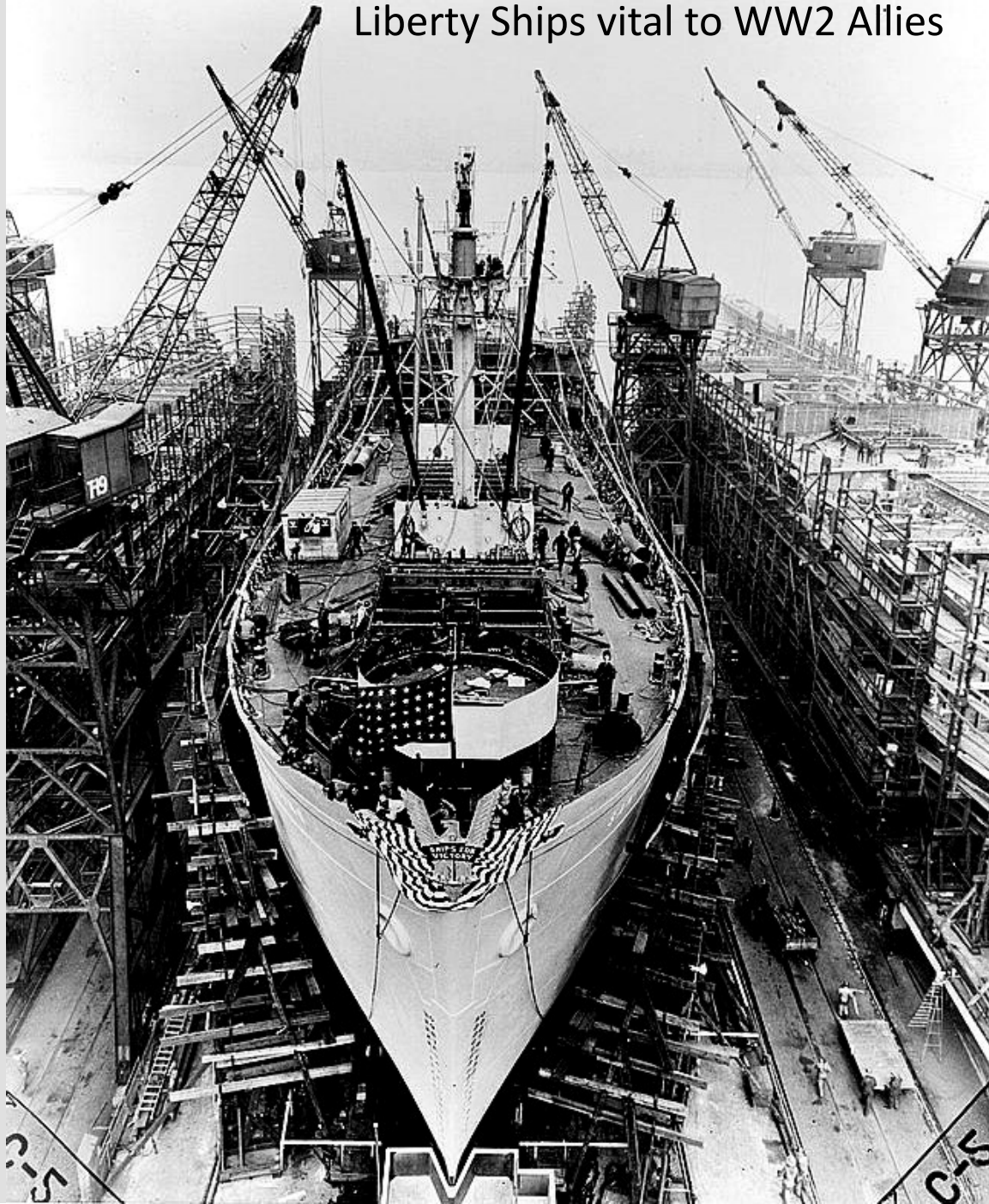
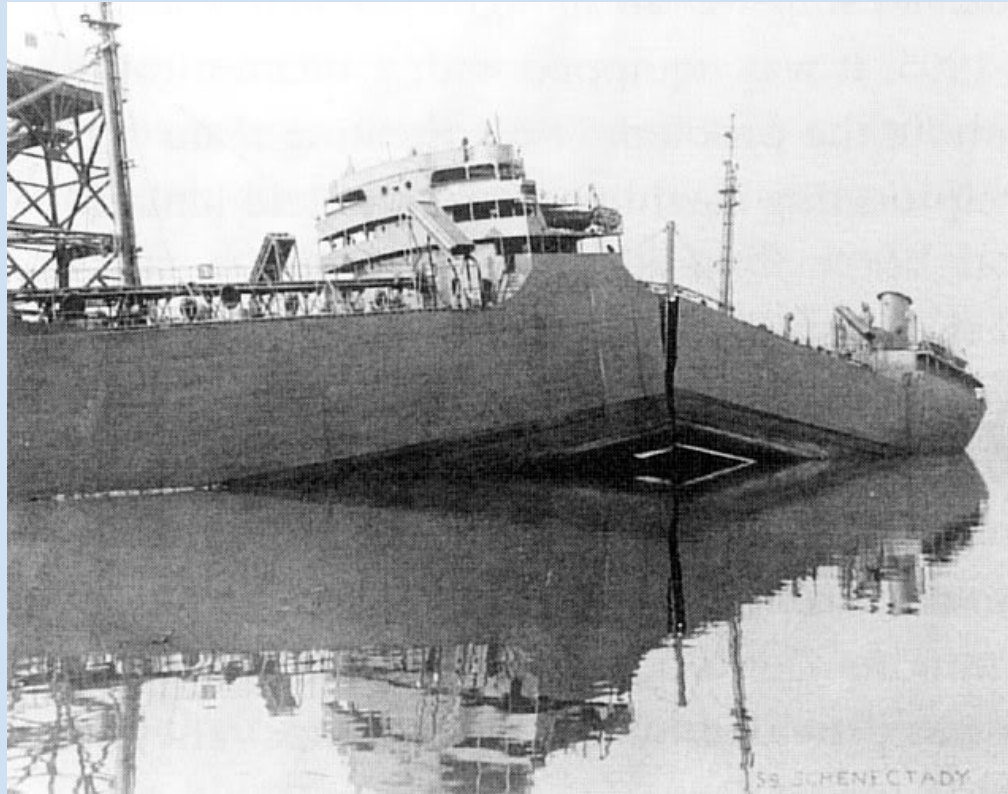


