

Applications of elastic behaviour of materials.

Elastic after effect - The delay in regaining the original state by a body after the removal of the deforming force is called elastic after effect.

In galvanometers and electrometers, the suspensions made from quartz and phosphor bronze are used as elastic after effect is negligible in wires of these materials.

Elastic fatigue - It is defined as the loss of strength of the material ~~is~~ caused due to repeated strains to which the material is subjected.

- Q. Bridges are declared unsafe after long use.
- During the use, a bridge undergoes quick stress and strain. Hence its elastic property diminishes. After long use, they develop more strain and may collapse. Hence they are declared unsafe.
- * Any metallic part of a machinery is never subjected to a stress beyond the elastic limit of the material.
 - * The thickness of metallic ropes used in cranes to lift heavy weights is decided by considering the elastic limit of the material.
 - * In designing a beam to support a load it is advantageous to increase the depth rather than the breadth of the beam.
The depression δ , $\delta = \frac{wl^3}{4bd^3y}$. i.e., $\delta \propto \frac{1}{d^3}$.
while $\delta \propto \frac{1}{b}$ only. So by increasing depth the depression δ can be reduced.
 - * Also I shaped pillars support more load compared to a pillar with rounded ends. This reduces cost and weight of the beam.