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Vegetable Tanned Leather

Vegetable Tannage: "A generic term to cover the process of making leather by the use of tannins obtained from barks, woods or other parts of plants and trees, as distinguished from "mineral tannages".^[1]

The most important organic tanning agents are the vegetable tannins present in tanning liquors. They are prepared from certain parts of plants by aqueous extraction. Their tanning power has been appreciated for a long time and Babylonian texts have recorded their use.

The use of vegetable tannins in the manufacture of leather probably predates recorded history, and there is creditable evidence that they were in use in Egypt as far back as 5000 B.C.[2]

Vegetable tanning materials occur in nearly all forms of plant life. They are used commercially where the amount of tan is high and large quantities can be extracted economically. Other considerations are color and particular properties of the tan extracted. This is the conversion of a raw or green hide into leather.

Table: Parts of plants used as sources of tannins.

Abu-Surgu

Algarobilla

Algarrobin

Alimu Bark

Aleurites fordii	Amlı Leaves	Angico Vermelho	Babool
Barbatimao bark	Beefwood	Birch Bark	Black Locust
Blue Fig bark	Box Myrtle	Bull Oak, Belar	Camanchile Bark
Canaigre	Caparrosa	Cape Sumach	Cascalote
Cedar (American)	Cevalina	Chestnut (France)	Chestnut Oak
Cu-Nao	Cutch	Deep Yellow Wood	Dhawa
Divi-Divi	Douglas Fir	Dragon's Blood	Eland's Boontjes
Emu Bush	Gall Nuts	"Gallol" Root bark	Gambier
Guara	Guyacan	Hemlock	Iron wood
Jamba Bark	Juniper	Khaki	"Kili" bark
Kino	Larch	Mallet Bark	Mangoustan Shells
Mangrove Bark	Mexican Sumach	Mimosa Bark	Myrobalams (fruit)
Oak Bark	Osage Orange	Palmetto	Pimenta Leaves
Pine	Quebracho	Sal Bark	Salai Bark
Silver Fir	Western Spruce	Strephonema Kernels	Sumach
Tea	Teri Pods	Tizra	Turwad Bark
Ulmo	Valonia	Willow Bark	Yew

This is not be a complete list.

This list was compiled from "Tanning Materials" by Arthur Harvey

There are three sections to an American Vegetable Tannery

- **The Beam House:** This is where the fleshing, liming, un-hairing and bateing and pickling process are done.
 - **The Tannery:** The hides are put into pits with proprietary “solutions.” This is where the tanning process actually takes place.
 - **The Currier:** This is where the hide is oiled and any and all dyeing and finishing is done.
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Oak Bark: Gives very bright colors due to the fact that the bark contain almost no coloring substances. Oak tanned leathers are light-resistant and have good fullness and softness and at the same time a fine, closed grain. These leathers will have a yellowish color. In leathers tanned with oak bark the grain resistance to breaking load is higher than that achieved with any other vegetable tannin.

Chestnut: especially suitable for the tannage of heavy hides and of sole leather in particular, as by its use it is possible to obtain a firm and compact yet flexible leather of good color, light resistant with low water absorption. Chestnut during the 1800's was thought to be the best overall type of tannin to be used in leather. Chestnut is a member of the oak tree family. Chestnut oak is also known as rock oak. In 1904 a blight killed the chestnut trees in the US. Chestnut bark is still used today but the bark comes from France. It is unknown if the bark that comes from France has the same qualities as the original chestnut used in the US during the 1800's.

Hemlock: This bark was most used by the tanners of the 1800's in the United States. Tanners especially favored hemlock and stripped the bark from this plant and almost

extinct it in the northeastern U.S. Formerly hides were sent from South America to New York and New England and then hemlock was used to tan them. The leather was sent to Europe. This continued until the hemlock was almost all gone. This leather has a similar color as Quebracho. There were several draw backs to this type bark one is the inability to hold black when dyed with the iron mordants. Since hemlock had problems dyeing black the tanners stained the leather with logwood in order to get a tannin that would bond with the iron mordants. A faster tanning time was gained with hemlock over oak. This allowed the tanner to tan more leather in a give period of time, this along with the higher weight gain of hemlock than oak made it very popular with tanners in New York and Pennsylvania. This is important due to the fact leather was sold by the pound until the middle 1880's when measuring machines were invented and leather switched to being sold by the square foot, as it is today. "A very large majority, perhaps eight-tenths, of all calf skins taken off in this country are tanned in hemlock bark."^[3]

