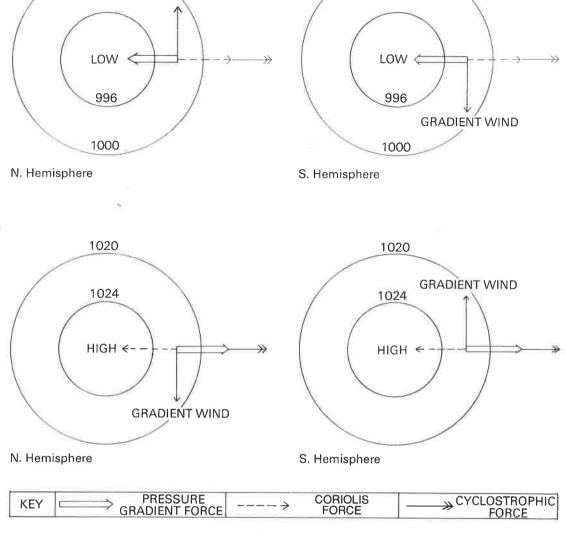Fig. 7.6 Gradient wind.

The *gradient wind* is the horizontal air motion parallel to isobars which are curved, and is due to the action of the pressure gradient, Coriolis and *cyclostrophic* forces (Fig. 7.6). The cyclostrophic force acts radially outwards from the centre of rotation of an air particle following a curved path. The value of the force is directly dependent upon the gradient wind speed. Thus the direction of the gradient wind in each hemisphere is as follows:

Pressure System	N Hemisphere	S Hemisphere
Low High	Anticlockwise Clockwise	Clockwise Anticlockwise

Air moving across the surface of the earth is affected by *friction*, and does not achieve the speed which in theory is directly related to the horizontal pressure gradient. As a result, the Coriolis and cyclostrophic forces have smaller values, and therefore neither geostrophic nor gradient winds exist. The pressure gradient force becomes dominant, and the net result is a cross-isobaric component of the surface air flow from high to low pressure. Thus the surface wind has an *angle of indraught* which is 10° to 15° over the sea (Fig. 7.7). Over land the effect of friction is greater, and the angle of indraught is therefore larger.