



Knife Steeling Program – Theory Session

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Background

- This program was created in the collaboration of multidisciplinary researchers and employees in multiple pork plants.
- Identification of the proper methods to maintain knife sharpness using a steel
- Led to the creation of the video and manual used today
- Newfoundland researchers have worked to move this program into action in Newfoundland industry

- Involves a “train-the-trainer” approach
 - Allows worker representation in the project, and employee input in the project.
- The program in knife steeling can maintain blade quality and improve ergonomic factors:
 - Less cuts = less repetition
 - Less force = less strain
 - Reduced work effort = less fatigue and lowered risk of injury.

Knowledge...

- *of different parts of the knife and the steel*
- *of the importance of a sharp knife*
- *of the tools (knife and steel) and their maintenance*
- *of steeling techniques*
- *of the impact of work on the knife*

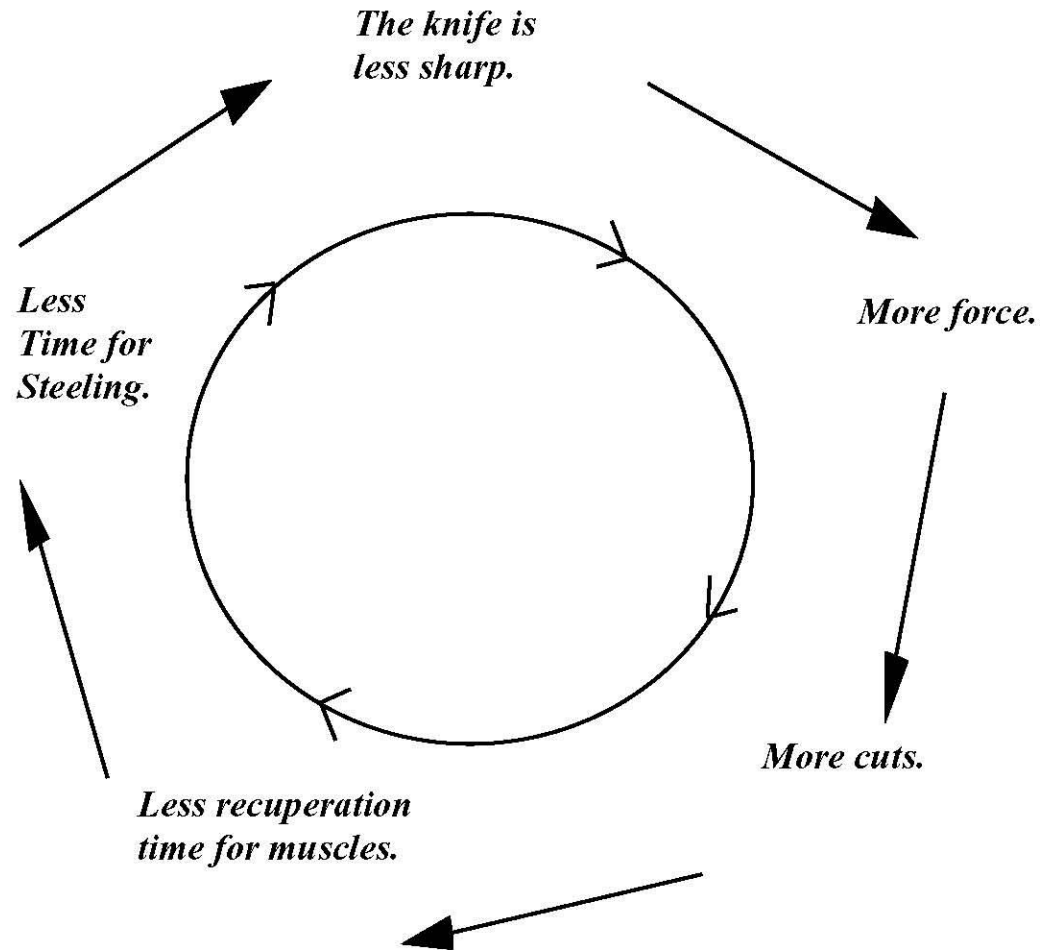
Ability...

- *to evaluate a knife (angle and smoothness of the bevel, state of the cutting edge)*
- *to produce a controlled, refined movement during steeling*
- *to work without damaging your knife*
- *to recognize your needs (tools, support)*

When the knife is not sharp:

- *You use more force;*
- *You make more cuts;*
- *There is less time to do each piece; The quality of the work can also be reduced.*

The less sharp a knife is, the less it will cut!



Parts of the Body at Risk



Prevention of Soft-Tissue Injuries

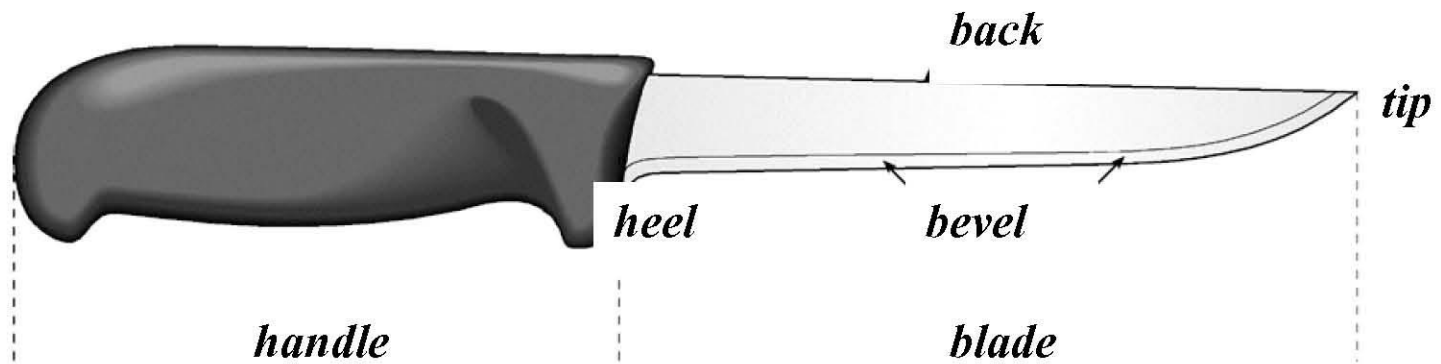
- *You reduce your force with a sharp knife*
- *Each steeling is important*
- *The worker's motivation is essential*

