H. 1974-1976. *Inventarissen van de inboedels in de verblijven van de Oranjes en daarmee gelijk te stellen stukken 1567-1795*. 's Gravenhage, Nijhoff, Rijksgeschiedkundige Publicatiën.

Gaastra, F.S. 2002. *De geschiedenis van de VOC* (seventh edition). Walburg Pers, Zutphen.

Gilbert, S.F., Loredo, G.A., Brukman, A. and Burke, A.C. 2001. Morphogenesis of the turtle shell: the development of a novel structure in tetrapod evolution. *Evolution and development* 3 (2), 47-58.

Goslinga, C.C. 1971. *The Dutch in the Caribbean and on the Wild Coast 1580-1680*. Assen, Van Gorcum.

Goslinga, C.C. 1985. *The Dutch in the Caribbean and in the Guianas 1680-1791*. Assen, Van Gorcum.

Goslinga, C.C. 1990. *The Dutch in the Caribbean and in Surinam 1791/5-1942*. Assen, Van Gorcum.

Glasbergen, J.B. 2004. *Beroepsnamenboek. Beroepsaanduidingen vóór 1900 in Nederland en België.* Amsterdam, Veen.

Grall, E. 2002. Tortoiseshell imitations, in P. van Duin and H. Piena (eds.), *The meeting of East and West in the furniture trade. Proceedings of the sixth International Symposium on Wood and Furniture Conservation,* 26-32.

Hardwick, P. 1981. *Discovering horn.* Southampton.

Heijer, H. den 2002. *De geschiedenis van de WIC* (second edition). Walburg Pers, Zutphen.

Lehrer, J. 1998. *Land- en zeeschildpadden* (translation of Turtles and Tortoises 1990). Lisse, Rebo Productions.

Moore, S. 1999. *Cutlery for the table*. Sheffield, Hallamshire Press.

Mulder, W.J. 1981. Cultuurhistorische aspecten. In *Graven in de Pieterskerk.* Stichting, Vrienden van de Pieterskerk Leiden.

Nierop, L van 1933. Gegevens over de nijverheid van Amsterdam. Bijeengelezen uit de advertenties in de Amsterdamsche Courant 1795-1811, en in de advertentien, aankondigingen en verschillende berigten van Amsterdam 1812-1813. *Jaarboek Amstelodamum* 30.

Noorduyn, J. 1983. De handelsrelaties van het Makassaarse rijk volgens de notitie van Cornleis Speelman uit 1670. *Nederlandse Historische Bronnen* III, 96-124.

Noordwijk, B. van 2006. *Zondags Zilver. Drie eeuwen versierde kerkboekjes.* Heerenveen, NBG.

Payen-Appenzeller, P. 2000. *Fancy fans*. Paris, L'Aventurine.

Rijkelijkhuizen, M.J. 2004. *Dierlijke materialen in Amsterdam*. Unpublished MA Thesis, University of Amsterdam.

Romer, A.S. 1962. *The vertebrate body*. Philadelphia, Saunders.

Schmidt, J.T. de, and van der Lee, T. 1979. *West Indisch Plakaatboek. Publikaties en andere wetten betrekking hebbende op St. Maarten St. Eustatius Saba, 1648/1681-1816.* Amsterdam, Emmering.

Schmidt, J.T. de, van der Lee, T. and Schiltkamp, J.A. 1978. *West Indisch Plakaatboek. Publiakties en andere wetten alsmede de oudste resoluties betrekking hebbende op Curaçao Aruba Bonaire, 1638-1816.* Amsterdam, Emmering.

Shenton, H. 1988. The use of membranes in conservation: the case histories of a tortoiseshell bookbinding and the lady Clapham doll's mask. *Preprints for the UKIC 30th Anniversary Conference,* 76-80.

Shenton, H. 1992. The history and conservation of tortoiseshell bookbindings. *Papers of the Conference on Book and paper Conservation, held in Budapest 4-7 September 1990,* 174-187.

Spruit, R. 1988. *Zout en slaven. De geschiedenis van de Westindische Compagnie*. Houten, De Haan.

Vuilleumier, R. 1979. Schildpatt. Verarbeitungstechniken und Imitationen. *Maltechnik, Restauro* 85 (1), 40-47.

Williams, D.C. 2002. Tortoiseshell and imitation tortoiseshell, in P. van Duin and H. Piena (eds.), *The meeting of East and West in the furniture trade.* Proceedings of the sixth International Symposium on Wood and Furniture Conservation*,* 33-43.