Saw, Axe & Knife Safety

Everyone has their own ideas and techniques on how and when these topics should be presented. Many Clubs would deal with this area at the beginning of the Club year in the fall, preferably at the first campout where "hands on" is more feasible.

The intent here is to present a consistent approach to these "bush tools" in order to develop a Provincial Standard for Warden and Leader training. There is often a confusing line between the safety aspect and the skills aspect. To use these tools properly and safely requires some techniques that can be expanded on later under the banner of a "Skills" course as the student gains experience.

Primarily we will deal with knives as they are the most predominant tool. Currently the use of axes and chainsaws for Warden use is prohibited by our insurance policy but that may change in the future. Chainsaw use and safety is a whole other topic and will not be dealt with here. Just for information, any occupational use of chainsaws must include a Safety Course and protective equipment but there are no OHAS or WCB regulations covering private individual use.

We shall start with saws, proceed to axes and then on to the longer dissertation on knives.

Permission: **The use of each of these tools at a Club level is by parental consent only. This is not a Leaders decision. The parent is ultimately responsible!**

CREDO: Never put anything in front of a sharp blade that you are planning on keeping!

SAWS:

Saws are safer, easier to learn to use and much less tiring than an axe. Saws are used by JFW's primarily for shelter building and firewood preparation. It is the only tool you can use with reasonable safety after dark.

Appropriate types: Bucksaw, Bow Saw, Folding Saw, some handsaws.

Inappropriate types: Crosscut Saw, some handsaws.

Demonstrate [show and tell] as many of these types as you can. Discuss cutting on the push stroke (most common), the pull stroke and bidirectional cutting.

Safe cutting techniques: 1 person, 2 persons ----- Fixed wood/ move saw.
Fixed saw/ move wood.
Safe hand positions, second person holding, 2 on a Bucksaw/Crosscut...cooperation!

Tree felling is again a whole other topic.

Felling large trees with saw or axe is one of the most dangerous activities in outdoor living!

However, while doing shelter or firewood work, we should be aware of the dangers of some trees such as leaners, hangers, rotten bases and tops, high wind potential blow-downs etc.

LOOK UP!

Care of saws: Discuss protective covers, safe storage off the ground (won't get stepped on), moisture/rust and sharpness.

Axes:

The axe was the first great technological invention! It is by far the most dangerous of the three tools as body parts can readily be removed permanently! It is also the most difficult tool to become competent with.

There are very seldom minor axe cuts!

As well as misdirection of a cutting stroke, they present other dangers. What are they?

Loose heads, split handles, glancing blows from knots/frozen wood, wrong axe for the job, dull. Some of the "off shore" manufactured axes are of very poor quality. Many have epoxy in the eye so there is no way to tell how deep the handle is seated. Some are only ½ way! Most axes, when purchased new are quite dull and it may take half a day's work to sharpen them correctly!

Appropriate types: There are literally hundreds of types and styles but they are generally used for either felling or splitting/chopping or smiting! We will include wedges here also.

Inappropriate types: Depends on age, type of work and experience but generally there is no place for the double bitted axe (a felling axe).

Demonstrate [show and tell] as many of these types as you can. Discuss the various advantages and disadvantages – particularly from a safety point of view.

Splitting: A heavy head requires less energy but may be harder to control (maul). A hatchet is easier to control but more dangerous to use. Why? In addition, with the hatchet, unsupervised use can occur quite easily.

Sharpness: Felling vs. splitting & blade angles. How to carry the axe. Where and how to store the axe – at camp – at home. Another safety issue? Axe sheaths/covers ***Must provide proper containment of the cutting edge***

Proper sizing of the axe: Armpit method. Proper balance of the axe: throw test.

