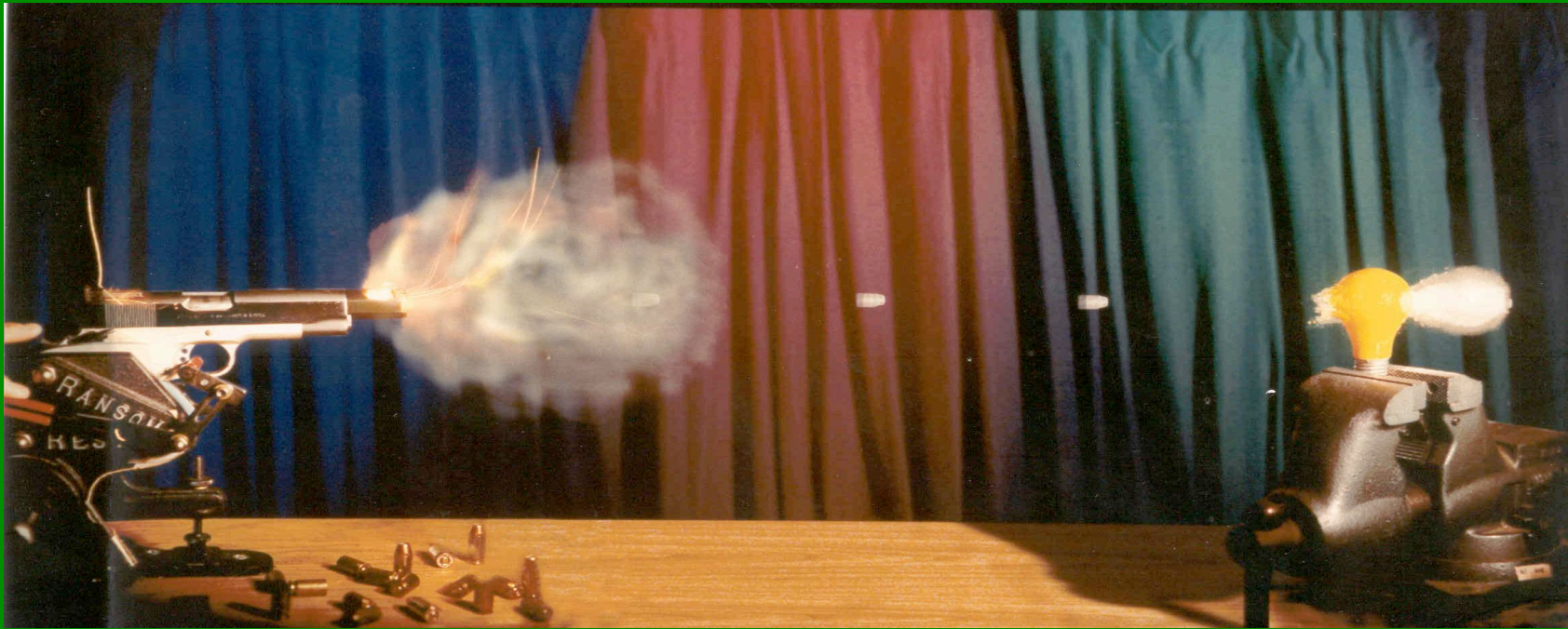


Firearms Identification



Mr. Tomasevich Forensics



Firearms Identification

A discipline mainly concerned with determining whether a bullet or cartridge was fired by a particular weapon.

