

position, the *Upper* and *Lower*.\* It will be most advantageous to treat of these separately.

## Section II. *Upper Fresh-water formation.*

(a) *Chemical and external characters.* This formation lies above the bed already described as belonging to the Upper marine formation, from which it is separated by a bed of sand six inches thick; it is covered by alluvium of which the summit of Headon hill consists, and is in great measure composed of a yellowish white marle, that does not endure the frost, enclosing masses which are more indurated, and appear to contain a greater proportion of calcareous matter. It is the most remarkable and best characterized of all the beds of Headon hill.

(b) *Mineral contents.* Through all these strata run veins, frequently several inches in thickness, of a very pure carbonated lime, which is crystallized, frequently in a radiated form.

(c) *Organic remains.* This stratum every where contains fresh-water shells in abundance, without any admixture whatever of marine exuviae. They consist, like those of the lower fresh-water beds, of several kinds of lymnei, helices and planorbis, and other fresh-water shells which are extremely thin and friable; together with seeds of a flattened oval form, and parts of coleopterous insects.

(d) *Range and extent.* This stratum is not confined to the upper part of Headon hill, where it appears as a bed of very considerable thickness, but also may be seen in many parts north of the middle range of chalk hills. On the western coast it does not extend further than Totland bay, but occurs again at Warden point, forming the summit of the cliff. Numerous blocks of it lie loose in the soil in many parts about Cowes,

\* The English beds belonging to these formations may in general terms be considered as consisting of marle, argillaceous limestone, and sand, crossed by veins of calcareous spar. The external and chemical characters of the English and French beds, are considered to be sufficiently different from every other known rock, to render them distinguishable even without the shells they enclose. The beds of France are described as white or yellowish, sometimes as tender and friable as chalk or marle, and sometimes very hard, compact, and solid, with a fine grain and conchoidal fracture. In the latter case the stone breaks into sharp fragments like flint, and cannot be worked, but sometimes it will even admit of being polished as a marble. It is also frequently filled with infiltrations of calcareous spar. Both the English and French beds contain the cyclostoma, planorbis, and limneus. The Fresh-water formation of England is altogether without the beds of gypsum, which are even numerous in that of France, and on the uppermost of which were found the bones of unknown birds and quadrupeds, together with a few fresh-water shells.