

The exotics in footwear leathers

If the activities of the extreme animal rights movement over the last twenty-five years or so had succeeded, many tanneries producing reptile and other specialised leathers would have closed. However, the efficient farming of some of these species has enabled populations in the wild to prosper. Furthermore, many species are protected and trade in them is strictly controlled by the Washington Convention (CITES) where they come under one of three categories:

1. Species where threat of extermination is a fact.
2. Commercial use is allowed under the control of the country of origin.
3. Species which are under restriction in certain countries.

This has proved to be effective conservation where it is exercised, but there are still many animals that are not covered. Let's take a look at some of these creatures and the leathers they produce.

Crocodilians

These fall into four main groups: crocodiles, alligators, caimans and gavials. All are protected and legal trade in them has two stipulations without which it is illegal:

1. A CITES certificate written by the country of the skin's origin.
2. A tag on the tail which remains throughout the tanning process (Figure 1).

Tanning these skins is a specialist process as they are up to ten times thicker than mammals and, in some species, contain bones in the belly which is the only part of the skin that is used. The pickling process is therefore quite involved in order to remove scales and dissolve calcium deposits.



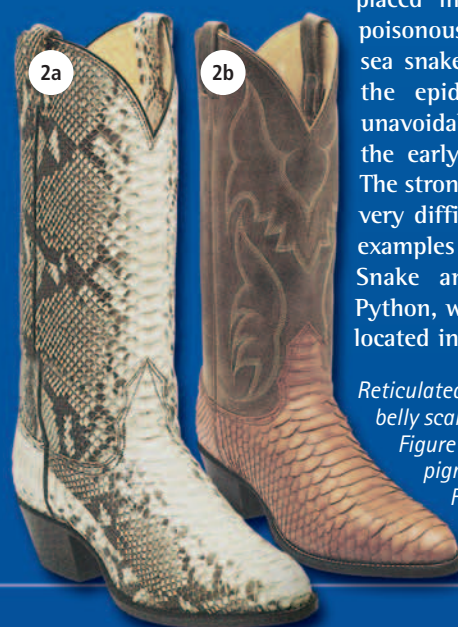
Figure 1: Tail tag as used by the Australian authorities

The finishing formula is each tannery's closely guarded secret, as a perfect finish is a major selling point. As a general rule, most are based on proteins such as egg white, blood and milk, followed by careful glazing. The leather is predominantly used for leathergoods, although very exclusive footwear is also produced where pair-matching for scale size and pattern adds to the cost due to wastage on an already costly material.

Snakes

Next to crocodilians, snakes are probably the best-known specialised leather. Snakes are a diverse and fascinating group of creatures but, unlike lizards, are generally feared even though only less than a third are poisonous and, of these, probably no more than 10% are regarded as being fatal to man. Many species are covered by CITES and their trade is well-regulated. However, due to the volume used, there is also a healthy black market.

The main attraction of snake skin is its natural pigmentation, but retaining these characteristic patterns is only possible where at least 65% of the pigments are placed in the corium. Most poisonous snakes, including sea snakes, have it placed in the epidermis and this is unavoidably removed during the early stages of tanning. The strongest pigmentation is very difficult to bleach, good examples being the Karung Snake and the Reticulated Python, where 90 and 80% is located in the corium.



Reticulated Python (back cut, belly scales undivided)

Figure 2a: visible natural pigmentation

Figure 2b: bleached and dyed

Some 20 species are used for leather, with those that retain their natural pigmentation during processing obviously being the most popular. The best of these are the anacondas, boas and pythons, which not only retain good markings but also offer more scope due to their size. The finished leather is very thin and for footwear purposes requires careful backing, particularly where shaping occurs as in the case of Western boots (*Figure 2a & b*).

Lizards

Lizards first appeared on Earth about 180 million years ago and now number about 3,000 species. Only twelve are of commercial value, being essentially monitors and iguanas. Other than the Common Iguana, all are again covered by CITES.

