BUILDING THE OSAGE BOW

This is an Osage Orange tree.

Here in the Midwest this tree has multiple uses.It is best suited for the making of fence posts that once in the ground they are good for many decades.It also has another use which is that Osage Orange is an excellent wood to make Osage Bows from.The next ten pages will cover the Osage Orange Bow and Osage Orange

History.

Osage Orange Profiles.....

James with this year's Buck harvested with one of his Osage Bows.This Bow was a Selfbow at 45 pounds draw weight.

www.bowstaves.com

www.osagestaves.com

E-mail

From several points of view the Osage Orange is a tree of extraordinary interest.The historian will tell you that long before the settlement of America by the whites,the Indians used the wood for war-clubs and bows, a custom that gave rise to one of its common names "Bow-Wood"and that its other common name is due to the fact that it was introduced into cultivation among the earliest settlers in St.Louis by specimens procured from the Osage Indians.Also during the developement of the great prairie region beyond the Mississippi the species served an important purpose as a hedge plant,thousands of farmers utilizing it for fencing their fields.The new growth hedge was interwoven to make a tight fence.

Although the introduction of barbed wire greatly reduced the importance of these hedge fences.These remaining Hedge Rows now are an excellent source for Hedge Posts.

Osage Orange is of interest from root to fruit.The bark of the roots is of a bright orange color and furnishes a yellow dye;the ridged and scaly bark of the trunk furnishes tannin for making leather;the branches have attractive leaves with thorns at their bases;the pollen-bearing and seed-bearing flowers are borne upon seperate trees.

These round heads mature into one of the strangest fruits known to science:the so-called "Hedgeapple" is a greenish compound fruit made up of a large number of seed-bearing fruits grown together on their edges.

The Osage Orange can be propagated very easily and makes good hedges and also a bushy tree that when loaded with fruit attracts much attention.The wood is also relatively immune from insect and fungis attack.

The Osage Orange has been recorded to heights of over 60 feet and trunk diameters of 4 to 7 feet.

Texas,Oklahoma,and Arkansas are its sites of original growth.....

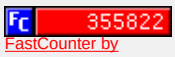
Please E Mail or call
319 835 5892
319 835 0916

E-mail

Here is a nice Osage Orange log for the 12/28/02 year.This log weighs about 250 pounds,12 feet long and 12 inches in diameter.These are hard to find....We will have several like these this year....

We at Osage Orange support all the brave men and women in the Armed Services.Without these people the freedoms we enjoy here in the USA simply would not be.Their sacrifices for us are unparalleled.

I Pledge Allegiance to the flag of the United States of America and to the Republic for which it stands, one Nation under God,indivisible,with liberty and justice for all.



FastCounter by bCentral

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osagebow@iowatelecom.net

This page last modified on Tuesday March 16, 2004

OSAGE ORANGE PROFILES

Building the Osage..

Staves and Billets

Cutting this tree for it's uses can be a very interesting ordeal.The branches are tightly woolven together and full of thorns.You have to work your way to the trunk clearing a path before you can saw.Then the job of keeping the thorns from sticking you never ends.Most fence posts are cut to 9 or 10 foot lengths if they are over 8 inches in diameter to be used as Corner posts.The rest 8 inches diameter or under are made into Line posts 6 to 8 feet long.

Putting these in the ground for fence posts usually means that the wire wears out first.The great thing about the Osage Orange is that is a renewable resource.Within a few short years your next crop of posts are well on their way.You can trim the new growth trees up so there are only 4 to 5 new trees to a cutoff.These can then be groomed each year to make straight posts.

They can also be groomed to make the Osage Bow.Don't forget those big green apples that are produced each year.These are reported to have a repellant effect to the insects that invade your home each winter.They are well worth a try and there is a Web Site solely dedicated to these called Hedgeapple.com.Please check it out.More on the Hedgeapple at bottom of page.Pictures,How to cut it,and other interesting information.

E-mail

Thorns on an Osage Orange limb.Ouch!

An Osage Orange Corner post of about 8 inches in diameter that has been in the ground for over 20 years.

We also call the Osage Orange a "Hedge" tree.These are Hedge apples.Deer and squirrel eat on these.They get about 6 to 8 inches in diameter.

Mr.Hedgeapple

Red Wiggins does this fine hand work with all kinds of wood.I liked the Osage Orange so here are pictures of his work.These make great gifts.I carry mine everyday and get many who ask about it.Red lives in Lynchburg,Tennessee (Jack Daniels Country).Please click on the picture and away you go to Red's web site.

SITE OF THE MONTH web STUDIO WINNER

MARCH 2000

Hedge Apple

There was once estimated to be over 250,000 miles of Osage Orange hedge rows such as this.Many are long gone as they are easy places to cut the Osage for fence posts and the farmer no longer needs them to contain his livestock.

Osage Orange seed was once priced at 50 dollars a bushel in 1850 as settlers moved west.This is SE Iowa hedge.

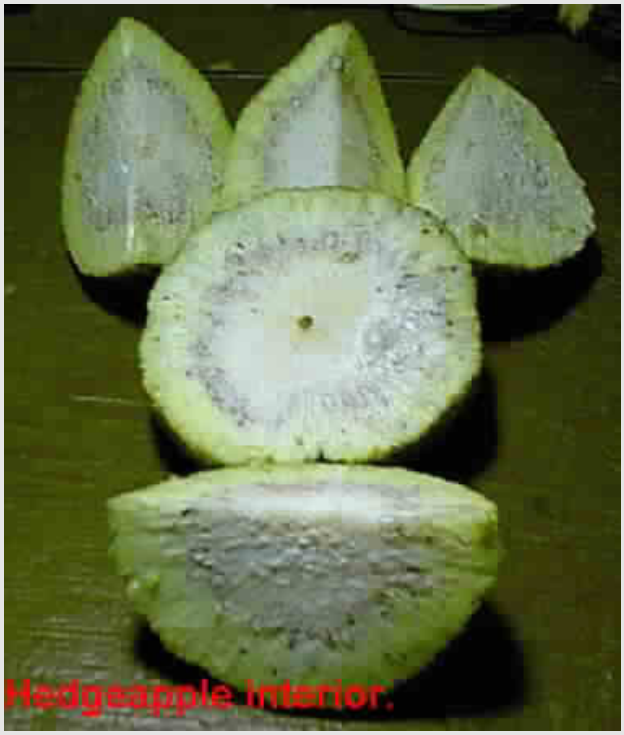
No other wood played such an important part in the early movement west of the settlers as the Osage Orange.It provided the necessary means to divide land and contain livestock.As it grew the branches were intertwined to make the hedge almost impenetrable by animals as well as man.The thorns were also very good help for this as was the quick growth.

Al Herrin publishes the White Bear Newsletter.James has subscribed to this for sometime.It has bits of information that blend very well with the Longbow Hunter.

His "Cherokee Bows and Arrows" should be read by every person who wants to make their own bow.This book can ordered from his link here.This book will interest you enough to read it twice or more.

click here

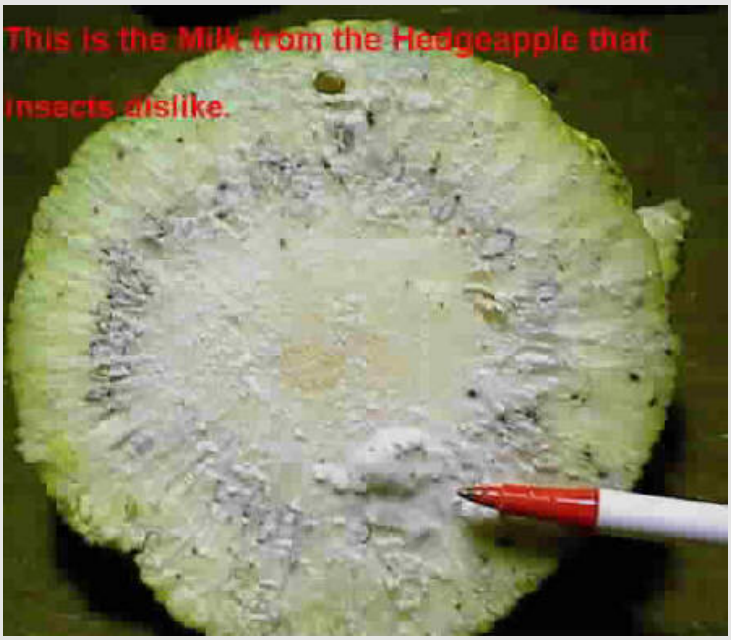
The Hedgeapple...



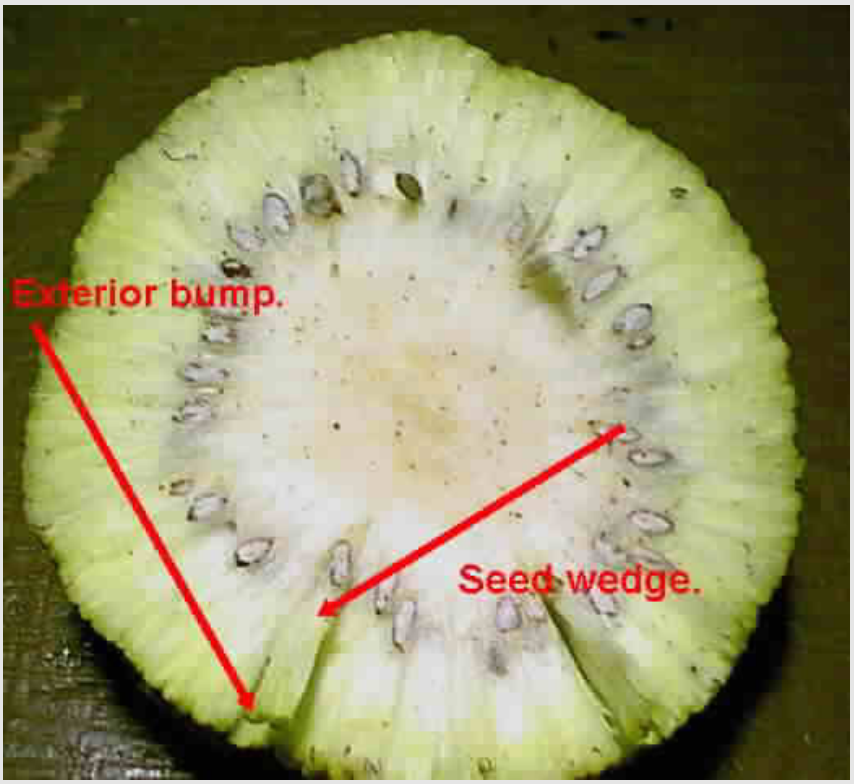
You can cut the hedgeapple up very nicely with a common fine tooth Hacksaw as shown.Pick them or buy them in October and November and they will be full of the milk that insects really don't like.Place the wedges on something and then place them around where you want the little creatures to leave.The Milk is sticky and will feel like alum on you skin but it washes off quickly.


Seed wedge.


Each bump contains a seed.


This is the Milk from the Hedgeapple that
Insects dislike.


Seed


Exterior bump.
Seed wedge.


Exterior of Hedgeapple; the only non edible fruit
in the world.Each bump contains a seed.

"Planting the Osage" by Robert McMuririe comes from a little booklet put together by James Conrad called "A brief History of the Bois d'Arc Tree".

A place called Commerce, Texac takes the Osage Orange Tree serious and has a Bois d'Arc Bash every year that is all about the history of the this tree.Their web site is listed at osageorange.

Growing Bois d'Arc Fences

By Robert C. McMurtrie

Raising Plants. - The seed can generally be purchased of any seedsman. I soaked the seeds in water for forty-eight hours before planting. When treated thus they sprouted almost as freely as could be desired. Those not soaked came up sparsely and very badly.

The ground was prepared as for ordinary garden seeds. The seed was placed in rows, about one foot apart and about one inch deep. I kept the plants carefully weeded from their first appearance till the autumn. The result has been that plants raised one spring are fit for setting out as hedges the next spring.

Preparing ground for the Hedge. - In the autumn the line of the ground on which the hedge is to stand is dug as a trench, about eighteen inches wide and one foot deep. The earth is laid on the side of the trench and the bottom broken with a pick. In that condition I left it during the winter for the frost to do its work.

Cultivating or Tilling. - In the spring when the ground is warm enough to cause the plants to show the first symptoms of life, by pushing, I put a quantity of the best barnyard manure in the trench or ditch, and on that placed the loose earth left lying at the side during the winter. In this ground the plants were placed. If in two row, eighteen inches apart; if in one row, nine inches apart. The latter, I am inclined to think from experience, is the best for every purpose.

The plants thus set out were kept carefully weeded and cultivated all summer. They sprouted slowly and very irregularly. But these were plants purchased. Those I grew were much quicker and more uniform. By the end of July nearly every plant was growing. In one instance, by count, I found two out of two hundred and eighty failed.

Subsequent Treatment. - In the autumn, the plants treated as above stated had grown, in single stems, from three to six feet high, depending on the earlier or later start. The stems were quite thick.

These I laid down without cutting, nicking or breaking, by simply bending them nearly flat to the ground and weaving them as one would osiers in wicker work. There is little elasticity but great toughness in the wood, and the thorns secure them in place, when bent and woven, without tying or any other sort of fastening.

The next year the hedge started with an average height of six inches from the ground, or the stems thus lying laterally along the ground. The leaf buds sent up shoots similar to those of the first year, but thicker and higher; many grew eight feet. The ground was cultivated with a hoe and weeded. In the autumn these stems were again laid down, without nicking, breaking or cutting. This made a hedge of lateral stems about eighteen inches from the ground.

The next summer the shoots grew, the upright ones much more vigorously than the laterals. When the upright shoots reached three feet or more I cut the tops with a sickle at the height I determined. This was repeated at intervals, whenever there were a few inches above the line determined, from time to time, as the height of the hedge. This permitted the shorter and weaker stems to grow without checking till they reached the proper line.

The result was, that in the third summer from setting out the plants there was a good hedge, sufficient to turn ordinary cattle, as it seemed. Certainly in all subsequent years it was impervious to man or beast. And it had a foundation as firm as a fence.

osagebow@iowatelecom.net

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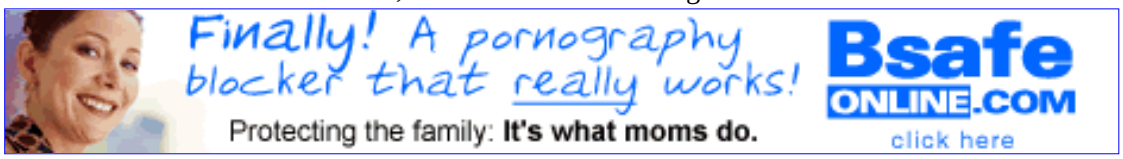

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OSAGE STAVES

THIS OSAGE ORANGE LOG WAS CUT IN NOVEMBER 2001.JAMES EASTER HAS MADE THE OSAGE BOW NOW FOR 12 YEARS AND WORKS ONLY THE OSAGE THAT HE FEELS WILL MAKE A BOW.
WE CUT OSAGE OVER 8 INCHES IN DIAMETER AND UP TO 25 INCHES IN DIAMETER BY 10 FEET LONG TO GIVE NICE FLAT BACK GROWTH RINGS.THE BEST WE CAN FIND HAS VERY LITTLE KNOTS,TWIST,AND CARRIES A GOOD GROWTH RING PATTERN.THE OSAGE END ABOVE IS 16 INCHES IN DIAMETER AND 100 INCHES LONG AND VERY STRAIGHT.

PLEASE CALL HIM @ 319 835 5892 OR E MAIL AT osagebow@iowatelecom.net FOR YOUR OSAGE STAVE.

HE IS ALWAYS WILLING TO TALK ABOUT OSAGE ORANGE STAVES TO FIT YOUR NEXT BOW MAKING PROJECT.

YOU CAN ONLY BUY JAMES EASTER'S BOWS AND STAVES FROM HIS WEB SITES BY GIVING HIM A CALL.THEY ARE NOT SOLD ELSEWHERE

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A few Bow Staves of other types of wood are now in stock also.We have Hackberry (nice wood for the beginner,and this is clean straight stuff,nice!!),Black Locust (a favorite on the East Coast by Native Americans in earlier centuries),and we have plenty of the old stand-by Hickory.Please ask us about a First Time Bowyer's starter package.This is one of three woods listed plus an antique used Draw Knife (I think they sharpen easier and besides they have some history),and Al Herrin's book "Cherokee Bows and Arrows" all for one price.

We have a nice supply of old Draw Knives for your Bowmaking pleasure also.These have stories to tell and what a better way to bring life back into them by using one to build your Bow.
Call us anytime for pricing at 319 835 5892 Office.
319 835 0916 Shop.
We accept MasterCard/Visa.

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There are many good books on making bows and we recommend you please read what you can before you work the Osage Orange.Al Herrin's book "CHEROKEE BOWS AND ARROWS" is one of the best.Jim Hamm,Dean Torges,and Paul Comstock are other authors of great books of archery.

...WARNING!...WARNING!...WARNING!...WARNING!...

The Osage is a wood that tests the patience of your character.It is the King of bow woods and it knows it.If you have made Bows before but not from Osage Orange this will be a new experience...THIS WOOD CAN TEST YOUR SKILLS AND THE SKILLS YOU THINK YOU HAVE!...There is no guarantee that you will be successful on your first try with the Osage Orange.Many have had more than one attempt to get the Osage Bow built to their liking.It is a very hard wood and can also be hard to work.

Osage Orange loves to grow twisted,crooked,and full of limbs.Finding good quality Bow Staves is very diffucult.Getting a straight Stave,excellent growth ring pattern and few limb knots is very time consuming and even then getting all three wood issues at the same time is rare.All of our Osage Staves are carefully selected as best we can to help provide you good wood.We try to match the Osage Stave to you by asking many questions about your Bowmaking experience.We want you to have a pleasant Bowmaking experience.

But once you master it and become one with the wood you have then reached one of the highest levels of bow making.

You may call James Easter at 319 835 5892/319 835 0916 Bowshop or e mail him at

osagebow@iowatelecom.net to discuss your Osage Orange Stave.

Our home site www.osageorange.com is full of information on the Osage Orange Tree and the making of the Osage Bow as well as Osage Bow examples.Please drop by there and bookmark it as it is very in-depth and takes some time to see.

WE CURRENTLY HAVE SEVERAL HUNDRED OSAGE STAVES NOW SEASONING AND PRICES ARE ON REQUEST.

YOU MAY CALL JAMES EASTER 319 835 5892 OR EMAIL HIM AT THE LINK BELOW.

Osage Orange is NOT an easy wood to work.Please give that some thought if this your first Osage Orange Bow.

SOME QUESTIONS YOU MAY WANT TO ASK YOUR SUPPLIER BEFORE YOU BUY YOUR OSAGE ORANGE STAVE ARE:

a-Has the sapwood and bark been removed?
All of our Osage Staves have both removed, making your work easier.

b-Does a Bowyer pick,work,and grade the Osage Staves you offer?
James Easter has built the Osage Bow for over 11 years and personally works up each Osage Stave we offer for sale.He also grades each stave with careful consideration of Growth Ring thickness,Limb Knots,and Straightness.

c-When do you cut your Osage Orange Stave wood?
We cut most of our Osage Orange Wood at the correct time of year and we pick each potential Stave with great care.Besides experience there are many "old time practices" that give you the best wood from the timber.We use those and are always learnig better ways to harvest the Osage Orange.

d-What size and weight are your Osage Staves?
We offer all lengths from 50 inches to 80 inches and all of our Osage Staves are very generous in the amount of wood we provide.Some weighing in at 10 to 16 pounds.

e-Do you ship to Europe?
We will ship anywhere customs allows the Osage Orange to enter.We have a good market in Europe.

f-How do you ship your Osage Stave?
All of our Osage Staves are shipped in a corrugated container to protect the back of the Stave from damage.

**g-Is Osage Orange an easy wood to build my first bow from?
The answer is NO and even if you have used Whitewood before Osage is still a challenge.**

Our Osage Orange Staves and Bows are sold only at www.osageorange.com Please call us anytime at 3198355892 or email us.We sell the wood that gives you an opportunity for a real EXPERIENCE in Bowmaking.

REMEMBER, THE BETTER THE STAVE YOU START WITH THE EASIER THE WORK TO MAKE THE BOW.OSAGE ORANGE IS NOT FOR EVERYONE AND FIRST TIME BOWYERS SHOULD READ ALL THEY CAN BEFORE THEY TAKE THE PLUNGE.EXCELLENT BOOKS BY DEAN TORGES,PAUL COMSTOCK,AND JIM HAMM ARE AVAILBLE ON OUR www.osageorange.com.

WE TAKE THE OSAGE ORANGE SERIOUSLY AND WORK HARD TO PROVIDE GOOD OSAGE STAVES IN ALL GRADES.OSAGE ORANGE NEVER GETS TO OLD, IT ONLY GETS BETTER WITH AGE.

**JAMES EASTER,Bowyer
319 835 5892 Office.
319 835 0916 Bowshop.
Please call anytime.
osagebow@iowatelecom.net.**

OSAGEORANGE

BOWSTAVES

CROTON IOWA

osagebow@iowatelecom.net

● HOME Bodarc Stave OSAGE WALKINGSTICK

Osage Orange Bow Staves

James Easter has made Osage Bows for over 12 years and spends considerable time and work to produce the Osage Stave.James does his best to provide the right Osage Stave for you.He works each Stave by hand and with the knowledge only a Bowyer has from his experience to produce the best you will find anywhere.He uses NO POWER TOOLS...

Please call him at 319 835 5892/319 835 0916 anytime to talk about Osage Orange Staves.

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BEGINNER BOWYER'S PACKAGE

A few Bow Staves of other types of wood are now in stock.We have Hackberry (nice wood for the beginner,and this is clean straight stuff,nice!!)and Black Locust (a favorite on the East Coast by Native Americans in earlier centuries).Please ask us about a First Time Bowyer's starter package.

This is one of the woods listed plus an ANTIQUE Draw Knife (I think they may sharpen easier and besides they have some history,I have cleaned them up and sharpened them no doubt they wil last another lifetime of use),and Al Herrin's Soft Cover book "Cherokee Bows and Arrows","Signed by Al" all for one price.

Please see our NON PACKAGE DRAW KNIVES we have for sale on www.osagewalkingstick.com . There are two pages of Excellent Knives there to choose from.I will also have New Sheffield Draw Knives shown on www.drawknives.com .

REMEMBER "PATIENCE" IS KEY NO MATTER WHAT WOOD YOU USE TO MAKE YOUR BOW.READ ALL YOU CAN BEFORE YOU START YOUR PROJECT.
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...WARNING!...WARNING!...WARNING!...WARNING!...

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Remember, James works the wood with no POWER TOOLS.We do not short cut in preparing our Staves.

Please Note:

Every possible precaution is taken to insure your getting good wood,but there is no such thing as a perfect Stave.James tries very hard to ship the best Osage he can.Your stick may have imperfections.The price you pay determines as to the quality of the Stave.Absolutely no Stave is sent out from which a good bow can not be made,but as the maker is largely responsible for the finished bow,results are not guaranteed.

**It must also be understood that while a piece of wood may look perfectly sound on the outside imperfections
may appear when worked down,for which we cannot hold ourselves responsible.We,therefore,accept orders only on condition that you assume all risk on Staves.**

Never work on your Stave unless you are in the spirit or mood to make your Bow.Never rush your work;leave it and come back another day to finish up.

If you are inexperienced in Bowmaking please read all you can before you attempt the Osage.I cannot mention enough times that Osage is not for the beginner."Cherokee Bows and Arrows" is one of the best books ever written on the Osage.Please consider buying and reading it.Guess what! I sell that book by calling 319 835 5892.$23 plus shipping USA.All of my copies are signed by Al Herrin the author.

Even if you are an experienced Bowyer but have never used Osage please beware.I know many of you in Europe are great Bowyers but some are not fimiliar with Osage.It is not like Yew nor is it like Hickory please take heed of this when considering to use Osage.Learning more about this wood before you work it will make me the supplier much happier to sell it to you and you will be more understanding of Osage Orange's traits.

Osage Orange may never be popular in stringent regulatory Bowmaking that requires the wood to meet certain criteria.Please keep in mind Osage very rarely grows perfectly straight (I can say that a straight piece of Osage is probably 1 in 700 or more).If you are looking for Osage to make a Bow to meet English Archery Club standards that were set for Yew,Hickory,and other woods centuries ago then you may hunt a long

time for that piece of Osage and also it will come with a price.If you are after the best Bow Wood in the world that may be a maverick at times to tradition then Osage is the wood.

But once you master it and become one with the wood you have then reached one of the highest levels of bow making.

You may call James Easter at 319 835 5892 or e mail him at osagebow@iowatelecom.net to discuss your Osage Orange Stave.

I would like to thank all of you who have purchased Staves from us and hope we have met your Bowmaking needs and we look forward to serving you in the future.Thank you.

Our home site www.osageorange.com is full of information on the Osage Orange Tree and the making of the Osage Bow as well as Osage Bow examples.Please drop by there and bookmark it as it is very in-depth and takes some time to see.

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What of the bow?
The bow was made in England,
Of the true wood,of yew wood,
The wood of English bows;
For men who are free
Love the old yew-tree
And the land where the yew-tree grows.'

Marching song of the White Company by Conan Doyle.

'We'll all drink together
To the grey goose feather
And the land where the grey goose flew,
What of the men?
The men were bred in England,
The Bowmen,the yeomen,
The lads of dale and fell.
Here's to you and to you
To the hearts that are true,
And the land where the true hearts dwell.'

Marching song of the White Company.

The Bowmen of England carried 24 arrows by their side and the bow was 80 to 120 pounds of pull.Think of the test in strength as they placed 7+ arrows into the air in less than a minute.

Edward IV made law that ships of England were required to bring back four Yew Staves for every cask of Greek and Italian wine admitted into the London custom house.Later Richard III made it ten Yew Staves for a cask.
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==========
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****

E MAIL FROM CUSTOMERS.

The following E Mails are what our Osage Stave Customers have to say about the quality staves from www.osageorange.com and handworked by James Easter Bowyer.Please Email us with any questions you may have.Customer satisfaction is our number one goal.
osagebow@iowatelecom.net 319 835 5892
****
****
Cherokee Bows and Arrows by Al Herrin was great reading - right up there with the Bowyers Bible Books. I wish all Native Americans were as willing as Al Herrin to pass on "the old ways" to all of us. In addition to the two great bow staves I recently purchased from you, I bought one from you last year that I have been patiently aging. After months and months of working on old, crooked, cracked, knotted, and gnarly Osage fence post staves, I began work on the stave I bought from you last year. What a difference! Its as if the bow I made was screaming to be let out and put to use immediately. From Friday night until Sunday night, I worked feverishly to produce a 68" "Plains Self Bow", 60 lbs. @ 28"draw - Beautiful. I am ready to take it out and test its seemingly inherent desire to begin a new life as a stealthy and deadly weapon. Maybe it is just me, but it seems that your staves "exude" spiritual sacredness born out of being well prepared and cared for as it was being turned into a Bow Stave. I'll keep you posted and thanks for the great Osage bow staves!Feel free to quote me on your web site! Thanks.
Mark A. Shriver
12-10-01
Texas

===
Hi James,

I have just recieved the Osage Orange stave from you today. What a nice straight stave. I am looking forward working on it. Won´t start until I have read the book you recomend Cherokee bows and arrows by Al Herrin.
Next time I come to USA I will come and vistit you and buy a stave or two to take with me home. By the way I hope other bowyers in Denmark will contact you in the near future since I wrote about your staves of Osage Orange in a danish debat web page like the one you have on Primitive Archer.
Sincerely
Martin
Denmark

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The stave you sent me this summer really is an extraordinary piece, not cheap, but the quality makes up for it. I never replied to your last email, so I wanted to express my appreciation in this way. Having built some walnut and locust longbows as practice, I will soon start on that osage stave; it will become my favorite for sure. Thanks again, Hannes from Germany.

===

HI ' MIKE I HAVE RECEIVED THE STAVE JUST TODAY, YOU WORK VERY FAST. THE STAVE IS WONDERFUL IT WILL MAKE AN EXCELLENT BOW. I, AM, LOOKING FOR STAVES OF ASH, AND ELM, CAN YOU HELP .

P.S. I, AM, FORWARD TO RECEIVING THE STAVE THAT YOU HAVE ON RESERVE FOR ME

THANK YOU

CHRIS

===
Mr. Easter,

Most certainly you can quote me. I think that the only reason that people dont understand how much work goes into a quality stave is because they never tried to knock of the bark and sapwood.I went to work on the back of that
stave yesterday after work and it was a breeze.Now a true craftsman should make 30.00 per hour

and i am sure if the total time that your son put into that stave to get it to the condition it is in is worth at least a couple of hours. so the stave is really less expensive than your competitors, in that respect. The shipping is less because of it and my overall cleanup is a lot less, it is just a good clean product. I really appreciate that because of the yard full of dogs that i have, kids, and work I dont have a whole lot of
time. So that is where my appreciation comes from. So quote me if you wish,
and keep up the good work.

Aaron Bruce
==========

Mike,
Sorry I could'nt get back to you sooner but I just wanted to thank you for the nice stave. It was worth the money. Hope to do business with you again.

Thanks,

Scott Feltch
==========Howdy James! I was just wondering how much you get shipping and all for a stave that is approx. 70" long? I will be turning it into a flatbow that is 68" between the nocks. I bought a stave from somewhere online last summer and just this weekend got around to messing with it. To make a long story short I had to take it down about 7 rings to get to a good one . I roughed out the bow and was getting close to where it needed to be and that is where the crack showed up. Needless to say this will end up being a bow for one of my children as it will NEVER make more than a 30# bow. It had a sever radial crack at the first ring. the only way to turn this stave into a bow is to make it narrower and shorter.(There was another crack going from the belly to the back down near the tip) I should have known better than to buy wood from a NON- bowyer. Everybody thinks they know how to select trees and split them out and make good staves, the truth is they don't. Your site is quite extensive and it looks like you've got it going on. I am curious as to why you debark and remove the sapwood though? Oh well I'd appreciate a quote if you have the time! Tom (aka. raging toxophiliac)
==========
Hi James----------Just a note to let you know that that repair on my bow is still holding up . The more I shoot it, the smoother it gets---------- What a nice bow ! ------- hope that you're doing good & that business is good.

Hi James---I'm not ready to order anything special as of right now but I'll let you know. Glad to hear that business is good of
course , you're welcome to use my testimonial. You build real nice bows. Good luck , Gerry
==========
Thank you for your reply to all of my inquiries. I spent about am hour at
your site the other night reading everything I could, and I do have to admit
that it is a rare occassion that one sees an osage stave as straight as the
ones pictured.
Jason
==========
Thanks Jamie. You make a good looking bow. Nice workmanship. I'm still
a beginner at making selfbows. Made two flat bows from yew and a couple from
Lemonwood. I have a few more roughed out in various phases of completion. I'm
anxious to get started on the osage but my right arm still isn't strong
enough after my surgery. I'll let you know how it goes and will probably be
talking with you about another stave or two. Take care, Terry
==========
Aloha Mike,

Got the stave! Already started working it. Really nice stave. Very clean with
the exception of two small knots. Don't think either of them will be a factor.
It does have a considerable twist, but I think I can straighten it with heat.

The stave was just as you represented it to be. I am happy with it and I look
forward to getting the A+ stave in November. You can certainly use me as a
referral if you ever want give out my email as a "satisfied customer".

Thanks for your customer service.

Aoha,

Warren

magic@WARRENandANNABELLES.com
==========
Hi Mike & James!

Long time ago we bought two staves from you ...

Your two staves had reached us in best condidtion. Norbert has made two fine bows. According to our previous conversation I send you 3 pictures from one of the bows as well as from Norbert in action.

Finally we want to thank you and wish you all the best.

Norbert and Hugo from Austria.
==========
Hi James,
Thanks for the Osage! My visit to your shop was well worth the trip. Your personal attention was appreciated and the pointers on how to work with the character of Hedge made me much less intimidated when I began to cut on the yellow wood. For a first time woodbutcher I did a good job thanks to your wood and your know-how. I now have an osage warbow with all the pull needed to launch some big arrows with all the beauty of Osage.
Thanks, Paul White -
Illinois 3/03/02
==========

I highly recommend James Easter and his bows and staves. I personally got to visit with James and his family.
Not only is he extremely friendly, he has some of the finest products in primitive archery. I have used several of
his staves and can honestly say they are some of the finest quality premium Osage staves I have seen. The truth is, you
really do get what you pay for. James not only selects and cuts his own staves, he debarks them, removes the sapwood, and then coats them with a varnish that prevents drying cracks. He has the largest and finest selection of Osage staves I know of.
You will not be disappointed in doing business with him!
Sincerely,
Rick Yonker
Primitive Bowyer - Kickapoo Valley Longbows
www.kickapoobows.com
==========

Not sure if you like to see what comes of your staves, especially in the hands of first-timers like me, but I'd like to send you a few pictures of the bow I built from the stave you sent me.
I am very pleased.
Thanks,
Pete Vordenberg
First Bow
==========
11/02....

James
I just receive the billets. I am very happy with them. I like the matching
snake ends and the set back. I am going to let them sit in my shop until
after Thanksgiving, and then I will start on the bow. The billets, with a
little luck, should make a beautiful bow.
Thanks again,
John McWilliams
==========
11/02
Mike:
I received my stave today in the mail. Very nice, I can quickly understand why there is so much talk about this species of wood. Beautiful, I did notice that the grain is a lot like ironwood, But osage orange has the beautiful color.
I can see one good looking superior bow in this stave.
Many thanks.
Brian Welshman
==========

James,

I bought an osage stave from you about 3 months ago. I now have a fairly nice sinew-backed bow that pulls about #42. This is my first bow ever. The stave was beautiful and I'll call if I ever need another.

Thanks,
Scott Laidlaw
North Carolina
==========

Sent: Friday, March 21, 2003 10:16 AM
Subject: homemade bow
I want to thank you for getting me started in bow making. I purchased a starter kit from you that included a draw knife, a black locust bow stave which was perfect and a book. Through patience and fun work I build my first
bow. A nice indian flat bow 68 inches long, 44# @ 28". I am already purchasing an osage orange stave from you to start on my second bow.Thanks again.
Rene Eldidy.
Minnesota
==========
The osage stave you sent got here on Tuesday. I am very happy with the stave, it's a beutifull piece of osage. I can't wait to start working on it in a few weeks. The grain is straighter than most of the osage that I have
seen in New Zealand. I enjoyed the book Cherokee Bows and Arrows, it has me wanting to try making a raw hide bow string.

Thanks alot
Dean Martin
New Zealand
==========

Hi Jamie,
I'm sorry it's taken me so long to get back to you after receiving my replacement strings.The strings are grea and the color of them and the serving thread are perfect.As you can see from the pictures I had already chosen
a dark green leather to bind the handle and doesn't it look sharp.I am so thrilled with my completed work of art.
I have shot it about thirty times and it works great,or should I say Think it works well as this is my first bow and
I have nothing to compare it with.There is very little hand shock so I think the tiller is pretty accurate.The final
draw weight is 35 lb @ 28",a little lighter than I had aimed for but all the same a very pleasing first attempt,also
it's easier to brace,and for target shooting its great.I have a couple of questions,I have read a lot about string
follow in bows,if one is going to developed this does it happen quickly or over a long period.Mine show no sign
as yet and still have a nice back set to them.One more question,when the strings are new do they stretch a lot
because at the moment I have to keep twisting it to keep the correct fistmele.
Once again I can't thank you enough for selecting a more perfect piece of wood for my first bow and it has made
me an instant lover of Osage Orange,I shall definitely be ordering from you again.I am moving to the states in May
and will be living in Virginia so maybe I could come and visit your workshop.

Trevor Harding
Japan 4-10-03
==========
Hi guys,

I bought an Osage stave from you back in January. You had it shipped over to Northern Ireland in about two weeks... I have been working quite hard on the stave, doing everything by hand. Well, it has been finished for a while now, though I did not yet have the chance to use it. This evening however, I did for the first time. And I am very happy that the bow shoots enormously good! There is a little hand shock, but overall, it performed much better then a commercial recurved bow I used to have of about the same poundage. I have included a few photo's in this e-mail,

though I don't yet have any photos from the finished bow. The bow now shoots at a poundage of about 43. I am very happy!

Thanks very much, and I hope to do business again soon!
Anthonio Akkermans
4/27/03
==========

Jamie
The Stave was great, I wish I could work a Stave that gorges every time. It was exceptionally straight and no knots at all, unheard of in Osage in Kansas. The bow has virtually made itself. I can hardly wait to shoot it at the Pawhuska shoot. These staves are worth every penny and then some. Thanks much. If your ever down this way swing through and visit Look forward to meeting you

Robert Rasico
4/28/03
==========

James,

I bought an osage orange bowstave from you about
a year and 3 monthes ago. With your advice and
a copy of Al Herrin's Cherokee Bows and Arrows
plus lots of other reading and work I have a
bow that draws about 30 inches at 60lbs. It
has a 71 inch rawhide bowstring and the length
from nock to nock is 74.25 inches. Im still
polishing up the handle but it shoots nice!
Im shooting goose feathered arrows with
sharpened bone points.

This bow is my second attempted longbow. The
first one was a hard maple longbow that
developed a split on one end and will now have
to become a short bow. OH well! :) I did
learn alot from that experience.

I am having alot of fun with my new hobby and
wanted to thank you and your father for helping
me out and answering my questions.

Thanks for your help.

Sean Duffy
Pennsylvania
==========

Thank you Jamie for picking me out such a nice stave..Those 3 years of persistent work with other bow wood (and many broken ones too) only kinda prepared me for the challenge I faced with Osage. I have no idea on how many hours I worked on it, but a spiritual connection is present when working with such a challenging wood. I just received Cherokee Bows And Arrows by Al Herrin..that your Dad sent me EXCELLENT BOOK!!!
Take Care,
John E. Gray
Alaska
========

James works hard to obtain customer satisfaction from each Osage Stave.Every Osage Stave has many hours applied to it from picking the tree to placing the Osage Stave in a building to season.

Osage Bow

Osage Staves

Osageorange Profiles

osagebow@iowatelecom.net

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OSAGE ORANGE STAVES AND BILLETS

Osage Orange Prof...

Bows that are for...

If you have other uses for the Osage Orange like carving,musical instruments,or other unique projects please give us your measurements and we can give you a cost.We try to ship worldwide.

CALL JAMES @ 3198355892 OR E MAIL osagebow@iowatelecom.net
Please call or E Mail for

These pieces are Osage Orange Billits (short lengths of Osage Orange used in two piece Bows) and Staves(longer lengths that will make one piece Bows).

Examples of our high quality Billits and Staves that are available.

Our Osage Orange Staves and Billets come from carefully selected trees and are hand split to provide the best grain formation possible.They are sealed to prevent cracking and then stored to slowly age.If you are interested in building your own bow;please E mail James Easter for more information.

E-MAIL

Anybody can cut and split osage but only a Bowyer who builds osage bows can have the best feel for it.

WE SHIP ANYWHERE ALLOWED.....

PLEASE CALL 319 835 5892

These guys are in the learning stages and therefore very SLOW; so these Osage Staves will be some time in the process.The young man working the stave is our AFS student in 1988 from Mexico (Aaron) and the supervisor on the job is a friend of Aaron's (Omar).They came here this fall just to learn the finer details of bowmaking.Hehe.Not!

Here are some nice staves for 2003.A lot of extra hard work here.

PLEASE CALL 319 835 5892
FOR MORE INFORMATION.

This is long ways from the dirt floor, 60 watt light bulb,and no heat James had at age 14 when he made his first Osage Bow.

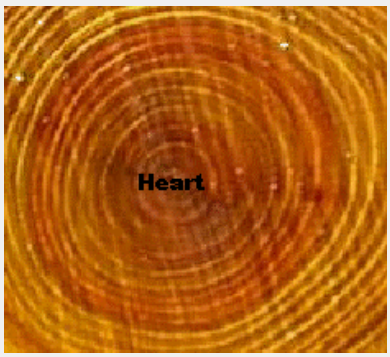
E-mail

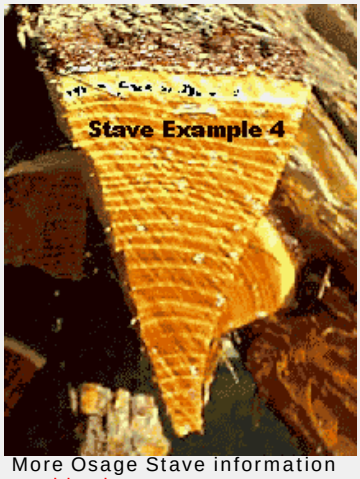
Examples of hard to find Osage Orange Stave material;Straight,No Knots,Limb Growth,or Twisted Trunk.Osage Orange likes to grow twisted with many limbs up the trunk.You can prune your crop of Osage Orange to get this result 25 years later.

