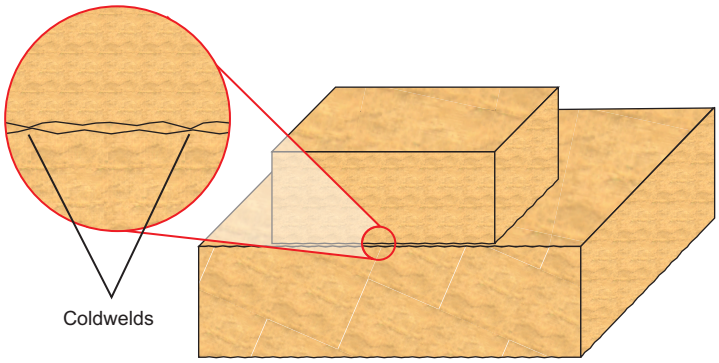

Figure 3.**17:** A magnified view of the two surfaces in contact.

contacts between them. The contact points between the two surfaces form a sort of **coldwelds.** These cold welds resist the surfaces from sliding over each other. Adding weight over the upper block increases the force pressing the surfaces together and hence, increases the resistance. Thus, greater is the pressing force greater will be the friction between the sliding surfaces.

Friction is equal to the applied force that tends to move a body at rest. It increases with the applied force. Friction can be increased to certain maximum value. It does not increase beyond this. The maximum value of friction is known as the **force of limiting friction (F_s).** It depends on the normal reaction (pressing force) between the two surfaces in contact. The ratio between the force of limiting friction F_s and the normal reaction R is constant. This constant is called the **coefficient of friction** and is represented by **μ.**

Thus $\mu = \frac{F_s}{R}$ … … … (3.20)

or $F_s = \mu R$ … … … (3.21)

If m be the mass of the block, then for horizontal surface;

$R = mg$ … … … (3.22)

Hence $F_s = \mu mg$ … … … (3.23)

Friction is needed to walk on the ground. It is risky to run on wet floor with shoes that have smooth soles. Athletes use special shoes that have extraordinary ground grip. Such shoes prevent them from slipping while running fast. What will we do to stop our bicycle? We will apply brakes. The rubber pads

TIDBITS

Pushing the opposite walls by palms and feet increases friction. This enables the boy to move up on the walls.

Coefficient of friction between some common materials

Materials	μ_s
Glass and Glass	0.9
Glass and Metal	0.5 - 0.7
Ice and Wood	0.05
Iron and Iron	1.0
Rubber and Concrete	0.6
Steel and Steel	0.8
Tyre and Road, dry	1
Tyre and Road, wet	0.2
Wood and Wood	0.25 - 0.6
Wood and Metal	0.2 - 0.6
Wood and Concrete	0.62