Liberty Ships vital to WW2 Allies





Formed mysterious cracks at sea

De Havilland Comet, world's first commercial jetliner (1950s)...



De Havilland Comet, world's first commercial jetliner (1950s)... In 1954, two mysteriously broke apart in mid-air, killing dozens and bankrupting the company.





Todd Murray



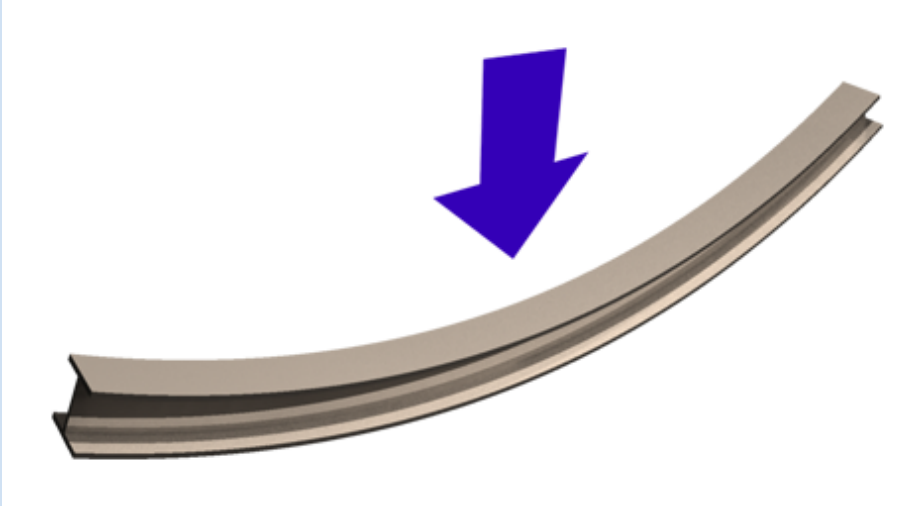
The I-35W Mississippi River Bridge
before it collapsed suddenly in 2007.