E-mail

PLEASE E MAIL OR CALL 3198355892

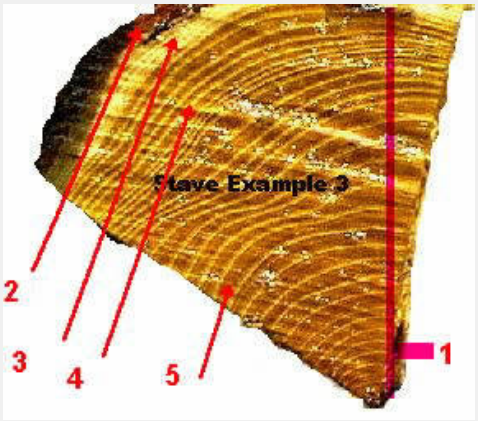
General growth ring pattern. A little flat on one side.Count the rings.I get about 26.This about 12 inches across.





More Osage Stave information on this site.

Here is a real nice group of staves.



These Osage Staves are examples of hard work and patience.

I came across some very good information on the growth ring pattern of the Osage Orange and description.I know there are misconceptions on this and hope I can shed some light on the subject.The area in No.1 is called the Heartwood.No.2 is the bark.No.3 is the Sapwood and this wood is removed along with the bark in all our staves.No.4 is the Earlywood and this is a narrow ring of porous light colored wood between the Latewood rings.No.5 is the Latewood and the ring that the Bowyer is interested in keeping intact the length of his bow.When the Bowyer talks of Growth Rings it is about the Latewood rings that hold the key element of his Bows strength on the Bows back.You should stay on the same Latewood Ring the whole length of your bow.

Good Osage Orange should have tight Earlywood Rings;should be 8 to 10 inches or larger in diameter and as straight as you can procure;Latewood Rings should be thick and dark,and as few knots as you can find.All of this sounds good but Osage Orange is noted for it's nice twisted growth with many limbs protruding from the trunk so finding the log as shown above is the exception not the rule.The perfect Stave probably does not exist.

Here are two examples of Osage Orange Staves that are as good as any you will see.James has about 4 to 6 hours in each of these.The path is:Hunt for the best tree,Cut it down,Get it home,Scope it out as to how you want to split it,Split it out,Debark it,Coat the ends,and put it away to season.

EMAIL OR CALL 319 835 5892
WITH YOUR QUESTIONS.

E-mail

MAURICE THOMPSON

Drop over to Cornell University and there you find almost all of Maurice Thompson's works.If you are a fan of his please take a look.You will have to type in his name in the search box and then you will be taken to all his writings.

Building the Osage Bow | Osage Orange Profiles | Osage Orange Staves and Billets | Osage Bows that are for Sale | Osage Orange History | More Osage Bow Pictures | Roughing out The Osage Bow | Bow Staves | Osage Orange and Bugs | James Easter Bowyer | Des Moines River | Osage Staves 2002 | Osage Walking Sticks | Draw Knives | Osage Orange Notes | Archery Books

This page last modified on Monday August 16,2004

OSAGE BOWS THAT ARE FOR SALE

Staves and Billets Osage Orange History

This is an Osage Bow that has cocobolo tips and is 61.5 inches long , pulls 56 lbs.@ 26 inches.This Bow is an excellent example of a James Easter Bow.This Bow was sent to a customer in Norway.

PLEASE CALL 319 835 5892

Please e mail James with any questions you may have about the Osage Orange Bows,Staves,and Billets.The e mail link is provided below.Let James build your next bow.

e-Mail

Every James Easter Bow is a work of art as well as your personal hunting or target shooting bow.Each is unique and no two are alike.James is in his 12th year building Osage Bows.He takes his profession very seriously and this is a full time endevor for him.These can last a lifetime and become an heirloom to pass on to the next generation of the family.For more on costs and time frame please call him anytime.He likes to talk bows. 319 835 5892/319 835 0916.

These are a few examples of James Easter Bows.

E-mail

Rounded belly Bow.

E-mail

First deer with the muzzleloader at 15.

Ok, what are these two doing in here???Well we were taking some pictures of the Bows and Brandy(L) and Jack(R) refused to hunt this fall without a little recognition.Soooo James gave in and they set for the picture.The looks on those two mugs show how ready they are for Quail season.

A couple of Bows with character.

PLEASE CALL 319 835 5892 FOR MORE INFORMATION.

E-mail

1 I shot an arrow into the air,
2 It fell to earth, I knew not where;
3 For, so swiftly it flew, the sight
4 Could not follow it in its flight.

5 I breathed a song into the air,
6 It fell to earth, I knew not where;
7 For who has sight so keen and strong,
8 That it can follow the flight of song?

9 Long, long afterward, in an oak
10 I found the arrow, still unbroke;
11 And the song, from beginning to end,
12 I found again in the heart of a friend.

Oct. 16, 1845. Longfellow

James and Maria are real outdoors people;here our daughter fishes for Salmon in Alaska.She says she loves to fish Salmon and once in a while catches one.

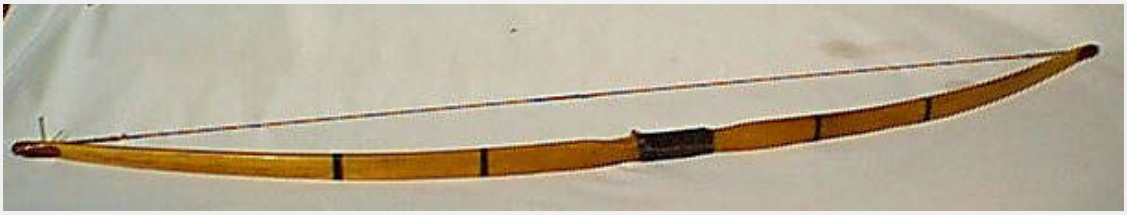
A far cry from 30 lb. Salmon.He keeps the location secret where the big ones are.

These Bows are fast,have very little shock and exhibit almost no set.

THIS IS THE BOW THAT IS SHOWN AT THE TOP OF THE PAGE.AS YOU CAN SEE IT EXHIBITS MINIMAL SET.IT IS 61.5 INCHES LONG,56 LB.PULL @ 26 INCHES.

PLEASE CALL 319 835 5892
or 319 835 0916
FOR MORE INFORMATION.

E-mail



THIS OSAGE BOW IS 61.25 LONG,PULLS 46 LBS. @ 26 INCHES.EXOTIC WOOD IS ALSO ON THE TIPS.THIS BOW EXIBITS VERY LITTLE SET AND IS ANOTHER FINE EXAMPLE OF A JAMES EASTER BOW.PLEASE E MAIL JAMES EASTER AT jastr@fort.net OR CALL HIM AT 3198355892 FOR MORE INFORMATION.THANK YOU.

PLEASE CALL 319 835 5892

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This page last modified on Tuesday March 16,2004

OSAGE ORANGE HISTORY.....

Osage Bows that a...

More Osage Bow Pi...

This is an old Bow of mine, made a few years ago that was on a Lewis and Clark display in the Phipps Observatory at Pittsburg,Pa.It is a great shooter and not ready to retire.

THE POOR MAN'S FENCE OSAGE ORANGE

The Poor Man's Fence
(Osage Orange)

Although it was John S. Wright who first made significant suggestion of the Osage Orange hedge and the Agricultural University to the prairie people, it was not he, but Professor Jonathan B. Turner of Jacksonville whom they would remember, generations later, as the "father" of those two epochal institutions.

As brother reformers, Wright and Turner had much in common although their personal intimacy was never great. Each had come from New England in the early '30's, fresh from classical studies. Turner had preached in New England for a short time before migrating on his mission Westward, and had combined preaching and teaching at Jacksonville, Illinois, till 1848 when his objections to his brother-clerics' conservatism on slavery and orthodox religion prompted him to resign both pulpit and classroom.

Both Turner and Wright were always subject to the evangelistic impulse; each fought unselfishly for better schools as for the propagation of a great faith. Turner, nearer to fanaticism, remained poor all his life, never attempting as did Wright to roll up a fortune so that he might, among other pleasures, endow educational projects. Single-tracked of mind where Wright was catholic, sarcastic where Wright was only stormy, then gentle, Turner fought for school reforms with a challenging pen, Wright with a contagious enthusiasm.

Each wrote with fiery eloquence when deeply stirred, but where Wright was never able to stick long enough to a subject to master its intricacies, Turner was patient scientist.

Both were mystics, called "cranks" by their neighbors. But while Wright went no further than the field of ecstatic prophecy about cities and regions, Turner believed in spiritualism and mental telepathy and wrote pamphlets on metaphysical subjects. Wright urged farmers to solve their problems by their own efforts; Turner experimented on his own farm at Jacksonville, studying insects with a microscope, analyzing soils, rotating crops, and inventing farm implements. His was among the first of the mechanical corn-planters, and he took out patents on various weeders and cultivators.

Public morals interested Turner far more than Wright, and the professor's pen flayed the Mormons most intemperately in one of the several pamphlets he issued. Another of his publications assailed Slavery with true Abolitionist fervor. Wright, craving national unity, favored keeping Slavery where, and as, it was.

Turner courted Wright's favor and made The Prairie Farmer the chief medium for his campaigns for progress in fencing and education.

Some twenty years after his arrival in Illinois, Turner described in Wright's paper how "from the first time I rode over these beautiful prairies for some thousand miles on horseback, and kept sometimes on my saddle for a pillow - without food or blanket - I have never had but those two ideas in my head... . But two things were needed for this State to make it the very first State in the civilized world, viz,:
"1. A feasible and easy mode of enclosing its rich soils.
"2. A practical and feasible mode of educating all the people." (1)

(1) Prairie Farmer, March, 1852
1)
2) The more he saw of the prairie the more he "was led to see the utter impossibility of a proper social organization of society, so long as the want of fencing material compelled the people to form broken and scattered settlements on the margins of groves and streams, while all within was left a solitary waste... . I then thought that the greatest moral, intellectual, social and pecuniary benefactor would be the man who should first devise some feasible mode of fencing. Accordingly... . I commenced a series of experiments with hedge plants." (2)
3)
4) Like a man possessed, he began filling the acre and a half, which he owned, with whatever plants might conceivable turn out to be the "poor man's fence," anything that might prove "horse-high, bull-strong and pig-tight."
5)
6) He scoured the agricultural papers, the botanical encyclopedias, he wrote to friends in all parts of the country, he talked to everybody he saw. By 1852 he had tested in succession and found wanting, the black locust, the thorn locust, the black walnut, the poplar, cottonwood, mulberry, privet, gooseberry, sweet briar, crabapple, wild rose, English thorn, Alabama rose, Scotch furze, arbor vitae, and several native American thorns.
7)
8) Then one day in the summer of 1835, when he had been sitting in a camp meeting at Pisgah, Illinois, God had seemed to come to his assistance.
9)
10) Turner had been, like the rest of the congregation, bored almost beyond endurance by the tedious sermon of a formal, broadclothed, orthodox cleric from New York. Indeed, the young people had slid off the split-log benches and had stolen out in the woods, presumably to pick blackberries. Turner's mind, was always impatient with the "over-educated," strayed, too, and as the long afternoon wore on, he was in the midst of a day-dream when a dusty, disheveled and almost radded man caught his eye. The fellow was striding up the grassy aisle of the open air meeting, with a worn shoe on one foot and a

tattered boot on the other. Assuming the man to be some vagrant, blundering into the wrong place, Turner reached out and stopped him.
11)
(1) Hedges, by Prof. J. B. Turner, Prairie Farmer, November, 1847.
1)
2) But even as he did so the elegant preacher stopped his monotonous lecture and, springing down from the crude pulpit, rushed to take the stranger's hand, and then to introduce him as the Rev. Dr. David Nelson, head rider of the circuit of Illinois, Kentucky, Tennessee, Arkansas and Missouri. Led to the pulpit, the famous divine began speaking, the congregation woke up, the young people deserted blackberries and Cupid, and soon the benches were full. For three hours the people sat spell-bound as Nelson warned them of hell and promised salvation.
3)
4) When the service was done, Turner took Nelson home with him, and they talked far into the night. "I expressed my views to him freely," Turner recalled later on, "especially as regards the social and religious advantages of closer settlements among our Western people." Turner explained why he was hunting so desperately for a hedge fence. Had Nelson in his travels seen any plant that might possibly serve?
5)
6) "He told me," said Turner, "he had seen a plant in the wilds of the far South, which, if it could be procured and acclimated, he had not the least doubt would answer our purpose." The only trouble was that the old circuit-rider couldn't remember the name of the plant, and for the next four years Turner wrote everybody who might know of it, sending letters right and left "both in the United States and Texas." Finally he saw in an agricultural paper an article by Colonel MacDonald of Alabama on a hedge called the "Maclura." It sounded like the Reverend Nelson's plant, and, writing to the Colonel, Turner procured "one simple plant" as he remembered for which I paid, I think, one dollar."
7)
8) "The moment I saw it I was satisfied it was precisely the thing if it could be made to stand the climate and not run up at the top or sprout at the root."
9)
10) Setting out a hedge of the precious plants in 1839 he watched and tended them with passionate zeal, saying nothing about his hopes, however, and waiting, like a true scientist, for proof before he made any announcement.
11)
12) Up in Chicago, John S. Wright, knowing nothing of Turner's experiments, had come upon a description of the same plant in an old magazine, and had immediately seized upon it as the thing that might well solve the great problem of fencing the prairie.
13)
14) While preparing copy in the autumn of 1840 for his first formal issue of the Union Agriculturalist, he had spent days, scissors in hand, studying the back numbers of Eastern farm papers. A sentence caught his eye in the

Hartford Silk Culturalist, the organ of the faddists who had been caught up in the "Silk Mania" - a dream that the United States could become a nation of silk producers, with worms feeding on mulberry leaves all summer in the back yard and surrendering long threads of silk to farm women in attics all winter.
15)
16) The magazine, in discussing various substitutions for the mulberry, mentioned that there might be splendid worm food in the foliage of the Osage Orange, or the Maclura, as it had been scientifically named for its "discoverer" Dr. William Maclure, the geologist. As President of the Philadelphia Academy of Natural History, surveyor and explorer in the United States, Spain, the West Indies and Mexico, McClure had in 1825 made vain efforts to start an agricultural school at the communal colony in New Harmony, Indiana, so near the great prairies of Illinois.
17)
18) The Maclura was a native of Arkansas where the Indians called it "Bow Wood" because its branches made tough and springy hunting weapons. The French, passing through the region, called it "Bois D'Arc," a name soon corrupted by American settlers into "Bowdark." Since the plant was of the mulberry family, the hope that it would feed silk-worms was only as vain as was the "silk mania" itself. What was important to Wright was that the Horticulturist's article declared, in passing, that the Osage Orange trees, "when set at a distance of fifteen inches asunder, make the most beautiful as well as the strongest hedge fence in the world, through which neither man nor animals can pass." Reprinting the item in his January, 1841, issue, Wright asked, "Can any one tell us more of this tree?... it seems well adapted... and if any has been used in Missouri or elsewhere, it would be a great favor to have an account of it furnished to us."
19)
20) There was no response. In the May issue he printed a description he had found in another old magazine and added, "It seems to be a most excellent material for hedges and if there is seed to be obtained anywhere or if anyone can give directions for procuring it, I should very much like to have it." Almost a year later when farmer, B.F. Lodge, in Edgar county, wrote that he had been trying it out, Wright passed the information on to his readers, with the observation, "Ever since the first number we have been trying to learn something relative to the Osage Orange, but hitherto without success."
21)
22) Even when such authorities as Solon Robinson wrote to him that "Hedges will never fence the prairies; they are too subject to blight," Wright answered in the March, 1842, issue that the critics were talking about the imported hedges; he, himself was convinced more strongly than ever that the right hedge would be found among the native shrubs. "Our views of its practicability and importance to the West are not changed; we still think it is to be our chief means of fencing."
23)
24) When one farmer suggested the cottonwood, Wright declared that "something not quite so old-maidish would

declared that "something not quite so old-maidish would look better"; the cottonwood had "too much primness and mustn't-touch-me sort of air." Month by month he printed settlers' descriptions of their experiments with many kinds of picket, paling, log and board fences, finding each a failure because of the same old shortage of lumber. For a time high hopes were held for a system of earthen ramparts fronted by the deep ditches - six feet from foot to crown, but the intrepid "land-shark" hogs went up and over the battlements with the same triumphant flourish of a pig-tail that Wellington's grenadiers had given in the Napoleonic Wars.
25)
26) With the advent of J. Ambrose Wight in 1843, Wright concentrated on educational news and his associate for a time did nothing more aggressive than publish the letters of farmers who kept up the struggle to find the right fence.
27)
28) When Charles H. Larrabee, later a judge in Wisconsin, stopped in at The Prairie Farmer office one day late in 1844 and handed over some Osage Orange seed, saying that he had seen it growing in Arkansas and that it would be "a good hedge for Illinois and Wisconsin," Ambrose Wight planted the seed near the office, but neglected the plants when they came up, and they soon died. Furthermore that same year, Wright visited Turner's home at Jacksonville and saw the progress the Professor was making with the Maclura, but failed to be impressed. A born conservative and a narrowly religious man, familiar with the controversies which plagued his friends, the orthodox clergy, on the frontier, he was no one to be sympathetic with a "rebel" and possibly a "heretic" like Professor Turner, who that year was quitting Illinois College and the ministry because both seemed too reactionary.
29)
30) Ambrose Wight had already settled upon the buckthorn hedge as his candidate for the honor of fencing the prairies, and he was probably offended at Turner's decision that it wouldn't do.
31)
32) Turner, himself, was not ready for publicity on his experiments, and as late as December, 1845, was telling The Prairie Farmer readers that while had had proved the Osage Orange would stand the northern climate, he wasn't yet convinced the plants would "grow close enough together to form a good hedge." And he held to his refusal to endorse the Maclura even though a storm of requests for seed poured in on him following his December article. His scientific soul must be satisfied.
33)
34) That he was depending upon Wright's paper as his medium was indicated by a letter he wrote on December 1, 1846, to Augustus H. Higgins of Petersburg, Illinois: "The Prairie Farmer is the only journal of education published in our State, so far as I know; it is issued, as you are aware, from Chicago; and aside from its department on education, it is one of the best agricultural papers in the Union, and the only one I know take." (3)
35)
36) Through 1846 and '47 he kept trying to stop the rush

36) Through 1846 and '47 he kept trying to stop the rush of the curious by informing them through The Prairie Farmer of his inability to yet assure them the hedge would stop the rapacious razorbacks. He told them how he had sent to Texas for two million seed in '47 and how these had all come up in '48, giving him enough plants to complete the enclosure of some twelve or thirteen acres. That year he sent for enough more seed to equip eight Illinois nurserymen, making them promise first that they would sell to the public at from $5 to $10 per thousand, no more, no less. (4) Three or four years before, the price in the East had been $500 per thousand, but had now fallen to $12 since various Eastern agricultural journals had begun recommending the plant to farmers.
37)
(1) Turner letter, Illinois State Historical Library.
(2) Turner in Prairie Farmer, August, 1848.
1)
2)
3) Never had Turner "been able for one moment to persuade himself that the beneficent Creator had committed the obvious blunder of making the prairies without also making something to fence them with... and if all men should fail for a hundred years to come to make the discovery, I should still believe that God had somewhere on this continent produced a shrub which he designed especially for the purpose of fencing the prairies." (5)
4)
5) By August, 1848, he was telling the paper's readers that the Osage Orange "is that shrub, and the greatest blessing ever introduced upon the farms of the West," and in the November number he announced he was now ready to sell plants at a price that would permit the fencing of 80 rods for not more than $15. The minimum for "a good post and board fence" built at a point remote from timber was put by one correspondent at $100 for a similar distance. (6) So rapidly did seed pour into the country that Turner advised Prairie Farmer readers in the October, 1853, issue that the price was now down to a point where 80 rods of Osage Orange would cost only $7.50 as against $75 in either rail or picket fencing. Moreover, if a rail fence escaped the prairie fires, it would still wear out in twelve years, whereas the Maclura fence, if trimmed with a "splasher" (half a mile a day by a green hand, a mile a day by an expert) would be stronger than ever at the end of twelve summers.
6)
7) "I now write" Turner told the readers of that October issue, "with my eye resting upon a hedge four years old... on the public street through which thousands of mules and wild Missouri steers, hogs and sheep are driven each year and all the stock of this village runs at large. And Pharaoh of old knew what a starved town cow was." Behind this hedge lay all Turner's fruit trees and gardens, yet "the wild Missouri steers will not throw it down or bulge over in droves... as they used to do every year before I had a hedge."
8)
(1) Ibid.
(2) "J. G." in Prairie Farmer, April 1855.

(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
	(3)	(3)	(3)	(3)	(3)	(3)	(3)
	(3)	(3)	(3)	(3)	(3)	(3)	(3)
	(3)	(3)	(3)	(3)	(3)	(3)	(10)

Now that it was established, he proposed that it be called just "The Prairie Hedge Plant" since "It is our plant - God made it for us, and we will call it by the name of our 'green ocean home'."

That Turner should be hailed as the "father" of the sensational discovery, irked Ambrose Wight, and in the June, 1855, number he declared "it is perfectly ridiculous to assert, as many are in the habit of doing, that this or that man introduced the Osage Orange as a hedge plant." Going back across the files of the paper he was able to show how John S. Wright had begun the agitation for it, and how often h is columns had discussed it before Professor Turner had made his appearance in print. He thought Alexander J. Downing, writing in his Horticulturalist, an Eastern publication, had made the plant a national sensation by commending it along with the buckthorn in February, 1847, and that a wealthy Ohio horticultural zealot, William Neff, had made the first "extended and accurate experiments." Professor Turner, he admitted, had "undoubtedly done more than any other man to get it to the notice of the farmers of our State" due principally to "his elegantly written articles" which "were put forth in the columns of this paper."

Neither Wright nor Turner took official notice of the controversy which ensued, with champions of the latter snowing Ambrose Wight under with facts and arguments supporting the general belief of the farmers that it had been the Professor who had given them the fence which was destined to be one of the major reasons for Illinois increasing its population more than 100 per cent in the decade of the '50s - rising from eleventh place among the States in 1850 to third in 1860.

Ambrose Wight was in no frame of mind to do Turner justice, for between them had risen still another issue - the Agricultural University, which, like the Osage Orange, John S. Wright, the editor, had first suggested for the prairies and which Turner, the practical experimenter, had more recently made his own project.

Among the countless agricultural inventions of the 1850s

and '60s was this elaborate machine for husking corn - ingenious

but destined never to be popular. From The Prairie Farmer, August 26, 1858.

ROGER ASCHAM

Roger Ascham was born in Kirby Wiske, Yorkshire, in 1515, the youngest son of John and Margaret Ascham. In 1530 Ascham entered St. John's College, Cambridge, where he applied himself to the study of Greek. He received his bachelor's degree at the age of eighteen on February 18, 1534 and became fellow of the college in March. In 1537, at the age of twenty-one, Ascham became master of arts and began tutoring younger students. Ascham became reader in Greek around 1538 until Henry VIII founded a lecture to take his place. One of Ascham's favorite hobbies was archery. In 1545 Ascham published the treatise Toxophilus or the Schole or Partitions of Shooting partly in defense of archery against those who found the sport unbefitting a scholar. The work was dedicated to Henry VIII who enjoyed the treatise so much that he granted Ascham a pension: ten pounds a year. Ascham was further honored by being assigned to tutor Prince Edward. In 1548, after the death of Princess Elizabeth's tutor, Ascham was appointed to the post of teaching the young woman who would become Queen Elizabeth I. He held the post until 1550 when he left the post without her consent. He was appointed secretary to Sir Richard Morisine and accompanied him to Germany later the same year. During his trip Ascham wrote his Report and Discourse of the Affairs in Germany containing his impressions on the people and culture of Germany. On the continent he also visited Italy, later recounting "the vices of Venice" in The Scholemaster.1 Morisine was recalled to England at the death of Edward in 1553, returning Ascham to Cambridge. During Ascham's absence he had been appointed Latin secretary to King Edward, a post he was instated in also under Queen Mary I. In 1554 Ascham married Margaret Howe. Upon Mary's death in 1558 he was appointed secretary to Queen Elizabeth, and in 1559 he was given the prebend of Westwang in Yorkshire. In 1563 Ascham was invited by Sir Edward Sackville to write a treatise on education. This became The Scholemaster, published posthumously in 1570. Ascham took ill in 1568 with an unidentified disease and died at the age of fifty-three. Hearing of his death Queen Elizabeth is said to have exclaimed: "I would rather have cast ten thousand pounds in the sea than parted from my Ascham."

Sources: . Johnson, Samuel. "The Life of Ascham." Works. Oxford: Oxford University Press, 1825. Available: http://andromeda.rutgers.edu/~jlynch/Texts/ascham.html. . The Norton Anthology of English Literature, 6th ed. v1. New York: W. W. Norton & Company, 1993. 1991.

OSAGE ORANGE

Maclura pomifera
Family: Moraceae

Osage Orange

The genus Maclura contains about 12 species native to: North America [1], with the rest in tropical America and Africa. The genus name maclura is after William Maclure (1763-1840), and American geologist, while the species epithet pomifera means bearing pomes or apples, in allusion to the large, spherical fruits.

Maclura pomifera-Bodare Us, Bodark, Bodeck, Bodock, Bois d'arc, Bowwood, Geelhout, Hedge, Hedge Apple, Hedge-plant, Horse Apple, Maclura, Mock Orange, Naranjo Chino, Osage, Osage Apple-tree, Rootwood, Wild Orange, Yellow-wood.

Distribution

Native to Arkansas, Oklahoma and Texas, but since escaped and naturalized throughout the eastern and north western US.

The Tree

Osage Orange is a medium size tree with thorns which grows in bottom lands. It attains a height of 60 feet and a diameter of 3 feet. The bark has an orange cast and was used in making kaki dye during W.W.I. It produces large spherical fruits the size of large grapefruits in the fall.

The Wood

The sapwood of Osage Orange is narrow and light yellow, while the heartwood is golden to bright orange, which darkens upon exposure. The heartwood can also contain red streaks. It has no characteristic odor or taste. The wood is very hard, heavy, tough, resilient and takes a high luster. It is ring porous and commonly confused with black locust (Robinia pseudoacacia).

Drying and Shrinkage

Working Properties: Osage Orange is difficult to work due to its hardness. It holds glue and screws well, but is difficult to nail.

Durability: Osage Orange is considered one of the most durable woods in North America.

Preservation: No information available at this time.

Uses: : Fuel wood, fence posts, game calls, smoking pipes, artificial limbs, crutches, insulator pins, wheel rims & hubs of farm wagons, railroad ties, treenails, machinery parts, archery, bows (Native Americans), dye from roots, planted for windrows and hedges.

Toxicity: The sap can cause dermatitis.

If you can find these books you will enjoy them as they are a group some of the best titles in Archery.

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Women in Medieval Guilds

The role of the craft guild in medieval society, specifically in Western European society, has been extensively researched and analyzed over the past 150 years.

A fair collection of written records concerning guild membership and structure has come down to us, most often in the form of pipe rolls

of those taking out the freedom in a particular borough, and less commonly in the annals of court proceedings involving disputes or other legal actions taken between guild members or against them by municipal or private litigants. We have, for example, extensive records of the guilds in York, London, Leicester, Dublin, Coventry, Bristol, and Gloucester from the 13th century onward, and careful study of these reveals a wealth of information about the sociopolitical characteristics of the artisan and merchant classes in these locations.

The intent of this treatise is to explore some of the roles played by women in the structure and functioning of the collective organization of craftspeople in a representative medieval city, in this case York. York was a thriving merchant center of perhaps 8,000-15,000 inhabitants (maximum) during the period covered by this paper (late 13th through early 16th centuries), with hundreds of specialized artisans contributing to its ranks. The York Register of Freemen, which forms the backbone of the facts and speculations presented herein, runs continuously from 1273 to the early 16th century, and as such is a priceless 'core sample' of the makeup of the artisan class during this period.

Unfortunately for our research, medieval administrative records only included those people who had recognized public status, that is men. Judicial records mention women on occasion, but too often it was the husband, as head of the household, who was held accountable for the actions of his wife and thus the role of women was further obscured in official accounts. Of course, few, if any, male artisans operated on their own. In most cases they did not set up shop until after they were married, and this made them the ostensible head of a production system that included the wife, children, and sometimes other relatives as crucial components. Throughout much of the later Middle Ages, at least, the role of women can be detected obliquely through references in both public and private records. The widely accepted law of femme sole allowed women to trade in their own right, although most commonly this right was not exercised except in the case of a widow continuing her husband's craft.

For the purpose of this discussion, I will arrange artisans into convenient categories, keeping in mind that such arbitrary distinctions frequently would have had little if any meaning in contemporary usage. Artisans seldom kept to only one craft; the economic realities of the time made them opportunists who dealt in whatever commodity would gain them a benefit under a given set of circumstances.

Following convention, I will separate craft guilds into six broad categories: Victuallers, Textile Trades, Leather Trades, Metal Trades, Building Trades, and Others. The logical basis for these distinctions lies in the distribution of artisans across occupations and the associations they tended to form, although these are by no means uniform.

Victuallers

The victualling industry included bakers, brewers, butchers, fishmongers, graziers, hostelers, hucksters, millers, regraters, tapsters, taverners, vintners, and many other more obscure specialties. I will touch upon several of these below.

Bakers made and sold bread of different varieties, including brown, white, black, and 'horse.' White bread, also called wastel, simnel, cocket, or domain bread, was the finest and most costly (about a penny a loaf). Brown bread, also called bastard wastel and bastard simnel, was next at about a halfpenny a loaf. Lowest on the scale was black bread, or 'panis integer' at about a farthing. Horse was an extremely coarse form made from the lowest quality flour and not generally considered fit for human consumption.

Because bread was the staple food throughout the Middle Ages, regulations concerning bakers were in force from an early time. Most of these involved penalties for insufficient bread in the community, or for poor quality product.

While a great deal of the bread offered for sale was likely to have been baked by women, few women are recorded as master bakers in the official roles. This is a pattern that persists throughout the litany of crafts, and necessitates a fair amount of speculation when speaking of the overall economic and political impact of women in the context of craft guilds and the goods they manufactured.

Brewers made alcoholic beverages, specifically those made by fermenting grain without distillation. This encompassed mostly ales (in later years ale brewers were sometimes designated 'tiplers') in the early period, but with the introduction of hops brewers began to experiment with beer as well. It was viewed with some suspicion at first, and even militated against by some, but eventually hopped beverages gained quite a wide popularity and even supplanted ale as the principal beverage of the artisan and laboring classes. In some locations, clear distinctions were made between brewers, vintners, and tapsters, in some they were blurred. Vintners made wine, generally a drink for the upper classes. Tapsters served ale and beer, but theoretically were forbidden actually to make it themselves. This was not a widely-enforced restriction, however.

The most common association most people will call to mind concerning women in this context will be that of the alewife. Indeed, women were quite common in this industry, the alewife in particular referring predominantly to a woman whose husband was in some other trade, usually bakers (the common use of yeast for the two processes of baking and brewing drove this relationship). Evidence suggests that women made as much if not more of the ale and beer served in the Middle Ages as men. Butchers were widespread and consistently prosperous, in comparison with othervictuallers. Butchers supplied most of the beef consumed; indeed, many regulations required them to supply beef before any other type of meat. In fact, many, many regulations were passed to control virtually every aspect of the professional lives of butchers, but the very bulk of them suggests that they were largely ineffectual, especially given the wealth of most established butchers. Butchers also sold mutton, veal, and pork, but pigs, in particular, were common household livestock and as such were not in as great demand from commercial sources. Graziers were supposed to be the ones who actually raised the livestock, but by the end of the fifteenth century butcher-graziers had monopolized most of the grazing land near urban centers, and driven the graziers further afield. Some cities, like York, took steps to halt this, as it allowed butchers to control their own supply prices, but others did little or nothing. Butchers also supplied the raw materials for tanners, chandlers, and other trades, and benefitted from this symbiosis.

Women often continued as butchers after the death of their spouses, and in this one area seemed to be somewhat immune from the protection usually afforded women by being social 'non-entities.' Butcher's wives, not the butchers themselves, were frequently fined for leaving dung and entrails in the street. The monetary effect of these fines was of course identical to what it would have been if the butchers had been fined directly, but it is curious that court records name women specifically far more often in these offenses than in diverse others. Fishmongers were of two varieties: salt and fresh, corresponding to the habitats of their respective goods. Freshwater fish sellers tended to be local and small-time; saltwater fishmongers tended to be of the merchant class and international in scope.

Salt fishmongery seems to have harbored more women than did fresh, for reasons that are not altogether clear to me. While comparatively few people, men or women, listed themselves as fishmongers, the apparent number of people peddling fish was enormous, suggesting that fishmongery was practiced frequently by people with no official connection to the craft. Of course, proximity to fishing grounds played a large part in availability and number of fishmongers. Salted fish was common for long voyages or during winter months, but fresh fish was preferred, and less expensive. Hostelersran public houses that offered combinations of food, drink, and lodging. In later years the term hosteler was replaced by innkeeper, and the profession grew more respectable with time. It was quite common for a master of one craft, especially those in other quarters of the victualling industry, to have a wife who ran an inn, usually from spare rooms in the main house but sometimes in a separate building. It was uncommon for men to take out the freedom as hostelers before the fifteenth century; indeed, none are recorded in York until 1396. The first female hosteler to take out the freedom appears in 1526. Interestingly, though, court records show plenty of instances of hostelers of both sexes being prosecuted for one offense or another prior to this date. Probably the gradual increase in acceptability of hosteler as a bona fide profession late in this period led to open declaration. Hucksters and Regraters were similar. Hucksters sold a variety of items from stalls,the street, or other shops, attracting potential customers by yelling their pitches over the noise of the market crowds. Regraters were resellers, or middlemen, who bought goods 'wholesale' and resold them, either to patrons directly or to hucksters and other similar retailers. Both of these crafts were largely populated by women, although as usual little official record exists of their activities.

Textile Trades

The textile industry harbored such diverse crafts as broggers (wool-sellers), cappers, carders, drapers, dyers, embroiderers, fullers, hatters, hosiers, knitters, litsters, mercers, shearmen, spinners, tailors, tapiters, vestmentmakers, and weavers. It is evident that women played a critical role in the skilled workforce of the textile industry.

Drapers were cloth merchants, although the original definition of the term included those who made cloth (woolen or linen) as well. For obvious reasons there were close ties between drapers and tailors, and much crossover of function was to be seen. Because drapers were often very successful, they tended to cross the boundaries between the artisan and merchant classes with some regularity. While drapers no doubt employed women, little record of this exists.

Dyers and Litsters were at first essentially identical, i.e., people who used vegetable or animal-derived dyes to color cloth at various stages during its production. As time progressed a distinction came to be made between the listers, who did the actual dyeing, and dyers, who frequently dealt only in the tools and raw materials or dyestuffs. Women often continued in this craft after their husbands.

Tailors found that their fortunes were inversely related to those of the drapers. Early in the period, drapers were dominant in the industry, but as their fortunes and status gradually declined, the tailors, who had been only moderately successful, grew in stature and economic influence until by the sixteenth century tailors were widely considered part of the merchant class. Women played important roles as tailors, but the vast majority of them took commissions from the male master tailors, and thus remained in perpetual obscurity themselves. Some few stood out in wills, however; Margaret de Knaresburgh in 1398 bequeathed two gold rings and six silver spoons.

Weavers wove cloth, either from wool or flax (linen). Combing, carding, and spinning to prepare wool for weaving was done almost exclusively by women. Although many women undoubtedly worked as weavers, usually for their husbands or male relatives, very few actually gained their freedom as weavers. Isabella Nonhouse, made free in 1441, two years after the death of her husband, is the only known female master weaver in the York register. Those who bought their freedom sometimes became true entrepreneurs in this field, organizing small groups of female laborers. The poorer women who carded and spun were paid piece-rates, either by the pound of yarn produced or by the pound of wool delivered to be spun. Many of them had to rent spinning wheels, as they could not afford to own one themselves. There are multiple records of husbands leaving looms and associated materials to their wives to continue the family business, however, so it is safe to assume that many women did pursue the craft after their husbands' deaths.

Women also played significant roles as cappers, embroiderers, knitters, and vestmentmakers (for the clergy).

Leather Trades

These included bottlemakers, bowgemakers (bagmakers), cardmakers, chapmen, cobblers, cordwainers (shoemakers), curriers, girdlers, glovers, horners, leatherworkers, parchmentmakers, patoners, pointmakers, pouchmakers, saddlers, sheathers, skinners, tanners, tawers, and whitawers.

The leather industry processed animal skins for use in a wide variety of products. The two principal types of preparation were tanning and tawing. Tanning involves soaking leather in a series of liquors (called woozes) of grading strength over a period of months until all the water has been driven out and replaced by tannin from oak bark. Red leather has been simply tanned; black leather has been tanned and curried, or thinned, dyed, and treated with tallow for suppleness. Tawing was a dry process, consisting of adding alum or oil to the hide, usually with a mixture of salt, then stretched and softened with oil and egg yolks. This was an expensive and laborious process, but it produced exceptional leather. Tawing produced white leather, so tawers were sometimes called whitawers.

Cardmakers set metal teeth into rectangular leather pieces to be used to card, or tease, wool. Probably the great majority of these craftspeople were women, as regulations concerning the craft frequently employ the feminine pronouns.

Cordwainers, or shoemakers, were so called because they worked with cordwain, or cordovan leather, named for the Spanish process by which it was tawed. While shoes were certainly made from cordwain, they were made from a wide variety of other leather and even from cloth; the designation is one of convenience only. Early in the period cordwainers manufactured shoes, whereas cobblers merely repaired them. By the end of the sixteenth century, however, cobbler had assumed both meanings. The trade of cordwaining was inextricably bound up with those of tanning, tawing, and currying, and much struggle for power took place among these rival crafts. Here and there are hints (as in wills) of great numbers of women employed as shoemakers, although registers and roles mention them seldom in this context.

Women did much work assisting skinners, by sewing together skins. They also contributed greatly as glovers, pouchmakers, bagmakers, bottlemakers, and especially parchmentmakers. In some areas, in fact, women dominated the parchmentmaking craft.

Metal Trades

Armorers, bell-founders, bladesmiths, brakemen, braziers, cutlers, ferbers, ferrours, founders, glaziers, goldbeaters, goldsmiths, hookmakers, ironmongers, latoners, lockyers, lorimers, marshalls, painters, pewterers, pinners, plumbers, silversmiths, smiths, spurriers, stainers, wiredrawers.

Metal workers constituted less than 10% of the total artisan population, overall. They were categorized not so much by individual craft, but by the type of metal they employed: iron and steel, non-ferrous metals such as copper, pewter, bronze, and brass, and precious metals such as gold and silver.

Armorers were usually quite successful, but as the period progressed became less so as armor gradually waned in necessity with the introduction of more powerful projectile weapons. At least one woman, Agnes Hecche of York, was trained by her father as an armorer. Ferbers or furbers refurbished worn or damaged armor. One specialized form of armor, mail, made from drawn wire, was often constructed by women, who here used their patience and dexterity to great advantage. While the actual drawing of iron wire was very strenuous, copper wire was more easily drawn and this craft was populated by a fair number of women.

The most prestigious products of medieval foundries were probably bells. Bell-founders frequently attained high positions in civic society, becoming even mayor and MP. Quite often the trades of bellmaker and potter or brazier were combined, since the techniques of manufacture were associated. While little if any record exists of women specifically as bellmakers, evidence can be found to show that they were potters, some, such as Margaret Soureby in York and Joan Hille in London operating large and respectable foundries, employing many male apprentices.

Goldsmiths and silversmiths, not surprisingly, often rose to wealth and lofty social status. Not all of them prospered, however, and the fortunes of even the richest of them were precarious and subject to considerable fluctuation.

While female precious metal smiths were rare, women excelled in the manufacture of fine jewelry. In Paris, in fact, some of the work in precious metals was reserved specifically for womens' guilds. Especially in major continental cities, independent female jewelerswere not uncommon.

Smiths made a wide variety of metal items. While their work was often very strenuous and could involve lifting substantial weight, there is evidence that women assisted, at the very least by tending the fires, preparing tools, and performing tasks such as quenching and tempering. This assertion is borne out even by a few surviving illuminations from various manuscripts.

Building Trades

Builders, carpenters, cartwrights, carvers, dawbers, dykers, earthwallers, glaziers, groundwallers,joiners, masons, pavers, plasterers, reeders, sawyers, shipwrights, tilers, wheelwrights.

Builders, like other craftsmen, probably involved their families in their craft. Katherine Rolf of Cambridge, as an example, took time off from her customary occupations of spinning, candle-making, and threshing for the nuns of St. Radegund's to help thatch the roof of the nunnery. At least four specific trades were known to have supported women who survived their husband and continued in his craft: carpenter, shipwright, plasterer, and plumber.

I can find no direct evidence that women were employed as carvers or glaziers, but given the nature of the work (glaziers painted on glass), it seems highly likely that they were involved in these crafts. In the case of glaziers, especially, few records of their doings exist at all, yet much of their exquisite work has survived, providing mute testimony to their great skill and artistic integrity.

