

Last class -

Ceramic tools

Cast irons

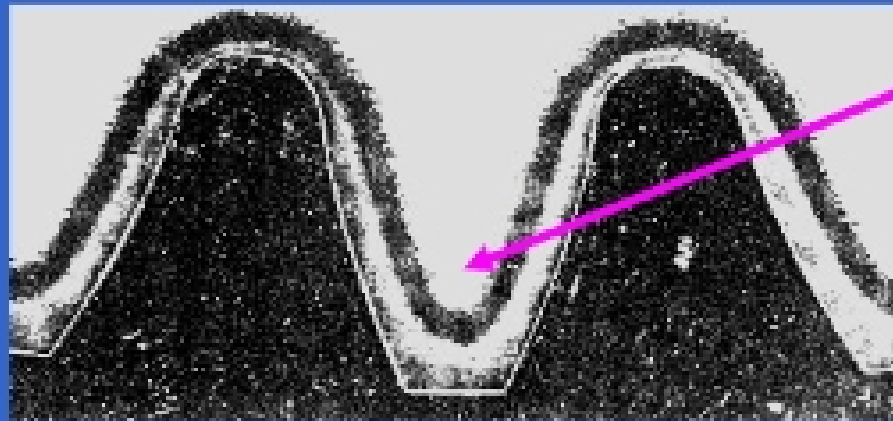
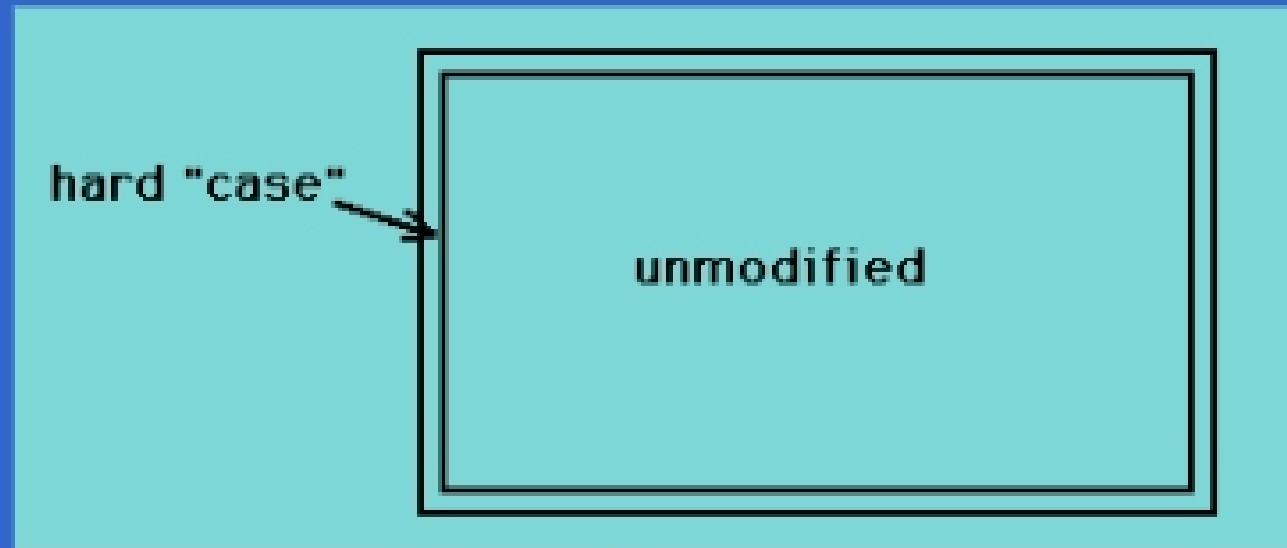
Today -

Case hardening

Hardenability test

Quenching design

# Case hardening



Gear tooth

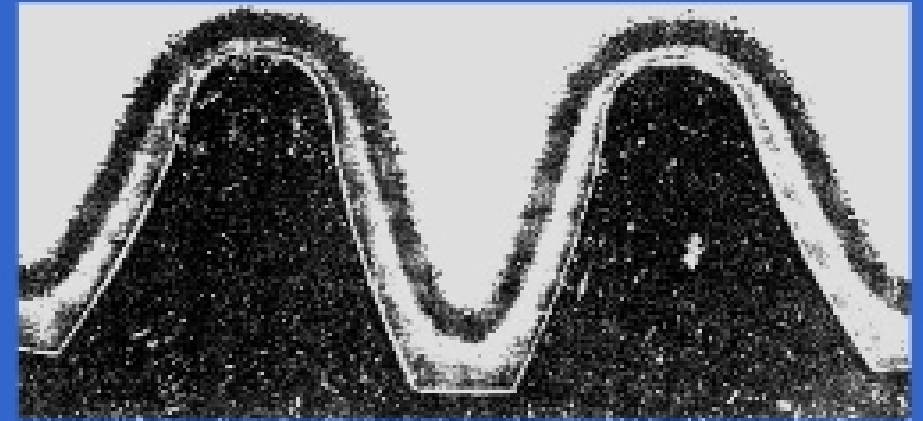
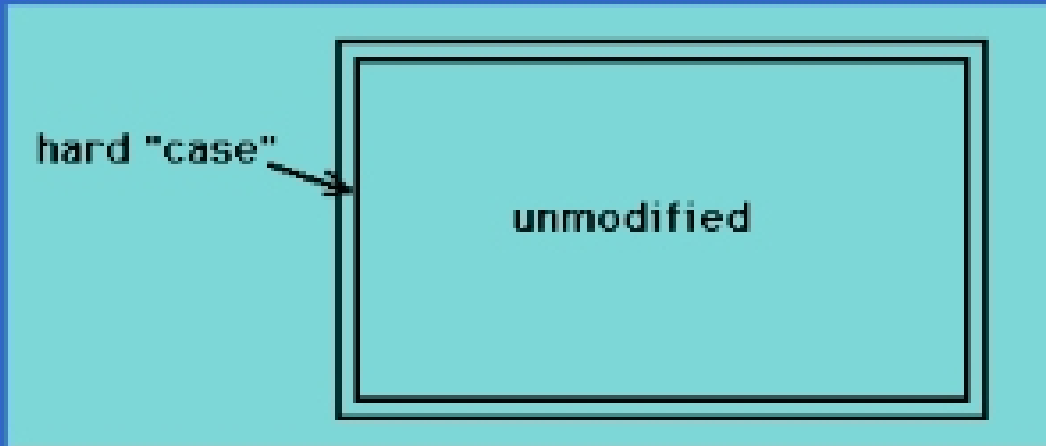
Carburizing - pack & gas - add C from CO gas

Nitriding - add N from

$\text{NH}_3$   
Carbonitriding - add C  
& N from CO &  $\text{NH}_3$

Case must be Q & T, except for nitrided

# Case hardening



## Alternate case hardening method

Induction hardening -  
surface heating by  
high-frequency AC, then  
Q & T