cavities, channels, and tunnels in sand-dunes, clay, and loess deposits, and in glacier ice.

The formation of sand-dunes is due to the driving action of prevailing winds blowing over flat sea-boards and arid inland districts. Lyell, De la Beche, and Élie de Beaumont were among the earlier investigators of sand-dunes, and later authors have added much to our information on the changes of shape, the mode of travel, and the particular kinds of sand characteristic of the dunes in various localities.

The clay deposits so widely distributed in the Pampas of South America were considered by A. Bravard in 1837 to be æolian or wind-blown deposits; but Burmeister regarded them as fluviatile in origin, and Santiago Roth as partially marine and partially fluviatile in origin, afterwards altered by the growth of vegetation.

The term "loess" has been applied to yellowish clay or loam deposits, which were first described in the Rhine Valley, and have been found to be present sometimes in remarkable thickness over wide tracts of country. Baron von Richthofen found in China that these deposits attained thicknesses of 1500 to 2000 feet, and occurred locally as high as 7000 feet above sea-level. He noted the want of stratification and the uniform character of loess deposits over great distances, its constituents being invariably the finest particles of sand, clay, and limestone, no matter what the nature of the ground might be upon which the loess had gathered. He further observed its porous structure, and showed that the rootlets of grass growing on its surface gave origin to pipes similar to those which perforated the whole mass. Another important feature was the rich occurrence of remains of land molluscs, and of herbivorous and other mammals, whereas fresh-water shells were absent. Upon the evidence of those observations, Von Richthofen concluded that the loess had originated as wind-drift. And he pointed out how the dry, fine-grained material, readily transported by wind, would naturally tend to accumulate on vast steppes covered with grassy vegetation. At the same time, Von Richthofen recognised a "lake-loess" in certain localities, in the formation of which water had participated.

This explanation of Von Richthofen's was then applied to European occurrences of loess deposits, but the question seems to be one which has to be determined independently