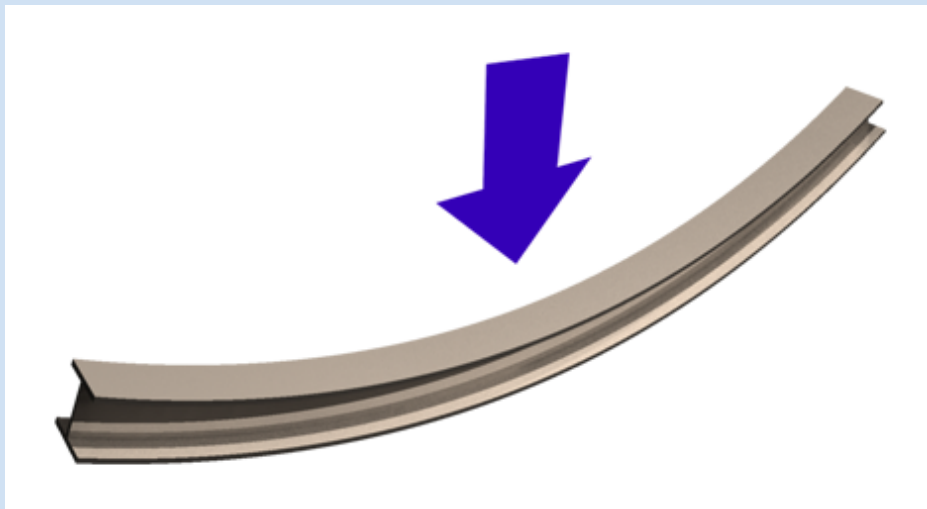


Security cameras video-tapped the collapse.

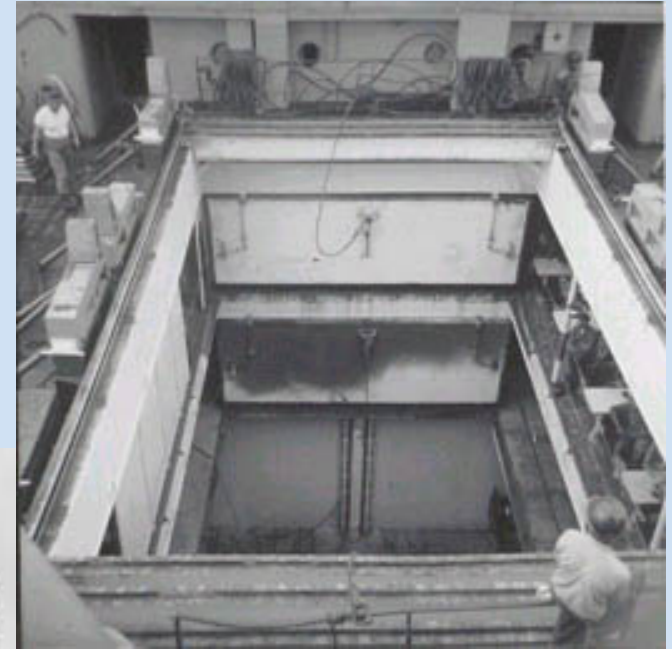
Why do the things we make sometimes fail?







How is a dandelion stem like an I-beam?



Cracks in Liberty Ships started at squared corners of hull openings



Cause of cracking discovered by engineer Constance Tipper, whose work saved the vital WW2 shipping activity



Cracks in Liberty Ships started at squared corners of hull openings

Crash of the Comet due to cracks that formed in the window corners
(that's why airplane windows today are oval)

