Parmananda das (in overalls) talking to Srila Prabhupada during a visit to Gita Nagari in 1976.

Ox Power Handbook

The art and science of ox training

By Parmananda das 1986
Compiled by Hare Krsna dasi
Revised by ISCOWP 2019

OX POWER - KI JAYA! AN OX-POWER HANDBOOK

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Revised by ISCOWP 2019

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INTRODUCTION

Isvari Pati taking a break with the oxen.

Establish a Good Relationship from the very Beginning

There is an old saying, "The horse is as good as the driver." So, the first thing to remember is: The effectiveness and utility of an ox are limited by the ability of the driver. Working the oxen can be very productive and rewarding if it is done properly, but if the animals are abused physically or verbally, or - on the other extreme - not controlled with a strong enough hand, then they will rebel in one way or another and not perform up to your expectations. Unless the oxen are well trained and well driven, they aren't very useful. They have to be cooperative enough so that they can work very hard because that is the nature of farm work.

The animals are being pushed hard, to their maximum ability, like an athlete. The athlete trains himself to work under great stress all the time. So that is that the way it is with the oxen. They should be prepared to be under stress all the time. Whenever they pull, you are going to want them to pull with their maximum strength, as hard as they can, and as long as they can, without spending excess time resting.

In order for them to do this, there has to be a very strong relationship between the driver and the oxen. The relationship is that of master and servant. The master is firm but kind, he never abuses his servant, but he is very demanding, and he expects him to perform nicely.

That relationship has to be established. And it has to be very clear, more so than with a person, because an ox is a dumb brute. This is perhaps the most difficult thing in training oxen - to accept that you are not working with another human being. Although there is also a spirit-soul within the ox, and he is quite conscious, still, he doesn't speak your language. You have to over-emphasize all your commands and instructions or he won't even hear them. You have to get his attention, which requires that you magnify all your emotions

about a hundred times more than if you were dealing with another human being.

When a good relationship is established with the oxen, they become very loyal and hard working. They love to work. It's their nature - their dharma - as long as you don't allow them to be on the lazy mental platform. Their tendency is to be lazy, just like us. It seems that, like us, they have this fall-down tendency. The tendency is to just stand around and eat. But if you take them off that mental platform, by giving them strong, clear commands, they will work very hard, be loyal servants and come to fully depend on your instructions, following them without hesitation. On the other hand, if your instructions are vague and unenthusiastic, they will adopt all kinds of bad habits, all designed to avoid hard work.

The Teamster's Qualifications

The person who is training the ox should be the same person who is going to work the ox. This is an important principle: An ox should have only one master. In the beginning, if you have different people training and working him, the training will not be very effective. The ox will not be a good student; he won't learn the commands properly. After you have worked with an ox for a couple of years and he is very well trained, then different people can work him - as long as they are consistent, all using the same commands and the same type of procedures. But in the beginning, during the training period and the initial working period, there should be only one person working with the ox. Anything else is much less than ideal.

I always like the person who will be training the ox to have worked with cows for at least two years. When you have worked with cows, you will see that it takes a person about two years to learn how to handle them properly. There is a certain rapport that you develop with the cows. You understand how they think and act, and what they can and can't do. In other words, an instinctive communication develops over a period of time. It doesn't happen quickly with anyone. So, ideally, anyone who is going to work with the oxen should have worked with cows for two years. Otherwise, the training will be less effective. So, the first principle is that only one person should do the initial training of the ox, and if possible, it should be someone who already has substantial experience working with cows.

Naming the Ox

The second consideration is naming the ox. The ox should be given a simple one-syllable name. This name is a practical tool. It is used constantly while working the ox to address him. Your ox may be in a group of oxen, maybe in a team of six or ten oxen, and you may want to give him an instruction. Perhaps he steps out of line - you shout his name, and he immediately understands that you are talking to him. He knows that your command is meant for him because he knows his name.

For this to be effective, the ox has to have a name that he can distinguish from other words and sounds. It can't be a four syllable transcendental name or three syllables even. It should be one syllable or, at most, two syllables. But you will find that in the heat of the moment, addressing the ox while working him, even a two syllable name is too much. You won't say it; you will abbreviate it into one syllable.

Sometimes Hare Krsna devotees have an aversion to using a mundane name. This is worthy of some comment. We like to have everything remind us of Krsna, but it may not be so appropriate to give an ox a name of Krsna because often you are not addressing him in a

reverential mood. Sometimes he may even be treated roughly. Because he is a dumb brute, that may be required to get his attention, although rough treatment should not be the ordinary thing. If you are very expert, it will rarely be required. In any case, a simple one syllable name should be chosen. Maybe it is Rock or Buck or Jai or Red; some simple sound. You should use that name whenever you address the ox. He should be able to easily distinguish his name from other names. It's best if his name doesn't rhyme with or sound similar to names of other oxen he might work with.

Don't call him by different expressions or exclamations like "Boy," "Come on, boy," or anything other than his name. Say his name: "Get up, Buck." That way he will learn to know his name, and he will distinguish it from other names. This is essential for getting his cooperation while working. The ox's name should be established before the first lesson, and you should always use that name along with your commands.

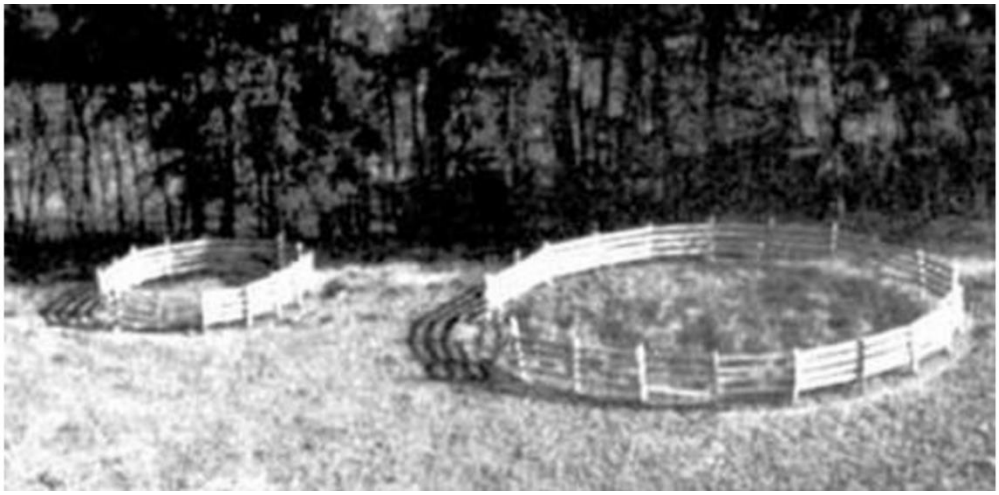
Age for Training

It is simplest to start training an ox when he is very young before he is big enough to overpower you. You can't actually work the ox at hard labor until he has grown up, because his growth can be permanently stunted if he has been using up his food to create working energy rather than for growth in his body. Before engaging in hard work, the ox should be almost to his full size, which is about two years old or maybe a little younger. The ox continues to grow after that for several years. His body fills out and gets bigger.

Once a calf is trained, you can go back to him every few months and refresh his memory, work him a little bit, drive him around so that he doesn't forget his lessons. You can actually have a little calf pulling a small wagon around. By the time he is big enough to work, the training will be very simple. When we start with a full-grown animal, which sometimes happens due to circumstances, then more forceful methods of subduing the animal have to be employed, for instance putting a nose ring in. If an ox is full-grown, he is so big and strong that if he wants to walk away from you, you can't stop him physically with just a halter. So you may have to put a nose ring in just to control him. Also, we train him in a confined area, in a little corral. That also helps control a big animal.

Avoiding Use of a Lead Rope

I recommend the use of a fenced in training ring or corral in all cases, to make things easier, although a fenced-in ring is not always necessary. A confined area without any foreign objects should be used in every case, but it could be a less formal set up than actually building a ring. It could be inside a hay barn with everything cleaned out, no foreign objects, nothing on which the animal could injure himself if he ran or became frightened, and also with no outlet where he could escape. Otherwise, if he is not in a confined area, then you have to have a rope on him all the time, which is very restricting. In his working condition you won't have a rope on him, so to train him like that; always having to hold him by a rope is conditioning him to a bad habit.



Training ring should have boards nailed to fence posts which are spaced every 6 to 8 feet (about 1.8 to 2.5 m) in a circle and there is a 4 foot (about 1.2 m) gate for entering that closes very securely.

The Training Ring

The training ring should be 24 feet (about 7.5 meters) in diameter. You could construct a fence of hardwood board, 1"x 6" or 1" x 8" (about 2.5 cm x 15 cm or about 2.5 cm x 20 cm) boards. [Editor: For teamsters who are training only young calves, somewhat lighter material can be used. For example, some teamsters use cattle panels, which consist of 4 foot high by 16 foot long heavy gauge mesh such as might be used around construction sites. For further information on training young calves, see Balabhadra's Ox Training (PDF) lesson one. It should be high enough so the animal will not consider trying to jump over it. That means it should be six feet high. Some animals, out of fear, will try to jump over anything, regardless of how high it is, but they can't succeed if it is high enough. So this training ring should have boards nailed to fence posts which are spaced every 6 to 8 feet (about 1.8 to 2.5 m) in a circle and there is a 4 foot (about 1.2 m) gate for entering that closes very securely.

The reason the fence has to be very strong and high is so the ox doesn't even think about getting out. He will put his nose up as high as he can on the fence and consider whether or not he can jump over it or he may try to crawl underneath it if there is a little space.

The first thing a cow or ox does when it is put into a confined area no matter how big it is - even a twenty-acre pasture - is walk around the boundaries and calculate the limits of her confinement. You may have heard the expression "The grass is greener on the other side." This expression comes from cows. No matter how big the area of confinement their instinct is always to try and get outside that area. As soon as you bring the animal into this training ring, he will probably try to escape.

The training ring should be set off from the residential area or any area where there are a lot

of people around because outside activity will be a big distraction to the ox when he is going through his lessons. Also sometimes you may have to discipline the ox, which may not be understood by innocent bystanders. So I recommend that the training ring is located away from the mainstream of activities as much as possible. This provides the ideal facility for confinement and mental concentration.

The First Trip to the Ring

The first trip to the ring from the barn or the pasture where you are keeping the animal should be made carefully. For one thing, you don't want to try to teach the ox anything on that trip. That is not part of the lesson. We just want to somehow or other get him into the ring without having to hit him or drag him. As much as possible make it an uneventful trip. We want to minimize his anxiety.

For an animal that has not been handled much, the first trip to the ring can be very traumatic. If that happens his negative his first impression of you may be lasting. That is something we want to avoid. So if he is just standing and he won't move, if he doesn't want to be led, then just go slowly. You should have a strong halter on him and a lead rope. And, you should have one or two people with you.

The best way of moving an ox or cow that does not want to move is to push him, not to pull him. The reaction for most oxen or cows when they are pulled is to pull back in the opposite direction, and they are much stronger than we are. Even ten men can't pull a cow or an ox that wants to go backward. You can even hook a tractor to them, and if they are stubborn enough, they will just lie down and make you drag them, which certainly we don't want to do. So just cajole the ox along to the ring. By no means should you let him get away.

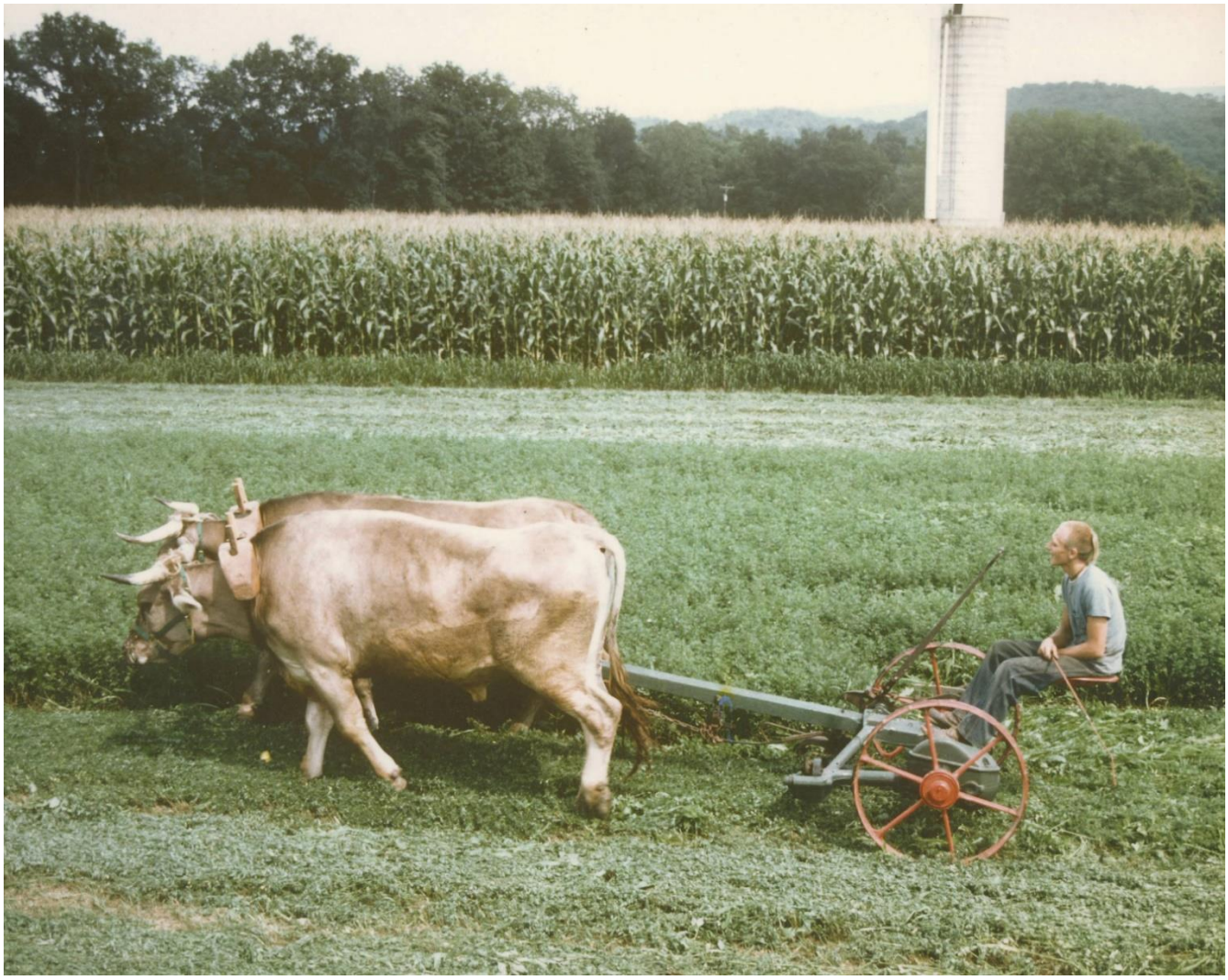
It is important that when you start to take an ox into your hands, you must maintain control of him. You are making a commitment. If you let him control you in any way, you are encouraging the worst possible thing: disobedience. So once you set out to bring him to the ring, you have to get him there. You cannot let him overpower you; you cannot let him drag you around the field. You have to have enough people. If necessary, attach two ropes to his halter so that there is no question of his overpowering you and running away. That would be a very bad way to begin the first lesson.