Usage: * Read the Wood!* When splitting, position the work on a solid chopping block and orient the same way as the tree grew (butt down). It splits easier. Observe the position of the knots and split inline or between them. NEVER try and cut across a knot! A huge amount of energy and time has been expended by people who just start chopping. ***Read the Wood***

Kindling: Making kindling brings the fingers and axe much too close for comfort. Instead of holding the wood with your hand, hold it down on top with a small stick. Fingers are now at a much safer distance!

An axe is really a wedge with a handle on it. When splitting wood, it will split easier if you "wedge it" apart from the edge rather than striking it in the center.

Wooden wedges can be a great boon for splitting difficult or large wood like some of the poplars. Indeed, a good Warden exercise is to have them carve some wedges. They can then split large blocks without an axe!

NOTE: Pounding in a wood wedge with a steel axe destroys the wedge quite quickly. Use a heavy wood baton instead. Wood on wood lasts much longer.

BEFORE you START: REVIEW these SAFETY ISSUES!

A. Diameter of safety circle around the job - especially when taking down a tree.
B. Proper stance, good footing and substantial footwear (no sandals).
C. Check the condition of the axe to be used.
D. Who is standing directly behind you?
E. Who is standing in front if the head comes off?
F. Where will split or chopped sticks fly?
G. Possible glancing blow on knots or frozen wood.
H. Safe follow through in the event of a "miss".

Knives:

This topic can be expanded indefinitely into areas such as various crafts, survival, sharpening etc. We will try to stick to topics relating to safety issues.

Appropriate types: There are literally thousands of different knife styles and sizes. For our purposes there are 3 types – Folding Blade (Jack), Lock Blade and Fixed Blade – point out the pros and cons of each.

Demonstrate [show and tell) as many of these styles as you can. Discuss size of blade (palm width), carbon vs. stainless, guard vs. no guard, handles (wood-bone-plastic-rubber-metal), cost vs. quality. Use some diplomacy here as many Wardens already have a prized and sometimes inappropriate knife that was a gift from Dad, Uncle etc.

Inappropriate types: Knives that are too big (Bowie, Rambo, Kukri), most military combat and personal protection styles and serrated blades. Poor quality types are a curse but sometimes hard to recognize.

The Knife Sheath: This is VERY IMPORTANT from a safety perspective! The sheath MUST provide proper containment of the blade under many adverse circumstances! Homemade or cheap commercial sheaths can present a considerable hazard.

Wearing the knife: This is a matter of sheath style and personal preference. Discuss the belt loop vs. the lanyard around the neck. Boys vs. girls (most boys have a belt). There is also the possibility of a concealed weapons scenario to consider.

Sharpness: This is a primary safety issue. A dull knife requires more pressure to use. This in turn causes uncontrolled slippage resulting in major knife cuts! ***A knife that won't cut paper without tearing it is too dull to cut wood!***

A sharpening workshop may fit in well around this time frame, but again, it is a whole other topic!

Prior to doing knife craft, get comfortable – no awkward stances. For the beginners, a sitting stance may be more stable and easier to control than a group just standing around. A work surface will be required. Scrap plywood or OSB for table tops or 2 stumps for outdoors (one to sit on).

NOTE: When sitting, it is a reflexive move to steady work on your leg. The potential then arises for a serious cut to your **femoral artery.** Indeed, in a worse case scenario, you can **bleed to death in 90 seconds!**

Demonstrate the various methods of supporting the object being carved:

1. Just the hand.
2. Hand /chest.
3. Hand/table (stump).
4. Hand/leg? No way!

NOTE: The holding hand is always in the most danger of receiving cuts. Holding the work in such a manner that the blade will bypass tender parts is one of the most difficult things for the student to learn. Sometimes you should move the knife while holding the work. Sometimes you should move the work while holding the knife. **ALWAYS** consider a **SAFE FOLLOW THROUGH** when the blade slips, for you can be sure that at some point - **IT WILL!**

Demonstrate the baton method. A baton will permit the cutting of larger wood by weaker hands. This technique is for fixed blade knives only. A folding knife of whatever style is not rugged enough. If you are outdoors, good weather is essential. Cold hands are awkward hands, which presents a danger and mitts or gloves reduce proper control.