Importance of Steeling

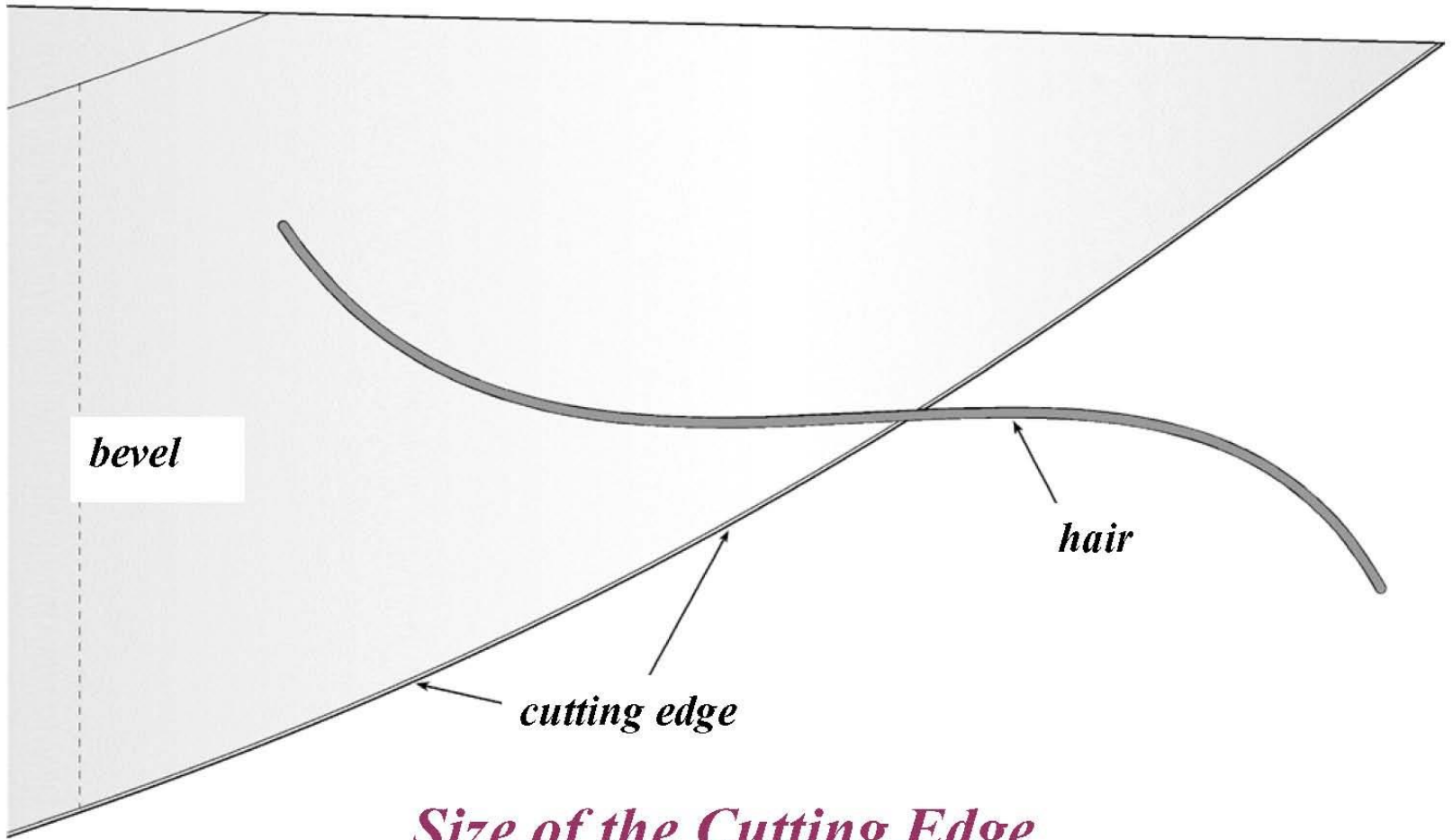
- *Steeling is repeated frequently (as often as possible, do not wait too long between each piece)*
- *Steeling can make up 10% of the work.*
- *Steeling must be done according to needs (station and individual)*
- *Important to be in control of your tools*

Learning Difficulties

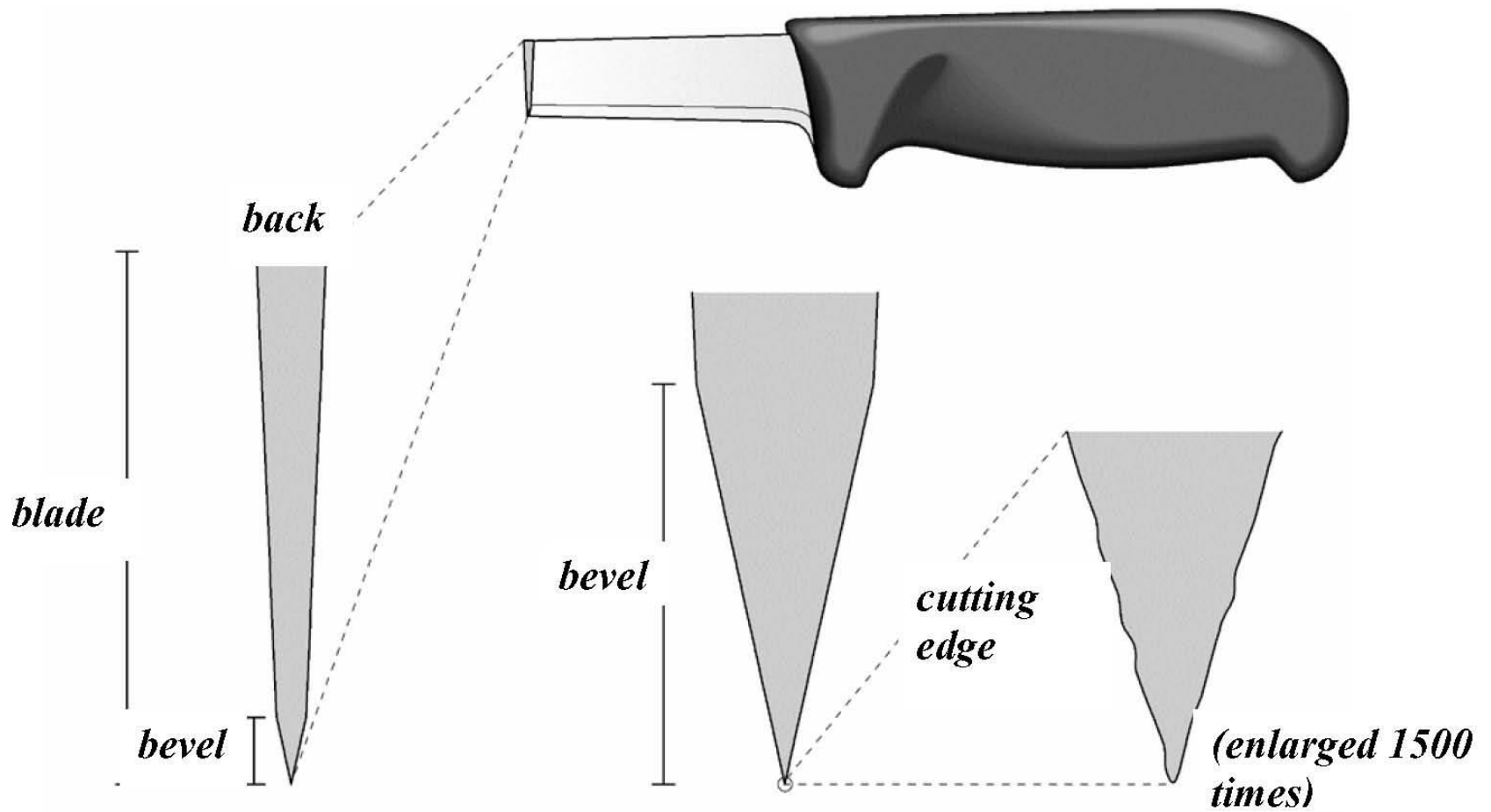
- *Impossible to see the cutting edge with the naked eye.*
- *Developing perception and coordination abilities.*
- *76% of abattoir workers who had not received training reported having problems with their knife.*
- *Worker : “I’ve been in this plant for 25 years and my knife isn’t sharp.”*
- *Expert Trainer : “It takes 10 years to learn to steel when training is done on the job!”*