You should have a halter on the ox. The halter should have a lead rope fastened near the ox's nose because the way to control an animal who is much bigger than you are by turning his head. If he tries to run away, you can usually pull his head around and control him in that way. If you just have a rope around his neck, it won't be possible to restrain him because he will pull with his full strength and bodily weight, and no man or even group of men can restrain an animal in that way if he really wants to get away. But if you have the rope attached next to his nose, you can turn his head. Then at worst, he will run around in circles and eventually get tired of it.

So, somehow you have to coerce the animal toward the ring. When he gets very close to the gate, he will understand that he is being brought into a confined area, and he won't want to go in. Even though most animals won't go in easily, you may come across one who will become very curious and willingly walk right into the ring, not realizing that the gate will be closed, locking him inside. Once again, if the animal is very young, then none of these

factors will pose a very great problem. You can forcibly cajole a small ox to the ring without any big traumatic experience, simply because you are as strong as he is or stronger.

LESSON 1: TEACHING THE COMMAND "GET UP.



Isvari Pati das cutting alfalfa hay with a number nine McCormick Deering sickle bar mower.

"Now the ox has entered the ring, and the gate is closed behind him. The first thing is to simply let him explore. When you shut the gate behind the ox, he may walk up to the gate and sniff it and try to see if he can get back out again. Then he will walk around the ring to standing in different places and look around, maybe looking for some other cows. If he sees anybody, he may start mooing - "Help! Help!" Allow him to freely explore the ring and calm down because he will probably be a little nervous.

After a few minutes, when he starts to settle down, it's a good idea to approach him to comfort him a little bit. It is important to be very demonstrative, both when you are pleased with an ox and when you are displeased with him. There should be a very clear distinction

between your pleasure and your displeasure. As I mentioned previously, everything should be overemphasized because you are dealing with a dumb brute who doesn't speak the English language.

Let him know that you are his friend and that he is not actually in a dangerous or threatening situation. Approach him slowly. Hold out your hand and pat him. Stroke him on the head and behind the ears, speaking some kind words like, "Good boy, good boy" - very demonstratively, very clearly. Make it very clear that you are being kind to him. You are complimenting him. Your pleasure or displeasure will motivate the ox and show him when he has done right or wrong. When you compliment and comfort him and indicate that you are pleased with him, you will see a change in him. His anxiety will be greatly reduced.

A lot depends on how you give rewards. If you reward the ox in such a way that he fully comprehends that he has done what you wanted, it will be a big help to you in fixing an impression on his brain. An ox's fear of you is what makes him resist training. That fear can be removed by systematically rewarding the ox when he does the right thing. If he has confidence in his master and understands what he wants of him, the ox will be ready and willing to obey every command that is given him.

When you see that he is calmed down and is actually waiting to see what is going to happen next, then you can begin to teach him the first command which is "Get-up!" "Get-up!" means to go forward.

The Lash

At this point, I want to explain the use of the lash. The lash is a vital tool for training and working the oxen. It could be made from a fairly rigid green stick that has some spring in it. It should not be too heavy, or you won't be able to move it quickly and easily. The lash should be an inch (2.5 cm) at most at the butt, tapering down to a half an inch (1 cm) at the tip. In the training ring, it is good to use a long lash, a stick about 4 feet long (1.2 m). On the tip of the stick, you can attach a piece of thin rope with a knot on the end. The rope should not be too heavy. It must be very flexible and snap easily. Alternatively, you could use a strip of leather, also not too thick. That piece should be about 2 feet long (about 60 cm).

You use the lash to hit the ox in different places to indicate what you want him to do. With each command, there is a certain way to use the lash to indicate to the ox what he should do. He learns that if he doesn't respond, the more he resists, the harder the lash comes down. So he is actually working under this fear principle. That has to be understood. You must establish this very clearly and strongly from the beginning.

Once he has understood a command, if he doesn't obey it, the alternative is immediate pain. The ox must understand that this is not a partnership. You are going to have it your way all the time. But, as soon as he becomes submissive and obeys your commands promptly, you stroke his head and treat him kindly. If he is smart, he will very quickly adapt to this new situation, and it will rarely be necessary to hit him hard. With some oxen, training may take longer, but eventually, they get the idea, and it is no longer necessary to hit them.

Ideally, the lash is just an emergency tool that you carry with you. After having been fully trained, the ox should respond to the commands without any indication of using the lash. Simply by hearing your command, the ox responds fully. At that point, we say he is "broke to the word."

Once an ox attains that level of training, it is not even necessary to tap him with the lash, unless there is some emergency situation which requires a quick response. For instance, you may need him to stop all of a sudden, when he isn't expecting it. Just to be extra sure that he responds instantly, you use the lash to make sure that he understands. You use the lash to avoid an accident in an unexpected situation.

You don't want to become dependent on the lash. That is an important thing to understand. The lash should be an implement to use with oxen that aren't fully trained. Once the oxen are properly trained, the lash should be simply an emergency tool that you keep with you at all times. The oxen should be carefully trained so they reach the point that they are "broke to word." If they are not trained to reach this level of response, their usefulness is seriously hampered. You cannot always be right next to every ox, using the lash to show him what you want him to do. If you want to ride on a wagon, or if you are working big teams of oxen, they must respond simply to your voice commands. It is not practical for you to have to use the lash on each ox every time you give a command. So there is good reason for this careful method of training.

The lash is an essential tool when the ox is first being trained. The goal, however, is to train the ox to the level that he is "broke to the word." From that point on, the lash is used only in an emergency.

"Get-Up!"

Let's return to the ring. At this point, you are standing in the center of the training ring with your lash. The ox is standing somewhere in the ring, probably near the edge along the fence facing away from you. Now we are going to teach him to go forward. We start with this because the easiest, most natural, and obvious thing for the ox to do is just to start walking forward.

The command is "Get-up!" The action is to swat the ox on the rump with the lash from behind. At the same time as you hit him, you say "Get-up!" The principle is that the voice command and the action to indicate that command must be given simultaneously. That way the ox understands the relationship. When you hit him and say "Get-up!" you can reinforce the message by walking toward him, thereby indicating with your whole body that you want him to move forward.

When you hit an animal on the rump, it is natural for him to be propelled forward because he wants to get away from the lash. He will probably start walking around the edge of the ring. He may only take a few steps at first and then stop, not really understanding what you want him to do or what is going on. So hit him again right away. Again, shout, "Get-up!" at the same time and follow after him. Walk after him, making him go forward. If you want, give him a little push to indicate to him that you want him to go forward. He will start again, maybe walk a few more feet and then stop.

At this point, you might stop if you think he has understood that you wanted him to go forward, and he has actually done it. Now you can reward him. You should have a whole act that you do when you are pleased with him, that you repeat the same way every time so that he gets to know when you are pleased. Put the lash under your arm, and hold it there so it is sticking out behind you. The ox doesn't see much of it, so he is not afraid that you are going to hit him.

Walk up to him slowly, and pat him on the head, saying, "Good boy, good boy." When you see that he is calmed down again, step back. This time just hold the lash up in the air and don't even hit him with it. Just threaten him from behind and shout, "Get-up!" See if he has understood. If an ox is smart, it is possible that even that quickly, even after a couple of times, he will make the connection between the word and the action. He will understand what you want him to do. Try it.

Don't be overanxious to hit him. You don't ever want to hit the ox ever when it is not necessary. If you do, he will fear you in a bad way. The less excitement and punishment used, the better. It's just like with people if they are well-intentioned and just about to do the right thing, but then we out intolerance or impatience, get angry at them, then they become mistrusting. So test the ox and see if he understood the command. If you yell, "Get-up!" and he doesn't move, then hit him again on the rump. Hit him hard enough so that there is absolutely no hesitation on his part, "Should I do it or should I not do it?" No! The command and motion should be so strong that there is no mental doubt: "I must go forward. This is so severe and extreme that I can't even think of not doing what he said. No question about it." And then once again, he will step forward.

Communicating with the Ox

I would like to interject here that during training, the individual nature and disposition of your ox must be considered carefully. It is not possible to give hard and fast rules for teaching a command. I can give the basic principles, guidelines, and methods, but the technique will differ somewhat according to the animal that you are working with. Your animal may be very smart, stupid, lazy, or nervous.

You have to be sensitive to what is going through your ox's mind and respond accordingly. In other words, if you sense that the ox understands your command, but won't comply because he is just obstinate, then there is some call for discipline and severity. But if you sense that he doesn't understand you, that he hasn't learned anything - which is the case just as often as not - then you shouldn't discipline him. To discipline an ox when he doesn't understand what you are asking of him will just make things worse. He will just develop a fear of you and will not be able to listen to anything you say. He will become filled with anxiety when he sees you approaching him.

Remember, when we are dealing with a dumb creature, it must be very difficult for him to understand our motions, signs, and language. It is something like for us to try to understand a foreign language. We should never get impatient with the ox because he doesn't understand us, and we shouldn't be surprised when he does things wrong.

Be sensitive to his mental state and don't be overly quick to discipline. We should work on

his understanding rather than working on the different parts of his body. That is why I say that an ox trainer should have worked with cows and bulls for two years before he begins to train the oxen. There are very sensitive and subtle perceptions the trainer will need to use, in order to not spoil the ox.

The surrender you are demanding from the ox is difficult. That means you have to be very familiar with these animals so you can interpret their motions. You have to know how to use your body and voice so that they understand you. If a person hasn't had this experience, there is a risk that he is going to spoil the ox right from the very beginning because he won't be able to tell whether the ox is being obstinate or if he is just confused about what he is supposed to do.

Training Style: Patience and Firmness

The ultimate import of the command, "Get-up!" is to go forward without stopping. There should be no question of stopping until he is told to stop. Right now, however, we are not concerned with teaching the ox to stop. We just want him to start walking upon hearing "Get-up!" and to continue walking around the edge of the ring without stopping. The more he understands the command, the longer he will continue to walk.

In the beginning, you should follow him, standing a little bit towards the center of the ring but behind him, so it is clear to him that you want him to continue walking. It will be almost like he is running away from you. If he starts to slow down, he might be preparing to stop. Be ready with the lash. Have the lash poised up in the air so if he looks back at you and sees it, that may be sufficient to keep him going. But if you see that he is about to stop anyway, then come down with the lash and hit him again and say, "Get-up!" and he will start going again.

Then when you see that he has got the idea, let him stop. Or, if he starts to get in too much anxiety about the whole thing, becoming bewildered by so much pressure being put on him to do something new confined in a little ring, let him stop. Let him calm down. Go up to him again with the lash under your arm, stroke him and tell him, "Good boy, good boy." He has been a good boy. He did what you wanted. After he has calmed down step back and tell him again, "Get-up!" Don't hit him hard unless it is necessary. If you think that he has got the idea a little bit, then just tap him on the rump with the lash and say, "Get-up!" and he will probably go with just that. But once again, if he just takes one step and then stops, hit him harder.

You will find that a half-hour is the maximum time that you can spend in one lesson, teaching one command. The pressure and anxiety on the ox increases more and more, due to his being confined for so long in such a new situation. After about half-hour in the ring, the ox doesn't really learn anything. After that, it is just a matter of repeated practice.

It is good to have a lesson every day for up to half an hour. Never attempt to teach an ox more than one command in a lesson. That will confuse him. Repeat each lesson daily until the ox has learned it perfectly. Then go on to the next command. Every day you can go over the commands that you have already done. Don't go into the lesson with big expectations.

You should be prepared for the ox to make small increments of advancement every day. You may come across an ox that will learn quickly, but in general, you also don't want to be too pushy. Don't be frustrated if all that happens on the first day in the ring is that the ox just gets used to being in the ring.

Potential Problems

When you first bring an ox into the ring, there is a lot that you might not know about him. It is even possible that he is untrainable. You have to take this into consideration. I have had some oxen that were so nervous and spooked that they were untrainable. Even after repeated lessons, they were like an insane person. I was unable to reach them no matter what I did. Some of these oxen changed as they got older. We went back to them when they were three or four years old, and they were completely different and able to be trained. So the fact that an ox can't be worked with at a younger age doesn't necessarily mean that he will always be useless.

But in general, when an ox doesn't understand in this first lesson that he is expected to walk around in a circle in the ring, this is a symptom that he is not going to be trainable because it is so obvious and natural in this situation to walk around in a circle. Actually the training can hardly progress beyond this point unless the ox will go forward when he is hit on the rump. In several cases, I have found that such an ox, at least for the time being, was useless. If, when you hit him and tell him to get up, he just backs up and walks around in circles or walks across the ring, and has no idea what is going on, this is a strong indication that he is useless.

Another thing that indicates that an ox is not qualified to be trained, at least for the time being, is if he actually tries to jump over the fence. This is a very bad sign. It has happened to me, so I thought I would mention something about how to deal with that situation.

Suppose you have a big ox and even though the fence is six feet high, he tries to jump over it. He gets his front legs over it, but of course, he can't jump high enough. So his whole body comes down on the fence and breaks the boards, and he ends up stuck on the fence, front legs on one side and back legs on the other side. He is hanging on some boards, and he can't move. He can't go backward, and he can't go forward. In a situation like that, you have to be very careful because already something very bad has happened. The ox has become so scared that he did this crazy thing, and now he has gotten hurt, which can have a permanent effect on his relationship with you.

The psychology is that being in a training ring can be a new and frightening experience for an animal like this. He is simple-minded. He doesn't have any intellectual capacity. His reasoning powers are limited to his past experience, so he is looking at your actions to try to understand what is going on. If somehow or other in this situation he actually gets injured, he will connect that experience with you. This creates a psychological disadvantage for you in trying to get him to surrender to you and trust you.

