**Causes of Aridity**

Rainfall generally occurs when the moisture-laden air rises, expands, and cools. As a result, vapors condenses and precipitation occurs.

**Factors effecting the worldwide distribution of rainfall**

**1.**General circulation of the atmosphere**, 2**. Relief**, 3.** The distribution of land and sea

**1.General circulation of the atmosphere**

**The hydrological cycle**

The earth's moisture is involved in a cycle of continuous circulation called the 'water cycle' or 'hydrological cycle'.Water is evaporated from the soil and from the water surfaces by solar energy, and transported as vapour by the general circulation of the atmosphere. Eventually the moist air is cooled to the point of condensation and may fall as precipitation.

**Cause**

The basic cause for the general circulation of the atmosphere is the unequal heating of the earth by the sun. The polar regions have an annual heat deficit, whilst the equatorial belt receives more heat from the sun than is lost by radiation into space. This temperature gradient between the equatorial belt and the polar caps provides the energy to set in movement a general circulation of the atmosphere, transporting heat from low to higher latitudes, and thereby mitigating the disparities in heat distribution over the earth.

**Relief**

**Orographic rain**

When rising ground, or mountains running at right angles to the prevailing winds, deflect moisture-laden air upwards, the air cools, resulting in condensation and subsequent precipitation. This is called 'orographic' rain (Fig. 1.9). When the air moves down the leeside of the mountain range, it has already lost most of its moisture. During subsidence, the air again becomes warmer and its relative humidity is decreased further, which explains why the leeside of a mountain has little rainfall. Examples of this so-called rain-shadow effect are the Patagonian Desert, which lies in the rain shadow of the Andes, and much of the Australian Desert behind the

**Distribution of land and sea**

Winds may also arise as a result of the seasonal heating and cooling of the continents, which warm up rapidly in summer and cool rapidly in winter. Such winds are the so-called 'monsoons', which in summer are moist and blow landwards whereas in winter the direction is reversed. This latter outflow of dry air is characterized by lack of precipitation.

The greater part of the earth is covered by oceans; the distribution of land and sea will, therefore, have a marked effect on climatic patterns only in regions in which large land masses are involved - such as Asia and, to a lesser degree, Africa, the Americas, and Australia - and in which the zonal circulation pattern may be entirely obscured by the great thermal differences between land and sea. Air moving over warm oceans becomes moisture-laden. When it moves inland, any factor that causes this air to ascend, such as rising ground or a wedge-shaped mass of cold air, will result in cooling, condensation, and precipitation (Fig. 1.10). Land areas near warm ocean waters are characterized by high temperatures, high air humidity,