The value of lizard is governed by scale size, regularity and colour of pigmentation. Tegos are the only larger lizards whose underside is evenly covered by rectangular non-keeled scales and, as they are relatively big, this is the part that is used. The Common Iguana suffers from the fact it has upturned scales down some 20% of its length that give a rough feel. Monitors are the most useful thanks to rows of tiny scales on their bodies and legs. These are called 'granula' and form an attractive ring pattern around each individual oval scale (*Figure 3*).

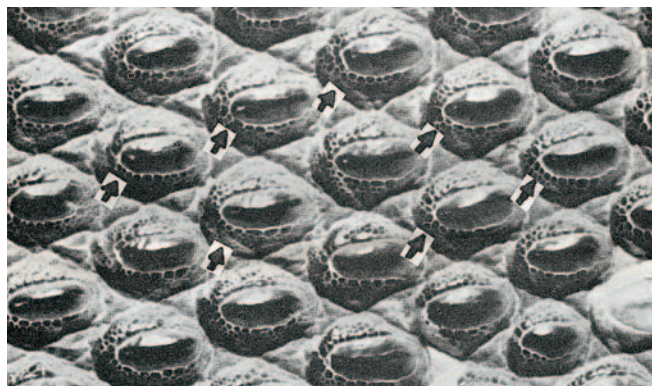


Figure 3: Rings of granula round the scales of a monitor skin

Lizard skins also need specialist tanning and, while most are again used for leathers, they can also be used for entire ladies' shoe uppers or for insert panels. Skins are normally selected and bought in pairs to ensure final matching of scale pattern and pigmentation in the final shoe.

Sharks and rays

Sharks are highly successful and have barely changed in over 100 million years. The shark trade is largely unregulated and, of the 350 known species, only 20 are used to any extent for leather. Sharkskin is characterised by having a sharp tooth-like projection (denticle) in the middle of its scales (*Figure 4a*). These are removed during tanning in the case of larger animals, but left *in situ* on smaller ones to avoid making the skin too thin. It is not often used for complete shoe uppers but more as an insert or other decorative feature.

Rays are cousins of the shark and only a few of the stingray sub-species are used for leather. The denticles in this case are known as 'bucklers' and are generally quite large and deeply rooted. Like the smaller sharks, these are not removed as they do not hinder tanning and also provide a particularly attractive

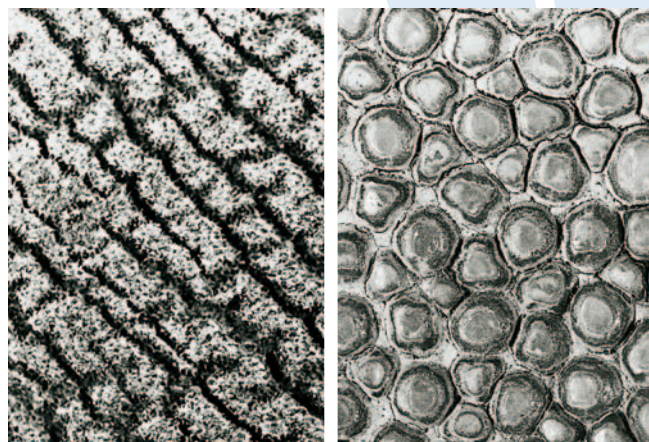


Figure 4: Typical shark (a) and ray (b) skin denticles

grain (*Figure 4b*). While excellent for leathers, ray is again best used for aprons or similar panels on footwear as it can lack flexibility.

Bony fish

Although frequently compared, the skins of snakes and bony fish (as against sharks and rays that have cartilage instead of bone) share nothing in common. Fish scales are derivatives of the skin's surface and are removed for tanning, whereas those of snakes are outgrowths of the lower corium layer and are retained.

Almost all fish skins can be tanned but the only ones used commercially are certain species of eel, carp, salmon, catfish and the Baramundi, which is often known as Emperor leather. Fish skin is also surprisingly strong and although not having particularly good elongation at break, scores well in terms of tensile strength and stitch tear resistance.