The ox is fearing some bodily harm, so if harm actually does come to him, then his fear has been justified, and it can make a lasting impression on him. First impressions are the most

lasting. On the other hand, if, in spite of his fear, no harm comes to him, then he should gradually lose the fear.

At all times when training or working oxen, you should be extremely careful not to let them get injured while trying to sincerely and submissively follow your commands. For example, if you tell an ox to "Get-up!" and he takes a step and falls down in a hole and hurts his leg, then next time you tell him to "Get-up!" he will hesitate. As soon as he hears the sound, "Get-up!" he may become filled with anxiety because last time he got up for you, he hurt his leg. So you have to be careful.

Now, this ox is stuck on the fence, so don't try to make him jump backward or forward. First of all, just try to calm him down. Approach him slowly and pet him. If he is very big and heavy and you can't lift him up over the fence, have someone stand with him to see that he doesn't get excited and start struggling and injure himself. Get some tools and take the boards off the fence so he can become free of this position without further excitement.

I have seen a situation in which an animal fell down and got stuck. The teamster, out of impatience and brutishness, just hit him to make him get up, instead of taking off the ox's yoke, or with a horse, taking off the harness, and making it easy for him to get up. Just to assume that an animal is being obstinate and starting to hit him only aggravates a situation which is already difficult. The animal may hopelessly struggle to get up and only hurt himself further in the process. This kind of ignorance and impatience should be avoided.

Once the ox is freed from being stuck on the fence, I would hook a good strong rope onto his halter and tie him up inside the ring so he can get used to it there. If you immediately turn the ox loose after he tried to jump out, he might conclude that his attempted escape was successful and that would encourage him to do it again. That would reinforce this very foolish thing that he did. The message would be: He tried to escape, and he succeeded.

A negative idea like that is the wrong message to send to an ox you want to train to be obedient. So, without further ado, just tie him up inside the ring and leave him there until you think that when you let him out, he won't feel like he succeeded in escaping from the ring. You might want to leave him in there a whole day. Maybe even bring him some hay and water. Let him get used to being in there.

Whenever you tie up an animal, the rope should not be too long. It should be short enough so that he can't get his leg over the rope. That means that the distance from his nose to the post to which he is tied would be, at most, 2 feet (60 cm). That way he will have enough rope to lie down, but it is not so long that he can try to jump over a fence, nor can he get tangled up in the rope by stepping over it.

If you have an animal on a long rope, there is always a chance that the rope will get tangled around his feet. If he then falls down and starts struggling to free himself, he may get seriously injured. This is especially dangerous on a hillside, but of course, a training ring would be on flat ground. Just for your information, it is important to know that you should never leave an animal tied on a hill or a slope because if he falls down, he can get tangled up in the rope or stuck in some awkward position, and break his neck. I have seen that happen both with horses and with oxen. Having been left tied somewhere, the animal got

tangled in a long rope, fell down, and, while struggling to free himself, broke his neck and died. So certainly this is a risk to be taken seriously and avoided at all cost.

A Peaceful Return to the Barn

When you have finished the lesson, the return from the ring should be done in the same way as the trip that I described to the ring in the last lesson. It should be uneventful. You should not try to teach the ox anything on the return trip. I never like the practice of just turning the ox loose from the ring, because it makes him feel more inclined to get out of the ring during the lesson.

If the moment the gate is opened, he is going to be free, it will encourage him to anticipate his release too much. So I always like to lead him somewhere, to the barn or to some pasture where he is staying, any facility some distance away from the ring. Once he learns a little bit how to "Get-up!" you can use that command to make him walk, but don't make a big thing out of it. You want this trip to be uneventful.

LESSON 2: REVIEWING "GET UP." TEACHING THE COMMAND "WHOA."

Fall plowing with two span of six oxen each. Each span pulling a double bottom plow.

In the first lesson, I described how to teach "Get-up!" The ox probably got some idea of the spoken command and that you wanted him to walk in a circle around the ring when you

shouted "Get-up!" He also got acquainted with the lash, which he had never seen or felt before. Your next trip to ring should again be made with extreme caution, being careful not to alarm the ox or excite him in any way.

Your ox might have been traumatized by the first lesson, and he may realize as soon as you start toward the ring that he is in for another lesson and another period of confinement in that little training ring. He might be very obstinate about not wanting to go there again.

Reviewing "Get-up!"

So use the same patience and care that was described for the previous trip. Don't try to use the command "Get-up!" or be too demanding of the ox. Make the trip uneventful. If necessary, have extra people around to help ensure that the ox doesn't get away from you. After the ox is in the ring, let him explore for a couple of minutes until he relaxes. Approach him slowly. Stroke his head and tell him he is a good boy.

Now step back toward the center of the ring and test him by shouting, "Get-up!" You can have the lash in your hand, held straight up in the air so that he sees it, but don't hit him with it. First, test him to see if he remembers the command. If he doesn't remember, then follow the same procedure that was followed in the first lesson.

On the command, "Get-up!" the ox should walk forward and not stop. The better he knows the command, the longer he will walk. You should keep working on him until he does not stop except on command.

At first, you are using your body language along with the lash by following closely behind him so that it is very obvious that you want him to move forward. As the ox learns what is expected of him, move away from him more and more. Eventually, stop following him altogether. Just stand in the center of the ring and tell him to "Get-up!"

Increase your expectations of him gradually. Ultimately, he should follow the command without being hit or even threatened with the lash. You certainly might not reach this point within the second lesson. It might even take a week of lessons to gradually increase his understanding to the point where you can just stand in the center of the ring without following or threatening him and say, "Get-up!" and have your ox walking around the ring.

At first, while positioned in the middle of the ring, you can gradually spin around in a circle as the ox walks around so that you can watch him. That visual contact has a definite motivating effect on him. Usually, when he hesitates and starts slowing down, you can see that he is watching you and trying to figure out if he can get away with stopping. In that case, repeat the command without the lash and see if that works. If he still doesn't speed up, then lunge after him quickly and crack him on the rump with the lash. Get him off the mental platform. Your ox will always be testing his limits. Therefore you have to make your expectations crystal clear.

When he has succeeded in walking continuously around the ring on the command "Get-up!" without being threatened except by your stare, then stop staring at him. Just stand still in the center of the ring and expect him to walk around you in a circle. The ox usually knows when you are looking at him, so if he is behind your back, he may try to get away with

something. Stand with your lash poised just like a cat ready to pounce on a mouse.

When the ox is behind your back, and you see him out of the corner of your eye starting to slow down or if you hear him stop, turn around and pounce on him. Shout the command again and hit him on the rump. Then immediately go back to the center of the ring and expect him to keep walking. If he walks around you a couple of times without your watchful eye, then go up to him and reward him. Rewards should always be given when the ox does something right, especially if it is something new and he just did it correctly for the first time. The return to the center of the ring and ask him to "Get-up!" again.

When the ox will walk continuously around the edge of the ring on command, without you even watching him, then he has really understood the meaning of "Get-up!" Once again, it may take a number of lessons to arrive at this point. Lessons should be short, and they should be given every day if possible. That is the most effective way of training, to use short daily lessons. You will find that your ox will learn quickly. Your trip to the ring should become easier every day. When the ox has really understood "Get-up!" you can start to use it as you walk him to and from the ring. Walk next to him, always on his left side, holding a lead rope and tell him to "Get-up!"

The next lesson is "Whoa!" Do not begin this lesson until you are sure that your ox fully understands the "Get-up!" command. If you try to teach two commands at once, you will just confuse the ox and reduces your effectiveness with him. It is harder to fix a strong impression on his mind if you have two things going on at once.

"Whoa!"

Hopefully up to this point the command "Whoa!" has not been used. If it has been used casually without the ox having been taught the proper meaning of the word, then this lesson will be much more difficult. The first time you say "Whoa!" you must be sure you are in a position to make the action associated with that command so that the ox will learn the correct meaning.

In other words, when you say "Whoa!" you must make the ox stop. "Whoa!" means stop and stand still and not move at all until told to move. It is the opposite of "Get-up!" which means to walk and not dare to stop unless told "Whoa!" When we say "Whoa!" to the ox, we want him to understand that he should stop completely, stand still, and not dare to move until he is given some other command.

I can't over-emphasize the importance of this command. Your life may depend on a hearty "Whoa!" being well understood by your ox. You may find yourself in a situation where your animals must quickly respond to "Whoa!" or you and others may be put into serious danger.

Introduce this command while the ox is walking around the edge of the ring. When he wants to stop, anticipate it and step in front of him, raising the lash, and shout "Whoa!" This usually works well because your ox already wants to stop, and you are just taking advantage of his laziness.

Then stand back out of his way, toward the center of the ring, and tell him to "Get-up!" again. After he has walked around the ring, step out in front of him and hold the lash up and

say "Whoa!" Usually, this works very easily if you wait until the ox wants to stop. If he doesn't want to stop and you step in front of him, he may shy off to the side and try to walk around you. In that case, you can understand that simply threatening him was not strong enough to show him what you wanted.

The next thing to do would be to use the lash. You can either hit him on the nose with it or on the top of his head. Just as hitting him on the rump propels him forward, if you hit him on the front of his head, the message is to stop. You have to be careful not to hit him in the eyes. He will always close his eyes to protect himself and develop a bad habit of squinting whenever he sees the lash.

As we discussed previously, the action to indicate the meaning of the command should be swift and sure. It should be as strong as necessary to make it crystal clear to the ox that "Whoa!" means to stop abruptly and not take another step. When he stops, then you can reward him. Put the lash under your arm, approach him, and reward him. Let him calm down. Then repeat the process.

When you think the ox has understood the meaning of the command, test him by asking him to stop when you know he doesn't want to stop. That is an increase in training. That is the next step. Tell him to "Get-up!" let him walk a few feet, the shout, "Whoa!" and crack him on the head with the lash.

It is crucial to teach the ox that once he is told "Whoa!" he must not move until further notice. In order to show him this, you must stand right by him when he stops. If he starts to move, you should be ready, poised to again show him by your action and your command that he may not move. As soon as he starts to take a step, you shout "Whoa!" and if he doesn't respond, then hit him with the lash.

When he is standing still, then start to walk away from him to test and see if he understands that he may not move. Gradually walk further away until he tries to move and then immediately reinforce the lesson again. Go back to him and shout, "Whoa!" and then tap him with the lash and make him stand still. Walk all around him in a circle, patting him on the back the whole time, but watch him closely.

If you see he is about to move or is attempting to take a step, then immediately repeat the command and make him stand still. By doing this, you can get the idea across to the ox that "Whoa!" means to stop and not move without further notice. This is absolutely essential.

"Whoa!" does not mean to just stop for one second or a few seconds and then start walking again. This is a most annoying and dangerous habit. From the very beginning, it should not be allowed. When you feel that your ox has understood that he may not move, then tell him to "Get-up!" again. And, wherever you tell him to stop, make him stay in that spot and not move.

Test him by walking around him. He should completely understand that wherever you tell him to stop, that is where he must stay. He must stand still and not move. If you are careful in teaching this command and practice firmness, in two or three lessons you will have an ox who will stop at the word "Whoa!" and will stand still in any circumstance and in any

excitement.

Abuses of the "Whoa!" Command

"Whoa!" is one of the most abused of all the commands in that people say it at many inappropriate times. Whenever they want the ox to do something different from what he is doing, they say "Whoa!" When they want him to slow down, they say "Whoa!" or to calm down a nervous ox who is already standing still they say "Whoa!"

You should never say "Whoa!" to an animal who is standing still. Then he cannot understand the true meaning of "Whoa!" He will become completely confused about the meaning of the word. When you want an animal to slow down, there are other commands for that (such as "Easy"). If you give a command lightly, when you don't really intend to make the ox obey it, then he won't have the proper understanding or respect. Thus, you may endanger yourself and others.

LESSON 3: TEACHING THE COMMAND "BACK."

Spring plowing April 1st with two span of six oxen each. The ground was not frozen so the oxen kept plowing

The command for backing up is simply "Back!" plus the ox's name - "Back, Buck, Back!" The physical action you perform indicates this command will depend on your ox. Here's what I do. With one hand I hold the ox by his halter from underneath his chin and push him backward, and with the other hand I take the butt of the lash and tap him on the forehead and say, "Back, Buck, Back!" Generally, the ox will take a step or two backward, which is all he needs to do. But remember, the tapping with the butt of the lash may have to be quite sharp. Now stop and let the ox gather his wits, and repeat the procedure.

You have to be careful not to let the ox bump into anything when backing up. Otherwise, he won't trust you, because he can't see behind himself. If by your instruction he bumps into something, he will become fearful and hesitant to follow you. To obey you, especially with this command, he must trust you. Later on, when you have your ox hooked up to some implement or wagon, and he has to back up - a very awkward and uncomfortable task - he will have to have been carefully and patiently trained, and he must trust you.

So this method of tapping the ox on the forehead and pushing him back with the halter is good initial training. But later, when you're working the ox, to get into the ideal position every time you want him to back up may be difficult, so you'll have to use the lash more. But that comes later. For now, concentrate on teaching you ox to back up as I described above. He can be in the ring or out, but he shouldn't be hooked up to any wagon or load -

not yet.

Once your ox begins to associate the word "Back!" with the idea of walking backward, try hitting him with the lash across the front of his legs instead of the front of his forehead. You should find that after a while you don't have to hit him at all; just hitting the round in front of him as though threatening to hit him on the legs should be sufficient. Ideally, however, an ox should respond to just a spoken command: "Back, Buck, Back!" That comes with practice.

Techniques for Backing Up Straight

It's important that the ox learn to back up straight. In an attempt to get away from you or to try and see where he's going, he'll tend to turn one way or the other as he's backing up. That is bad. Turning while backing up requires a different command - one he should learn later - but on the command, "Back!" he should just go straight backward. If he's not trained to do this properly from the beginning, you'll have a difficult time getting him to back up a big wagon load of wood or hay. His tendency will always be to back up in circles, which isn't very useful. Unless you tell him otherwise, he should back up straight.

I've found a helpful technique for teaching this to an ox who's having trouble understanding the commands. Stand him beside a wooden fence of any kind of straight fence. You stand on one side of the ox with the fence on the other side and tell him, "Back!" If he tries to turn one way, he bumps into the fence, and if he tries to turn the other way, you're standing there with the lash. So he has to go straight back.