Barrel

-A) Land

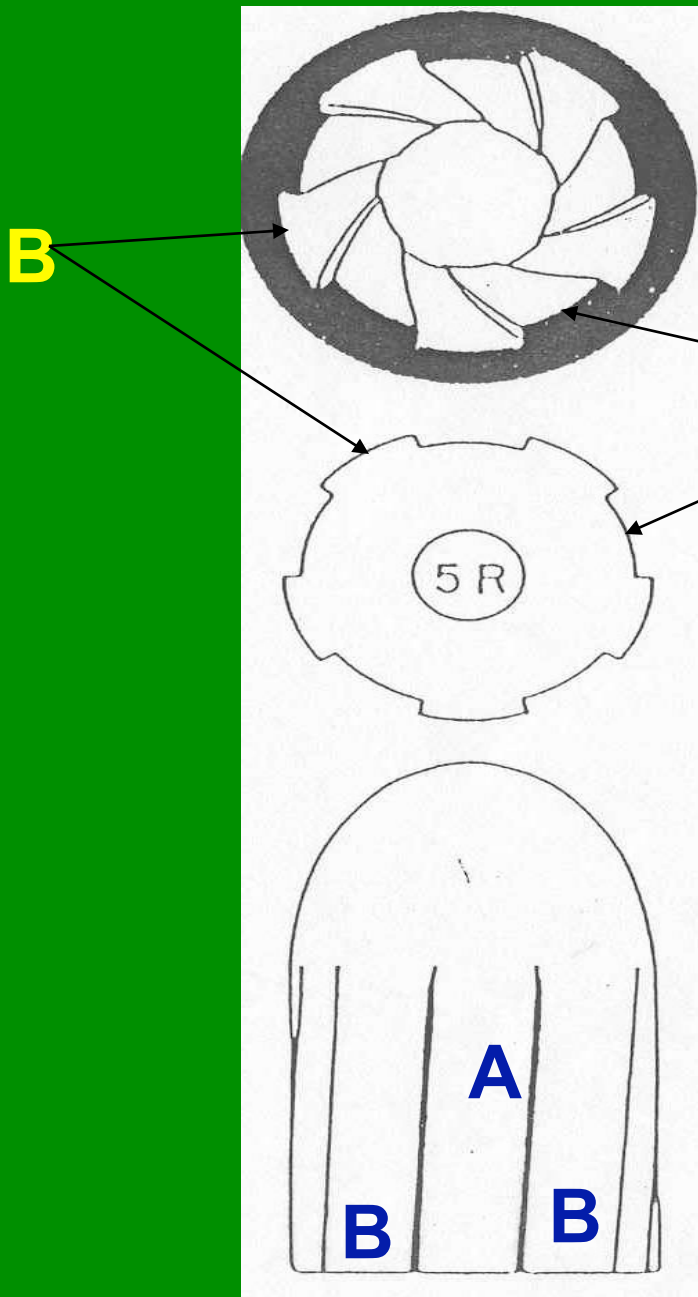
-B) Groove

Bullet

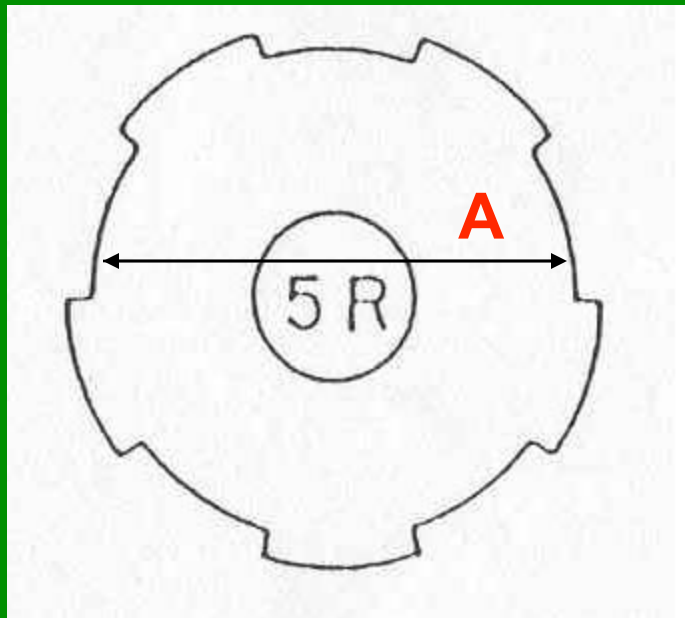
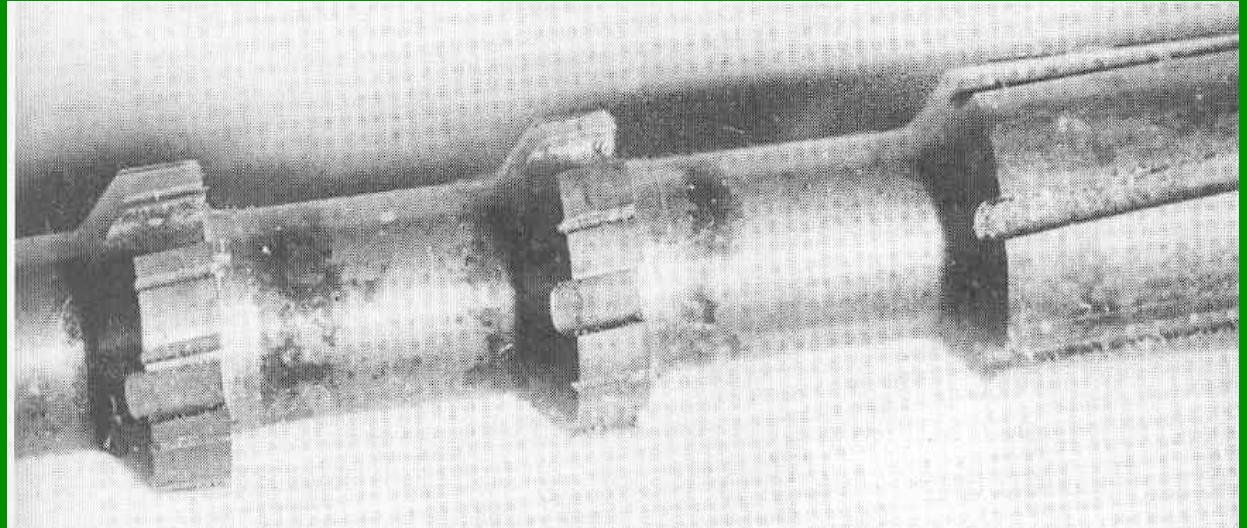
-A) Land impression