Other Trades

Apothecaries, barbers, bowers, chandlers, coopers, fletchers, hairsters, mariners, moneychangers, ropers, scribes, stringmakers, turners.

The above is really only a representative list of a much larger body of crafts and trades that do not readily fit into even the broad categories I have chosen for this paper. Women play an important role in several of them, and so I have found them worthy of inclusion.

Chandlers were a small group, but usually a disproportionately affluent one. Mostly they dealt with wax candles, not tallow ones (who were as often as not made by butchers or skinners because of their access to animal fat). The demand for wax candles, especially from the church, was consistently high throughout the period. In addition, most people left provision in their will that as many candles as they could afford be burned at their memorial services. Many chandlers specialized in casting wax into images and other complex shapes that could be left on altars as offerings, which were then periodically collected and melted down for candles by the church officials. Because chandlers were relatively well off, the incidence of widows taking over the family business was high, bringing many women into the front lines of commerce in this field.

When the English longbow became a standard armament during the Welsh wars of Edward I (c. 1277), the crafts of bower (bowyer), stringmaker, and fletcher took on added importance. Not until the reign of Edward III (1327-1377) did the government take responsibility for equipping its troops with weapons, so the somewhat motley armies of earlier kings relied on local artisans to provide them with such before they answered the levies. Despite the reputation that English yew has acquired for being the premier bow wood, contemporary bowers thought it too open-grained and preferred yew imported from the Baltic. Women played a large role as stringmakers, most of them probably the wives of craftsmen in other industries. Elizabeth Baker of York was made free as a stringmaker in 1467.

Women were scribes, especially as lay scriptoria became more widespread and workshops were established in the urban areas, but this subject is one I would rather treat by itself in a separate paper.

In conclusion, I find that, while evidence of women's contributions to medieval society must often be hunted for between the lines, it is there. There can be little doubt that the roles played by women, either as direct participants in mercantile affairs or as infrastructure for a given craft, can hardly be overstated. Much of what we think of as medieval culture, and thus what has become our modern way of life, is directly and unequivocally the product of the creative and intellectual talents of women.

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For clarifications of spellings and often of basic meaning, I am forever indebted to the Compact Oxford English Dictionary (2nd Edition), without which my life would be discernibly poorer.

R.G.Ferrell Essay's http://lonestar.texas.net/~ferrell/ was the author of the above

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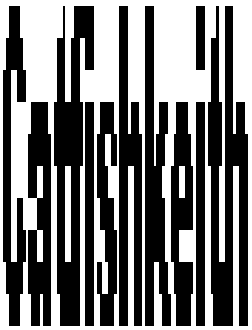
OSAGE ORANGE HISTORY AT THE BOTTOM OF PAGE

THIS OSAGE BOW HAS AN EXCELLENT UNSTRUNG PROFILE.



COCOBOLO TIPS ON AN OSAGE BOW

I LIKED THE GRAIN ON THIS ONE.

The following is some very interesting HISTORY on the OSAGE ORANGE used as fences in the 1850's to 1870's as the settlers moved west.Until the advent of Barbed Wire the Osage Orange was the only proven method of fencing for your farm.The "open range" was to be no more and this created much animosity between the Rancher and the Farmer.This information is taken from the book "The Great Plains" by Walter Prescott Webb and published in 1931 by Grossett and Dunlapp.

10 per cent, and 10 per cent interest on this cost, also, will show the annual cost to each farm of one section (640 acres) to be $768. Neither ornamental fences in towns and cities nor road fences have been included in these estimates, but left as an offset to that portion used as division fences.

Owing to the great scarcity of timber in many parts of the state, we can scarcely expect to renew these fences with material similar to that now in use, and as neither stone nor wire can be brought into general use, our only economical alternative is to cultivate hedges or live fences, which cost but little to grow, will last for generations, require no repairs other than pruning, and will keep out stock of all kinds, large or small.[1]

The Agitation for Hedges

The traveler through western Missouri and central Kansas is struck by the novel sight of farms inclosed by closely cropped hedges — ribands of green which lend variety to the otherwise monotonous landscape. These hedges, which may also be found in Illinois, Iowa, Nebraska, and middle Texas, are survivals of an early effort to solve the fence problem. They come down to us from the decades of the sixties, seventies, and early eighties, before the general introduction of barbed wire, when the prairie farmer found it impossible to fence his lands with rails and boards. In the government agricultural report of 1871 it appears that as we approach the Great Plains the traditional fences tend to disappear and there is a great threshing about in search of something that will serve as a substitute. Among these substitutes the hedge fence soon became the most prominent, Cloud County (Kansas) reporting 100 per cent; Cedar County (Iowa), 60 per cent; and Kankakee County (Illinois), 75 per cent. It is hard for us now to realize how much interest the public manifested in the possibility of fencing with hedges. The wide public discussion of hedges grew out of the agricultural report of 1871, increased in intensity until about 1878 or 1879, and then within a space of two years ceased. The movement will be followed here.

[1] *Galveston News*, April 4, 1878.

Without Osage Orange the movement Westward would have been a much longer trek.

The favorite hedge plant was the osage orange, commonly known as the bois d'arc, from the fact that the Indians made their bows from it. The osage orange is indigenous to the black prairie region, and in the southern part is not killed by the cold. Texas and Arkansas and other Southern states became the osage-orange nursery, exporting the seeds and plants to the Northern states.

A man writing in 1872 discussed the hedge question at some length. He began with the statement that fencing was one of the greatest burdens that agriculture had to carry, and that some substitute fence was needed which would lessen the cost, adding that "many of our planters have nearly or quite exhausted their supply of rail timber and cannot procure more at prices within distances that will justify the outlay." In the face of such conditions, asked the correspondent, what is to be done? He answered, Try the osage-orange hedge, which, he declared, had been a success wherever tried, either in the North or in the South. He stated that the people of Illinois thought for a long time that osage-orange hedges could not be grown in that region because of extreme cold. He went on to say that in 1845 Professor J. B. Turner of Jacksonville, Illinois, reported that he had grown the hedge for six years and that it was a success. The following year both seeds and plants were imported into the prairie states. In 1851 from three to five hundred bushels were taken to Illinois, in 1855 one firm purchased a thousand bushels, "and in 1868 the trade in the Northwest amounted to eighteen thousand bushels." The price ranged from $8 per bushel at first to $50. It was estimated that ten thousand bushels were planted in the Northwest in the spring of 1860 — producing 300,000,000 plants — sufficient, allowing 30,000 plants to the bushel and 5000 plants to the mile, to make 60,000 miles of hedge!

Turning to Texas the writer asserted that the farmers in the western portion would be compelled to resort to hedging. He declared that the osage orange offered the best hedge, that when full grown it would not cost more than fifty cents a

rod, and that within four years after planting the farmer would have a fence "pig tight, horse high, and bull strong."

The newspapers discussed every phase of hedge-growing: the planting of the seeds, transplanting, pruning, and the proper methods of cultivation. Osage-orange seed rose to fabulous prices. Jacob Haish tells us that he sold it for five dollars a pound. At such prices it became the object of speculation, with the usual tragic results. When William H. Mann, who lived on Bois d'Arc Creek in Fannin County, Texas, heard that bois d'arc seed was bringing eighty dollars a bushel in Peoria, Illinois, he washed out thirty bushels of seed, loaded it in the farm wagon, and drove the long distance with optimistic visions of a small fortune. On reaching his destination he learned that the bottom had fallen out of the market, and he sold his seed on credit for twenty dollars a bushel, a price he had refused in Texas.[1]

The method of washing out the seeds has been told by W. H. Harper:

> In about the year 1870 nearly everyone was trying to get bois d'arc seed either to speculate on or to plant for hedges. The apples first had to be gathered and put in piles and let lie until rotten. Then the four sides were cut away with knives and the core was ready to grind up in a small wooden mill with a horse hitched to it.
>
> Then they were put in a trough with holes bored in the bottom. The seed had to be washed through three or four waters, and then put on a scaffold to dry. It was necessary to stir the seed to keep them from moulding.
>
> It took about one thousand apples to make a bushel of seed. Four or five good hands could get out ten bushels a day. The apples were bought at $1.50 per thousand, and the seed sold at $25 per bushel.
>
> I learned all I know about bois d'arc apples or osage-orange seed while living five miles from Ladonia, Fannin County. The market for seed was Bonham, Texas.

For a time the discussion of hedges died out, but in 1877 a correspondent wrote: "While traveling through 'the States' last year I suppose I was asked by a thousand people, 'What is the best hedge plant for Texas?'" The writer stated that

[1] *Galveston News*, February 6, 1872.

it was the most perplexing question that could have been asked him, and that he did not know the answer. He thought it would depend on the locality and the varying conditions, and he ventured the opinion that the bois d'arc was best for central Texas and the huisache for western Texas, but that for the coast region in which he lived he had nothing to offer. He thought the pyracantha rose or the pomegranate might do, and concluded: "I am thinking seriously of the hideous prickly pear for a prairie hedge. I have seen castles of these things twenty or thirty feet in height, as many in depth, through which I do not think the devil himself could penetrate." He issued an invitation for public discussion through the newspapers in the hope of arriving at some answer to the question. A deluge of letters followed immediately.[1]

The first reply came from the eastern part of Chambers County, Texas. The writer began with the statement that the first essential was a thorn, "for nothing but thorn hedges will avail against hogs or cattle." He discarded the osage orange because it was unsuited to the poor and sandy soil, and advocated the Cherokee rose, which would, he said, grow in either heavy or light soil. He also mentioned experiments with the hyacinth and the thorn locust.[2]

One writer said that the subject was of interest "in that large portion where nature has established the 'no fence laws' — the prairie regions of the state." But he added that wherever nature had established the no (rail) fence law she had provided a substitute in hedge plants. He proposed experiments with the mesquite, which is found throughout the region west of the ninety-eighth meridian to the High Plains. It was, he said, of rapid growth (an error), armed with thorns; it could be dwarfed by clipping, and grown from bean, slip (also an error), plant, or grub, and under every variety of circumstances.[3] Another writer declared that "the Almighty never would have made such a country as Texas without furnishing a hedge plant to go with it." He advocated a name-

[1] *Galveston News*, November 28, 1877, "The Best Hedge Plant for Texas," signed N. A. T. [2] Ibid. December 20, 1877. [3] Ibid. January 10, 1878.

less rose which he had seen in a Cherokee country nursery. This rose, he stated, would grow from cuttings, required little trimming, did not spread, would turn cattle, was ornamental and fragrant, and would furnish feed for cows and strip the fur from a rabbit. He thought it might be the hedge plant for Texas.[1]

There were advocates of the McCartney rose, of Smith's hedge rose, in fact, of practically every sort of plant. In general the advocates of the rose hedges were from the rainy sections or near the coast, the advocates of bois d'arc were from the prairie Plains region, and the supporters of cactus and huisache and mesquite had in mind the more arid portions of the country. In reality none of the plants advocated would have proved practicable on the barren High Plains.

This discussion indicates that the people of the prairie country were interested in hedges; but, as one correspondent said, they were "all topsy-turvy as to where to get the plants or seeds." A nurseryman from Bryan, Texas, who declared that he was a professional hedge-grower, sounded the death knell of that profession in Texas. He said:

> Cheap and durable fences are imperatively demanded on our broad Texas prairies, where timber is scarce and of slow growth. And we may accept it as a demonstrated truth that if we are to depend upon the old method of inclosing our fields and pastures, . . . millions of our most valuable lands will lie idle for many years to come. Substitutes, of many varieties, have been offered, but with poor success. Plank does very well, but soon rots, and, remote from railroads, is too costly. Smooth wire makes a tolerably good but quite an expensive fence. Barbed wire makes a good but barbarous fence, and ought to be dispensed with as soon as possible. Either of these substitutes for the old-fashioned and time-honored rail may be used temporarily; but for durability and efficiency nothing can equal a good hedge.[2]

Barbed wire! Little did the professional hedge-grower of Bryan realize that in less than two years his profession would be gone. A few months later the following advertisement appeared in the *Galveston News*[3]:

[1] *Galveston News*, March 21, 1878, letter signed J. S. O. B.
[2] Ibid. January 17, 1878, article signed N. F. G. [3] December 30, 1879.

Walter Prescott Webb the author of the above historical information was a native Texan and renowned historian.He is one of few who has given the Osage Orange a place in History that it readily deserves.No infringement or copyrights are intended and I have tried to be as accurate as possible to give all information as to the author and this publication of 1931.This book is available from Amazon as ISBN 0803297025.For anyone who wants to learn more about the History of the West don't pass this up.Just click on the Icon and then place the title or ISBN number into Search.Walter Precott Webb, the author has several other History Books listed as well.

osagebow@iowatelecom.net

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Hedgeapple History.....

A Brief History
of the
Bois d'Arc Tree

By
James Conrad

Bois d'Arc Bash
Commerce, Texas
1994

A History of the Bois d'Arc Tree

The bois d'arc tree is indigenous to a total of 10,000 square miles in a narrow boot-shaped area of rich bottom lands in Northeast Texas, Southeast Oklahoma and Southwest Arkansas. Man has spread the bois d'arc across the U.S. and the globe.

The bois d'arc (also known as Osage orange, bodark, horse apple, hedge ball, Osage apple, mock orange, yellow wood, palo de arco, and by its Indian name ayac and by its scientific name Maclura pomifera) is the sole surviving member of the genus Maclura-of its relatives from past geologic life, only fossils remain. The bois d'arc tree (a member of the mulberry family and related to the fig) grows to a maximum height of 50 to 60 feet, has a trunk seldom more than 1 to 2 feet in diameter, and prefers creek and river bottoms. The bark of the tree is fibrous, vertically ridged, grayish on the outside and rather orange under the surface. The roots are covered with a brilliant orange, papery bark which makes them look like they have been painted a brilliant orange color. A ball of yellowish green flowers appears in the spring in both the male and female trees.

The female bois d'arc tree produces in the late summer the distinctive large yellow/green apples from 5" to 10" in diameter, which bear some resemblance to the grapefruit in appearance. The surface of the apple is rough, crinkly, wrinkled and inside fibrous with a white milky substance that oozes out of the fruit if bruised, the fruit contains many seeds. The apples appear to some to resemble oranges and leas the uninformed to think that the tree is botanically related to the orange tree of the tropics, which is not the case. Inedible to man, cows and horses will eat the apples and the leaves, while gray and fox squirrels, rabbits and birds often seek out the fallen apples feeding on the seeds inside. The glossy dark green leaves have smooth edges and are three to six inches long and two or three inches wide, generally egg-shaped, but terminating in a slender point. The leaves turn a bright yellow in the fall of the year. (The silkworm can live on the leaves of the bois d' arc tree, producing silk. For a time in the 1870s, families in the Dayton, Ohio area took up the cultivation of silkworms on bois d'arc leaves. The federal government supplied the silkworms but the cost of labor and the brittle nature of the silk produced made the enterprise impractical.)

What makes the bois d' arc different from most other trees is the quality of the wood which is noted for its hardness, flexibility, durability, and resistance to contact with moisture and soil. Local Hunt County historian, Walworth Harrison, described the wood as "ever lasting," because of its immunity to rot.

Bois d'arc grows from seed but the tree sprouts from cuttings and from the roots also. "All that is needed," explained a nineteenth century book on growing bois d' arc hedges, "is to hack a tree to bits and put them into the ground' each fragment takes root and sends up a flourishing shoot." Bois d'arc's ease of propagation and its extensive system of roots makes the tree a good erosion fighter.

Noted for its many uses, the bois d' arc tree is an important part of the history and folklore of Northeast Texas. Bois d'arc has found its way into the place names of Hunt County and Northeast Texas. Almost every city in North Texas has a bois d'arc street. Bois d'Arc Springs, 17 miles north of Bonham, feeds into the Bois d' Arc Creek, that flows into the Red River at the northeastern corner of Fannin-Lamar county line. Bonham, the county seat of Fannin County, was first called Bois d' Arc. In the 1930s a Dallas County railroad took the name Bois d' Arc and Southern Railroad Company, although it had only seven miles of track and soon went out of business.

When early French explorers ventured west of the Mississippi River-into what is now eastern Texas-they encountered the Osage Indians, who were known for making bows that were superior weapons for fighting and hunting. The unusual tree that the Osage used for making their bows was unknown to the French, who promptly called it bois d'arc, or "wood of the bow."

Later the whites made a brilliant orange-yellow dye from the root, bark, shavings and sawdust of the tree to color their quilts, and clothes. The dye-mixed with certain mordants-can produce a green, dull shade of yellow, a tan, various gold shades, dark brown, chocolate, khaki and olive shades. The dye seems to work best on wool, but can be used to dye cotton and as a tannin in the treatment of leather. Early settlers claimed that wool dyed with bois d'arc prevented mildew on fabric. Modern-day Navaho weavers use the bois d'arc dye in coloring their hand-made rugs.

The wood was valuable for other uses: railroad ties, telephone poles, bridge pilings, mine timbers, machinery parts, police maces, insulator pins, and coopers wares. The early settlers also made bois d'arc grave markers, floors, gates, foundation blocks (bankers in central Texas would not loan money to build a house, unless bois d'arc blocks were used), county boundary markers, posts for brush arbors and pulley blocks. Wagon builders found the wood of the bois d'arc which is twice as strong and harder than hickory, excellent for making wheel rims. When green, the wood was flexible enough to bend into a circle but hard enough to absorb shocks without cracking or splitting, which made for high mileage wheel rims.

The most novel uses was for paving blocks for city streets during the early part of the twentieth century. At one time or another Greenville, Honey Grove and Dallas briefly experimented with bois d'arc bricks for paving streets. But heavy rains had a tendency to dislodge the bricks and wash them away.

The tree's real claim to fame was its use as a hedge row fence in the Midwest. Before the invention of barbed wire in the 1870s, farmers and ranchers living on the prairies far from a cheap supply of wood needed an efficient yet inexpensive fencing material; on the treeless great plains, board fences were too costly and were continually in need of repair, while livestock had a bad habit of working their way through smooth wire fences. But the bois d' arc hedge with its 3/8" to 1" long thorns and dense foliage, said to be "horse high, bull-strong and pig tight," filled the need for a practical, inexpensive fence. A nineteenth century farm economist estimated that it "cost $48 for the first year, $20 for the second year, $12 for the third and after that very little beyond the expense of trimming. It can be pruned and trained into an impenetrable fence that will discourage even small animals. If woven tight throughout it, chickens could not get through it.

To grow a hedge, farmers planted seeds eight to twelve inches apart in a plowed row along boundary lines. As the bois d'arc reached several feet high, farmers intertwined the individual sprouts to form "living fences impervious to man or beast." In parts of the great plains, farmers learned to plant the bois d'arc on raised beds some 20 inches in height. As the hedge began to grow into viable fence, the farmer pruned the roots growing out from the hedge with a revolving coulter plow and the ditch along the hedge row served to collect water for the cattle.

Midwest farmers planted it everywhere and for a generation or two (1850-1880), it was considered the best fencing material. In 1869, maybe the peak year for bois d'arc hedges, farmers in the Midwest planted over 60,000 miles of bois d'arc. Kansas even paid folks to plant the bois d'arc hedge. Starting in 1868 the state of Kansas paid farmers $2 a year for eight years for each 40 rods of hedge or hawthorn they planted starting when it was big enough to resist livestock. The idea was that such hedges would be thinned every few years to produce needed fence posts and to keep the fences under control, but most farmers failed to keep up their hedge fences.

Surprising as it may seem today, the export of bois d'arc seeds represented one of the primary exports of our region. All across Northeast Texas in the fall and winter, people gathered the bois d'arc apples for the seeds. On January 20, 1875, The Denison News ran a story to promote the sale of bois d'arc seeds to sell in the mid-west. "The gathering of the bois d'arc and preparing the seed for market is rapidly becoming an important branch of industry and as the seed grow in large quantities in this part of the state it is a little singular that more efforts are not made to save them. The seed commands a price that assures nice return for the time and labor in securing it."

Before the coming of the railroad, farmers grew little cotton because it was difficult to get the bulky cotton bales to market, so the main exports from the counties of Northeast were livestock, hides, pecans and bois d'arc seeds. Several families in Fannin County became wealthy selling the seeds. At the height of the craze for bois d'arc hedge fences, seeds were bought anywhere from $25.00 to $50.00 a bushel. One authority states that in 1868, Texas farmers and nurseries sold to midwestern farmers $100,000 worth of bois d'arc seeds. In 1875 a Denison business, Clark and Tallant, shipped over 100 bushels of seeds to St. Louis for sale to farmers in Illinois. Charles Marion London, who ran a freight business between Jefferson and his home in Sherman, profited from the trade in bois d'arc seeds by buying seeds in Bonham and selling them in Sedalia, Missouri. Then on his return trip from Sedalia, Mr. London brought back clothing, shoes, hardware, guns, nails, shop supplies and tools which he sold for a profit in Sherman.

Not all had such financial success with selling seeds. Walter Prescott Webb cites in his history of the great plains a farmer William H. Mann, Fannin County, who heard that the bois d'arc seeds were bringing eighty dollars a bushel in Peoria, Illinois. He washed out thirty bushels of seeds, loaded them in his wagon and drove all the way with "optimistic visions of a small fortune. On reaching his destination he learned that the bottom had fallen out of the market, and he sold his seed on credit for twenty dollars a bushel, a price he had refused in Texas."

To separate the seeds from the core, the apples first had to rot, then the four sides cut away with a knife and the core ground up in a small mill similar to the machinery used to make syrup. The seeds had to be washed three or four times in water to separate them from the pulp, the seeds going to the bottom and the pulp to the top. Then the seeds were put on a scaffold to dry and stirred occasionally to prevent the growth of mold. It took about a thousand seeds to make a bushel, and four or five persons could process about two bushels a day.

The Civil War disrupted the trade in seeds but it resumed after the war only to end with the introduction of barbed wire in the 1870s. Eventually nursery men in the Midwest began to grow great stocks of the bois d'arc and sell young plant by the millions to Midwest farmers, depriving Texas of its lucrative trade in seeds.

Bois d' arc hedges had several features that made them less than ideal as fences. If planted from seed, bois d' arc hedges took three to six years to reach fence height. Furthermore, farmers found it necessary to constantly trim the hedges, recommended twice a year, a time-consuming and costly job when done manually. A Northerner did invent a machine for cutting bois d'arc hedges made of heavy timber that straddled the hedge and automatically trimmed it but it never came into widespread use. Another problem in the Midwest was that cold northern winters with light snow coverage tended to kill sections of hedge rows; sometimes the roots sent up new shoots, sometimes they did not.

Barbed wire was a much better, less expensive fencing material than the bois d'arc. But historians think that bois d'arc inspired the inventor of barbed wire, Joseph F. Glidden, who had a bois d'arc fence on his farm in Illinois. He saw the large thorns on the bois d'arc hedge and came up with the idea of "putting steel thorns" on twisted wire. Barbed wire took up less space than a hedge' the roots of the bois d'arc hedge sapped the ground 75 feet out into the field on either side of the fence.

In the North and Midwest many bois d'arc hedge row fences remained for years and spread to great widths, sapping wide areas on both sides of fence rows and interfering with mechanized farming. Eventually in the 1940s these hedges were pushed out by bulldozers. When the market for the seed disappeared after the introduction of barbed wire, farmers let their old hedges grow into small trees and then cut the trees for fence posts, getting almost two posts per foot and selling the posts for 10 to 20 cents each. The heart wood of the bois d' arc makes the best fence posts available impervious to weather, insects or subsoil moisture.

Before the introduction of chain saws, farmers used large cross cut saws to cut bois d' arc trees for fence posts. They carried flat files to sharpen their saws because the wood soon dulled the teeth. After cutting, they employed wedges and a sledge hammer to split the large trunks into multiple posts. For corner fence posts' builders preferred stout large bois d'arc trunks. For the line posts, smaller posts-limbs and large trunks split into smaller posts-would do. Early farmers drove the fence posts into the ground with a mallet or sledge hammer. First, he put the bois d'arc post on a large wood block and sharpen with an axe one end of the post into a point. The farmer waited until winter when the ground was moist, built a 3 foot platform to stand on and pounded the post, pointed end down, into the ground. Fence builders use a special short fence staple in nailing barbed wire to bois d arc fences because of the hardness of the cured out posts. The large long staples would "fly off" the hard bois d' arc posts. Ranchers today still favor bois d'arc for fence posts because of the wood's resistance to rot and insects.

For a time cutting bois d'arc fence posts was a lucrative business in Northeast Texas. In the late 1930s, a Lone Oak farmer bought 160 acres at $10.00 an acre from an insurance company that had repossessed the land during the depression. The farmer borrowed the money' he and black field hands cut enough bois d'arc fence posts off the land to pay for the land in full.

Today, some find more exotic ways of utilizing the wood of the bois d'arc tree. Bud Hanzlick, who lives in Belleville, Kansas, has found another use for bois d'arc fence posts' he turns old bois d'arc fence posts in to beautiful handmade furniture. As a youngster, Hanzlick made his money by cutting bois d' arc to make fence posts and doubletrees. (T-shaped hitches used to equalize the load for a two horse span by use of a tongue and two singletrees. They were used with horses to pull farm implements or a wagon.) Bud calls his furniture style "refined rustic." "My furniture isn't for people who prefer perfectly shaped arms and legs. The folks who appreciate it are artists and nature lovers who believe that nobody can improve on nature." Closer to home, Dr. Grady Titus, a retired professor at East Texas State University, makes all kinds of useful things from bois d'arc ranging from walking sticks and letter openers to pedestals for sculpture. Other area craftsmen make everything from dominos to knife handles from the wood of the bois d'arc tree.

John Phil Baumgardt summed up the essence of the history of the bois d' arc: "By some standards the bois d' arc is not a thing of beauty. But it is a tough, rugged looking tree that has proved its value to man. The Indians valued its wood for bows and dyestuff. The early white settlers depended upon it for enclosures, for fuel (it burns like hard coal and spits fire to the carpet from the fireplace), dyed their wood with it in lieu of Old World fustic, kept cockroaches out of their cupboards with the fruits. Today flower arrangements worked the glossy foliage and hedge apples into their summer bouquets and autumn creations. For instances of Texana it ranks with the log cabin and barbecue, essential for a while but soon replaced. As a vigorous native it will always maintain its place in the prairie wood lots and farmyard corners."

osagebow@iowatelecom.net

Building the Osage Bow | Osage Orange Profiles | Osage Orange Staves and Billets | Osage Bows that are for Sale | Osage Orange History | More Osage Bow Pictures | Roughing out The Osage Bow | Bow Staves | Osage Orange and Bugs | James Easter Bowyer | Des Moines River | Osage Staves 2002 | Osage Walking Sticks | Draw Knives | Osage Orange Notes | Archery Books

This page last modified on Tuesday March 16,2004

BOW STAVES

Roughing out The ... James Easter Bowyer.

James Easter has made Osage Bows for over 12 years and spends considerable time and work to produce the Osage Stave.James does his best to provide the right Osage Stave for you.He works each Stave by hand and with the knowledge only a Bowyer has from his experience to produce the best you will find anywhere.He uses NO POWER TOOLS...

Please call him at 319 835 5892/319 835 0916 anytime to talk about Osage Orange Staves.

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BEGINNER BOWYER'S PACKAGE

A few Bow Staves of other types of wood are now in stock.We have Hackberry (nice wood for the beginner,and this is clean straight stuff,nice!!)and Black Locust (a favorite on the East Coast by Native Americans in earlier centuries).Please ask us about a First Time Bowyer's starter package.

This is one of the woods listed plus an ANTIQUE Draw Knife (I think they may sharpen easier and besides they have some history,I have cleaned them up and sharpened them no doubt they wil last another lifetime of use),and Al Herrin's Soft Cover book "Cherokee Bows and Arrows","Signed by Al" all for one price.

Please see our NON PACKAGE DRAW KNIVES we have for sale on www.osagewalkingstick.com . There are two pages of Excellent Knives there to choose from.I will also have New Sheffield Draw Knives shown on www.drawknives.com .

REMEMBER "PATIENCE" IS KEY NO MATTER WHAT WOOD YOU USE TO MAKE YOUR BOW.READ ALL YOU CAN BEFORE YOU START YOUR PROJECT.

Call us anytime at 319 835 5892 Office.

319 835 0916 Shop.

We accept MasterCard/Visa.

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...WARNING!...WARNING!...WARNING!...WARNING!...

The Osage is a wood that tests the patience of your character.It is the King of bow woods and it knows it.If you have made Bows before but not from Osage Orange this will be a new experience...THIS WOOD CAN TEST YOUR SKILLS AND THE SKILLS YOU THINK YOU HAVE!...There is no guarantee that you will be successful on your first try with the Osage Orange.Many have had more than one attempt to get the Osage Bow built to their liking.It is a very hard wood and can also be hard to work.

Osage Orange loves to grow twisted,crooked,and full of limbs.Finding good quality Bow Staves is very diffucult.Getting a straight Stave,excellent growth ring pattern and few limb knots is very time consuming and even then getting all three wood issues at the same time is rare.All of our Osage Staves are carefully selected as best we can to help provide you good wood.We try to match the Osage Stave to you by asking many questions about your Bowmaking experience.We want you to have a pleasant Bowmaking experience.

Remember, James works the wood with no POWER TOOLS.We do not short cut in preparing our Staves.

Please Note:

Every possible precaution is taken to insure your getting good wood,but there is no such thing as a perfect Stave.James tries very hard to ship the best Osage he can.Your stick may have imperfections.The price you pay determines as to the quality of the Stave.Absolutely no Stave is sent out from which a good bow can not be made,but as the maker is largely responsible for the finished bow,results are not guaranteed.

It must also be understood that while a piece of wood may look perfectly sound on the outside imperfections

may appear when worked down,for which we cannot hold ourselves responsible.We,therefore,accept orders only on condition that you assume all risk on Staves.

Never work on your Stave unless you are in the spirit or mood to make your Bow.Never rush your work;leave it and come back another day to finish up.

If you are inexperienced in Bowmaking please read all you can before you attempt the Osage.I cannot mention enough times that Osage is not for the beginner."Cherokee Bows and Arrows" is one of the best books ever written on the Osage.Please consider buying and reading it.Guess what! I sell that book by calling 319 835 5892.$23 plus shipping USA.All of my copies are signed by Al Herrin the author.

Even if you are an experienced Bowyer but have never used Osage please beware.I know many of you in Europe are great Bowyers but some are not fimiliar with Osage.It is not like Yew nor is it like Hickory please take heed of this when considering to use Osage.Learning more about this wood before you work it will make me the supplier much happier to sell it to you and you will be more understanding of Osage Orange's traits.

Osage Orange may never be popular in stringent regulatory Bowmaking that requires the wood to meet certain criteria.Please keep in mind Osage very rarely grows perfectly straight (I can say that a straight piece of Osage is probably 1 in 700 or more).If you are looking for Osage to make a Bow to meet English Archery Club standards that were set for Yew,Hickory,and other woods centuries ago then you may hunt a long time for that piece of Osage and also it will come with a price.If you are after the best Bow Wood in the world that may be a maverick at times to tradition then Osage is the wood.

But once you master it and become one with the wood you have then reached one of the highest levels of bow making.

You may call James Easter at 319 835 5892 or e mail him at osagebow@iowatelecom.net to discuss your Osage Orange Stave.

I would like to thank all of you who have purchased Staves from us and hope we have met your Bowmaking needs and we look forward to serving you in the future.Thank you.

Our home site www.osageorange.com is full of information on the Osage Orange Tree and the making of the Osage Bow as well as Osage Bow examples.Please drop by there and bookmark it as it is very in-depth and takes some time to see.

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What of the bow?
The bow was made in England,
Of the true wood,of yew wood,
The wood of English bows;
For men who are free
Love the old yew-tree
And the land where the yew-tree grows.'

Marching song of the White Company by Conan Doyle.

'We'll all drink together
To the grey goose feather
And the land where the grey goose flew,
What of the men?
The men were bred in England,
The Bowmen,the yeomen,
The lads of dale and fell.
Here's to you and to you
To the hearts that are true,
And the land where the true hearts dwell.'

Marching song of the White Company.

The Bowmen of England carried 24 arrows by their side and the bow was 80 to 120 pounds of pull.Think of the test in strength as they placed 7+ arrows into the air in less than a minute.

Edward IV made law that ships of England were required to bring back four Yew Staves for every cask of Greek and Italian wine admitted into the London custom house.Later Richard III made it ten Yew Staves for a cask.

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SOME QUESTIONS YOU MAY WANT TO ASK YOUR SUPPLIER BEFORE YOU BUY YOUR OSAGE ORANGE STAVE ARE:

A-Has the sapwood and bark been removed?

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All of our Osage Staves have both removed, making your work easier.

B-Does a Bowyer pick,work,and grade the Osage Staves you offer?

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James Easter has built the Osage Bow for over 11 years and personally works up each Osage Stave we offer for sale.He also grades each stave with careful consideration of Growth Ring thickness,Limb Knots,and Straightness.

C-When do you cut your Osage Orange Stave wood?

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We cut most of our Osage Orange Wood at the correct time of year and we pick each potential Stave with great care.Besides experience there are many "old time practices" that give you the best wood from the timber.We use those and are always learnig better ways to harvest the Osage Orange.

D-What size and weight are your Osage Staves?

==========

We offer all lengths from 50 inches to 80 inches and all of our Osage Staves are very generous in the amount of wood we provide.

E-Do you ship to Europe?

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We will ship anywhere customs allows the Osage Orange to enter.We have a good market in Europe.

F-How do you ship your Osage Stave?

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All of our Osage Staves are shipped in a corrugated container to protect the back of the Stave from damage.

G-Is Osage Orange an easy wood to build my first bow from?

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The answer is NO and even if you have used other woods before Osage is still a challenge.
This just means to read all you can before you start and have plenty of patience and you will do just fine.

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Our Osage Orange Staves and Bows are sold only at www.osageorange.com Please call us anytime at 319 835 5892 or email us.We sell the wood that gives you an opportunity for a real EXPERIENCE in Bowmaking.

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E MAIL FROM CUSTOMERS.

The following E Mails are what our Osage Stave Customers have to say about the quality staves from www.osageorange.com and handworked by James Easter Bowyer.Please Email us with any questions you may have.Customer satisfaction is our number one goal.

osagebow@iowatelecom.net 319 835 5892

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Cherokee Bows and Arrows by Al Herrin was great reading - right up there with the Bowyers Bible Books. I wish all Native Americans were as willing as Al Herrin to pass on "the old ways" to all of us. In addition to the two great bow staves I recently purchased from you, I bought one from you last year that I have been patiently aging. After months and months of working on old, crooked, cracked, knotted, and gnarly Osage fence post staves, I began work on the stave I bought from you last year. What a difference! Its as if the bow I made was screaming to be let out and put to use immediately. From Friday night until Sunday night, I worked feverishly to produce a 68" "Plains Self Bow", 60 lbs. @ 28"draw - Beautiful. I am ready to take it out and test its seemingly inherent desire to begin a new life as a stealthy and deadly weapon. Maybe it is just me, but it seems that your staves "exude" spiritual sacredness born out of being well prepared and cared for as it was being turned into a Bow Stave. I'll keep you posted and thanks for the great Osage bow staves!Feel free to quote me on your web site! Thanks.

Mark A. Shriver
12-10-01
Texas

==========

Hi James,

I have just recieved the Osage Orange stave from you today. What a nice straight stave. I am looking forward working on it. Won´t start until I have read the book you recomend Cherokee bows and arrows by Al Herrin.

Next time I come to USA I will come and vistit you and buy a stave or two to take with me home.

By the way I hope other bowyers in Denmark will contact you in the near future since I wrote about your staves of Osage Orange in a danish debat web page like the one you have on Primitive Archer.

Sincerely
Martin
Denmark

==========

The stave you sent me this summer really is an extraordinary piece, not cheap, but the quality makes up for it. I never replied to your last email, so I wanted to express my appreciation in this way. Having built some walnut and locust longbows as practice, I will soon start on that osage stave; it will become my favorite for sure. Thanks again, Hannes from Germany.

==========

HI ' MIKE I HAVE RECEIVED THE STAVE JUST TODAY, YOU WORK VERY FAST. THE STAVE

IS WONDERFUL IT WILL MAKE AN EXCELLENT BOW. I, AM, LOOKING FOR STAVES OF ASH,

AND ELM, CAN YOU HELP .

P.S. I, AM, FORWARD TO RECEIVING THE STAVE THAT YOU HAVE ON RESERVE FOR ME

THANK YOU

CHRIS

==========

Mr. Easter,

Most certainly you can quote me. I think that the only reason that people dont understand how much work goes into a quality stave is because they never tried to knock of the bark and sapwood.I went to work on the back of that

stave yesterday after work and it was a breeze.Now a true craftsman should make 30.00 per hour and i am sure if the total time that your son put into that stave to get it to the condition it is in is worth at least a couple of hours. so the stave is really less expensive than your competitors, in that respect. The shipping is less because of it and my overall cleanup is a lot less, it is just a good clean product. I really appreciate that because of the yard full of dogs that i have, kids, and work I dont have a whole lot of

time. So that is where my appreciation comes from. So quote me if you wish,
and keep up the good work.

Aaron Bruce
==========

Mike,
Sorry I could'nt get back to you sooner but I just wanted to thank you for the nice stave. It was worth the money. Hope to do business with you again.

Thanks,

Scott Feltch
==========Howdy
James! I was just wondering how much you get shipping and all for a stave that is approx. 70" long? I will be turning it into a flatbow that is 68" between the nocks. I bought a stave from somewhere online last summer and just this weekend got around to messing with it. To make a long story short I had to take it down about 7 rings to get to a good one . I roughed out the bow and was getting close to where it needed to be and that is where the crack showed up. Needless to say this will end up being a bow for one of my children as it will NEVER make more than a 30# bow. It had a sever radial crack at the first ring. the only way to turn this stave into a bow is to make it narrower and shorter.(There was another crack going from the belly to the back down near the tip) I should have known better than to buy wood from a NON-bowyer. Everybody thinks they know how to select trees and split them out and make good staves, the truth is they don't. Your site is quite extensive and it looks like you've got it going on. I am curious as to why you debark and remove the sapwood though? Oh well I'd appreciate a quote if you have the time!
Tom (aka. raging toxophiliac)

==========

Hi James----------Just a note to let you know that that repair on my bow is still holding up . The more I shoot it, the smoother it gets---------- What a nice bow ! ------- hope that you're doing good & that business is good.

Hi James---I'm not ready to order anything special as of right now but I'll let you know. Glad to hear that business is good of

course , you're welcome to use my testimonial. You build real nice bows. Good luck , Gerry
==========

Thank you for your reply to all of my inquiries. I spent about am hour at
your site the other night reading everything I could, and I do have to admit
that it is a rare occassion that one sees an osage stave as straight as the
ones pictured.
Jason
==========

Thanks Jamie. You make a good looking bow. Nice workmanship. I'm still

a beginner at making selfbows. Made two flat bows from yew and a couple from Lemonwood. I have a few more roughed out in various phases of completion. I'm anxious to get started on the osage but my right arm still isn't strong enough after my surgery. I'll let you know how it goes and will probably be talking with you about another stave or two. Take care, Terry

==========

Aloha Mike,

Got the stave! Already started working it. Really nice stave. Very clean with the exception of two small knots. Don't think either of them will be a factor. It does have a considerable twist, but I think I can straighten it with heat.

The stave was just as you represented it to be. I am happy with it and I look forward to getting the A+ stave in November. You can certainly use me as a referral if you ever want give out my email as a "satisfied customer".

Thanks for your customer service.

Aoha,

Warren

magic@WARRENandANNABELLES.com

==========

Hi Mike & James!

Long time ago we bought two staves from you ...

Your two staves had reached us in best condidtion. Norbert has made two fine bows. According to our previous conversation I send you 3 pictures from one of the bows as well as from Norbert in action.

Finally we want to thank you and wish you all the best.

Norbert and Hugo from Austria.

==========

Hi James,

Thanks for the Osage! My visit to your shop was well worth the trip. Your personal attention was appreciated and the pointers on how to work with the character of Hedge made me much less intimidated when I began to cut on the yellow wood. For a first time woodbutcher I did a good job thanks to your wood and your know-how. I now have an osage warbow with all the pull needed to launch some big arrows with all the beauty of Osage.

Thanks, Paul White -

Illinois 3/03/02

==========

I highly recommend James Easter and his bows and staves. I personally got to visit with James and his family.

Not only is he extremely friendly, he has some of the finest products in primitive archery. I have used several of

his staves and can honestly say they are some of the finest quality premium Osage staves I have seen. The truth is, you

really do get what you pay for. James not only selects and cuts his own staves, he debarks them, removes the sapwood, and then coats them with a varnish that prevents drying cracks. He has the largest and finest selection of Osage staves I know of.

You will not be disappointed in doing business with him!