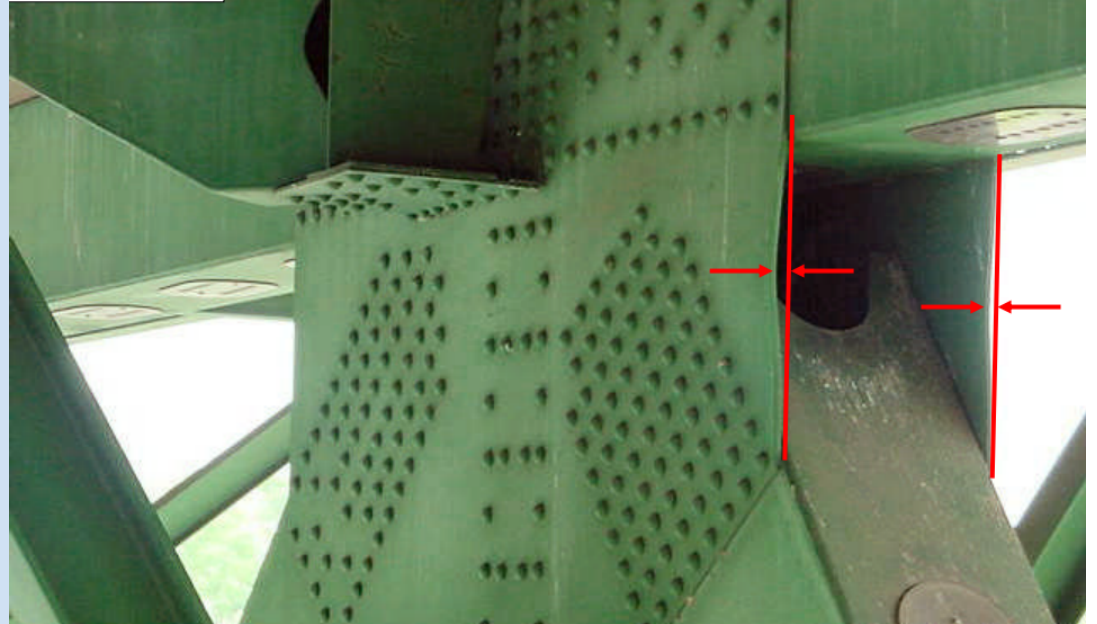


Air-Britain Photographic Images Collection

De Havilland Aircraft via R.A. Scholefield

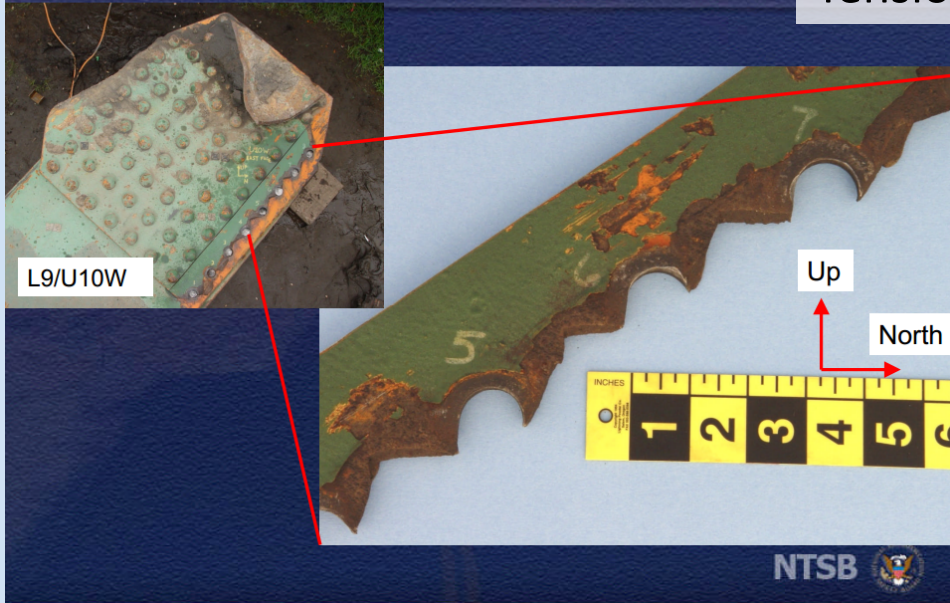


I-35 Bridge collapsed due to the build-up of stress concentration in the joint. The first sign was the plate that bowed under compression.

