

The floods of the Nile commence in southern Abyssinia (where the annual fall of rain is 50 inches or more) in April, and reach Cairo in mid-summer, and exert their beneficial influence over all the flood grounds by the fertile silt deposited, which is estimated to amount annually to 140 millions of tons. The maximum rise is 40 feet, and the area of the region flooded is 2100 square miles.

The distribution of tributaries influences the time and amount of floods. In the Amazon, the tributaries north of the equator are flooded during the rainy season of the northern hemisphere, and those south, during that of the southern. In this way many rivers, by their widespread arms, take advantage of the differences in the seasons or climates of the distant countries whence they get their supplies. The floods of the Amazon convert the larger part of its 500,000 miles of silvas into one great lake; 3000 miles up the river, an elevation above tide of only 210 feet is reached. The Mississippi hardly feels the great floods of the Ohio unless they come when the Rocky Mountain tributaries are also flooded; and these western tributaries are so widely distributed and so large that they may make successive floods, or pour in all together in one vast deluge, giving the Mississippi in some places below the Ohio a breadth of 50 miles. At high water the flood-level is 70 feet above low water at Cincinnati, 51 on the Mississippi at Cairo, and 17 at New Orleans.

The cycles of rainy and dry seasons sometimes seem to correspond with the sun-spot cycle of 11 years; and greater cycles include 4 or 5 of the 11-year cycles. No definite conclusions have as yet been formed regarding this point.

5. *Causes tending to determine the direction of draining courses.* — The chief causes are the following. As regards, —

(a) *Slope.* — The steepest descent accessible.

(b) *Surface-form.* — A depression leading downward to concentrate the waters from a large area for work.

(c) *Basement rocks.* — The belt of least resistance to wear. In the case of upturned strata, whether folded or in monoclines, the belt of weaker rock in the line of strike; or over folded rocks, the course of a region of warped strata between the extremities, overlapping or not, of the folds (page 388).

(d) *Fractures, faults.* — The courses of great fractures and faults, and especially those attending the flexing of rocks in mountain-making, as, for example, those which determined the location of the Great Appalachian valley of eastern Tennessee and its continuation northeastward (page 356).

(e) *Meteorological conditions.* — The belt or region of greatest precipitation.

DENUDATION.

1. *Work of the rain-drop.* — Denudation by simple impact of water commences with the descending rain-drop. The drop makes a shallow impres-