Time for a little quizzzzzz?

BEFORE you START: REVIEW these SAFETY ISSUES!

A. Is the knife reasonably **sharp?**
B. Diameter of safety circle around you – **arms length minimum.**
C. When (not-if) the knife slips, where will the blade go? **Safe Follow Through!**
D. Safe travel around the room or the camp – **always in the sheath!**
E. Safe handoff to another person – **handle first!**
F. **Do not throw** a knife or stick in trees or ground!
G. Do not use any **body parts for a workbench!**
H. No usage without **adult supervision!**
I. What if? **Safe Follow Through!** **Safe Follow Through!**

To complete any safety program, a practical exercise to bring into focus what was discussed and demonstrated is essential. This gives the Warden an opportunity to gain experience in safe practices.

Safety Note to Instructor: How many participants can you watch at one time?

Additional assistance is now required. One on one is an ideal ratio for beginners and even then a First Aid Kit may be required.

Use care in selecting the wood. Knot free straight grain material is required for these first exercises.

Suggested Exercises for the various age groups:

Pathfinder: Peel a green stick – Poplar or Willow. This emphasizes how to hold the knife, some minor edge control and is a straight "cut away" from yourself move.

Trailblazer: Peel a green stick also. Make a feather stick – dry straight grain spruce if you have it (old 2x4's). Discuss grain in the wood, direction of cut and blade edge control. It is a "cut away" from yourself move. Emphasize **Safe Follow Through!**

Adventurer: Make a feather stick also. The "cut toward" yourself move can be introduced if the sticks are long enough. Make a wedge – introduces bigger diameter material that is harder to hold onto. This may require another support technique.

Challenger: Feather sticks, wedges and make a Bull Roarer. Introduces the "square hole" and knife moves other than "forward" or "away" straight cuts. **Safe Follow Through** now requires a higher level of awareness!

As the participant gains experience, other carving projects may be introduced.