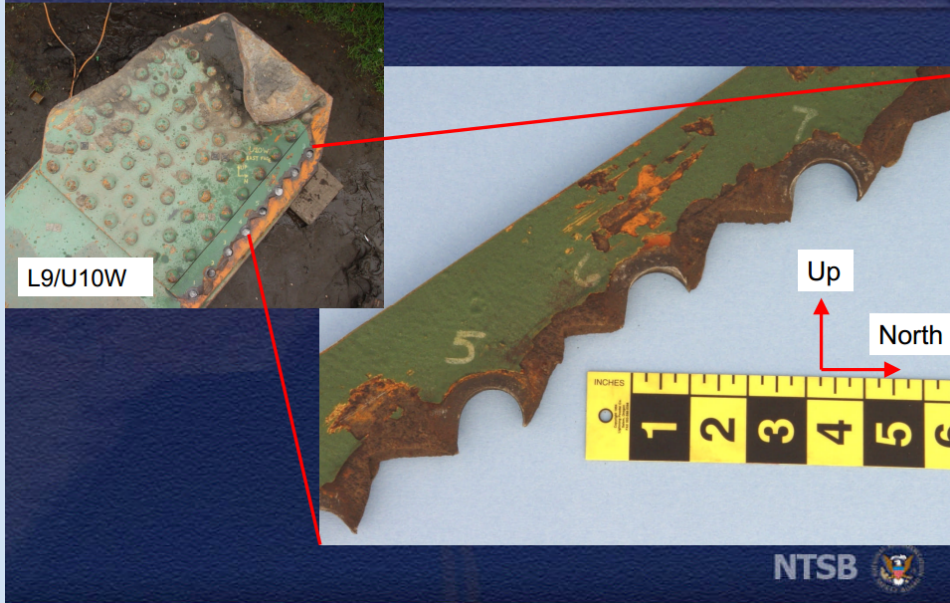


Initial Tension Fracture

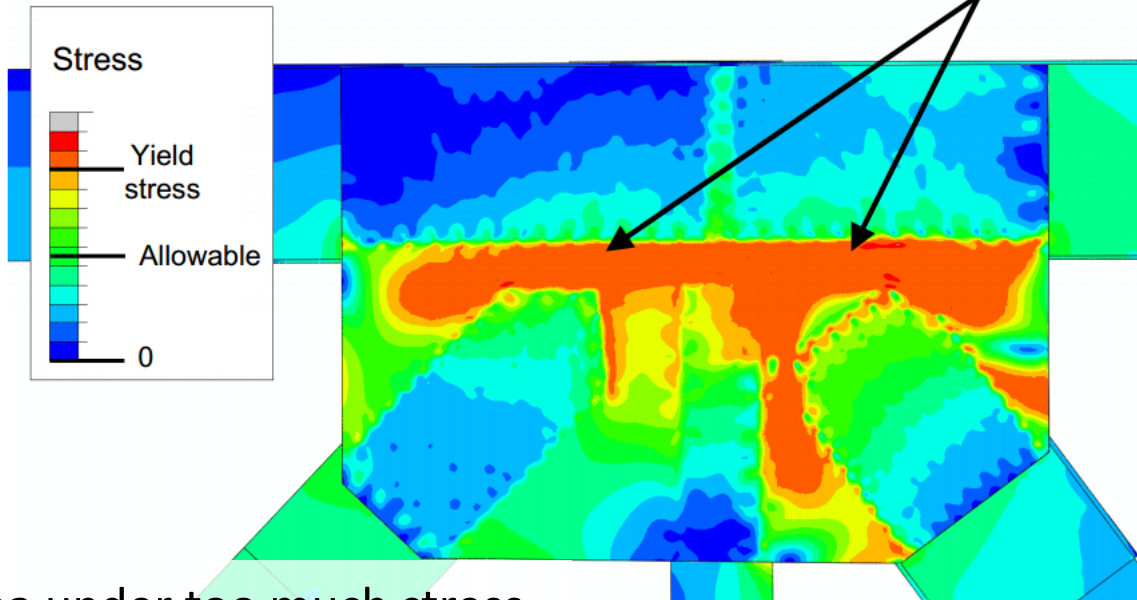
Tension fracture ripped across the rivet holes.



