

Bill Moran



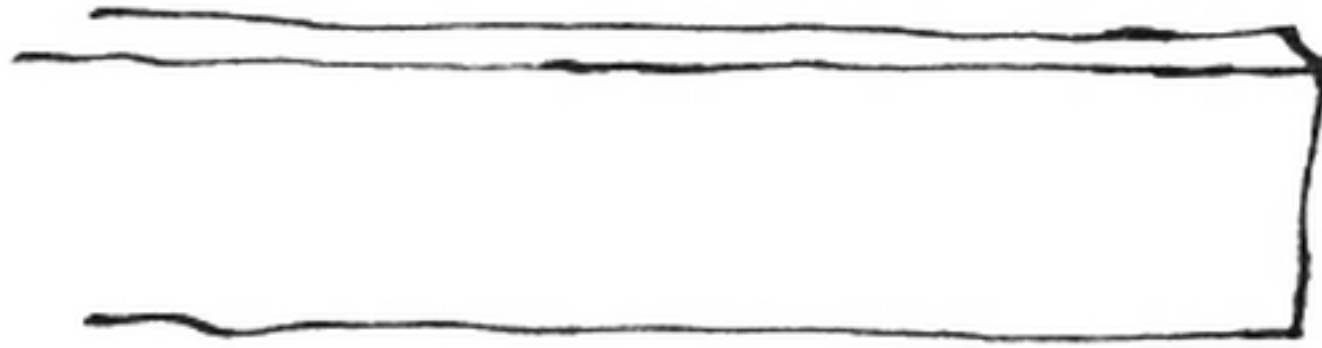
KNIFE MAKING

BILL MORAN

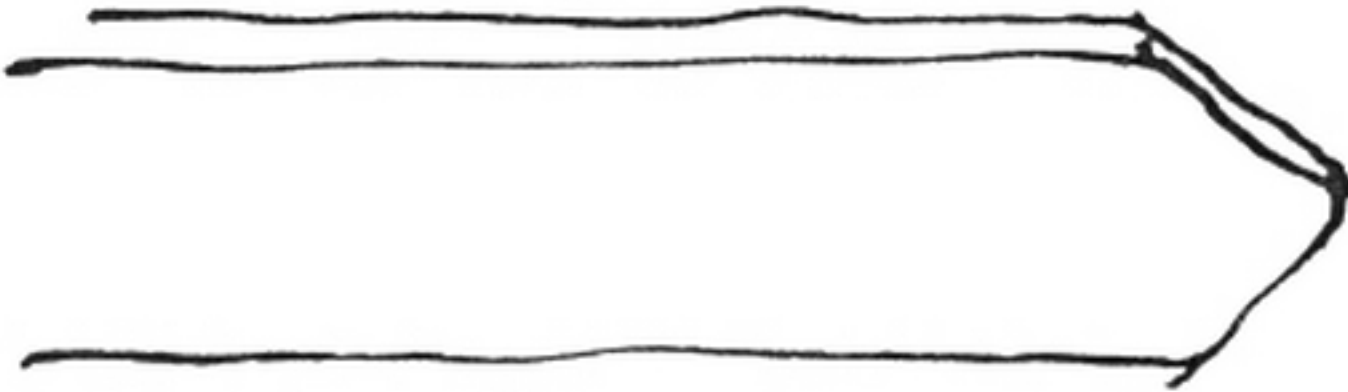
Texarkana College

ABS/BILL MORAN SCHOOL OF BLADESMITHING

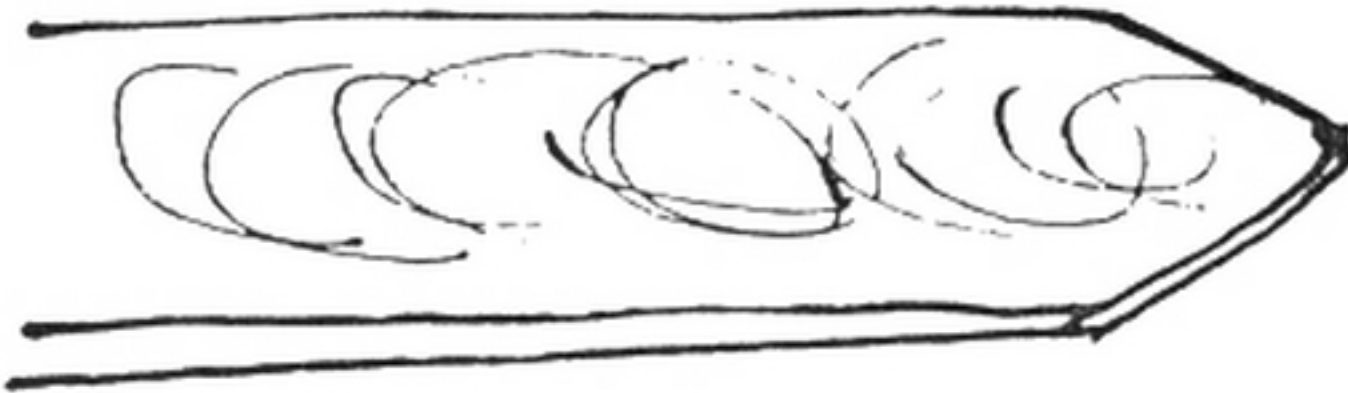
KNIFEMAKING / BILL MORAN.



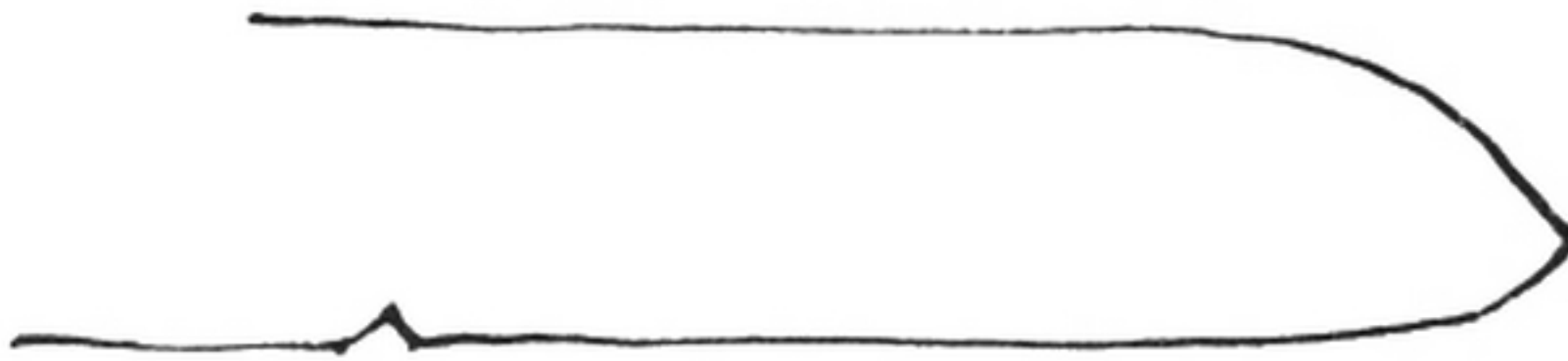
$\frac{1}{4}$ " X 1" 5160 STEEL



DUBBED OFF POINT
ON HORN OF ANVIL



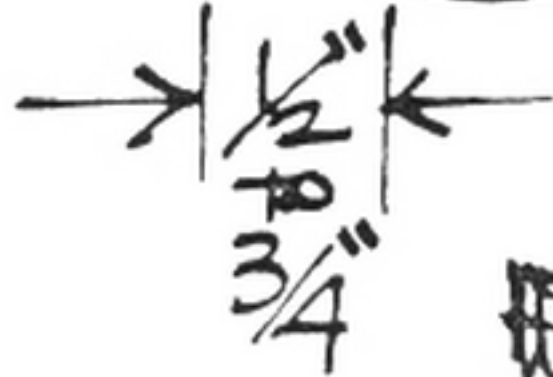
DRAW OUT TAPER



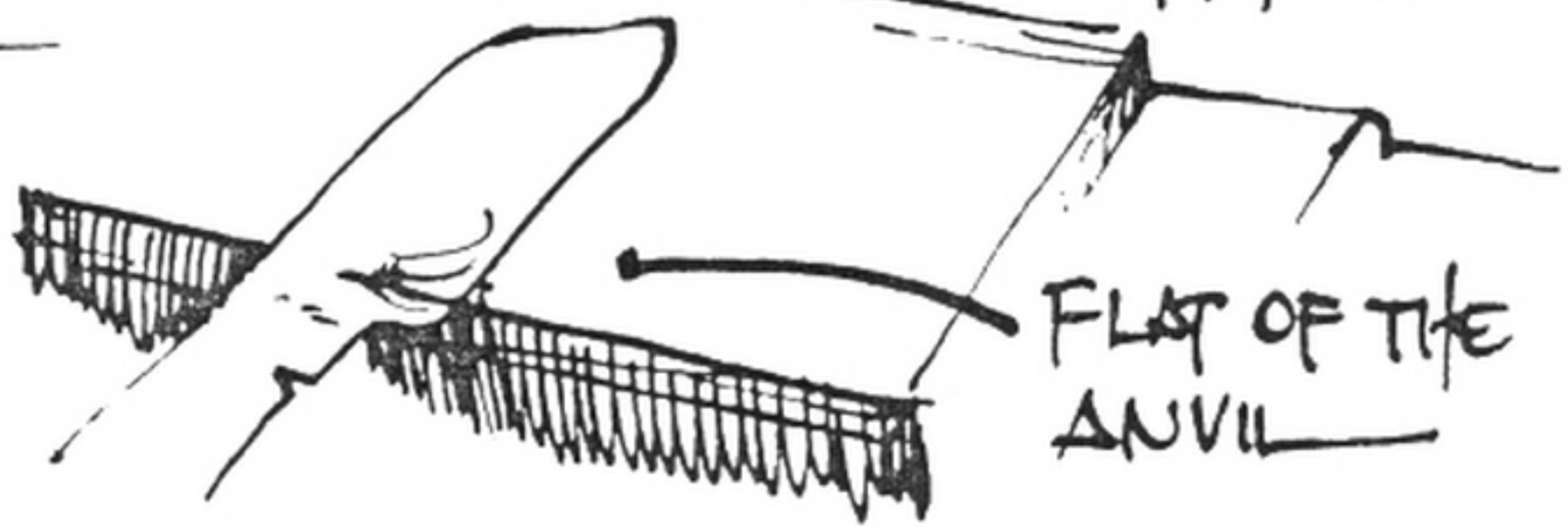
FOR 6" BLADE
MARK OFF $5\frac{1}{2}$ "
& NOTCH



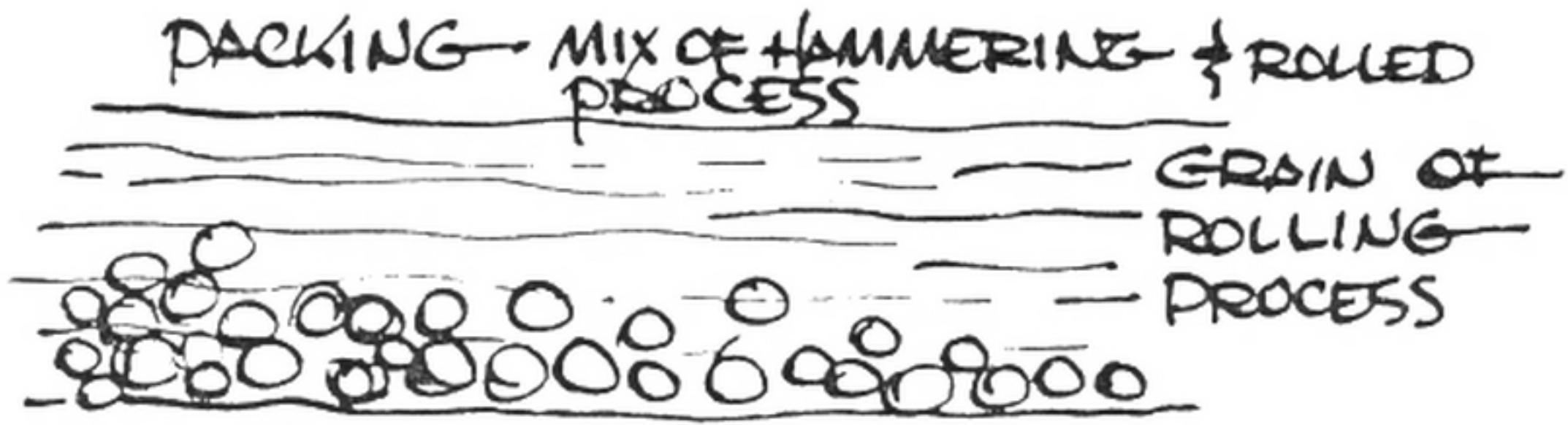
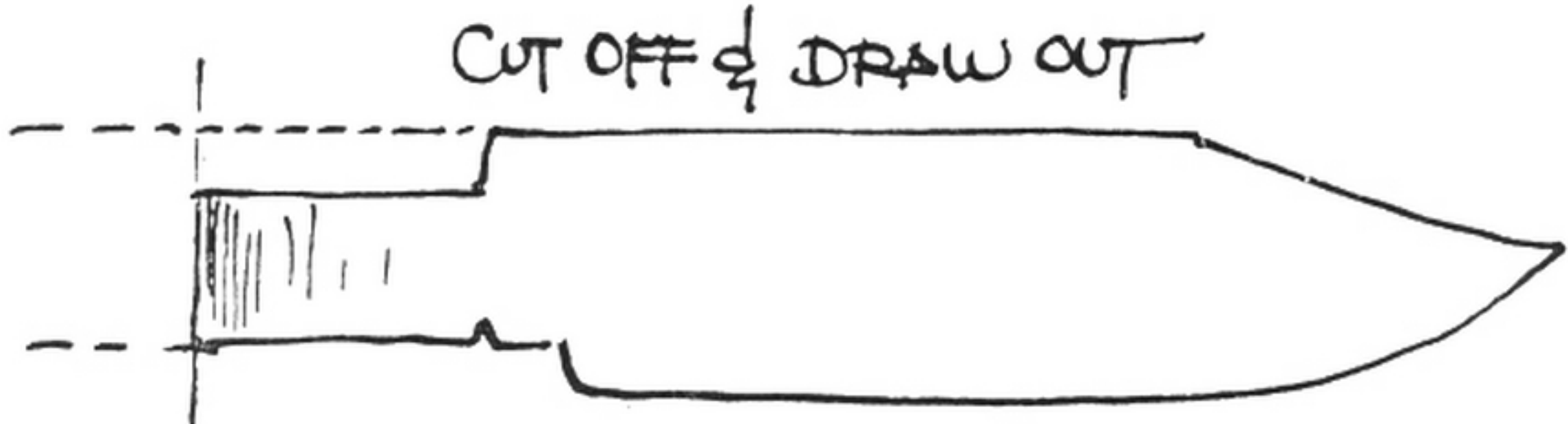
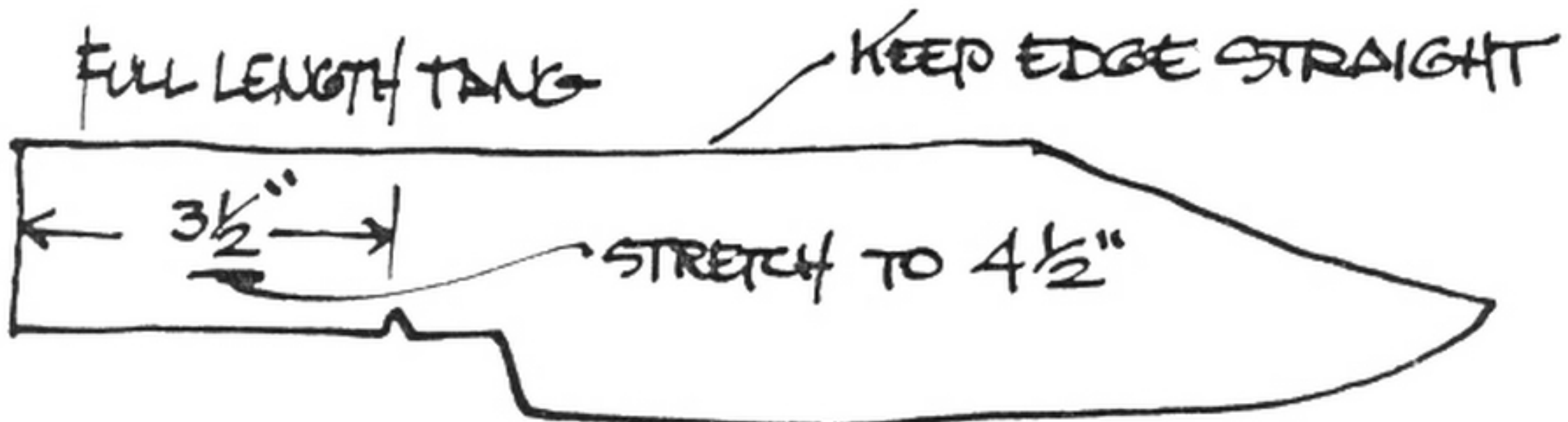
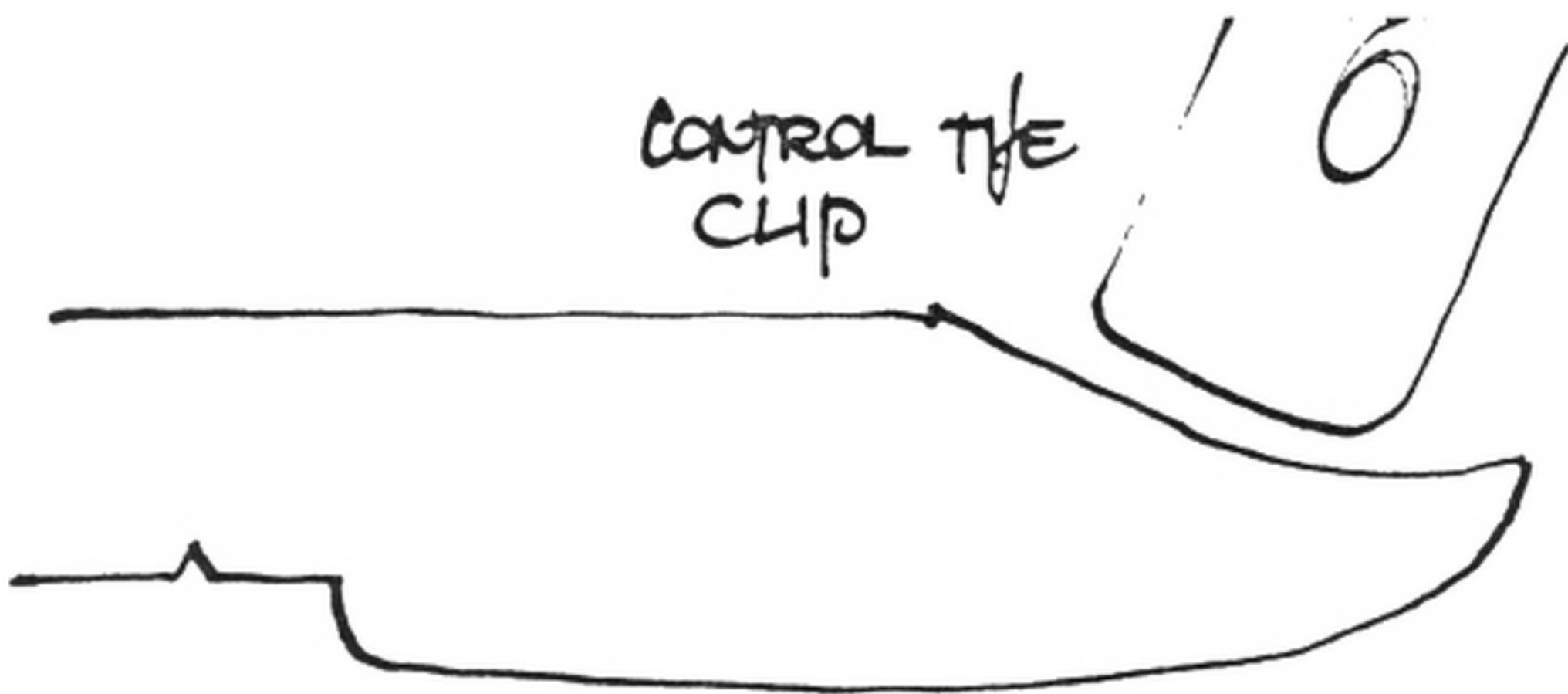
PULL OUT
METAL NEAR
NOTCH ON



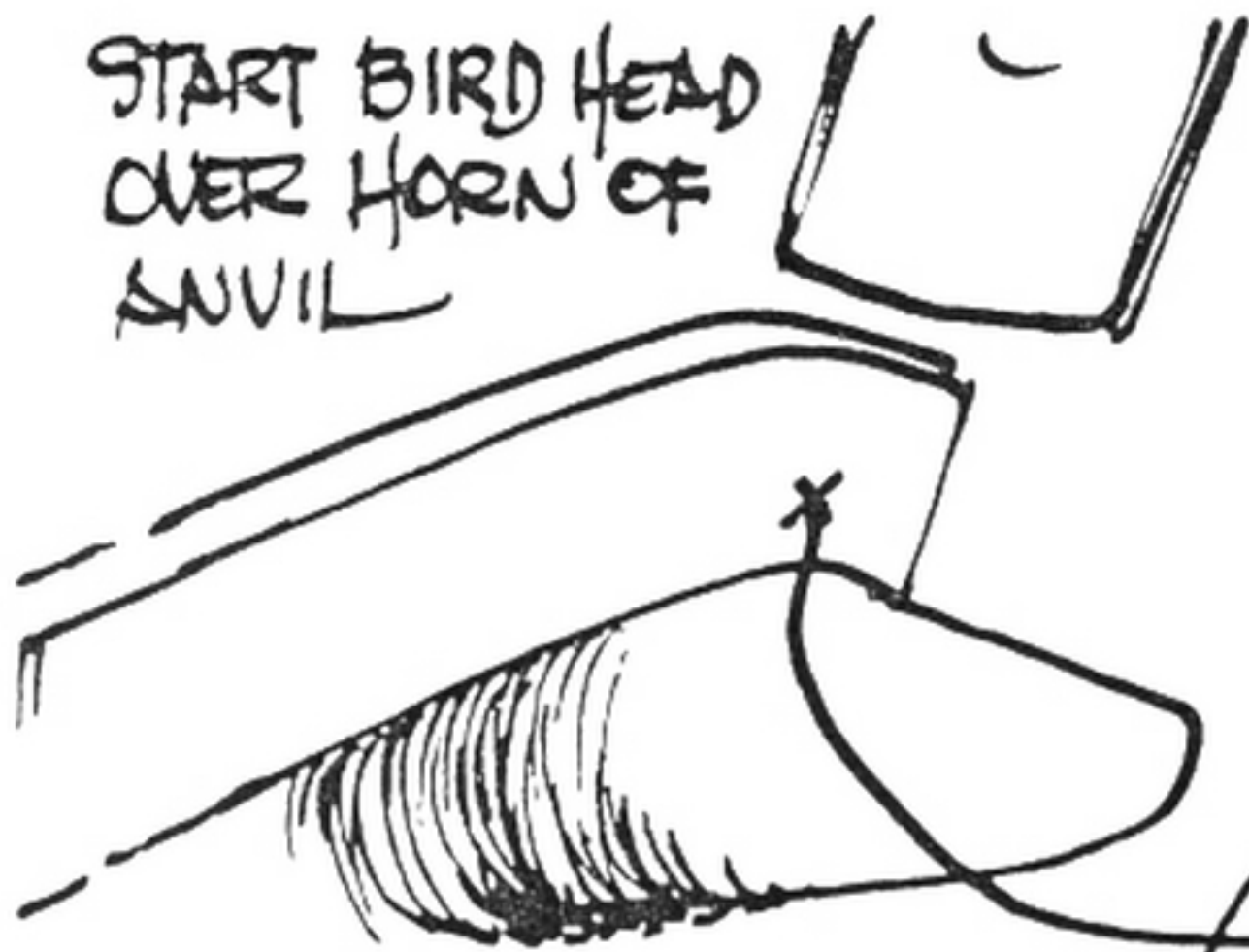
$\frac{3}{4}$ "