Some oxen may not require this; they might understand right from the beginning that you want them to go straight back. In general, it requires practice and good training. If you give an ox a good foundation of consistent, patient training in the beginning, the later training is easier.

You'll find that when you take the ox out of the ring, hook him up to something, and put him to work; it's like starting the training over again because he's in a new situation. He has to learn everything again in a new working situation. He may have learned "Back!" but once he has a big load to push backward, he's not going to be sure what you mean. He's going to think, "This is something different and new. I never did this before."

So it's critical that the basic training is done carefully. Don't be discouraged if it takes a lot of repetition day after day to teach an ox this command. You should have infinite patience, and then you will get a very satisfying result.

LESSON 4: TEACHING THE COMMANDS “GEE” AND “HAW.”

I have two training rings. One is 24 feet (7.5 m) in diameter, and the other is 48 feet (15 m) in diameter. For teaching "Gee!" and "Haw!" the larger ring is better because there is more room to walk across the ring when you make a turn.

"Haw!" - Come Here, to the Left

First I teach "Haw!" because it is easier to teach than "Gee!" "Haw" means turn to the left. You are working the ox from the left side with a halter and lead rope on him. Walk counterclockwise around the edge of the ring so that you are on his left side. The fence is on his right side. Command him to "Get-up!"

When he is walking along nicely, then you tap him with the lash on his right side somewhere between his ears and his mid-back and tug on the halter rope and say "Haw!" When you do this, your ox should turn towards you. If he just continues to walk straight and doesn't understand that you want him to turn, then you have to turn his head with the rope. If you pull his head around, he has to follow his head. He won't keep walking straight with his head turned. So be sure that you make him turn, at least a little bit at first so that he doesn't misunderstand the command.

When you tap him with the lash on his right side to propel him to the left, don't hit him in the face. You can hit him anywhere from behind the ears back to the middle of his back. We want to reserve his rear end for propelling him forward with the command "Get-up!" and his front part up to his ears is reserved for "Gee!" and "Haw!" left and right.

It is good if he understands that anywhere you tap him within that area, on the right side, means that you want him to turn left because you will be in different positions when you are walking next to the oxen. You might be behind them or up in front of them and not always be able to tap them in the same spot. But if you have a few feet of leeway, that makes it more practical.

If you want to turn him 90 degrees, you may have to repeat the command several times until he completes the turn. Then tell him "Get-up!" and walk across the ring. When you tell your ox to "Haw!" he should continue to turn to the left until you tell him to "Get-up!" again, which will signal to him that he has turned far enough and now he can resume walking straight ahead. Otherwise, how is he to know how far you want him to turn and how sharp? In the future, when he learns the command better, he can understand by the tone of your voice or the repetition of the command more than once that you want him to turn just a little bit or very sharp.

When he reaches the opposite side of the ring, say "Whoa!" Pat him on the head and congratulate him for turning so nicely. Give him a minute to gather his equanimity. Then tell him to "Get-up!" and again walk counterclockwise around the ring and repeat the same procedure. Tap him on his right side, tug him to the left towards you, and say "Haw!" at the same time.

When you see that he is showing some signs of understanding the command, which may not be in the first day, then try telling him "Haw" and tapping him with the lash but without holding the rope. Put the lead-rope up over his neck and walk alongside him. Just use the lash and tell him "Haw!" and see if that works. The sooner you come to this point, the better, so he doesn't get used to you tugging on the rope. When you are working him under normal circumstances, you won't want to be holding a lead-rope.

Next, when he has learned to turn without you pulling on the rope, you can stop using the lash and just use the command "Haw!" expecting him to continue turning until you say "Get-

up!" at which time he should walk straight ahead from whatever position he is in at the time you give the command. I think you will find that for every 45 degrees that the ox turns, you'll have to say "Haw!" again to make him turn another 45 degrees.

The number of lessons required to teach this command may vary dramatically from one ox to another. The smartest ox I ever worked with learned each command in one day. On the second day, he was performing without the lash. But it may take considerably longer with some oxen. I have found that these two commands, "Gee!" and "Haw!" may take longer to teach than any of the others because there is a little more subtlety involved. But by repetition in a proper atmosphere, an ox can learn these commands very well.

Also, you will find, especially with "Gee!" and "Haw!" that a great deal of their learning will take place after they start working. As long as you are very careful to be consistent in how you give the command both in your words and your actions, sooner or later the ox will understand. Don't give up on an ox because he doesn't learn quickly. It may take a lot of repetition.

"Gee!" - Go to the Right

Once you are confident that your ox has learned "Haw!" then you can teach him "Gee!" which is to turn to the right. I have found this a little more difficult because you can't use that simple method of pulling the ox toward you with the lead-rope. [The teamster normally walks by the ox's left shoulder. Some old timers say that "Haw!" means to come "Here" and "Gee!" means "Get away."] With the command "Gee!" the ox has to go away from you. Always remember that you are working the oxen from the left side most of the time, so you should maintain that position during the lessons. If you switch sides, they will become confused. Ultimately, you should be able to work them from either side, but the standard procedure is to walk on the left side.

To teach "Gee!" you have to push the ox off to the right to show him that you want him to turn in that direction. Your oxen might be quite large and to push them around in one direction or another may not be so easy. This is a good reason to train oxen when they are very young. The smaller they are, the easier it is to push them around and show them what you want them to do. They also tend to be more submissive when they are young.

When teaching "Gee!" you want to walk clockwise along the edge of the ring with the ox walking alongside of you. If you walk counterclockwise, your ox won't be able to turn right. Stand to the left of your ox and tell him to "Get-up!" Then tell him "Gee!" push his head over to the right, and tap with the whip on his left side. From the last lesson, he has already picked up on the idea of turning and then straightening out when you say "Get-up!"

So this isn't quite like starting from scratch. Your ox will already be used to the idea of turning. He might understand very quickly when you tap him on the left side that you want him to turn to the right. When you have turned about 90 degrees, tell him to "Get-up!" and walk straight across the ring. Stop when you get to the other edge of the ring and congratulate him. Then you can proceed again and repeat everything.

When teaching these commands, don't forget to use your ox's name. "Gee, Buck, Gee!" It is important that he learns his name so that he can distinguish commands that you make

specifically to him when he is working in a team. Especially the "Gee!" and "Haw!" commands are used this way. When you are making a very sharp turn, the ox on the outside of the turn is commanded to go "Gee!" or "Haw!" depending on the direction you are going, and the ox on the inside of the turn is actually commanded to "Back!" at the same time. It is something like pivoting on a point, and he actually has to back-up.

Once your ox has learned "Gee!" and "Haw!" it is much easier to take him out of the ring and walk around to practice. Now he has learned all the commands. If you want to stop him, you can stop him with "Whoa!" If you want to turn him left or right, you can do that. At least he has the idea. When you take him out of the ring to practice, at first, you should keep the lead rope on him to make sure that he doesn't get away. You can alternate the commands of "Gee!" and "Haw!" Give him lots of practice turning in both directions and stopping, starting, and backing up. It is just like going out for a drive to practice maneuvering.

I found that I can also teach the ox to turn while backing up. This makes the ox very maneuverable in tight situations. If you are in the woods and you want to back the oxen in between two trees to hitch to a log or if you are hitching the oxen to a wagon and you want to back them into a tongue, it comes in very handy if they know how to turn when backing up.

Stand in front of the ox holding his halter. Tell him "Back-haw!" and guide him back and to his left. You're actually walking him in a counterclockwise circle backward. Do the opposite with "Back-gee!." He will soon get the idea, and then you can switch over to the lash. Tap the ground in front of him to get him going back and then tap his side to turn him left or right, and, as usual, repeat the verbal commands simultaneously. Then, when he is responding well, drive him with the word alone.

LESSON 5: STARTING TO WORK.

Five teams each a span of two.

Your oxen have individually learned all the commands, but you will find that there is some relearning involved when you yoke two oxen together. You should repeat all the lessons so the oxen can relearn the commands as a team. A large training ring - 48 feet (30 m) in diameter - should be used. There is plenty of room for them to walk around, and yet they are confined, which helps focus their concentration. Since they have already learned the commands individually, it should not be difficult. Continue the lessons until you are satisfied; they are obeying you.

When you yoke the oxen, each ox should have his own side. You shouldn't switch them back and forth. If an ox gets used to working on one side, and then you switch him, you may experience extreme difficulty.

Keeping the Neigh Ox Near

Generally, you put the better ox on the far side because he is more easily controlled. Your off ox (the ox on the right or far side) is not directly within your grasp, so he should be a good boy. You can even put a rope on the halter of the near ox [neigh ox] and hold him if necessary. You can speak and use the lash to control the neigh ox more directly. Also, if one ox walks faster than the other, he should be on the off side. If the off ox is slower and is always standing back and you can't see him very well, it's hard to control him.

When you begin training a pair of oxen to work bear in mind that it is going to be a gradual process. They may be very strong, but you must start with an almost weightless load and gradually increase it to their full capacity. I know this is just common sense, but you would be surprised how this simple dictum is readily abused by passionate teamsters, who go against their better judgment in the name of "getting the job done." When you first hook the oxen to load, the whole concept of pulling is new. However, it is to your great advantage that pulling is their natural propensity. That is why they are called "beasts of burden." They also have a propensity to be lazy, but this training is not so difficult, as long as you don't prematurely overload the oxen.

Start with a Light Load

So at first, you want to hook them up to something very light. I like to use a small two-wheeled cart because it offers no resistance at all. The oxen are aware that they are pulling something, but it is very easy to pull. If they get scared and back up, the cart will just back up with them; whereas if you had a four-wheeled wagon, they could jackknife the wagon and break the tongue.

If you hook them up to a dead weight (a load without wheels) like a log or a sled, their freedom of movement is also restricted. If they back up or turn too sharply, they can break the tongue or step on top of the log. But if they are just hooked up to a two-wheeled cart, whether they turn or back up, no matter what they do, the cart just follows along with them, and you are less likely to have any accidents.

Even if the unthinkable would happen (the oxen get away from you and run off), this two-wheeled cart will just follow along with them wherever they go. Of course, the cart should not have any weight on it at first. We just want the oxen to get used to pulling something and overcome whatever fear they have. If you hook them up to a heavy load right away, you are beginning the inauspicious process of ruining your oxen. On your two-wheeled cart, be sure that the tongue is long enough so that when you go downhill, the cart doesn't bang into the oxen. This is very disconcerting, and they really don't like it. If something from behind them, which they can't see, comes crashing into their legs, it is frightening, and it hurts.

Of course, this would only be an issue with a wagon or any implement which is on wheels. A sled doesn't slide forward and bump into the oxen, unless, of course, you are pulling it on ice or snow. So make sure the tongues on all your implements are long enough so the oxen don't start off their training by being banged in the heels. It is hard enough for them to get used to the yoke being pushed up against their horns. They have to learn to keep their heads up when they are going downhill and hold back the load with their horns. The load will push forward, and their horns are very functional for holding it back.

You have to be alert that the oxen don't run off when you are first hooking them up. That is another bad way to start off a career of working. The oxen may be quite nervous at first. When you hook this cart up to them, they hear it clanking, and they feel the weight. They may decide that if they walk or run away fast enough, the cart will be left behind, not understanding that they are chained to it, and it is going to follow them wherever they go.

So you should really hold on to these oxen when you hook them up and have an assistant to help hold them or to walk in front of them. Tie the two oxen together by their halters, so that they can't separate from each other beyond the regular walking distance. Put a lead rope on the near ox and walk next to him on the left side. Don't leave these oxen unattended or untied when they're yoked up, and don't try to drive them without holding on to the lead rope. Especially in the beginning, they might get spooked by the cart and decide to run away.

Some animals, having once run off, never lose the inclination to do it again. Once they've realized their strength, the possibility of doing it again is always in their minds. They see it as an immediate solution to their problems. Certainly, it is very dangerous. The oxen are likely to get injured if they run off while hooked to a load. Also, the load may catch on various objects like fences, vehicles, trees, and who knows what - and destroy them. So be really careful and hang on to that lead rope when you are starting these new oxen.

The oxen must learn correctly how to start a load; otherwise, it will always be always a sore point. If the oxen jerk on the load to start it moving, it puts undue mental and physical stress on them. You run the risk of breaking equipment, and it is very inefficient. It takes many times more power to start a load than to pull it once the load is actually moving. So to learn it properly, the oxen should start slowly with something which is technically a load but actually has little weight.

Once the oxen get used to performing all the commands with the cart hooked up, then you can gradually add more and more weight, but never so much at once that they notice the difference and become alarmed. Just increase the load in very small increments and your oxen will learn how to start a load smoothly - and keep it going without becoming neurotic.

As long as you start small, the oxen will start smoothly. If the load is not heavy, then all they have to do is naturally start walking. If it is a little bit heavier than it was before, they will just lean over a little more, but they won't have to jerk the load. If you make a big increase in the weight, then their tendency will be to back up and then try to run forward and jerk the load to start it. But you will find that if you very gradually increase the weight, they won't develop this bad habit. You can slowly build them up to their full pulling capacity in this way.

If you hook the oxen to a load that really frightens them because it feels very heavy, they jump to the conclusion that they can't pull the load. They feel the weight and give a little jerk to try and move it. If it doesn't move right away, they become alarmed and conclude, wrongly, that they are trying to pull a mountain. They then decide that you are just a madman and that they are never going to pull anything ever again. The next time you hook them up to something and tell them to go, they're just not going to do it at all. As a matter of fact, they will go backward. This is called "balking," and is a certified "bad habit."

Therefore we emphasize the importance of starting the oxen off very gradually. Don't ever put so much weight on them that they jump to this wrong conclusion, that the load is so heavy that it is impossible to pull. If you overload the oxen before they are used to pulling heavy loads (and before they trust you and understand that the harder they pull, the more likely they are to move the load), the result could be that the slightest load would cause

them to immediately short-circuit, stop, back up, get all flustered and nervous, and think that some impossible, horrible task is about to be imposed on them. When animals get like that, they are called "spoiled." That comes from repeatedly asking too much of them too soon, or more than they are willing or able to do at any give time.

The oxen are not so unforgiving, though, that you can never make a mistake. For instance, maybe they are pulling a log, and it gets caught on a stump or a rock, and you don't realize it. You tell them to get up, they pull, and the log won't move. The oxen get flustered. That may happen.