Sincerely,
Rick Yonker
Primitive Bowyer - Kickapoo Valley Longbows
www.kickapoobows.com
==========

Not sure if you like to see what comes of your staves, especially in the hands of first-timers like me, but I'd like to send you a few pictures of the bow I built from the stave you sent me.

I am very pleased.
Thanks,
Pete Vordenberg
First Bow
==========
11/02....

James
I just receive the billets. I am very happy with them. I like the matching
snake ends and the set back. I am going to let them sit in my shop until
after Thanksgiving, and then I will start on the bow. The billets, with a
little luck, should make a beautiful bow.
Thanks again,
John McWilliams
==========
11/02
Mike:
I received my stave today in the mail. Very nice, I can quickly understand why there is so much talk about this species of wood. Beautiful, I did notice that the grain is a lot like ironwood, But osage orange has the beautiful color.

I can see one good looking superior bow in this stave.
Many thanks.
Brian Welshman
==========
James,

I bought an osage stave from you about 3 months ago. I now have a fairly nice sinew-backed bow that pulls about #42. This is my first bow ever. The stave was beautiful and I'll call if I ever need another.

Thanks,
Scott Laidlaw
North Carolina
==========

Sent: Friday, March 21, 2003 10:16 AM
Subject: homemade bow
I want to thank you for getting me started in bow making. I purchased a starter kit from you that included a draw knife, a black locust bow stave which was perfect and a book. Through patience and fun work I build my first

bow. A nice indian flat bow 68 inches long, 44# @ 28". I am already purchasing an osage orange stave from you to start on my second bow.Thanks again.

Rene Eldidy.
Minnesota
==========
The osage stave you sent got here on Tuesday. I am very happy with the stave, it's a beutifull piece of osage. I can't wait to start working on it in a few weeks. The grain is straighter than most of the osage that I have

seen in New Zealand. I enjoyed the book Cherokee Bows and Arrows, it has me wanting to try making a raw hide bow string.

Thanks alot
Dean Martin
New Zealand
==========

Hi Jamie,
I'm sorry it's taken me so long to get back to you after receiving my replacement strings.The strings are grea and the color of them and the serving thread are perfect.As you can see from the pictures I had already chosen

a dark green leather to bind the handle and doesn't it look sharp.I am so thrilled with my completed work of art.

I have shot it about thirty times and it works great,or should I say Think it works well as this is my first bow and

I have nothing to compare it with.There is very little hand shock so I think the tiller is pretty accurate.The final

draw weight is 35 lb @ 28",a little lighter than I had aimed for but all the same a very pleasing first attempt,also

it's easier to brace,and for target shooting its great.I have a couple of questions,I have read a lot about string

follow in bows,if one is going to developed this does it happen quickly or over a long period.Mine show no sign

as yet and still have a nice back set to them.One more question,when the strings are new do they stretch a lot

because at the moment I have to keep twisting it to keep the correct fistmele.
Once again I can't thank you enough for selecting a more perfect piece of wood for my first bow and it has made

me an instant lover of Osage Orange,I shall definitely be ordering from you again.I am moving to the states in May

and will be living in Virginia so maybe I could come and visit your workshop.

Trevor Harding
Japan 4-10-03
==========

Hi guys,

I bought an Osage stave from you back in January. You had it shipped over to Northern Ireland in about two weeks... I have been working quite hard on the stave, doing everything by hand. Well, it has been finished for a while now, though I did not yet have the chance to use it. This evening however, I did for the first time. And I am very happy that the bow shoots enormously good! There is a little hand shock, but overall, it performed much better then a commercial recurved bow I used to have of about the same poundage. I have included a few photo's in this e-mail, though I don't yet have any photos from the finished bow. The bow now shoots at a poundage of about 43. I am very happy!

Thanks very much, and I hope to do business again soon!
Anthonio Akkermans
4/27/03
==========

Jamie

The Stave was great, I wish I could work a Stave that gorges every time. It was exceptionally straight and no knots at all, unheard of in Osage in Kansas. The bow has virtually made itself. I can hardly wait to shoot it at the Pawhuska shoot. These staves are worth every penny and then some. Thanks much. If your ever down this way swing through and visit Look forward to meeting you

Robert Rasico
4/28/03
==========

James,

I bought an osage orange bowstave from you about
a year and 3 monthes ago. With your advice and
a copy of Al Herrin's Cherokee Bows and Arrows
plus lots of other reading and work I have a
bow that draws about 30 inches at 60lbs. It
has a 71 inch rawhide bowstring and the length
from nock to nock is 74.25 inches. Im still
polishing up the handle but it shoots nice!
Im shooting goose feathered arrows with
sharpened bone points.

This bow is my second attempted longbow. The
first one was a hard maple longbow that
developed a split on one end and will now have
to become a short bow. OH well! :) I did
learn alot from that experience.

I am having alot of fun with my new hobby and
wanted to thank you and your father for helping
me out and answering my questions.

Thanks for your help.

Sean Duffy
Pennsylvania
==========

Thank you Jamie for picking me out such a nice stave..Those 3 years of persistent work with other bow wood (and many broken ones too) only kinda prepared me for the challenge I faced with Osage. I have no idea on how many hours I worked on it, but a spiritual connection is present when working with such a challenging wood. I just received Cherokee Bows And Arrows by Al Herrin..that your Dad sent me EXCELLENT BOOK!!!

Take Care,
John E. Gray
Alaska
=====

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James works hard to obtain customer satisfaction from each Osage Stave.Every Osage Stave has many hours applied to it from picking the tree to placing the Osage Stave in a building to season.

This is a bunch of Osage Staves split out in 2003.We did several hundred that year.

Where can you find nicer Osage Staves than these? Just a few of the best we are splitting out for 2004 year.These are straight and pretty clean Osage Orange.For several months each Spring all we do is Hand Work our Osage Logs into Staves.No Bark! No Sapwood! How do you grade a Stave as to quality with the bark and sapwood intact? You don't.Those have to be removed to determine the true quality of the Osage.Buying Osage with bark and sapwood intact is not a good idea.

Building the Osage Bow | Osage Orange Profiles | Osage Orange Staves and Billets | Osage Bows that are for Sale | Osage Orange History | More Osage Bow Pictures | Roughing out The Osage Bow | Bow Staves | Osage Orange and Bugs | James Easter Bowyer | Des Moines River | Osage Staves 2002 | Osage Walking Sticks | Draw Knives | Osage Orange Notes | Archery Books

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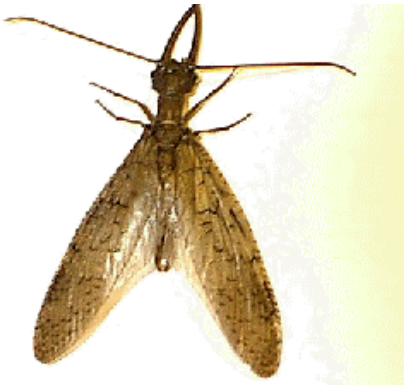
OSAGE ORANGE AND BUGS

Bow Staves James Easter Bowyer

Jaws of Steel on Bottom of Page.They eat Osage like butter.
Also read and see about the Medieval arrowheads below.

Over 6000 acres in Lee County Iowa are included in state owned public hunting areas.Iowa deer are fed the best of Iowa farmers corn and beans.Good grasing land abounds as does the heavy timber for day rest.Iowa is becoming an excellent place to find that Trophy Buck.Out of state licenses can be purchased by phone at the state DNR offices.

The deer harvest has been in the 80,000+ for a few years and the DNR has managed the herds very well.



This is a Dobson fly. He spent a few years as the Hellagramite;good catfish bait.

As you travel this site you will find something about the Osage Orange on about every page.The Winter of 2002 I intend to add much more to these 11 pages.Hopefully about

Osage,English Bows,English Arrow Heads,and more on the Bowmen of England.Thank you for dropping by.

Please E Mail or call James Easter anytime about Bowstaves or Osage Bows. 319 835 5892 Donnellson,Iowa.

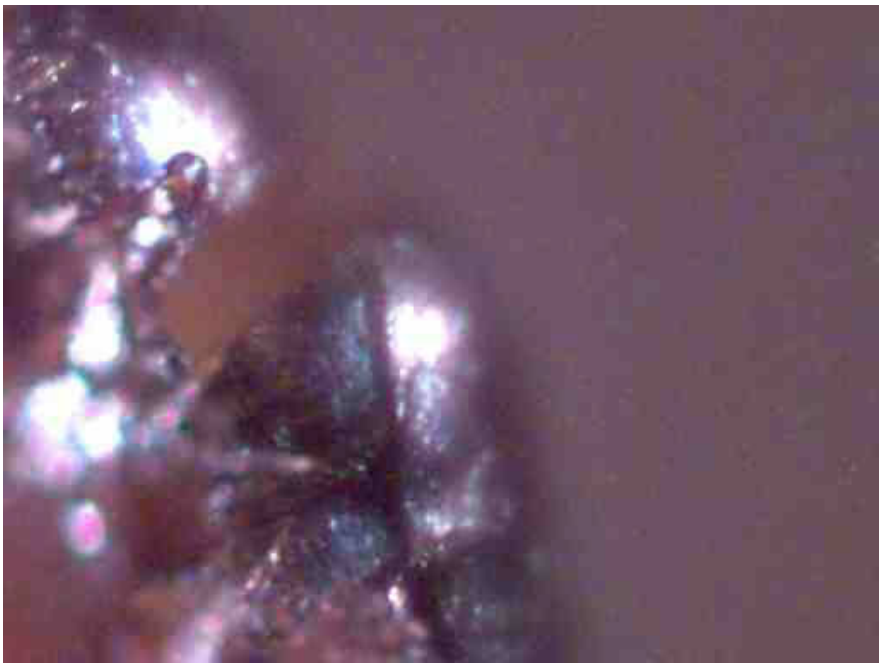
Buggs on and in the Osage Orange

Long-horned beetles or round-headed borers (Coleoptera: Cerambycidae)
Adults are called long-horned beetles because their antennae are occasionally longer than their bodies. Larvae tunnel underneath bark and into the heartwood. The tunnels are oval to almost round in cross section because of the round shape of the larvae (See Fig. 2). Larvae of some species are legless, but most have three pairs of small legs on the first three segments behind the head capsule. While tunneling, larvae continually pack their tunnels with excrement (frass) which looks like compressed wood fibers, or push frass out of the holes they produce. This excrement, along with the sap exuded by the plant in response to the damage, is often visible on the outside of infested trunks or branches. Many species of beetles belong to this group, but most are secondary invaders. Some examples of long-horned beetles are described below.

Red-headed ash borer (Neoclytus acuminatus) is one of the most common wood-boring beetles. It has a narrow body with a reddish thorax and light brown wing covers marked with four yellow lines on each. The yellow lines are slanted downward toward the middle, giving the appearance of a "V" across the back. The antennae are rather short and the long legs are thin and fragile. Red-headed ash borers feed in many species of wood including ash, oak, elm and even grapes. Adults can be found on dead logs.

Red-Headed ash borer found in Osage Orange
before debarking and Sapwood removal.

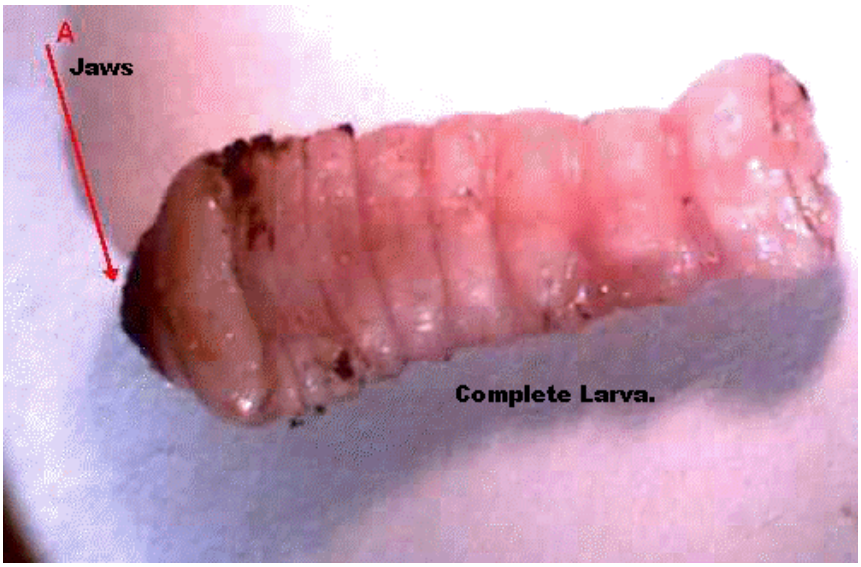
These are trails left by the Larva you see buried in the center.You
can also see the frass left behind in the burrow.



A picture of the Jaws of Steel at 200X,you can see the armor
plating aroung the Jaws.Item A are the opened Jaws.

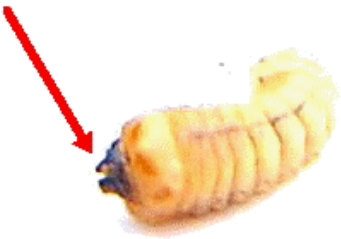

A


JAWS
Jaws at 60X


A
Jaws
Complete Larva.

These Larva were found in 4 in. square.

Jaws of the Larva.



These will eat through to the Heartwood so it is necessary to strip the Bark and Sapwood from the Osage Orange.This is also referred to as the Branded Stenocorus.Reference found 1879 vol. 18 Scribner's.The larva of this species lives in the Hickory through the trunk of which it bores and forms long galleries;often these larva continue in the wood even after it has been manufactured into furniture and they continue to bore and excavate until the wood is perforated and damanged.

THE COLLECTING OF ANCIENT ARROWHEADS & SPEARHEADS

Hold History In Your Hands

By Ed Lee

After more than 40 years in the business of selling antique rarities ranging in value from under $50 to $1 million, I am always interested in drawing more attention to the collecting of antiquities, rare coins and related. This article will focus on collecting ancient iron arrow and spearheads and is by no means meant to be an in depth study of this fascinating subject. For those who wish to pursue it in greater detail I have listed some top reference works at the tend of the article. I strongly recommend taking an educational approach to this, as it will greatly enhance the collecting experience, as well as providing you with some consumer protection.

First of all, I am focusing on iron weapons because they are more affordable in general than Bronze-Age weapons and because it eliminates the problems associated with bogus bronze patina and sand cast fakes that plague ancient bronze artifacts and weapons. I don't know of even one dealer who hasn't gotten stung with bad "ancient" bronze items. In fact, it's so bad that we have to first examine every item with a 10 x glass and then test the bronze with heat and/or solvents.

Therefore, ancient iron weapons are a great place to start collecting and to learn as you go along. There is little capital risk, especially if you buy from dealers who get their weapons directly from reliable sources in Europe, which is the case with my firm.

1) There is ongoing disagreement amongst dealers, collectors & even experts as to the Provence (where it was found) and era (age) of these fascinating artifacts because they were not dug by archeologists who carefully uncover a site. Then they use radioactive carbon dating to test the organic remains found at the various historical level they "peel" back as they dig deeper. Their assumption is that if the organic remains found at a certain level date at circa 50 BC or 1450 AD the iron, pottery and other non-organic remains are also circa 50 BC or1450 AD. This is scientific, accurate and very expensive work.

2) Therefore you often see these arrow/spearheads described as "Roman," which actually means Roman era, as they could have been used by the Romans, their allies or even their enemies. This is a substantial period of time ranging from BC to 476 AD for the Western Roman Empire...the Eastern Roman Empire lasted far longer. Ancient Rome also covered a wide swath of the "known world" ranging from England to the Middle East and even parts of Africa.

However, it seems that most of the ancient iron arrow/spearheads are coming from Eastern Europe and from metal detector finds in most of the countries of Western Europe. "Detecting" is a very popular hobby in Europe as it is in the US. Some unknown numbers also come from collections put together some time ago.

In the countries where metal detecting is allowed, Britain for example, one only needs permission of the land owner and the knowledge that if you got really lucky and made a major discovery, you have to notify the government in case they want to purchase any items which they may not have in their museums. And there have been stupendous finds in England and elsewhere in recent times.

3) Although we all know what the "world's oldest profession is," another very early one is grave robbing, which plagued the ancient Egyptians despite severe punishment that involved torture followed by death. But, hunger, poverty and greed are powerful motivators both in ancient times and now. This means that there are a large number of diggers and detectors at work [whenever and wherever] who go about their legal or illegal business as time and circumstance permit.

When amateurs dig away, this disrupts the layers of history that archeologists might otherwise carefully uncover, and mixes up the dates of the artifacts being recovered. It also hides the Provence as many of these people don't talk about their work or hobby.

4) Another problem in accurately identifying the arrow/spearheads is that there was a large amount of trade going on in ancient times. I have found Saxon spearheads in groups of arrow/spearheads supposedly found in Eastern Europe.(1) And certainly most of what is found is a mixture of Roman era, Dark Ages & Middle Ages. Despite the uncertainty involved in this non-professional approach to the discovery of these artifacts there are advantages which include affordability, a wonderful mixture of types of weapons available, and the need to research them yourselves...or to even clean them up to your satisfaction so that your archeological interests can also be met. In fact, these advantages are what has caused me to both collect and deal in ancient weapons including arrow/spearheads. My original intent was to just buy and sell them, but I found them so interesting that I decided to start a collection while prices are still low. It's one thing to see them in a museum showcase behind glass, and quite another experience to hold them in your hands and examine them under a magnifying glass, which helps account for their growing popularity.

Might prices rise? A very real possibility especially when the dollar declines in value against the major Euro currencies. Most important of all, if the US or other major Western countries decide to ban the importation of all ancient artifacts prices, will soar. Collectors and dealers view it in their own way, but governments are not equipped to decide whether an artifact is relatively common or a museum piece. So they use simple rules such as if it is ancient and made of gold, they may simply seize it. Or, if it is large and looks like it belongs in museum, they make also keep it or simply put it in storage and forget about it. Or even conduct their own auctions.

To be frank, the illegal traffic in high- end antiquities, especially from Italy and Greece, is a $ billion a year business. Italy alone has about half of the best remaining archeologically important tombs left in the world.

BASIC FACTS ABOUT BOWS & METAL ARROWHEADS

In order to understand the importance of iron arrowheads it is crucial to understand the importance of bows. Let's start with some statistics. A modern archer can send an arrow as fast as 300 feet per second (fps) while the speed of sound is 1,000 fps. That's about 200 mph. The record for distance with a bow shot in the traditional way is close to 950 yards which is more than a half-mile. Therefore, you can run from an arrow but you can't run fast enough...or far enough. Literature mentions Turkish bows with ranges exceeding 850 yards which many "experts" scoffed at until a real expert in 1959 shot an arrow from a Turkish bow in the traditional way, and the distance traveled was measured at about 937 yards, which confirms the historical record.(2)

There have been many famous bows in the history of warfare such as the English Long Bow which made them almost invincible as they could rain death on their enemies from a distance that opposing archers could not match. This large powerful bow was about 5-6 feet from end to end{ Modern experts put their range at 180 to almost 250 yards.} (3) And they were quick to "re-load" their bows so there was a constant barrage of arrows falling on their enemies. By "quick" I mean 10-12 arrows per minute with some experts referring them to the "machine guns of their time."(4) The onset of guns and artillery eventually ended the supremacy of the English Long Bow and others, but it didn't happen overnight.

However, the invention of crossbows and other weapons of mass destruction, such as the catapult and the balista, greatly changed warfare long before gunpowder did...as did the increasing use of armor. The catapult allowed heavy rocks to be thrown a considerable distance and resulted in victories even against enemies with artillery. They were especially effective against siege towers made of wood which were equal in height to the walls of the castle being attacked. The balista was a weapon related to catapults, but which fired stones or heavy javelins weighing 6-7 pounds each, and with ranges of up to 450-500 yards. Imagine the force of impact of such weapons? After all, force of impact is mass times speed.

Since this article is slanted towards arrowheads I won't go into crossbows too much except to say that the Chinese invented a multiple crossbow capable of shooting 15 arrowheads in 15 seconds. Simple arithmetic states that 100 soldiers standing on the Great Wall could unleash 1500 arrows against an attacking force which was only able to return 200 arrows in the same 15 seconds. (5) This means that the Chinese could rain down arrowheads at about 6,000 per 100 soldiers per minute while being on the receiving end of only 800 arrows. Any gambler would love those odds if betting on the Chinese.

The Chinese then invented a crossbow that could fire two arrows per "shot" thereby doubling the above murder & mayhem to something on the order of 12,000 arrows per 100 soldiers per minute vs the same 800 arrows shot at them. Then the Chinese made their arrows far more deadly by dipping some of them in a particularly deadly poison taken from a tree still growing in China. Although their enemies also used deadly poison on some arrows the numbers clearly and overwhelmingly favored the Chinese defenders with crossbows that truly were the equivalent of machine guns. I say "some arrows" were dipped in poison because they obviously had to be very careful in handling their own poison arrows and must have worn gloves for protection. By accident I saw a modern demonstration of how deadly this poison is and it seems that even a relatively minor wound would result in death, especially as there was no antidote.

Basic Types of Iron Arrowheads

Although there are many different types and sizes of iron arrowheads there are only a few basic types which are: 1) Anti-infantry. 2) Armor piercing and 3) Anti-calvary or anti-knight, being designed to bring down the horse along with the rider. So let's take a look at some of these starting with the anti-infantry. In general these are quite broad compared to the armor piercing arrowheads and totally different to the anti-calvary types. The armor piercing arrowheads were relatively heavy with sharp points whether we are discussing Chinese or European arrowheads. The ones designed to bring down horses were designed to break off when anyone tried to remove them from a horse, thereby requiring them to be pushed through, and causing maximum damage to the poor animals. Some call these "swallow-tailed" as they resembles the wings of a bird swept back. This is one reason why so many have said that "war is hell." Today war is sanitized, but back then it was very "up close and personal."

Iron Spearheads As with iron arrowheads there is considerable controversy among collectors, dealers and experts as to what an arrowhead is and what a spear is. Some say it's the length while others say it's the weight. Others say that if its socketed, it's a spear. Yet I have seem socketed "spearheads" almost as small as the smallest arrows. However, the truth is that in many cases we just don't know with any certainty what's what and there are virtually no books on iron arrowheads and not many on iron or bronze spearheads. Obviously if the arrow/spearhead is large it must be a spear, but who is to determine exactly how large is large? The best solution is to buy books, then take photos of the items in your collection, and go to European museums. They should have some on display with data provided by archeologists. {Ask if they will allow photographs of their weapons} I recommend going off- season and asking some museum professionals to take a look at the photos of your collection...perhaps even make an appointment in advance to insure that someone will see you? The fun of identifying one of your treasures is a major reason to collect these tangible pieces of ancient history. You might call it tracing the genealogy of your weapons. After all, in most cases these were the very weapons used by our European ancestors...at least those lucky enough to have survived countless wars over 25 centuries. Thus, they are also windows into our own past.

And if one ancestor had been killed before fathering at least one child, we would not be here today...or not the person we are today. It's like Star Trek...if someone or something interferes with time it can change many things over the ensuing centuries. In Sci Fi it's usually some time traveler whereas in the real world the culprit may have been one iron or bronze arrowhead or spear. Isn't life interesting?

Sources

1) Spearheads of the Anglo-Saxon Settlements by Swanton. A classic book and long out of print. Copies are sometimes available at European booksellers who handle history and archeological books. That is where I got mine.

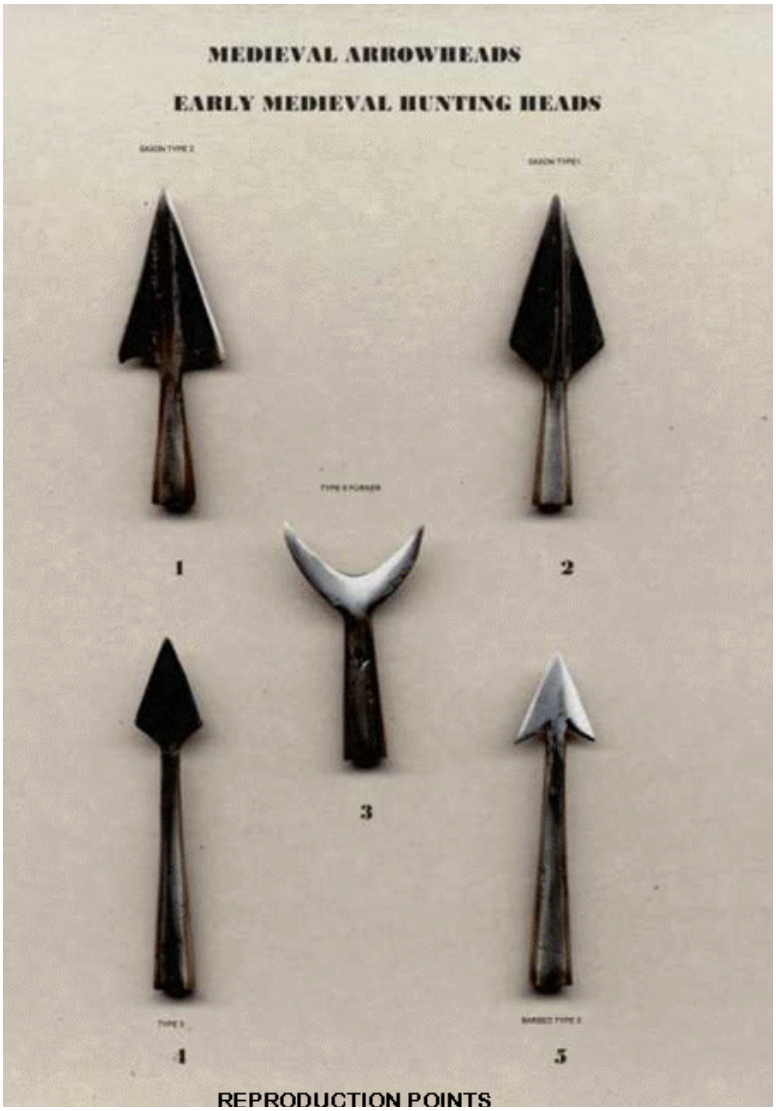
2) The Book of the CROSSBOW by Ralph Payne-Gallwey. Dover Publications, New York

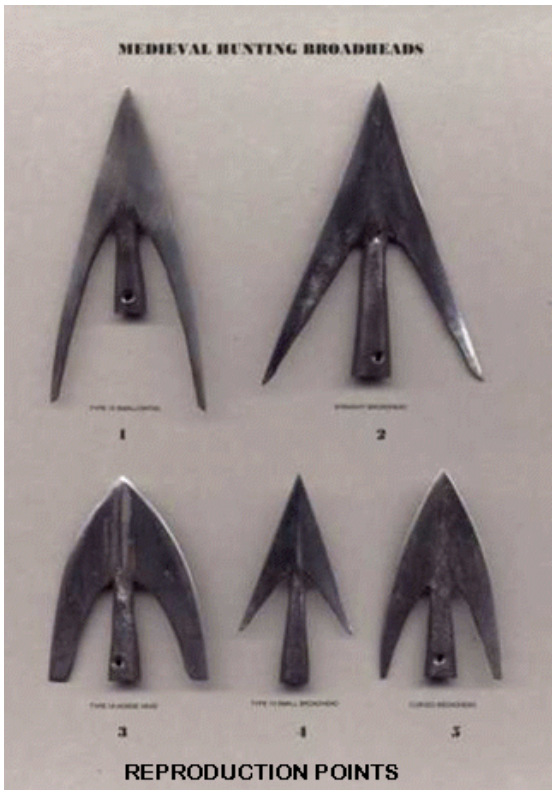
3) The Medieval English Longbow by Robert E Kaiser, M.A. First published in the Journal of the Society of Archer-Antiquarians. Vol 23, 1980.

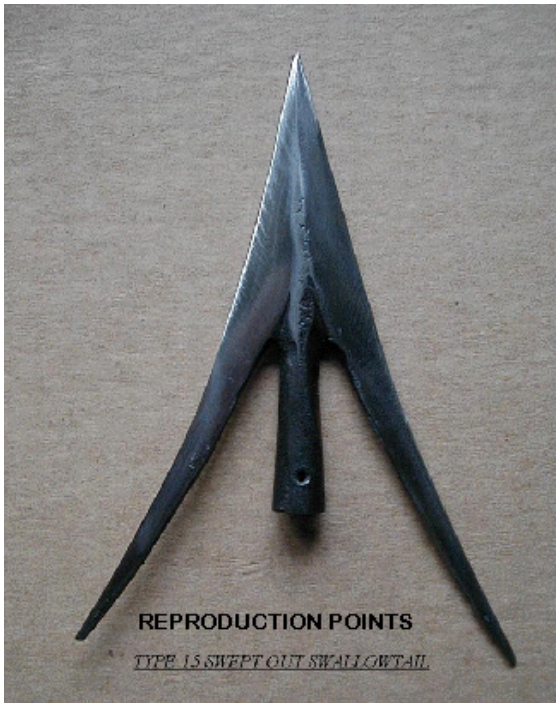
4) The Book of the Longbow, by Elmer, R. & Smart. Doubleday.

5) The Book of the CROSSBOW as above.Also recommended: Ancient Chinese Weapons- A Collection of Pictures. Paragon Books.The Origins, Evolution And Classification of the Bronze Spear-head In Great Britain & Ireland.

You can find Ed Lee on E Bay as Seller leecoins@aol.com .




MEDIEVAL HUNTING BROADHEADS
1
2
3
4
5
REPRODUCTION POINTS


REPRODUCTION POINTS
TYPE 15 SWEPT OUT SWALLOWTAIL

Building the Osage Bow | Osage Orange Profiles | Osage Orange Staves and Billets | Osage Bows that are for Sale | Osage Orange History | More Osage Bow Pictures | Roughing out The Osage Bow | Bow Staves | Osage Orange and Bugs | James Easter Bowyer | Des Moines River | Osage Staves 2002 | Osage Walking Sticks | Draw Knives | Osage Orange Notes | Archery Books

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JAMES EASTER BOWYER

OsageOrange Bugs

Des Moines River

This was one of my Bows on exhibit at the Phipps Observatory in Pittsburg,Pa.

I am not currently making any Bows to custom order as I have several orders to fill.I will be making Bows again in the Winter of 2005 but not custom Bows.I will make Bows by letting the wood give up the draw and pull from each stave and then I can fill orders by matching my completed Bows to the Customer.Making the Osage Bow correctly is a slow process and I can not rush it.

Thanks to my many customers my Osage Stave business has grown nicely and it takes several months to process my Osage,Hackberry,and Black Locust inventories to provide quality Staves to Bowmakers.Producing these top Staves requires I am as indulgent to each Stave as I am in making each Bow.

As always I thank each and every customer who buy my products and I am always there for support if needed.

If you are thinking of making your own Bow I have the Stave or Staves for you.

You can only purchase from my website by phone or email.

I feel Primitive Archery is a personal experience and Electronic Shopping Carts and Automatic Checkouts takes away from this.We enjoy talking to each customer,answering their questions,and making their Bowmaking a fun experience.

Please surf this site often as it contains a lot of information as well as my other sites on Primitive Archery.

Thank you,
James Easter,Bowyer
2603 148Th Ave.
Donnellson,Iowa 52625
319 835 5892/319 835 0916
My web sites on Archery:
www.osagebow.com
www.osageorange.com
www.bowstaves.com
www.osagestaves.com
www.croton-iowa.com
www.desmoinesriver.com
www.osagewalkingstick.com
www.osageorange.com
www.archerybooks.com
www.drawknives.com

As usual you will find no Pricing on any of my Web Sites.Please feel free to call anytime or email and we all will be glad to help.

E-Mail

osagebow@iowatelecom.net

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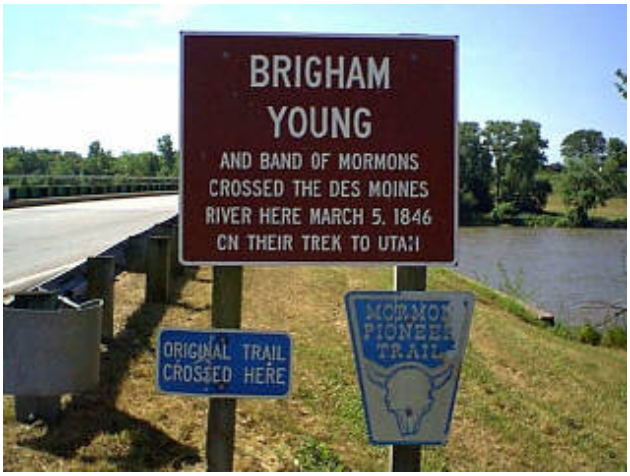
DES MOINES RIVER AT BONAPARTE,IOWA

James Easter Bowyer

Osage Staves 2002



One of the many Mormon Trail Markers in Lee and Van Buren County Iowa.This is on the Des Moines River at Bonaparte.

View looking up river [West] from the Des Moines River bridge at Bonaparte,Iowa.This river is a canoer's heaven for the 400+ miles it meanders through Iowa.The River will take you back in time with it's remote path.

It does not get any better than this to get away from the fast pace of the city.We are looking East from the Des Moines River bridge at Bonaparte,Iowa.

You have to have some low water too.This allows you to wade and fish those hidden spots you were kept out of during the high water.Looking for artifacts or just walking the river shore is fun.

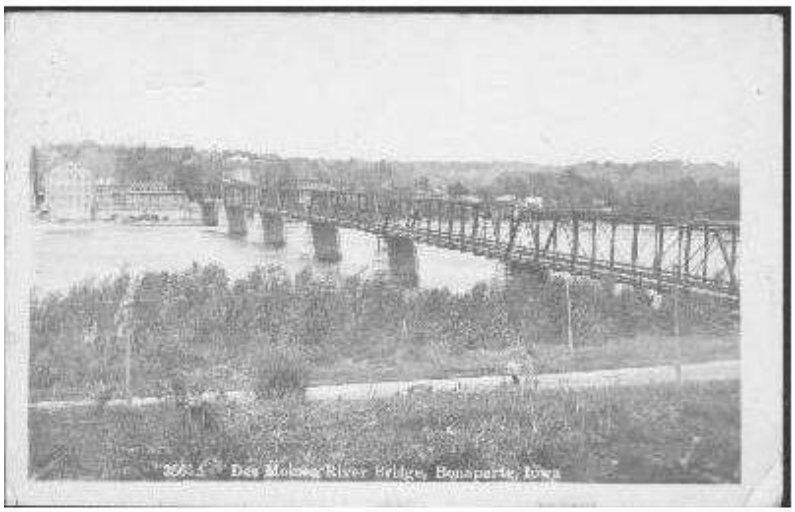
Sand bars,rock bars,and sometimes a waist deep spot are all part of the enjoyment here.You can also walk across the river without going above your knees if you are careful.September usually brings low water levels.

Bonaparte,Iowa

Upriver to Bentonsport,Iowa

Located a few miles up the river is Bentonsport,Iowa.This is a very quiet and scenic town taking you back in time.You can walk across this bridge or walk out and sit in on the many benchs there and relax as the water flows by below.

MORE ON THE DES MOINES RIVER


Des Moines River Bridge, Bonaparte, Iowa


North Side Front St, Bonaparte, Iowa.


Park, Bonaparte, Ia.
Photo by Cummings


BAPTIST CHURCH, BONAPARTE, IOWA
Dear Madge —
We received your


front street Bonaparte Jan. May 3 1917

ALL THE ABOVE PICTURES ARE OLD BONAPARTE IOWA ERA.

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OSAGE ORANGE STAVES FOR 2002

Des Moines River

Osage Walking Sticks

FIGURE 93. *Arrows.* 1. *Eskimo.* 2, 3. *North American Indian.* 4, 5. *Pima.* 6. *Cheyenne.* 7, 8. *Apache.* 9. *Sioux.* 10. *Navaho.* 11. *Sioux, stone head.* 12. *California, notched to receive a stone head.* 13. *Tosahumac, Mexico.* 14. *Michol, Mexico.* 15. *South America.* 16. *Guagignon.* 17 to 20. *Besanii.*

Congo. The heads are of iron and the barbs below them are of wood. 21. Congo. 22. Pigmy, Congo. 23. Dahomey. 24. East Coast, Africa. 25 to 28 and 30, 31. Guiana. 29. Terra del Fuego, obsidian head. 32 to 38. Central Africa. 39. Mandingo. 40. Somali. 41. Central Africa. 42. Masai. 43. Central Africa. 44, 45. Bushman. 46, 47. Congo, dwarf tribes.

THESE PLATES ARE FROM THE BOOK "A GLOSSARY OF THE CONSTRUCTION,DECORATION AND USE OF ARMS AND ARMOR WRITTEN BY STONE.

FIGURE 92. *Arrows. 1 to 16 Chinese. The first ten are in pairs, each pair showing two views of the same head. 3 and 4 are military arrows of the end of the 19th century. 15. Feathering of an ordinary arrow. 16. The feathering of a large whistling arrow. 17 to 21. Cashmere, iron heads.*

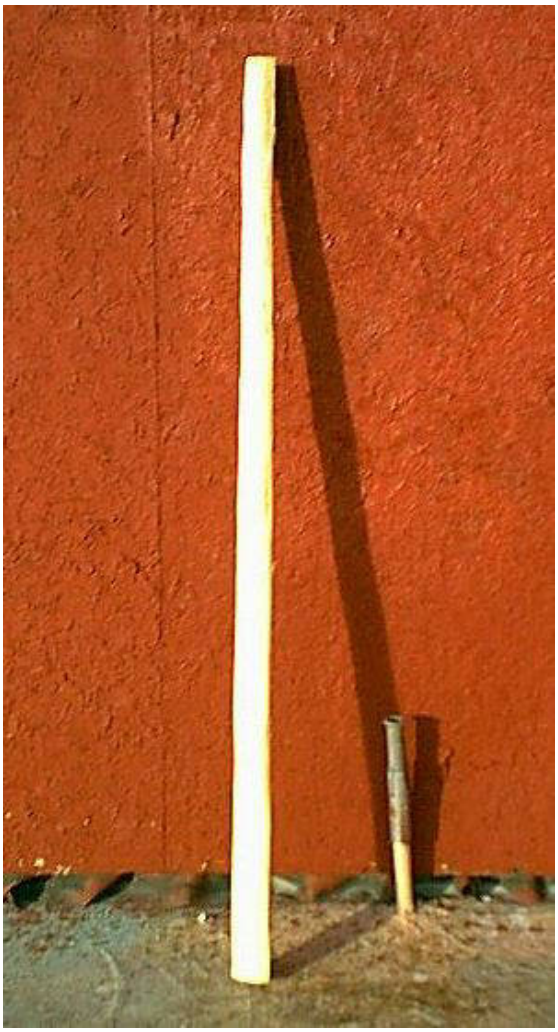
22 to 25. Sikkim. 26. Korea, square iron head. 27. Ainu, bamboo head with a recess for poison. 28. Cambodia. 29 to 32. Java, round iron heads. 33 to 37. Turkey, 17th century. 36 and 37 are the point and feathering of a flight arrow. 38. Mindoro, wooden head. 39. Silkiot, wooden head. 40. Mangayan, wooden head reed shaft. 41, 43, 45. Ilongot, iron heads. 42. New Guinea, triangular head and round shaft cut from a single piece of wood. 44. Tiruray, wooden head, reed shaft

THIS OSAGE ORANGE LOG WEIGHS ABOUT 400 POUNDS.GETTING A HERNIA LOADING IT AND UNLOADING IT IS A FIRM POSSIBILITY;NOT TO SAY THE SMASHED TOES.REMEMBER JAMES HAND SPLITS ALL THESE OSAGE LOGS AND ONE LIKE THIS CAN TAKE A DAY TO SPLIT IT AND MOST PEOPLE ARE NOT UP TO THE CHALLENGE.IT IS HARD WORK.THEN YOU MUST REMOVE THE BARK WITH A DRAW KNIFE.

THERE ARE NO POWER TOOLS USED AFTER THE TREE IS FELLED AND THE ENDS ARE CUT! YOU CANNOT GET GOOD STAVES WITH BAND SAWS AND LOG SPLITTERS.THIS IS PRIMITIVE ACHERY AND THE FIRST THING WE WANT TO DO IS CHEAT THE SYSTEM.WELL WE DO NOT CHEAT THE SYSTEM.WE WANT OUR CUSTOMERS TO HAVE THE BEST OSAGE WE CAN PROVIDE AND WE BELIEVE THIS IS THE WAY TO DO IT.