FLAT OF THE
ANVIL



START BIRD HEAD
OVER HORN OF
SNUI



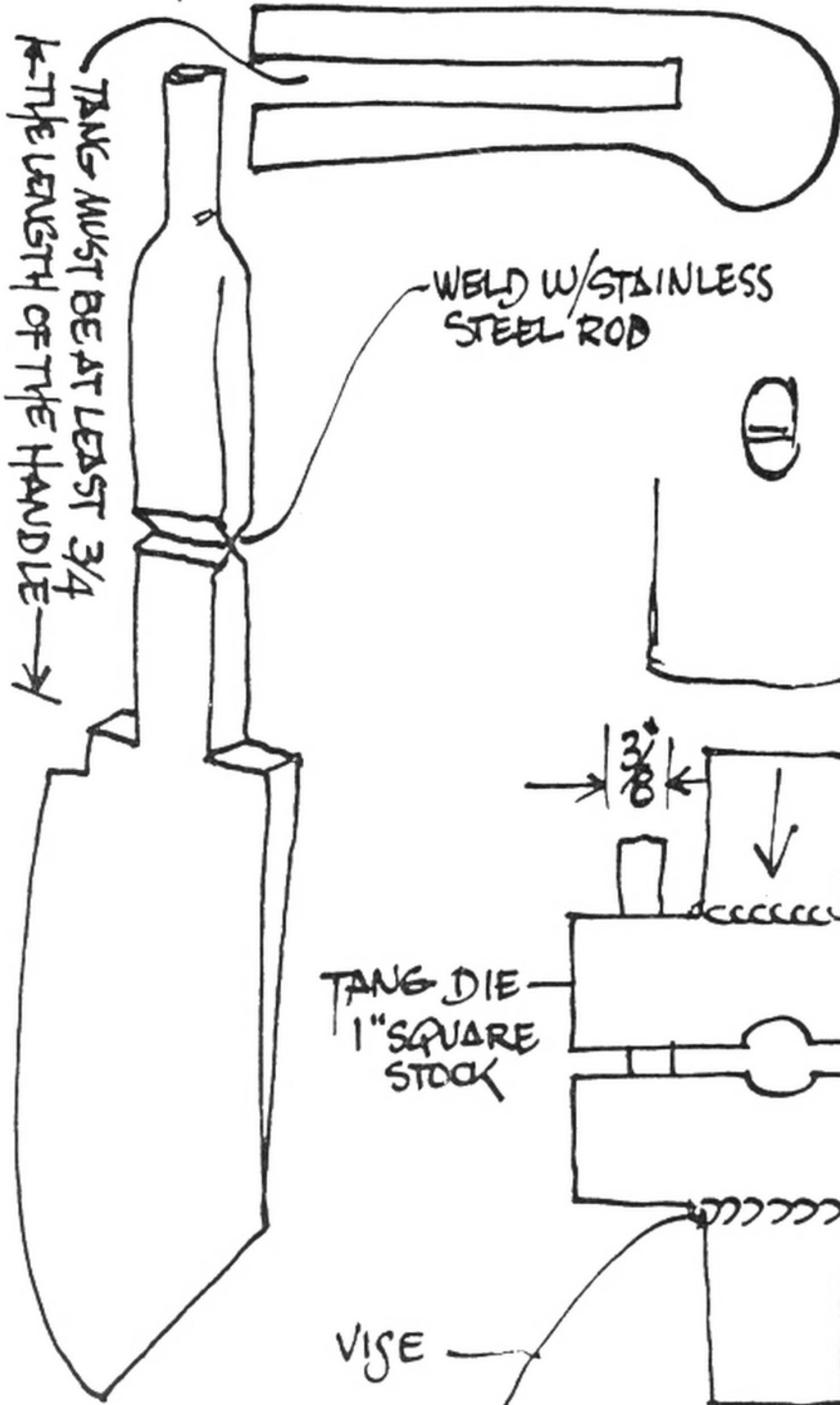
TAPER THE TANG



DECIDE ON BEND
WHEN METAL IS AT
ITS HEAVIEST

BIRD HEAD TANG
WILL STRETCH
 $\frac{1}{2}$ " TO $\frac{3}{4}$ "
ALLOW FOR IT

NARROW TANG



TANG MUST BE AT LEAST 3/4
← THE LENGTH OF THE HANDLE →

WELD W/STAINLESS
STEEL ROD

TANG DIE
1" SQUARE
STOCK

VISE

3/8

GENERAL INFORMATION •



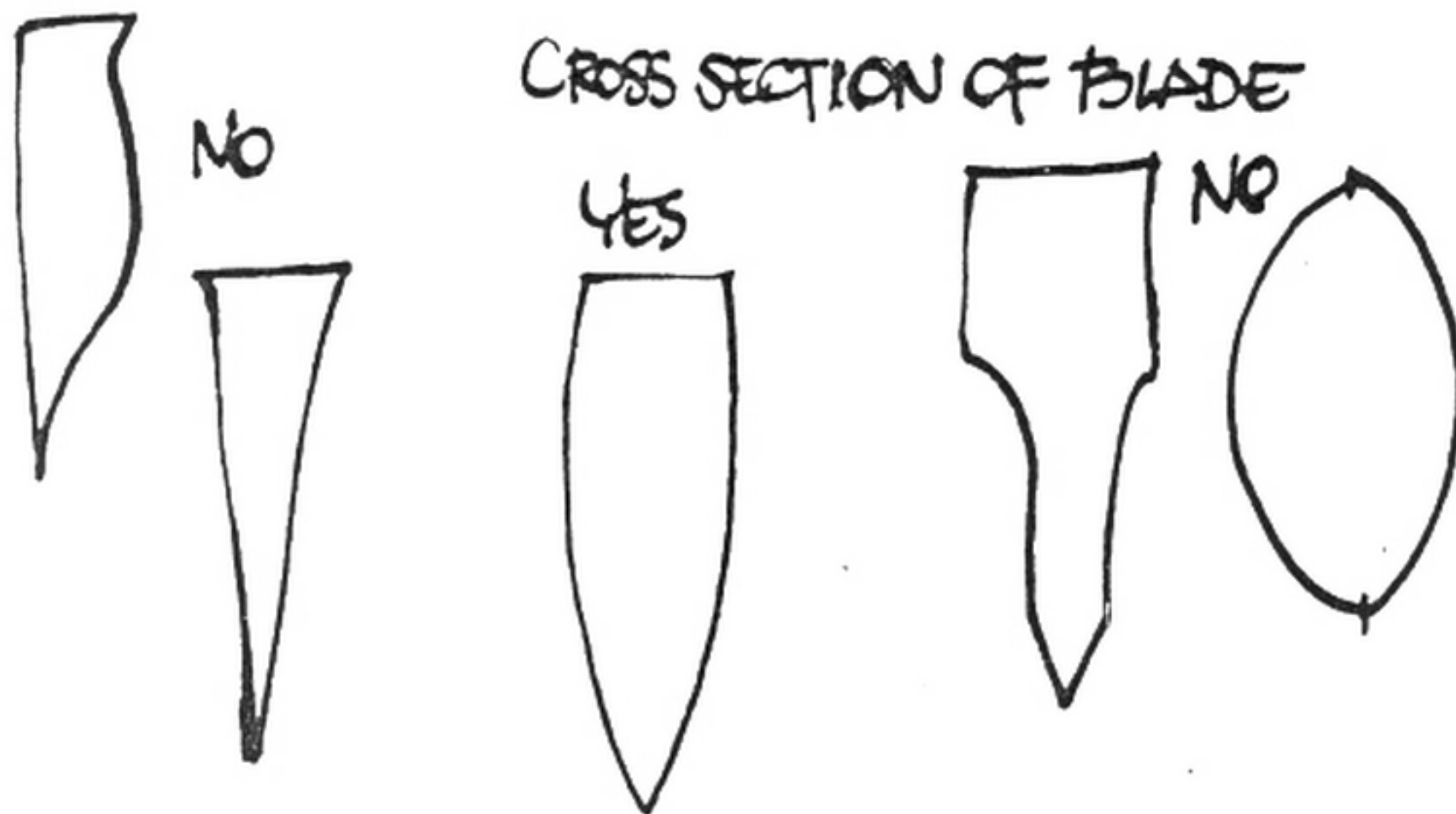
DON'T OVERHEAT
STEEL



CORRECT

- GAS FORGE IS DESIRABLE FOR FORGING MORE THAN ONE BLADE AT A TIME
- COAL FORGE IS USED FOR ONE BLADE AT A TIME
- DON'T USE O1 STEELS THEY AIR HARDEN
- 1095 ALMOST THE SAME AS W2
- 1060 TOUGHER BLADE STEEL
- 9260 EXTREMELY TOUGH TOUGHER THAN DAMASCUS
- 51 = 1% CHROME IN STEEL EX- 5160
.60 = CARBON
- 5, 6, 7% CHROME INDICATES AIR HARDENING STEELS
- ALL STEELS ARE HARDENED IN OIL

GENERAL INFORMATION •



TO TEMPER SMALL OBJECTS

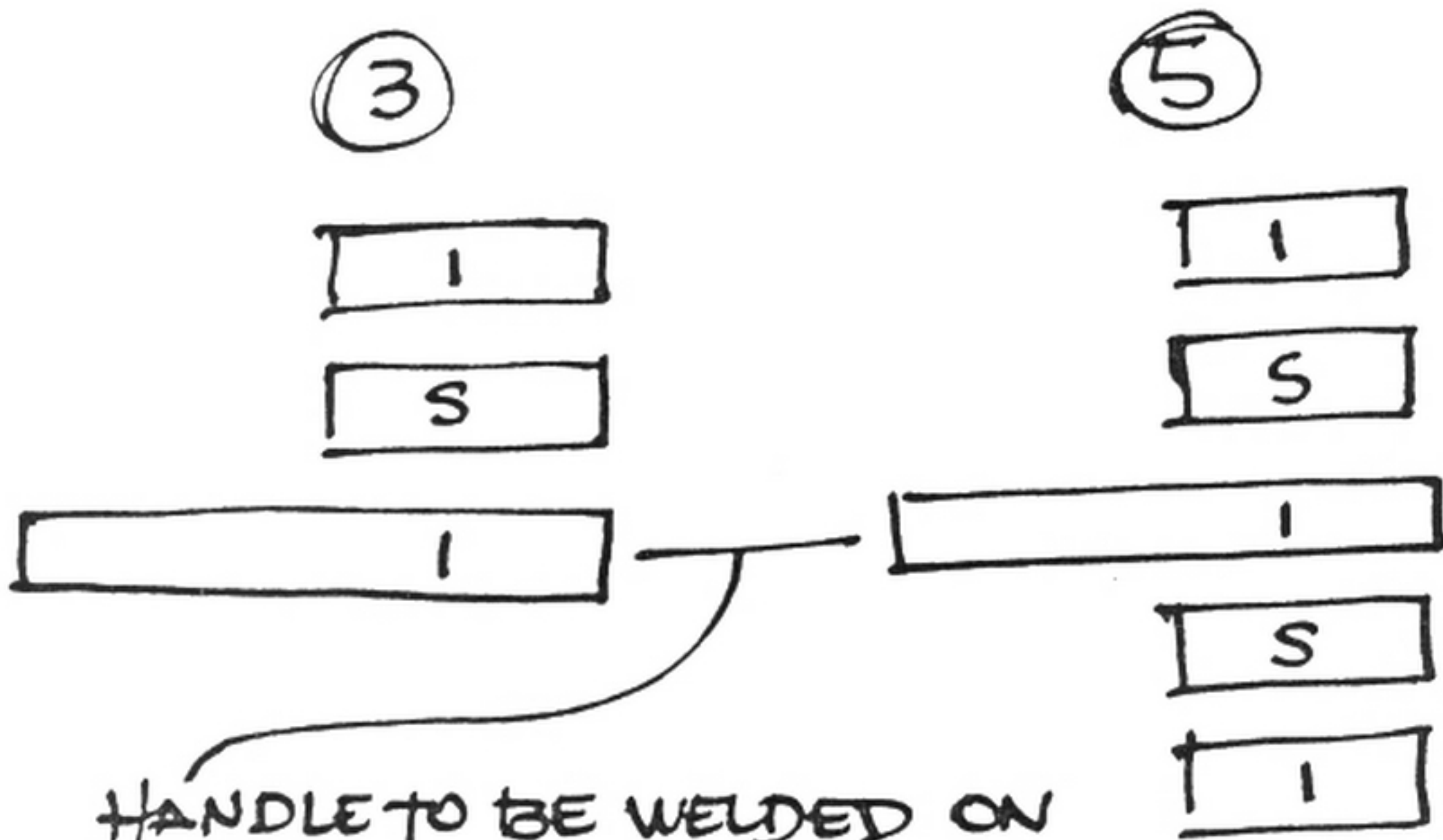
- BRING UP TO RED HOT & OIL QUENCH
- SUBMERGE IN LADLE & HEAT UNTIL OIL CATCHES FIRE
- REMOVE FROM SOURCE OF HEAT & ALLOW LADLE & CONTENTS TO BURN OFF

QUENCH HARDEN STEEL AT LOWEST TEMPERATURE • CHECK W/MAGNET FOR PROPER DULL CHERRY RED.