Depending on the temperament of the oxen, they may or may not be affected by it at all. It may take repeated mistreatment of that sort to actually spoil them. But don't underestimate the possibility of spoiling your oxen, even if they seem to be very tolerant and forgiving. Don't subject them to that kind of misjudgment, of being commanded to do things that they cannot do without hurting themselves, or tripping and falling down, or bumping into things that cause them pain - things that they cannot do without great difficulty, or at all. Repeated treatment of that sort will eventually spoil any oxen. They will become dull, oblivious, and callous to your commands because they don't really trust you. Once you've had practice with the cart, and the oxen are used to the idea of pulling, a nice easy thing to hook them up to is a log. This trains them to pull a dead weight. You have a lot of control over the weight by gradually increasing the size of the log. So, it's a nice way to develop their strength and teach them how to start a dead-weight load.

Training in the Woods

Many people like to train oxen in the woods. As soon as I did it, I understood why. The oxen become very dependent and submissive when they are in the woods. They tend to look to you for instructions because they are so much surrounded by trees and obstacles that they are bewildered. Because of all the trees, they don't know where to go.

If you are out in the open and the oxen can see the barn or any place familiar to them, usually they will want to go there. Oxen always want to go toward the barn, because that is where they live, and that is where they eat. They always walk a lot faster toward the barn than when they are going away from the barn. But in the woods, it's neutral territory. It's just trees all around, and the oxen have pretty much lost their sense of direction, so they look at you as though to say, "What do I do next?"

Also, they tend to walk slowly in the woods because of their natural caution. You can really practice your "Gee!" and "Haw!" commands weaving in and out of the trees. And there are so many nice logs to drag, lying around in the woods. You can pick a size log just suitable for the oxen you are working. When you feel confident that they are used to it, you can hook up a bigger log.

Oxen become very dependent and submissive when they are in the woods. In the woods, it is neutral territory, it's just trees all around.

Preventing Injury and Fears

Beware of simple obstacles that frighten the oxen. For example, some animals really dislike walking through ditches and puddles. They may be used to avoiding such things in the pastures, but now they must overcome their fear because it is not very practical if the oxen won't walk through a puddle or step over a ditch. An ox who is afflicted in this way looks at a puddle with terror, as though he is being asked to jump ship in the middle of the ocean; and to walk through a one-foot-deep ditch is like asking him to jump off a cliff and commit suicide.

So when an ox stops in front of some obstacle, obviously frightened, be prepared to quietly coax him along. If you get excited and try to force him along, he will try to jump over the puddle or ditch. Since he's yoked to another ox and hooked to a load, he'll never leave the runway and will land in the puddle or ditch, possibly on his knees, and who knows what other commotion will be caused.

As you can see, this is another opportunity to spoil your oxen, so don't get excited. Stand in the puddle or ditch yourself, walk through it, speak kindly to the ox, splash the water around with your hand, and rub some on his nose so he can smell and touch it. Oxen and horses rely heavily on their sense of smell to test things. Then try to lead them across the abyss, one step at a time if necessary. Don't forget; this is basic training. Don't make him cross the obstacle until he is convinced it is harmless. You may be impatient, but the oxen must be given first consideration.

You can accelerate the work training of new oxen by hooking them together with fullytrained oxen. This principle of association is very effective. In our case here at Gita-Nagari, now that we have so many trained oxen, we can work with a new team a little bit, and then just put them in the middle of a span of six oxen, with a trained team in front of them and a trained team behind. If they stop, they are simultaneously dragged from the front and bumped from behind. They very quickly understand what is going on, and they start walking along and pulling. Since it is natural for them to pull, in that situation they respond quickly and understand what they are supposed to do.

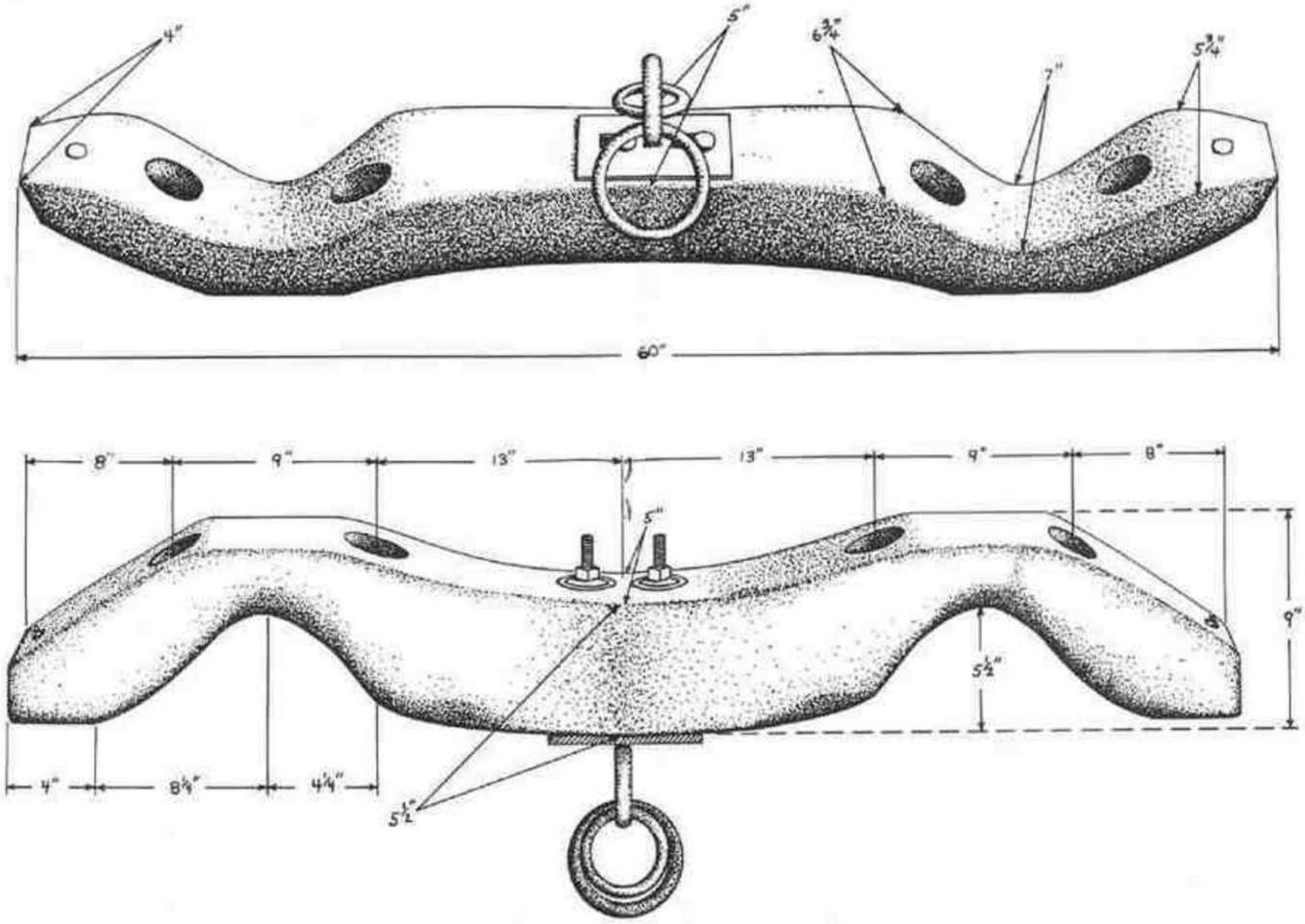
Generally, we train the oxen in teams of two right from the beginning and have them always working and learning everything together. That works fairly well. But, if we just need one new ox as a replacement, then we may team him up with a trained ox and have him learn that way.

Obviously, the material in this article covers many lessons. Each training lesson with the oxen should be short and teach only one procedure. Repeat the training session until the procedure is thoroughly understood.

A small portion of Gita Nagari's fields early 1980's.

HOW TO MAKE A YOKE

The yoke is the most basic piece of equipment you have for working an ox. It is considered to be one of the great advantages of working oxen rather than horses. With a horse, a somewhat complicated harness is needed to work the animal. The horse's harness requires a constant supply of rivets, leather, buckles, and rings for maintenance and repair. An ox's yoke, on the other hand, is a simple piece of equipment which seldom needs repair.



Yoke Styles

An ox yoke should be well made and very strong. The oxen are going to be completely dependent on this piece of equipment throughout their work. If it breaks, it could endanger the people with the oxen and the oxen themselves. It will be under great stress when the oxen are full grown, weighing perhaps a ton each, and are pulling with all their strength on this yoke. So it is definitely worth the trouble to make it in the best possible way. There are many different styles of ox yokes. The yokes that I use fit over the necks of the two oxen. I've seen head yokes that are simply strapped onto the horns of the oxen and don't sit on the necks at all. The oxen pull with their heads.

I've also seen, in New England, what they call a sliding yoke. It is actually adjustable for different purposes. Different types of work might require the oxen to be different distances apart. For instance, when plowing, we want the oxen to be quite close together.

The yoke that is used in South Asian countries like India, with oxen that have a big hump on their back such as the Zebu, can hardly be called a yoke. It is just a straight stick that leans up against the hump on the Indian ox's back.

The yoke for European (Taurean) oxen has to fit over their necks because the Taurean oxen don't have a hump of any substantial size. The yoke is held on the neck by curved sticks called "bows" which go underneath the neck. A bow is generally made from hickory wood or ash wood - some kind of wood that will bend. It is actually carved into a rod and then bent into a "U" shape after being steamed to fit it underneath the neck of an ox.

The Wood

The first thing to look for in making a yoke is a log with good straight grain, without a lot of knots, and big enough to make the yoke out of one-quarter of it. (See diagram 1.) The yoke could be made out of a half or even the whole tree, but it would be weaker. We don't want to waste our time to make an inferior piece of equipment. Even if good wood is not available in your locality, you can usually purchase it from somewhere else. If there are any sawmills near you, they usually travel some distance to get logs and therefore have a greater selection than you might find on your own property.

An ox yoke should be made out of wood that is strong and doesn't split easily. Very coarse-grained wood such as oak is strong but splits too easily. Also, oak is a very dense and heavy wood which is not so ideal for an ox yoke although a heavy wood can be used. The ideal wood for a yoke is light and strong. The particular variety of tree that meets these specifications will differ all over the world. In the northeastern U.S., basswood is very light and strong when it is dry. There is a tree called cucumber that is supposed to be ideal for ox yokes. Some varieties of poplar are good for a yoke, being quite light and tough when they are dry, although I have tried poplar that cracked severely when it dried.

Where I live in Pennsylvania, the elm tree has proven to be the best for yokes. Although it is quite heavy, it has a very twisted grain and its consistency is gummy, not brittle at all. Those two qualities together make it almost impossible to split or break, and it makes a virtually eternal yoke, even though it is very dense and heavy. But it doesn't seem to bother our oxen. They have tremendous strength in their necks and can hold up a heavy yoke if necessary.

The type of wood that I am showing in the pictures here is sycamore. I was satisfied with the grain of this piece of wood, but after it was done, I wasn't so satisfied with the checking. It checked, in other words, it cracked, during the drying process more than I would have liked. But the yokes have since held up. They are in regular use and seem quite strong, and they have stopped cracking.

If you use wood that is already dry, there will be less cracking, but it is much harder to work the wood. When you use a green piece of wood, it is soft and easy to work with even though it may be a hardwood. The traditional method of drying out a yoke is to bury it in a haystack so that it dries out very slowly.

When wood dries out too quickly, it tends to crack more. So the yoke would be buried in the hay and taken out the next year. That way it would be all dried out without any cracks. But I don't do that. I just oil it. I completely saturate the yoke with linseed oil. I find that prevents the cracking to a great degree during the time that the yoke is drying out, and it can be used in the meantime.

Squaring the Log

In Picture 1, I am standing next to a sycamore log. The diameter of this log is about two and a half feet (about 75 cm). In order to get the grain lined up so that it goes lengthwise across the whole yoke and gives maximum strength, we want to make the yoke out of one-quarter of the tree. Therefore, the tree has to be quite large. If you are making a six-inch by eight-inch (15 x 20 cm), or a seven-inch by nine-inch (18 x 23 cm) yoke, you have to start out with a quarter that is at least a foot (30 cm) wide, so that by the time you get it trimmed down and squared, it won't be too small. There is a two-inch (5 cm) difference between the depth and width of the yoke that I am going to describe.

The yoke I am making here is six inches (15 cm) across the top and from the highest point to the lowest point it measures eight inches (20 cm). If you had bigger oxen, you might want to make it seven by nine (18 x 23 cm). I've never made a yoke bigger than seven by nine. I don't think it is necessary for the strength of the yoke, and if you make it bigger than that you are really just adding extra weight on the necks of the oxen without any purpose. A yoke should be designed to be as trim as possible without compromising strength.

Picture 1. This is a sycamore log. Since you only use one-quarter or one-third of the log, it has to be quite large to begin with.

The log should be six feet long (1.82 m) to begin with. To quarter the log, I use wedges and a sledge hammer. Such a big log may take a lot of wedges. You may have to make some quite large wooden wedges in order to split the log. Be careful to split it evenly so you don't ruin the log. It is possible that only one or two quarters will be good and the others will have a lot of knots in them. If you can't split your log with wedges, you can resort to a chain saw and slice the log in quarters.

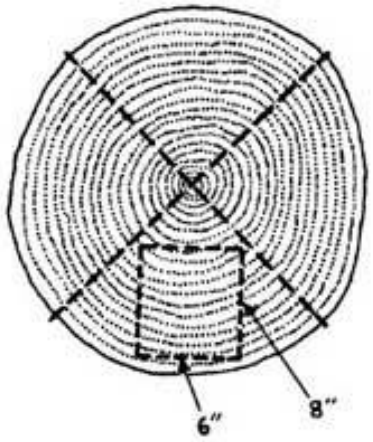


Diagram 1. The end grain view is showing how yoke can be cut from one-quarter of a log.

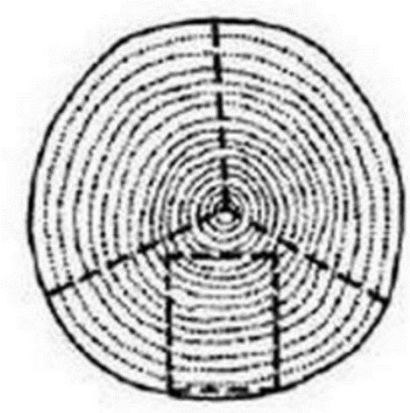


Diagram 2. End grain view is showing how yoke can be cut from one-third of the log.