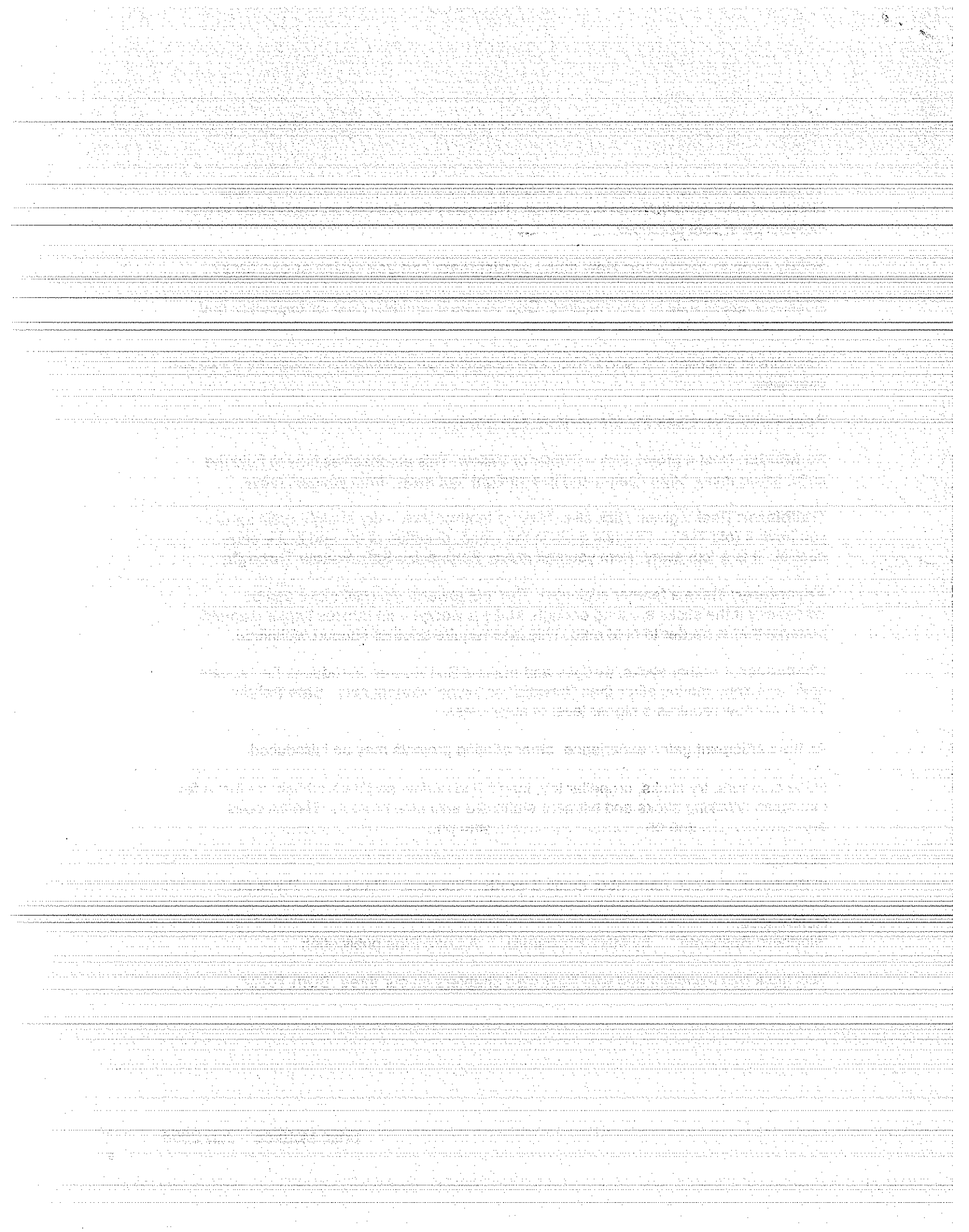
Rope spinners, try sticks, propeller toy, long billed curlew and bark on fish are just a few examples. Walking sticks and biltmore staffs are also nice projects. The list goes on.....and on.....and on.....

First Aid:
In the event of a cut, remember these 3 words. Pressure – Pressure – Pressure.

References:
"Northern Bushcraft " by Mors Kochanski. A Lone Pine publication.

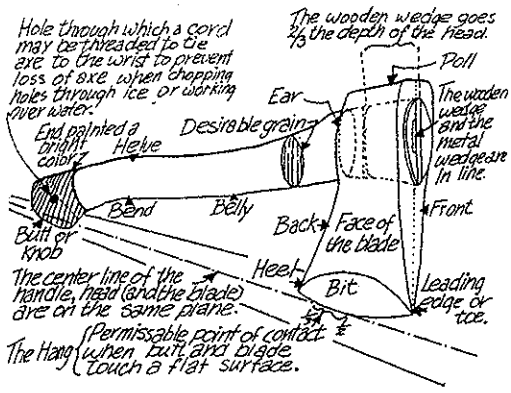
This book has excellent and well illustrated chapters on our three "Bush Tools".