Figure 5: The versatility of eelskin

The one we are most familiar with is the eel and the best of these is the Japanese variety, which has a smooth surface without any scales. It is farmed in many Asian countries and produces a beautiful soft and shiny leather that can be used for footwear as well as a wide range of leathers, provided it is carefully sectioned and seamed. ➤

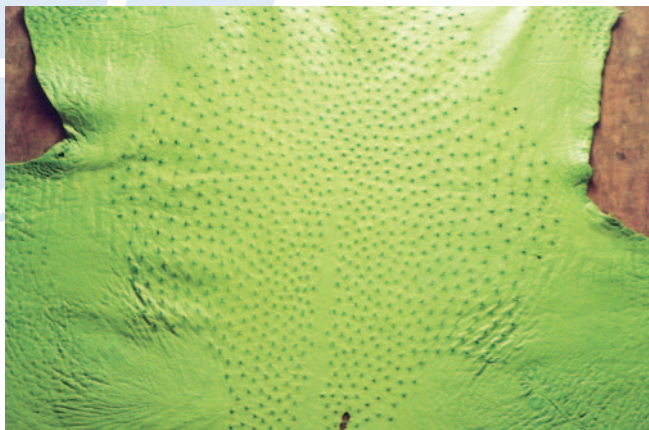


Figure 6: Drum dyed and polished ostrich skin

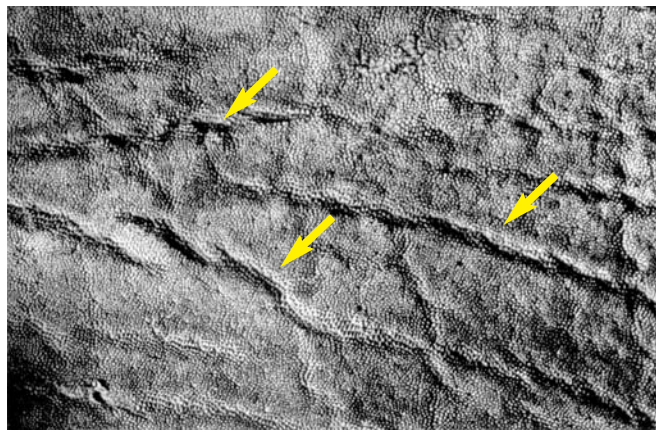


Figure 8: Deep grooves of the elephant grain

Birds

Although feathers, like the hair of mammals, are an epidermal outgrowth, they do not grow from a raised papilla but from depressions where the epidermis has sunk deeply down to the tissue underlying the corium. In this, they are very much like the bristles in pigskin. While not produced commercially in any real volume, the emu, rhea and ostrich all provide attractive leather with good physical and wear properties.

The ostrich produces the best-looking leather due to the fact that, unlike the other two, the quill holes are not evenly spread but are arranged in distinctive patterns that vary over its body. This feature calls for more skill to cut it into uppers but creates very individual finished shoes. The skin of the lower leg known as 'ostrich knee', can be glazed to make a quite presentable substitute for crocodile. Although they are farmed in southern Africa for meat, ostrich skin is still very much a luxury footwear material.

Elephants

Here we see an ultimate contrast in both size and configuration. The two surviving species are the African and the Asian. Both are totally protected under CITES except for some countries in southern Africa where—thanks to protection—the population has recovered dramatically over the past 20 years—some commercial culling is allowed under strict licensed quotas. This same population increase has also unfortunately led to a growth in poaching.

The only hides that come on to the leather market are therefore from the African species, the size of which creates many processing problems: The skin typically weighs 1,000kg or some 16% of body weight. Its area (excluding ears) is around 35m² with a thickness that varies from 3-4cm. The ears yield a further 2-3m² on the outer side and 0.8-1.4m² on the inner side.

This enormous size leads to the actual skinning being carried out in parts to facilitate handling, transport and tannery processing. The resulting panels of 1-3m² in size remain something of a challenge and after basic tanning, are split to below 2mm and then shaved to a final substance that will vary with end use. This is done in gradual stages with careful settings of the shaving cylinder to avoid damage to the deep grooves of the grain (Figure 8).

Whereas all the creatures covered in this survey were slaughtered indiscriminately in the past, they are almost all now protected and their commercial use is strictly regulated. This naturally adds to cost. Perhaps this is a good thing, as if this means we can continue to enjoy the varied leathers they produce and at the same time assist their survival, it has to be the best of both worlds. 🌍



Figure 7: Different sizes of elephant skin panels