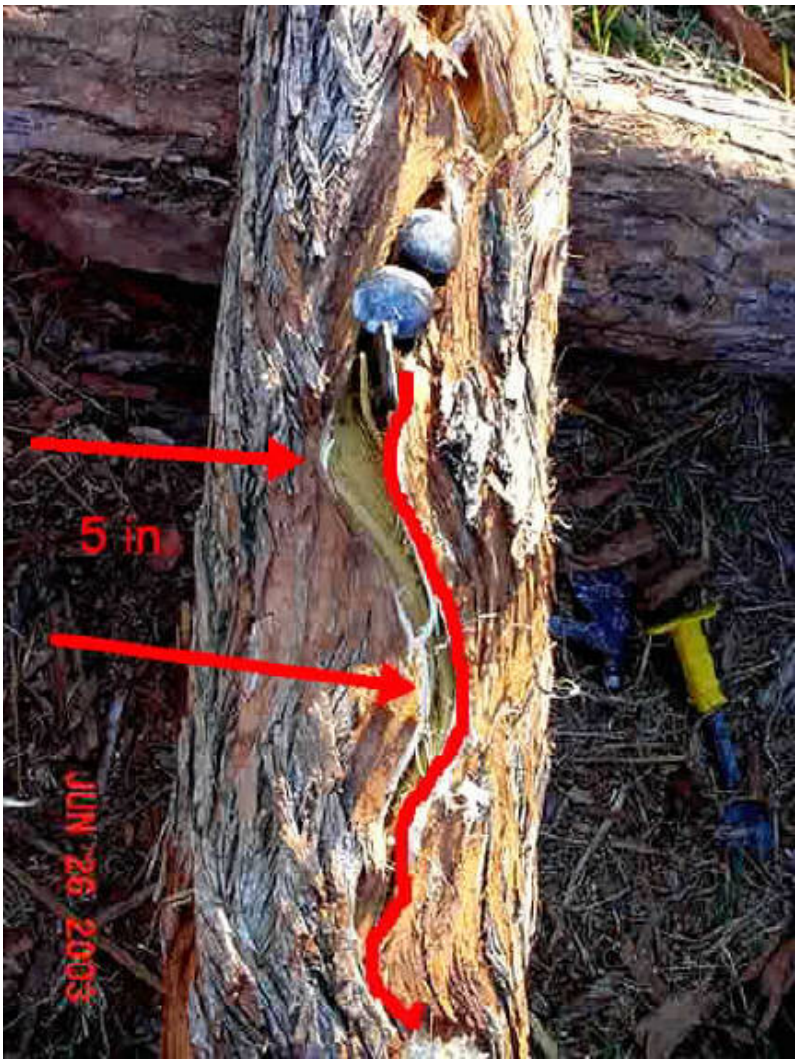
WE WANT TO THANK ALL OF OUR REPEAT CUSTOMERS AND NEW CUSTOMERS WE AQUIRED IN 2002 AND HOPE TO SERVE THE PRIMITIVE ARCHER'S NEEDS IN 2003.

THANK YOU.



OSAGE ORANGE STAVE

THE STAVE BELOW WAS ABOUT 12 INCHES IN DIAMETER AND THE BARK TWISTED AT 45 DEGREE ANGLES RIGHT AND LEFT.AT 10 FEET LONG IT DEFIED THE WEDGES AND WE HAD AS MANY AS 10 IN IT AT ONE TIME;SPACED ALMOST TOGETHER.THIS LOG DID NOT WANT TO GIVE UP TO THE SPLIT.MOST CHARACTER BOWS COME FROM STAVES PROCURED FROM THIS TYPE OF OSAGE LOG.THERE WERE OVER 4 HOURS DEVOTED TO GETTING JUST THE TWO STAVES YOU SEE PICTURED.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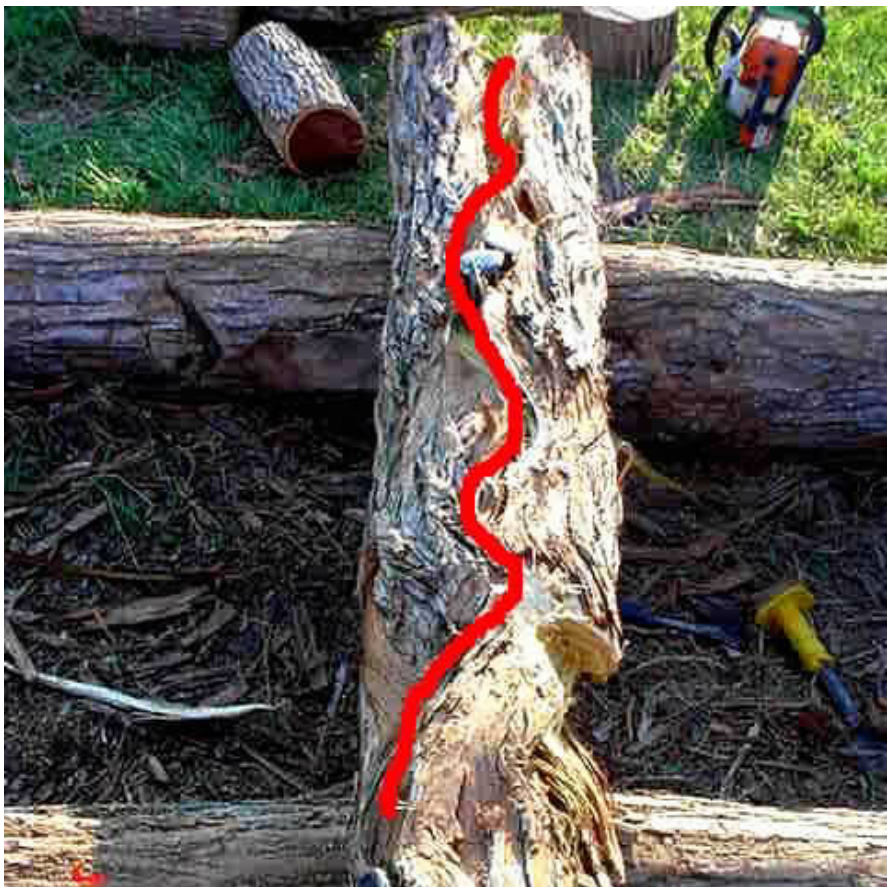


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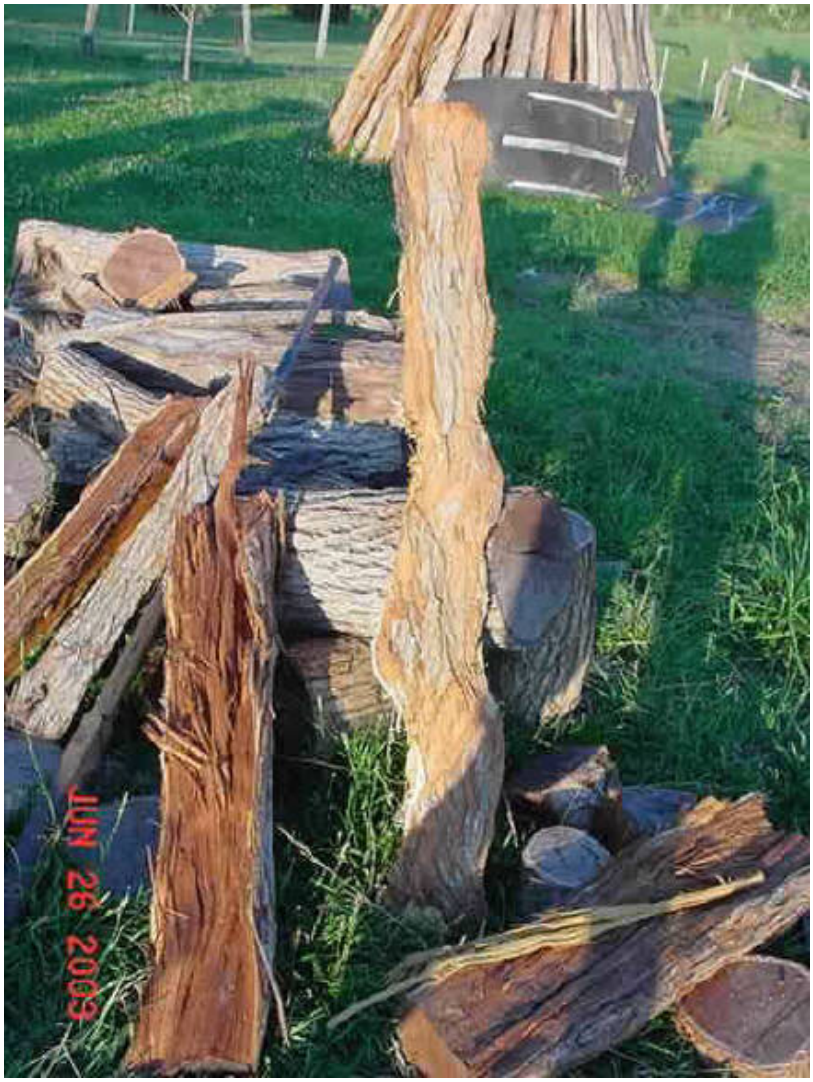
JUN 26 2003

THESE DOGS WANTED SOME RECOGNITION;SO HERE THEY ARE.MAX ON THE LEFT IS MARIA'S DOG,MY WIFE AND I CLAIM BRANDY,JAMES' HAS BOB (BRANDY'S PUP,MAX'S SON) AND JACK.ALL ARE LESS SMART THAN BRANDY.SHE IS THE SMARTEST.ALL ARE PART OWNERS OF THE HOUSE AND ACT THE PART.NO KENNEL TIME FOR THEM;THEY LIKE HEAT AND AIR CONDITIONING.SHOULD MAKE THEM PAY RENT BUT JACK IS A PRIME HUNTER AND HAS TAKEN TO BOB AND IS TEACHING HIM TO BE AS GOOD,MAYBE YOU GET ONE GOOD BIRDDOG IN A LIFETIME AND WE HAVE FOUR.

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This page last modified on Wednesday,January 21,2004

OSAGE WALKING STICKS

STAVES 2002

Draw Knives

WE CAN FURNISH YOU THE OSAGE ORANGE WOOD TO MAKE A NICE WALKING STICK AS SHOWN.THIS WOOD ONCE IT HAS HAD THE BARK AND SAPWOOD REMOVED,WORKED TO YOUR STYLE, AND A NICE HANDRUBBED FINISH APPLIED HAS NO ENEMIES.IT CAN BE LEFT OUTSIDE AND NOT ROT,IT ONLY GETS HARDER.IT IS VERY HARD AND STRONG TO HANDLE YOUR WEIGHT IN THE HIKING TRAILS OF AMERICA.THERE IS NO EQUAL TO THIS WOOD FOR YOUR WALKING STICK.

WE NEEDED A PLACE FOR OUR OSAGE BOW STAVES THAT SIMPLY WERE NOT GOOD BOW MATERIAL.

THIS IS WHAT WAS DECIDED AS THE BEST USE FOR THEM AND YOU CAN NOT FIND BETTER WOOD TO HAND FASHION YOUR STICK FROM.TAKE A CHALLENGE AND TRY YOUR HAND AT MAKING YOURSELF A WALKING STICK.IT IS NOT HARD TO DO AND WHEN FINISHED YOU WILL BE PROUD OF YOUR WORK.

THE ABOVE STICK ON THE LEFT WAS MADE FROM A SPLIT OFF A LARGE OSAGE ORANGE LOG.THIS STICK WAS HAND FINISHED WITH DEER TALLOW.YOU CAN APPLY ANY GOOD OIL OR URETHANE FINISH TO THESE AS YOU DESIRE.YOU WOULD BE THE ENVY OF ALL ON THE HIKING TRAILS OF AMERICA WITH AN OSAGE STICK.

I CAN ALSO MAKE AN OSAGE WALKING STICK FOR YOU.EACH OSAGE STICK IS UNIQUE AND NONE ARE SOLD ANYWHERE BUT FROM MY SHOP DIRECTLY TO YOU THE CUSTOMER.

WE ALWAYS HAVE PLENTY OF OSAGE STICKS IN STOCK FOR YOUR ORDER.

THANK YOU

JAMES EASTER
2603 148TH AVE.
DONNELLSON,IOWA 52625
319 835 5892

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This page last modified on Tuesday, March 16, 2004

DRAW KNIVES

Osage Walking Sticks

Osage Orange Notes

I HAVE MANY ANTIQUE DRAW KNIVES FOR SALE.THESE ARE VERY NICE DRAWKNIVES FOR THE BOWYER AND WALKING STICK MAKER.

I use a drawknife probably over 600 hours a year and have for several years.Stripping Osage bark,sapwood,and making Osage Bows.The draw knives I am listing here are all used.I have not put a fine edge on each as each user likes a different sharpness.Besides learning to sharpen this knife goes with territory.

All have nice Handles and End Caps on the Handles and will last a Bowyer or Walkingstick maker a lifetime.

The ones I list can be turned upsidedown and also used as a scraper to remove the finer amounts of wood as you fashion your Bow.These can also remove the Bark and Sapwood from your Stave.

You may pay with PayPal by sumitting my email osagebow@iowatelecom.net and then filling out the part number,name,and size of the knife.

You may also call 319 835 5892/0916 and order with your credit card.Shipping UPS on any knife is $7.50 in the 48 states.We like to talk about Bow Staves so this way is more fun.

Here a few Excellent Draw Knives I have for sale.There are many new models out there for under $25 but you will never use one of them if you try one of these first.There is no comparison.Thank you.

James Easter
2603 148Th Ave.
Donnellso,Iowa 52625

319 835 5892,319 835 0916,641 891 1622

#252 8 INCH GREENLEE

#253 10 IN GREENLEE APR 4 2004

#254 10 INCH CRAFTSMAN 004


A REAL NICE LOOKING
KNIFE HERE FOR $53.00
PLUS SHIPPING.
#255 8 INCH CUT EASY
APR 4 2004


THIS IS A NICE
LIGHTWEIGHT KNIFE @
$42.00 PLUS SHIPPING.
#256 10 INCH WITHERBY
APR 4 2004


AN ATTRACTIVE
DRAWKNIFE FOR MANY
YEARS USE @ $48.00
PLUS SHIPPING.
#257 9 INCH CHIPAWAY

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This page last modified on Saturday, April 10, 2004

OSAGE ORANGE BOW NOTES

Draw Knives

Archery Books

I hope to find in my Archery archives a few interesting notes about Osage Orange Bowmaking.Some pictures and written material on Osage Bows as I can find them.

Please remember you can only order James Easter Staves by phone or email.We have Osage Staves,Hackberry,or Black Locust Staves.

Call 319 835 5892 or 319 835 0916 anytime to talk to James about Staves and Bows.

OSAGE ORANGE LONG BOWS—6'0" LONG

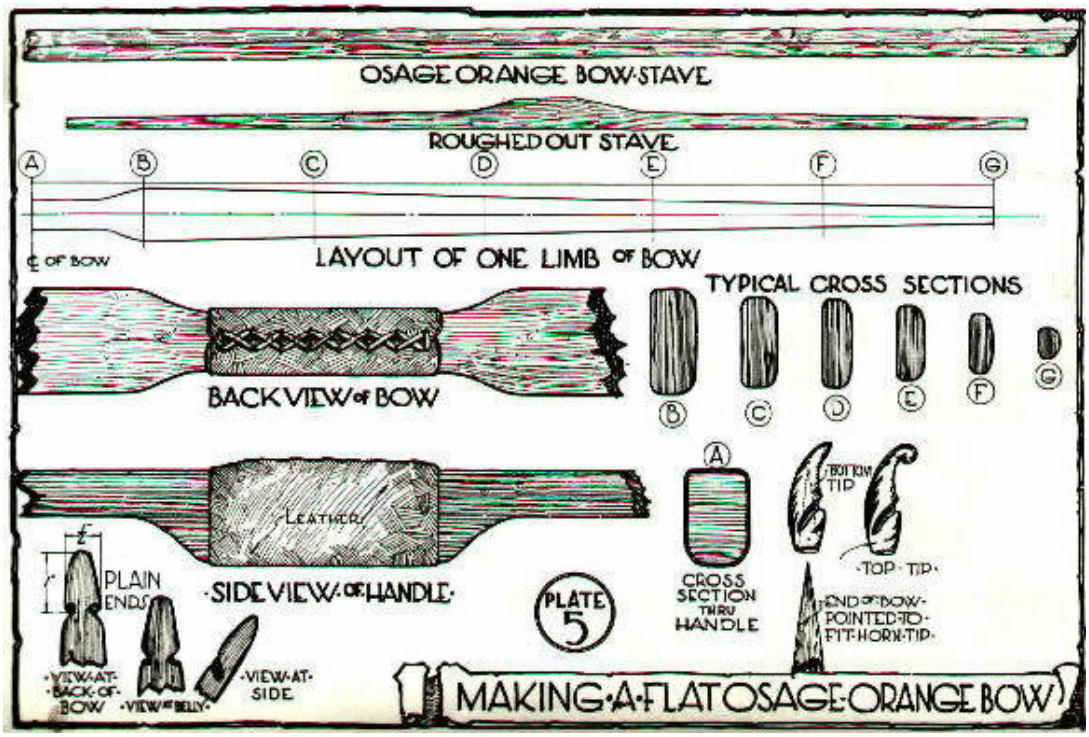
	43 Lbs.		45 Lbs.		55 Lbs.	
	Across Back	Back to Belly	Across Back	Back to Belly	Across Back	Back to Belly
At the Handle.....	17/16"	16/16"	18/16"	16/16"	19/16"	19/16"
6" Above Handle ..	16/16"	13/16"	17/16"	13/16"	18/16"	15/16"
12" " " ..	16/16"	12/16"	17/16"	13/16"	17/16"	13/16"
18" " " ..	15/16"	10/16"	16/16"	10/16"	16/16"	12/16"
24" " " ..	14/16"	9/16"	14/16"	9/16"	14/16"	11/16"
30" " " ..	10/16"	8/16"	11/16"	8/16"	11/16"	9/16"
At the Nocks.....	7/16"	7/16"	8/16"	8/16"	8/16"	8/16"

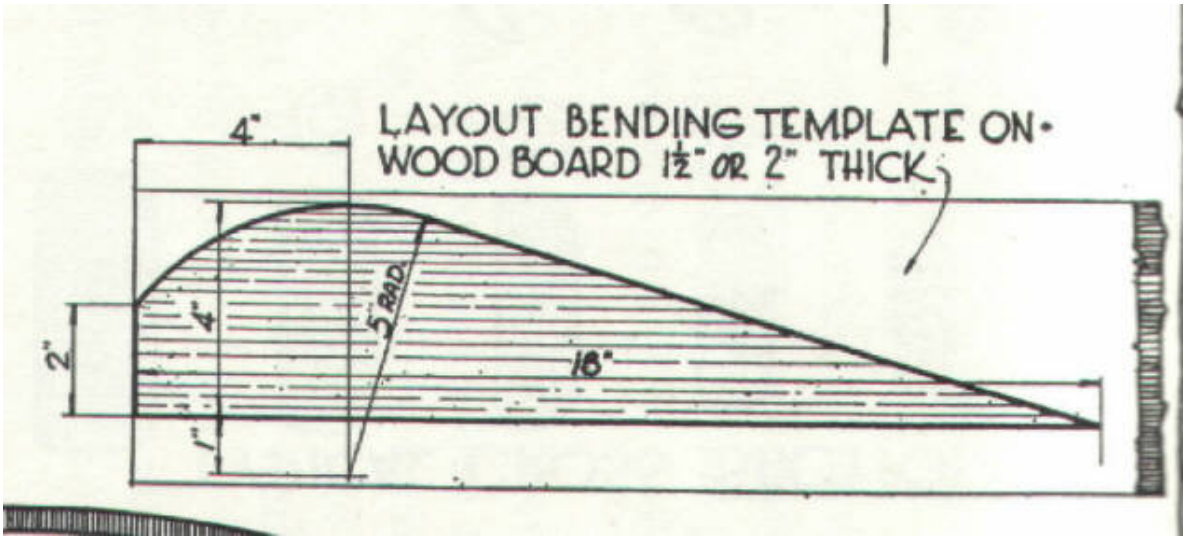
FLAT OSAGE ORANGE BOWS

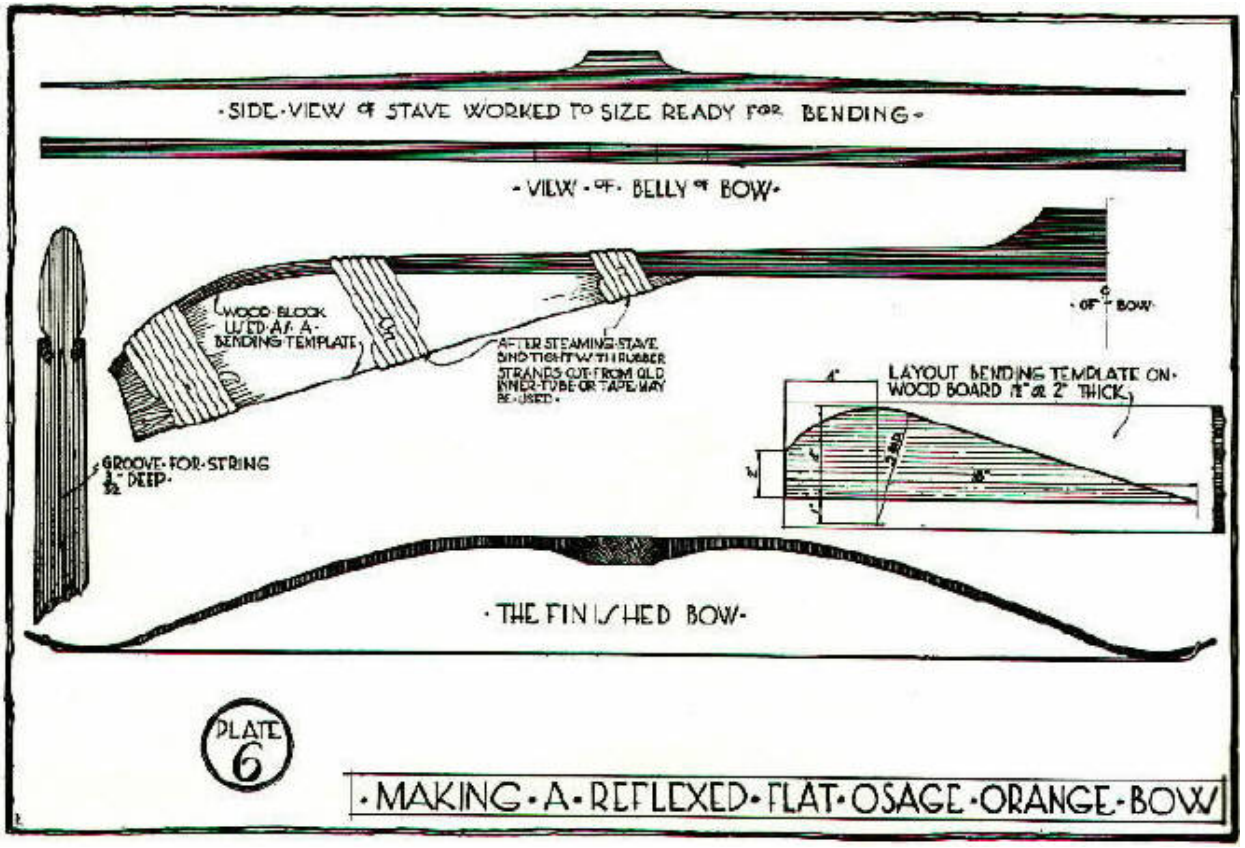
Osage Orange lends itself beautifully to the Flat, Semi-Indian Type of bow. Read again the section on making the Flat Bow of Lemonwood. With an osage stave 5'6" long in your possession, the first step is to transform it into a Flat Bowstave.

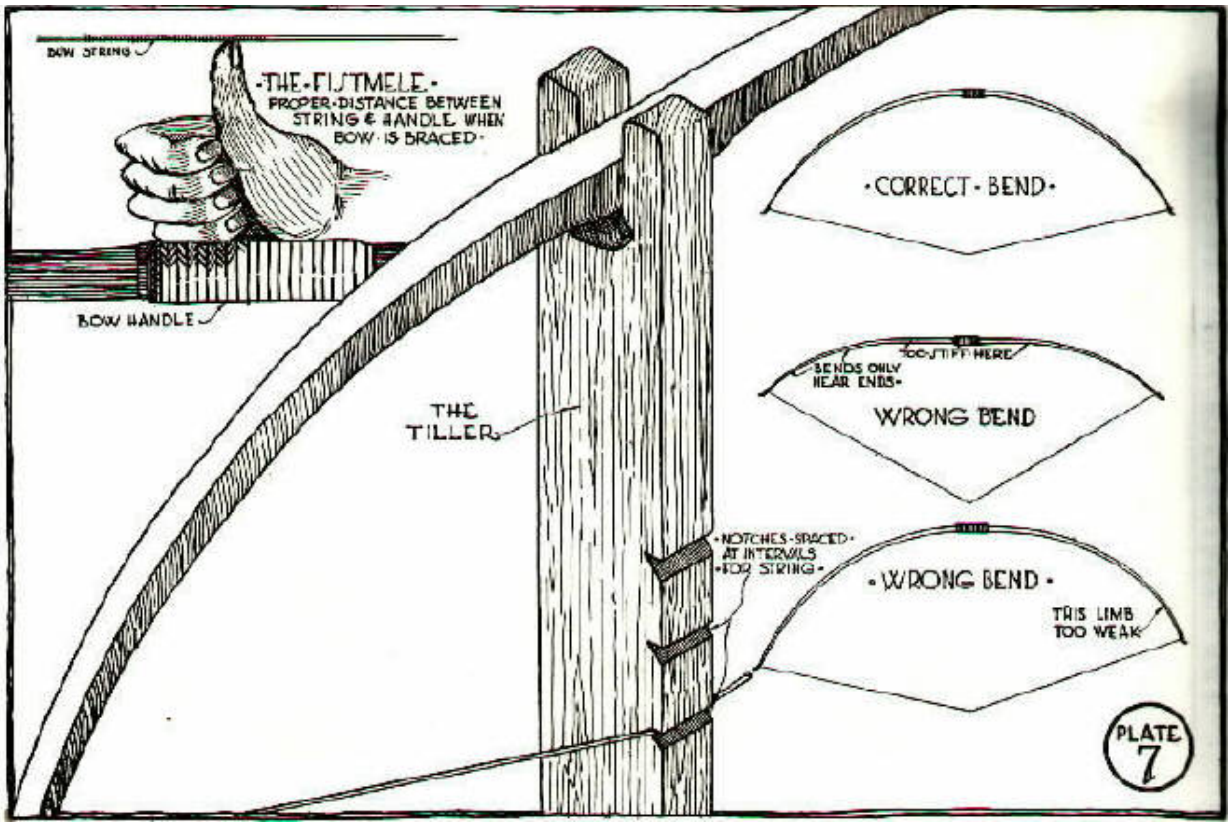
Remove the bark if it has not already been taken off, and clean up the back; be sure to follow the grain when using the draw-knife. Determine the center of your stave. One inch above the true center draw a line around the bow; 3" below the center draw another line around the stave. This is where your handle will come. Refer to Plate 5 and note how the handle looks. With draw-knife and coarse wood rasp, work your handle to this shape. The abrupt dips at either end of the handle riser flow gracefully into the flat limbs.

At the widest part of your limbs—just a bit below where the handle riser dip disappears into the limbs, your stave should be 1¼" to 1½" wide, depending on how wide your original stave was. It should be ¾" through from back to belly, and taper off at the ends 5/16" from belly to back. Next taper your sides. Measure in from each extremity 18", and draw a line across the back. Place a dot at each end. Measure ¼" to either side of this dot. Connect up the ends of the line across the back 18" down, and you will have a triangle with its base the width of the stave and the apex ½" across. Plane down to this line and lead into the sides so there are no harsh lines. Consult Plates 5 and 7. Round off the belly into a low flat arch, cut your notches, brace your bow and tiller as described. Finish and handle to suit your fancy.




LAYOUT BENDING TEMPLATE ON WOOD BOARD 1½" OR 2" THICK
4"
4"
2"
1"
5" RAD.
16"


SIDE VIEW OF STAVE WORKED TO SIZE READY FOR BENDING
VIEW OF BELLY OF BOW
WOOD BLOCK USED AS A BENDING TEMPLATE
AFTER STEAMING STAVE BIND TIGHTLY WITH RUBBER STRANDS CUT FROM OLD INNER TUBE OR TAPE MAY BE USED
OF BOW
LAYOUT BENDING TEMPLATE ON WOOD BOARD 1½" OR 2" THICK
GROOVE FOR STRING ½" DEEP
THE FINISHED BOW
PLATE 6
MAKING A REFLEXED FLAT OSAGE ORANGE BOW



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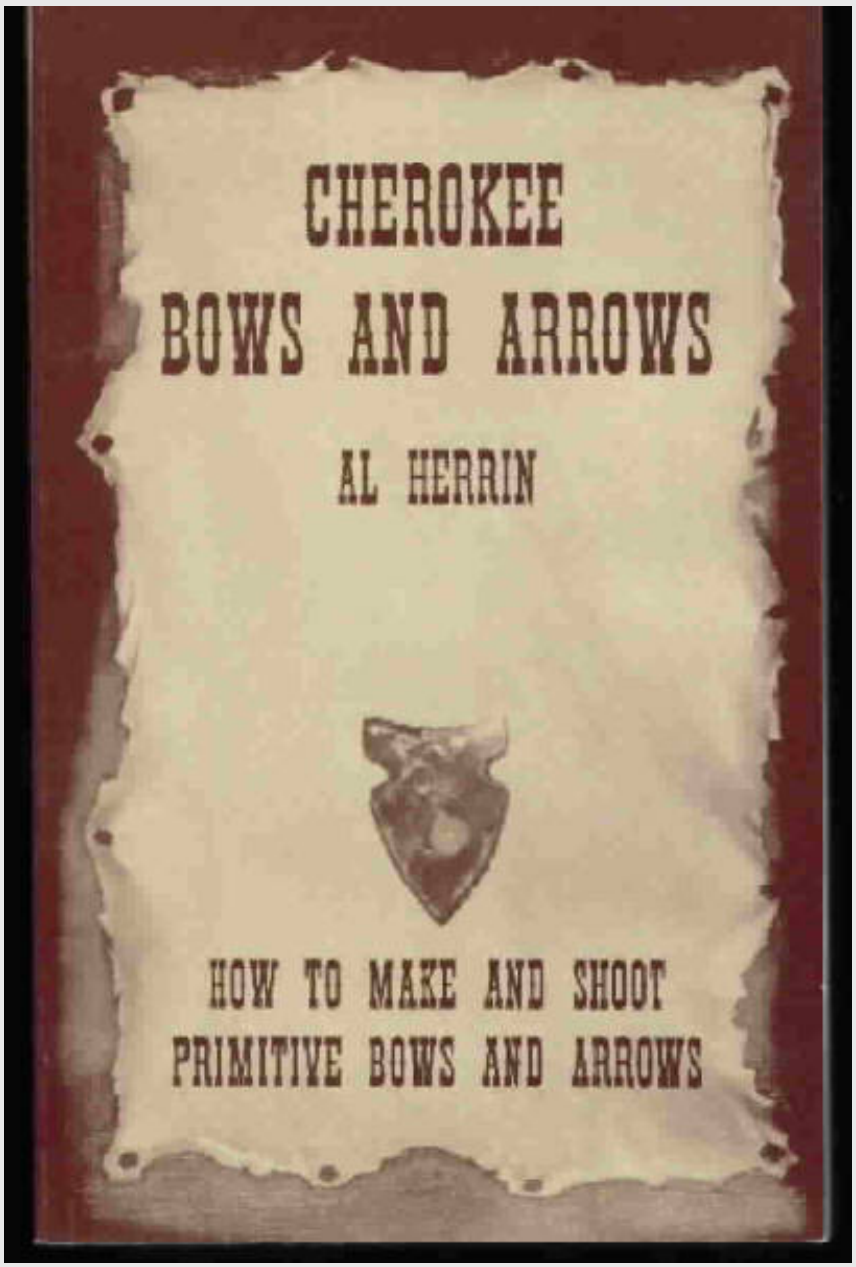
ARCHERY BOOKS

Osage Orange Notes



CHEROKEE BOWS AND ARROWS

by

AL HERRIN

This is the best book available today to use as your reference and guide in Building your Osage Bow.

There are one hundred sixty eight pages of Bowmaking,Arrow making,String making,and many other things about Primitive Archery.

These are in stock most of the time and all of mine are signed by the Author.

Call us anytime at 319 835 5892 to order yours.

MasterCard,Visa,PayPal,or mail a personal check.

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This page last modified on Friday, March 19, 2004

Welcome to The Bent Styck

"Go afield with a good attitude, with respect for the wildlife you hunt and for the forest and fields in which you walk. Immerse yourself in the outdoor experience. It will cleanse your soul and make you a better person."

Fred Bear

This page is dedicated to those who love to hunt with Traditional Equipment.

Review of Bowyer James Easter's Selfbow

Traditional Bowhunters of Florida

Friends Photos

Page 1

Page 2

Page 3

Marriah Bow Pics

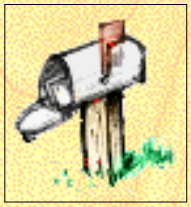
Smokey Hill Longbow Pics

Chek-Mate Bow Pics

Friends Bows

Links

To post a picture send it in either .jpg or .gif format to:



Jeff Dodd

CW300MAG'S Hunting Page

English Longbows

Ten-Ring Longbows are made in our own workshops and can be made within reason to any specification required. All bows come with Horn Nocks, Leather Grip, Hardwood Arrow plate. Right or left hand. For prices & details of the wood the bows are available in please go to the on-line shop or contact / visit us for more information.
Click on any of the images to view an enlarged higher resolution version in a popup window.

Introduction | How Longbows Are Made | Taking Care Of A Longbows

Our handmade English Longbows need to be treated with respect, We make bows to the draw length and weight required.
The bow has been trained (Tillered) to bend in our workshop as part of building the bow,
And being a new bow you should when first using your bow remember a few points please take note.
Don't draw your bow to full draw length on first stringing it, Gently does it by drawing your bow to about 6" a few times over a period of about 10 minutes then to 12" a few times over a period of 10 minutes, continue this until you reach your draw length (you are training your bow).

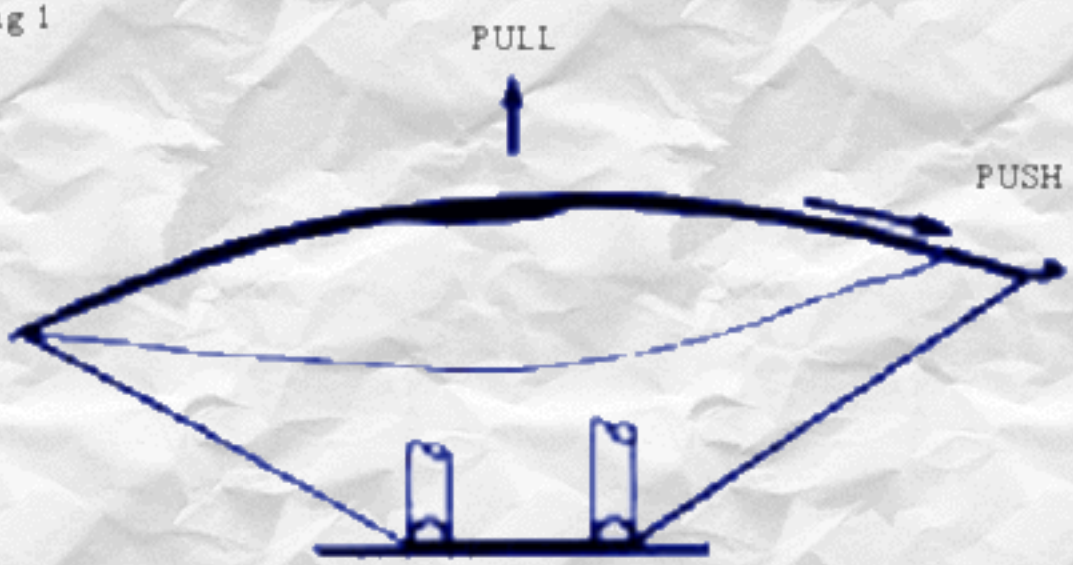
Do not lend your bow to others who may draw your bow to a longer draw length than yours (They could break your bow)
You must also remember that temperature can effect your bow, The hotter the weather becomes the more supple wood becomes and the cast of your bow will be less. The colder weather will have the opposite effect on your bow making the wood brittle, in the cold weather, you will see longbow archers warming their bow by briskly rubbing the limbs (The bow limbs). To warm them. Look after your bow and it will give you good and long service.
Now you are ready to shoot your bow you have strung your bow check your bracing height it should be between 6-25" — 6-50". After shooting your bow for a short while check your bracing height again as the string will settle in when you first shoot your bow. Once you have shot your bow in all you need to do each time you string it is to warm it up by giving it a number of short draws before being fully drawn. Never dry loose your bow (Shoot without Arrow)
Don't leave your bow where heat can effect it (In closed cars near radiators etc). Wax the bowstring on a regular basis with beeswax.

STRINGING YOUR LONGBOW
There are only two ways to string a longbow that we recommend.

USING A STRINGER Method Fig 1

This is the safest method and the way we recommend you string your bow with the stringer provided with your bow.
Place the stringer on bottom nock and in the top groove on the top nock holding the bow parallel with the ground, Place your foot on the stringer and pull upwards, Holding the grip (handle) and slide the bowstring onto the top nock.
Then slowly let the pressure on the grip down until the bow string has the weight.
To take the bowstring off just reverse this. (It's the safest way as you apply even pressure to the bow).

Fig 1



PUSH & PULL Method Fig 2

(for right handed archers) Place your feet shoulder width apart put the bottom nock against the instep of your right foot, With your left hand on the top limb, and pull towards you with your right hand on the grip (center of bow) while pushing with your left hand away from you sliding the string onto the top nock bottom groove. (be very careful).

If you have any questions please contact us

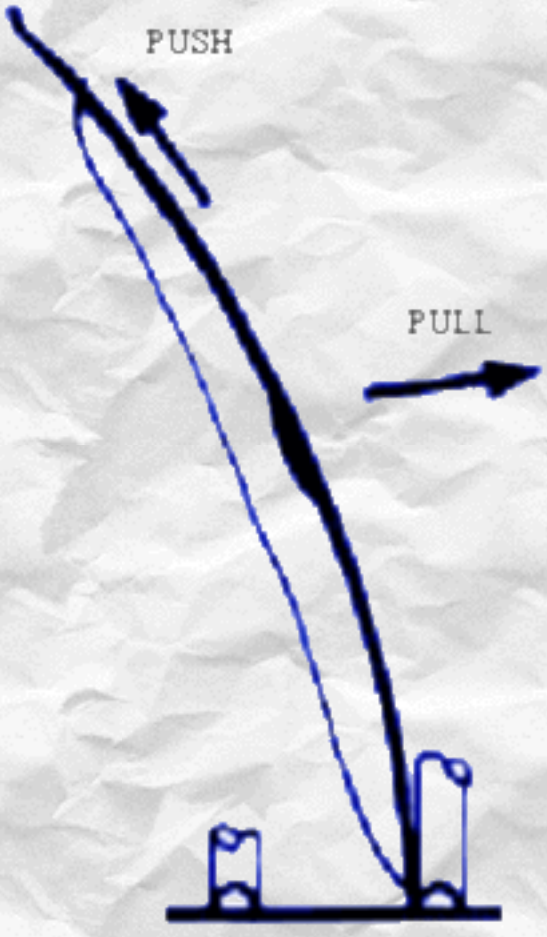


Fig 2

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Archery and mathematical modelling

by B.W. Kooi

This article was first published in the journal of The Society of Archer-Antiquaries, Volume 34, 1991.

Introduction

One way of studying ancient bows is to make replicas and use them for experiments. In the present paper the emphasis is on a different approach, the use of mathematical models. Such models permit theoretical experiments on computers to gain insight into the performance of different types of bow. The use of physical laws and measured quantities, such as the specific mass of materials, in constitutive relations yields mathematical equations. In many cases the complexity of the models obtained will not permit the derivation of the solutions by paper and pencil operations. Computers can then be used to approximate the solution. However, even this procedure will mostly necessitate simplifications. Sometimes essential detailed information is missing. In other situations assumptions need to be made to keep the model manageable. In that case the model has to be validated by the comparison of predicted results with actually measured quantities to justify the assumptions. For that purpose, fortunately, replicas can be employed.

Mathematical models must accommodate all quantities which determine the action of the bow. Such quantities are often called design parameters. Calculations are possible only if all the parameters are known. Descriptions of bows in the literature are often incomplete, so that comprehensive evaluation becomes impossible.

Theoretical experiments with models consists to a large extent of the research on the influence of the design parameters on the performance of the bow. This presupposes definition of good performance which fits the context of interest. Flight shooters are only interested in a large initial velocity. For target archery, on the other hand, the bows have to shoot smoothly and steadily .

In the 1930s bows and arrows became the object of study by scientists and engineers; see Hickman, Klopsteg and Nagler 1, 2. Their work influenced strongly the design and construction of the bow and arrow. Experiments were performed to determine the influence of different parameters. Hickman made a very simple mathematical model for flatbows. Later Schuster 3 and Marlow 4 also developed mathematical models to describe the mechanical action of a bow. Schuster dealt with the ballistic of the modern, so called working-recurve, bow. Schuster's model has the strange feature that bows appear to have 100% efficiency. Marlow introduced an elastic string on the model in order to explain this discrepancy with reality.