Brian McBride - July 2008

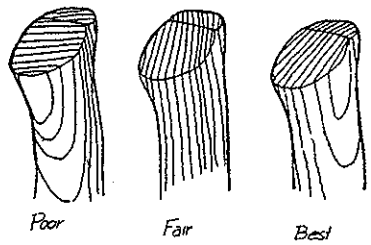


Design of the Axe

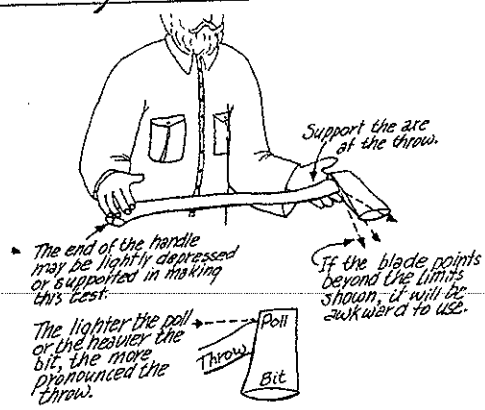
A blade displaying a slightly convex face, rather than a flat or concave one, releases easily from the cut, throws chips well and is stronger when used with frozen wood. If the face is too convex, the axe blade does not penetrate to maximum depth resulting in a waste of energy. If a blade is too thin, it tends to bind in its cut and requires a particularly annoying tug to free it which also loosens the handle. Change the shape of the blade until enough convex face is achieved to effect release at a maximum depth of cut.



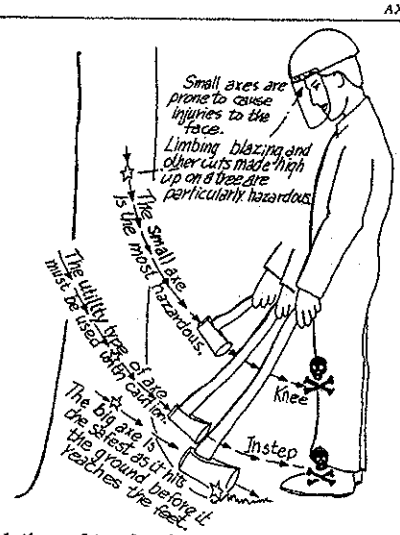
Axe nomenclature.



Desirable grain in axe handles.



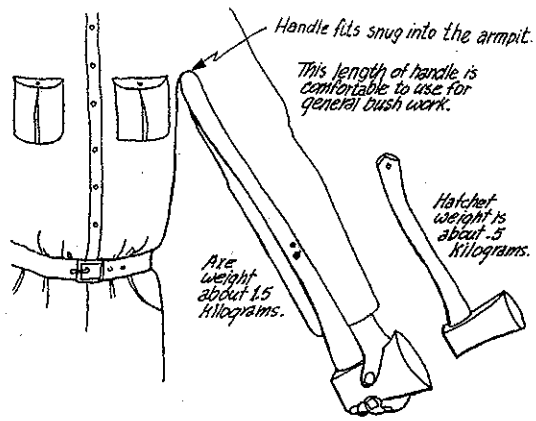
The throw of an axe.



The relative safety of various sizes of axe.

The General Purpose Axe. If you hold the head of this axe in your hand you should be able to fit the end of the handle into your armpit. This is a favorite size for wilderness survivalists, trappers, horse-packers and carpenters. If misused, an axe of this handle length can still cut you in the face, but instead of the knee, it can end up in the instep or make your toes longer or shorter depending on where it hits.

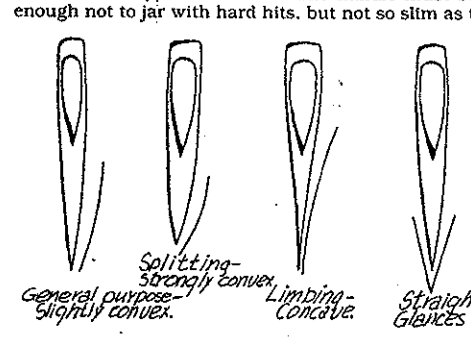
The Large Axe. The full-sized axe with a handle length of about a metre is the safest as it normally deflects into the ground before reaching any part of the body.



The axe and hatchet.

The temper of the axe blade should be tough but not too hard, or it will be difficult to sharpen with an ordinary file or whetstone. A blade that is too soft will dull easily and wear out faster. A hard-tempered axe is prone to chip when used in very cold temperatures.

A good handle should feel comfortable to the hand, being neither too thin, nor too thick. The handle must be slim enough not to jar with hard hits, but not so slim as to flex



Common axe cross sections.