-B) Groove impression

Rifling – the spiral grooves that are formed in the bore of a firearm barrel. Makes projectile spin when fired.



Broach cutter
used to create
rifling
impressions in a
barrel.



A -Caliber –the diameter of
the bore of a rifled firearm.
The caliber is usually
expressed in hundredths of an
inch or millimeters. Example .
22 caliber or 9mm.

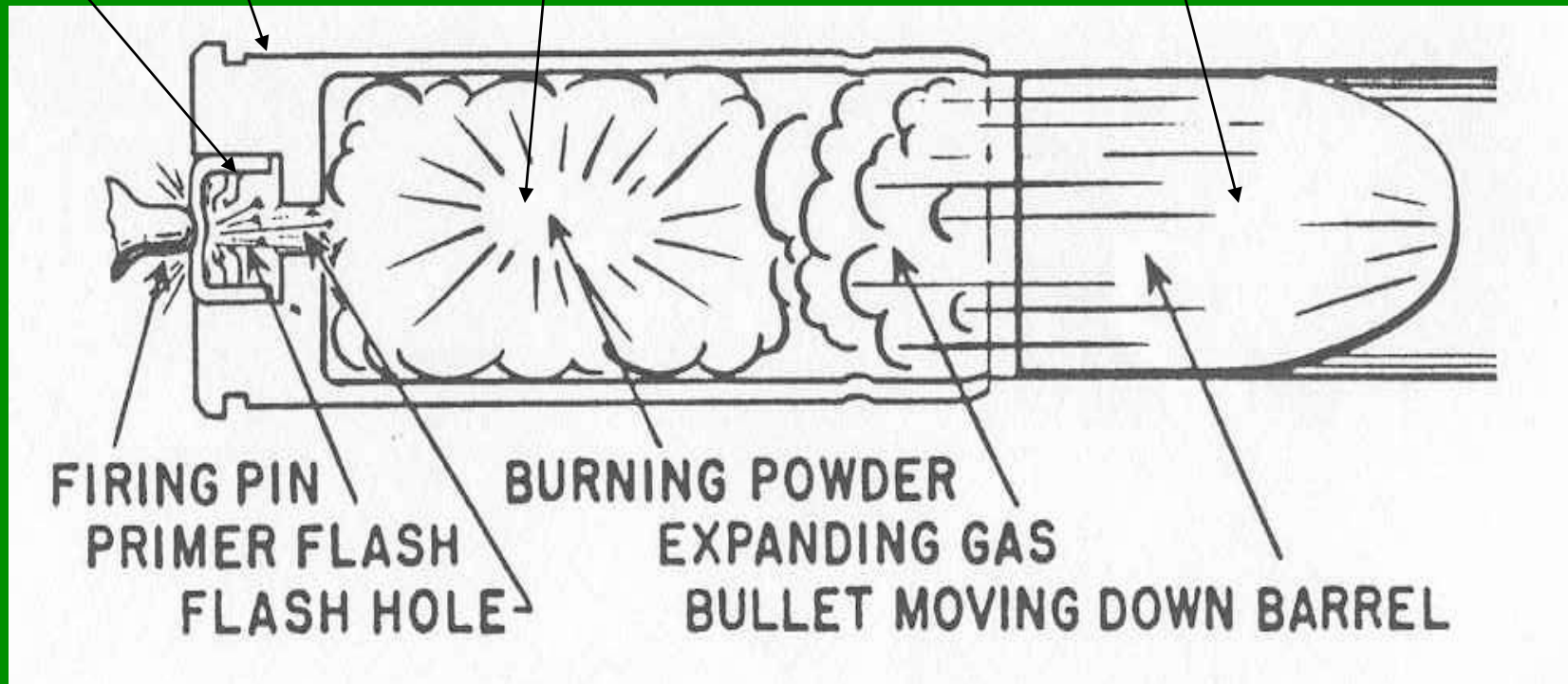
Cartridge Parts and How it Works

Cartridge Case

Lead Bullet

Primer

Gun Powder



Bullet Comparison

Class Characteristics

Different gun manufacturers use different rifling techniques. These techniques impart the class characteristics of a bullet.