Parts of the Knife

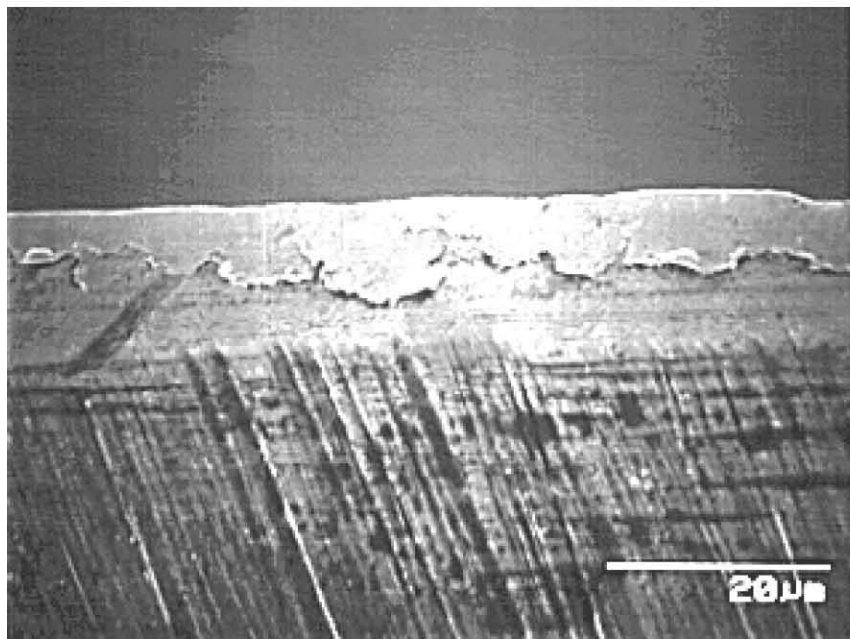


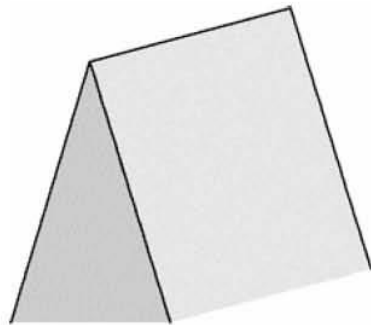
Size of the Cutting Edge



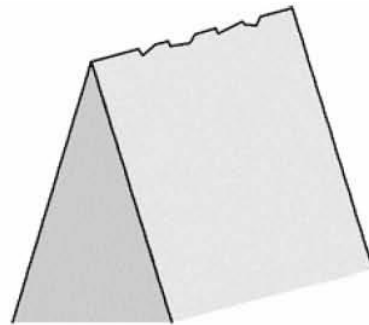
Parts of the Blade

The tiny size of the cutting edge

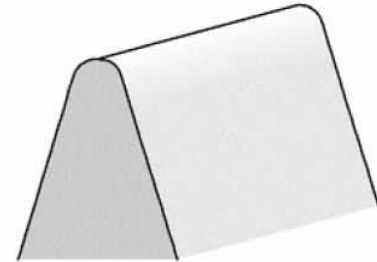




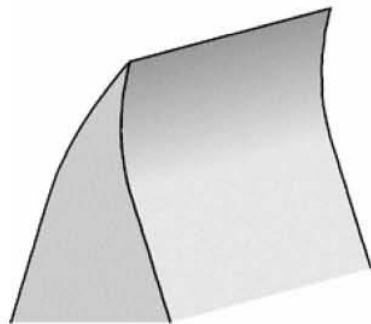
straight



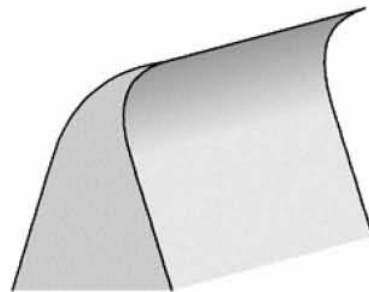
chipped



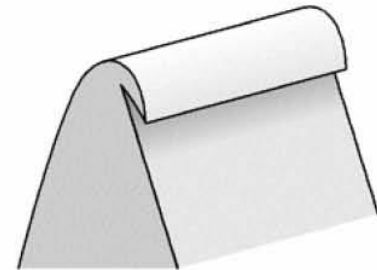
round (cutting edge absent)