QUENCHING OILS W/ADDITIVES TEND TO LOSE THEIR QUENCHING CAPABILITIES

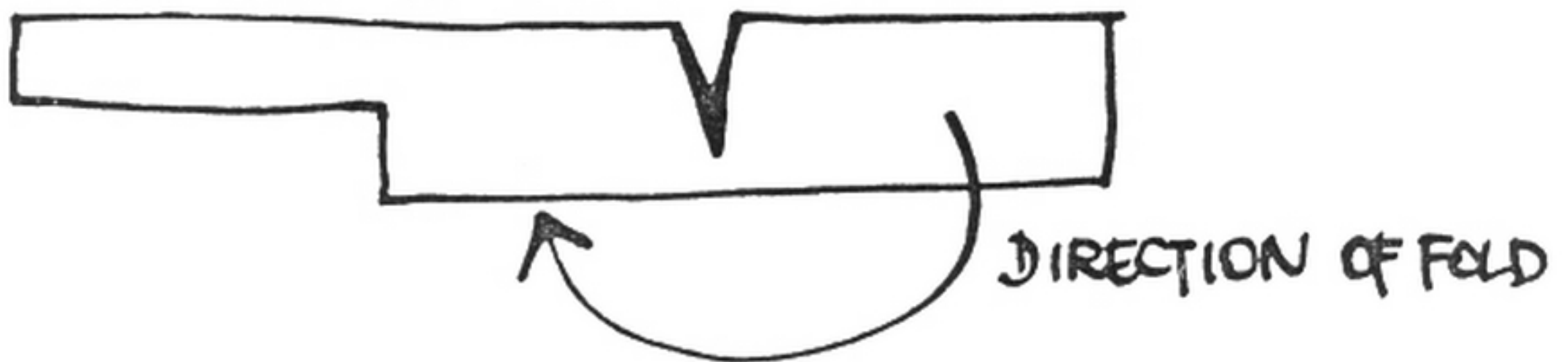
CHECK QUENCHING OIL(S) FOR SLOW, MEDIUM OR FAST CAPABILITIES

DAMASCUS STEEL



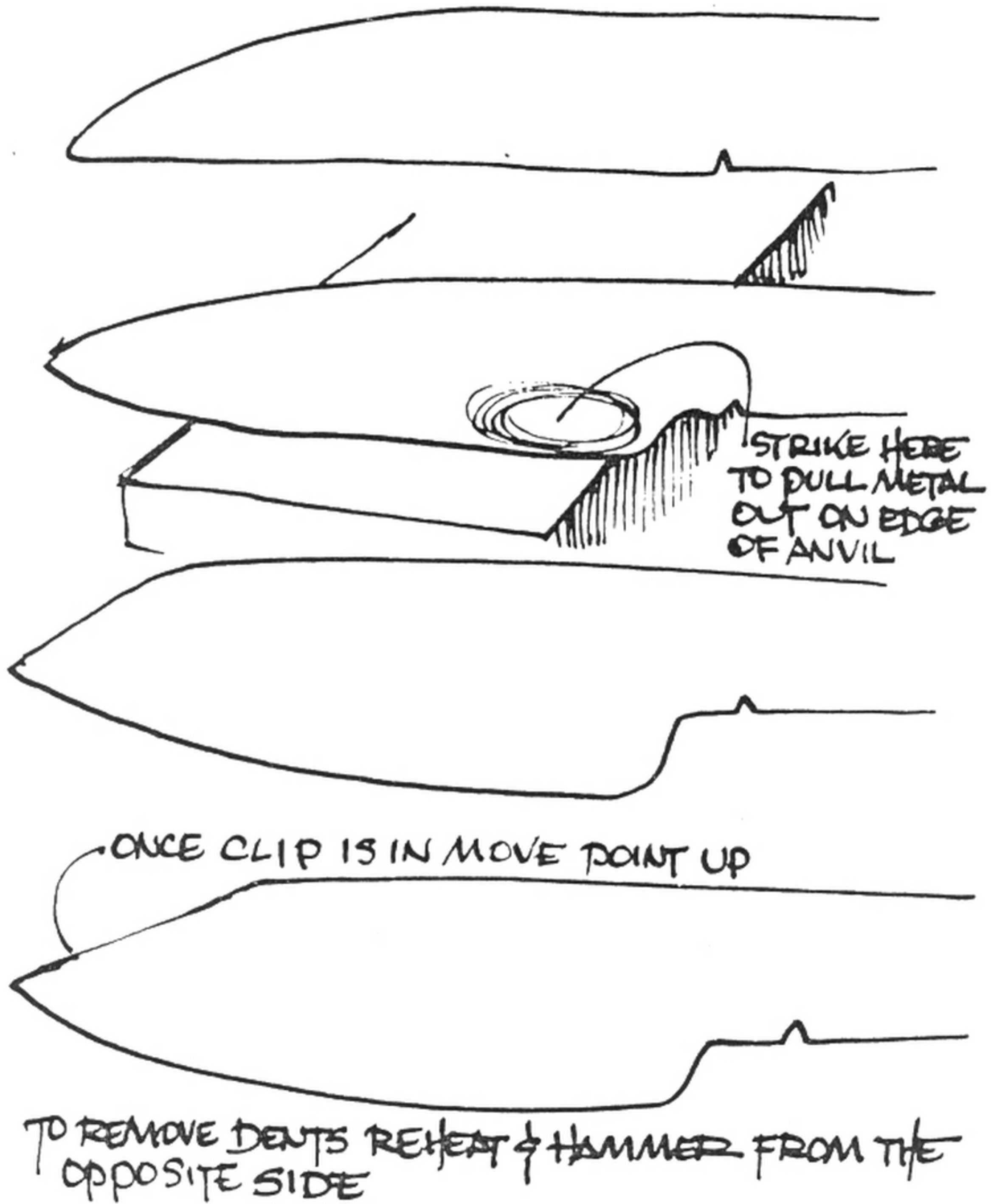
HANDLE TO BE WELDED ON

- HOT ROLLED MILD STEEL IS REFERRED TO AS IRON
- FIRE IS TWICE AS BIG AS STEEL FOR FORGING

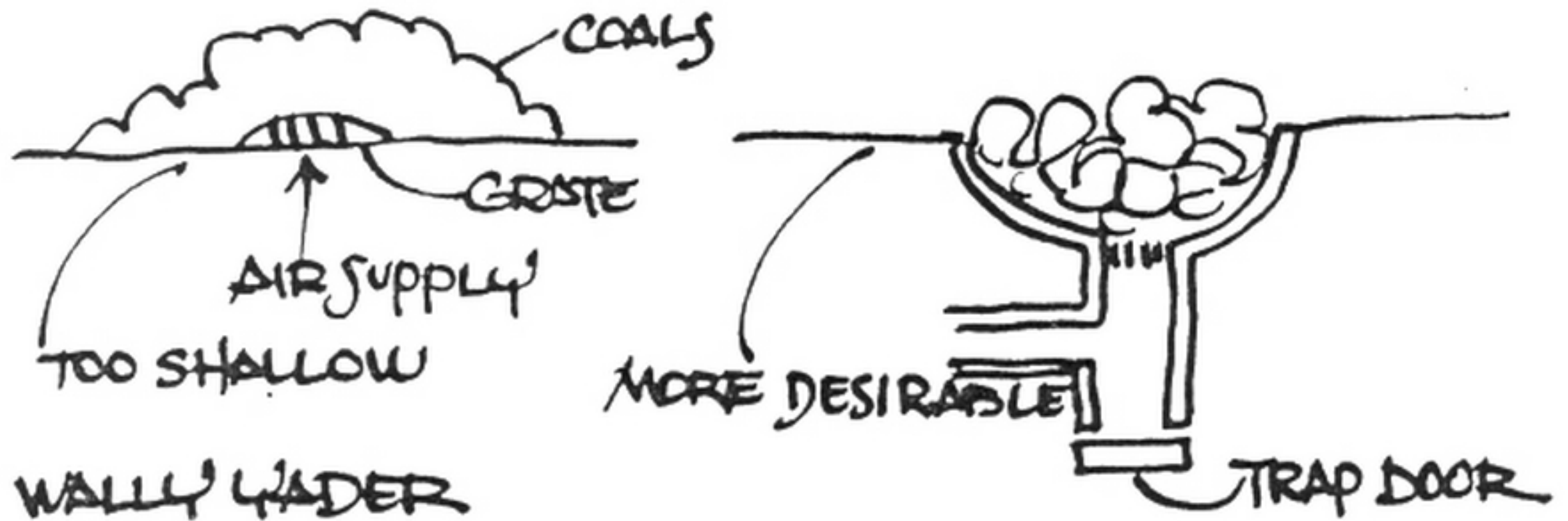


GROUND GROOVES CREATE WAVY PATTERN IN FORGING

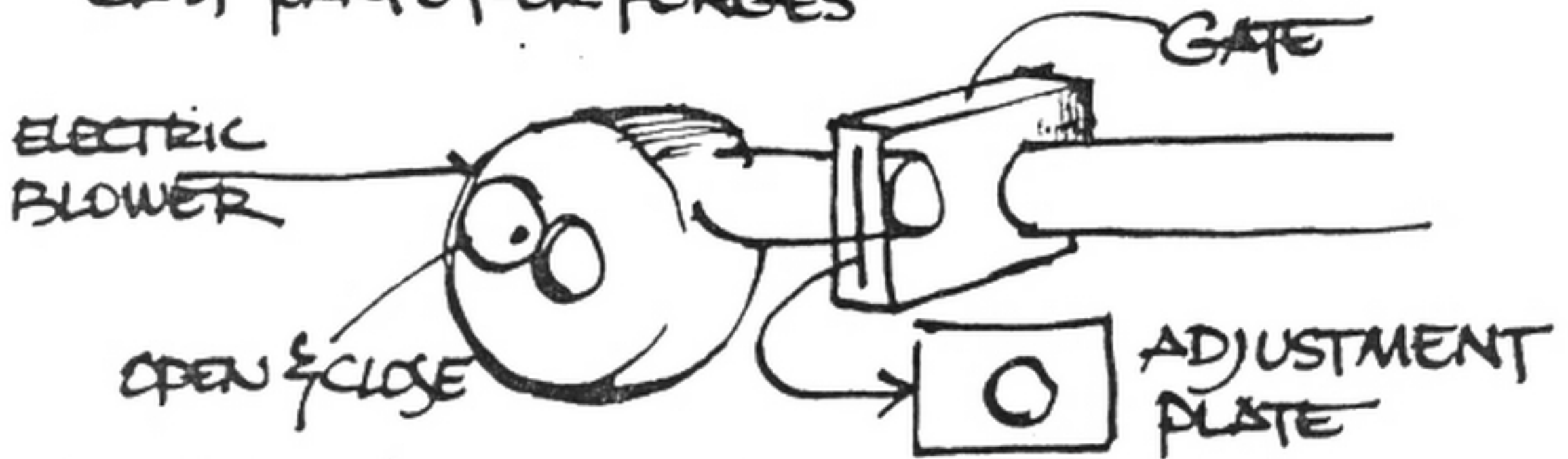
FORGING REVIEW



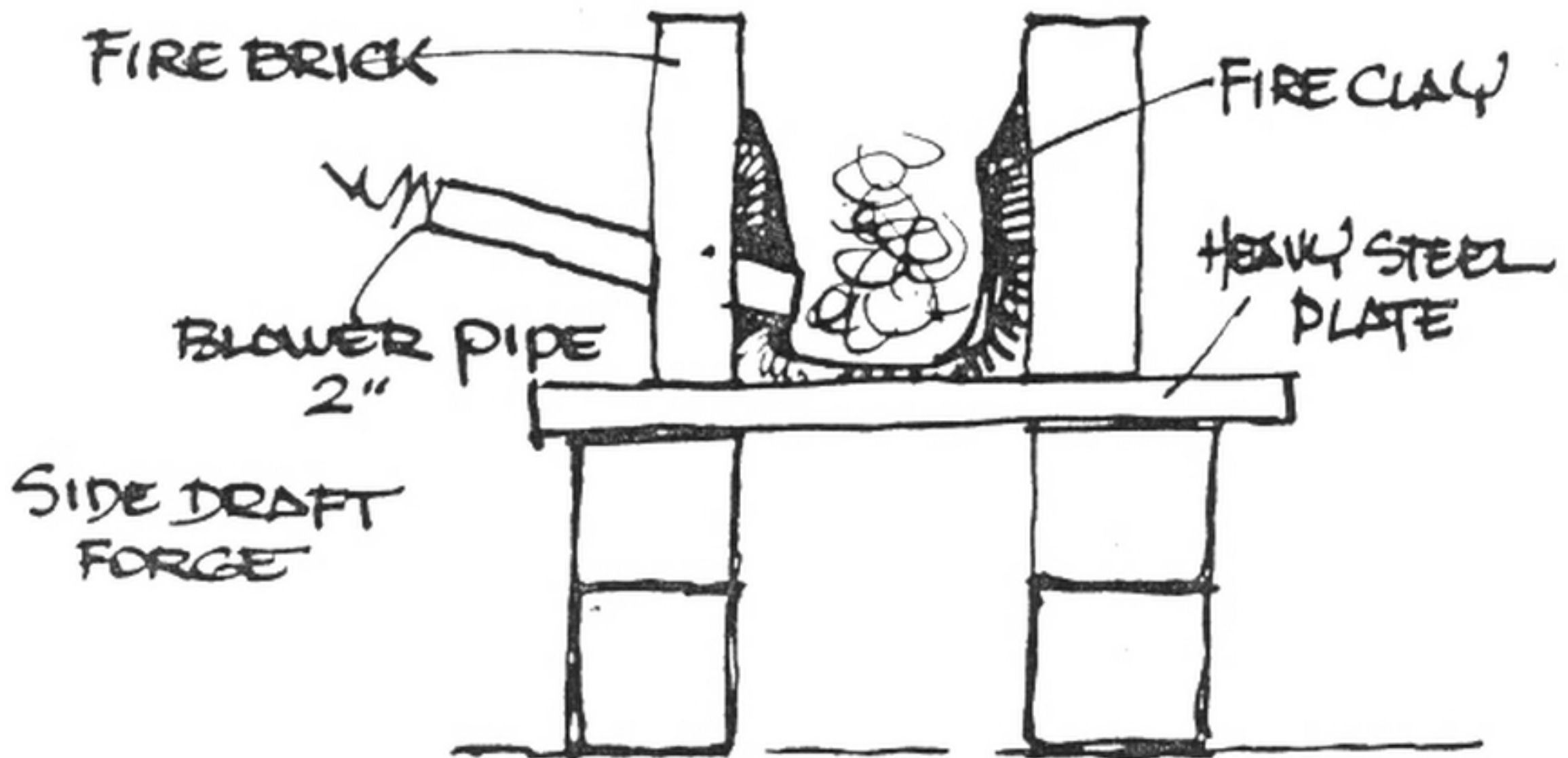
FORGES



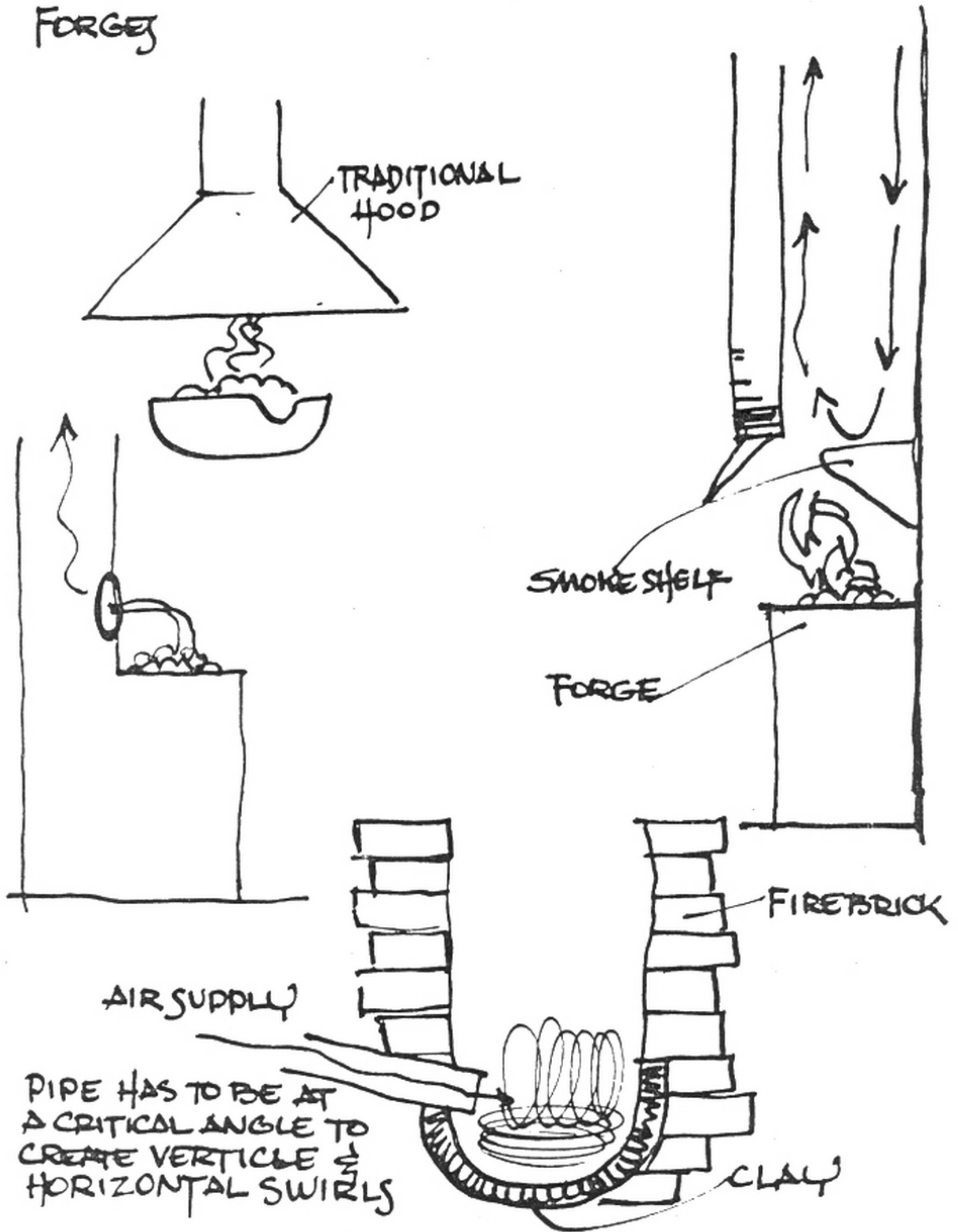
WALLY WADER
CAST PARTS FOR FORGES



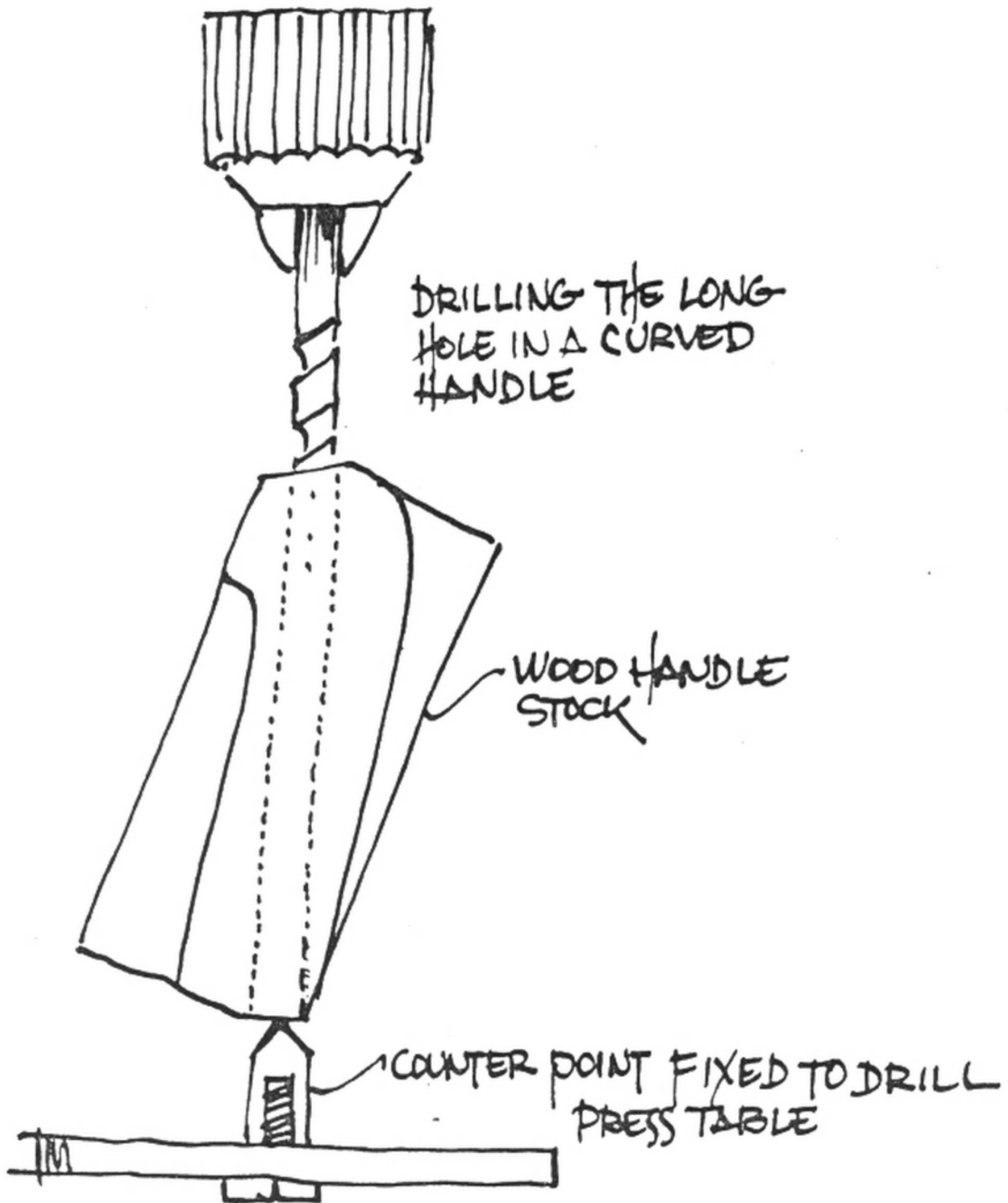
GATES AREN'T NECESSARY FOR HAND BLOWER



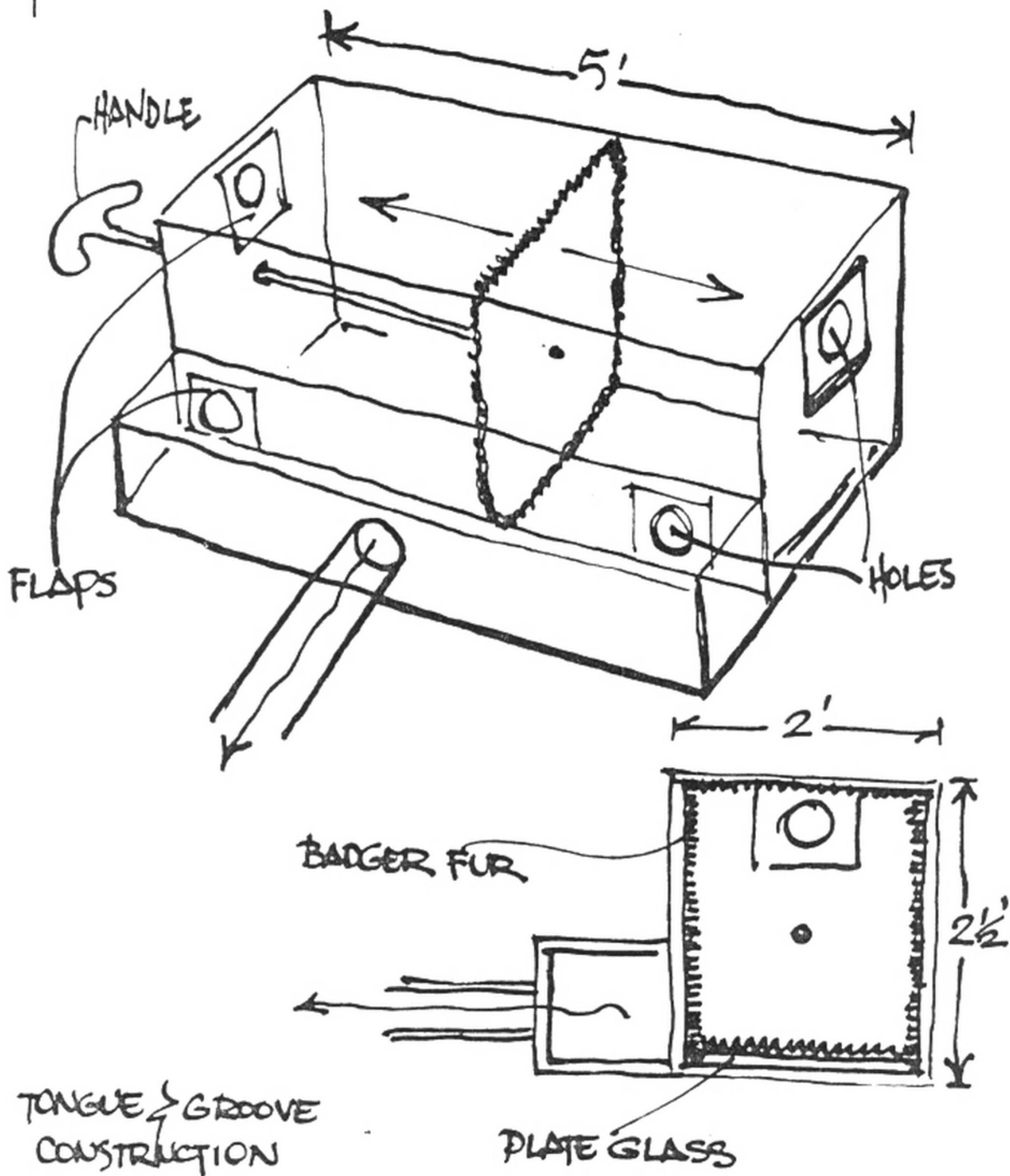
FORGE



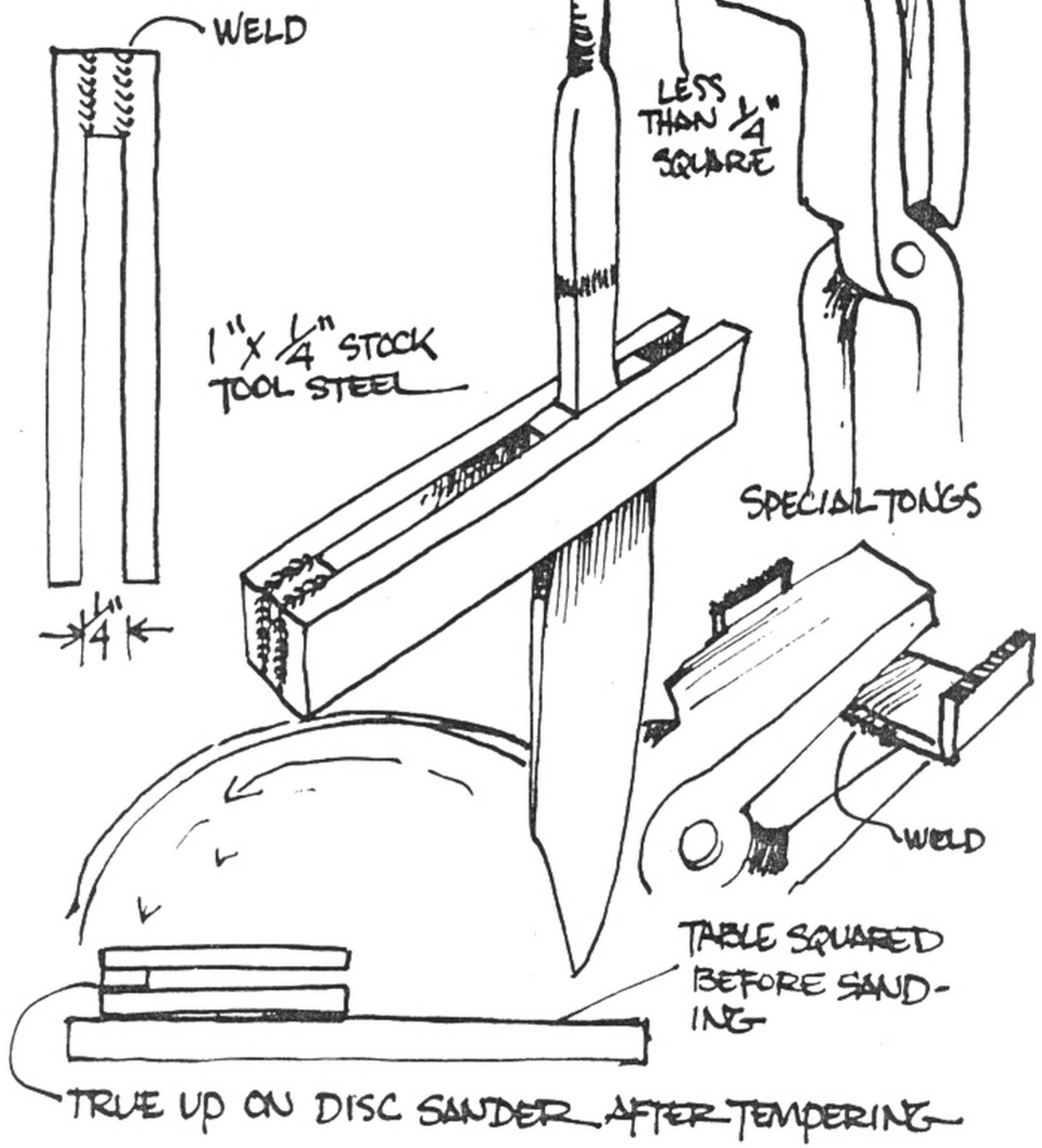
HANDLE FOR NARROW TANG



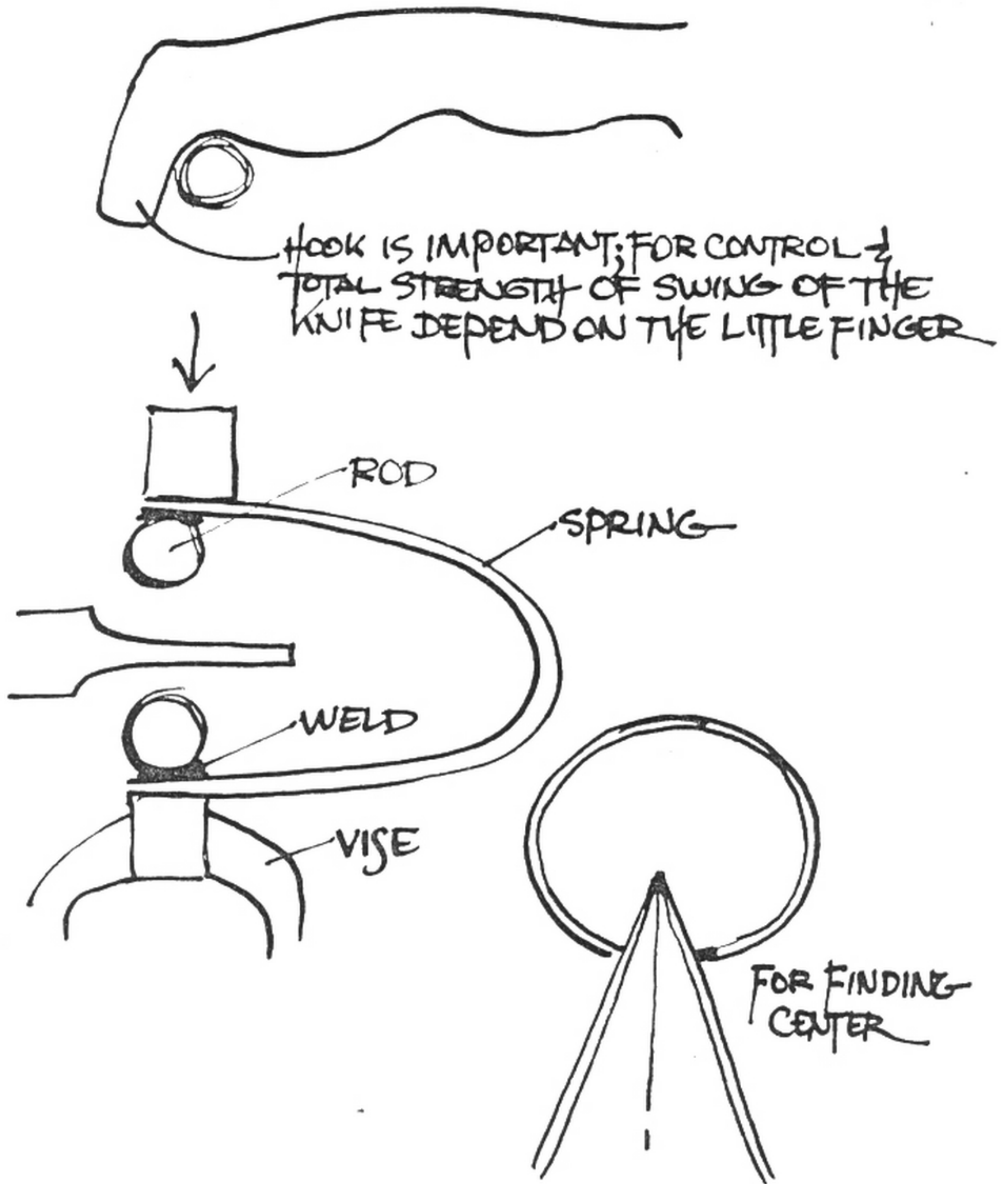
HAND OPERATED AIR SUPPLY FOR FORGE.