- Number of lands and grooves
- Width of lands and grooves
- Depth of lands and grooves
- Pitch
- Twist

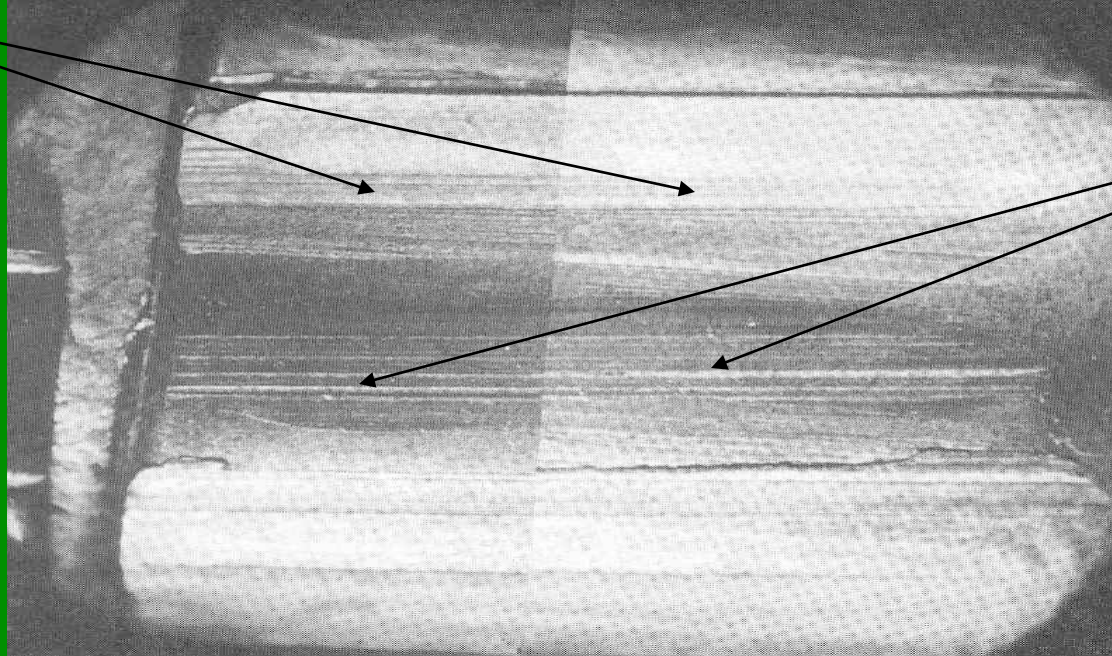
Bullet Individual Characteristics

- A cross section of a gun barrel will show small grooves or striations all along the lands and grooves (machine markings)
- These are created when the barrel is rifled. No two gun barrels have the exact same markings.
- These markings leave unique striations or impressions on a bullet. This allows a bullet to be traced back to a particular firearm.