slightly bent

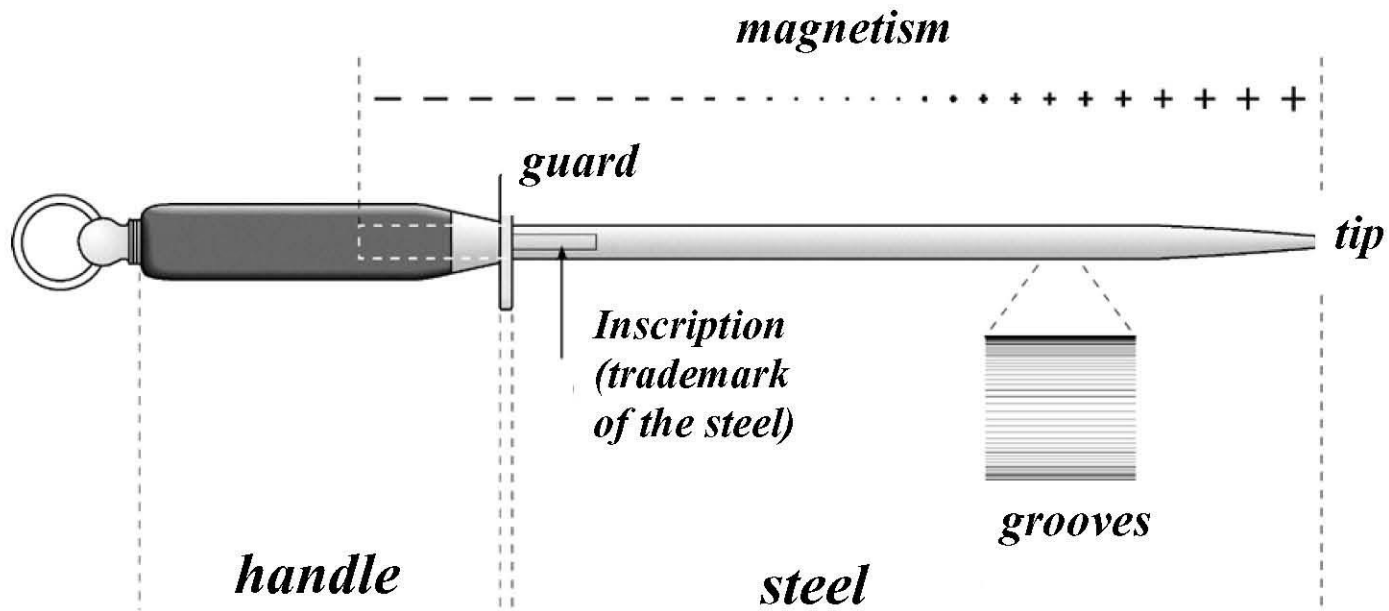


bent

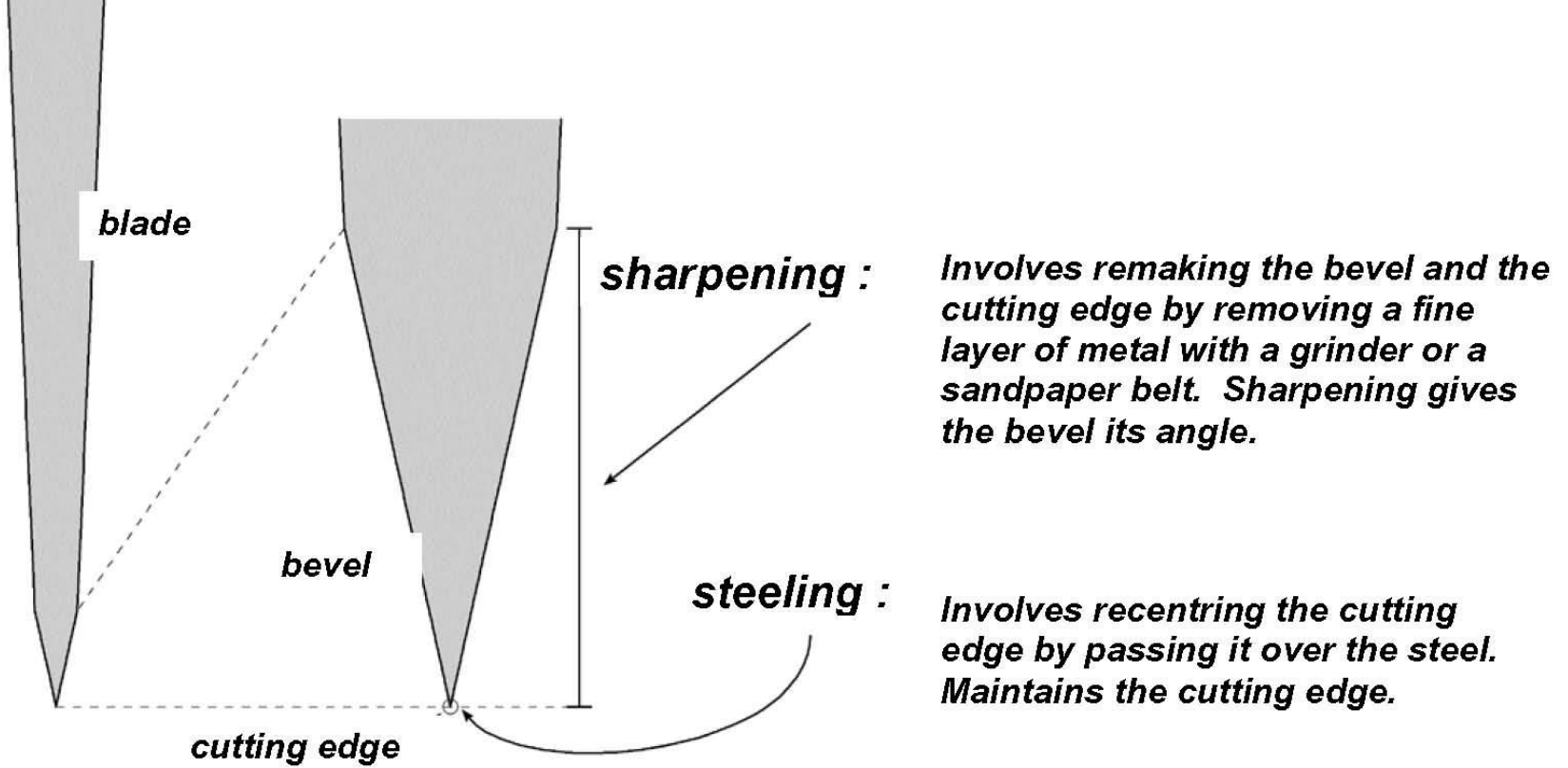


crushed

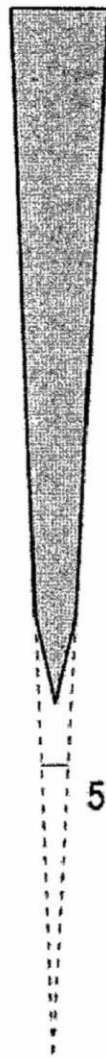
Six States of the Cutting Edge



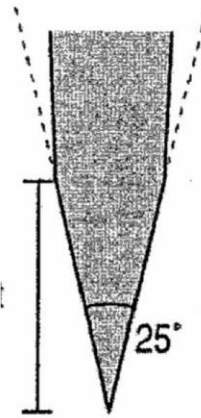
Parts of the Steel



Sharpening and Steeling



5°
angle of the blade



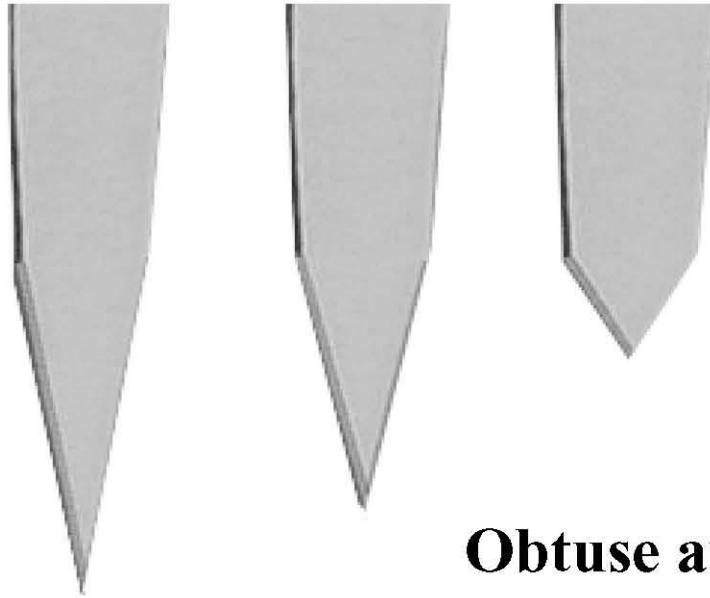
Bevel

25°

Angle of the bevel:
sharpening

The angles of the blade

Sharpening Angles



Acute angle