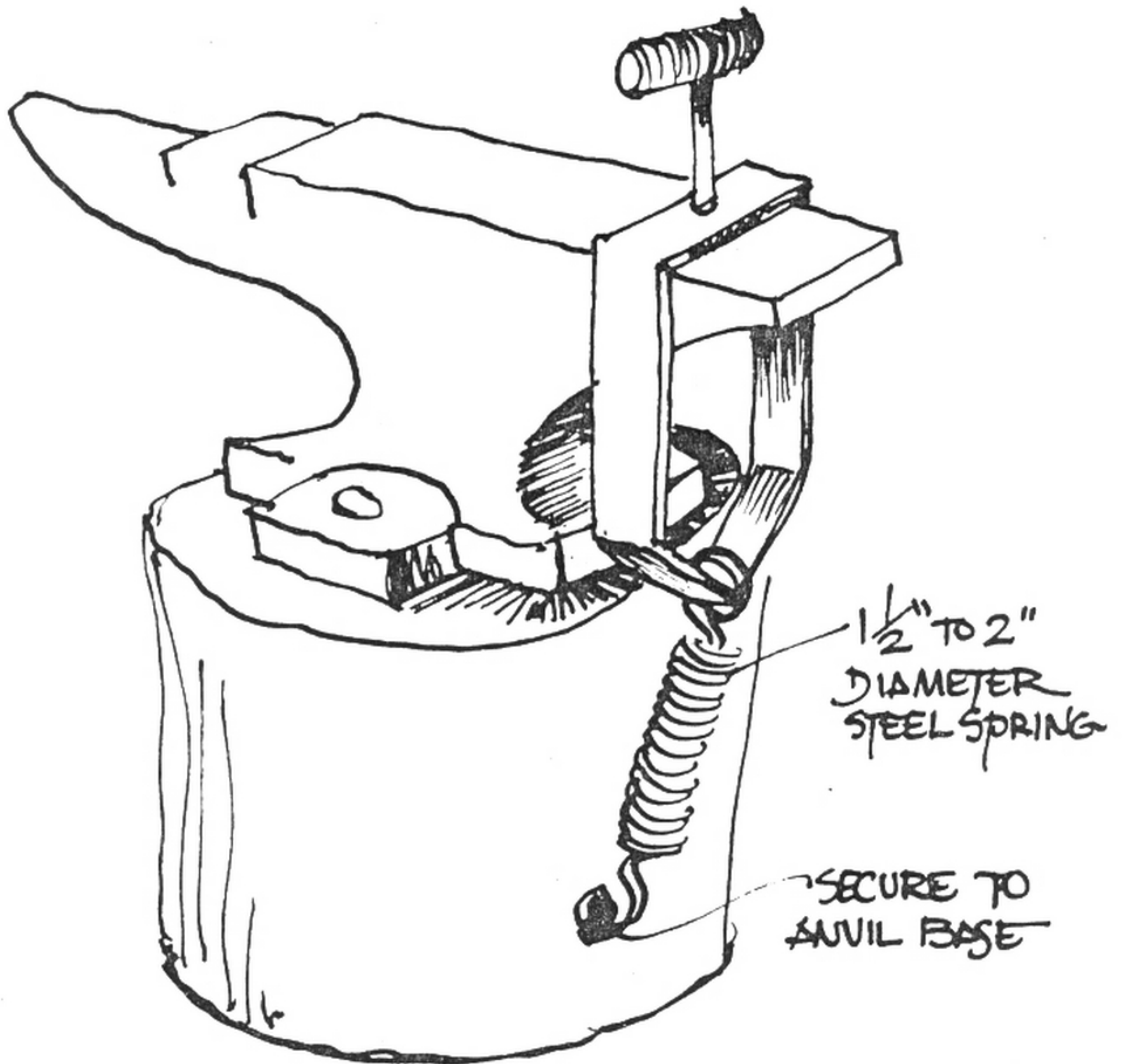
JIG FOR FILING SHOULDERS SQUARE



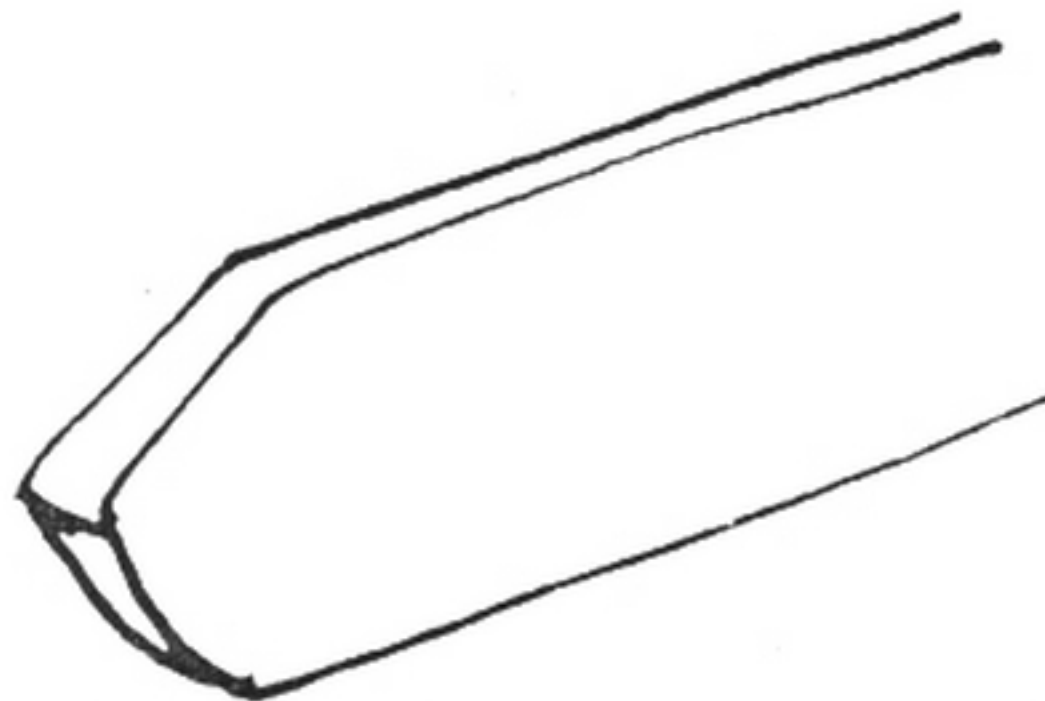
GENERAL INFORMATION



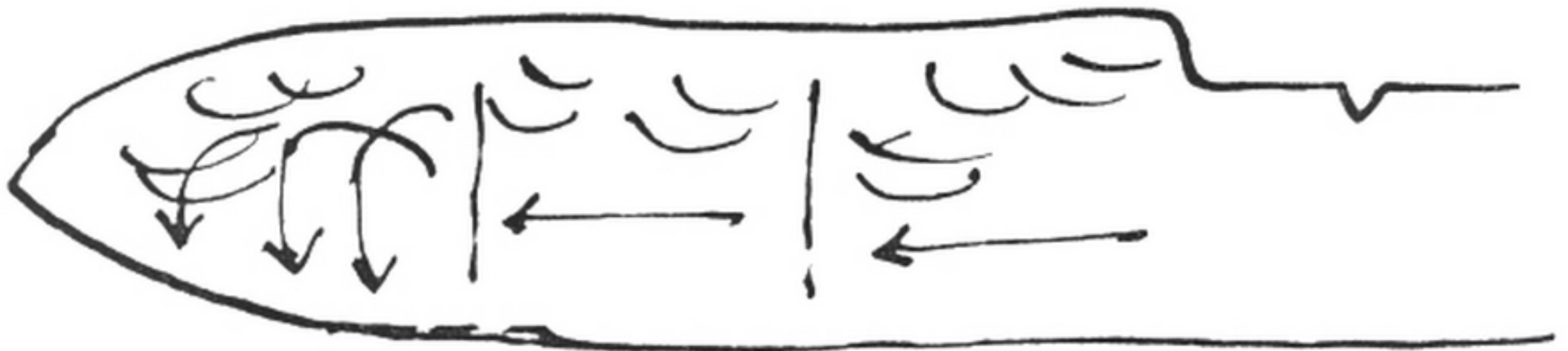
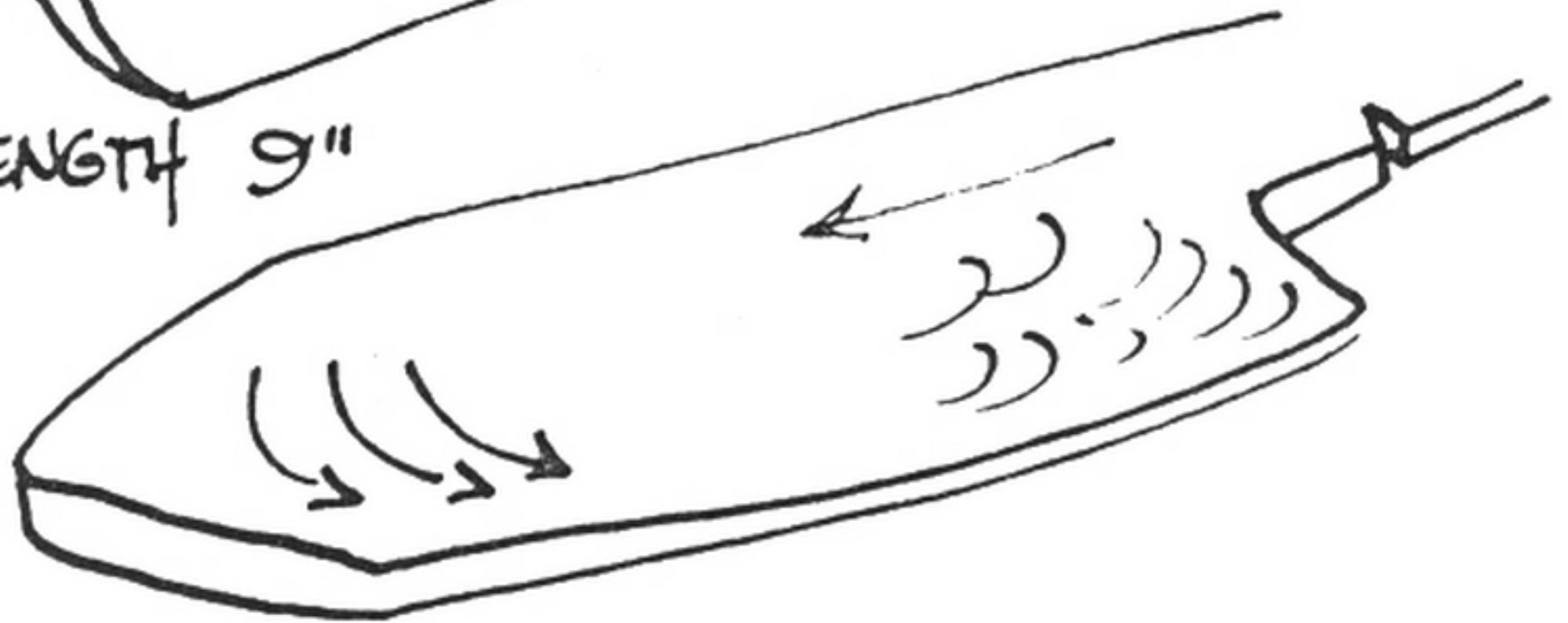
THE THIRD HAND



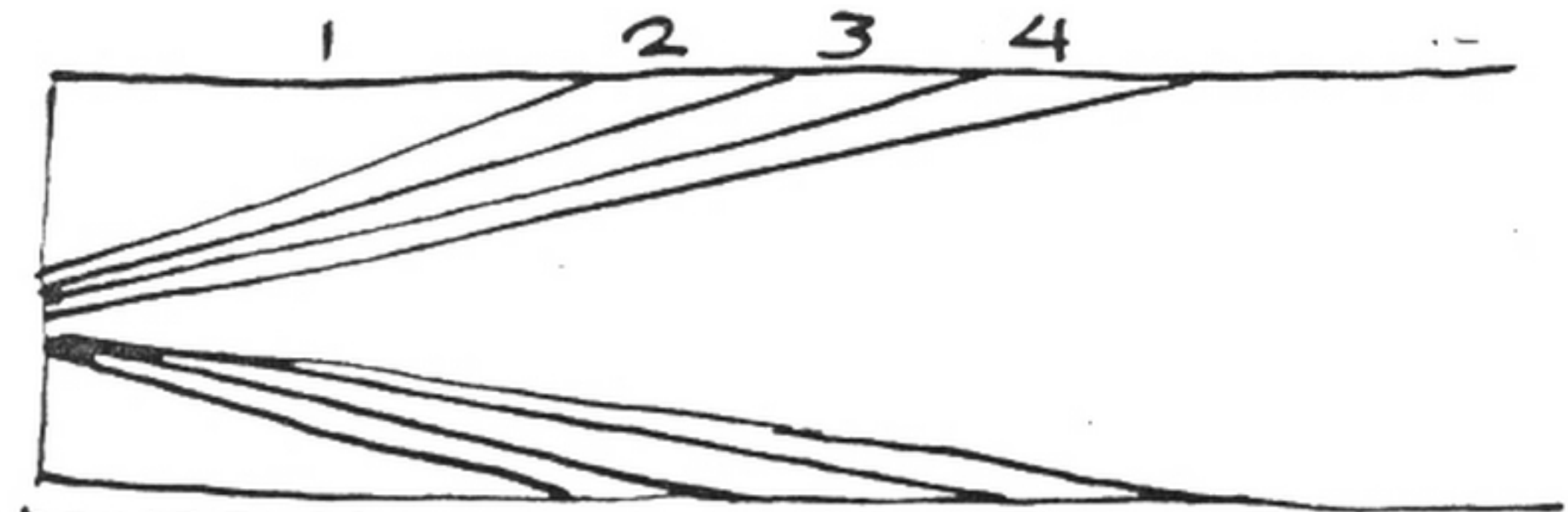
GREEN RIVER KNIFE



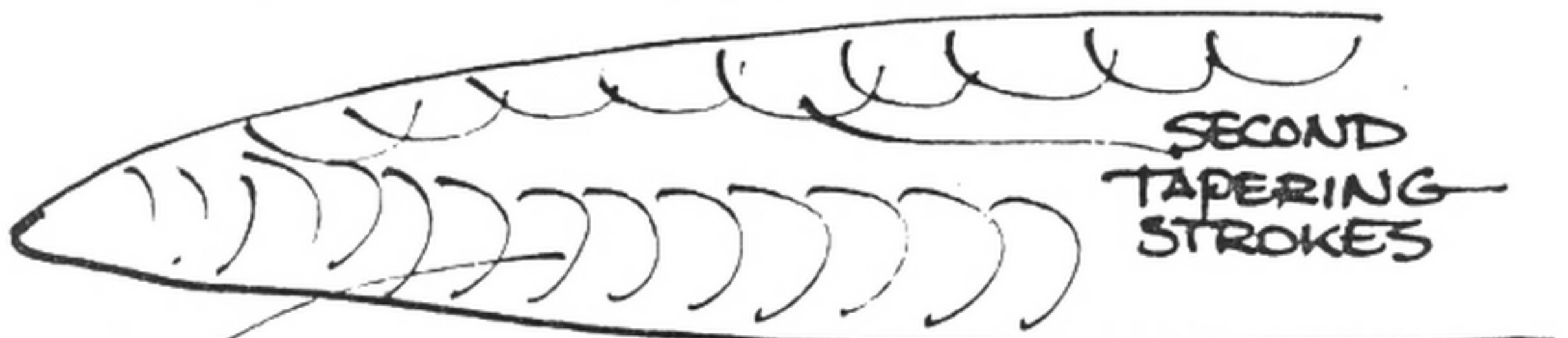
BLADE LENGTH 9"



COMBAT KNIFE

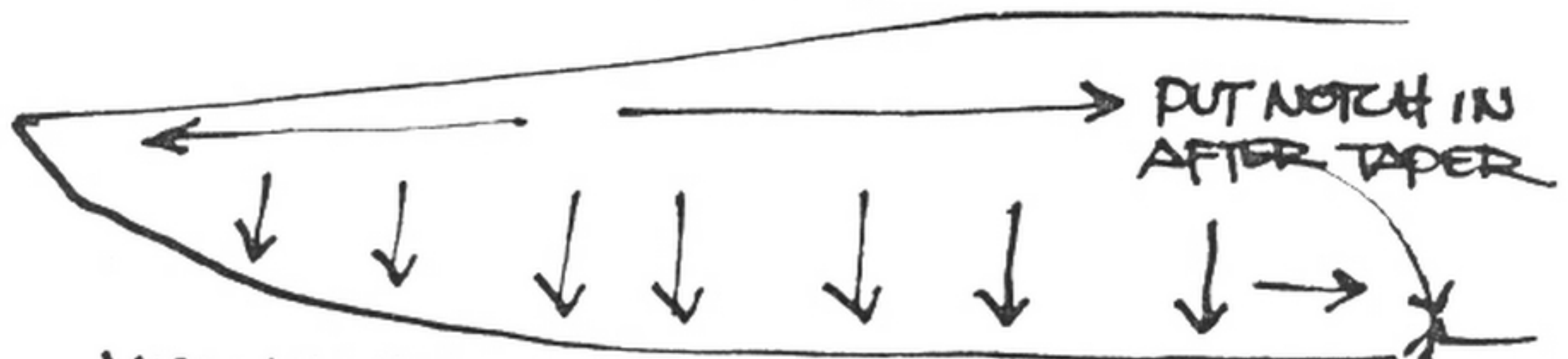


POINT GOES BACK $\frac{3}{4}$ 'S OF THE BLADE



FIRST TAPERING STROKES

USE HORN OF ANVIL TO START TAPER



PUT NOTCH IN
AFTER TAPER

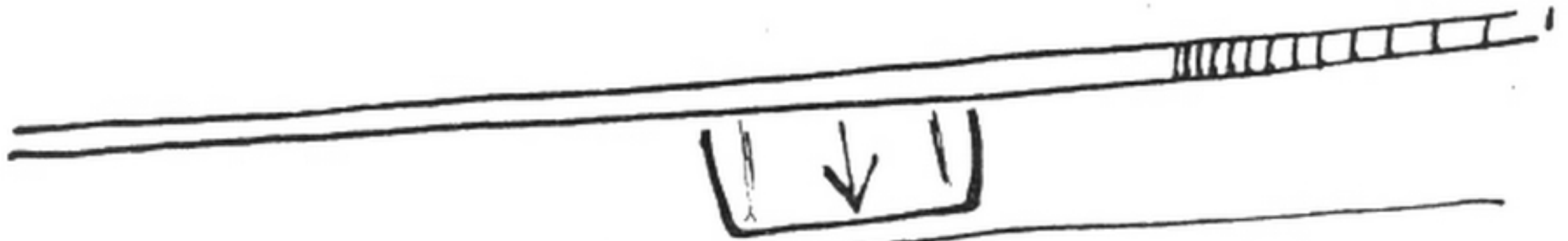
WORK TO EDGE AFTER SHAPING & TAPERING
THE BLADE

8"

COMBAT KNIFE



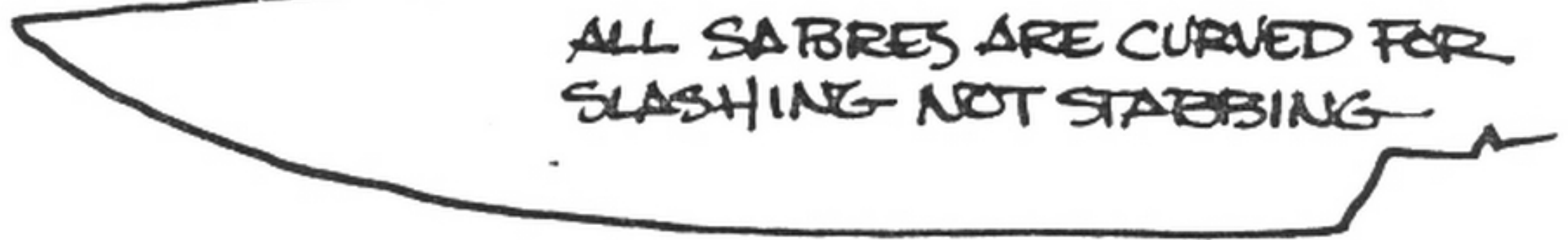
USE EDGE OF HAMMER
TO PULL METAL OUT



CONTINUOUS TAPER IS MOST DESIRABLE

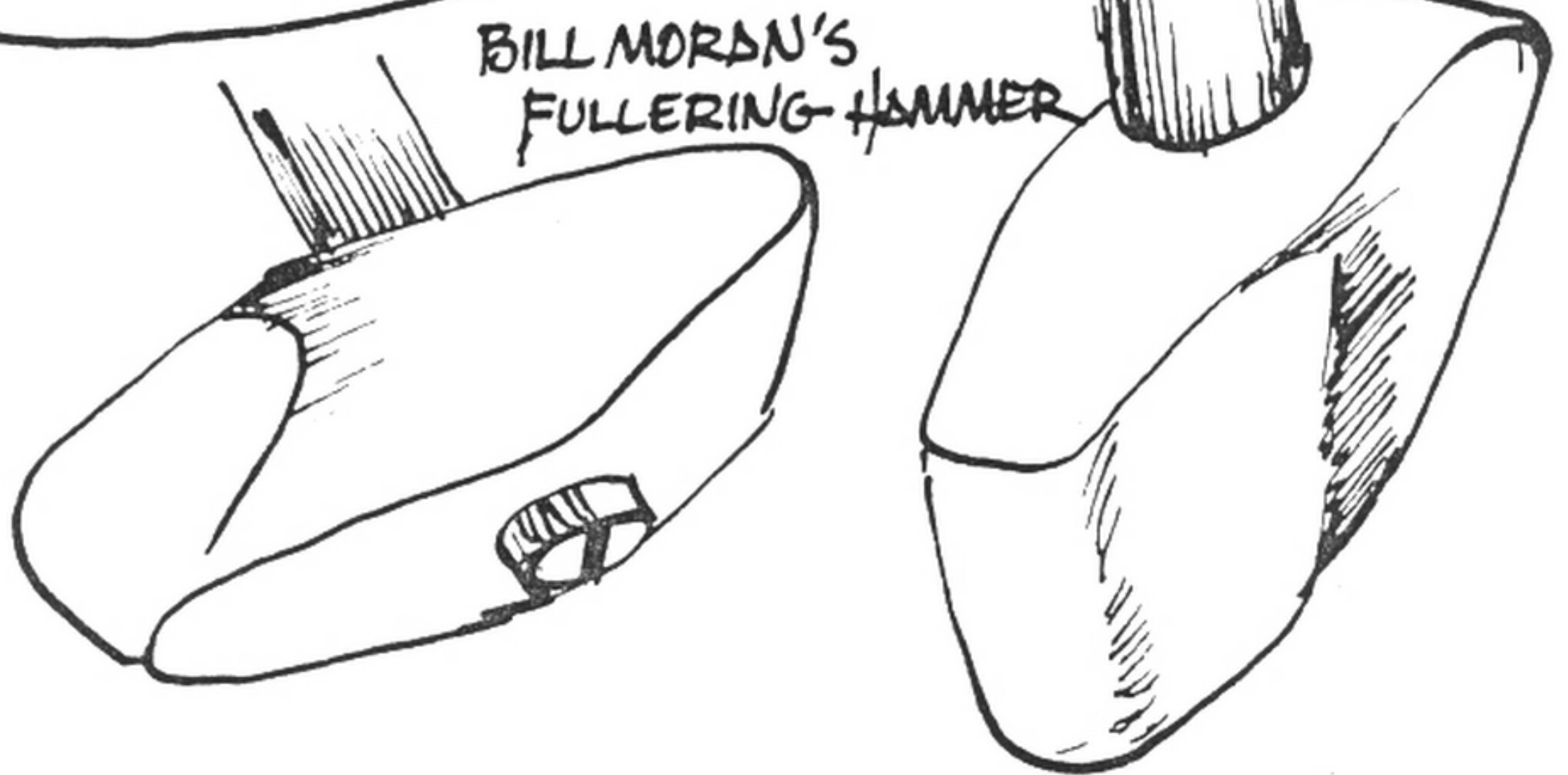
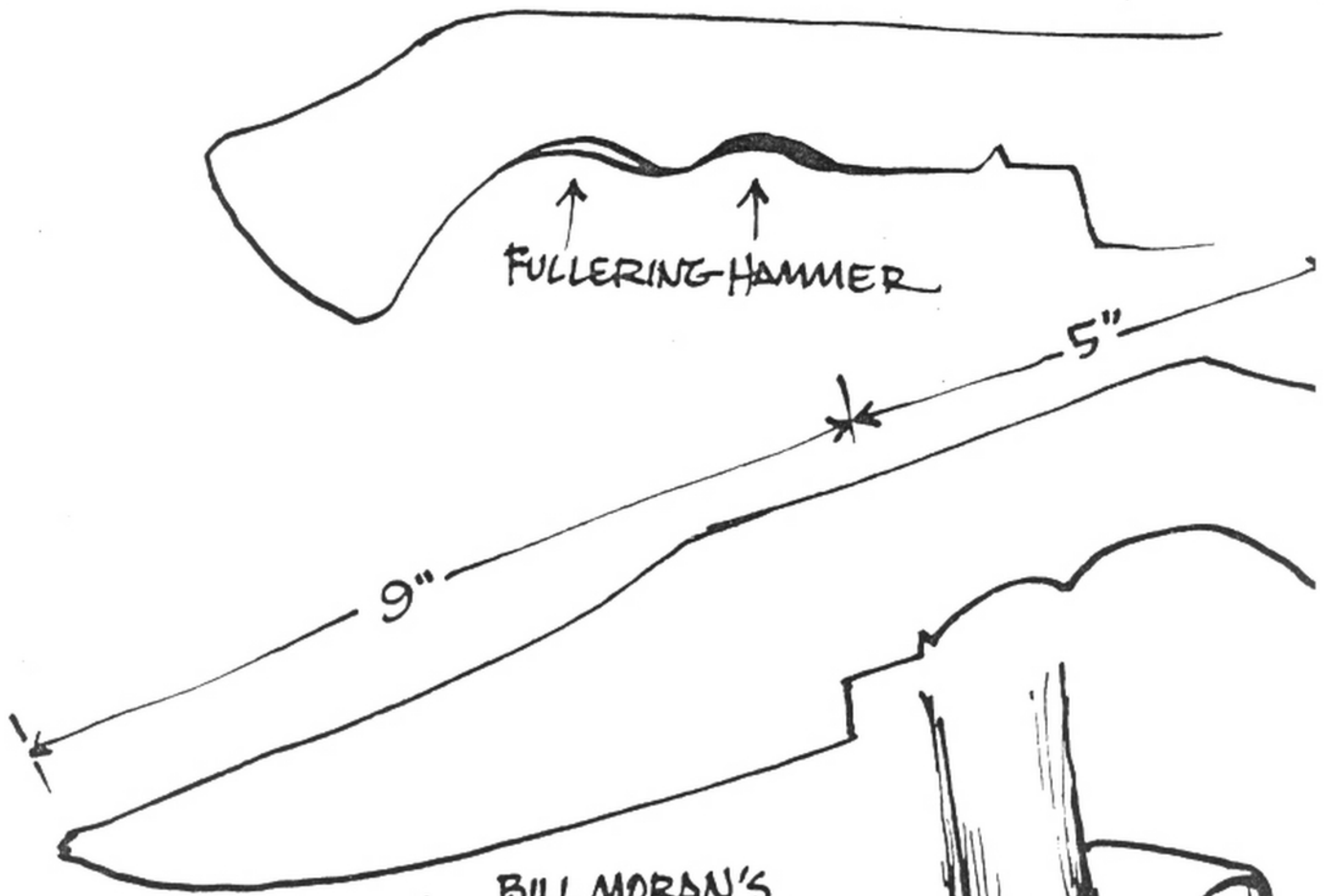