This diagram shows the end of the log. The dotted rectangle is the end of the yoke. If cut this way, the grain will run all the way through the center of the yoke. This rectangle should be laid out at both ends of the log and then lines drawn to connect the two ends. These are important guidelines for squaring the log. This rectangle should be laid out before splitting the log, so you make sure your section of wood will be large enough for the yoke. If a quarter is too small, you can split out a bigger section and make the yoke out of a third.

Make sure to leave an extra inch (2.5 cm) around the dotted lines. You may have to shift the layout a little due to irregularities in the grain or an unforeseen knot.

Picture 2. Here I'm using a broad ax to hew the log.

Picture 3. Continue hewing the log until it's squared out.

As you see in Picture 2, I'm using a broad ax. If you have this tool, it is ideal for squaring a log and hewing it. It is flat on one side, and it is specifically made for hewing. Its broad cutting edge facilitates making a flat surface. In Picture 3, I am going to flatten out this quarter on all four sides and make it into a rectangle, six by eight inches (15 x 20 cm).

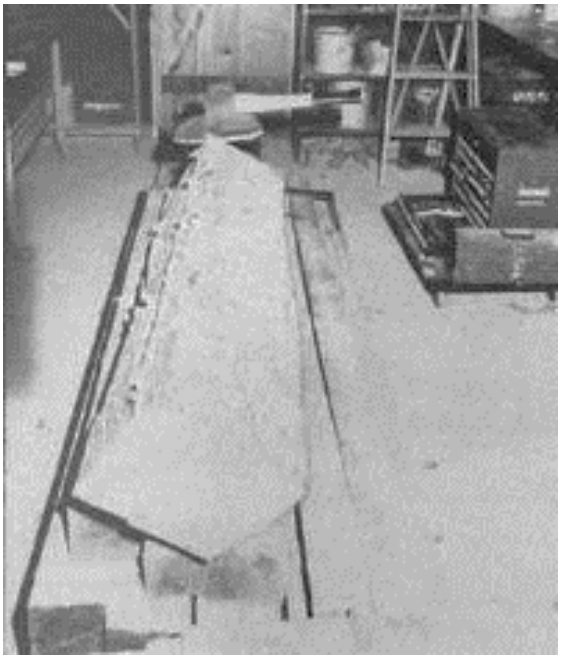
To hew a log, hit it at an angle and make notches that penetrate as deeply as possible. After you have made a whole row of notches, lower your ax almost parallel to the log and swing it right along all the notches and they all come off. In that way you work your way down and begin to develop a flat, hewed-down surface.

Picture 4. Beginning to square the log.

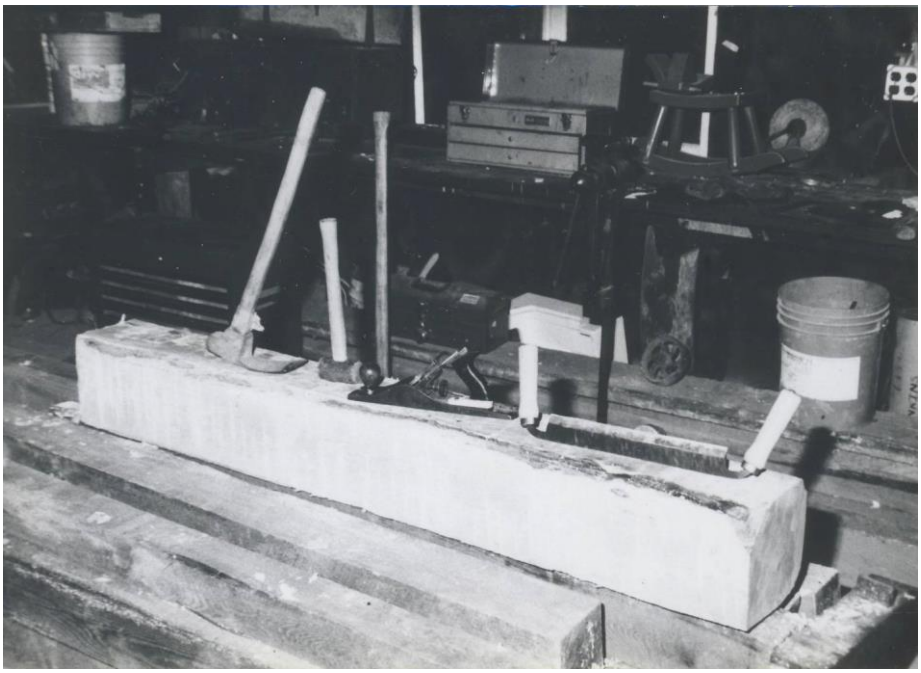
Throughout this process, you want to be careful to keep looking at your lines to make sure you are making a nice squared off piece. Keep turning the log and working on all four sides at once. Gradually work your way in toward your lines. Don't come too close to the lines because there may be some irregularity since you are working with a very rough piece of wood and you are doing a lot by eye.

Use an L square to check your angles. You want to get the right angles as you go around the log. Be careful not to take big chunks out of the wood when you hit a knot or if the grain changes a little in the wood because it could spoil your yoke and make it into a very ugly, messy, irregular thing. If you want to do a nice job, you have to watch the grain carefully. If you see that the grain is changing and the ax is digging in too far, then you turn around and hit the chunk from the other direction. This hewing is not light work. I tried to show the mood in Picture 5. In this mood the quartered log can be squared in a day.

Picture 5. The proper mood to square a log in a day.



Picture 6. A roughly squared off log. The broad axe stage is complete.



Picture 7. After the broad ax stage, smooth and square the surface using (left to right) an adze, a hammer, a plane, and a draw knife.

Picture 7 shows the squared off quarter of the log with the different tools that I used sitting on top of it. These are the tools that were used to finish it off after I was done using the broad ax. The first tool on the left is called an adze. It is used for the finer work of smoothing out a log, making it nice and flat, and for carving the yoke into its final shape.

I hit this adze with the heavy hammer which is sitting next to the adze. This hammer is made of copper which is a soft metal. A regular hammer, which is very hard, would destroy the adze if you repeatedly hit heavy blows on it. You could also use a dead-blow mallet which is made from plastic and is filled with lead pellets.

Using this mallet you can hit with quite an impact, but the mallet has some resiliency so it also won't mar the adze. The adze is used for the finer stages of leveling and carving the piece of wood. You'll get tremendous control over your wood with this tool. You can hold it at different angles to cut any direction you want and as thick a piece or as thin a piece as you want. The next two tools are a large size plane and drawknife. I use both of these to finish smoothing and leveling after finishing with the adze. First I use the drawknife to get out humps and ridges in the log, and then the plane which is very helpful in coming up with a very flat, square surface.

During this time I have to be constantly checking with the L square because the successful laying out of the yoke depends on the corners being perfectly square. If they are not square, the whole layout of the yoke might be lopsided which could make it considerably weaker due to not taking full advantage of the grain of the wood.

Carving the Roughed-Out Yoke

Now that the log is squared, it is time to lay out the actual yoke. You should have two patterns made - one for the top of the yoke and one for the front. (See Diagram 3.) First, draw center lines on the top and bottom, both ends and all around the middle of the stick. You have some choice where to lay out the yoke lengthwise because your stick is about one foot longer than the yoke. The thinnest part of the yoke is over the necks, and the most stressed point is the center, so try to avoid any knots or grain irregularity at these points by shifting the pattern to the left or right, wherever it fits best. When you draw the pattern on opposite sides of the stick, make sure the two drawings are lined up together, that they exactly correspond.

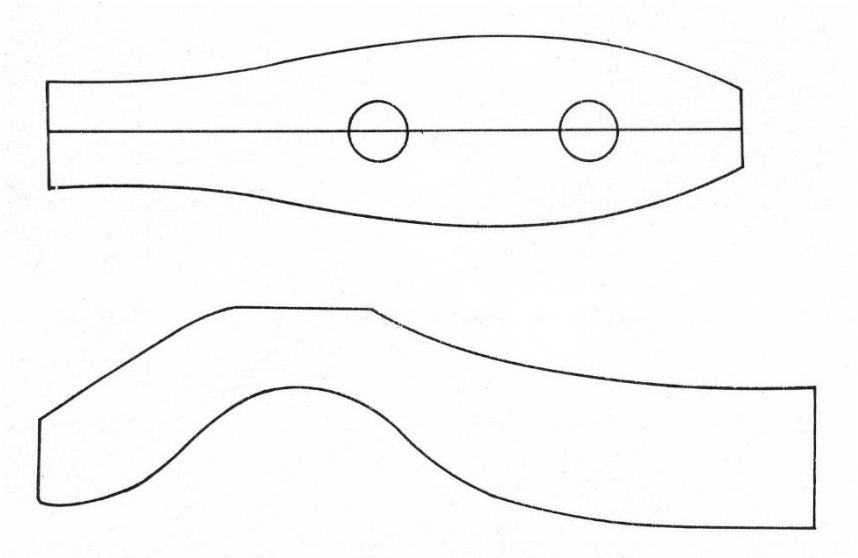
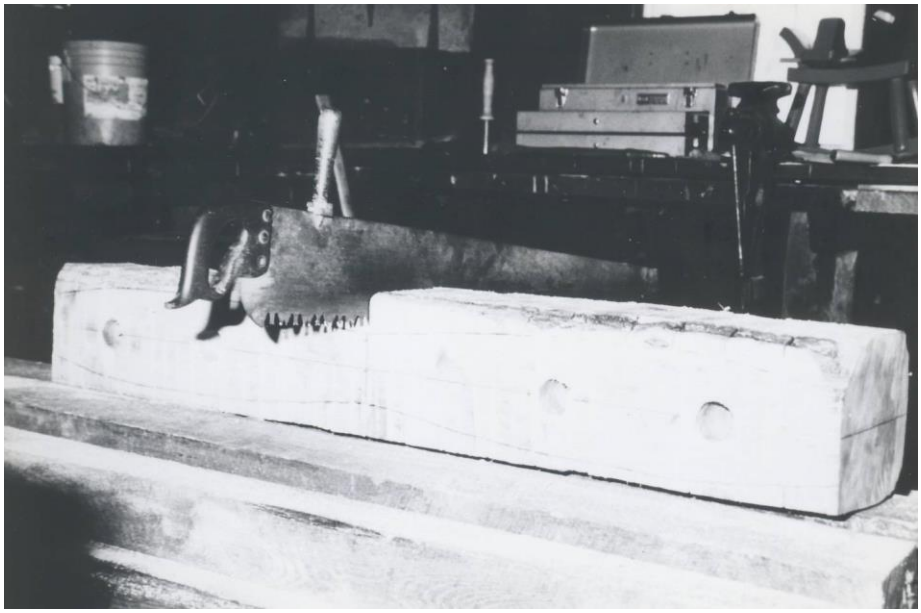


Diagram 3. Templates for the top and front views of the yoke. Make them life size out of paper.

There are two holes for each bow, as you can see. These holes are two inches (5 cm) in diameter. I don't know of any power drill, unless you have an industrial type drill press that will drill a hole this big. It can best be done with a hand auger similar to the one you see in the picture. As you can see in Picture 11, I've finished drilling the holes and laid out the top pattern of the yoke.

Pictures 8 and 9. Using the template in Diagram 3, draw the top lines and drill the holes.

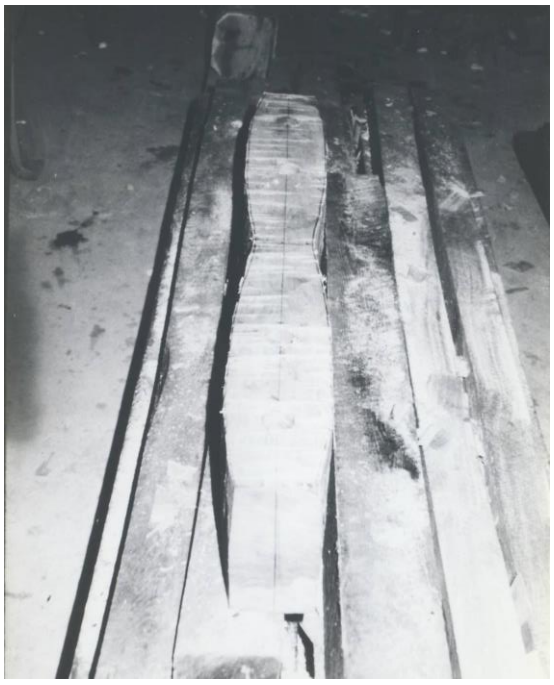
Picture 10. A hand auger is a simple way to drill the two inch holes.



Picture 11. After the top pattern is drawn and the holes are drilled begin to saw slits for easy removal of excess wood.

The next step is to take a hand cross-cut saw and make a slit every two or three inches within a quarter of an inch (.5 cm) of the line. I do this all along the outer edge of the yoke, which makes it very quick and easy to chop these sections out with the adze. After all these slits are sawn, you take the adze and very carefully hit it with the hammer and chop out all these blocks, changing directions so that you are always chopping downwards and with the grain.

Smoothing with the Adze

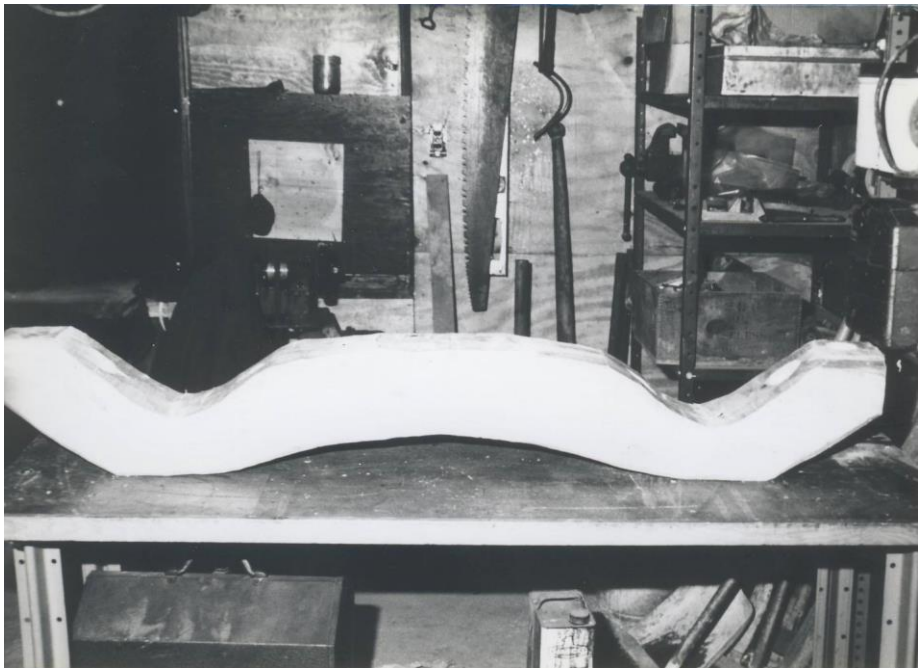


Picture 12. Top view of yoke with pattern roughed out.