"Union Tanned Leather" or mixed tannage is another type of tannage that should be mentioned. This is a combination of both hemlock and oak bark as a tanning agent. The tanners of the time believed mixing hemlock and oak barks would produce leather of better quality than either bark could do by itself. "The two kinds united are supposed to produce better leather than either of them alone."^[4] Ratios of hemlock and oak barks would vary. Leather produced in this manner will still have the fading problems.

Quebracho: is obtained from the heart-wood of the quebracho tree which grows in South America chiefly in Argentina and Paraguay. Ordinary- or warm soluble Quebracho is the natural extract rich in condensed tannins. This type of bark give a leather color close to what the hemlock bark tanned leather would have looked like during the 1860's. This is the most common bark used in vegetable tanning done today in the US. This wood was first used in combination with hemlock bark in the 1870's; since the 1920's until present, quebracho is used alone.

Pit tanning was the way vegetable leather was tanned during the Civil War and before.

This is when the leather is put in pit dug into the ground and covered with a combination of water and wood bark. This type of tanning produces very firm dense leather. The drawback to this method is the amount of time it takes for the tanning process to complete. The average during the 1860's for oak bark was 6 to 8 months. The same average for hemlock bark was 5 to 7 months. If you were producing sole leather an extra 2 to 3 months would have been added to the time required. The good thing about pit tanning is it produces the best leather for what the Army needed for the troops in the field.

Today leather is tanned differently as far as how the end product looks. Weight is the way leather was sold during the 1860's but this all changed when a measuring machine was invented in the 1880's. This would cause the type of leather tanned to change. No longer was all the effort put in to weight which made the square foot smaller. There also was no need to add the extra expense of all the materials used in making the leather weight heavier. So as you can see there is no way to get leather with the same feel and weight as the leather used in the manufacturing of Civil War equipment, and all of this happened by the 1890's. The next best thing is a good "true" pit tanned leather. There are still a very few with leather quality that gets as close as we and the best one is Hermann Oak Leather out of St. Louis.

Here an description of what it took to tan leather in the 1860's

“Process of Tanning as performed at the Shaker Tannery of New Lebanon, N. Y.---We are indebted to M. Fred. Sizer, the Shaker tanner, for the following account of the process of tanning as preformed in that village.

“I take a pack of calf-skins ---say one hundred dry skins---and put them in a water vat to soak; after they have soaked two or three days, I take them out and mill the (a wheel is best for milling hides). I then beam them on the flesh side, removing all the lean meat and grease from the skin, stretching them out well with the beaming knife, and put them into the vat of clean water until they are soft enough to go in the lime. They must be as

soft as they were when they came off the animal, or as near that as they can get them. “Fresh hides that come directly from the butcher are put in the water a day or two; change the water once; beam on the flesh side to get the meat and grease off, then they are ready for the lime.

“I make my lime in a vat 8 feet long, 4 wide, and 4 deep. One bushel of slaked lime and 2 gallons soft soap, put in the vat two-thirds full of water, will make a lime sufficient for 100 calf skins, or 50 sides of upper leather. The hides should be hauled out every day, while in the lime, to air and change their position; then stir the lime well before they are put back.

“The lime needs strengthening every time a new pack is put in, by adding say half bushel lime two or three quarts soap. I lime my calf-skins and upper leather hides until the hair comes off easily; then un-hair them wash them out in the mill, beam them on the flesh side, trim off the pates and shanks, and put them in the bate.

“I put 5 or 6 bushels hen dung into a vat of the same dimensions of that used for the lime, and fill two-thirds full of water, and let it stand two or three day to ferment. Haul them two or three times while in the bate, and work them twice on the grain with a common worker on the tanners’ beam; mill them before working them the last time; then beam them, and they are ready for the tan vats.

“I make a liquor of moderate strength to handle them in, put them in this liquor, and stir them with a pole a while; then I handle them up smooth on a box or rack three or four times in the course of the day; let them remain in this until the next morning, then change the liquor, giving them about the same strength they had the first time; handle them tow or three times a day in this liquor, when the liquor is exhausted change again and handle less as the skins get colored and the grain set. I make my liquors of hemlock bark, ground and put in leeches.