Obtuse angle

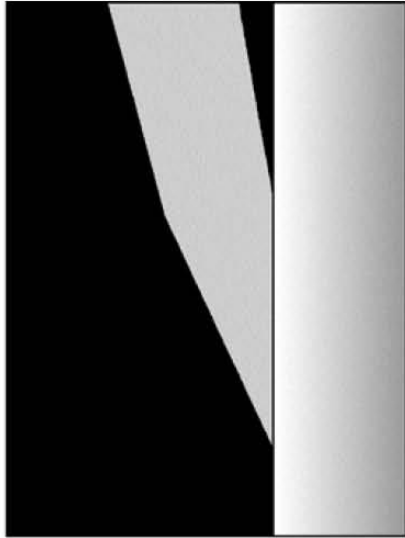
Types of Cutting Edge Angles



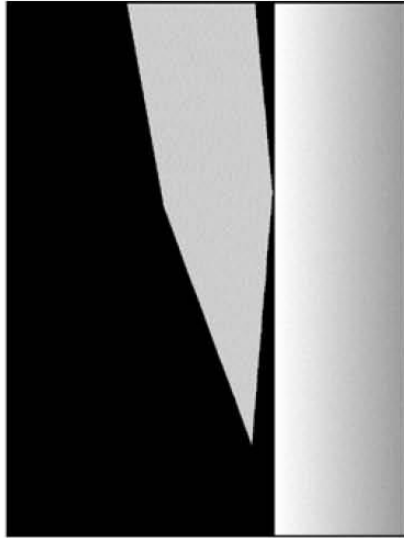
Right Angle



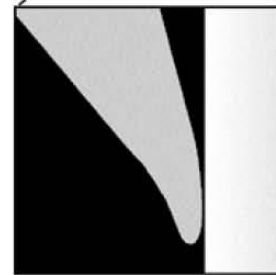
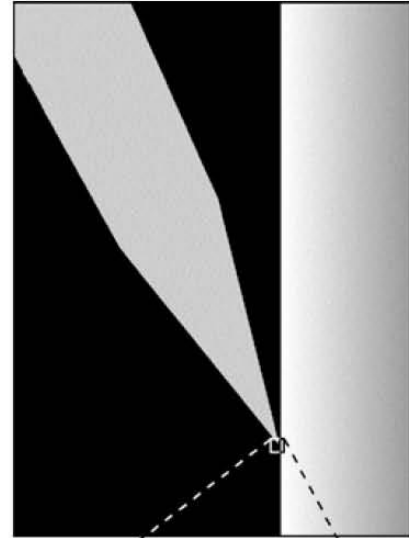
Rounded Edge



The support angle is the same as the angle of the bevel.



With an angle that is too small, the cutting edge will not touch the steel.



With an angle that is too big, the cutting edge will bend.