The description of our mathematical model is beyond the scope of this paper. The reader is referred to papers 5, 6, 7. The developed mode is much more advanced, so that more detailed information is obtained. This gives a better understanding of the action of rather general types of bow. Elsewhere 8, 9 we have show how this model can be adapted for the description of the ballistics of a modern bow. The predicted efficiency is smaller than 100% because in this model

part of the available energy remains in the limbs and string and is not transferred to the arrow.

This model is validated by a comparison of the measured initial velocity of an arrow shot with a modern bow with a predicted value 10.

As part of the Mary Rose project 11 the measured weight of a replica was correlated with the predicted value. In both cases the predictions were sufficiently good.

The aim of the present paper is to use the model for an evaluation of the performance of bows used in the past and in our time. We try to uncover the function of the siyahs or ears of the Asiatic composite bow and to find the reason for the differences in the performance of the longbow and the Turkish bow in flight shooting

Mathematical modelling

In essence the bow proper consists of two elastic limbs, often separated by a rigid middle part, the grip. The bow is braced by fastening string between both ends of the limbs. After a arrow is set on the string the archer pulls the bow from braced situation into full draw. This completes the static action in which potential energy is stored in the elastic parts of the bow After aiming, the arrow is loosed or released. The force in the string accelerates the arrow and transfers part of the available energy as kinetic energy to the arrow. Meanwhile the bow is held in its place and the archer feels a recoil force in the bowhand. After the arrow has left the string the bow returns to the braced position because of damping.

As stated before, a complete description of the mathematical model is beyond the scope a this paper. An extensive discussion is presented elsewhere. 5, 6, 7, 8, 9. A summary of all important quantities in the model which determine the mechanical action of the bow is listed below.

Bow

- length of the limbs
- length of the grip
- shape of the unstrung limbs
- shape of cross-section of the Iimbs at all positions along the limbs
- elastic properties of the materials of the limbs
- specific mass of the materials of the limbs
- shape and mass of the ears, if these are present
- mass of the horns
- fistmele
- draw length

String

- mass of the string
- elastic properties the string

Arrow

- mass of the arrow.

These quantities, the design parameters, determine the weight of the bow. In practice the bowyer tillers the bow such that it has finally the desired weight for a particular draw length. The archer on the other hand sets the fistmele by the adjustment of the length of the string.

For flight shooting the initial velocity of the arrow leaving the string is very important. The higher this velocity the greater the maximum attainable distance. The actual distance depend also on the elevation angle (nearly 45°) and the drag of the arrow in the air. A requirement for target shooting and hunting is that the bow shoots smoothly. It is difficult to translate this feature into mathematics. High efficiency is a good criterion. However, a heavy arrow always yields a high efficiency and, unfortunately so, a small initial velocity and therefore a short distance. Hence, we have a combination of factors. The recoil-force, i.e. the force the archer feels in the bowhand after release, also seems to be important. The way this force changes in time can be calculated with the model, but it cannot be summarised by a single number.

The bow should not exaggerate human error. To assess the sensitivity of the bow, its performance is calculated repeatedly with slightly different values for the design parameters. If the performance depends strongly on a design parameter, the archer has to take care that the value of this parameter is as constant as possible. To achieve this archers need skill besides technique.

Moved Permanently (legacy course lockers)

Effective May 15th, 2004, all non-WolfWare course lockers served by NCSU ITD have been relocated to the legacy.ncsu.edu web server.

Please update your link to: http://legacy.ncsu.edu/WPS202/hardw.id/ringinfo/orange.html.

You will be redirected to the new location in about 10 seconds, or you may click on the link above to go there immediately.

For more information about this redirect, see our SysNews Posting.

Osage Orange

Common Name: Osage Orange

Scientific Name: *Maclura pomifera*

A.K.A.: Hedge, Hedge Apple, Bodark

Osage orange trees are a common sight on the Great Plains today although they were not a member of the prairie community originally. Native to a limited area centered on the Red River valley in southern Oklahoma and northern Texas, they were planted as living fences - or hedges - along the boundaries of farms, and have spread widely from these restricted, linear beginnings. The trees are easily recognized by their glossy, lance-shaped leaves (see illustration), and their short, stout thorns.

The name of the tree comes from the Osage tribe, which lived near the home range of the tree, and the aroma of the fruit after it is ripe. (Find one of the fruit that has been sitting in the sun on a balmy Indian Summer day and notice the pleasant, orange-peel smell of the skin.) Not all of the trees will have fruit because Osage Orange are either male or female, and only the females will bear fruit.

Photo by Jim Mason

The fruit of the Osage Orange - the so-called "hedge apple" - stands out vividly in an autumn treeline. It is a large, dense, green wrinkled ball up to 6" in diameter that often persists on the tree after the leaves have fallen off. In good years, the branches will bend low with the combined weight of these heavy fruit. They have a sticky, white juice within them.

Chop one in half and you will see a pithy core surrounded by up to 200 small seeds that are much sought-after by squirrels. Try to harvest these seeds for yourself and you will get a clear understanding of how much the squirrels must like them! In addition to ripping apart the tough, stringy fruit, there is a shell around each individual seed that must be opened also before the seed can be eaten. Nonetheless, Osage Orange trees are a magnet for every squirrel in the neighborhood. They typically sit on the ground at the base of the tree or on a wide branch up in the tree to disassemble their prize, making a big mess in the process. Piles of shredded hedge apple are a sure sign of squirrels in the area.

Photo by Jim Mason

Before the invention of barbed wire in the 1880's, many thousands of miles of hedge were constructed by planting young Osage Orange trees closely together in a line. The saplings were aggressively pruned to promote bushy growth. **"Horse high, bull strong and hog tight."** Those were the criteria for a good hedge made with Osage Orange. Tall enough that a horse would not jump it, stout enough that a bull would not push through it and woven so tightly that even a hog could not find its way through! After barbed wire made hedge fences obsolete, the trees still found use as a source of unbeatable fence posts. The wood is strong and so dense that it will neither rot nor succumb to the attacks of termites or other insects for decades. The trees also found use as an effective component of windbreaks and shelterbelts.

Osage Orange is a cousin to the mulberry tree. The family resemblance can be seen in:

- A papery orange-colored skin on the roots.
- The structure of the fruit. (Look carefully at a hedge apple and you will see basically a big, overgrown green mulberry!)

Its strong yet limber branches were prized for the construction of bows by the Native Americans. The common name "Bodark" is an altered version of the French "bois d'arc" or "bow wood".

Many people believe that the fruit of the Osage Orange will keep insects out of the house. They will gather and place them around basement windows and other likely locations to discourage entry by crickets and other insects. Other people say this only works as long as the fruit is green. (Of course, by the time the fruit is dried up, there will no longer be any bugs trying to get inside!) Other people say it does not work at all. One method that definitely works is to pick up the hedge apple and smash the offending bug with it. That is a sure thing!

Many miles of hedgerows have been removed for various reasons over the last few decades. The remaining hedgerows on the Great Plains are habitat islands for those creatures that prefer the forest to the prairie. Along with the gallery forest found next to streams and rivers, hedgerows provide a place to live for many kinds of wildlife that would not otherwise be found on the prairie. In areas that have been converted to agriculture, hedgerows may be the only winter shelter available for wildlife. Osage Orange trees are the backbone of most of those hedgerows and are a distinctive member of the flora of the Great Plains.

Learn more about the Osage Orange at Hedgeapple.com !!

Mike Easter has lots of information on Osage Orange at OsageOrange.com !!

Top of page

Up Coralberry Cottonwood

Eastern Red Cedar | Osage Orange | Poison Ivy
Redbud | Sycamore

- This page was spun by Jim Mason -

Questions or comments? Send Email to Jim Mason
Or write us at:
Great Plains Nature Center
6232 E. 29th Street North
Wichita, KS 67220-2200 Call: 316-683-5499 Fax: 316-688-9555

COMBROGI
PRE CONQUEST LIVING HISTORY

Making a Longbow by Simon C B Day

Introduction & Explanation
Method
Tensioning the Bow
Bow Strings
The Bowyers knot
Testing the Poundage
Stringing the Bow
Checking your draw length
Making a Tiller

Introduction & Explanation

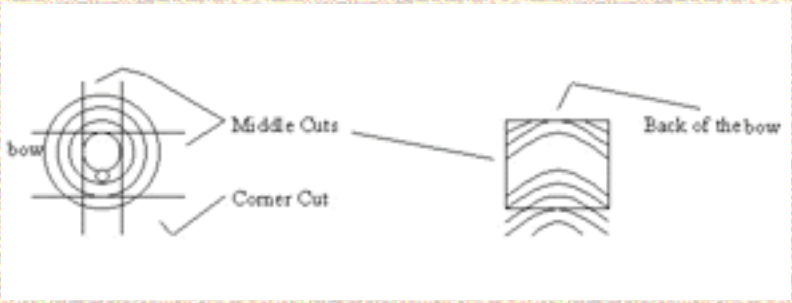
Making a longbow is a fun and rewarding experience. Standing in amongst a row of archers with a fine bow, gives you an amazing feeling of "Aha – I made this".

The following instructions are based on experienced gained during a Living History training weekend when I made a bow under the expert tuition of Colin Levick.

Method

Top of page

In order to make your longbow, you will need to start with a stave of wood (dimensions 1.5" x 1.5" x "the height of the person using it"). For my bow, I have used Ash, but many other close even-grained woods are suitable. The stave itself should ideally be from the middle cut of the wood, rather then the corner, and have a few knots in it as possible. This means that the wood will have optimum strength and last longer.



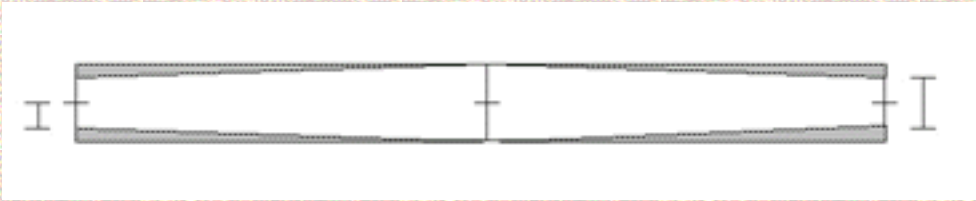
First of all take your stave and decide which is to be the back of the bow (i.e. the bit that faces away from you), then mark it lightly with a pencil. To work out which side is the best for the back, look at the way that the grain is flowing through the wood and try to visualize the finished bow in the shape.

Once this has been decided, you need to mark the stave as follows and trim off the shaded area using an axe, knife or saw:

N.B. On this diagram, the back of the bow is the bottom line of the stave. The length of the non-shaded ends is ½" and the height of the mid-point is 1 1/8".

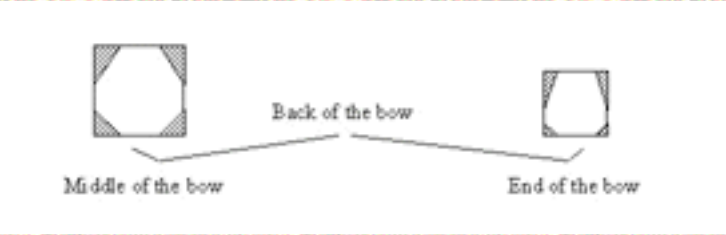
On the back of the bow, find the mid-point of the centre line and mark it. Do the same at each end, so that the three points form a perfectly straight line.

Taking these end points, mark 3/16" either side either side of the back of the stave, and link then with the ends of the middle line (see below). Trim off the shaded area.



N.B. On this diagram, you are marking the points on the back of the bow. The marker line at the left hand end of the diagram is 3/16" and the one on the right is 3/8".

Now that you have a basic bow shape, you need to trim off the corners of the stave to give a more rounded shape. This is best done with a spoke-shave or surform/rasp. In cross section, this is roughly the shape that you're after (remove the shaded areas):

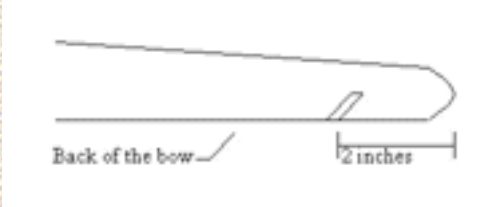


While trimming the bow to match the diagram above, you should ensure that no bulges or dips occur along the length of the bow. To do this, continually look down the length of the bow, working as you do so. If bulges to occur, then smooth them off. If dips occur, then you will need to trim the entire bow to remove them.

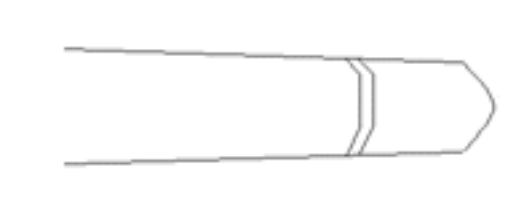
It is important that you try to keep the shape of the bow uniform on both sides at all times, otherwise the bow will not pull correctly.

Once you have reached a stage that you are happy with, you can test the flex of the bow by placing one end by the instep of your foot, your opposite hand on the other end, and pulling the middle towards you with your other hand. Ensure that the 'back' of the bow is facing away from you. As you do this, you will notice some 'stiff' areas of the bow (sometimes its easier to get someone else to do this as they can get a better view). Do not try to flex the bow too far at this point. Trim down these stiff areas so that the bow flexes evenly all down its length.

Once you are happy that your bow is even and flexes nicely, you can make some nocks on either end to hold the string. These should be around 2" from the ends of your bow and are best made using a round needle file. Starting with the side of the bow, make a small mark at 45 degrees, so that the top of the mark is towards the end of the bow (see diagram below)



Repeat this on the other side of the same end of the bow, then join them up (see below). Repeat this at the other end of the bow.



Now that you have created the bow and put nocks on it, you need to teach the wood to bend. This is very important, because if you don't, then the first time you draw the bow it will snap!

To teach the wood to bend, you will need to put a string on your bow that is **NOT** under tension (see the section below), and use a tiller (see later for instructions how to make one).

The way a tiller works, is that the bow is placed into the space at the top so that it is horizontal, with the back of the bow uppermost. Then pull the bow string **SLOWLY** down to the first notch. While the string is in this position, examine the bow checking that it is not pulling to one side, and that the overall curve is smooth with no 'straight' areas. Mark these stiff areas with a bit of charcoal. Gently release the string to its natural position, remove the bow from the tiller, unstring it and trim the areas marked with charcoal.

Restring the bow, put it back onto the tiller and take it to the first notch again. Repeat this as many times as necessary until no 'stiff' areas remain on the bow and the bow curves smoothly. Once you are happy with that, take the string to the next notch and perform the same checks/actions.

It is a good idea to let the wood rest for around 20-30 minutes between visits to the tiller, so that the sinews within the wood do not start to break.

Once you have reached the fourth notch on the tiller, you can add a little bit of tension to the string. Repeat the slow progression through the notches of the tiller, checking for and trimming any stiff areas until you once again reach the fourth notch. It is very important that these stages are not rushed, or the wood will strain too quickly, the sinews will start to snap and your bow will not reach it's full potential or will simply snap.

Again, add a little more tension to the string, repeat the checking until you reach the fourth or fifth notch. At this point you can put the string under full tension (see below) and work down the tiller. Once you have reached the draw you require for your bow (see the section about measuring your draw length - below) , you can put a couple of coats of boiled linseed oil on it to protect it from the weather.

Tensioning the Bow

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To have a string that is not under tension, simply extend the string to that it is firmly attached in the nocks at both ends of the bow, but the wood itself does not bend.

Tension can be increased by slightly shortening the string, so that the bow bends a little when strung. It is best to shorted the string an inch at a time so increase the tension slowly.

When the bow is at full tension, the distance between the middle of the bow (i.e. where you hold it) and the bowstring should be the same as your clenched fist with the thumb stuck out. This is known as the fistmele (a fancy archery term).

Bow Strings

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When buying bow strings, it is important to remember that three main types are available. These are no loops, one loop and two loops. Personally, I have found that one loop strings are best as it is possible for the archer to set the length of the string to be perfect for their use. To tie the second loop (for the bottom of the bow) you will need to use a bowyers knot (see below).

The Bowyers knot

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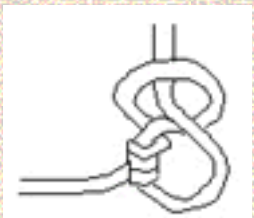
A bowyers knot is designed so that it will not slip when tension is put onto it.

1. First form a loop by passing the end of the string underneath the main body of the string, so that the loop is about 1" in diameter.

2. Next, pass the end of the string back over the main part of the string.

3. Pass the end of the string up through the loop on the non-moving side of the loop.

4. Repeat the loop twice more



Testing the Poundage

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To test the poundage of the bow, attach a fishing scale to the string while the bow is on the tiller and slowly add weights to it until the string reaches the draw that you require. This will give you the "x pounds draw at y inches" required when checking your bow for competition/combat purposes.

If the finished bow is a higher poundage than your require (i.e. you want to use it in combat and it's too strong), then evenly trim the bow and go back through the routine of checking it on the tiller.

Stringing the Bow

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To string your bow, ensure that the lower end of the bowstring is attached correctly in the lower nock using a bowyers knot.

Place the lower end of the low to the inside of your right foot with the top of the bow being in the left hand.

Ensuring that the back of the bow is towards you, gently pull the middle of the bow towards you with your right hand and slide the top loop of the bowstring into the top nock with your left hand.

This is written with a right handed person in mind. For a left handed person, simply reverse everything.

Checking your draw length

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To check the length of your draw, place one end of a long stick on your chest, with the other end running between your palms. Lift your arms so that they are horizontal and mark the stick at the point where the ends of your fingers are. This is just beyond your maximum draw.

When "training" the bow on the tiller, you will need to draw the bow to this length, or when you come to full draw when using the bow, it will snap.

Making a Tiller

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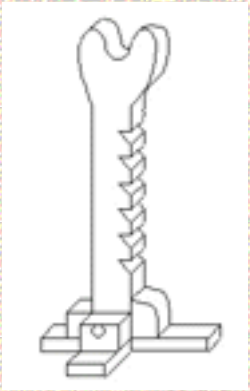
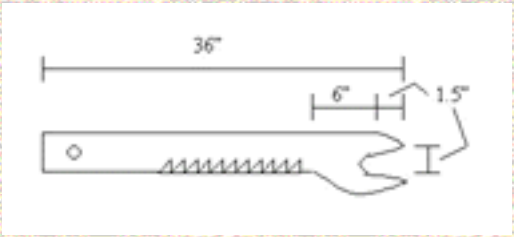
A Tiller is the piece of equipment used to "train" the bow to bend without breaking. Basically, it is a vertical piece of wood with a number of notches cut into it at fixed intervals, with a semi circle cut out at the top which the bow can rest in. The whole thing is supported on a suitable base.



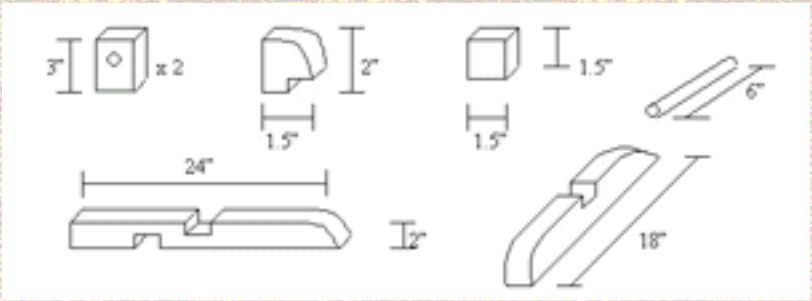
The tiller itself should be made out of a good hardwood which can resist a lot of pressure since when the bow is under tension, a lot of pressure will be put onto the notches.

This tiller is designed to fold flat for easy transport.

To make a tiller you will require a hardwood plank (1.5" x 2" x 8') and either screws and/or dowel to join the pieces together.



The first notch should be 7.5" from the top of the tiller. There should be 16 notches all together with a distance of 1.5" between the top of one notch and the top of the next notch.



Join all the pieces together as per the diagram above, except for the 1.5" x 1.5" block which is tied onto the base piece to prevent the arm from falling over. If this piece is attached, then the tiller will not fold flat.

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Technology Transfer Fact Sheet

Center for Wood Anatomy Research
USDA Forest Service • Forest Products Laboratory • One Gifford Pinchot Drive • Madison, Wisconsin 53726–2398

Maclura pomifera

English Metric

Family: Moraceae

Print

Osage Orange

The genus *Maclura* contains about 12 species native to: North America [1], with the rest in tropical America and Africa. The genus name maclura is after William Maclure (1763-1840), and American geologist, while the species epithet pomifera means bearing pomes or apples, in allusion to the large, spherical fruits.

Maclura pomifera-Bodare Us, Bodark, Bodeck, Bodock, Bois d'arc, Bowwood, Geelhout, Hedge, Hedge Apple, Hedge-plant, Horse Apple, Maclura, Mock Orange, Naranjo Chino, Osage, Osage Apple-tree, Rootwood, Wild Orange, Yellow-wood.

Distribution

Native to Arkansas, Oklahoma and Texas, but since escaped and naturalized throughout the eastern and north western US.

The Tree

Osage Orange is a medium size tree with thorns which grows in bottom lands. It attains a height of 60 feet and a diameter of 3 feet. The bark has an orange cast and was used in making kaki dye during W.W.I. It produces large spherical fruits the size of large grapefruits in the fall.

The Wood

General

The sapwood of Osage Orange is narrow and light yellow, while the heartwood is golden to bright orange, which darkens upon exposure. The heartwood can also contain red streaks. It has no characteristic odor or taste. The wood is very hard, heavy, tough, resilient and takes a high luster. It is ring porous and commonly confused with black locust (*Robinia pseudoacacia*).

Mechanical Properties (2-inch standard)

	Specific gravity	MOE x10^6 lbf/in^2	MOR lbf/in^2	Compression Parallel lbf/in^2	Compression Perpendicular lbf/in^2	WML[a] in-lbf/in^3	Hardness lbf	Shear lbf/in^2
Green	0.76	1.33	13,700	5,810	2,260	37.9	2,040	â€”
Dry	0.85	â€”	â€”	â€”	â€”	â€”	â€”	â€”

[a]WML = Work to maximum load.

Reference (59).

Drying and Shrinkage

Type of shrinkage	Percentage of shrinkage (green to final moisture content) 0% MC	6% MC	20% MC
Tangential	â€”	â€”	â€”
Radial	â€”	â€”	â€”
Volumetric	9.2	7.4	3.1

The wood of Osage Orange seasons well and thereafter, maintains dimensional stability well.
???

Reference: (90).

Kiln Drying Schedules[a]

Condition	Stock 4/4, 5/4, 6/4	8/4	10/4	12/4	16/4
Standard	T6-A2	T3-A1	â€”	â€”	â€”

[a]References (6, 86).

Working Properties: Osage Orange is difficult to work due to its hardness. It holds glue and screws well, but is difficult to nail.

Durability: Osage Orange is considered one of the most durable woods in North America.

Preservation: No information available at this time.

Uses: **:** Fuel wood, fence posts, game calls, smoking pipes, artificial limbs, crutches, insulator pins, wheel rims & hubs of farm wagons, railroad ties, treenails, machinery parts, archery, bows (Native Americans), dye from roots, planted for windrows and hedges.

Toxicity: The sap can cause dermatitis (105)

Additional Reading and References Cited (in parentheses)

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Maclura pomifera

Common name:	Osage orange	Family:	Moraceae
Author:	(Raf.) Schneider.	Botanical references:	11, 60, 200
Synonyms:	Toxylon pomifera (Raf.), Maclura aurantiaca (Nutt.)		
Known Hazards:	The milky sap can cause dermatitis in some people[200]. An extract and the juice of the fruit is toxic, though a 10% aqueous infusion and extract diluted 1:1 are not toxic[240].		
Range:	Southern N. America - Arkansas to Texas.		
Habitat:	Woods, fields and thickets in rich bottom lands[73, 83].		
Plants For A Future Rating (1-5):	2		

Other Possible Synonyms:	From various places across the web, may not be correct. See below.
	Ioxylon pomiferum[B,P] M. pommifera[HORTIPLEX] Toxylon pomiferum[B,H,P]
Other Common Names:	From various places around the Web, may not be correct. See below.
	Bois D Arc [H], Hedge Apple [H], Orange,Osage [E], Osage Orange [H,E], Osage-orange [B], Osageorange [P],
Other Range Info:	From the Ethnobotany Database
	Us

Physical Characteristics

A decidious tree growing to 15m by 12m at a medium rate. It is hardy to zone 5 and is frost tender. It is in flower from May to June, and the seeds ripen from September to December. The flowers are dioecious (individual flowers are either male or female, but only one sex is to be found on any

one plant so both male and female plants must be grown if seed is required). The plant not is self-fertile. We rate it 2 out of 5 for usefulness.

The plant prefers light (sandy), medium (loamy) and heavy (clay) soils, requires well-drained soil and can grow in nutritionally poor soil. The plant prefers acid, neutral and basic (alkaline) soils. It cannot grow in the shade. It requires dry or moist soil. The plant can tolerate maritime exposure.

Habitats and Possible Locations

Hedge, Woodland, Canopy, Secondary, Sunny Edge.

Edible Uses

One report suggests that the fruit is edible[74] but this is surely a mistake - although very large, the fruit is harsh, hard, dry and astringent. The fruit does, however, contain an anti-oxidant which can be used as a food preservative, especially for oils[61].

The heartwood and the root yield a non-toxic antibiotic that is useful as a food preservative[240].

Medicinal Uses

Disclaimer

Cardiac; Ophthalmic.

A tea made from the roots has been used as a wash for sore eyes[222, 257].

The inedible fruits contain antioxidant and fungicidal compounds[222]. A 10% aqueous infusion and an extract diluted 1:1 have cardiovascular potentialities[240].

Other Uses

Dye; Fuel; Hedge; Preservative; Repellent; Shelterbelt; Tannin; Wood.

A yellow dye is obtained from the bark of the root and the wood[46, 57, 95, 149, 169, 257]. Green and orange can also be obtained from it[168].

The sap of the fruit is used as an insect repellent[95]. It is said to be effective against cockroaches[222].

The bark is a source of tannin[82, 149].

The plant is often grown as a hedge in N. America and Europe[1, 20, 50], it is very tolerant of severe pruning[200], makes an effective stock-proof barrier[200] and succeeds in maritime

exposure[K]. A hedge in a very exposed position at Rosewarne in N. Cornwall has grown well (1989), though it is very bare in winter[K]. This species is also used in shelterbelt plantings[200].

Wood - coarse-grained, exceedingly hard, heavy, flexible, very strong, very durable, silky, lustrous. It weighs 48lb per cubic foot. It is seldom used commercially, but is used locally for fence posts, bows etc and makes an excellent fuel[46, 82, 95, 171, 200, 227, 229].

Cultivation details

Prefers a well-drained soil in full sun[200]. Succeeds in poor soils and also in dry ones[20]. Plants are fairly tolerant of maritime exposure[K]. They dislike waterlogged soils[188].

Dormant mature plants are hardy to about -20°c though the young growth in spring can be cut back by late frosts[200] and young plants can be damaged in cold winters[188]. Plants require hot summers to fully ripen their wood if they are to thrive in areas with cold winters[188].

Plants are tolerant of severe pruning[200].

This species is notably resistant to honey fungus[200].

Dioecious. Male and female plants must be grown if seed is required.

Propagation

Seed - best sown as soon as it is ripe in pots in a cold frame. Pre-soak stored seed for 48 hours in warm water and stratify for 2 months at 4°c then sow in a cold frame[113, 200]. Germination is normally good. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts. The seed stores for 3 years[113].

If growing larger quantities of plants, it is probably best to sow the seed in an open seed bed[200]. Grow the plants on for a couple of years in the seed bed before planting them out into their permanent positions.

Cuttings of half-ripe wood, July/August in a frame[200].

Cuttings of mature wood, November to January in a frame[113].

Layering in summer[200].

Root cuttings 4cm long in December. Plant horizontally in pots in a greenhouse and plant out as soon as possible. Good percentage[78].

Web References

- [H] Details of Scandanavian and European Common names in Henriette's names database
- [E] Ethnobotany Data (common names, uses, countries) from the Ethnobotany Database (sadly ftp only. The searchable web pages have been pulled).
- [V] Images from the Vascular Plant Image Gallery of the Texas A&M Bioinformatics Working Group.
- [B] Data (Latin & Common names, other references) from the BONAP's Synonymized Checklist of the Vascular Flora of the United States, Puerto Rico, and the Virgin Islands.
- [G] Data (Common Names, Uses, Distribution) from the USDA/ARS NPGS's GRIN taxonomic database.
- [C] Taxon data. from the CalFlora database.
- [P] Data. (uses, distribution, wetland) from the UDSA's plants database.

References for *Maclura pommifera* (a possible synonym).

- [HP] Links, Photos, Suppliers from Hortiplex Plant Database

References for *Toxylon pomiferum* (a possible synonym).

- [H] Details of Scandanavian and European Common names in Henriette's names database

See the PFAF Links Pages for other sources or the The Gatherer where you can search many other sources all in one go.

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Notes from observations, tasting etc at Plants For A Future and on field trips.

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A classic with a wealth of information on the plants, but poor on pictures.

[20] **Riotte. L.** *Companion Planting for Successful Gardening.* Garden Way, Vermont, USA. 1978 ISBN 0-88266-064-0
Fairly good.

[46] **Uphof. J. C. Th.** *Dictionary of Economic Plants.* Weinheim 1959
An excellent and very comprehensive guide but it only gives very short descriptions of the uses without any details of how to utilize the plants. Not for the casual reader.

[50] **?** *Flora Europaea* Cambridge University Press 1964
An immense work in 6 volumes (including the index). The standard reference flora for europe, it is

very terse though and with very little extra information. Not for the casual reader.

[57] **Schery. R. W.** *Plants for Man.*
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[60] **Hitchcock. C. L.** *Vascular Plants of the Pacific Northwest.* University of Washington Press 1955
A standard flora for Western N. America with lots of information on habitat etc. Five large volumes, it is not for the casual reader.

[61] **Usher. G.** *A Dictionary of Plants Used by Man.* Constable 1974 ISBN 0094579202
Forget the sexist title, this is one of the best books on the subject. Lists a very extensive range of useful plants from around the world with very brief details of the uses. Not for the casual reader.

[73] **Adamson. and Salter.** *Flora of the Cape Peninsula.*
A good flora but rather short on details of habitat. Not for the casual reader.

[74] **Komarov. V. L.** *Flora of the USSR.* Israel Program for Scientific Translation 1968
An immense (25 or more large volumes) and not yet completed translation of the Russian flora. Full of information on plant uses and habitats but heavy going for casual readers.

[78] **Sheat. W. G.** *Propagation of Trees, Shrubs and Conifers.* MacMillan and Co 1948
A bit dated but a good book on propagation techniques with specific details for a wide range of plants.

[82] **Sargent. C. S.** *Manual of the Trees of N. America.* Dover Publications Inc. New York. 1965 ISBN 0-486-20278-X
Two volumes, a comprehensive listing of N. American trees though a bit out of date now. Good details on habitats, some details on plant uses. Not really for the casual reader.

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Deals with the genus Sedum. Fairly easy reading, it gives cultivation details and some notes on habitats.

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A very detailed book on propagating trees. Not for the casual reader.

[149] **Vines. R. A.** *Trees of Central Texas.* University of Texas Press 1987 ISBN 0-292-78958-3
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[168] **Grae. I.** *Nature's Colors - Dyes from Plants.* MacMillan Publishing Co. New York. 1974 ISBN 0-02-544950-8
A very good and readable book on dyeing.

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Covers all aspects of growing your own clothes, from fibre plants to dyes.

[171] **Hill. A. F.** *Economic Botany.* The Maple Press 1952
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[188] **Brickell. C.** *The RHS Gardener's Encyclopedia of Plants and Flowers* Dorling Kindersley Publishers Ltd. 1990 ISBN 0-86318-386-7
Excellent range of photographs, some cultivation details but very little information on plant uses.

[200] **Huxley. A.** *The New RHS Dictionary of Gardening. 1992.* MacMillan Press 1992 ISBN 0-333-47494-5
Excellent and very comprehensive, though it contains a number of silly mistakes. Readable yet also very detailed.

[222] **Foster. S. & Duke. J. A.** *A Field Guide to Medicinal Plants. Eastern and Central N. America.* Houghton Mifflin Co. 1990 ISBN 0395467225
A concise book dealing with almost 500 species. A line drawing of each plant is included plus colour photographs of about 100 species. Very good as a field guide, it only gives brief details about the plants medicinal properties.

[227] **Vines. R.A.** *Trees of North Texas* University of Texas Press. 1982 ISBN 0292780206
A readable guide to the area, it contains descriptions of the plants and their habitats with quite a bit of information on plant uses.

[229] **Elias. T.** *The Complete Trees of N. America. Field Guide and Natural History.* Van Nostrand Reinhold Co. 1980 ISBN 0442238622
A very good concise guide. Gives habitats, good descriptions, maps showing distribution and a few of the uses. It also includes the many shrubs that occasionally reach tree proportions.

[240] **Chopra. R. N., Nayar. S. L. and Chopra. I. C.** *Glossary of Indian Medicinal Plants (Including the Supplement).* Council of Scientific and Industrial Research, New Delhi. 1986
Very terse details of medicinal uses of plants with a wide range of references and details of research into the plants chemistry. Not for the casual reader.

[257] **Moerman. D.** *Native American Ethnobotany* Timber Press. Oregon. 1998 ISBN 0-88192-453-9
Very comprehensive but terse guide to the native uses of plants. Excellent bibliography, fully referenced to each plant, giving a pathway to further information. Not for the casual reader.

Readers Comments

Maclura pomifera

Donna Kolwaite Wed Nov 20 22:38:06 2002

I have just discovered the osage orange in my back yard a week ago. I live in Upstate New York (Utica). So I am finding this "hedge" very interesting. I have lived here for 8 years and this is the first time I have seen the osage orange. I'm amazed that it is growing in my area. Why is that?

Add a Follow Up to this comment

Maclura pomifera

Bill Allen (billandbonnie@peoplepc.com) Tue Sep 23 03:49:48 2003

There is a good stand of Osage Orange trees in Shreveport, LA, along the "Kings Highway Bayou". Most sources give the original range of the Osage Orange as "East Texas and Southwestern Arkansas and southern Oklahoma", but I was wondering if these trees could be original, as Shreveport is near the texas border. Another factor that makes me wonder is that this bayou (I believe) was at one time the bed of the Red River, and although the Osage Indians are credited with making bows from the wood, could not the Caddo Indians also have used the tree? I would welcome information on this from anyone, my e-mail is billandbonnie@peoplepc.com

Add a Follow Up to this comment

Maclura pomifera

(javlin@accnorwalk.com) Tue Oct 21 00:04:37 2003

I don't have a comment, but I do have a question I have recently bought a home that we have found out has bugs roaches to be exact and some one had told me that the osage orange is a good repellent I would like some one to tell me how to use them so that I canget rid of these things as quicky and as cheaply as possible if any one has any idea please let me know by e-mailing me at javlin@accnorwalk.com

Add a Follow Up to this comment

Maclura pomifera

James Easter (osagebow@iowatelecom.net) Sun Feb 29 07:34:45 2004

Link: Building the Osage Bow Good site for Osage Orange information and Osage Staves.

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Maclura pommifera

Cultivation Notes

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Latin Name: Maclura pommifera
Common Name: Osage orange
Family: Moraceae
Synonyms: M. aurantiaca. Toxylon pommifera.
Known Hazards: The milky sap can cause dermatitis in some people[200]. An extract and the juice of the fruit is toxic, though a 10% aqueous infusion and extract diluted 1:1 are not toxic[240].

Author: (Raf.)Schneider.

Habit: A Medium Growing Deciduous Tree
Habitat: Woods, fields and thickets in rich bottom lands[73, 83].
Height: 15.0 **Width:** 12.0

Cultivation Details:
Prefers a well-drained soil in full sun[200]. Succeeds in poor soils and also in dry ones[20]. Plants are fairly tolerant of maritime exposure[K]. They dislike waterlogged soils[188]. Dormant mature plants are hardy to about -20°c though the young growth in spring can be cut back by late frosts[200] and young plants can be damaged in cold winters[188]. Plants require hot summers to fully ripen their wood if they are to thrive in areas with cold winters[188]. Plants are tolerant of severe pruning[200]. This species is notably resistant to honey fungus[200]. Dioecious. Male and female plants must be grown if seed is required.

Propagation Notes:
Seed - best sown as soon as ripe in an open seed bed[200] or in pots in a cold frame. Pre-soak stored seed 48 hours in warm water and stratify for 2 months at 4°c then sow in a cold frame[113, 200]. Germination is normally good. The seed stores for 3 years[113]. Cuttings of half-ripe wood, July/August in a frame[200]. Cuttings of mature wood, November to January in a frame[113]. Layering in summer[200]. Root cuttings 4cm long in December. Plant horizontally in pots in a greenhouse and plant out as soon as possible. Good percentage[78].

The information above has been supplied solely via the hard work and dedication of the team at 'Plants for a Future'.

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Erica Melanthera

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Horticulture

Horticulture & Home Pest News

Facts and Myths Associated with "Hedge Apples"

While many Iowans have undoubtedly seen the yellow-green, grapefruit-sized fruit at farmer's markets, supermarkets, garden centers, and other locations, few individuals know much about these rather unusual fruit. Questions abound. What are they? Where do they come from? Are they good for anything?

The Tree and Its Fruit

The yellow-green fruit are commonly call "hedge apples." They are produced by the Osage-orange (*Maclura pomifera*). Other common plant names include hedge apple, bodark, bois d'arc, and bowwood.

The Osage-orange is a small- to medium-sized tree. It commonly grows 30 to 40 feet tall, occasionally as tall as 50 to 60 feet. It typically has a short trunk and a rounded or irregular crown. The leaves of the Osage-orange are a shiny medium to dark green. They turn yellow in the fall. The twigs are buff to orange-brown and are armed with 1/2-inch long spines. The stems exude a milky sap when cut. The Osage-orange is dioecious. Male and female flowers are produced on separate trees. The small, green flowers appear in May or June. The female trees produce 3- to 5-inch-diameter fruit which ripen in September or October and fall to the ground. The "hedge apple" is an aggregate fruit composed of numerous one-seeded druplets. The Osage-orange is a member of the Mulberry or Moraceae Family. Other cultivated members of this family include the mulberry and fig.

Native Habitat and Current Distribution

The Osage-orange is native to a small area in eastern Texas, southeastern Oklahoma, and southwestern Arkansas. This region was also the home of the Osage Indians, hence the common name of Osage-orange. White settlers moving into the region found that the Osage-orange possessed several admirable qualities. It is a tough and durable tree, transplants easily, and tolerates poor soils, extreme heat, and strong winds. It also has no serious insect or disease problems. During the mid-nineteenth century, it was widely planted by midwest farmers, including those in southern Iowa, as a living fence. When pruned into a hedge, it provided an impenetrable barrier to livestock. The widespread planting of Osage-orange stopped with the introduction of barbed wire. Many of the original hedges have since been destroyed or died. However, some of the original trees can still be found in fence rows in southern Iowa. Trees have also become naturalized in pastures and ravines in southern areas of the state.

Uses of the Osage-Orange

The wood of the Osage-orange is golden yellow or bright orange when first cut, but turns brown on exposure. The wood is extremely hard, heavy, tough, and durable. It also shrinks or swells very little compared to the wood of other trees. The wood is used for fence posts, insulator pins, treenails, furniture, and archery bows. In fact, many archers consider the wood of the Osage-orange to be the world's finest wood for bows. (The name bodark is from the French bois d'arc mean "bow wood.") Also, a bright yellow dye can be extracted from the wood.

It is the fruit of the Osage-orange that most individuals find intriguing. In the hands of a child, the fruit can become dangerous weapons. They are a nuisance in the home landscape. The "hedge apples" are not an important source of food for wildlife as most birds and animals find the fruit unpalatable. (However, the thorny trees do provide nesting and cover for wildlife.)

The use of the hedge apples for insect control is one of the most enduring pest management home remedies. Placement of hedge apples around the foundation or inside the basement is claimed to provide relief from cockroaches, spiders, boxelder bugs, crickets and other pests.

The use of hedge apples as a pest solution is communicated as a folk tale complete with testimonials about apparent success. However, there is an absence of scientific research and therefore no valid evidence to confirm the claims of effectiveness. Although insect deterrent compounds have been extracted from hedge apples in laboratory studies, these do not provide a logical explanation about why hedge apples would work as claimed. At this time, there is nothing to recommend the use of hedge apples for pest control.

While the Osage-orange is hardy in southern Iowa (USDA Hardiness Zone 5), it is not a suitable tree for the home landscape because of its large fruit and sharp thorns. Attempts have been made by horticulturists to identify and select male, thornless cultivars. Unfortunately, no cultivar has proven to be completely thornless. Until a true thornless cultivar is found, the Osage-orange is probably best suited for wildlife plantings in rural areas.