Bullet Individual Characteristics

A



B

It is possible to determine the bullet on the left and the bullet on the right are from the same gun by matching the striations. See examples A and B

Cartridge Case Class Characteristics



Manufacture (i.e.. Winchester)



Shape (i.e.. rimless, rimmed)



Caliber (i.e.. 45 ACP, 9mm, 12gauge)



Composition (i.e.. brass, steel, plastic)

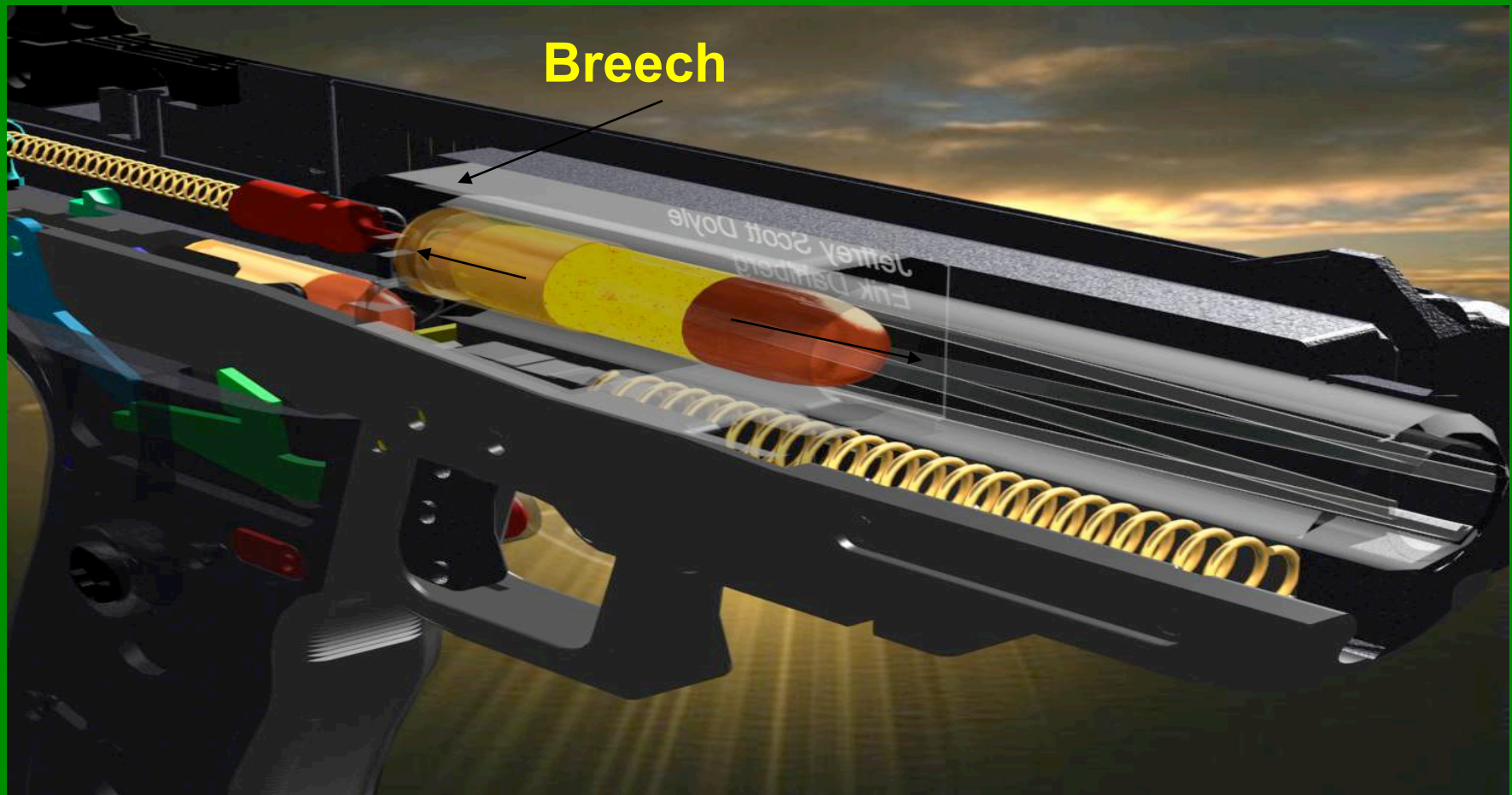
Cartridge Case Individual Characteristics

- Firing Pin Impressions**
- Breech Face Marks**
- Ejector Marks**
- Extractor Marks**



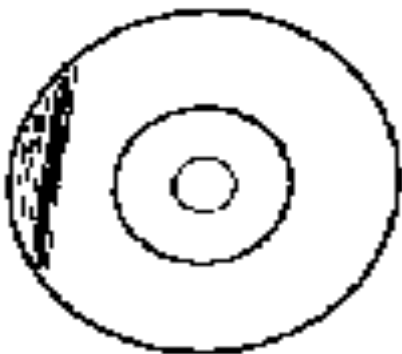
Ejector (not shown)

Heckler & Koch USP 45



When a cartridge is fired, the explosion forces the bullet down the barrel and the shell casing is forced back against the **breech**. This leaves impressions unique to the individual gun's **breech** on the shell casing.

