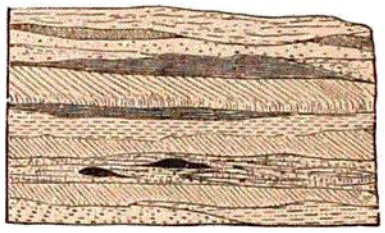
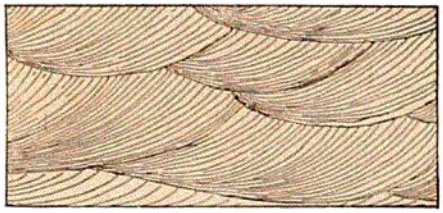
ment of the tidal waters out of an estuary or of a stream over a sand-bed. It has been called *current-bedding*. The water, as it moves on, pushes up some of the sand before it, and then keeps depositing the sand over the front slope of the little elevation so made, producing on the slope a series of thin layers pitching at an angle usually of 20° to 35° in the direction of the flow. During a time of quiet following, as the ebb of the tide, slower deposition may make a layer that is horizontal in bedding; and thus the cross-bedded layer is often made to alternate with the horizontal.

61.



(9) In the *flow-and-plunge* structure the cross-bedded layer is broken up into curving wave-like parts, as shown in Fig. 62. This effect is produced when there is a wave-like plunging action in the rapidly flowing waters and a large supply of sand or fine gravel for deposition. One of the wave-like parts in such a layer is usually a yard or more long and six inches to a foot thick; and may be much smaller, as well as very much larger. In one place in the stratified drift near New Haven, Conn., the thickness was six to eight feet. The whole thickness, in all cases, was produced by one fling of the waters.

62.



By studying the structure of layers, we are enabled to determine the conditions under which rock-formations were made; and hence the facts have great interest to the geologist

(10) The *beach-structure* is another of like interest, indicating a beach origin. The upper part of a beach, above high-tide level, is made by the toss of the waves, and especially in storms; and it is generally irregularly bedded. But the lower part, swept by the tide, has usually an even seaward slope; and the beach deposits over it have therefore a corresponding inclination — usually 5° to 8° when the tides are low, but 15° to 18° when high. When the sands are coral or shell sands, they become cemented into a calcareous sand-rock, and show well the straticulation.

(11) The *wind-drift structure* is of very different character. It is made up of straticulate portions, in different positions, oblique to one another, as in Fig. 63. A ridge of sand made by the drifting winds on a coast becomes straticulate parallel to its upper surface, because the deposition by the winds is necessarily over the surface. But if such a ridge has its upper half shaved off obliquely in a heavy storm, deposition will afterward go on parallel to the new surface, and hence at an angle with the earlier layers. By repetitions of such events the wind-drift

63.