Dermatitis

The milky juice present in the stems and fruit of the Osage-orange may cause irritation to the skin. While the fruit have been suspected of being poisonous to livestock, studies conducted in several states have been negative. However, the fruit may cause death in ruminants by lodging in the esophagus and preventing eructation or release of ruminal gases.

This article originally appeared in the October 10, 1997 issue, p. 143.

Prepared by Richard Jauron, Department of Horticulture
Iowa State University, Ames, Iowa.

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Last updated 12/23/97 by John VanDyk
http://www.ipm.iastate.edu/ipm/hortnews/1997/10-10-1997/hedgeapple.html

Robert Meek Home

"Hillcrest House," built by Robert Meek about 1865-1870, stands majestically at the top of West Street overlooking the community. Bonaparte was originally known as "Meek's Mills".

Back

Långbågar mm / Longbows etc

Due to the massive amount of information I decided to keep this text in it's native language.

If someone translates it to any other language then please post me the file and I will include it on this side.

Subject: FAQ: Traditional Archery CREDITS: Rob McNeur Rob@ccc.govt.nz

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Traditional archery is assumed to relate primarily to archery using techniques and materials which were in major use prior to the 1950s, as it was shortly after this that archery changed significantly due to the introduction of new materials for both bows as well as arrows (eg fiberglass, steel, aluminium, pulley systems etc). Some of these had been experimented with earlier but had not been common at all.

Covered in this document are :- Terminology Arab/Asiatic traditional bows European/African/American Indian traditional bows Bow straightening Bowstrings Arrows Arrow straightening Archer's Paradox Arrowheads Armguards (Bracers) Competitions Suggested reading

Terminology ---------- Recurve - Any bow which has the tips of the working limbs bent backwards in the opposite direction from the draw when at rest. This allows the bow to develop extra power when drawn, to store and release energy more efficiently, as well as increasing velocity in the arrow by adding an extra flick in the arrow at the last second as the arrow starts to leave the string. The amount of recurve can vary from a slight curve at the tips, (similiar to a ']' shape) to a total curve whereby the whole working limb of the bow bends backwards from the handgrip, giving a totally reversed 'C' shape, sometimes curved backwards to the point that the two tips will actually touch when unstrung. (Also known as 'retro-flexed') Compound - a modern bow using a system of one of more pulleys to develop mechanical advantage. These pulleys may be concentric or eccentric and include wheels or cams. If eccentric, they can allow variable advantage and variable let-off, eg the elaborate pulley system can allow the draw weight of the bow to be variably set and altered and also to allow the draw weight of the bow to drop off as it reaches full draw (eg a common example is for the bow to be set to 60 lbs when partially drawn (maximum weight) but dropping off to 30 pounds at full draw position so that the draw can be held at that point more easily for a longer period). This is the opposite of other bows which tend to generate their maximum force at full draw and minimum force at undrawn. Self bow - a one piece bow, usually made of a single stave of wood, or any other single material (this now includes 'all steel' or 'all fibreglass' bows). Also used to mean a bow which may be made of 2 staves of wood of the same type, jointed at the midpoint (handle), to give a single length of uniform strength and uniform properties. This was often necessary due to the difficulty of getting a single bowstave of a decent length without knots, warps or other defects. This is the main European/African/American Indian etc style of traditional bow but can be applied to solid fibreglass, steel, horn, etc. Composite - a bow made by laminating multiple materials together in thin layers. Materials most commonly used in traditional bows were different types of wood and layers of horn, often bound together with sinew and glued in layers. Modern bows usually use layers of wood, fibreglass and/or steel. Traditional Asiatic and Arab bows were often horn/wood/sinew recurved composites. The

different materials allow the bow to use the best properties in the best location to maximise their efficiency. Manufacture of these types of bows is a slow and painstaking task, as any weakness in any of the joints will give either reduced performance, or a bow which will break under load. Backed bow - a bow primarily of wood, but having a thin strip of another material along the back of the bow (see composite bow). Usually the material used was a thin strip of wood (eg bamboo or hickory), or a strip of raw hide or even silk glued in place. This backing did not add much (if anything) to the strength or efficiency of the bow, rather it helped the bow to return slowly to straightness. Bows backed with sinew are the exception to this, as the sinew greatly increases the tension of the bow. Longbow - Usually a 'Self' or 'Backed' bow, the longbow is effectively a straight (or slightly curved) length of wood with string on each end. Fibreglass, steel and composite longbows are also often made. It has no recurves, no pulleys or cams, and is the traditional shape associated with the European archers of the middle ages. Spine - the measure of stiffness in an arrow. Of less importance with 'centre-shot' bows (ie those firing through the centre of the handle), but of major importance with arrows fired past the side of the bow (See 'Archer's Paradox' below)

Hence there can be 'Composite Compound' bows, 'Composite Recurve' bows, 'Self recurve' bow etc. Modern bows are nearly all of a composite style (recurve or compound) although many clubs do have archers shooting with 'traditional' equipment, and some clubs exist (mainly in the UK) solely for the traditional archer.

Arab/Asiatic traditional bows ---------- Usually made of thin layers of horn and softened (soaked and softened) sinew glued to a central core of wood. (For more detail, see the Asian/Arab traditional bowmaking section of the FAQ). They are often shorter (42"-72" = 107cm-183cm) than their European counterparts (60"-78" = 152cm-198cm) as they were more often used from horseback, whereas the European bows were more often used from the ground. The Japanese bow was different again, being up to 84" (=213 cm) (or more) in length. Many of the Turkish, Asian and Arab races drew the bow using a thumb- ring, a ring worn on the thumb of the drawing hand. The string was hooked behind it (in the palm of the hand) and the thumb closed over the string so that it rested tightly against the middle finger. For heavy bows, the forefinger could also be used to lock the thumb closed. To release, the thumb is opened, allowing the string to slip off the edge of the ring. (With the heavy bows, the forefinger should be raised first to save undue strain on the thumbnail as it slides free from the forefinger). Using the asian release, the arrow would rest on the opposite side of the bow to that of those using a finger release i.e. for a right handed archer, the arrow would rest on the right side of the handpiece, whereas usually for those using a finger release, a right-handed archer will have the arrow resting on the left side of the grip. Regular war tactics involved charging on horseback until close enough to fire arrows then circling away again for another go.

European/African/American Indian traditional bows ----------
Usually a wooden 'Self' bow of between 60"-78" (=152cm-198cm) and intended for use from the ground, although the American Indian used the shorter versions very effectively from horseback. The American Indian also often used composite (horn/sinew or wood/sinew) or backed bows. The traditional yew bow of Europe acted as though it were a composite bow, as it was preferably made of a section of yew taken where the sapwood and heartwood joined. The different properties of the two different wood types allowed the bow to act with the best features of each wood type. The

properties of the 'Self Bow' are such that the minimum length of the bow is (2xDraw length) ie with a draw length of 28 inches (=71 cm), the minimum length of the bow will be 56 inches (=142 cm). The greater the length of the bow, the more even can be the spread of forces built up.

The short bows of the American Indian probably varied between 20-70 pounds, the European hunting bows normally ranged between 40-100 pounds, with the European war bow (eg the Welsh Longbows) ranged from 90-180 pounds.

However, the European war bows were drawn both to the chin and to the chest. Due to their great draw weight, and the fact that they were often used in ranks of archers and fired at large masses of opponants at long range, they were often drawn to the chest (with the bow-string passing down the cleft of the chin) using a longer arrow (36" = 91cm) the 'cloth-yard' shaft, and fired high into the air in massive volleys to fall almost randomly into their targets. (Hence 'clout' shooting - see competitions listing below) As the ranges got closer and the archers were more able to pick specific targets, they reverted to a more traditional aiming style, with the long arrow drawn past the side of the chin and the fingers of the nock hand back somewhere around the jawbone or ear and aimed normally. The heavy draw weight of these warbows requires a significantly heavier shafted arrow, usually with some form of bodkin head (see 'Arrowheads' below), which had enough weight to strike its target with frightening power.

Indications are that often many warbows were carried half made (as shaped staves) during prolonged campaigns, and finished as and when they were needed during the campaign. Normal (European) war tactics involved massed ranks of lightly armed or armoured archers firing large volleys of arrows into formations of targets. It was the Welsh Longbow, in the hands of thousands of archers, which effectively obliterated the cavalry force of thousands of French knights at both Agincourt and Crecy. Bad weather and mud were major contributing factors in this, as the French cavalry were unable to close to attack effectively, so that massive volleys of arrows wiped out the opposing crossbowmen and then the French Knights (and their horses).

Woods normally used for these bows include :- Europe :- Yew, Wytch-Hazel, Elm, Ash America :- Hickory, Osage Orange, Lancewood, Dagame (Lemonwood), Yew, Ash, Juniper, Chokeberry, Maple, Locust Asia/Pacific Islands :- Bamboo, Lancewood Australia/New Zealand :- The local native races down here never had the bow as a hunting or fighting weapon, so there are no traditions During the reign of England's King Henry VIII, he was concerned enough about the rapidly decreasing availability of Yew wood for longbows, that he made a law stating that for every Yew bow made, there would also be one made of each of the following timbers :- Wytch-Hazel, Brazil, Elm, Ash He also made it a law requiring every male in the kingdom to practice with the longbow, and decreed that it was not murder if anyone killed someone between the target and firing line during practice.

Bow straightening ---------- Virtually all all-wood (self) bows will slowly develop a constant curve during normal usage. This is termed "following the string" (Yew is one of the few woods which should return fully to its correct shape and even it will usually develop string follow.). This curving will effectively reduce the draw weight of the bow slightly. This curve can be removed by carefully and slowly heating the complete bow until the wood becomes slightly softer, the wood can then be curved to the desired shape and slowly cooled again. The whole bow should be warmed at the same time, not in stages, so this can be done in a section of pipe with the ends

closed, and the heat applied to the pipe, rather than directly to the bow. As long as the wood is not overheated or burned at all, it should return to straightness and recover most (if not all) of the lost poundage. This will, of course, not be permanent, but can greatly enhance the effective life of the bow

Because of this and other reasons, it is always a good idea to unstring any all-wood bow any time it is not required for use for more than an hour or so. Many modern composites (recurves and compounds) do not have this problem as much and are often left strung for extended periods, but for any self bow it is important to unstring them after use.

Bowstrings ========== These were normally made of hemp, gut or silk and either twisted or plaited with beeswax (for waterproofing) to the desired length. I have heard that steel strings were sometimes used for some of the middle eastern bows, but have not found references for this (and would hate to be using one if it snapped during use. The thought of steel wire under stress snapping close to the check and eye with 50+ pounds of tension on it doesn't inspire me). Often a loop is placed in one end, and the other end left hanging. When the bow is strung, this end was tied using a bowyers knot (now called a 'bowline' knot). Other methods allowed the maker to plait or twist a loop into either end during construction (e.g the Flemish twist method). Turkish strings were made with separate end loops (tundj) tied to the string with a special knot (same with Chinese, Mongolian, Persian and Tatar, probably others as well too) allowing it to be shortened or made longer to fit a particular bow/archer, the loop added stability to these short recurves.

Recently I was informed that the researchers on the Tudor ship "Mary Rose" have found their first complete bowstring of the period. It was preserved intact under the cap of it's unfortunate owner. The string itself is a very strong variant of English linen, although whether plaited, woven or 'endless string' I am unsure.

Arrows ====== Although originally made of a single length of wood, many archers used to splice different types of wood together to enhance the properties of the arrow. Hardwoods were often spliced into the head and/or heel (fletching end) of the arrow and softwoods used for the central shaft. Such spliced hardwoods are known as a footing. The softwoods allow the arrow to retain its flex and lowers the weight of the arrow. The hardwoods in the head and/or heel allow these areas of the arrow to withstand the major stresses in the arrow namely the splitting stress of the string thrusting against the centre of the arrow (if separate nocks aren't used), pushing it forward and possibly splitting the wood, and also the compressive stress of the arrow hitting it's target. Often nocks would be reinforced by cutting a slot at right angles to the nock and inserting a short section of horn or bone. Hence the stress of the released string is spread across the horn and thence across the whole end of the shaft, rather than being concentrated in the grain directly below the string.

Arrow straightening ---------- Wooden arrows will often warp slightly in normal usage. This warpage can be removed by gentle heating (usually with steam from a kettle or similiar) and carefully bent back to straightness. Fastening the arrow to a straightedge during the process will help to ensure straightness. The ancients used to do this by heating over a fire and then sliding the arrow backwards and forward through a small hole in a piece of bone.

Arrow flights were nearly always made of feather. The stronger and heavier the feather, the better for a flight. Goose and turkey feathers were often used, although many of the middle eastern archers preferred hawk or eagle feathers when available. And wing (pinon) feathers are always

preferred over any others although Turkish arrow flights were also made from tail feathers.

Archer's Paradox ========== This is not as significant with modern bows, many of which have a shaped handle allowing the arrow to pass through the middle of the handle. It is much more significant in older bows where the arrow is fired past the side of the handle, yet the string actually moves towards the centre of the bow, rather than the edge where the arrow rests. The arrow still manages to fly to the point of aim. In actual fact, the string moves directly towards the centre of the bow which causes the arrow to curve around the side of the bow and continues to curve and oscillate from side to side in flight. This results in a wavering arrow flight which smooths out as the arrow travels until this sideways movement has been fully damped out. During this flight, the arrow is actually flexing. Because of this, it is most important to get the correct amount of stiffness (spine) in arrows intended for a non centre-shot bow. If the spine is too high, the arrows cannot flex correctly in flight and hence are less able to correct for the travel of the string. If they are too low, then the arrow is less able to dampen the flex in flight, and hence the flexing continues too long. The arrow 'spine' must be closely matched to the bow weight, as a heavier bow will induce greater flexion. The shaft of the arrow needs to be thicker (to take the extra stresses) and also stiffer (to dampen out the added flex) for a heavy bow, and thinner and lighter for a light bow.

Arrowheads ========== Primitive man started with a arrowhead that was hardened by burning the end of the shaft slightly, then sharpened by shaping the burned end. A 2-blade broadhead (2 cutting edges) was used as the primary hunting and war arrowhead for centuries, either cast from bronze, chipped from flint, or forged in iron/steel. The arrival of plate steel armour meant that the arrowhead had to change to allow it to punch through rather than cut, so bodkin points were developed in a variety of sizes and shapes. They tend to be very narrow and longer than a hunting broadhead, with little or no cutting edges, in a square or triangular cross-sectional shape to enable it to place the maximum stress on the smallest area of steel plate armour as possible, so as to penetrate as deeply as possible. Japanese and Chinese arrowheads, on the other hand, have a wide assortment of warheads, each of which have specific effects and intended uses. Amongst these are specially designed heads with hollow channels through them to enable the air to flow through them, giving different sounds in flight. These can be used to scare men and horses in combat. They also have armour piercing alternatives etc. Turkish flight arrows often had horn tips, thus reducing weight as much as possible.

Armguards ========= Simple leather forearm-guards (bracers) with leather thongs were most common, although the more advanced craft of archery amongst some of the middle eastern groups used to make bracers from thin strips of wood, bone or ivory and held in or glued to a leather or cloth body and strapped on. Formal English archers were also known to have worn a large glove which extended as far as the elbow, and had pockets fitted for spare strings, wax etc..

Competitions ========== Clout shooting - A large circle or square (rope, painted etc) is laid out flat on the ground 160-240 yards (146-220 metres) from the archers. The object is to get the maximum number of arrows landing the closest to the centre of the circle. The circle is between 8-12 times the size of a standard target face with a light coloured flag marking the centre of the target. Popinjay - a wooden parrot is placed on the top of a tall pole. The archers fire from directly underneath and score points for how close they get (feathers knocked off etc) and also whether anyone can actually knock the bird off the pole. Modern rules are extended slightly to having a

Cock (wooden cylinder 5"x2" (=12.5x5cm)), 4 hens (4"x1.5"(=10x3.8cm)) and up to 24 Chicks (2"x1" (=5x2.5cm)) with feathers attached, all on platforms on the top of a pole up to 85 feet (26 metres) high. Around the base of the pole is a ring 15 feet (4.6 metres) across, in which the archers stand while firing directly upwards. Because the arrows tend to fall straight back downwards again, the arrows used are wooden with flat ends (3/4"-1" (=1.9-2.5 cm) wide blunts). Scoring is 5 points for the Cock, 3 for each Hen, 1 per Chick. They must be knocked off to score and all are reset as soon as the Cock is dislodged. Wand shooting - A peeled willow wand is set up at a specific distance and the archers attempt to split the wand (Robin Hood style). (Aka Prick Shooting) Butt shooting - similiar to modern target shooting. Flight shooting - Trying to gain the maximum range possible. Hitting a target is not a primary consideration. Early Persians have recorded ranges of up to 900 yards (822 metres) (with documented evidence), and it has been only during the last century with modern technologies that this has been surpassed. The current record is (I believe) somewhere around 1310 yards (=1200 metres). Speed shooting (aka Shower shooting) - firing as many arrows as fast as possible, attempting to maintain the maximum number all in mid-air at once. Several recorded attempts have shown archers having 9 in the air at once, The best record I have come across maintains a documented instance of a master Persian archer having 15 arrows all in flight simultaneously, using specially made arrows.

Suggested Reading ========== Some of these may be out of print. Quite a lot of information is available for the historical uses of European/African/American Indian/Japanese longbow styles. Much less is available for the middle Eastern/Asiatic aspects.

Toxophilius - Aschaum, Robert 15th Century treatise on English Archery Can be slow reading, but interesting historically The Archer's Craft - Hodgkin, Adrian Eliot Faber and Faber, London, England 1974 (second ed.) isbn 0 571 10493 2 - out of print, unfortunately. Longbow: A social and military history - Hardy, Robert Bath Press, Bath, Avon. first printed 1976, reprints 1986 and 1990,ISBN 0951174703 The second edition came out in the fall of '92; you want that one if you can, as it has the Mary Rose data in it. A good history of European archery The Traditional Bowyer's Bible, Volume 1 and Volume 2. Bois d'Arc Press, P.O.Box 233, Azle, Texas 76098 tel.: (817)237-0829 Both of these are well worth the money, having careful instructions on building archery equipment, as well as much discussion on woods and techniques as well as historical aspects. Target Archery - Elmer, Robert P (He was the US archery champ for several years in the 1920s and 1930s) Anchor Press Ltd, Tiptree, Essex, England (first published 1952) I believe the book is now out of print. He has quite a lot of stuff about all the different types of wood usable and their good and bad points, as well as a lot on curing the wood and finally making the bow, also includes some information on the Arab/Asiatic styles and equipment.

Some others suggested Turkish Archery and the Composite Bow" - Paul E.Klopsteg, first published in 1947(?), there was at least one reprint. It is a translation (with additions) of an article by Joachim Hein "Bowyery and the Sport of Archery among the Osmanli" in Der Islam, 1925, which is in turn a translation of an Arabic text by Mustafa Kani "Excerpts from the Writings of the Archers", 1847. This is a basic reference for Turkish bowmaking and shooting Investigative Report on Bow and Arrow Manufacture in Chengtu" by T'an Tan-Chiung, a reprint (and translation) from Soochow University Journal of Chinese Art History, Vol.11, July 1981. A detailed description of making a Chinese composite bow. Journal of the Society of

Archer-Antiquaries. Devoted to history and development of traditional bows worldwide. Annual, #7 subscription. To join: send to D.Elmy, Secretary, 61 Lambert Road, Bridlington, North Humberside YO16 5RD. (I assume this is a UK address) Bows and Arrows of the Native Americans by Jim Hamm, Bois d'Arc Press (see address with Trad. Bowyer's Bible above). Very good instuctions on how to make American Indian bows.

Thanks to the following for their thoughts, comments, fixes and additions :- mje@pookie.pass.wayne.edu (Michael J. Edelman) lalonde@cs.ubc.ca (Paul A. Lalonde) akarpowicz@mta.ca (Adam Karpowicz) EDUCC@lure.latrobe.edu.au (Lyn and John Clark) melin@hlrserv.hlrz.kfa-juelich.de (Stephan Melin) vader@meryl.csd.uu.se djenkins@axion.bt.co.uk (David Jenkins)

Any queries, changes, additions or abuse for this section of the FAQ to

Rob McNeur Rob@ccc.govt.nz

Bow and Arrow Making

The most important texts on the construction of traditional composite bows are the Klopsteg book (with a few detailes ommited and present in the original article by Hein) and the article by T'an Tan-Chiung. The two sources deal with Turkish and Chinese bows, bowmaking of other nations, however, can be inferred from these two, since all composite bows have similar construction. There are also a few articles in the Journal of the S.A-A.

Construction:

There are three layers in the composite bows: sinew on the back (the side under tension), wood for the core and horn on the belly (the compression side facing the archer).

Various hardwoods and bamboo were used for the bows core. Limbs in Turkish bows were usually made of maple, sometimes yew, in Chinese of bamboo or mulberry. Wood was selected very carefully, although not necessarily flat grain, if made of bamboo, outer side of a stem would face the horn.

All composite bows have several sections, roughly worked to shape before final assembly: a handle section joined to two arm sections (in bows with bamboo arms the handle is a chunk of wood glued in the middle of one split bamboo stem), arms are joined to a mid-portion (siyah in Turkish or a "knee" or "brain" in Chinese), which in turn is joined with strongly reflexed tips, usually straight pieces with nock grooves at the ends, often called ears and reenforced with a piece of horn. Single fishtail splices, about 3-5" long for knees/siyahs joints and 6-9" for arms/handles are used. Sometimes Cornelian cherry was used by Turks as an overlay for the handle section.

The relative lengths and the reflexed curvature of the various wooden sections varied, depending on the make and origin of a bow: in Turkish, Chinese, Mongolian or Persian bows the arms were more reflexed before assembly, in Tatar and possibly Indian bows the arms were straighter. In Turkish bows the ears were 3-4", siyahs 6-8" and arms 10-12"; in Chinese bows, the ears were much longer relative to arms, could be almost as long as the arms. Handles were short (6-7"). Bows had different lengths: Turkish bows are generally shorter (flight bows were about 44" betw. nocks), Persian a little longer, Chinese and Tatar could be over 6' long. Turkish war bows were longer than flight, but still shorter than target bows, Chinese bows used by foot soldiers were quite small too.

Chinese (and possibly Turkish) bowyers purchased green wood or bamboo. The parts were shaped and reflexed as needed, seasoned for about a year, fitted, joined with glue and dried for another year. Pre-shaped horn strips were glued onto the belly of a bow. Both wood and horn were scored with a special toothed tool and glued together (clamping was achieved by tight binding with rope). Maching pairs of water buffalo horns were used almost exclusively, with an exeption of longhorn cattle horns for some Turkish bows. For best Chinese bows, expensive, translucent, white horns were preferred. Buffalo horns have no sidewise twist as present in cattle horns. Cattle horns had to be boiled, heated and pressed into a correct shape in special wooden molds. Buffalo horns are also more flexible and resilient than cattle horns and provide thicker strips. It is probable that in Persian

bows, instead of a solid strip, many thin ones were glued together into one wider strip.

The back of a bow was then covered with sinew, leaving most of the ears/tips bare. Sinew usually came from cow leg tendons, possibly neck (back) tendons. Tendons from wild animals (deer, moose etc.) must have also been used, and, in the authors opinion, are better, leaner, stronger, longer and easier to work with. The dried tendon is pounded until separated into fibers, which are sorted into bundles of similar length. The bundles are soaked in glue and laid onto the back of a bow. 2-3 layers are used for a dry thickness of approx. 3-6mm. On Turkish flight bows a ridge along the centre of siyahs was formed to increase cast. Bows were always seasoned after this last operation from 6 months (Chinese) to at least a year (Turkish). Due to shrinkage of sinew and glue (and from deliberate, progressive reflexing betw. layers of sinew in case of Turkish) bows were at this point very strongly reflexed with tips touching or even crossed. The reflex made the tillering and stringing, which followed, a rather long and complicated operation.

Glue was an important component of the bows, the amount of glue in a finished bow was almost equal to the relative amounts of sinew or horn. Only three kinds of collagen-based glues were used: fish, tendon and skin. For the fish glue, either dry skin from "the roof of the mouth" of Danube sturgeon (Turkish, other fish for Chinese) or isinglas (sturgeon air bladder, Chinese) were soaked in water and heated into solution. The Turks mixed this glue with tendon glue, made from boiled tendons. A glue of lesser quality was made from boiled skins. Such glues readily absorb moisture rendering the bows useless in relative humidity above 70%. The bows had to be stored as dry as possible, kept by the fire, in the sun, or in heated cabinets.

The tillering was accomplished by gradual bending a warmed bow with minimal scraping of the horn layer to balance the arms. The arms were also given the desired curvature and/or weight by warming and tying to special wooden forms until cooled. Turkish flight bows were heated in "conditioning boxes" for 24 hours up to 4 days before competitions to thoroughly dry them (the sinew, glue and horn acquire very high strength and elasticity when very dry). Of course, the bows were never shot when warm; heat, as well as moisture, would make them weak and follow the string.

The finished bows (with an exception of Turkish flight bows) were richly decorated with painted and gilded leather or birchbark. Wooden or horn "bridges" were glued on the belly side where the ears join the siyahs/knees as supports for string loops. Chinese bows had cork and sharkskin wrapped handles and coloured writings can be seen through transparent (if white) horn on the belly.

Strings were made from unspun, raw silk wrapped with cotton at the centre and at a few spots along the length. All reflexed, composite bows had strings with two separate end loops for stability, the loops were tied to the string proper with special knots (the knots rested on the "bridges", as above).

The weight of the bows generally varied from 20 lb (Chinese infantry) to probably up to 100 lb. Turkish flight bows were usually 65 lb (the conditioning process however, see above, could easily add another 20 lb). There was a separate class of very heavy exercise bows. Military examinations in China required drawing heavy bows, up to 200 lb (!).

Shooting:

The Asian/Turkish bows were drawn with a thumb, protected with a special thumb ring, of various forms, made of horn, metal or semi-precious stones. The string rests on the smooth, inside surface of the ring, sometimes covered with a small leather tongue. There is a detailed description of the Turkish release in the Klopsteg book. The release is sharper than the three finger release and arrow spine becomes less important. The string was drawn to the ear. Turkish flight shooters used a device called siper, tied to the bow arm wrist, to allow for overdraw (flight arrows were 24- 25" long); also, a waxed strip of fabric was wrapped over the handle to provide a more comfortable grip.

The bows were highly efficient and the record shot with a light Turkish flight bow was close to 900 yards, far beyond the capability of a self bow.

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Created Dec 8 1994 by Aaron Rice (jar22@email.byu.edu)
a Timpview High School student
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David O. McKay School of Education
Brigham Young University

Catnip and Osage Orange Components Found to Repel German Cockroaches

Research in the lab of Dr. Joel Coats in the Department of Entomology at Iowa State University indicates that chemicals produced naturally by two plants, catnip and the osage orange (also known as hedgeapple) repel German cockroaches. Folklore includes numerous claims that catnip and osage orange are repellent to insects and spiders. Results presented at the American Chemical Society National Meeting in New Orleans, LA, August 22-26, show that when given a choice between a surface treated with these plant oils and an untreated surface, German cockroaches spent much more time on the untreated surface. Graduate research assistant Chris Peterson observed the responses of the cockroaches. He said that "the roaches will venture onto the treated surface, stop, turn around and walk off onto the untreated surface."

Catnip, well known for its intoxicating effect on cats, contains a chemical called nepetalactone. This compound is present in two isomers, which were isolated and tested individually for their repellency. The researchers reported that the minor isomer (the E,Z-isomer) was 5 to 10 times more repellent than the principal isomer (Z,E).

The essential oil of osage orange is also repellent to the German cockroach. Three of the compounds in the oil have been identified, while several others have not been. Identification of the repellent components is currently underway. Their individual and aggregate repellencies will be investigated on roaches, as well as other insect pests.

Potential applications include use as barrier strips to prevent cockroach entry into an area, or in packaging and shipping where treated containers may prevent accidental transportation of cockroaches with food items. Coats believes that there are sensitive areas in which natural roach repellents may be much preferable to spraying with conventional insecticides; such areas would include schools and daycare centers, hospitals, restaurants, kitchens, and bathrooms. "The essential oils of plants hold great potential for insect control, as natural insecticides and repellents," he says. Tests at Iowa State are currently being conducted to determine the activities of the catnip isomers and osage orange oil components against other insect other insect pests. "We're very interested to see if these compounds are active against mosquitoes, house flies, ticks, chiggers, black flies, pests of stored products, as well as other species of cockroaches," Peterson says.

In the current study, the osage oranges and catnip

plants themselves have not been proven to repel insects in houses or other buildings. However, the extraction and confirmation of repellent compounds from these plants will hopefully lead to the development of effective natural repellents. Three years of research by Peterson and several other researchers in the Coats lab has culminated in the Iowa State University Research Foundation filing two patent applications on the repellents developed from the studies.

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Wagner Electronics, the respected leader in moisture measurement technology, is proud to announce an exclusive partnership with fibre-gen, a Carter Holt Harvey Company.

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Wagner Electronics, the respected world leader in moisture measurement technology for over 40 years, is proud to announce the development of a new pocket-size moisture meter designed for the building inspection industry. This exciting "pin-free" hand held moisture meter uses state-of-the-art non-invasive electromagnetic wave technology to take relative moisture measurement readings.

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Wagner ElectronicsAnnounces its Exclusive Partnership with True View

Wagner Electronics, the respected world leader in moisture measurement technology, is proud to announce an exclusive partnership with True View, a Carter Holt Harvey Company.

This exclusive Sales Agent agreement gives Wagner Electronics the opportunity to bring you the LDS200 Surveyor.

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Duane Big Eagle
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William Least Heat-Moon
Yeffe Kimball
John Joseph Mathews
W.S. Penn
Carter Revard
Robert Allen Warrior
Terry P. Wilson

Online resources about the Osage Tribe

The Official Web Site of the Osage Tribe
Author: The Osage Tribal Council and The Osage Tribe
Type: tribal
Description: The Osage Tribe's Official Home Page, including information on their history, museum, and gaming center.
URL: http://www.osagetribe.com/

Resource Guide to Records on the Osage Indians
Author: Melodie Sanders
Type: tribal
Description: This genealogy guide for the Osage provides information about how to research both tribal records and white records, why the records are difficult to find and interpret, and suggestions for how to interpret the information.
URL: http://members.aol.com/bbbenge/page16.html

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Wood Moisture Meters

- Ideal for mills, dry kiln operators, lumber inspectors, custom driers, wholesalers
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SPECIFICATIONS

Range: 4.5 - 60% Wood MC

Resolution: 0.1% MC

Temperature compensation: -20 to 260° F (-28 to 126° C)

Species correction: 33 Species (expandable), plus 0-100 reference scale

Display: 3" digital LCD

Serial Interface: RS-232 (RDM-2S only)

Power: 1 ea 9V alkaline battery (RDM-2); 1 ea 9V NiCad w/ charger (RDM-2S)

Size/Weight: 7.5" x 4" x 2.25", 14 oz

Cat. No.	Model/Description	Price
19M11	RDM-2 Pkg Wood Moisture Meter	$625.00
19M12	RDM-2S Pkg Wood Moisture Meter	975.00

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Effective May 15th, 2004, all non-WolfWare course lockers served by NCSU ITD have been relocated to the legacy.ncsu.edu web server.

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Use the Wood Picker to identify candidate woods for a woodworking project. Just enter the desired criteria for each property of interest, click Submit, and a list of matching woods will be displayed. The output includes properties of woods that are exact matches as well as properties of all other woods, ranked from highest to lowest relevance.

Weight:	○ low	○ med	○ high	◉ omit	☑ show
Hardness:	○ low	○ med	○ high	◉ omit	☑ show
Stiffness:	○ low	○ med	○ high	◉ omit	☑ show
Strength - bending:	○ low	○ med	○ high	◉ omit	☑ show
Shock resistance:	○ low	○ med	○ high	◉ omit	☑ show
Decay resistance:	○ low	○ med	○ high	◉ omit	☑ show
Stability:	○ low	○ med	○ high	◉ omit	☑ show
Working ease:	○ low	○ med	○ high	◉ omit	☑ show
Type:	○ hardwood	○ softwood		◉ omit	☐ show
Location:	No preference				☐ show

Submit Reset

Wood Index and References

To display properties of all woods, select "omit" by clicking Reset button.

If "show" is unchecked for a particular property, it will not be displayed in the output results.

There are currently 128 woods and wood groups in the database.

Description of Wood Properties

Weight: Average ovendry weight. Rankings based on pounds per cubic foot: < 33 = low (light); 33 to 43 = medium (moderately heavy); > 43 = high (heavy).

Hardness: Side hardness or ability to resist compression perpendicular to the grain. Rankings based on fiber stress at proportional limit in pounds per square inch (psi): < 850 = low (dents easily); 850 to 1250 = medium (moderate hardness); > 1250 = high (hard).

Stiffness: Elasticity or ability to resist bending stress. Rankings based on modulus of elasticity in million psi: < 1.25 = low (bends easily); 1.25 to 1.65 = medium (moderate stiffness); > 1.65 = high (stiff).

Bending Strength: Maximum bending stress before failure occurs. Rankings based on modulus of rupture in psi: < 11000 = low (weak); 11000 to 14000 = medium (moderately strong); > 14000 = high (strong).

Shock Resistance: Impact strength or toughness. Measured by dropping a 50 pound hammer on a board supported on both ends at successively increasing heights until complete rupture occurs. Rankings based on max height of hammer in inches: < 30 = low; 30 to 55 = medium; > 55 = high.

Decay Resistance: Ability to resist deterioration due to decay fungi. Rankings based on relative decay resistance: low (little resistance); medium (some resistance); high (very decay resistant). Heartwood is generally more decay resistant than sapwood.

Stability: Dimensional stability in service associated with changes in humidity levels. Rankings based on average seasonal movement of kiln dried wood: low (not stable); medium (fairly stable); high (very stable).

Working ease: How easily the wood is worked. These rankings are somewhat more subjective than those for the other criteria but they take into account things such as blunting effects on cutting edges and how easily the wood splinters, chips, and burns. Rankings: low (works with difficulty); medium (works fairly easily); high (works easily).

Type: Hardwood (angiosperm) or softwood (gymnosperm). Softwoods are typically less dense than hardwoods, making them easier to cut and nail without pre-drilling. Pines, firs, hemlocks, cedars, and spruces are all softwoods.

Location: Geographic region where each tree grows. Note that the region "Australia-Oceania" includes Australia and surrounding islands such as New Zealand, New Guinea, Guam, Fiji, the Marshall Islands, Micronesia, and Tasmania. "Asia" includes mainland Asia as well as Indonesia, Malaysia, Japan, and other southeast Asia islands.

Scoring

A score is computed for each wood based on how well it's properties match the selected criteria. These scores are on a 100 percent scale. For example, suppose you choose to screen woods based solely on hardness and you specify a hardness criteria of "high". All woods with a hardness ranking of high will score a 100 percent, those with a ranking of medium will score an 80, and those with a ranking of low will score a 60. If you choose a hardness criteria of "medium", woods with a hardness of medium will score a 100 and woods with a hardness of low or high will score an 80. In other words, an exact match is worth 100, a close match (off by one unit) is worth 80, and a poor match (off by two units) is worth 60. All wood properties with three choices (low, med, high) are scored this way.

For wood type and location, an exact match scores 100 and an inexact match scores 60. For example, if you select "softwood" for the wood type criteria, all softwoods will score 100 and hardwoods will score 60. When multiple wood properties are selected for screening, the individual scores for each property will be averaged together to form a composite score that is still on a 100 percent scale. Woods with equal scores are arranged alphabetically within their group.

mild disclaimer: The scores are useful for seeing how woods compare to each other but they do have their limitations. For instance, in the real world, Lignum vitae far outranks perhaps all other woods in the categories of weight and hardness, but with the low-med-high ranking scheme used here, it would score the same as red oak. Further, there is a certain subjectivity involved in assigning rankings to properties such as working ease and decay resistance and also in determining the cutoff point between, say, a "heavy" wood and a "moderately heavy" wood.

Bottom line - use the scores as a guide but don't get too hung up on them. Also, the greater the number of screening criteria, the more realistic the scores.

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Computing Moisture Content of Wood

The moisture content of wood is directly related to the humidity and temperature of the surrounding air. The equilibrium moisture content (EMC) occurs when the wood has reached an equilibrium with its environment and is no longer gaining or losing moisture. Here is a calculator for computing the EMC of wood at or below the fiber saturation point (about 30% moisture content) given the temperature and relative humidity:

Temperature: 70 Rel. Humidity (%): 50
Fahrenheit ◉ Celsius ○

EMC:

The table below provides EMC values for a fairly representative range of atmospheric conditions that wood is likely to be exposed to. Values in this table are applicable to wood of any species for most practical purposes.

Relative Humidity %	**Ambient Air Temperature - degrees Fahrenheit**										
0	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**
5	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.1	1.1	1.0
10	2.6	2.6	2.6	2.5	2.5	2.4	2.3	2.3	2.2	2.1	2.0
15	3.7	3.7	3.6	3.6	3.5	3.5	3.4	3.3	3.2	3.0	2.9
20	4.6	4.6	4.6	4.6	4.5	4.4	4.3	4.2	3.0	3.9	3.7
25	5.5	5.5	5.5	5.4	5.4	5.3	5.1	5.0	4.9	4.7	4.5
30	6.3	6.3	6.3	6.2	6.2	6.1	5.9	5.8	5.6	5.4	5.2
35	7.1	7.1	7.1	7.0	6.9	6.8	6.7	6.5	6.3	6.1	5.9
40	7.9	7.9	7.9	7.8	7.7	7.6	7.4	7.2	7.0	6.8	6.6
45	8.7	8.7	8.7	8.6	8.5	8.3	8.1	7.9	7.7	7.5	7.2
50	9.5	9.5	9.5	9.4	9.2	9.1	8.9	8.7	8.4	8.2	7.9
55	10.4	10.4	10.3	10.2	10.1	9.9	9.7	9.5	9.2	8.9	8.7
60	11.3	11.3	11.2	11.1	11.0	10.8	10.5	10.3	10.0	9.7	9.4
65	12.4	12.3	12.3	12.1	12.0	11.7	11.5	11.2	11.0	10.6	10.3
70	13.5	13.5	13.4	13.3	13.1	12.9	12.6	12.3	12.0	11.7	11.3
75	14.9	14.9	14.8	14.6	14.4	14.2	13.9	13.6	13.2	12.9	12.5
80	16.5	16.5	16.4	16.2	16.0	15.7	15.4	15.1	14.7	14.4	14.0
85	18.5	18.5	18.4	18.2	17.9	17.7	17.3	17.0	16.6	16.2	15.8
90	21.0	21.0	20.9	20.7	20.5	20.2	19.8	19.5	19.1	18.6	18.2
95	24.3	24.3	24.3	24.1	23.9	23.6	23.3	22.9	22.4	22.0	21.5
98	26.9	26.9	26.9	26.8	26.6	26.3	26.0	25.6	25.2	24.7	24.2

EMC Equation

The EMC calculator and table employ the following equation to derive moisture content:

$$M = 1800/W \left[KH/(1-KH) + (K_1KH + 2K_1K_2K^2H^2) / (1 + K_1KH + K_1K_2K^2H^2) \right]$$

where

M = moisture content (%)
T = temperature (°F)
H = relative humidity/100

$$W = 330 + 0.452T + 0.00415T^2$$
$$K = 0.791 + 0.000463T - 0.000000844T^2$$
$$K_1 = 6.34 + 0.000775T - 0.0000935T^2$$
$$K_2 = 1.09 + 0.0284T - 0.0000904T^2$$

Source: U.S. Forest Products Laboratory

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Free (and almost free) Woodworking Stuff

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An excellent source for woodworking supplies, plans, books, hardware, and tools.

Internet specials from Rockler.com
Check this often as they are constantly adding new specials.

Home-Grown Software

Board Feet Calculator Windows
Here's a handy little calculator for quickly computing how much lumber you need to order for your next big project. *To install: download to a temporary location on your hard drive, click on bdft.exe to extract file components, click on setup.exe and follow directions. Delete all files created in temporary location.*

Bill of Materials html file
This is a template for creating a bill of materials or materials list once a final drawing is in hand.

Project Summary Template html file
Use this template to create a summary sheet for your woodworking projects. Includes project name, date, customer, material costs, labor breakdown, and construction notes.

Online woodworking utilities

Downloadable Software at WoodCentral

Arc Layout
Excel spreadsheet to calculate the path of a circular arc in a workpiece given the length of the arc bottom and the rise at its midpoint. By Ron Zuckermann.

Board Foot Calculator
Excel spreadsheet which calculates board feet given width and length. By David Lykins.

Compound Miter Angles
Excel spreadsheet for computing compound miter angles. Displays crosscut (miter guage) and blade tilt angles. By Robert Wilkerson.

