

slight pressure, it required further means of defence, and with these its Almighty and Beneficent Creator has amply provided it, by covering it, like a hedge-hog, with innumerable spines, varying in length, and capable of various movements. The long ones, when erected, defend it on all sides, both from the attack of enemies and from the effects of accidental pressure, and we may conjecture that when the longer ones are couched to answer any particular purpose, the short ones may come into play, and assist in keeping any pressure from the crust. Perhaps, as in the hedge-hog, the ordinary posture of the longer spines is couchant, and they are only erected when the animal is in motion or under alarm.

The wonderful apparatus which closes the mouth of the common or *typical* sea-urchin* (*fig. 23*), is another and striking proof that Creative Wisdom employs diversified means to attain a common end, the nutrition of the animal. The mouth of this animal is under its body, a situation far from favourable, according to appearance, for the mastication or bruising of its food: if its jaws moved vertically, like ours or the mandibles of a bird; or if they moved horizontally, like those of insects, it would have been attended with no small trouble to an animal whose mouth was underneath; but its five pyramidal jaws, with the points of the teeth in the centre, admit an action more accordant with the situation of the mouth. By means of its numerous muscles it can impart a variety of action to the mass and individual pieces that form its oral apparatus, so as to accommodate it to circumstances, a power not possessed by the higher animals. In those Echinidans, whose mouth is in the margin of the anterior part of the shell,† no such powerful apparatus is observable, its situation being in front of the animal, it is not as it were under restraint, it has less

* *Echinus esculentus*.

† *Ananchites*, *Spatangus*, &c.