THE HIGHER THE POINT THE GREATER THE SLASHING
CHARACTERISTIC
REFER TO SABRE

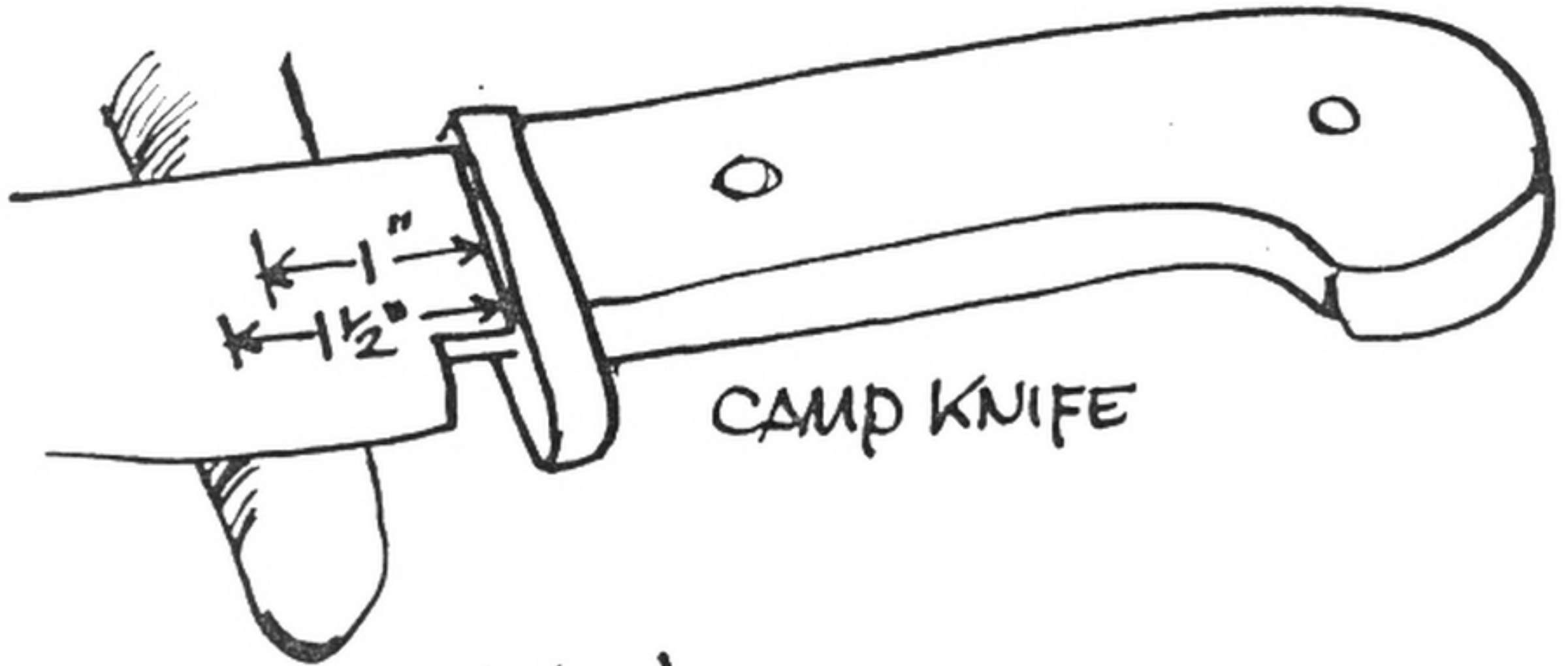


ALL SABRES ARE CURVED FOR
SLASHING NOT STABBING

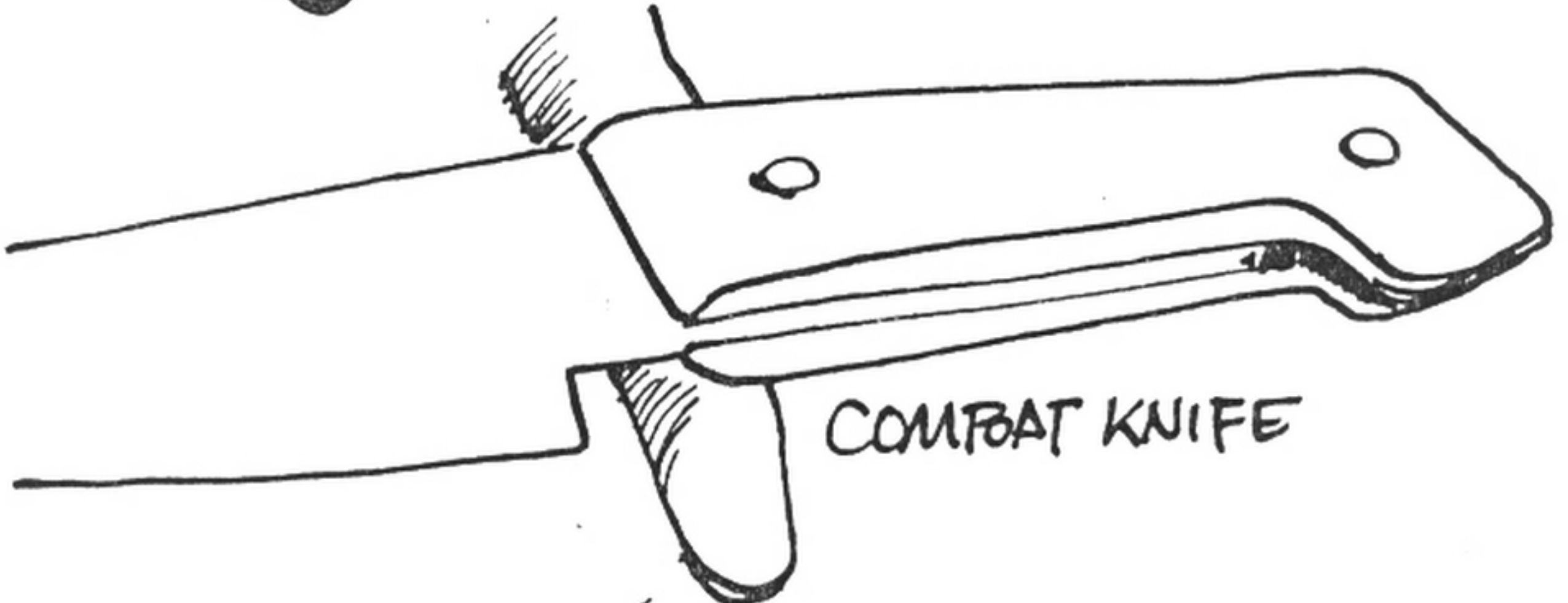
COMBAT KNIFE



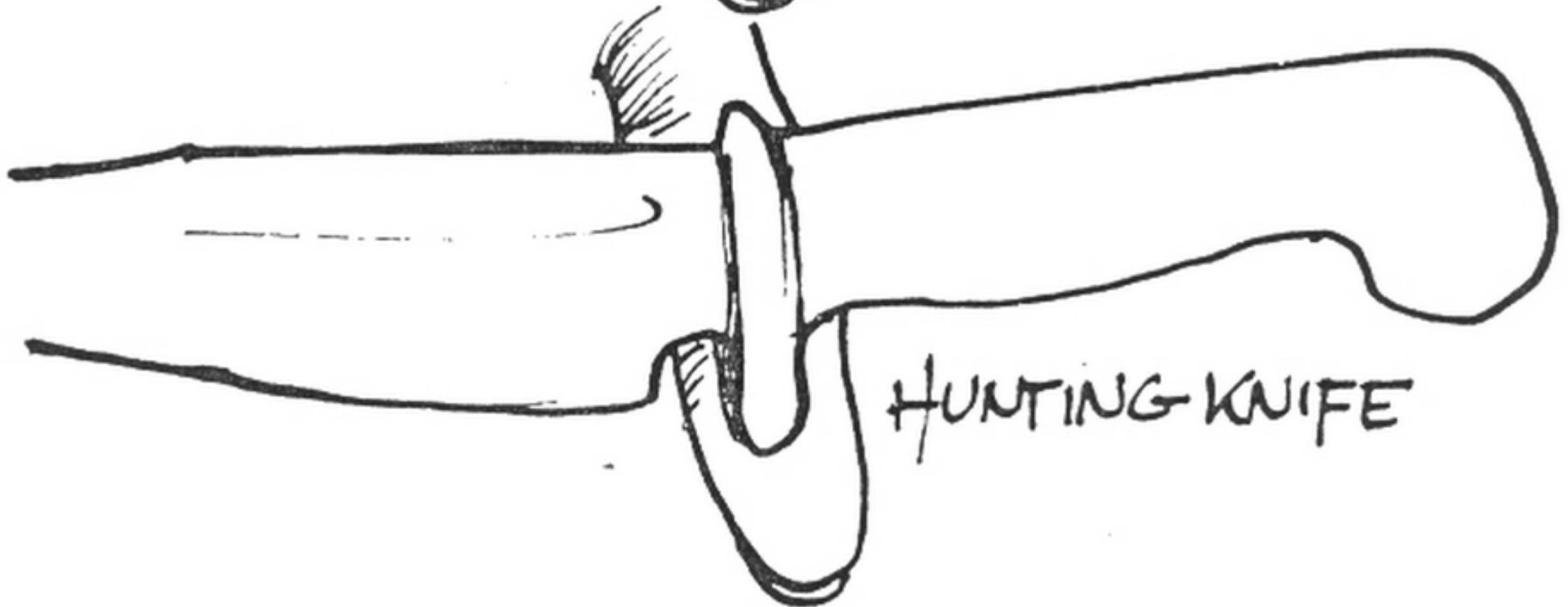
POINTS OF BALANCE



CAMP KNIFE

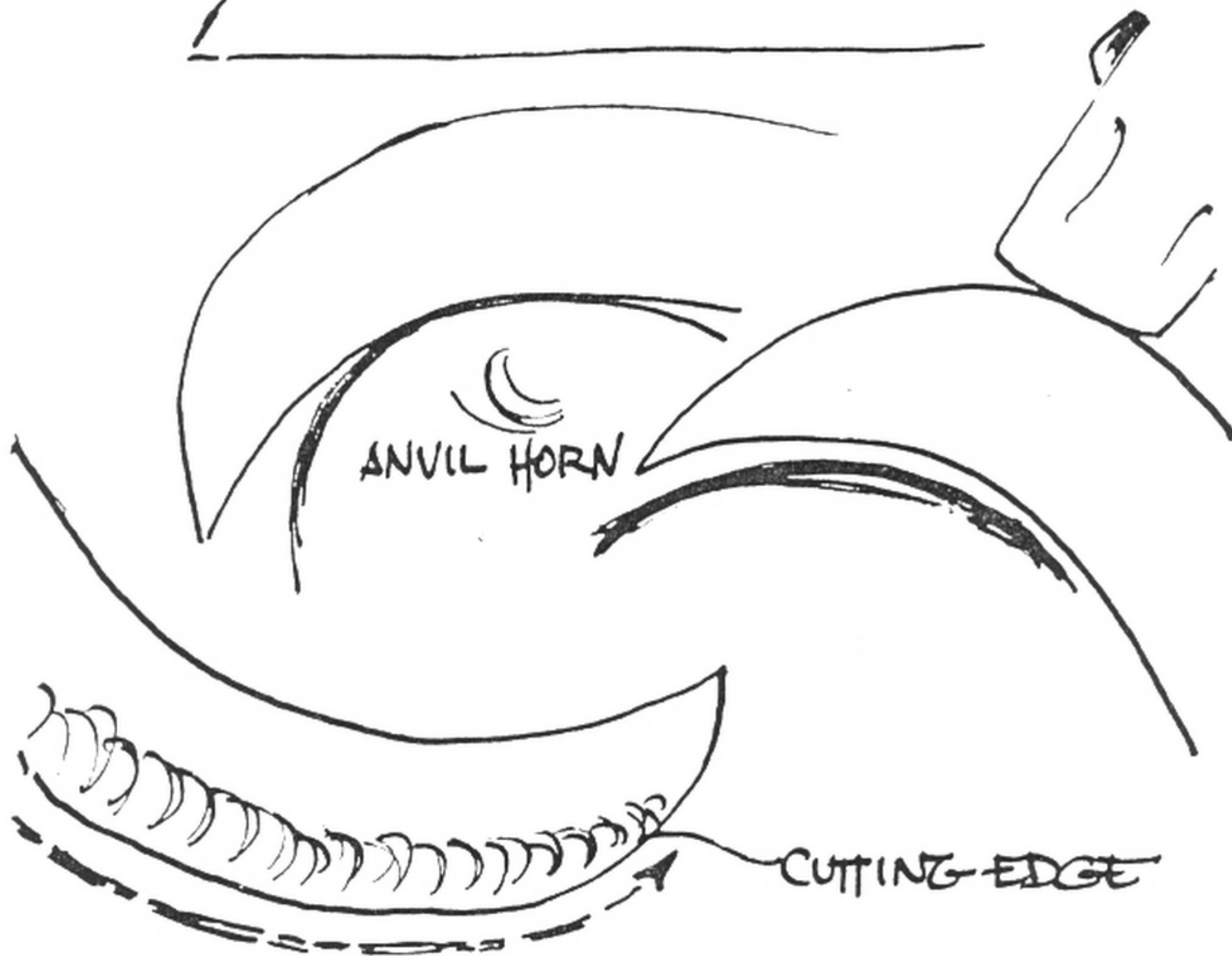
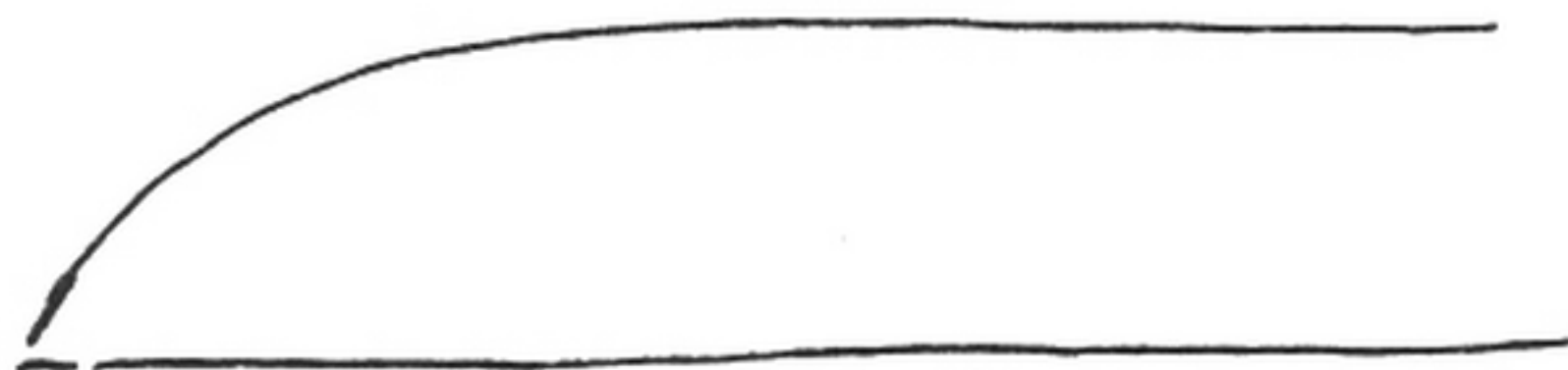


COMBAT KNIFE

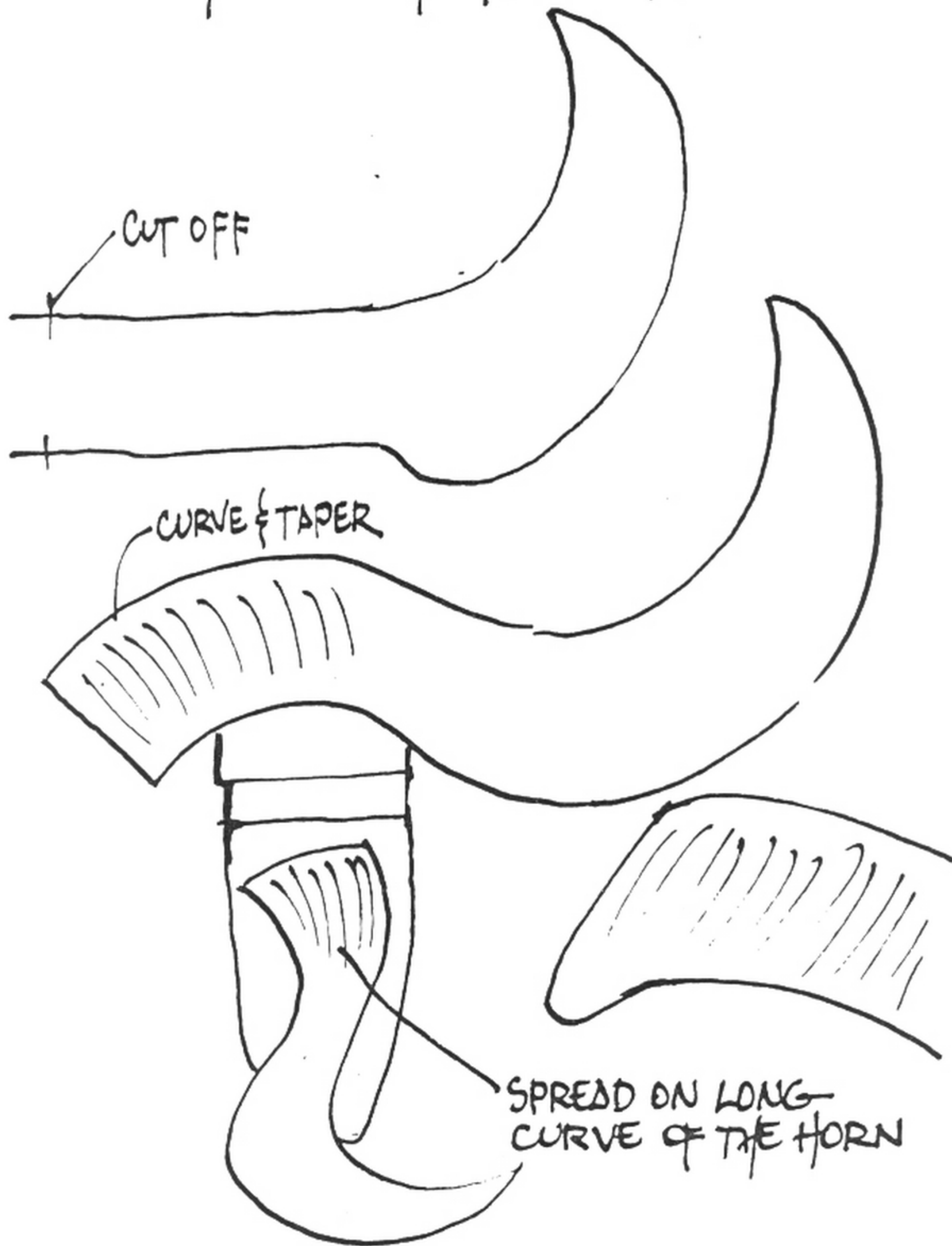


HUNTING KNIFE

SKIVING & GENERAL PURPOSE KNIFE



SKIVING & GENERAL PURPOSE KNIFE



MALCOLM SHEWAN - LECTURE
PRE-1600 JAPANESE SWORD MAKING.

(A)

STEEL (SWORD) MAKING CENTERS NEEDED;
CHARCOAL
IRON ORE
POLITICAL, ECONOMICAL STABILITY

THEY WERE:

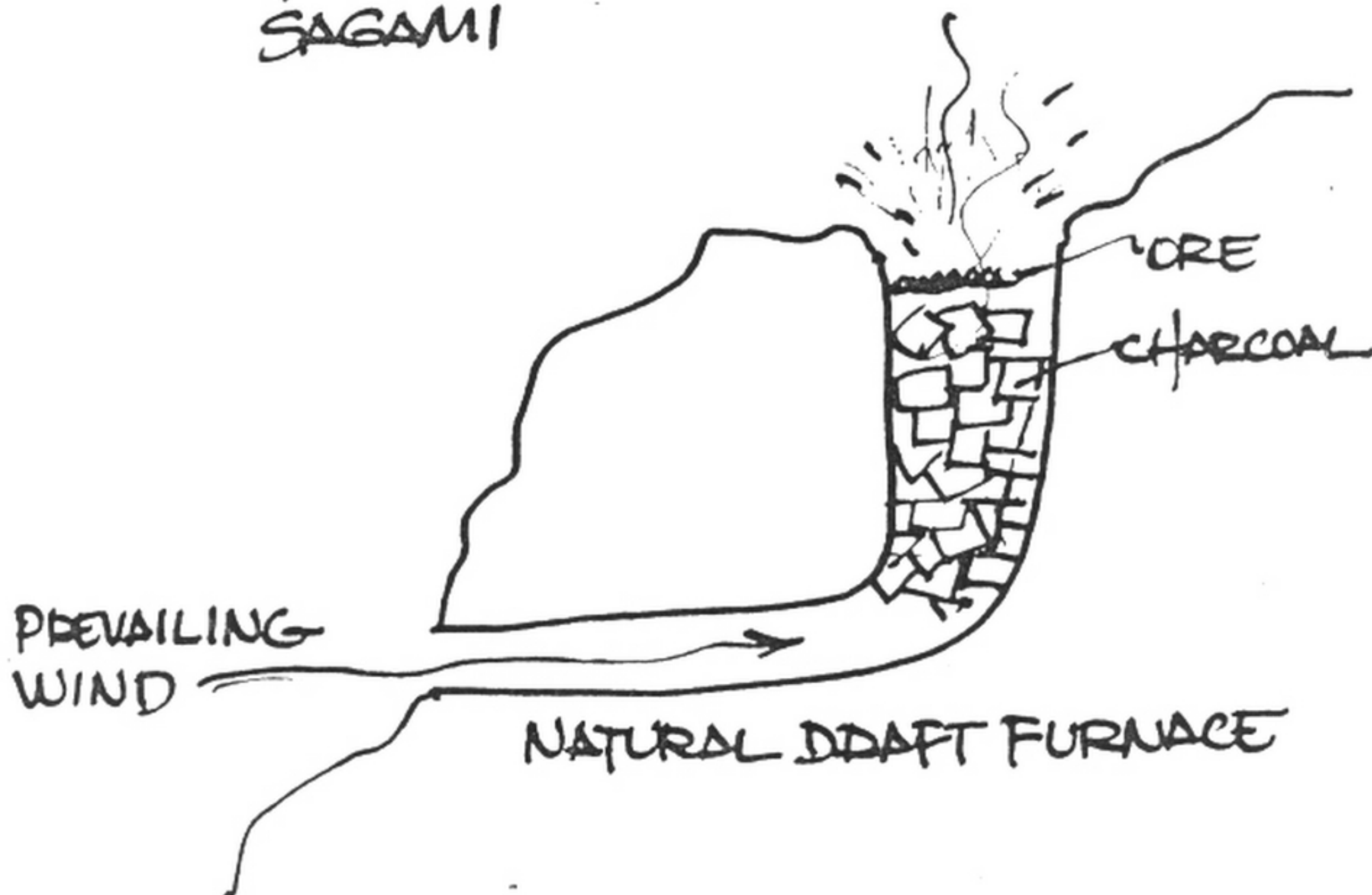
BIZEN - FINEST ORE DEPOSITS

MINO

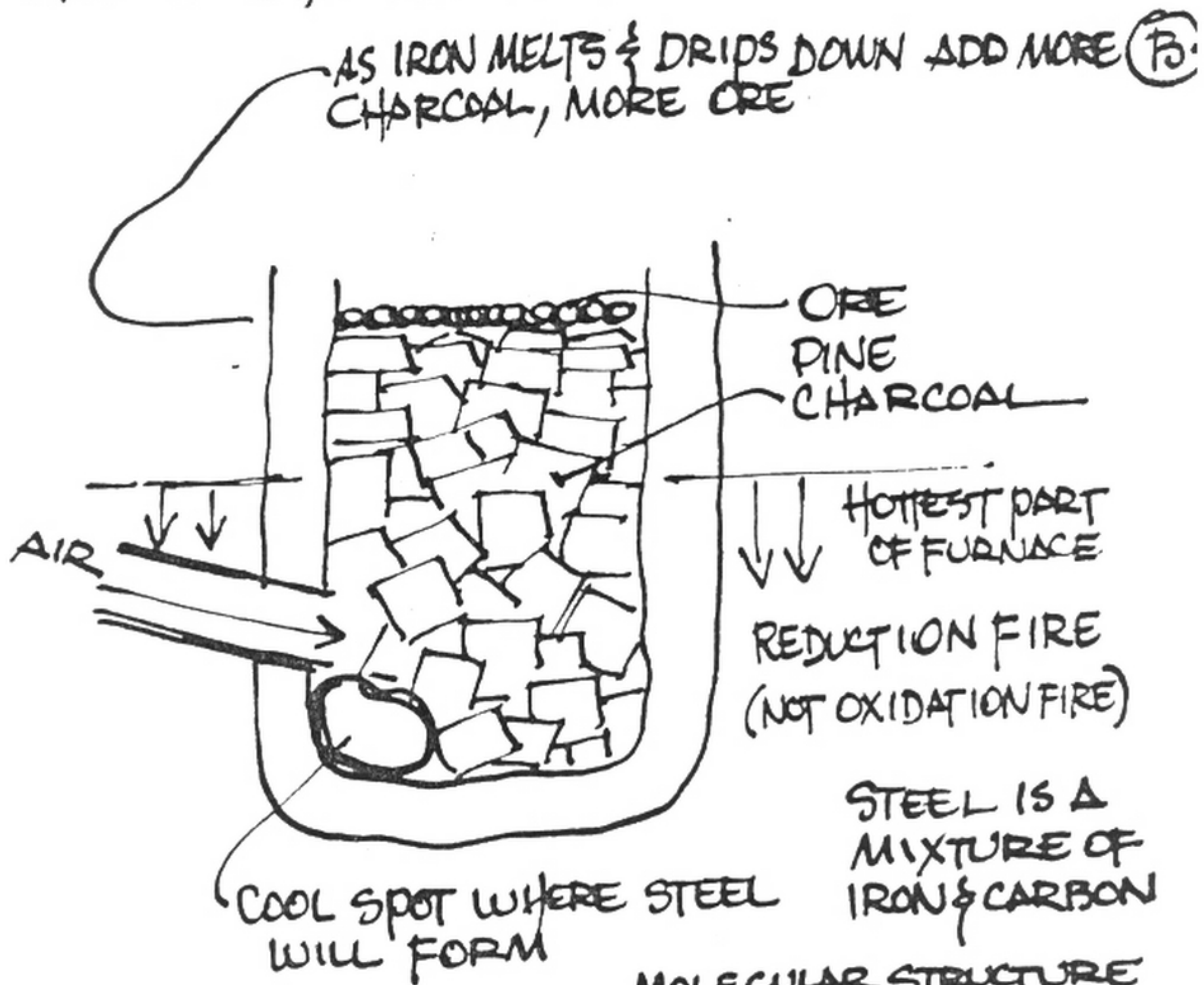
YAMASHIRO

YAMATO

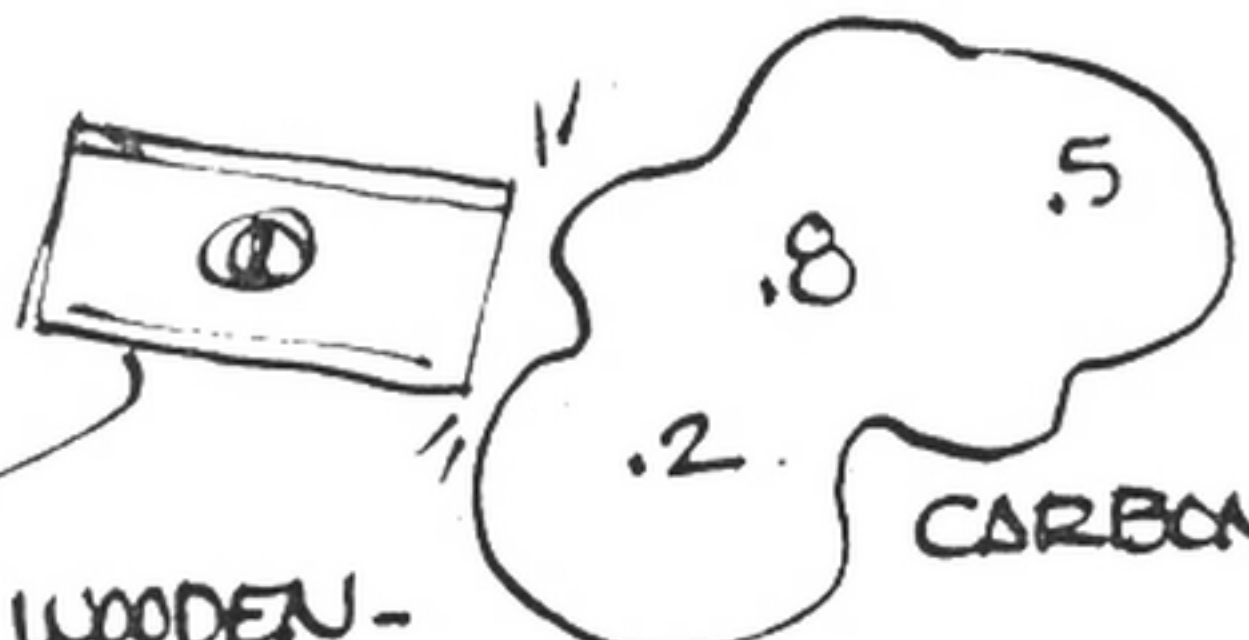
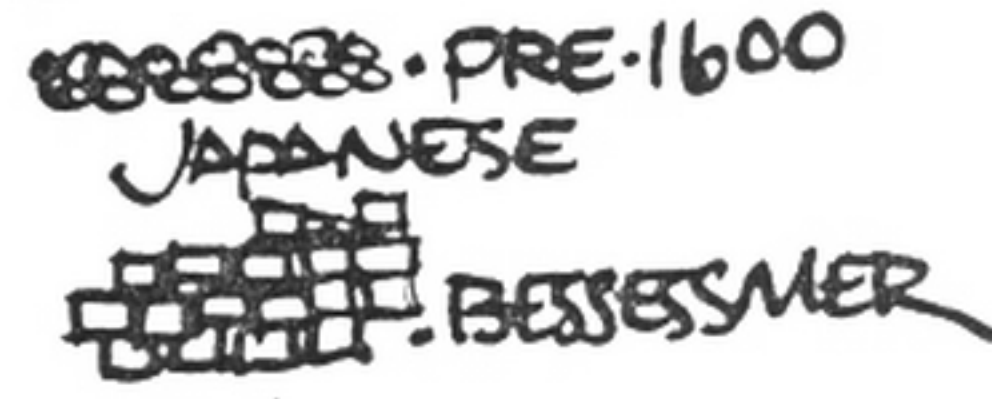
SAGAMI



MALCOLM SHEWAN - LECTURE



MOLECULAR STRUCTURE



USE WOODEN-MALLET TO BEAT THE SLUG INTO A BLOCK OF STEEL (WOOD PRODUCES MORE CARBON.)

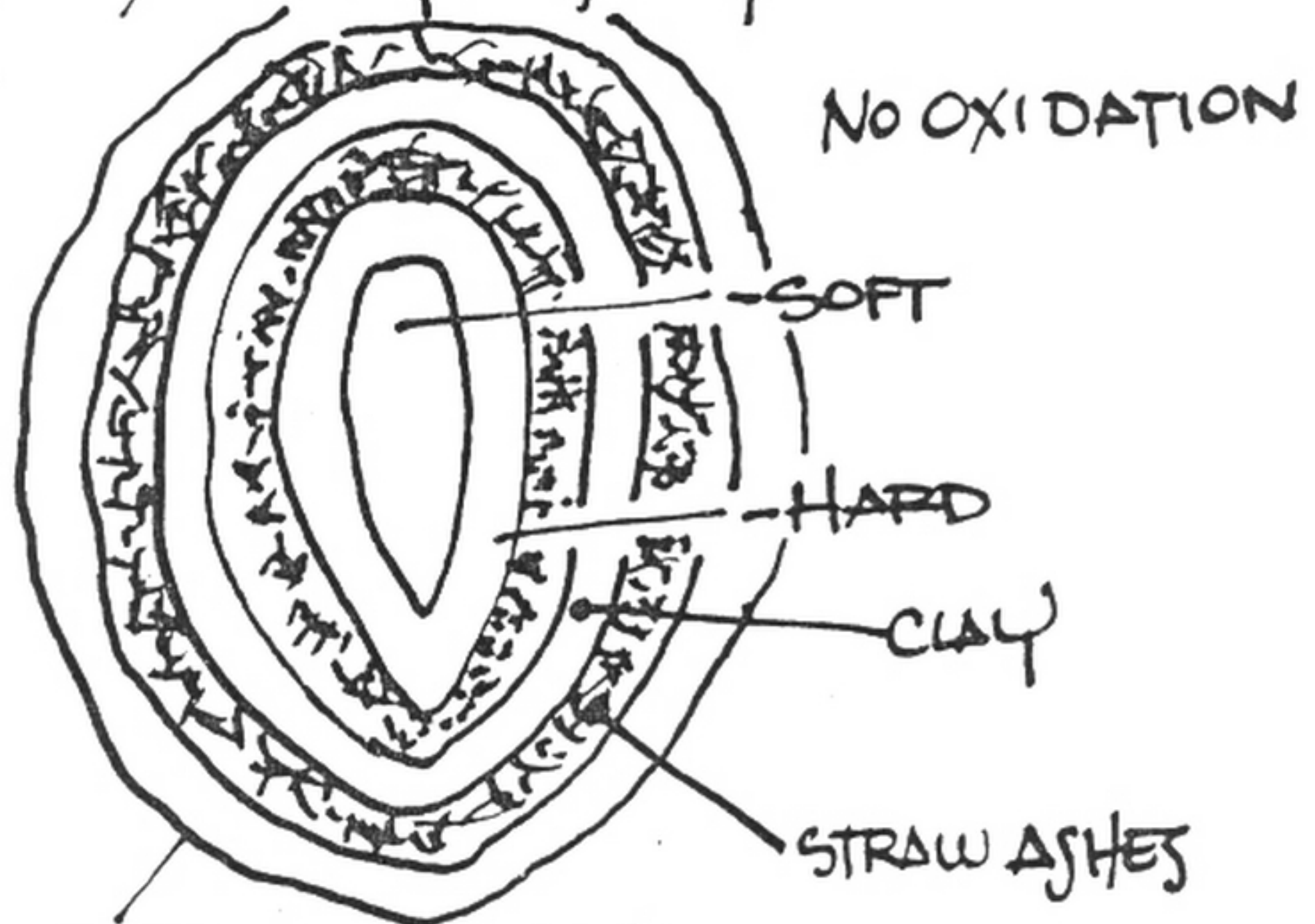
CARBON CONTENT

MALCOLM SHEWAN - LECTURE

THERE WERE NO PRESCRIBED FORMULAS FOR MIXTURES OF FUEL TO AIR. CLOSEST STANDARDIZATION TO PROCESS WAS THE CEREMONY OR RITUAL.

(C.)

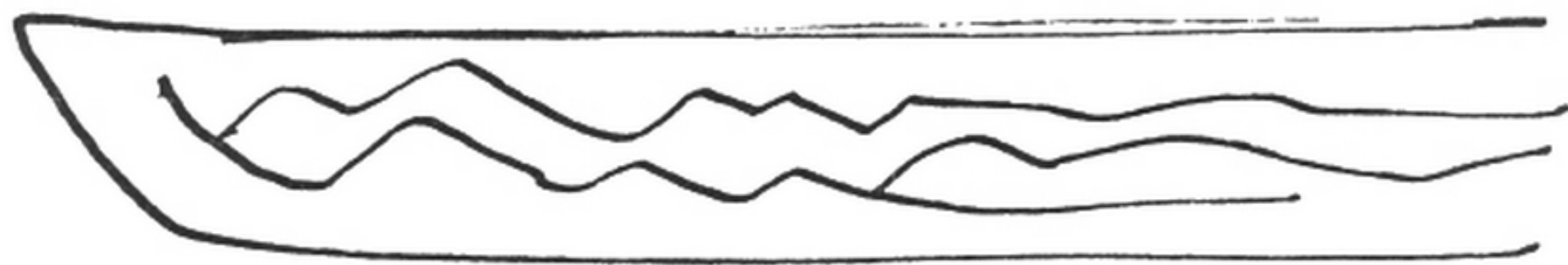
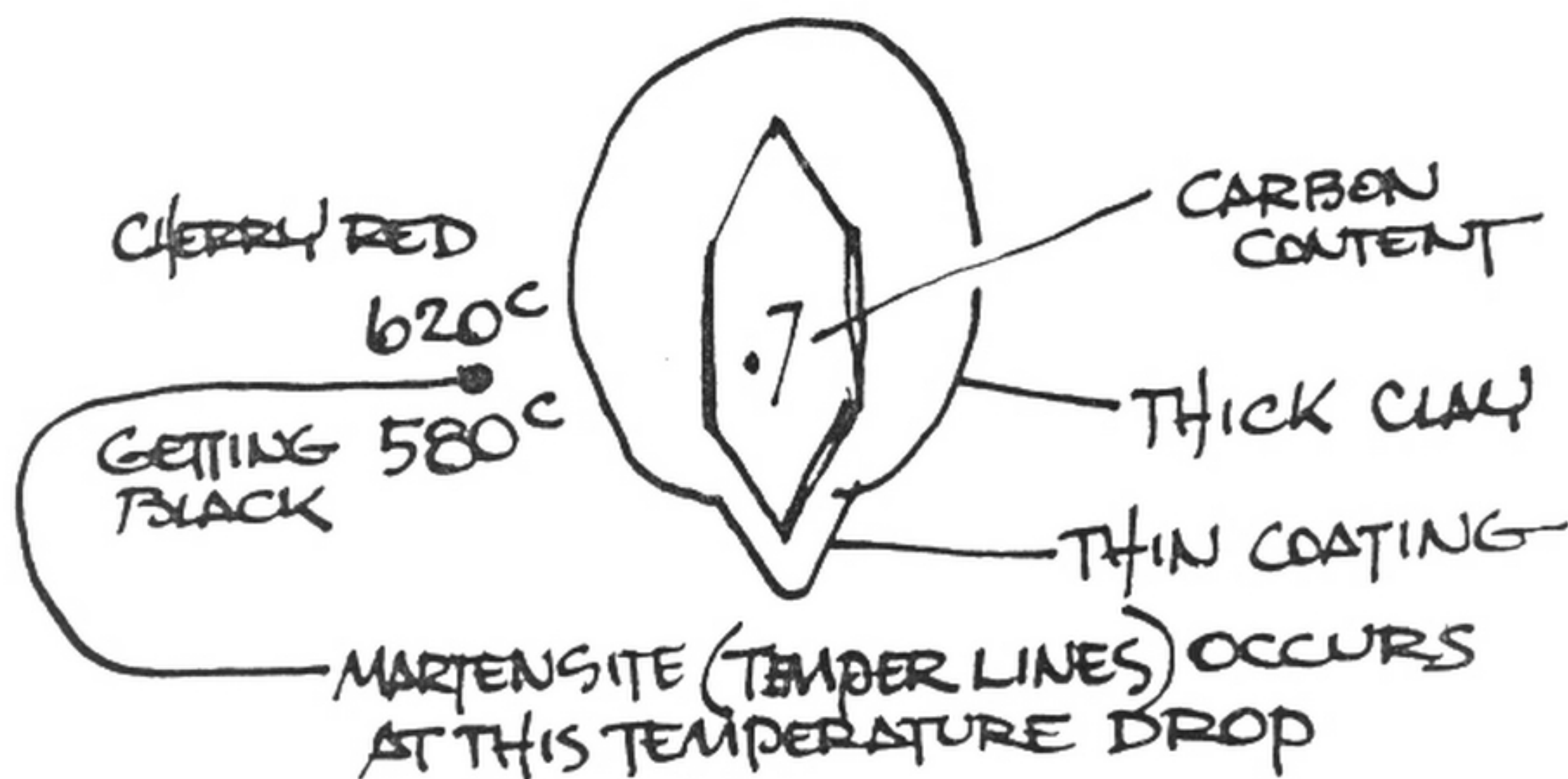
REMOVE LUMP OF STEEL FROM FURNACE
BRING UP TO WELDING HEAT & HOMOGENIZE
FOLD & WELD
COVER W/ CLAY & ASHES & WELD



BECOMES PORCELAIN
FIRE TO CONE 10-14

MALCOLM SHEWAN • LECTURE

HEAT TREATING IS DONE W/ CHARCOAL & SAND (D)

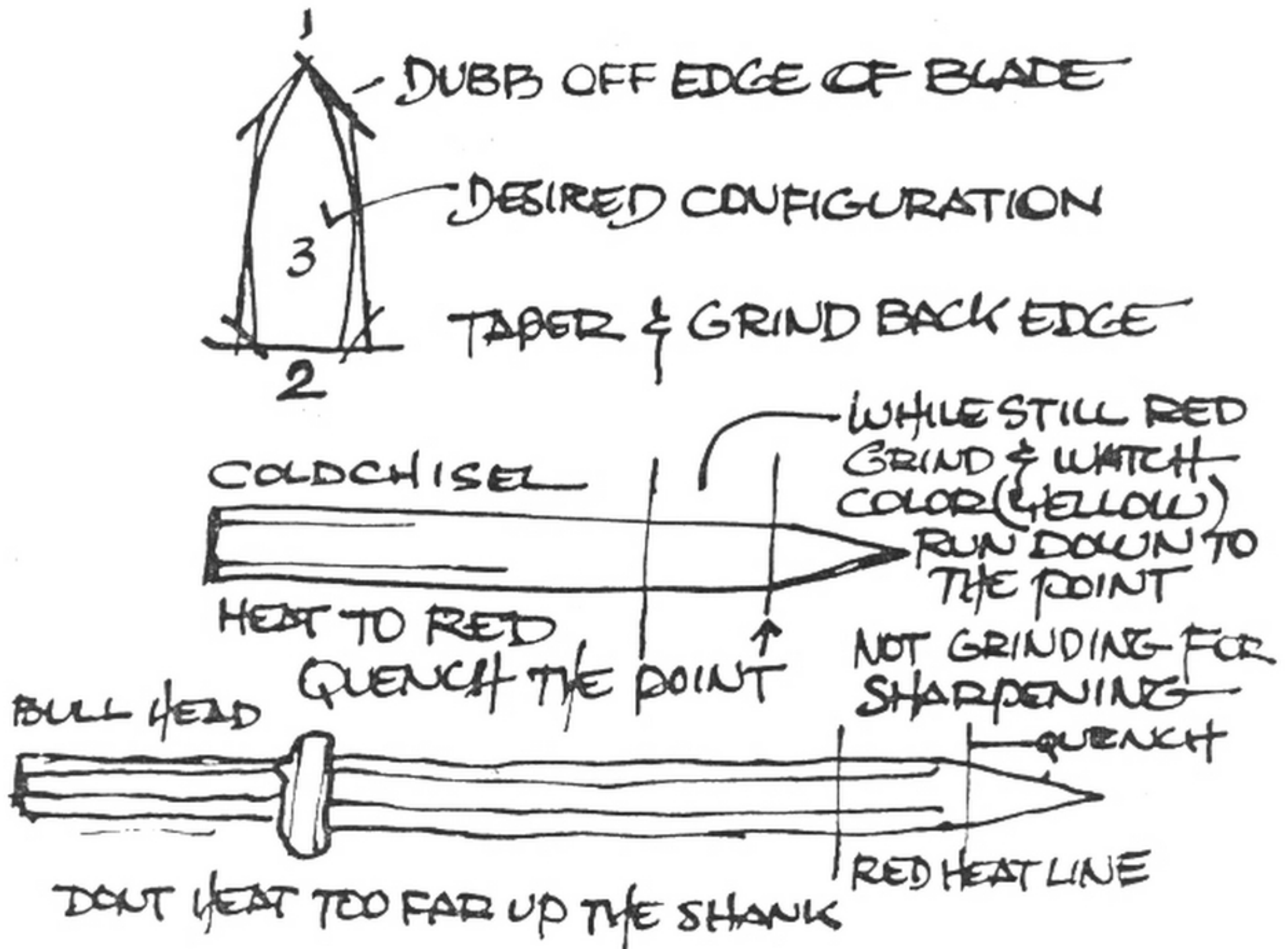


THE MEMORY OF THE METAL FROM THE FORGING
CREATES THE TEMPER LINE.

FINISHING THE BLADE

AFTER PROFILING THE BLADE, ANNEAL.
HEAT THE WHOLE BLADE INCLUDING TANG
TO DULL CHERRY RED COLOR. COVER
COMPLETELY W/VERMICULITE & ALLOW
TO COOL SLOWLY. DON'T BOTHER
W/FIRE SCALE.

WHEN BLADE HAS COOLED GRIND OFF FIRE-
SCALE W/EMERY WHEEL. AFTER
FIRE SCALE HAS BEEN REMOVED USE
36 GRIT ON THE BADER GRINDER
FOR INITIAL GRIND



GENERAL INFORMATION

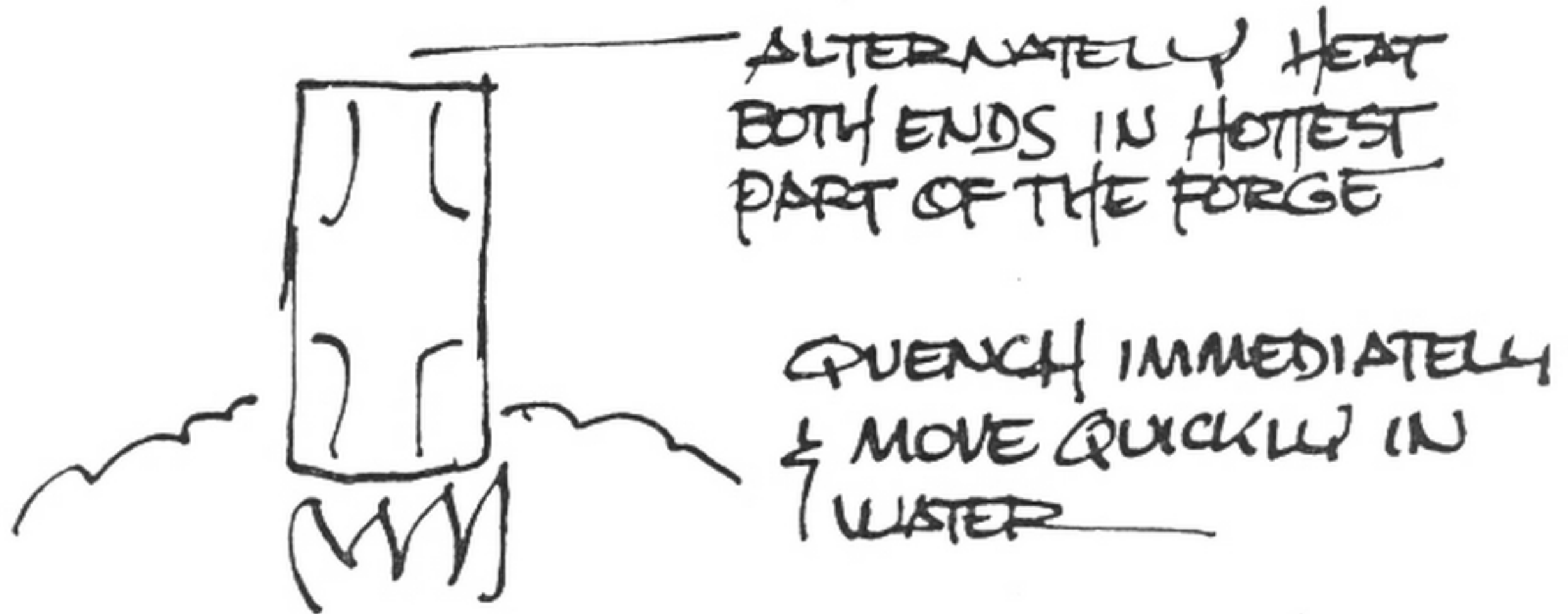
POWER HAMMER: CHECK RAM & CLUTCH

50 LB/2 HP IS A GOOD ALL ROUND HAMMER

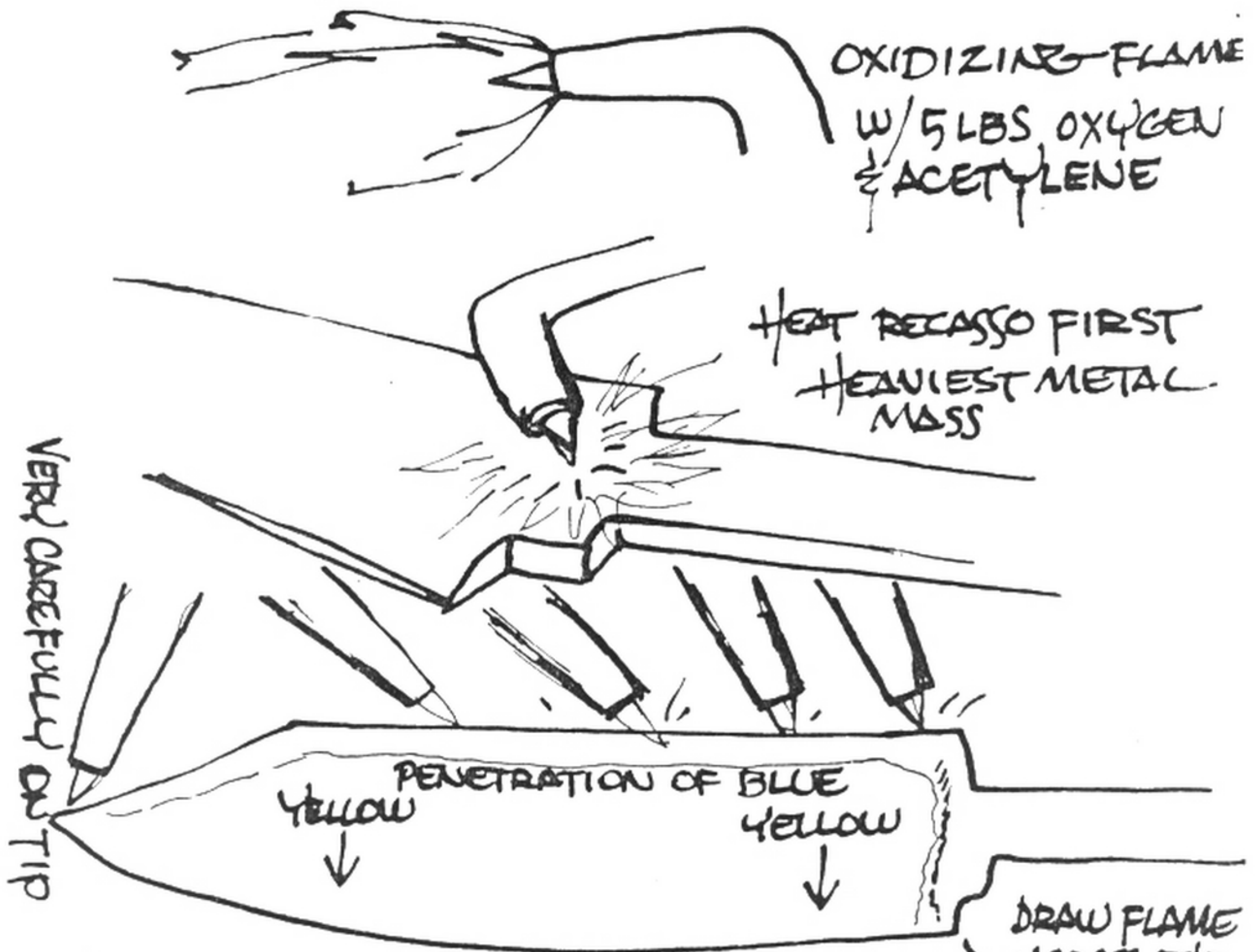
100 LB/3 HP GOOD (NECESSARILY) FOR MAKING
DAMASCUS.