Angle of the Knife on the Steel

Steeling with a round Bevel



The cutting edge touches the steel



Too small an angle will have no effect



If the angle is too big it will turn the cutting edge

T-4.1.3

Step 2 : Picking Up and Positioning the Steel

A



B



C





T-8.2.1

Step 3 : Holding the Knife

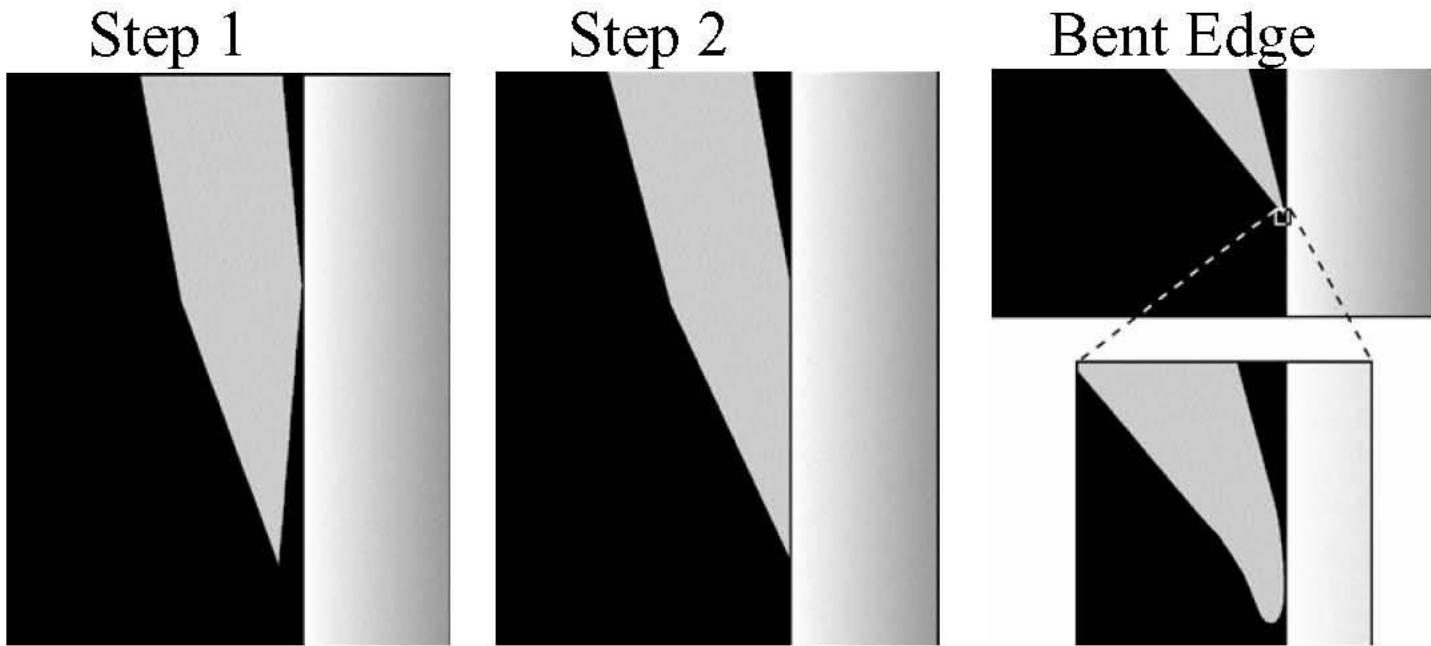
A



B



Step 4 : Positioning the Knife on the Steel



Steeling with a round Bevel



The cutting edge touches the steel



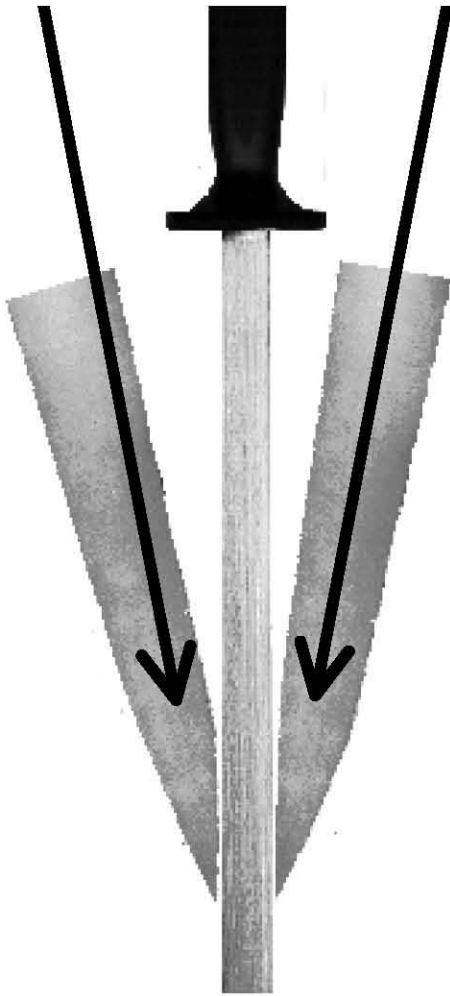
Too small an angle will have no effect



If the angle is too big it will turn the cutting edge

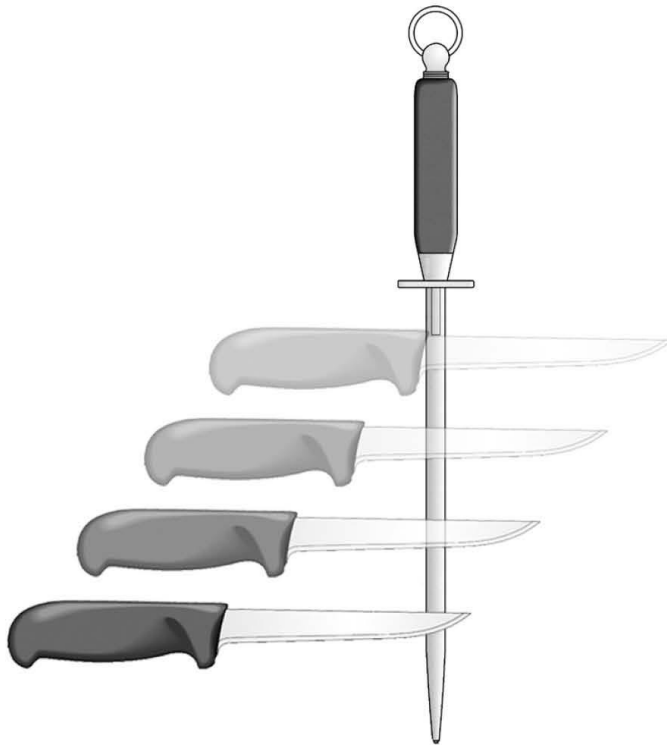
T-4.1.3

Different Steeling Angles on Each Side



The two angles represent a symmetrical tilt.

Step 5 : Moving the Knife Over the Steel



- **Feel the contact of the bevel on the steel and keep visual contact**
- **Slow speed**
- **Minimal pressure**
- **Be careful of the tip.**

Step 6 : Change Sides

- **Be careful of the tip.**
- **Angle often too open on the dominant hand's side (bends the cutting edge).**
- **Angle often not closed enough on the non-dominant hand's side (cutting edge not steeled).**

Step 7 : Number and Alternation of Passes

- **Never use more than two passes at a time on each side**
- **Finish on the side opposite to the one where the steeling began (even number of passes)**
- **Often a total of only one pass is needed per side; if steeling is done often enough.**

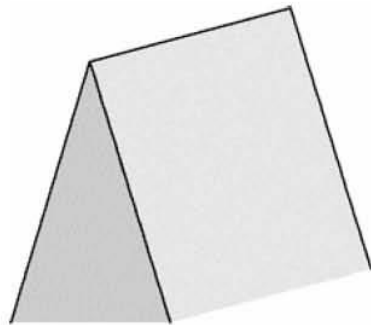
Step 8 : Evaluating the Quality of Steeling by Working with Meat

- **Remain attentive to your knife while cutting the meat.**
- **Notice any defects, such as the side to which the edge is bent.**

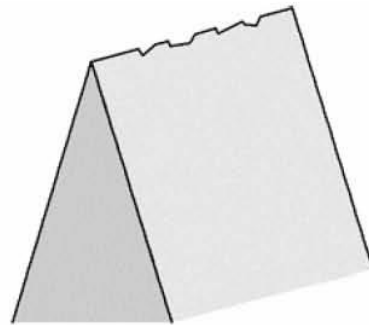
T-8.9

Step 9 : Beginning Steeling Again

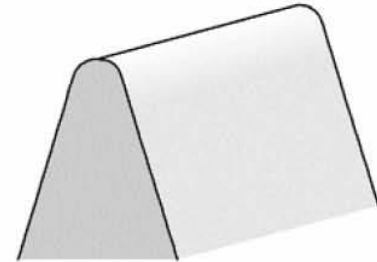
- **Keep a regular steeling rhythm rather than waiting for a reduction in the knife's performance (every 1 or 2 pieces).**



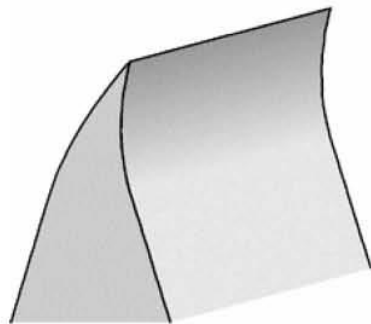
straight



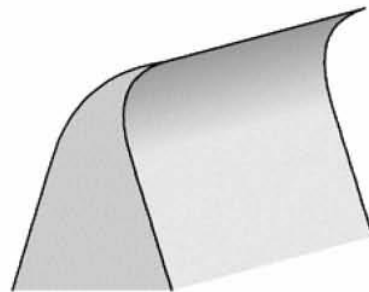
chipped



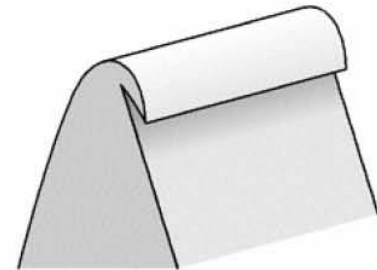
round (cutting edge absent)