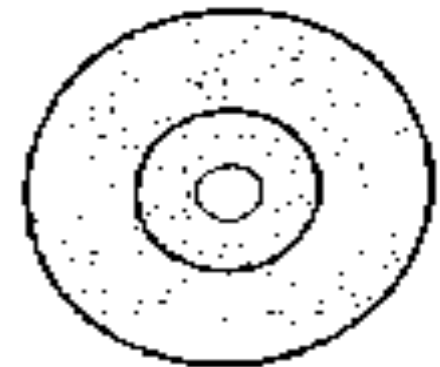
Examples of Breech Markings



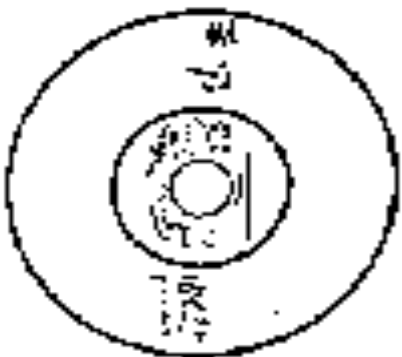
HEAVY LEFT
SIDE



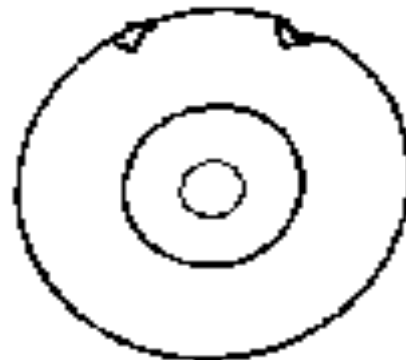
VERTICAL



SANDBLASTED



MOTTLED



RIM DENTS



MOUSE EARS

Firing Pin Marks



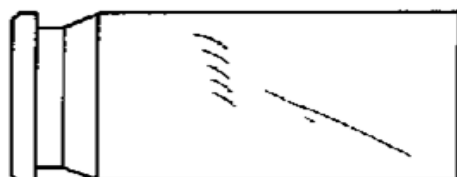
In order to fire the cartridge, the primer must first be ignited. To accomplish this a **firing pin** strikes the center ring of the cartridge. This will in turn leave a distinct impression that is unique to the **firing pin** of that particular gun.

