2. *Abundant precipitation.* — The annual fall of rain (and snow) over the Mississippi drainage area is, for the eastern, or Appalachian part, 40 to 50 inches; for the much larger west-central part, west of the Mississippi River, 20 to 25 inches; for the western part, among the summits of the Rocky Mountains, 25 to 30 inches. In the vast Amazon drainage area the annual precipitation exceeds 50 inches both on the west and north, and is everywhere over 25 inches.

3. *Upward waste, or that by evaporation, small.* — Under a hot and dry climate, and in the absence of forests, the waste is great. The western tributaries of the Mississippi lose a large part of the waters received in the mountains while descending the dry, bare eastern slopes. Where the Nile takes its rise, the annual precipitation is over 50 inches, but it is not more than 10 through the lower two thirds of its course. An extravagant example of this waste is shown on the map of western Maui, on page 179, where there are great channels in the mountains and mere threads over the surface to the west where it seldom rains.

4. *Downward waste, or that by gravity and soil absorption over the drainage area, small.* — Not only loose sands, but also many sandstones are very absorbent; and limestones, although nearly impervious to moisture, are often cavernous, and sometimes swallow up rivers. In western New South Wales the rivers take only 2½ per cent of the precipitation, owing chiefly, it is stated, to the porosity of the sandstone of the region. Most lavas are porous and somewhat cavernous, but may lose these qualities by infiltration of earth from decomposition. Further, most stratified uncrystalline rocks are loose in bedding, and take off much water along the open spaces between the layers. Granite and other crystalline rocks make the tightest basins; for they absorb little.

Frozen or icy ground is like impervious rock; almost all the water that falls over it goes to the rivers. Moreover, in cold weather evaporation carries off but little. Hence come the sudden rise and height of many spring floods in cold-temperate latitudes.

In very dry and warm climates, where the precipitation is reduced to a few inches a year, rivers fail altogether, or flow only during the short rainy season. Between drying up under the hot sun and soaking away in the sandy soil, they are soon gone, and the lakes along their courses, or receiving their waters, may share their fate.

Other sources of loss in surface waters are (1) the demands of vegetable and animal life; and (2) the chemical combinations attending the decay of rocks in which hydrous minerals, as the hydrous iron oxide and clays, are made.

Of the water precipitated, the rivers may get 45 to 50 per cent over regions of crystalline rocks, as is true of the Connecticut River. In other parts of temperate latitudes the amount is usually a third to two fifths of what falls. But in warm latitudes it may be under one tenth. The mean annual discharge of the Mississippi River is about 25 per cent of the precipitation; it