slightly bent



bent



crushed

Six States of the Cutting Edge

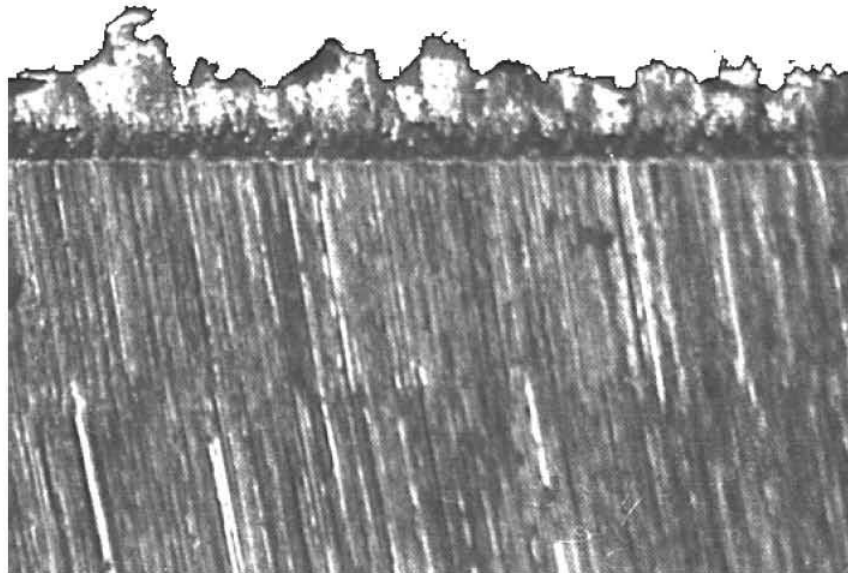
Waviness of the Edge Caused by Work



Cutting edge seen from above

Presence of Burrs After Sharpening

(bevel seen from the side)



Recognizing Faults in the Cutting Edge

- **With your fingers : especially for the sharpener**
- **With your eyes : bent, broken, or chipped cutting edge**
- **With the steel : feeling faults in the cutting edge**
- **In the meat : evaluating the cutting edge while cutting**

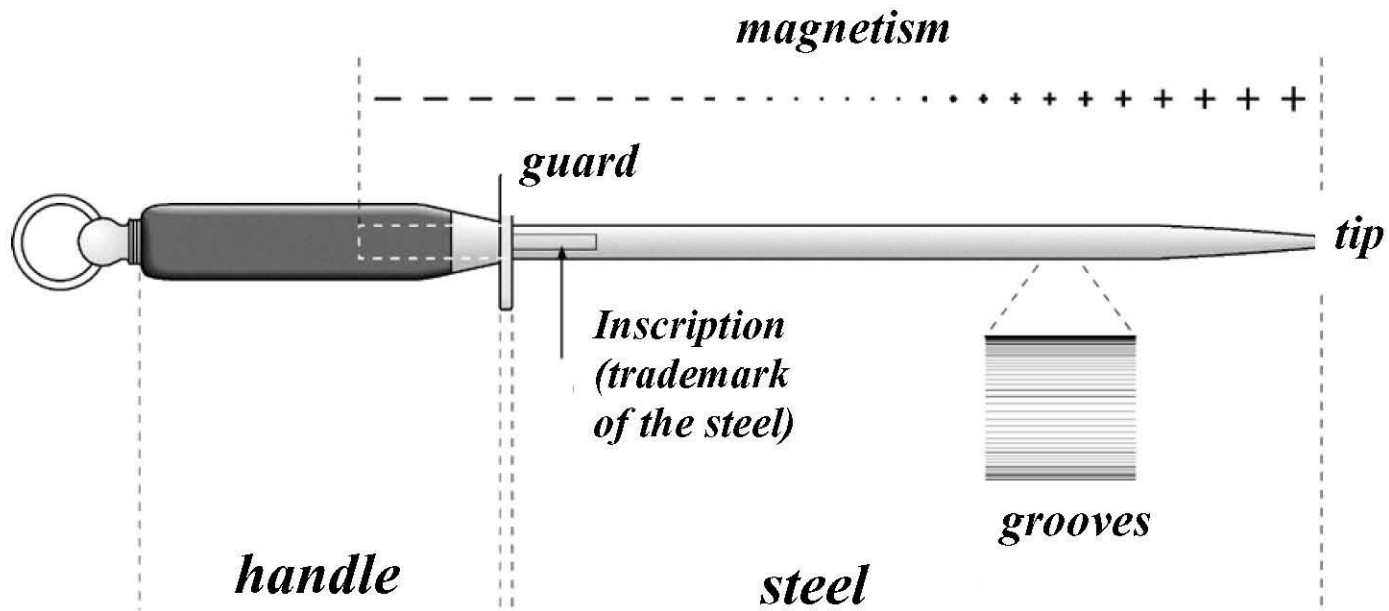
Bringing Back the Cutting Edge of a Bent Knife

- **Several Techniques :**

- **an extra pass on the steel on the side where the cutting edge is bent (the best method)**
- **slightly increase the pressure on the bent side**

To bring it back or not?

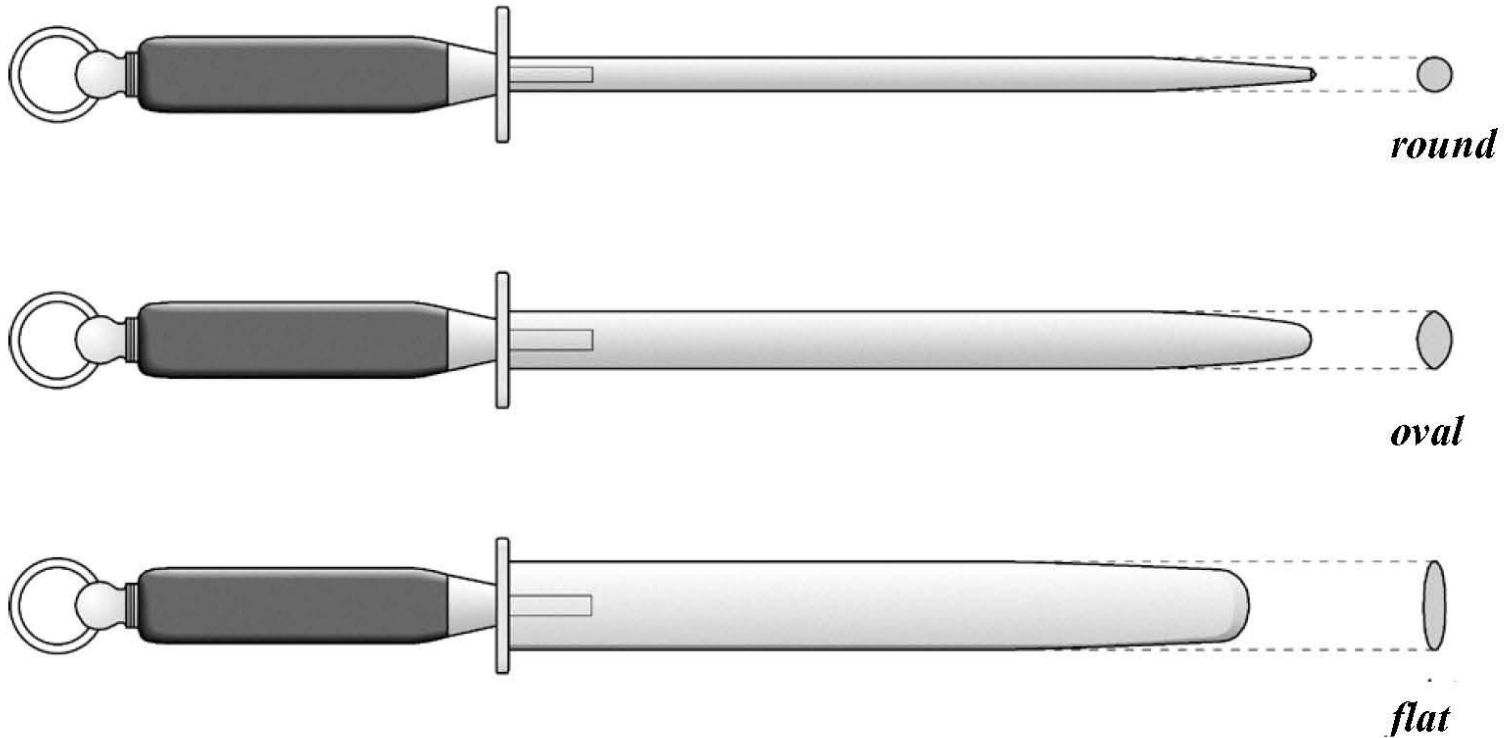
- **loss of sharpness if too bent**
- **demands of the work station**