Cove Cutter 1.0
Assists in determining blade height and cutting angle for making cove cuts on a table saw. Interactively generates a cross-section view of the cove - cool! By Tony Leonard.

Raised Panel Calculator
Excel spreadsheet that produces a rudimentary diagram and a cut list for raised panel doors. Inputs include width of rail and styles, outer dimensions and quantity. Handles single, double, and four-panel doors. by Mike Bon

More Downloadable Software

Anglesaw Excel workbook
Helps you calculate the angle of a jeweler's saw blade or scroll saw blade if you are inlaying any material into another. Courtesy of Dave Bilger of B&B Rare Woods, Mac/Windows.

Basics Free for limited time
An affordable, complete order processing and inventory control system for cabinet, furniture, fixture and millwork manufacturing. Designed for small companies (10 to 40 employees). Feldman Engineering Corporation, Windows.

Component/Summary Sheet
Excel spreadsheet that computes costs and material requirements for cabinetmakers. Component sheet is for listing components, dimensions and time. Summary sheet is for summing selected groups and setting waste variables. Courtesy of Lars Gandarve. Windows.

DesignWorkshop Lite
Build your own 3D models for home design and visualization of architecture, landscapes, exhibits, or any kind of spatial design. Artifice Inc., Windows or Mac.

Desktop Themes for Woodworkers
An interesting collection of woodworking pictures that can be installed as background images or screensavers. Courtesy of Stephen Waddell. Windows.

Dovetail Template Maker Windows
Here's a program that generates dovetail templates (for Incra and JointTech dovetail jigs) given board thickness, width, size, angle of dovetail bit, and number of dovetails. Courtesy of Tom Giammo, Crestline Enterprises.

Face-Frame Cabinet Cut List Calculator
Excel spreadsheet. Just enter finished cabinet dimensions and this utility generates cut lists and cost information for the various cabinet components. Courtesy of Jay C. Heil.

Inch2Metric
Downloadable calculator to convert from inches to millimeters. Courtesy of Peter Havel.

IntelliCAD 2000 by CADopia Windows
A nicely packaged 2D CAD product with many features and a high degree of compatibility with the AutoCAD command set, as well as AutoLISP and Autodesk ADS. Free Downlaod!

Kitchen Designer by Bob Vila Online utility
A custom kitchen design tool that walks you through the process of creating a floor plan, adding cabinets, counters, doors, windows and appliances-in various styles and colors.

Magazine Search Online utility
Free online search of a database of 3,600+ woodworking articles from 17 magazines. Covers issues from the last 5 years. Courtesy of Rick's Woodshop Creations.

Palm Pilot Board Foot Calculator
Computes board feet for single boards or entire projects. When you go to buy materials, you can input the size boards available, and it tells you how many to buy! George Ziegler, Palm Pilot. (Freeand registered versions)

Panel Pro Windows
Creates a bill of materials for a panel door given dimensions of opening, panel, rail and stile parameters and seasonal movement allowance. Courtesy of Lars Thomas, Chesapeake Woodworks.

Polycut Windows
A nifty little utility for graphically laying out angles of compound mitres. It calculates the proper angles for polygons having 3 to 16 sides and side slopes from 0 to 60 degrees. John McGaw, Windows.

Screensaver - Over 30 pictures of exotic and domestic woods. Courtesy of Willard Brothers.

Shelf Deflection Software DOS
Suite of 5 modules for computing shelf deflection, loading, and related parameters. Also includes comparative table of 38 wood species. Courtesy of Steve Stephenson.

TurboCAD 2D includes 200 drawing and dimensioning tools, an easy-to-use Windows interface and compatibility with MS Office.

WoodIndex Online utility
A searchable online index of woodworking articles from 9 popular magazines dating back to 1982. Many search results link directly to the publisher's 'backissues' section. The index is updated monthly. www.woodindex.com

Wood Movement Calculator Windows
Computes the dimensions of lumber at specified moisture contents so you can better allow for wood movement in your furniture designs. If you like the program, the author, E.C. Aumiller, says a $1 to $5 donation would be appreciated. Sounds like a good deal to me ....

Wood Movement Calculator Windows
Performs four different types of calculations with respect to wood shrinkage. And the download page contains lots of meaty technical info about wood shrinkage/expansion. Courtesy of Larry Marker.

Woodpro DOS
A lumber database and wood selection system featuring 331 common types of wood and their properties. Courtesy of Ken Young.

Woodsearch Excel workbook
A research-aid containing over 16,000 common wood names and their corresponding species names. Includes several wood searching and sorting macros. Courtesy of Dave Bilger of B&B Rare Woods, Mac/Windows.

Woodsearch Online utility

An online version of the Woodsearch Excel workbook. Type in the common or species name and get a list of all matching woods. Courtesy of Rick's Woodshop Creations and Dave Bilger.

Woodworkers Calculator
Performs simple operations on fractional and/or decimal data and converts between data formats. Enables working in inches or feet. Mike Hankey, Windows.

Woodworking Price Estimator - an online wizard for project cost estimating. From the makers of CutList Plus.

Charts and Reference Info

Drill Press Speeds
Keep this handy/dandy chart near your drill press. Provided by Just Woodworking Magazine.

Wood Screw Pilot Hole Sizes
Do you know what size hole do drill for what size screw? Well, now you will with this chart. Provided by Just Woodworking Magazine.

Nail Sizes
How long is a 3-penny nail? How about a 6-penny? This chart lists them all. Provided by Engineers Edge.

Combrogi recreate the society of Britain during the period between the Roman withdrawal and the Norman Invasion 400 to 1066 AD

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This site was designed by
AlixM

Last Updated 17 November 2003

COMBROGI
PRE CONQUEST LIVING HISTORY

Combrogi - real people, real history

Combrogi recreate the society of Britain during the period between the end of the Roman era and the Norman Invasion, 350 to 1066 AD. A time of great upheaval.

During this era, after the Roman troops left, the Romanised native Britons were defending their lands from incoming Germanic peoples who, in turn, were warding off Scandinavian raids and settlers. However it is a time which was not entirely dominated by warfare.

Since Combrogi was formed in 1995 our approach has been more towards daily life than many combat orientated societies. While other re-enactment groups concentrate on the life of the military minority, the reality for the majority of people was a daily battle of a very different kind.

The struggle was how to put food on the table, how to light and keep a fire going and how to stay dry in the winter. We are more often found re-thatching the roof of a recreated building than standing shield to shield in a battle line.

Working with archaeological evidence, documentary sources and a wide experience of living history we try to ensure accuracy in everything that we do. Operating hand-in-hand with reconstructed village projects, including Danelaw Viking Village at Murton Park near York,Avoncroft Museum, Bromsgrove and Cosmeston Medieval Village near Cardiff, we provide a living element to these excellent sites. . We have also been involved with

documentary film work for several programmes broadcast on the Discovery Channel.

We will be working at Chedworth Roman Villa again this summer, recreating life in a Romano-British country estate at the end of the Roman era.

The group has produced displays for the public in conjunction with:

-
- Dahrg De Belne
- Silures
- The Vikings
- Regia Anglorum

However, much of our work is for our own enjoyment and may not involve the public at all!

Many of our group live in the Gloucestershire area, however we work nation-wide and even internationally on occasions. Among our number, we are fortunate enough to have a good mixture of crafts people so we are able to produce most of our equipment in-house.

With a wide range of backgrounds and experience one thing brings us all together, the desire to do it right. We are passionate about being truthful to those we are portraying whether that be Anglo Scandinavian villagers, crew on a Viking longship or a Romano-British warband crossing country on horseback.

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Combrogi News

The calendar for 2004 for Viking and Saxon shows is currently being decided on. Please contact us if you'd like to hire us.
We will certainly be at the Danelaw Village for the Jolablot Viking Festival in York February 15 - 22 and other events are under discussion.

Chedworth Roman Villa

Combrogi will be again demonstrating Living History at Chedworth again in 2004. Do come and see us, and let us know if you read it here first.
See the Gallery for previous pictures

We will be there for five weekends over the summer, on the following dates:

---- April 3 - 4

---- May 15 - 16

---- June 26 - 27

---- July 31 - August 1

---- August 21 - 22

-

Avoncroft Museum, Bromsgrove

Some of us will be with the Birmingham Vikings at various times through the summer

And don't forget to include a visit to the Danelaw Village at Murton Park when you are in the York area..

Gary and Debbie are now living near Oldham. Gary is providing Living History Services to schools and Heritage industries.

Visit his website at

www.loreandsaga.free-online.co.uk

Bookmark this page and come back later to find out more.

If you would like to know where to see us next or how to get involved with our events please e-mail us for more information.

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PRE CONQUEST LIVING HISTORY

The Danelaw Village

Living history at York

Danelaw Village is a recreated Dark Age village situated at the Yorkshire Farming Museum at Murton, York. Built during the past 9 years, in the main by volunteers, the village now consists of about twenty buildings ranging from dwellings to workshops.

The site is open to the public daily, with various groups (Combrogi included) visiting throughout the year to help build and maintain the dwellings, populate the village and provide an in-depth knowledge of the numerous facets of Viking life.

The museum has presented us with one of the houses to provide Combrogi with a permanent presence on the village - our house is a gruben style dwelling. One of our group has built his own house on the village - Snorriholm is a large house with a woodshed and garden, right beside the main street.

The site is visited regularly by school parties who are shown that life in the dark ages was not all battle and raids. The main enemy facing the people of the time was starvation, consequently the children are taught the importance of guard duty, grinding flour, pottery skills and farming.

A Roman Fort, Brigantium, has been built in the field behind the Danelaw Village. Here, the children learn how the Roman Army lived and worked. A Celtic roundhouse is there too, complete with stockade and occasionally some livestock. Both represent the ways of life of people in Britain at the beginning of the first millennium.

The Roman Fort sometimes doubles as a Wild West fort and is inhabited by nineteenth century US soldiers. This is eminently suitable as the US frontier forts were built to the Roman pattern.

The Danelaw Village can be contacted at:-
Murton Park
Murton Lane
YORK YO19 5UF
Tel: 01904 489966 Fax: 01904 489159

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THE VILLAGE GOSSIP

The Danelaw Newsletter is no longer being produced, unfortunately. News will be added as and when it is available

Amanda@murtonpark.co.uk

Their website (still under construction) is www.murtonpark.co.uk

All education work/ official e-mails should be sent to Amanda@murtonpark.co.uk

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GALLERY - 2001 - Vikings

======>> Click here for Chedworth pictures <<======

Please click on any of the pictures below to see a larger version
(If you want to use these pictures please click here)

Working in the field

Raiders!

Attack!

Defenders

Leif at the quern

Snorri collecting firewood

The Village Green

Largs - the kitchen

Largs - trading

Largs - silverworking

Largs - weaving

Largs - woodworking

The pictures used throughout this site belong to Combrogi.
If you want to use any of our material for educational purposes please feel free.
A mention or, if possible, a link to this site would be greatly appreciated.

Please e-mail the webmaster and let her know about your educational projects. We may be able to help further but also we like to keep track of interest in our group, thank-you.

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Viking Crafts

>The crafts used in everyday life took skill and dexterity to master. Whether the end result was vital to the role of putting food on the table or for the creation beautiful jewellery the Viking artisan played a key role in their community.

Many of the skills have been handed down and are still used today by groups such as Combrogi to ensure authenticity. On these pages you can find out more about how to master Viking crafts.

Making a Longbow

Hnefltafl

Mead

We shall be adding new pages to this area on a regular basis so please return to find out more.

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Contact Us!

If you would like more information about Combrogi please e-mail Halley the webmaster.

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Secure On-line Shop

Welcome to Ten-Ring Archery's Secure On-line Shop

We stock a huge range of archery equipment form field to target archery. Our on-line shop contains products form the latest high tech compounds to our own traditional hand made English Longbows.

The shop also stocks thousands of archery accessories ranging from rest, sights, tabs, arrows, arrow making equipment to hand carved leather work.

On-line Shopping Guide

Enter The On-line Shop

If you would like more information on how to use the secure on-line shop. Click on the "On-line Shopping Guide" Image

We accept most major credit card such as Visa, Mastercard, American Express, Switch, Solo, Maestro, Electron & JCB.

We also accept personal & bankers cheques and direct bank transfers. For more information please contact us or go to the about us page.

Credit Card Security - We know of no documented cases of credit card fraud using our shopping system over the Internet. All credit card numbers are encrypted in the software when the order is placed using 128 bit encryption. They are only decrypted after they reach our computer. They are not held in clear text on any web site.

The on-line shop uses the latest web technology. If you are experiencing problem with the on-line shop please download the latest Internet Explorer 5.5, 6 or Netscape 6.x

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Contact Details

If you have any questions please contact us. Our address, telephone, e-mail and fax details are given below. Alternatively you can visit us at our shop / range, for directions click here.

Ten-Ring Archery
69a Ashburnham Road,
Ramsgate,
Kent, CT11 0BH,
United Kingdom.
Telephone: 01843 851819 Fax: 01843 853169
E-mail enquries@archery-ten-ring.co.uk

Shop & Range Opening Hours: 9am to 5pm Tuesday to Friday Saturday 9am to 4-30 pm.
The shop and range is closed on Mondays, but the phone is open for mail orders and enquires.

Map & Directions

Start

Street

Pc City

Destination
Ten-Ring Archery
69A Ashburham Road
GB-CT110 Ramsgate

Fastest Route

calculate

If you are unable to see the interactive map please switch to the static maps.

An on-line users guide is available for the interactive map and automatic directions.

On the left is an autoatic route planner. To calculate your route to Ten-Ring Archery simply enter your address into the form and click on the Route button.

For written directions by road and rail see below.

Directions to the shop by road:
Coming from London get of the M25 and head for the A2(M2). Follow the M2 east bound onto the A299 (Margate / Ramgsate). Carry along the A299, following the signs for Ramsgate and Ramsgate Ferry Port. As the A299 ends join the A253 heading for Ramsgate. At a round about with the Prospect Public House on the right-hand side carry straight across onto the A253. You will go through Cliffsend and at the double round about follow the signs for Ramsgate and St. Lawrence. Carry on along the A253 (Canterbury Road). At the Chilton Round about fellow the A253 (Nethercourt Hill). Ashburnham Road is on the rightat the top of the hill. (The St. Lawrence Tavern Public House is on the corner of the road). Ten-Ring Archery is situated near the start of the road.

Directions to the shop from the train station:
Walk out of the train station onto Station Apporach Road and walk 200 yards onto Queens Gate Road. AtTurn right onto the A253 (Park Road). At the roundabout turn left and walk past the petrol station. After a few hundred meters Ashburnham Road is on your left. (the St. Lawrence Tavern Public House is on the corner). Ten-Ring Archery is situated near the start of the road.

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English Longbows

Ten-Ring Longbows are made in our own workshops and can be made within reason to any specification required. All bows come with Horn Nocks, Leather Grip, Hardwood Arrow plate. Right or left hand. For prices & details of the wood the bows are available in please go to the on-line shop or contact / visit us for more information.

Click on any of the images to view an enlarged higher resolution version in a popup window.

Introduction | How Longbows Are Made | Taking Care Of A Longbows

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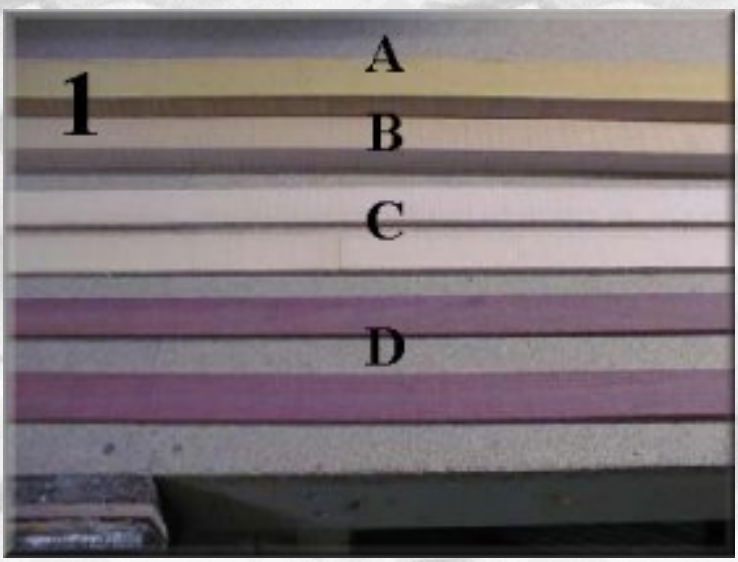
English Longbows

Ten-Ring Longbows are made in our own workshops and can be made within reason to any specification required. All bows come with Horn Nocks, Leather Grip, Hardwood Arrow plate. Right or left hand. For prices & details of the wood the bows are available in please go to the on-line shop or contact / visit us for more information.

Click on any of the images to view an enlarged higher resolution version in a popup window.

Introduction | How Longbows Are Made | Taking Care Of A Longbows



In picture 1
You can see two staves of (A) Pequia (B) Lemonwood. With strips of (C) Hickory used for the back and (D) Purple Heart ready for laminating.

In picture 2
You can see 4 bows that have been laminated. They are clamped together with a strong rubber band this applies even pressure to the laminates, (left for 10 days before unbinding them)

Picture 3
Shows a triple laminate stave being taken down to a size and shape ready for tillering (training the timber to bend into a bow).

Picture 4
Shows 3 bows on the workbench that have been tillered and are ready for horn nocks, arrow plate & leather grip.
The are a triple laminate of Lemonwood, Purple-heart backed with Hickory. Pequia & Hickory, Osage & Hickory.

Planed handle before a leather grip is fitted.

Crafting the Longbow:

The natural horn for the nocks

Working out the horn

Planing down the longbow

Attaching the horn nock

Leaving the nock to set

Shaping the nock

The unpolished fully shaped nock

Polishing the horn nock

The final polished and shaped nock

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References

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Sagittarius Twente

University Archery Club

Nederlandstalige Homepage

About Sagittarius	For Archers	Community
More about Sagittarius **Local information, competition results and club records**	Selected Archery Articles **Information about various Archery subjects, a.o. from the Society of Archer-Antiquaries, old usenet Threads.**	The Sagittarius Blackboard **Discuss any archery subject you like or just give us feedback**
Miscellaneous Matters **Pictures, Archery Event Reports, Excuses, Quotes and more!**	All Archery FAQs **A collection of Archery FAQs started way back in the old days of the Internet.**	Newsgroup Archer's Gallery **Meet some of the archers from the newsgroups and if you like add your own page to the collection.**
		Other Archery Web-Sites **With Descriptions and "Ratings", organized by category. No commercial and hunting links.**

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Archery articles

The following is a selection of articles we got permission for to put on the Net. Hopefully it will grow as times passes. If you would like to have your article on archery included, please let us know.

Articles from the Journal of the Society of Archer-Antiquaries

- The Compound Bow
  Twenty-five years after Allen's patent of December 1969. The history of the development of the well known bow and a little more.
- Steel bows from India
  High tech from a long time ago.
- Oriental Hinged and Take-apart Bows
  And you thought the recurve take-down bow was modern?
- The Medieval English Longbow
  Characteristics and origin. An article about the early longbows and how they came to England.
- Turkish Flight Arrows
  The arrows the Turks used to achieve incredible long distance shots
- The Decline of the Longbow
  The downfall of the English longbow.
- Some Speculations on the nature of Longbowstrings
  What were old strings made of?
- North American Sioux Indian Archery
  About the bows of Native Americans.
- Observations on the returning arrow
  This works, Marcelo tried it himself!
- Archery and Mathematical Modelling
  Enough to keep you busy for a while! Covers the modelling of recurve bows.
- On the Mechanics of some Replica Bows
  A further investigation on the modelling of bows.
- Ballistic Properties in Ancient Egyptian Arrows
  A piece on arrow spine by a non-engineer
- Whistling arrows
  The history of the noise making arrow.
- Ancient Composite bows
  An article about an Assyrian bow found in Egypt.
- Further Speculations on the nature of Longbowstrings.
  Some additional notes about longbowstrings

- A Bibliography of Archery
  Not in the Journal, but by one of the members. A list of books and other publications dealing with archery history.
- Glossary of archery terms.
  Less common archery terms explained.

Other articles

- [Some archery physics](#)
  A long article by one of our members dealing with the mathematics of arrow flight.
- [The measurement of arrow velocities in the students' lab](#)
  An article from the European Journal of Physics
- [The sling and the bow hand](#)
  This article deals with the use of the sling and bow hand placement. It covers the basics and has hints that might be useful to more experienced archers.
- [Extracts from Usenet](#)
  These extracts are taken from discussions in alt.archery and rec.sport archery.
- [Archery Frequently Asked Questions](#)
  All the Archery FAQs together.
- [10 Basic steps in Archery](#)
  A step-by-step instruction for the execution of the shot.
- [Selftest for 3D and field archery](#)
  This test helps you to find your weak-spots in preparations for tournaments.
- [Joe Tapley's Arrow Flight Simulator](#)
  This is a piece of software (free to download) with some documentation on arrow flight simulation.
- NEW! [Archers Reference](#)
  A very complete guide to archery in PDF. The author/editor is [Murray Elliot](#)

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Validation of the mathematical model

Mathematical models may be beautiful by themselves and the way to solve them interesting, but they should mimic the mechanical action of the bow and arrow closely if they are used in the design of a bow or a sensitivity study .

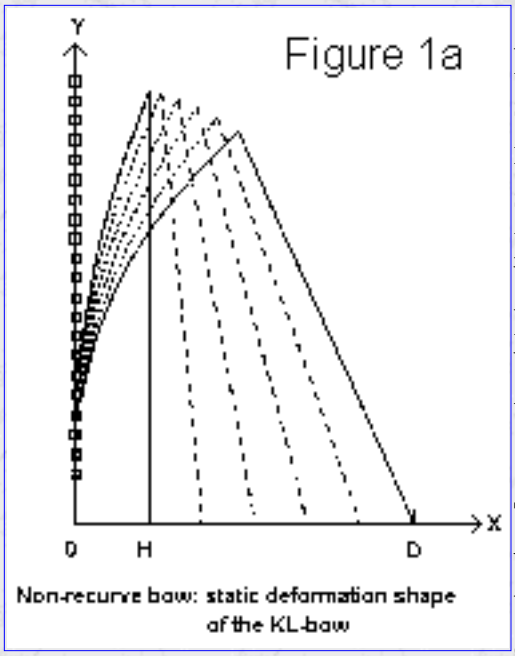
We checked static action by comparing the measured weight of a replica of one of the longbows found on the recovered Mary Rose with calculated values. The Mary Rose was Henry Vlll's warship which sank in 1545 in The Solent, a mile outside Portsmouth. She was recovered in 1982 with 139 yew longbows. Tests with these bows have demonstrated that while it is possible to string and draw the bows to 30 inch, considerable degradation within the cell structure of the wood has prevented a realistic assessment of the original weight. A replica was made by Roy King, bowyer to the Mary Rose Trust. Prof. P. Pratt, Imperial College of Science & Technology London, measured all parameters which are required to calculate the mechanical performance of a bow. The weight of this replica was also measured. It compared very well with the predicted value calculated with the mathematical model (differences within 1%).[11] These results imply that if a good estimate of the original modulus and density can be obtained, the original mechanical performance of the longbows can be calculated from the dimensions of these recovered bows.

Data obtained with the test set-up described extensively elsewhere, permitted a comparison of predicted and measured arrow velocities. The dynamic action of bows could be checked in this way. We used a modern bow made of maple in the core and glass fibres embedded in strong synthetic resin at both sides of the core. All the essential parameters listed above were measured. We measured the density and elastic modulus of both the wood and the fibreglass and at a number of stations along the limbs the shape of the cross-sections. The results were used to determine the bending properties of the limbs. Finally the elastic modulus and the mass of the string were measured.

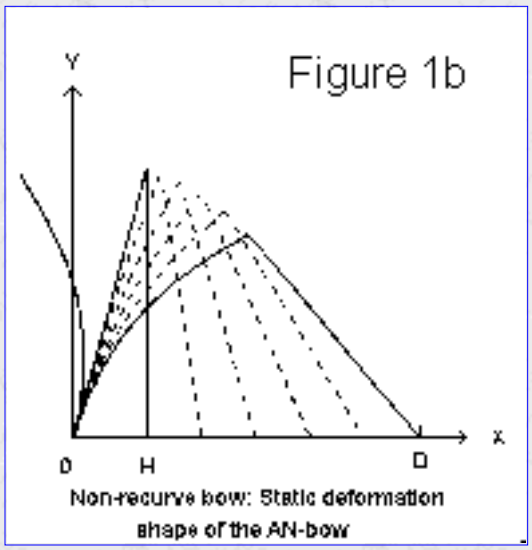
The predicted weight was too high and therefore a knockdown factor was used for the bending stiffness of the limbs, so that the calculated weight became equal to the measured value. The predicted amount of energy stored in the bow by drawing it from the braced situation to full draw, differed only slightly from the measured value. The measured efficiency was a few percent below the calculated value. In the model internal and external damping are neglected. This explains part of the discrepancy .

Classification of the bow

The classification of the bows we use is based on the geometrical shape and the elastic properties of the limbs. The bows of which the upper half is depicted in Figure 1 are called non-recurve bows. In the model the bow is assumed to be symmetric with respect to the line of aim.

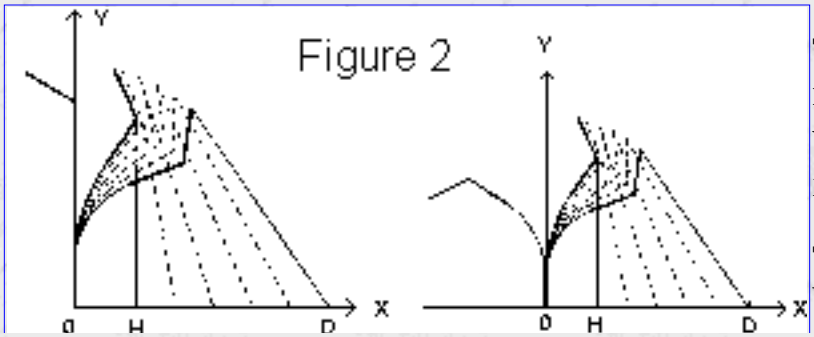


So we need to deal with only one half of the bow. These bows have contact with the string only at their tips. In the case of the static-recurve bow, see Figure 2, the outermost parts of the recurved limbs (the ears) are stiff. In the braced situation the string rests on stringbridges. These string-bridges are fitted to prevent the string from slipping past the limbs. When such a bow is drawn, at some moment the string leaves the bridges and has contact with the limbs only at the tips. In a working-recurve bow the limbs are also curved in the 'opposite' direction in the unstrung situation, see Figure 3.



The parts of a working-recurve bow near the tips, however, are elastic and bend during the final part of the draw. When one draws such a bow, the length of contact between the string and limb decreases gradually until the point where the string leaves the limb coincides with the tip. The string remains in that position during the final part of the draw. Elsewhere 5 we dealt with the statics (before arrow release) of these three types of bow. We studied the dynamics (after arrow release) of the non recurve bow 6 the dynamics of the static recurve bow and finally that of the working recurve bow. 8

In the model the action of a bow and arrow combination is fixed by one point in a high dimensional parameter space. Representations of different types of bow used in the past and in our time form clusters in this parameter space. We study the performance of different types of bow and start with a straight-end bow described by Klopsteg.1 This bow is referred to as the KL-bow. The shape of the KL-bow for various draw lengths is shown in Figure 1a. The AN-bow represents another non-recurve bow, the Angular bow found in Egypt and Assyria. The shape of the unstrung bow, shown in Figure 1b, implies that in the braced situation the limbs and the string form the characteristic triangular shape. We consider two static-recurve bows, one from China, India and Persia, to be called the PE-bow, and one which resembles a Turkish flight bow, to be called the TU-bow. The shapes of these bows for various drawlengths are shown in Figure 2. One of the working-recurve bows, to be called the ER-bow, possesses an excessive recurve. It resembles a bow described and shot by Hickman.1

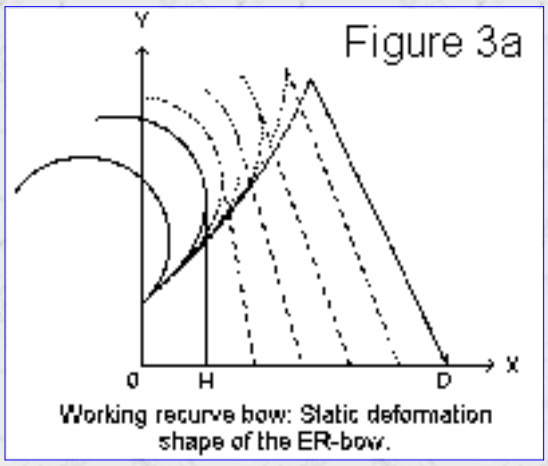


The other working-recurve bow is the modern one which was used for the validation of the model 10. This bow shown in Figure 3b, is referred to as the WR-bow.

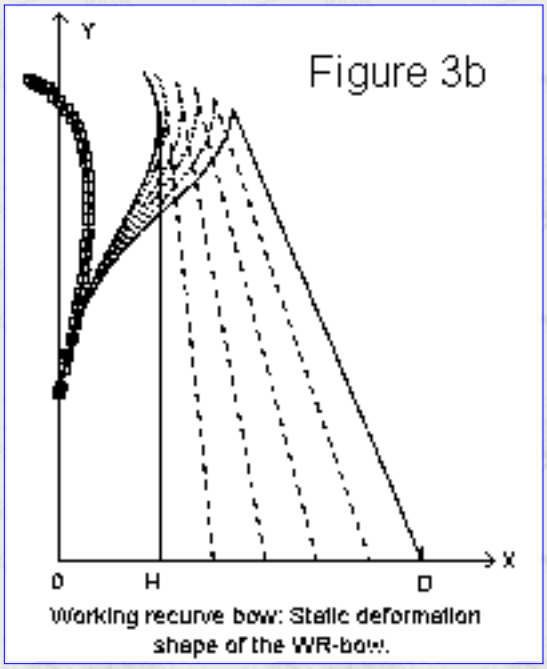
Three quality coefficients for these types of bow are shown in Table 1. These

Static recurve bows: Static deformation shapes
a) of the PE-bow b) of the TU-bow

coefficients are defined for equal weight, draw length and mass of the limbs. Moreover the mass of the arrows and strings were the same for al I reported bows. This makes an honest comparison possible. Unfortunately the stiffness of the string of the WR-bow is about twice that of the other bows. The static quality coefficient q measures how much recoverable energy is stored in the fully drawn bow. It is defined as the additional deformation energy stored in the elastic limbs and string by drawing the bow from the braced into the fully drawn position divided by the weight times the drawn length. The efficiency is the kinetic energy transferred to the arrow divided by the just mentioned additional deformation energy. So, it is the part of the available amount of energy which is transferred to the arrow as useful energy. The third quality coefficient v is proportional to the initial velocity. The constant depends only on the weight, draw length and mass of the limbs.



Working recurve bow: Static deformation shape of the ER-bow.



Working recurve bow: Static deformation shape of the WR-bow.

The static quality coefficient is 1 when the draw-force is uniformly equal to the weight for all draw lengths for a fictitious bow with no fistmele. Just as the efficiency, this coefficient gives the actual value relative to a basic, characteristic value. The results show that in practice q is slightly smaller than 0.5 except for the ER-bow with the extreme recurve.

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Last updated June, 2004

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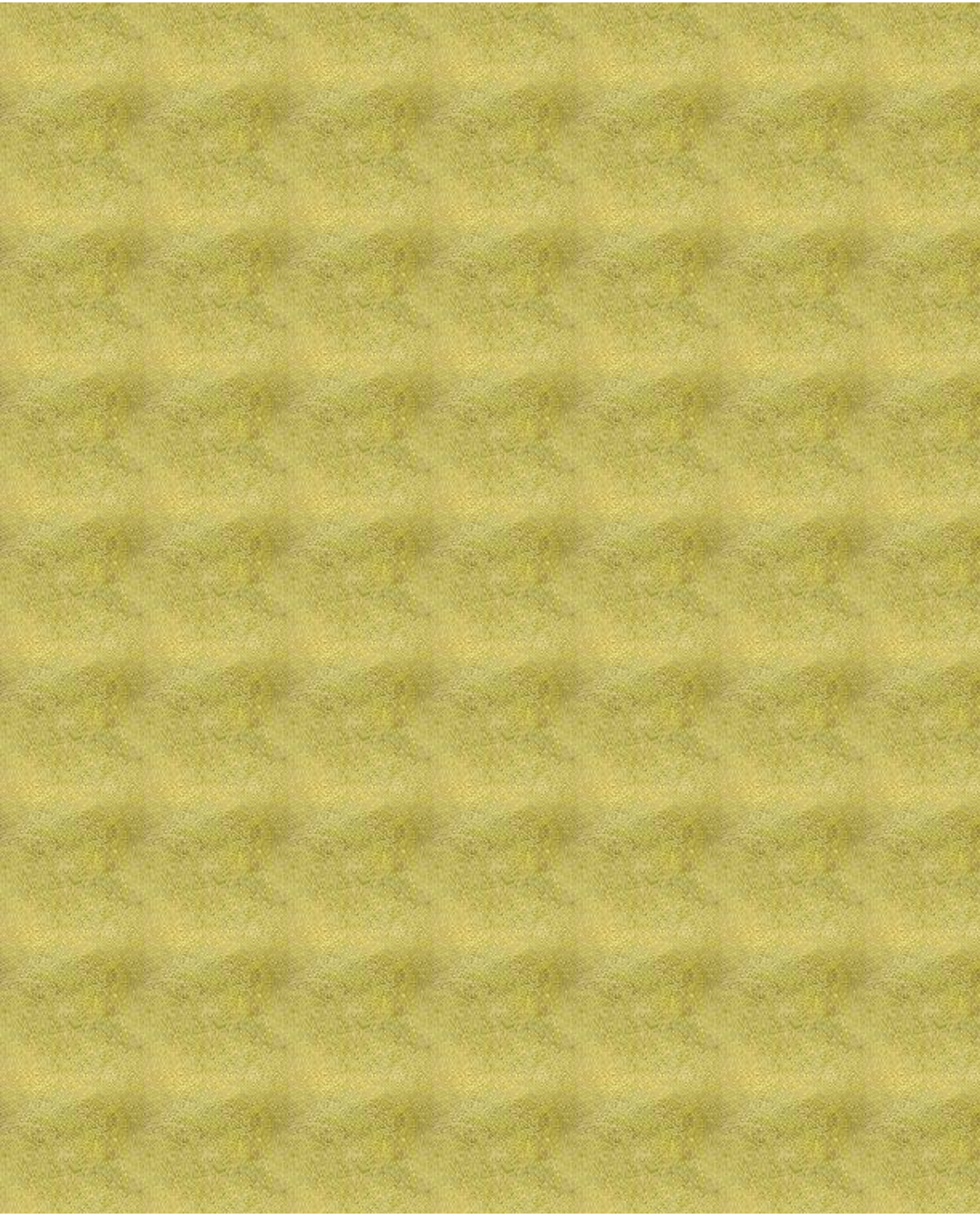
This was created for my Timpview High School Ancient History class taught by Ms Schoonmaker

Created Dec 8 , 1994 by Aaron Rice (ricej@ed.byu.edu)
Last updated 1-18-96



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A list of other **Web Sites**

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Created Dec 8 1994 by Aaron Rice (ricej@ed.byu.edu)
a Timpview High School student
in partnership with the
David O. McKay School of Education
Brigham Young University

Aaron Kenneth Rice

About Me

I was born in Oakland California March 7, 1977. I lived there for about 1 year before we took off and moved around for the next 5 years. We then moved to Provo Utah. I went to two different elementary schools: Maeser for 2 years and then Canyon Crest for the next years of my life. I went to Farrer and then after that I went to Timpview High School. I graduated with the class of 1995. I served a mission for the Church of Jesus Christ of Latter-Day Saints in the Tenneessee Knoxville Mission.

Interests

My Interests are backpacking, camping, anything to do with water activities, alpine skiing, cross country skiing. I enjoy watching baseball--my favorite team is the Oakland A's. I have backpacked everywhere imaginable in Utah and the surrounding states. I enjoy cinematography: filming, editing, and creating special effects. I was an intern at the L.D.S. Motion Picture Studio in Provo. But my greatest love is photography, darkroom work and my VW. I have won numerous awards for my pictures. My Web sites get 800-900 hits per day.

Web Sites Authored

Middle Ages
Egypt
Age of Protest and Change

ALLC

Favorite Web Sites

Ansel Adams: A Chronology

Computer Cartoons

The Jihad to Destroy Barney on the Worldwide Web

Guild Exhibit

Primus homepage

Sandra's Clip Art Server

something weird

WWW Scientific Photography Lab - Examples

Volkswagen Sites

Joe Clark's VWPage

Newsgroup: rec.autos.vw

VintageVW World Wide Web

VW Cult

Welcome To FUNKENGROOVIN's VWeb

Richard Kurtz Home Page

VintagVW World Wide Web

Joey's Volkswagen Home Page

Samba Server

David's VW Page

Air Cooled Frequently Asked Questions

Jeff Matocha's Concept 1 info

Created Dec 8 , 1994 by Aaron Rice (jar22@email.byu.edu)

The Brigham Young University McKay School of Education

has moved to http://www.byu.edu/mse/

Please update all references to this page.

This page will automatically forward in ten seconds.

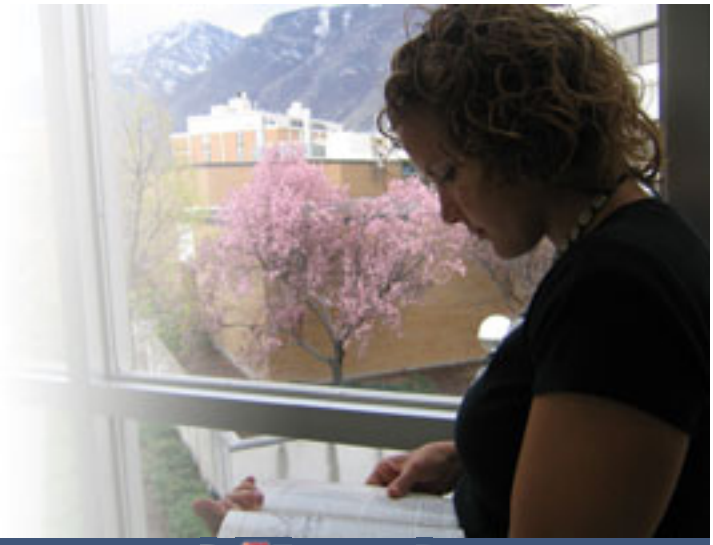
BYU | BRIGHAM YOUNG UNIVERSITY SEARCH GO

David O. McKay School of Education

Contact Us | HELP

"Education is an investment, not an expense."

President David O. McKay, 1952



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CITES

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Congratulations Graduates!
University Commencement
Thursday, August 12, 2004
4:00 p.m.
Marriott Center

McKay School Convocation
Friday, August 13, 2004
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Smith Fieldhouse

Speaker: Dr. Nancy Livingston

Fall Semester Begins
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BEEDE
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Photographs
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Education Websites
Multimedia Resources

August 30

Technology Grant
The Hewlett-Packard Corporation awarded Dr. Nancy Wentworth a Technology for Teaching Grant to support the integration of wireless technology into the BYU Teacher Preparation Program.

McKay School News
More information is available by viewing our newsletter (subscribe) and Educational Resources pages.

BYU
BRIGHAM YOUNG
UNIVERSITY

New vision
A new scientific instrument developed by BYU engineers, which could be used to identify cancerous tissue in patients more accurately than with present tests, creates black and white images that reveal previously unseen aspects of objects under scrutiny.more

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What's New Today
Tuesday, August 31, 2004

U.S. News ranks BYU in top tier

Brigham Young University is ranked 74th in U.S. News and World Report's annual survey, "America's Best Colleges," and the Marriott School of Management's undergraduate program came in at 38th in "Best business programs."

more

One Stop Student Services open weekdays

Giving to BYU
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Religious Programs
Speeches
Sports
Transcripts
Travel Study
Youth & Family Programs
Arts & Recreation
Faculty Services
General Services
Research Resources
Teaching Resources
Technology & Media

Administrative Advisory Council

One Stop Student Services will run weekdays from 8 a.m. to 5 p.m. in 3222 Wilkinson Student Center. Services will continue except on holidays through Sept. 13. One Stop consolidates advisement, enrollment and other services in one location at the beginning of each semester.

more

Clubs entertain at noon

Something entertaining happens each day at noon this week either in the Wilkinson Student Center or on Brigham Square as clubs try to attract new members. On Wednesday, it's Laugh Out Loud in the WSC Terrace and Human Speed Chess on Brigham Square.

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Athletic Complex

Joseph F. Smith Building

August 31
No Devotional

September 7
No Devotional

September 14
Devotional: President Cecil and Sister Sharon Samuelson,
11:05 a.m., Marriott Center.

Recent Devotionals: Audio and Text

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