Breech Marks

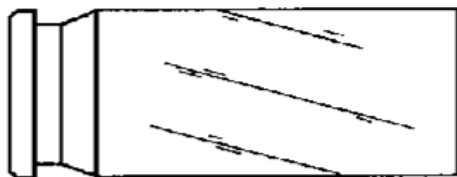
Firing Pin Mark



Extracting Pin and Ejector Marks



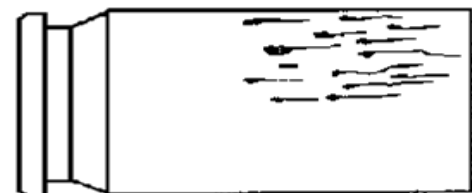
CURVED



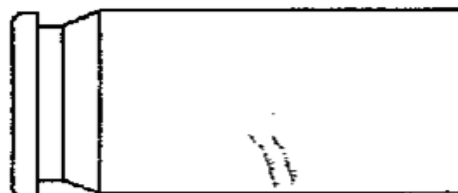
DIAGONAL



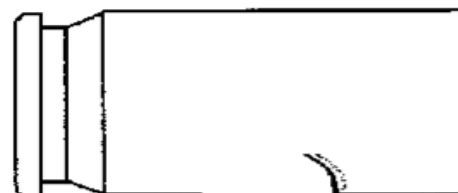
SPIRAL



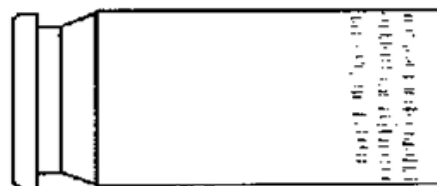
"DIRT FLOW" CHAMBER MARKS



LIGHT RAMP BULGING



HEAVY RAMP BULGING



"THIN" CHAMBER MARKS

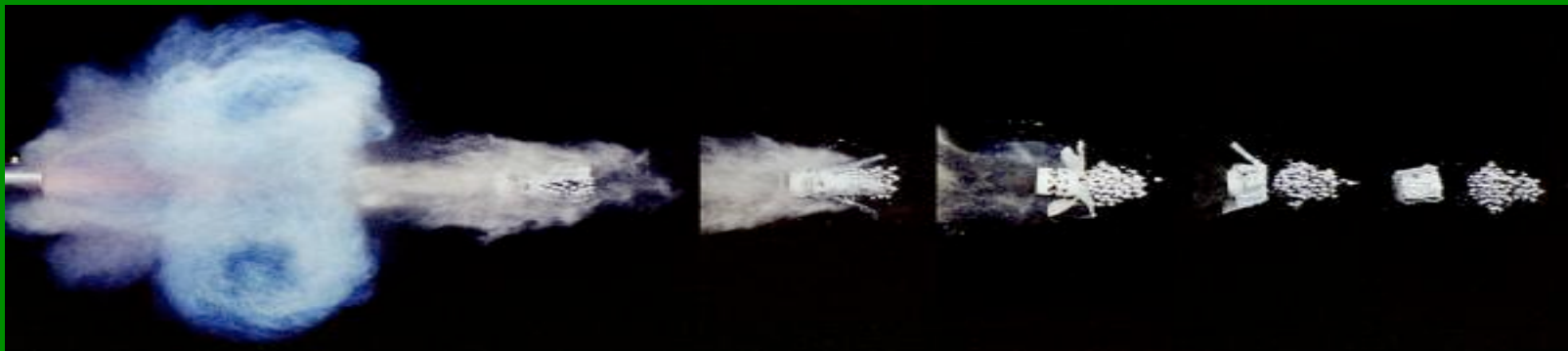
The **extracting pin** and **ejector** throw the spent shell casing from the chamber of the gun.

These leave marks on the shell casing that are unique to those parts on that particular firearm.

Shotgun identification



Shotguns have **smooth** barrels with not rifling. Therefore there are no land or groove marks left on the bullet. Identification can still be made by comparison of **extractor/ejector** markings on shotgun shell.



REVIEW

Define the term “Firearm Identification”.

The discipline concerned with determining if a bullet or cartridge casing was fired by a particular gun.

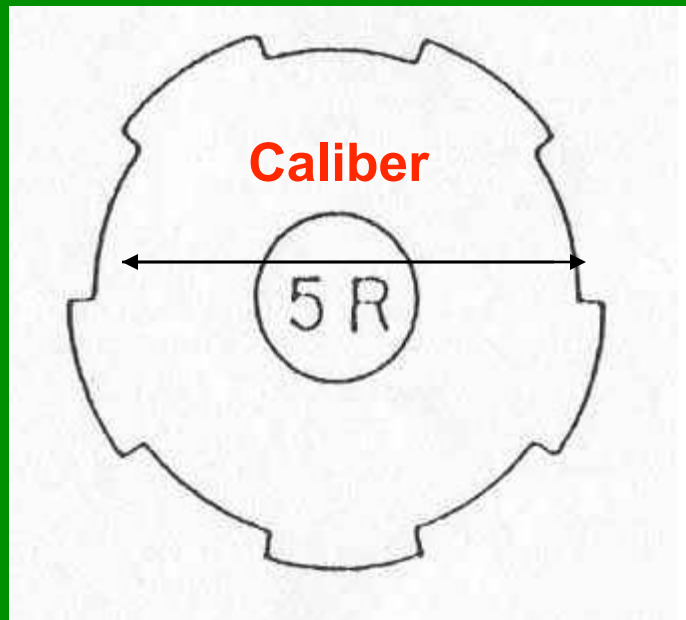
REVIEW

What is the purpose the lands and grooves that comprise the rifling in a gun barrel?

The lands and grooves make the bullet spin as it exits the gun barrel. This makes the bullet fly more accurate.