You then have a rough edge which you can smooth out with the adze and the hammer. The adze is the tool that you will use more than anything here. It is a small carpenter's adze, not a big heavy hewing adze. It is meant to be used with a hammer. If it is too heavy and too large, you won't be able to handle and control it easily enough.

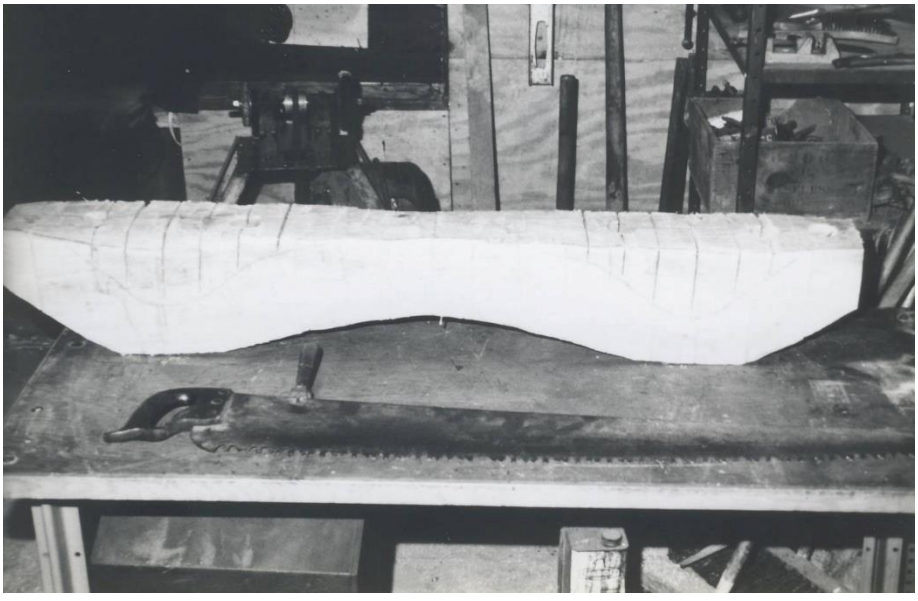
Picture 12 shows the top view of the yoke with just the top pattern drawn and roughed out. Next, we will work from the pattern on the front and the back of the yoke as shown in Picture 13. Saw the slits very carefully. Make sure you don't make any holes in the yoke. This big dip you see on each side of the yoke is where the neck of the ox goes. It is the most important part of the whole yoke, and it must be very smooth because it constantly rubs the neck of the ox and can make a sore if it isn't smooth.

Picture 13. Now for the front. Repeat the procedure you used to draw and rough out the top. Make sure you place the template correctly.



Picture 13. Now for the front. Repeat the procedure you used to draw and rough out the top. Make sure you place the template correctly.

Picture 14 shows the roughed-out yoke. It is not completed, but it is completely roughed out. At this point, the irons get put on, and any excess wood can get carved off, and the edges can be sanded. Make sure the edges get all rounded out. It should be very smooth, especially around the neck, so that the animals never get irritated by irregularities in the wood. A sore neck on the ox can put him out of commission in a season when you need him the most.



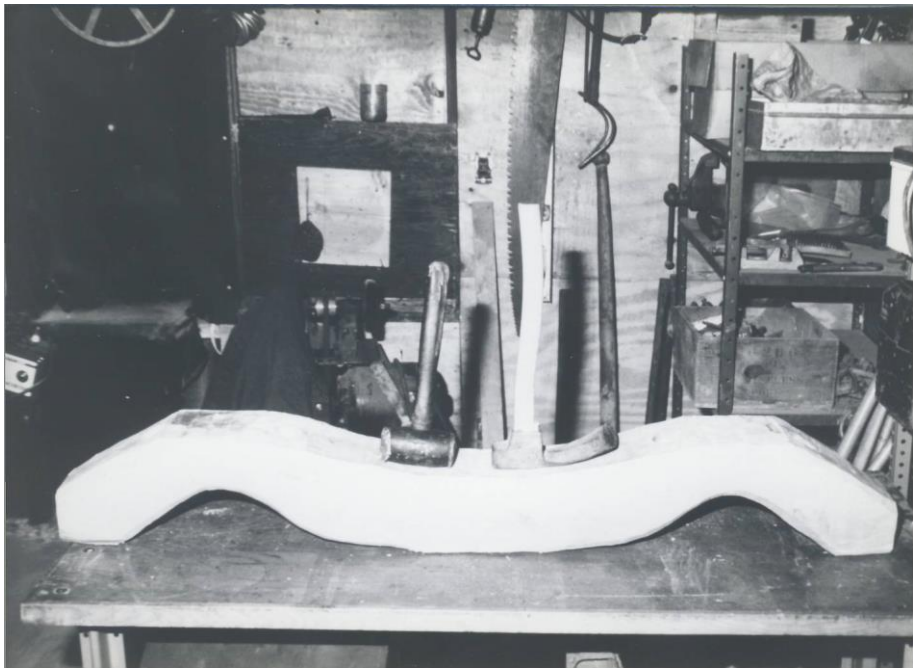
Picture 14. The yoke roughed out front and back, and top and bottom.

The only difference between the front and the back of the yoke is in the back, where the yoke contacts the ox's neck. The back edge gets dished out more than the front to insure the ox's neck doesn't get irritated.

The most stress on the yoke is on the center part; therefore you can see how it is thicker. You can see how the grain runs all the way through the yoke. If the yoke breaks, it is either right in the center or at the ends. If the ends are not very strong, they may break off when bumped into a post or a tree. So, they should be very strong.

But, as a principle wherever there isn't normally a lot of stress on the yoke, you should try to shave off as much wood as possible, so that it is not heavier than it needs to be. To rough out a yoke like this will take two days of steady hard labor. If you have a large band saw, you could do all of this roughing out in one hour, except for drilling the bow holes.

In Picture 15, you'll see the finished yoke. Although it isn't clear in the picture, I have placed carriage bolts vertically through the yoke at each end to reinforce them. Refer to the following Master Drawing for details.



Picture 15. Completed yoke with tools.

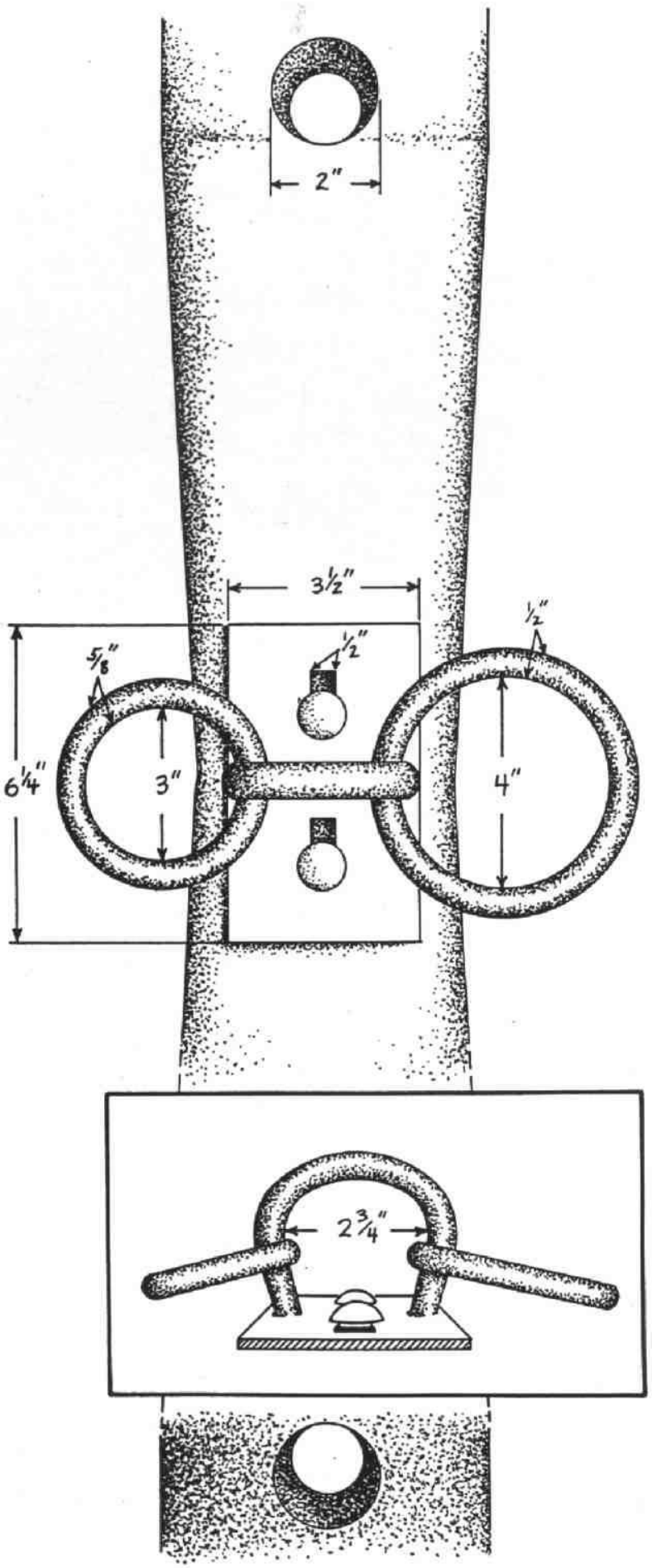
MAKING THE IRONS

Take a three-eighths inch (2.3 cm) thick metal plate and cut it to the size shown in the drawing, about three by six (7.5 x 15.2). First cut the bolt holes. These holes are a half inch (1.2 cm) by an inch-and-a-half (3.8 cm) so that the iron can be adjusted back and forth to compensate for one ox stronger than the other. This gives a little additional leverage to the weaker ox so that he can pull on the load evenly.

After these holes are made, then you cut two round holes for the rod that will hold the two rings. This should be at least five-eighths inch (1.6 cm) soft rod. After the holes are cut, then you bend the rod so that it fits right into the two holes, all the way through. The rod ends should stick out the other side of the plate.

Before you insert the rod into the holes, you have to make the rings. As you see in the drawing, there are two different size rings. The smaller one is heavier, made out of a five-eighths inch (1.6 cm) rod and is used for the chain that you use to pull your loads. The thicker ring for the chain fits through the thinner ring. The larger ring can be half an inch (1.2 cm) rod since it doesn't take very much stress. (Remember, the larger ring is thinner and the smaller ring is thicker.)

After putting the two rings onto the bent rod, insert the bent rod into the two holes in the plate and weld them. Weld on both sides of the plate all around the rod and then whatever is sticking out beyond the weld on the bottom of the plate, cut it off and grind it smooth.



When you mount the irons on the yoke you will have to make some little grooves in the wood for the stubs of the five eighths inch (1.6 cm) rod which are sticking out of the bottom of the plate. This is so that the plate can fit flush with the yoke and also slide back and forth when you want to adjust it. The irons get bolted onto the yoke with one half inch (1.2 cm) carriage bolts. The irons should be very well made with indestructible welds. When the oxen are pulling very hard on a load, if the irons give way and break, there can be dangerous consequences.

HOW TO MAKE AN OX BOW

An ox bow is made out of wood that can bend without cracking. I always use hickory. (Some people use walnut.) A freshly cut tree will be the best for bending. You soften the wood by steaming it. Freshly cut wood doesn't have to be steamed more than twelve hours.

If you are working with dry wood, I don't know exactly how long you would have to steam it in order to bend it, but it would take a lot longer. Even then, the chances of the wood splitting when you bend it would be much greater.

Selecting the Wood

So try to find a live tree which is perfectly straight for a six-foot (1.8 m) section and about six inches (15 cm) in diameter. It is very important that the section does not have knots in it. Within that six-foot section, at least three feet (90 cm) in the middle should be free of knots or even bird pecks.

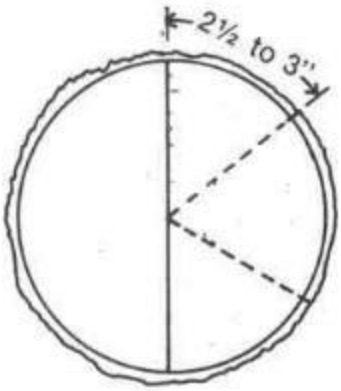
Sometimes when a tree is young, birds peck at it and a blemish remains which grows over and makes a bump like a little knot. It causes a definite imperfection in the grain of the wood. If you try to bend a piece of wood where there is a bird peck, the wood is likely to split. You are going to split this log lengthwise into six or eight pieces depending on the exact size of the log.

There might be a bird peck or knot on one side of the log, but on the opposite side you might get a good section. Knots are all different. Sometimes they go deep into the wood or sometimes they are just superficial. The more you work with trees, the better you can judge by looking at them how deep the bird pecks or the knots go. After you split your log into sections, you will be able to see where the knots are and how deep they go.

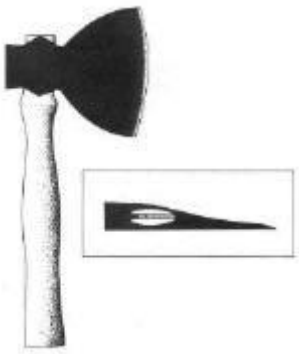
Splitting the Log

I use small wedges to split the log. First, split it in half. Then split it into sixths by splitting the halves into three sections each. You need at least three wedges to do this properly. Your ox bow, when it is finished, will be one and a half inches in diameter (3.8 cm) at the widest point. So, to start with, the outside edge of the section should be at least 2 1/2 inches or 3 inches wide 9 (6.3 or 7.6 cm).

The stick initially gets hewn with a broad hatchet until it is almost to its right dimensions. This hatchet is a small version of the broad axe which I described in the yoke-making article. A broad hatchet has one flat side which makes it ideal for hewing.



