Ivory : Genuine, Fake, and Confusing

By Matt Demerow

Historically, genuine ivory has been difficult to obtain, highly sought after and, consequently, an expensive luxury item. In some ways ivory is very similar to precious metals and gemstones. But, white gold and silver are not mistaken for platinum, nor are synthetic gemstones mistaken for genuine. Ivory, however, has been subjected to similar trade laws regarding gemstones or quality. It has never been illegal to sell imitations of ivory. As a result, there are a tremendous number of ivory look-alike objects in the market today. These include present day Mexico 1.000 carvers ivory substitutes like celluloid.

Ivory imitations and fakes have dramatically increased since the mid 1970s. This is largely due to laws, associated with the Endangered Species Act of 1973. Most third commercial ivory trading or product movement species like whales and elephants. Its additional laws continued to tighten the use of natural ivory and ivory look-alike substitutes. Consequently, the demand increased for ivory look-alike products are honestly sold as imitations at the price. But some of these pieces, as well as deliberately confusing intentional fakers of old ivory, frequently appear in the antiques market. This article will look at the forms, ways to recognize genuine ivory from present day simulated ivory as well as older look-alike ivory.

What Is Ivory?

Many people associate "ivory" with only elephant tusks but this is not accurate. Ivory comes from teeth as well as tusks of a number of mammals. Tusks are simply large teeth that extend outside the mouth. Most ivory is from the tusks of elephants, walrus, narwhals, and wild boars. Most ivory from teeth are formed of the same four parts: enamel, enamel tubes, cementum and ivory pulp. These parts are shown in an elephant tusk above but are included in all other forms of ivory regardless of animal species.

The mammals which provide ivory are: 1) elephants (order Proboscidea) which include species alive today (extant) as well as prehistoric elephants now dead (extinct) the mastodons; 2) walrus; 3) whales- sperm, killer, and narwhal; 4) wild boars; 5) hippopotamus; 6) warthog; 7) sea lion; 8) sea otter; 9) sea cow (manatee and dugong) and 10) extinct giant ground sloth. Small sized pieces of commercial ivory have also been obtained from other species such as tusks from most species of wild and domestic pigs and bears and from the teeth of beaver, elk, camel, deer, and moose.

Recognizing Genuine Ivory

Many people rely on the two months series for ivory. When touched with a hot needle, genuine ivory shears and turns black, a hot needle will cause artificial material to melt or burn. In our view this test is bad for two reasons. First, it is a destructive test. Second, it is not reliable. Ivory can be dyed black or other colors such as. Knowing the kind of ivory you are dealing with is now extremely important. Ivory is now determining the sales of whale ivories.

Antique Ivory Identification Guide for Ivory and Ivory Substitutes, the National Fish & Wildlife Forensics Laboratory recommends a three step approach to the identification of ivory and ivory imitations. 1) Macroscopic examination, 2) Microscopic examination, 3) Chemical analysis. Ivory is difficult to identify because it normally appears as nearly perfectly opaque feels and shows a definite repeating pattern. Grain or natural ivory is random without any noticeable pattern. A repeating pattern with uniform even lines is almost always a sign of a man made imitation.

The presence of grain also allows us to eliminate other natural non-ivory materials such as bone and ground ivory powder. Bone and ground ivory powder, if molded, will not generate a pattern to ivory. This must use several tests before you can make an accurate judgement.

Schreger Lines (Angles)

The key feature to identifying elephant ivory is a unique pattern of crosshatching that appear in cross sections of ivory. This pattern is called Schreger lines (angles). Schreger lines are formed by the way dentine tubes cross. Schreger lines are formed by the way dentine tubes cross. Schreger lines are formed by the way dentine tubes cross. The presence of Schreger Lines always qualifies a piece as elephant ivory. The lines are most easily seen in a cross section of ivory. Although Schreger lines are most easily seen in a cross section of ivory, Schreger lines can be observed on longitudinal cross cuts. However, they may not always be obvious and depending on how a piece of ivory was cut they aren't always clear. It is a myth that a piece made of ivory will always have them, so the absence of Schreger Lines cannot be a reliable indicator of a substance other than ivory.

Schreger Angles are used to establish whether ivory is from present day elephants or extinct elephants (mastodons). Angles of 90° indicate present day elephant ivory. Angles between 60° and 90° indicate extinct ivory. Angles of 60° indicate mammoth ivory. Angles greater than 115° indicate elephant ivory. Use the outer Schreger angles to determine the angle of the cross hatch. Use the inner Schreger Angles in the center of the tusk. Use several tests before you can make an accurate judgement.

Exceptions and Special Cases

Ivory look, which are the hard cellulose tannins from Tagua palms, are frequently confused with genuine ivory. Tagua nuts are the seeds of a palm tree native to the rain forests of Ecuador and Northern Peru. Although they can grow to the size of a small apple, the majority of ivory nuts are under 2" which makes them unsuitable for large carvings. The most common use of ivory nuts is for new netsuke. The definitive guide to Tagua nuts is Tagua Nuts: Ivory Look-Alike Carvings by Ron Ward. Tagua nuts are not the only vegetable ivory look-alike. However, they may not always be obvious and depending on how a piece of ivory was cut they aren't always clear. It is a myth that a piece made of ivory will always have them, so the absence of Schreger Lines cannot be a reliable indicator of a substance other than ivory.

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Summary

Ivory is a formed by growing tissue. The direction and forms of growth are unique to each ivory producing species (see illustration page). These unique growth patterns have so far been impossible to duplicate in artificial substances like plastics and resins. Generally, given always rules along the boundaries of a piece of ivory are reliable.