REVIEW

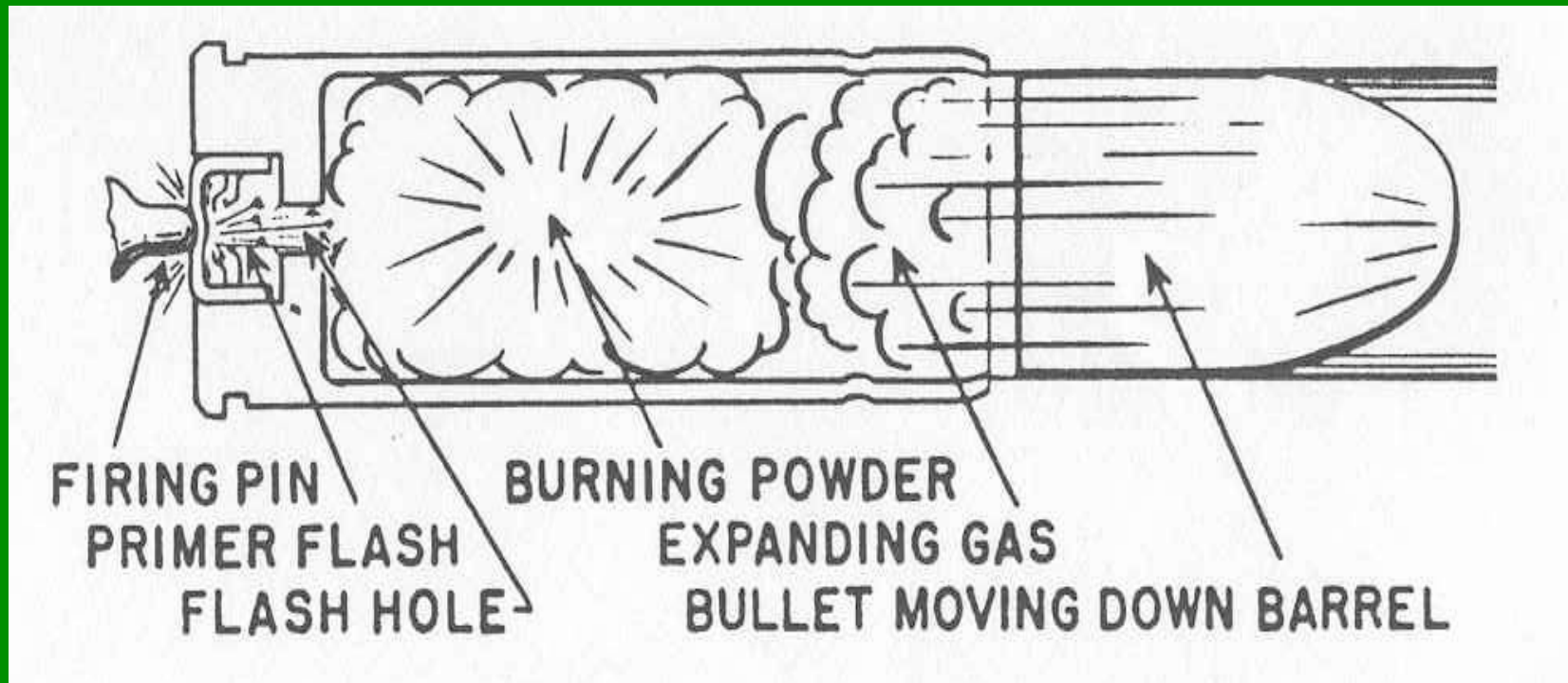
How do you determine the caliber of a gun?



You measure the distance from land to land in hundredths of an inch or mm.

REVIEW

What are the four parts of a cartridge?



REVIEW

Pretend you recover a bullet from a crime scene. How could you determine what kind of gun fired that bullet?

- The number of land and groove impressions**
- The distance between the land and groove impressions**
- The pitch and twist of the land and groove impressions.**

REVIEW

What type of individual characteristics can be used to match a shell casing back to an individual gun that fired it?

- Firing pin impressions**
- Breech impressions**
- Extracting pin marks**
- Ejector marks**

REVIEW

What is the difference between class characteristics and individual characteristics?

Class characteristics are general and can trace something back to a class or group (a type of shoe or tire). Individual characteristics can trace something back to a particular source(a particular persons shoe or a particular car).

REVIEW

What type of gun would you not be able to trace back to the bullet that fired it?



Shotguns do not have rifling and therefore do not leave impressions on the bullet.