Outside edge of section should be 2 1/2 to inches [6-8 cm] wide.



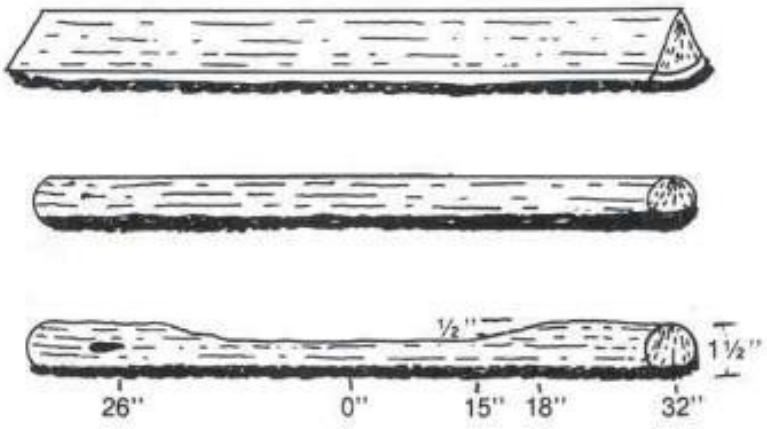
This is a Broad Hatchet. One side is flat, which makes it ideal for hewing.

The outside edge of the stick with the bark on it should be untouched. We want to leave the bark on to help keep the bow from splitting where it bends. The bark will always stay on if you handle the piece of wood properly. As you can see in the photos, the outside edge of the bow has the bark on it, and all the carving is done on the sides and the inside.

We have two-inch (5 cm) holes in our yoke, so we make the bows about 1 1/2 inches (3.8 cm) at the top. We found that most of the stress on the bows is right below the yoke. When a bow breaks, it is always at that spot. After the bow passes through the yoke, its depth is tapered down to about one inch, but the width remains the same. There is little stress on the lower portion of the bow.

Hewing the Stick

Hew the stick until it is just a little bit oversized. (Note drawings.) Don't go too close to your lines because the hatchet is a little bit crude and you might dig it in too far by accident and ruin the bow. Use an outside caliper often to verify that you aren't taking off too much or too little.



Progression of hewing the bow stick.

This is an Outside Caliper, used to take dimensions of the diameter of round surfaces.

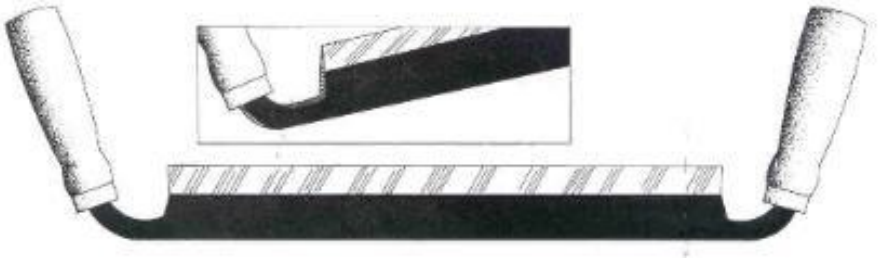
When you have finished hewing the bow, you should make your final decision exactly where you are going to bend it and mark the spot. Since you have a six-foot stick and the bow need only be five feet (1.5 m) long, you have one foot of leeway to choose the best spot for the center of the bend, based on the quality of the wood. Any imperfections in the wood should be kept as far from the bend as possible. If the bow splits when you bend it, it is useless, and you have wasted all the valuable time you spent in preparation, so be careful at this point to use your best judgment.

Shaping with a Drawknife

The final shaping of the bow is done with a drawknife. You can put your bow stick in a vice and shave it down to exactly the size and smoothness that you want with this drawknife. A drawknife should be used with the beveled edge down, facing the wood.

Your shavings should be long and thin if you are using the tool properly. The old gentleman who taught me to make bows and yokes once said, "You can tell a man by his shavings." In other words, the longer they are, the better the man.

Keep using the caliper to check your work. Be careful to use the drawknife with the grain of the wood so it doesn't dig in and make notches. You want the inside of the bow to be very smooth because it will constantly be rubbing on the ox's neck. The drawknife must be kept very sharp to be effective. After you are done shaping the bow with the drawknife, then you can smooth it with a wood rasp and then sand it.



This is a Drawknife. Note the inset showing the beveled edge.

Steaming the Bow

When it is time to steam the bow, we take an oval-shaped copper kettle approximately two feet long and one foot wide. Have the kettle over some constant source of heat like a gas stove. When the water is boiling, and steam is coming up, then lay the bows across the top with the bark facing up. You can steam two bows at a time.

Cover the top of the pot and the bows with burlap sacks to hold the steam in. Be careful not to let the edge of the sacks hang down near the flames and catch on fire. They should just cover the top of the pot so that most of the steam is contained although some steam escapes through the sacks. Steam the bows for about 12 hours to be safe.

The exact time necessary depends on your wood. If it is freshly cut wood, that certainly shortens the steaming time. I have even heard of people bending green hickory wood without steaming it at all. But I wouldn't try that. Whenever you steam the bow, the bark will come loose. But since we are only steaming about two feet of the bow, right where it gets bent, all the rest of the bark adheres to the wood nicely when it is steamed in this way.

A piece of wood can be steamed much quicker if you enclose the whole thing in a pipe with steam coming in. But the result may be that the bark comes off the bow. We have a steam boiler in one of our buildings. We put a shut-off valve at one of the steam ports and fix a pipe large enough to contain one ox bow. The pipe is connected to the steam port with the bow inside it and then capped.

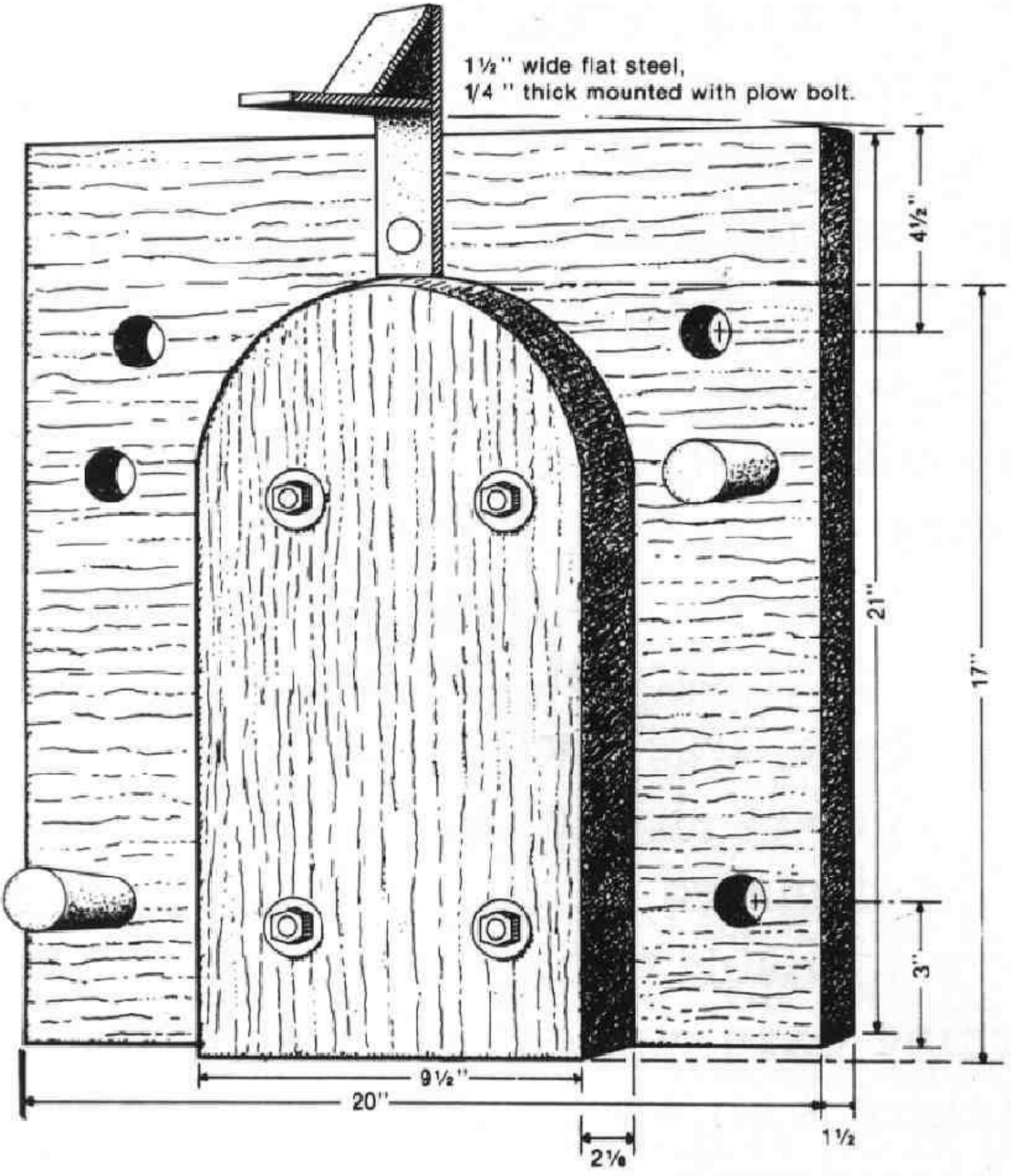
If the bow is left in there for twelve minutes with the steam at six pounds of pressure, it can then be removed, and bent and the bark will usually stay on. We found that if left for 15 minutes the bark would come off. More power is required to bend the bow using this short high-pressure method than when using the slow method with the kettle. However, the results were consistently good. Even when the bark came off, nine out of ten bows held up under normal service.

Bending the Bow

A bow should be bent immediately after it is removed from the steam. If you let it sit out in the open air, it will lose its softness very quickly, so you must have your form set up very near the steaming operation. The form must be bolted or nailed onto a solid workbench. The form is pictured above.

At the top, you can see that the bow is wedged in very tightly. That is very important. Otherwise, it will buckle right at the mid-point. That is the biggest stress point, right in the middle of the bend. The bow must be bent gradually. There are different holes in the form, and as you bend each side of the bow, you put the pegs in to hold it in position.

Depending on how thick your bow is, you may be able to bend it by hand. Bend one side until you pass a peg hole and put the peg in. Then you can let go and bend the other side to its corresponding hole. In the photo, I started the bend with two chain binders. I put a chain on both ends of the bow, and I gradually cranked the two ends together, switching from one binder to the other. When the bend was half done, I just pushed the bow in the rest of the way by hand. But don’t do it all of a sudden. Do It slowly. This will minimize the chance of the bow cracking.



This is the Form for bending the bow. For older oxen, widen the form to compensate for their larger necks.

Here is how the steamed bow stick is bent on the form.

Once the bow is bent all the way around the form and the pegs are holding it in place, then take some wire and wrap it around the ends of the bow to hold it in place. Remove the bow from the form and leave it wired up. You can use the bow the next day if you need it, but you must always leave it in the yoke. Otherwise, it will straighten out.

It may take up to a year before the bend is permanently fixed. I have seen that there is a tendency for the bend to gradually straighten out, so it is good to always keep the bows in the yoke or wired together. If you have a yoke that you are not using, just put the bows in the yoke and leave them there for an extended period of time and then they will become fixed in the shape of that yoke.

There should be a little space between the side of the ox's neck and the bow when the yoke is in its normal pulling position. The bows shouldn't be right on the ox's neck. You might want to have two different size forms. I have two forms, and now our older oxen have outgrown the large form shown in this article. Instead of making a new form, we put shims on both sides of the form to make the bow wider.

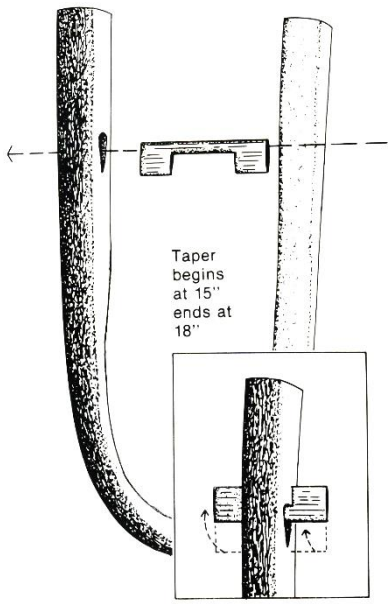
Bow Keys

You will have to put keys in the bows to hold them in place in the yoke. A wooden key works better than anything. We tried metal bolts, pins, spring clips, but anything we used was completely inadequate and very troublesome, always falling out or bending or wearing big holes in the top of the yokes. Finally, we started using the time-worn method of wooden keys.

Since the key must be small, it should be of very strong wood. We found elm makes the best keys and hickory second. They can be whittled with a knife. Seven-sixteenths of an inch (1.3 cm) is a minimum diameter for the body of the key. Three-eighths inch (1 cm) keys break

too easily, we found. It is a good practice to always carry an extra key when you work the oxen. A good key will break only in some extraordinary situation when the oxen are acting up.

The hole in the bow to receive the key should be drilled. It should be carefully centered and made perpendicular to the bow. We drill three different size holes. First drill the 7/l6-inch (1.3 cm) hole for the main shaft of the key and then two smaller ones below it. Then carve out the key hole so the key fits in well.



The key hole must be drilled perpendicular to bow stick, and must be carefully centered, about 6 inches [15 cm] from one end of the bow. Note

A leather washer will prevent key from damaging the top of the yoke.

The distance of the keyhole from the bottom of the bow is critical and depends on the size of your oxen. If the bows are too far down, the yoke slides back on their necks when they pull. The effect of this is that the oxen are using the bows to pull with instead of the yoke and the bows press up against their throats and choke them. For our full-grown oxen, the correct distance is 22 inches (56 cm), but you must adjust the distance for your own oxen.

You should be careful not to damage the yoke by the rubbing of the keys around the holes because there is no way you can repair that. A good yoke, if properly taken care of, can last a lifetime. So it is good to have large leather washers that fit over the bow. The key sits on the washer, and the yoke doesn't get damaged at all.

It is also advisable to have extra bows when you are working oxen and depending on their work because there is no way you can utilize the kind of yoke I have described here without a good bow. Before I knew how to make bows and I was only working one ox with a single yoke, I made a bow out of an iron pipe. This can be done in an emergency.