Parts of the Steel

Different Types of Steels

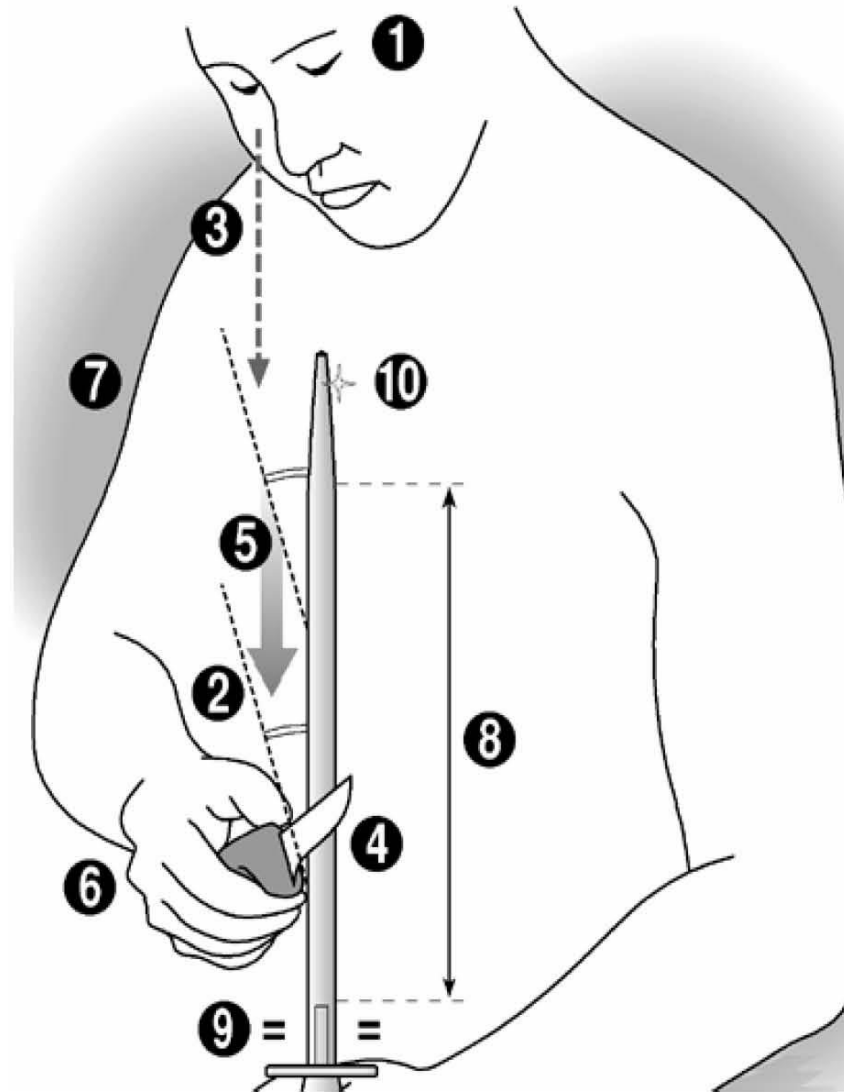
*cross
section*



Three Types of Steels

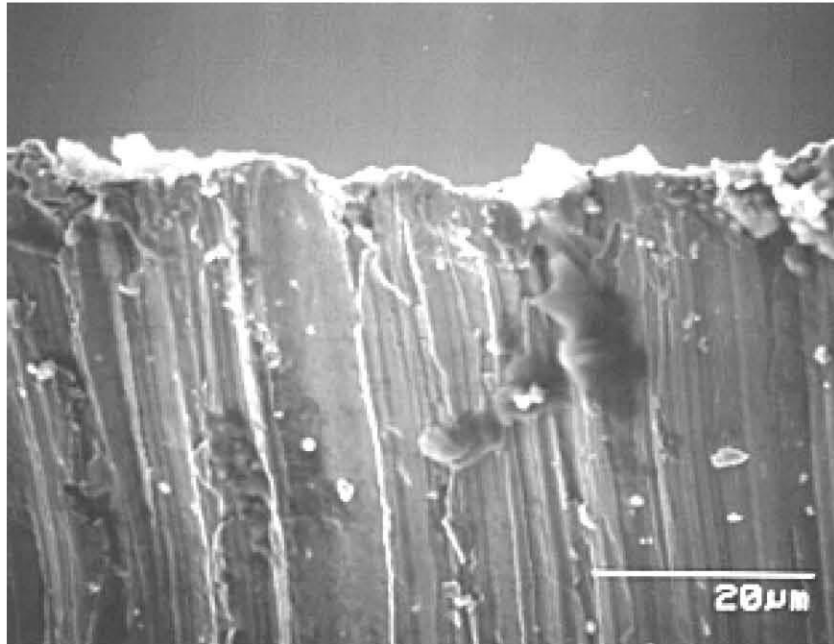
The Basic Principles of Steeling

1. Great concentration : visual attention, tactile perception, and coordination of movements.
2. The angle supporting the blade on the steel is the same as the angle of the bevel.
3. Watch the support angle of the blade.
4. The blade is supported on the steel without applying pressure. The steel is kept very stable.
5. While moving the knife, the angle and the pressure are kept constant.
6. The hand holds the knife lightly and the wrist is kept very straight.
7. The shoulder and the elbow make slow, easy movements.
8. The ends of the steel are avoided.
9. Alternate, passing the knife over the steel an even number of times on each side.
10. The knife and the steel are clean.



State of a new knife sharpened by...

The manufacturer



The expert

