

48, 49, *N. semen*; 50, *N. serians*; 51, *Pinnularia borealis*; 52, *P. viridula*; 53, *P. viridis*; 54, *Mastogloia* (?); 55, *Pinnularia aequalis* (?); 56, *Surirella craticula* (?); 57, 58, *Synedra ulna*; 59, *Odontidium* (?); 60, *Fragilaria pinnata* (?); 61, *Mastogloia* (?); 62-65, doubtful.

A shower which happened near the Cape Verd Islands, and is described by Darwin, had by his estimate a breadth of more than 1600 miles, — or, according to Tuckey, of 1800 miles, — and reached 800 or 1000 miles from the coast of Africa. These numbers give an area of more than a million square miles.

In 1755, there was a "blood-rain" near Lago Maggiore, in northern Italy, covering about 200 square leagues, which made an earth deposit in some places an inch deep; if averaging two lines in depth, the amount for each square mile would equal 2700 cubic feet. The red color of the "blood-rain" is owing to the presence of some red oxide of iron.

Ehrenberg enumerates a large number of these showers, citing one of the earliest from Homer's Iliad; and among those whose deposits he examined he distinguished over 300 species of organisms. The species, so far as ascertained by him, are not African, and 15 are South American. The zone in which these showers occur covers southern Europe and northern Africa, with the adjoining portion of the Atlantic, and the corresponding latitudes in western and middle Asia.

#### ANGLE OF REST OF FALLING SAND OR GRAVEL.

The angle of rest in falling sand or gravel varies with the size, density, shape, and smoothness of the grains; and also with the amount of moisture or water present among them, little moisture causing adhesion of grains, much water producing a flowing mud. With no friction, as is essentially the fact in the case of the particles of a liquid, like water, the angle is null; with ordinary dry sand,  $30^{\circ}$  to  $35^{\circ}$ ; with ordinary volcanic cinders,  $33^{\circ}$  to  $40^{\circ}$ .

Instructive experiments may be made by inserting vertically a graduated rod at the center of a circular board graduated similarly from its center outward, and then dropping over the board about the rod sand of different kinds, the ratio of height to radius giving the angle. The author obtained in this way for dry angular quartz sand about 0.005 inch in radius, the angle  $35^{\circ} 20'$  to  $36^{\circ} 30'$ ; for iron-sand, of like fineness,  $33^{\circ} 10'$  to  $33^{\circ} 40'$ ; for new (untarnished) shot, No. 10, very fine,  $20^{\circ} 12'$ ; same, No. 4 (coarser),  $27^{\circ} 50'$ ; same, No. 3 (buck-shot),  $29^{\circ} 40'$ ; and with tarnished shot, a higher angle.

When deposition is around a center, or pericentric, the resulting form is approximately conical, varying with irregularities in deposition through the winds and other causes.

#### ATMOSPHERIC PRESSURE.

Variations in atmospheric pressure, which may amount to two inches of the barometer in a few hours, or half as many pounds per square inch, are supposed to influence the resistance of the earth's crust to earthquake movements, and to volcanic eruptions. The tide-like movements in large lakes are attributed to other causes.