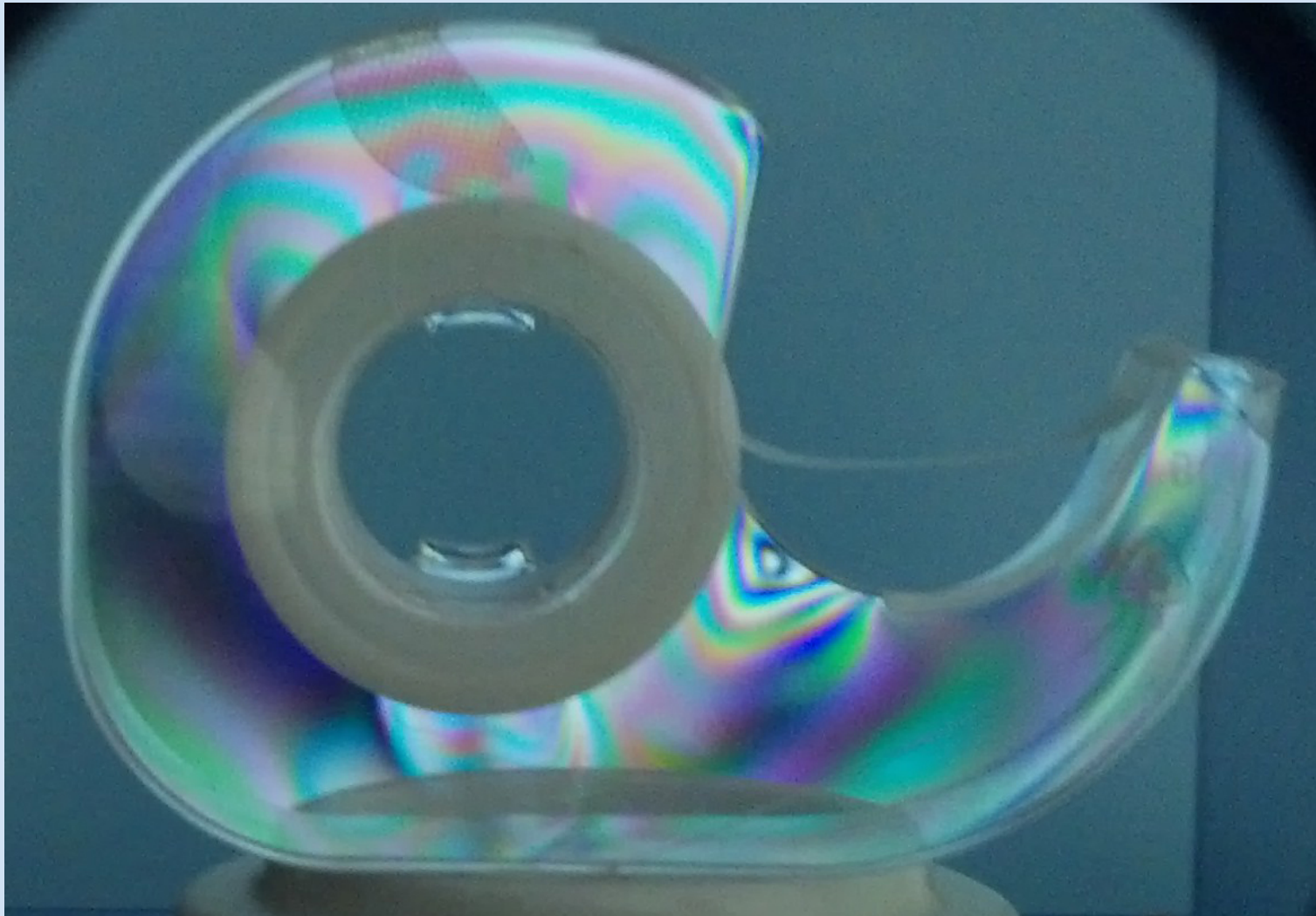
Initial Tension Fracture



Orange and red shading:
exceeds yield stress



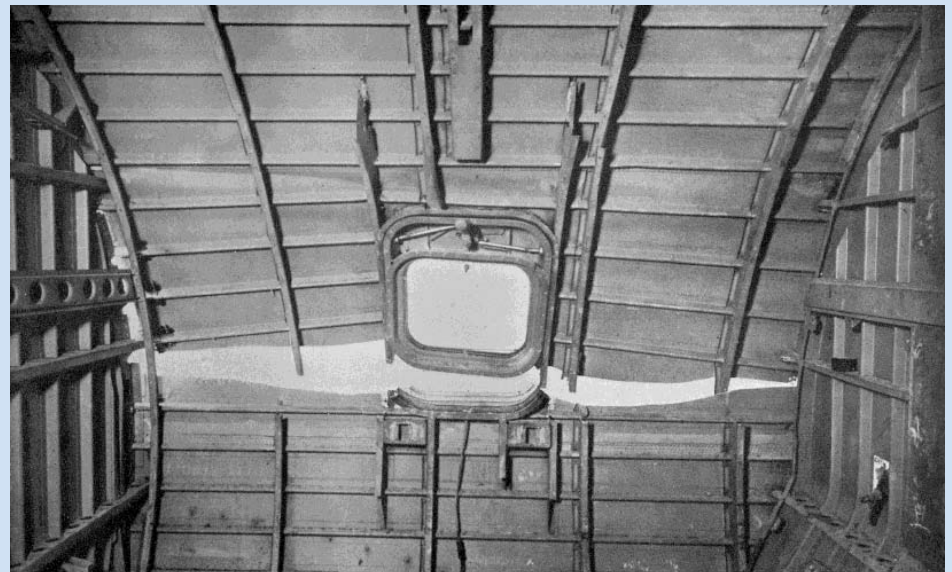
Analysis later showed the area under too much stress.



Most of the time we are completely unaware of these stress concentrations.



Car door handle. Cracks formed near corners rounded with a quarter circle.



On closer inspection, the Comet airplane windows propagated cracks despite being rounded with a quarter circle fillet.

How would Nature shape a corner?

