

smooth *horny* spines connected with the dorsal fin. In the *Cestracion Philippi* alone, (Pl. 1, Fig. 18), we find a *bony* spine armed on its concave side with tooth-like hooks, or prickles, similar to those that occur in fossil *Ichthyodorulites*: these hooks act as points of suspension and attachment, whereby the dorsal fin is connected with this bony spine, and its movements regulated by the elevation or depression of the spine, during the peculiar rotatory action of the body of Sharks. This action of the spine in raising and depressing the fin resembles that of a moveable mast, raising and lowering backwards the sail of a barge.

The common Dog-Fish, or Spine Shark, (*Spinax Acanthias*, Cuv.), and the *Centrina Vulgaris*, have a horny elevator spine on each of their dorsal fins, but without teeth or hooks; similar small toothless horny spines have been found by Mr. Mantell in the chalk of Lewes. These dorsal spines had probably a further use as offensive and defensive weapons against voracious fishes, or against larger and stronger individuals of their own species.\*

The variety we find of fossil spines, from the Greywacke series to the Chalk inclusive, indi-

\* Colonel Smith saw a captain of a vessel in Jamaica who received many severe cuts in the body from the spines of a Shark in Montego Bay. (See Griffith's Cuvier.)

The Spines of *Balistes* and *Silurus* have not their base, like that of the spines of Sharks, simply imbedded in the flesh, and