Attempts to fool people is a different story go back over 100 years. Celluloid, one of the earliest plastics developed, was used to make ivory look-alikes. Celluloid and other artificial ivory is usually easy to detect because it normally appears as nearly perfectly opaque feels and shows a definite repeating pattern. Grain or natural ivory is random without any noticeable pattern. A repeating pattern with uniform even lines is almost always a sign of a man made imitation.

The presence of grain also allows us to eliminate other natural non-ivory materials such as bone and ground ivory powder. Bone and ground ivory powder, if molded, will not generate a pattern to ivory. This must use several tests before you can make an accurate judgement.

Black Light

Using black light is an important tool ivory because it saves time by ruling out artificial materials. Virtually all plastics and resins fluoresce blue or blue/white under long wave black light regardless of the surface color in ordinary light. Genuine ivory usually fluorescence white but this can vary depending on whether the ivory is fresh or old and on the presence of any contaminants or surface coatings. Ivory substitutes made from natural fluorescence such as yellow on this indicates artificial aging or being, some or animal dye. Use black light as your first test, not your only test. Black light is useful for eliminating artificial materials but can not alone prove a piece is ivory. Bone, vegetable ivory (cellulose) and ground together ivory dust, for example, all react like genuine ivory under black light.

Physical Features and Structure

Ivory is formed by living growth tissue. The direction and forms of growth are unique to each ivory producing species (see illustration page). These unique growth patterns have so far been impossible to duplicate in artificial substances like plastics and resins. Generally, given always rules along the boundaries of a piece of ivory are reliable.

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Warning Signs of Fakes and Look-alike Ivory

Jagged edged pins and broken bubbles are typical in the surface of synthetic ivory substitutes. These material have the type of crystallization and are almost always molded. Tongued and grooved expanding gaps from imperfects virtually always cause rounded smooth-backed holes in the finished surface. No similar gaps pins or holes are found in genuine ivories.

No grain or the presence of a **repeating** grain pattern are two characteristics of artificial ivory look-alikes. Genuine ivory has a random grain. Artificial materials sometimes have a repeating pattern. Ivory and artificial ivory look-alikes have the same type of grain. Look at it closely at such over grain lines of regular radial thickness repeat in a regular pattern. Grain lines in real ivory are random.

Mammoth or elephant ivory? Look at the flower or cross section of tusk given on a photocopier (or scanner) to get a hard copy image of the Schreger lines on paper. Now use a straight edge to mark and measure the angles between the lines. Use the outer Schreger angles to determine the angle. If the angle of intersection is less than 90°, it is mammoth ivory, more than 115°, elephant ivory. Mark your measurements on the outer most angles and use an average of two angles minimum to insure accurate testing.

Fig. 1 Fig. 1.5F figure of new cow bones

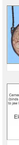

Fig. 2 19th century celluloid finger nail buffer

Fig. 3 New plastic tusk

Fig. 4 Pepsi powder flask with molded resin inserts.

Fig. 5 Tusks are only large teeth. All genuine ivories are made dentine found in the teeth of all mammals

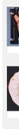

Fig. 6 Main sources of commercial ivory over the years

Note: Ground sloth ivory Other than a basic description, this article will cover some other commonly encountered ivories such as whale teeth. Genuine antique scrimshaw is highly regarded by federal and state governments and illegally sold by period only.

Fig. 7 Fifty to surface of synthetic ivory, about twice actual size.

Fig. 8 Broken bubbles in surface of synthetic ivory. Actual size.

Fig. 9 Surface of synthetic ivory. No trace of grain.

Fig. 10 Regularly repeated artificial grain in celluloid.

Fig. 11 - Mold seams and casting facts Many, but not all, case resins and plastics show seams. They are often mistaken for ivory grain lines. Genuine ivory shows no such seams. Mold seams are not.

Fig. 12 - Discovered pins, gauzier Jagged edged pins and broken bubbles show regular pits and irregular grooves under 10X magnification. Decomposition around pins is common.

Fig. 13 - Blue fluorescence. Virtually all plastic and resin artificial ivories fluorescence blue or blue/white under black light.

Fig. 14 - Bar fluorescence of rough or obvious tool marks. Rough or obvious tool marks are sometimes found on supposedly carved tusk. It is a piece of cast resin.

Fig. 15 - Joints and seams. Virtually all will ivory carvings are made of large pieces of ivory glued together. Ivory is being glued together to create large figures. This photo shows the meeting of four separately carved pieces of ivory to form a figure. This is here the statue in Fig. 1, is made.

Fig. 16 The bases of most larger genuine ivory figures consist from elephant or walrus tusks are oval because that is the natural cross section of tusk. Ivory is being glued together to create large figures. This is here the statue in Fig. 1, is made.

Fig. 17

Fig. 18

elephant
cambrian
Key factors
elephant and mammoth lines
Schreger angles
Schreger lines
walrus
sperm & killer whales
Key factors
Schreger angles
Schreger lines
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Sort: Trending Title, ASC-DESC Price

Hand Made Stone and Vegetable Ivory Figural Tea Caddy
$50

Lovely Antique Bronze Lion Paperweight
$50

Cast Iron Door Stop - Elephant
Antique Cast Iron Toys
$0.75

Vintage Tin Casing Pre-Made Elephant
Antique Cast Iron Toys
$0.75

VINTAGE 24 Piece Stacking Set Tonto Dishes Set
Vintage Wear
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Vintage Bronze Elephant Figurine Ashtray
Vintage Wear
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Complete Miniature Set Woodcarving Tools - Sculpting Tool Set Chisels
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Antique Bronze Elephant Figure Statuette Small
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Bowl - Large Vintage Hand Carved Vegetable w...
Vintage Wear
$0.99

Antique Bronze Elephant Figurine Statuette Small
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Antique Ceramic Figural Elephant Pedestal Lamp
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Bronze Elephant Figurine Statuette Small
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