MODELS W/ WOODEN BLOCKS MOST DESIRABLE

HARDENING A HAMMER HEAD



DRAWING THE TEMPER

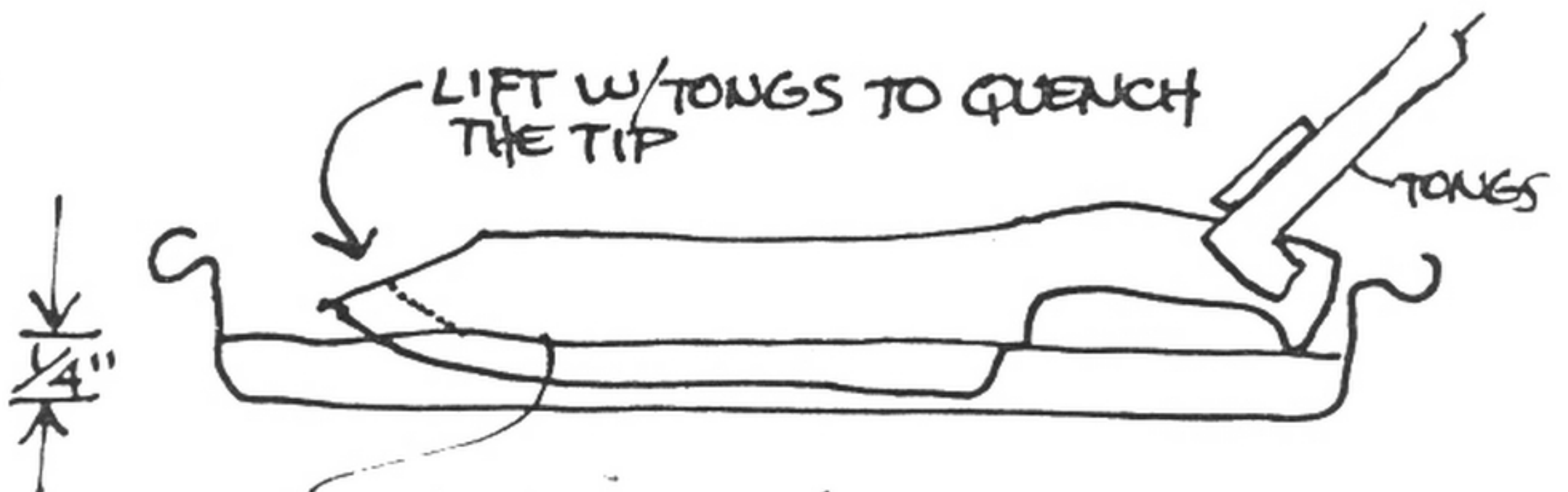
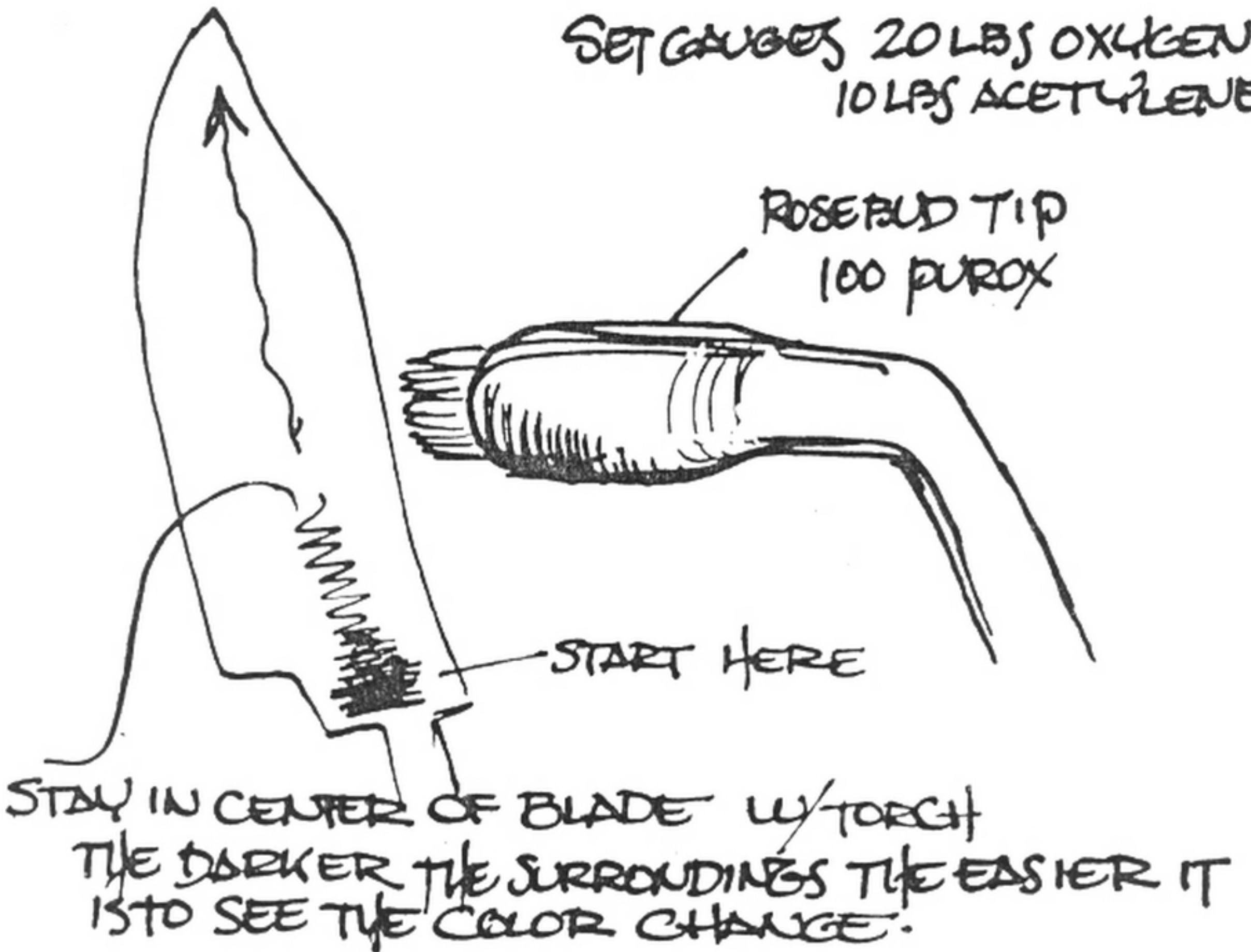


THE DOWNSIDE OF THE BLADE BECOMES DARKER AIR CIRCULATION IS RESPONSIBLE

HOLD BLADE W/ VISE GRAPS ON THE TANG & DRAW THE TEMPER WHILE SEATED WITH A LOT OF LIGHT ON THE BACK OF THE BLADE TRIPLE DRAW (EVERYTHING)

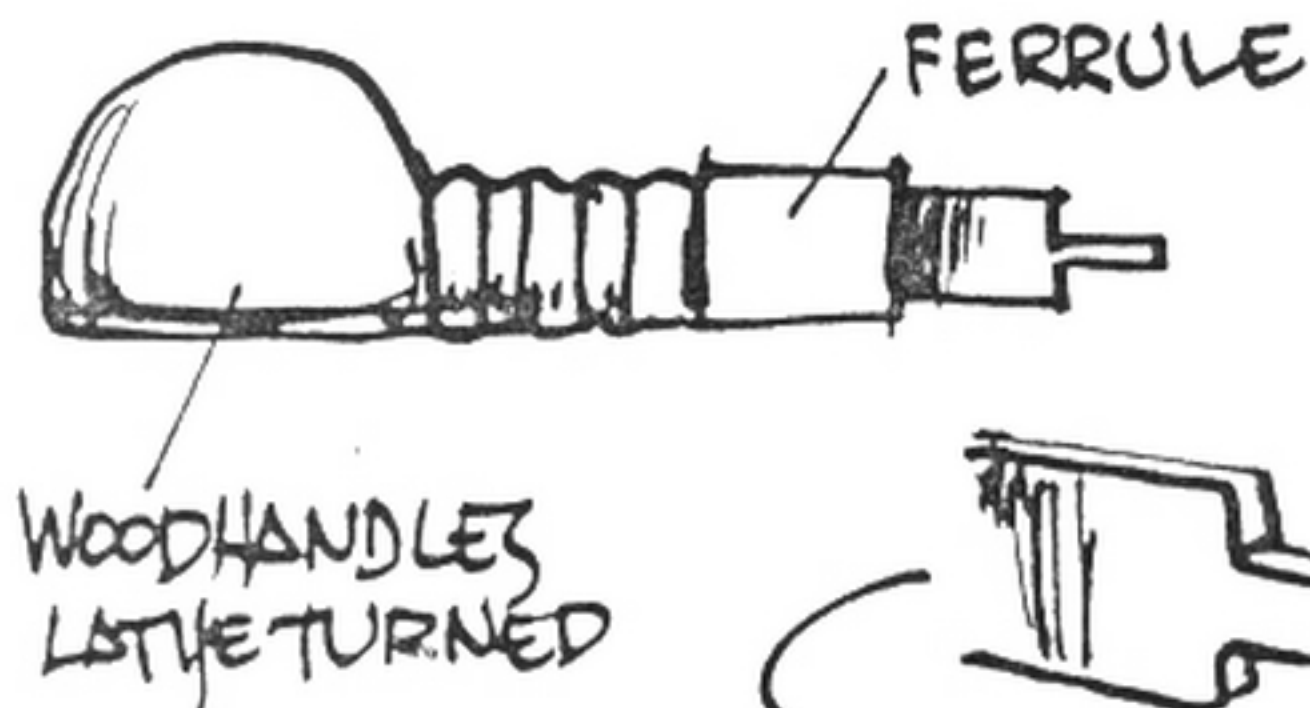
HEAT TREATING

SET GAUGES 20 LBS OXYGEN
10 LBS ACETYLENE

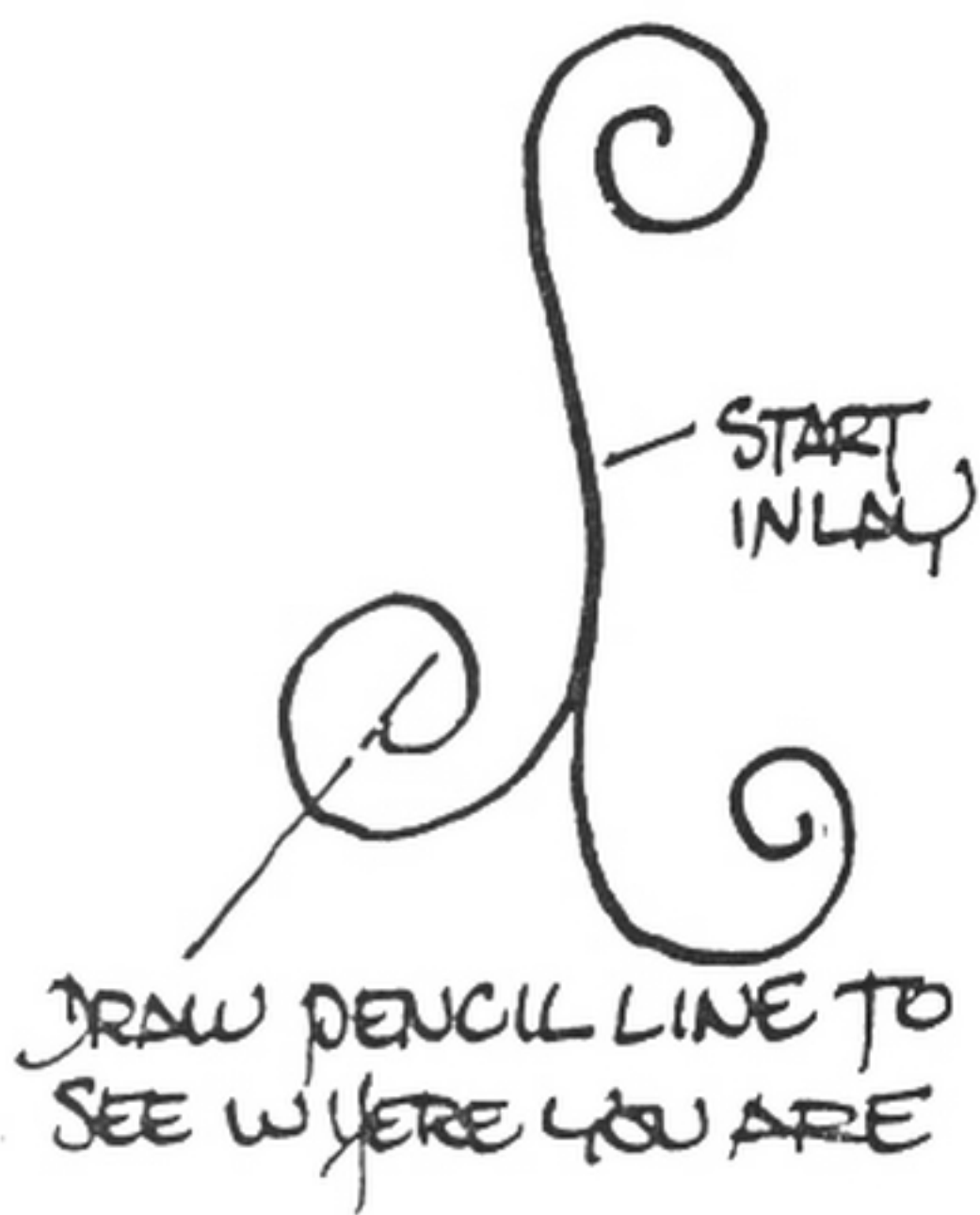


TEMPER LINE IS THE DEPTH OF THE OIL
RAECO PRODUCTS INC / QUENCHING OIL
P.O. BOX 404 • ROCHESTER NY 14602
716-271 8080

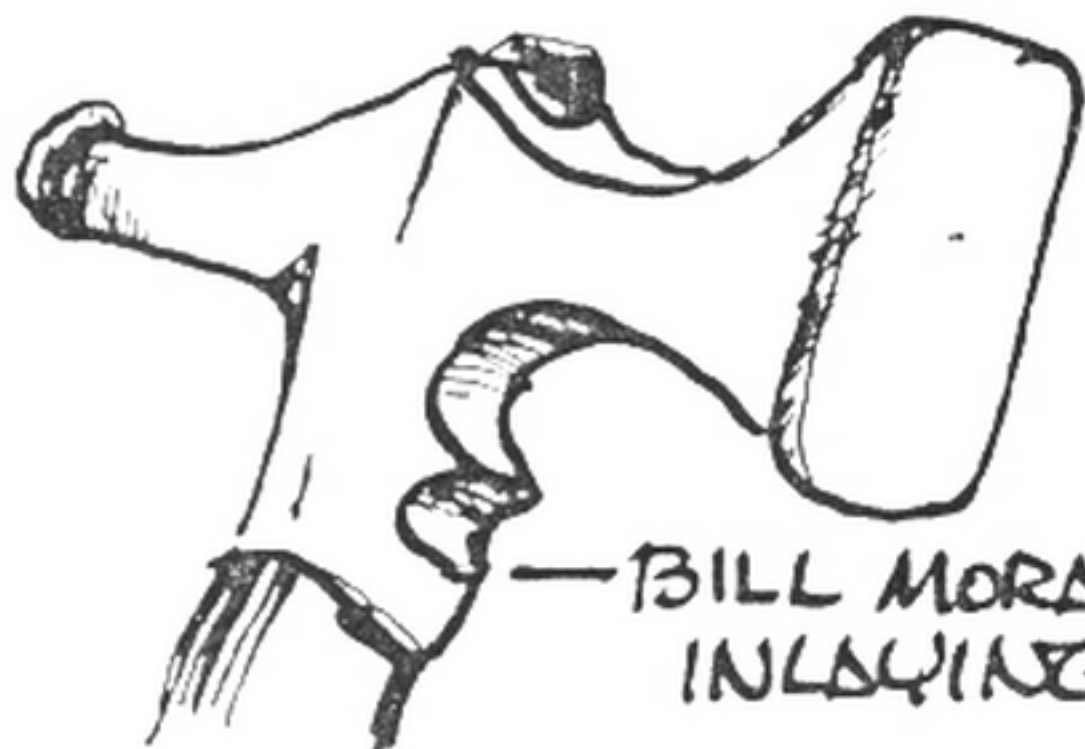
INLAYING SILVER WIRE



CUT DOWN HACK SAW BLADES



- USE 120 GRIT TO CLEAN & GROOVE FLAT FINE SILVER WIRE
- FINE SILVER WIRE .013 THICK .055 WIDE
- CUT W/SCISSORS FOR CUT W/O CRIMPING
- PUNCH A HOLE AT THE END OF THE SCROLL & DRILL A HOLE FOR A PIN $\frac{1}{16}$ "



GENERAL INFORMATION

WHISKERING - STEAM WOOD HANDLE UNTIL GRAIN RAISES & LET DRY. SAND W/ MEDIUM (220 PAPER). REPEAT TWO OR THREE TIMES. AFTER FINAL WHISKERING SAND W/ FINE (400 PAPER). FINISH COMPLETELY BEFORE STAINING.

FOR STAINING USE FIEBBINGS DARK BROWN LEATHER DYE FOR HANDLE.
FIEBBINGS ORANGE DYE MAY BE USED FIRST.

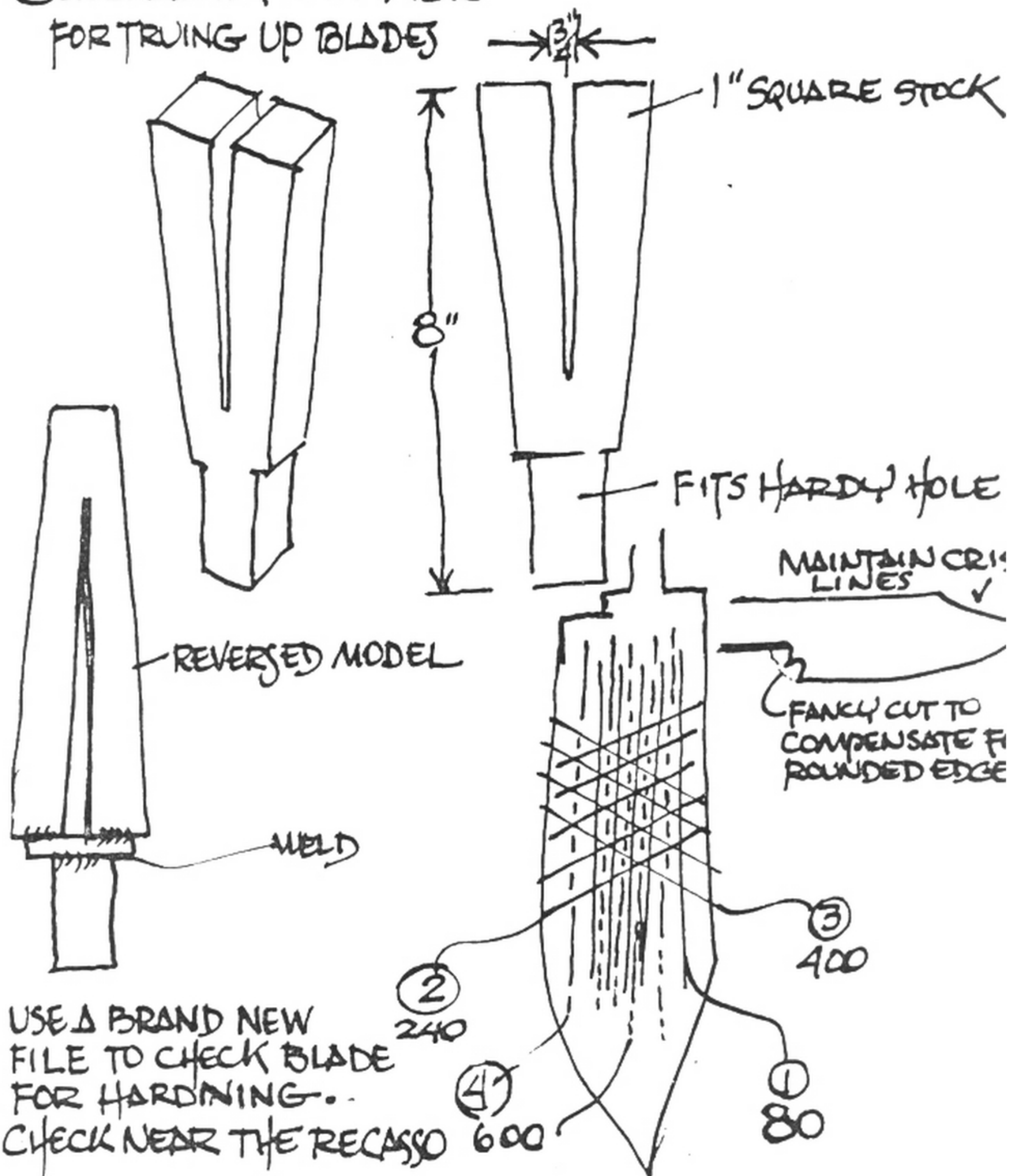
DISSOLVE STEEL WOOL IN A SOLUTION OF $\frac{1}{2}$ WATER & $\frac{1}{2}$ NITRIC ACID. APPLY TO HANDLE W/ SWABS & LET DRY.

