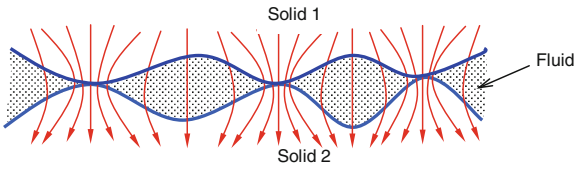

Fig. 1.1 Heat flow through a joint

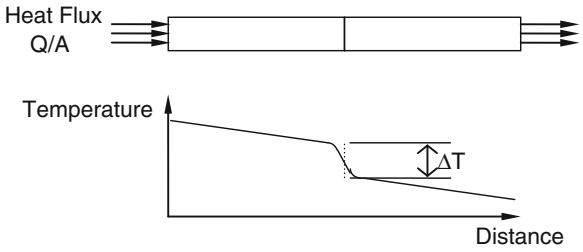

Fig. 1.2 Temperature drop at an interface

Thermal contact conductance, h, is defined as the heat flux to the additional temperature drop, ΔT, due to the presence of the (imperfect) joint (Fig. 1.2):

$$h = \frac{Q/A}{\Delta T} \tag{1.1}$$

In Eq. (1.1), Q is the total heat flow and A is the nominal contact area.

Thermal contact resistance, R, is defined as the reciprocal of thermal contact conductance:

$$R = \frac{A\Delta T}{Q} \tag{1.2}$$

It may be noted that the resistance, as defined above, is usually called specific resistance (or impedance) in heat transfer literature. But the above definition has been adopted by many contact heat transfer researchers, as it is easy to compare the results of different investigators without having to ascertain the area of contact in each case. Another frequently used definition of resistance is based on the total heat flow. This will be designated by the symbol R' in this work:

$$R' = \frac{\Delta T}{Q} \tag{1.3}$$

If it is possible to separate the heat flow through the solid contact spots, Q_s, from the heat flow through the interstitial medium (gas), Q_g, such that

$$Q = Q_s + Q_g \tag{1.4}$$

then the solid spot conductance be defined as:

$$h_s = \frac{Q_s/A}{\Delta T} \tag{1.5}$$