“I handle my hides and calf-skins through until tanned, changing the liquors as they get exhausted. (The general time I have found for leaving the leather in certain liquor is a fortnight. This usually takes between 6 to 8 weeks or three to four changes. Sole will need to be tanned longer, and this lengthens the tanning process by one month.)

“When I think my leather is nearly struck through I try it by cutting into the thickest edge, and when tanned through take it up and scour it out in the wheel to cleanse

it from the tan and soften the grain; then take them to the currying shop, and the calf-skins I skive and the upper leather smooth down with the currying knife; then put them in a tub of water and scour them on the table with a brush, stone and slicker; dry them a little to temper them, and then put them on the table and set them on the grain side to work the grain smooth. After that apply some thin stuffing made of oil and tallow; then turn them over, the flesh side up, and set them out with an iron slicker; then apply the stuffing more plentifully, made thicker with more tallow; then hang them in sticks and dry them, and then pack them down in a pile and let them stay two week. I then take them and rub off what stuffing does not strike in, and whiten them with a currying knife or slicker.”^[5]

Mr. Sizer was a tanner for 42 years when he wrote this. He had tanned with both oak and hemlock bark. (I did edit this for content and to reduce confusion.)

He used the term Dry Hides in the beginning of his tanning information. This is important since most of the hide used in the big three states in tanning (Massachusetts, New York, and Pennsylvania) were imported from foreign sources. These sources San Juan, Orinoco, Laguaira, Matamoras, Montevideo, Honduras, Buenos Ayers, and other sources.

Whiten or whitening is skiving or leveling the side to an even thickness and at the same time lightens the color of the flesh side. This is normally found after a staining operation. Staining is when the side or hide is pitted in a solution of Sal soda and logwood. The tanner had two main goals in staining. First, a weight gain and second, to help dyes adhere to the surface more easily. Staining gives the leather it distinctive brown color that we have all come to know as “russet”. It is difficult to distinguish between the oak bark and hemlock bark tanned pieces unless you have studied the finished products of both barks extensively.

Hopefully, this information will help you understand why modern tanned leathers do not have the same weight, feel and appearance of 1860’s tanned accoutrements. These were the days when leather was “king”. Great care was taken in making leather of high value as it would be used longer and to a greater extent than what we currently use in our modern “throw away” society.

[For more information on vegetable tanning of the civil War please follow this link](#)

[1] Leather Industries of America Research Laboratory Dictionary of Leather Terminology, University of Cincinnati, Eight edition 1991 Page 14

[2] Reed, R. *Ancient Skins, Parchments and Leathers*. New York NY:Seminar Press, 1972.

[3] Professor H. Dussauce, Chemist, *A New and Complete Treatise on the Arts of Tanning, Currying, and Leather – Dressing* (Philadelphia, Pennsylvania: Henry Carey Baird, 1867), page 428.

[4] Campbell Morfit, *The Arts of Tanning, Currying and Leather-Dressing* (Philadelphia, Pennsylvania: Henry Carey Baird, 1852), page 88.

[5] Professor H. Dussauce, Chemist, *A New and Complete Treatise on the Arts of Tanning, Currying, and Leather – Dressing* (Philadelphia, Pennsylvania: Henry Carey Baird, 1867), pages 386-388.

Links

[Leather Preservation Please follow this link for more information on the care and feed of leather.](#)

[Leather Preservation for leather tanned before 1890](#)

Other Links

[Hermann Oak Leather Company](#)--- This is the best vegetable tanned leather I have found bar none. American hides tanned in an American company that has been around since the 1880's.

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Take me back to [C&D Jarnagin's Civil War Home Page.](#)

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Remember that no matter how bad the day is there is always one bright spot and he is Christ

2 Corinthian 12:9&10

And He said unto me, My grace is sufficient for thee: for my strength is made perfect in weakness. Most gladly therefore will I rather glory in my infirmities, that the power of Christ may rest upon me. Therefore I take pleasure in infirmities, in

reproaches, in necessities, in persecutions, in distresses for Christ's sake: for when I am weak, then am I strong.