FINAL PRESERVATIVE. PRATT & LAMBERT'S, OKANE

BUFF W/ 556 GRAY ROUGE. AVAILABLE FROM MIDWEST BUFF CO / OHIO

"OUR METHODS RELY ON LEARNED SKILLS, NOT ON PUSHING A BUTTON."

GENERAL INFORMATION FOR TRUING UP BLADES

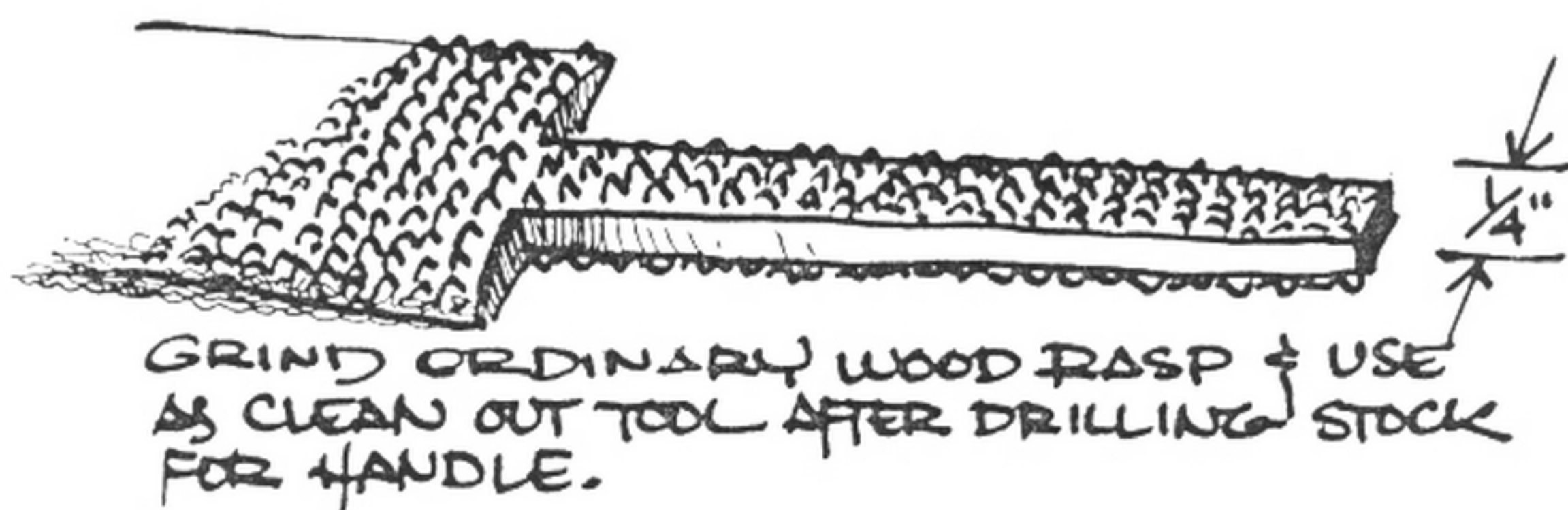
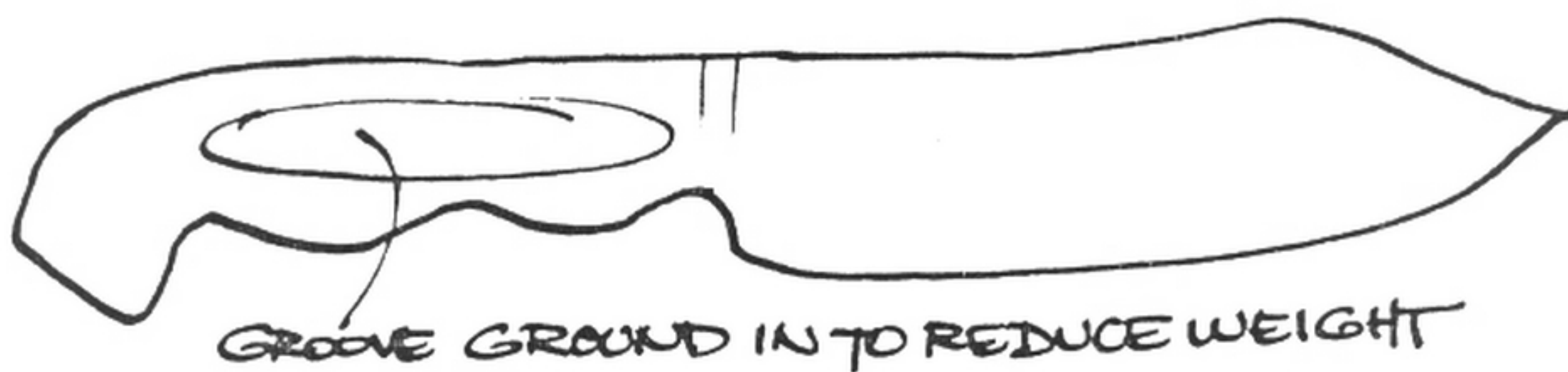
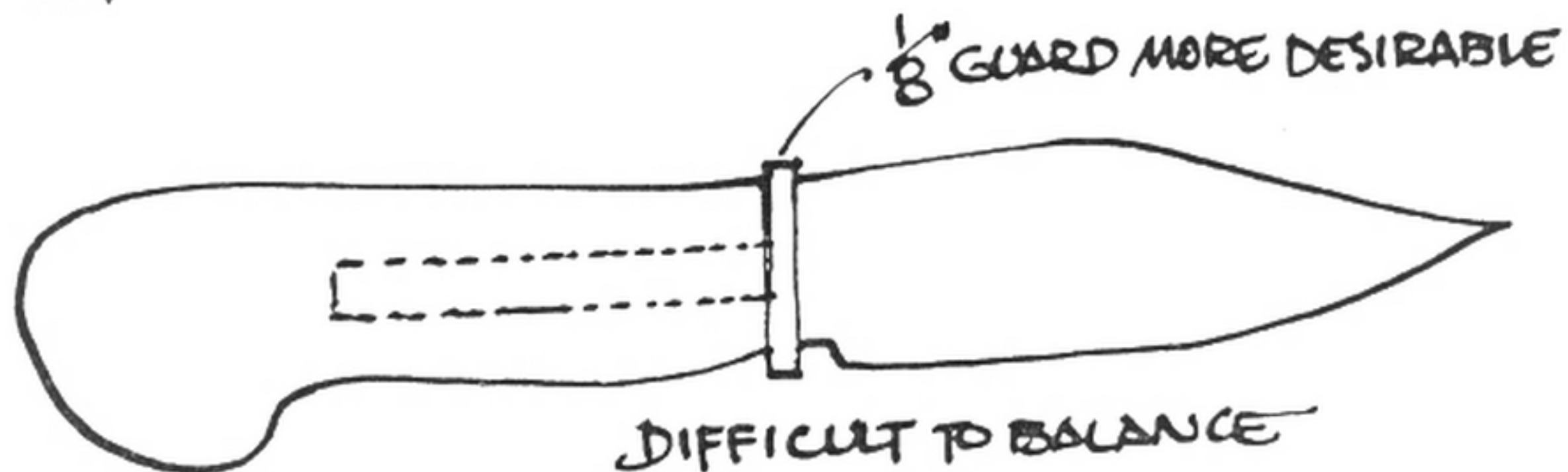
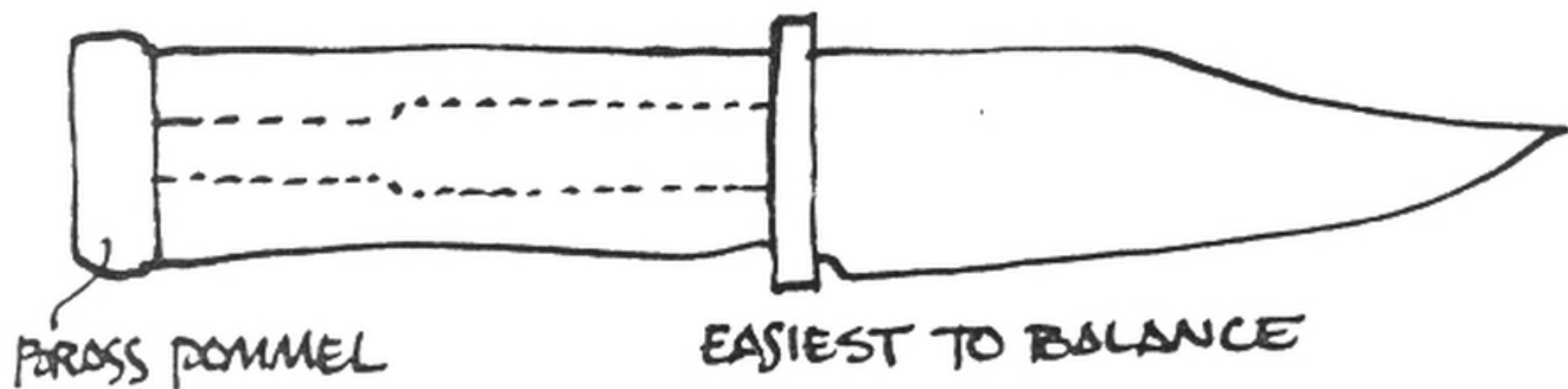


USE A BRAND NEW
 FILE TO CHECK BLADE
 FOR HARDENING...
 CHECK NEAR THE RECASSO

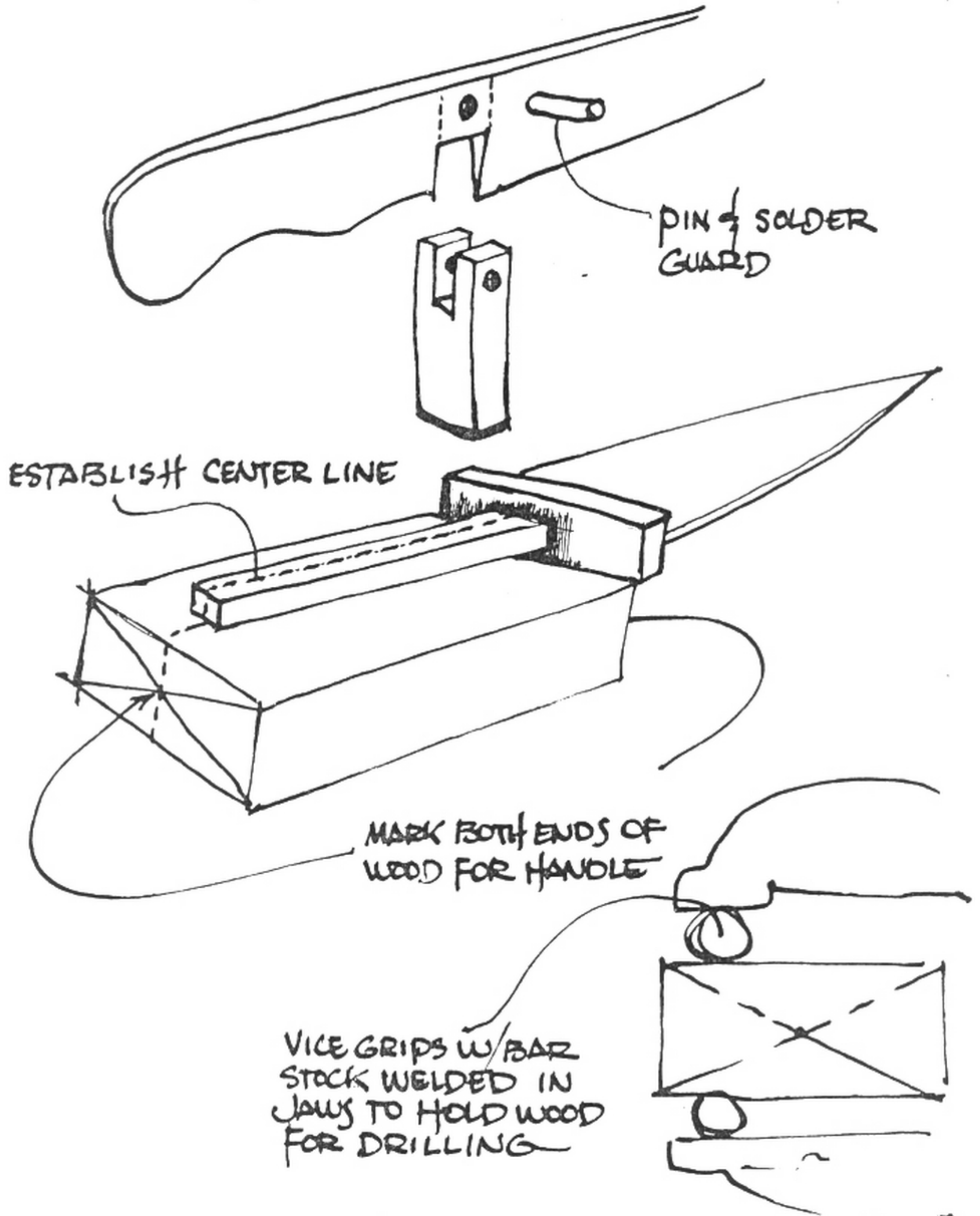
POLISHING SEQUENCE

USE 80 GRIT PRIOR TO HEAT TREATING, AFTER 80 USE
 POLISHING PAPERS

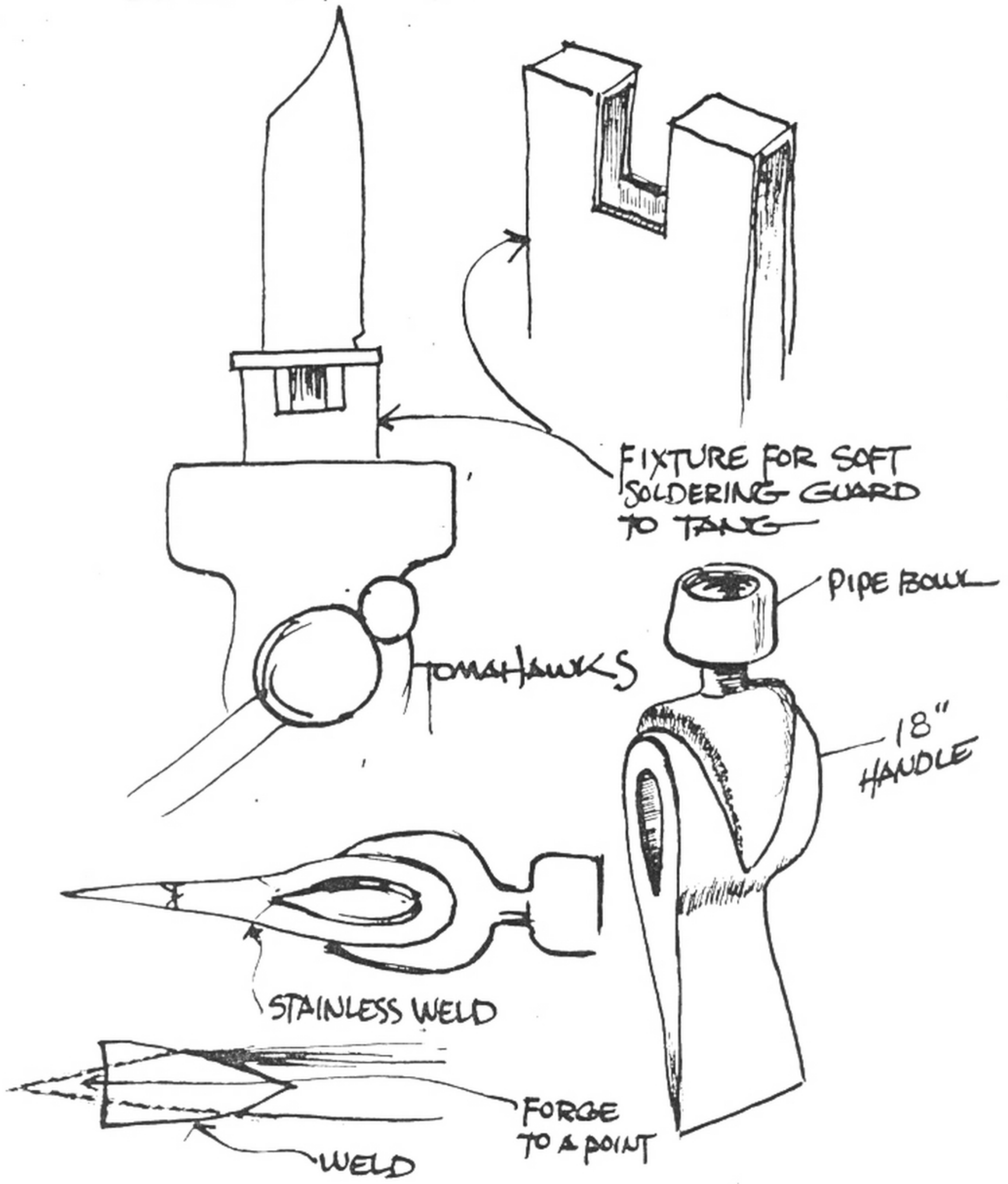
GENERAL INFORMATION



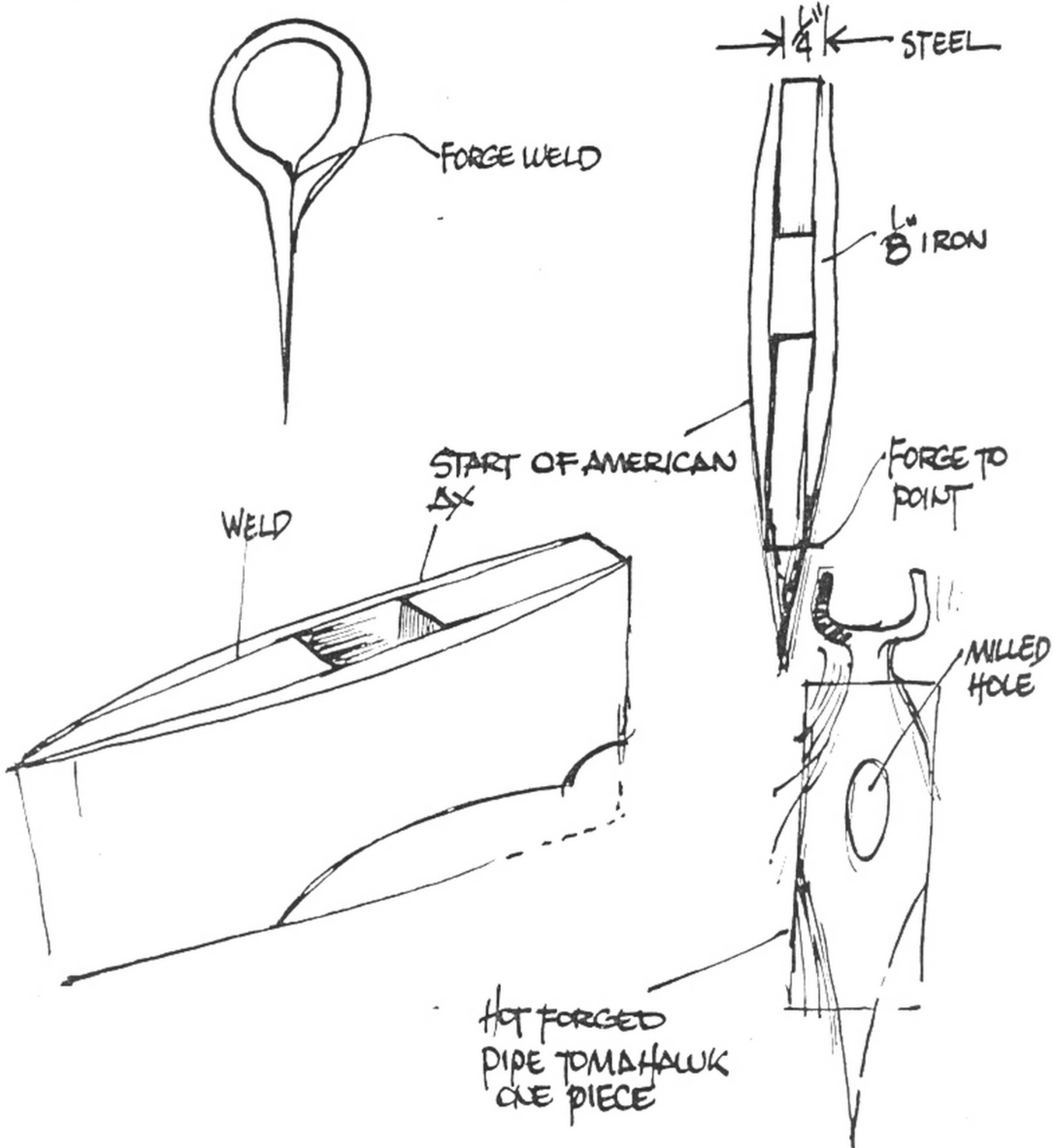
GENERAL INFORMATION



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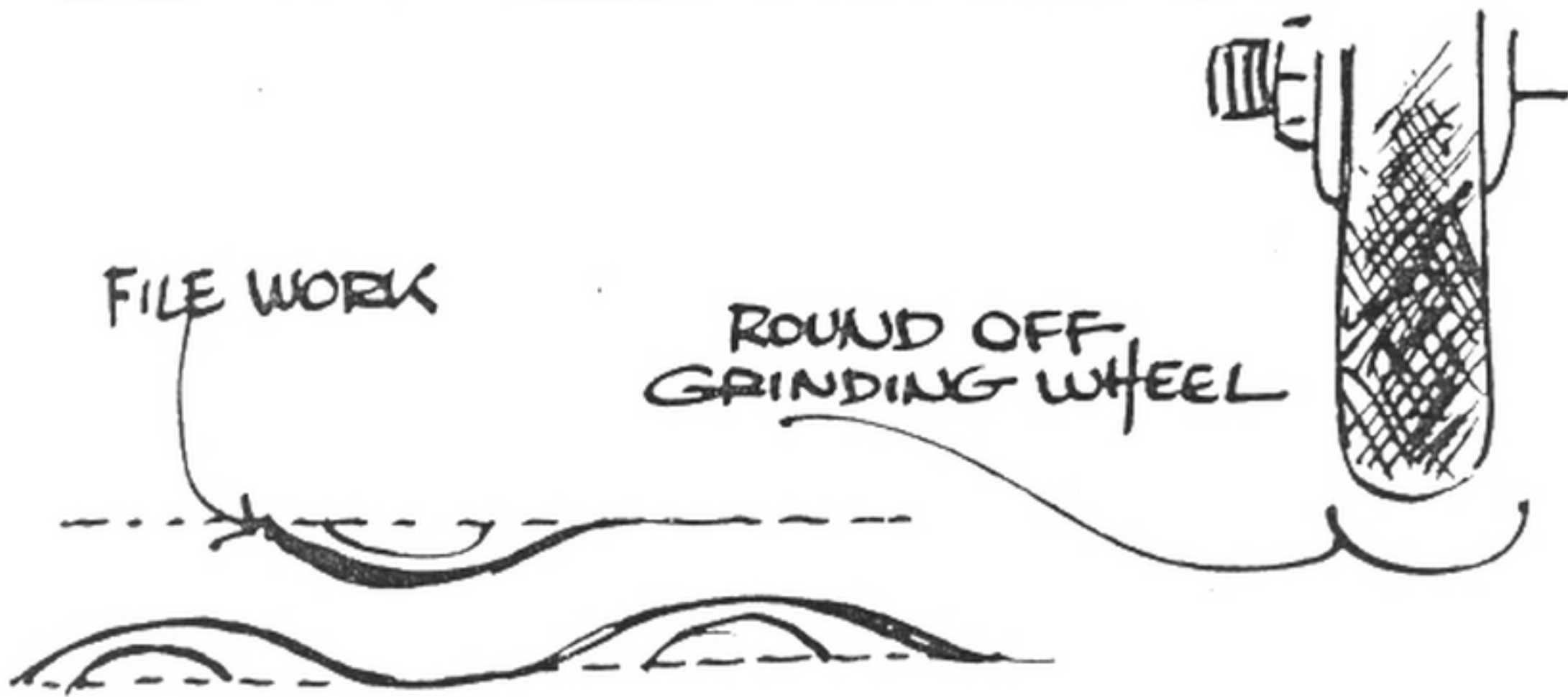
DAMASCUS REVIEW

$\frac{3}{8}$ " THICK



FILE WORK

ROUND OFF
GRINDING WHEEL



BASS WOOD USED AS WOOD LINERS IN SHEATHS
LEATHER SOURCE - SCHULTZ TANNERLY
TENNESSEE
120 SQ FT PER ROLL