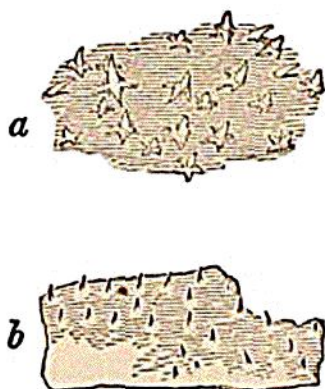


the back and sides of the sharks are, in most of the known species, considerably more elongated and prickly than the points which cover their fins, belly, and snout. The extreme forms, however, of the shagreen tubercle or plate seem to be those of the upright prickle or spine on the one hand, and of the slant-laid, rhomboidal, scale-shaped plate on the other.

Fig. 2



a Shagreen of the Thornback
(*Raja clavata*.)

b Shagreen of *Sphagodus*, —
a placoid of the Upper
Silurian.*

The minuter thorns of the ray (fig. 2, a) exemplify the extreme of the prickly type; the fins, abdomen, and anterior part of the head of the spotted dog-fish (*Scyllium stellare*) are covered by lozenge-shaped little plates, which glisten with enamel, and are so thickly set that they cover the entire surface of the skin, (fig. 3, b,) — and these seem equally illustrative of the scale-like form. They are shagreen points passing into osseous scales, without, however, becoming really

such; though they approach them so nearly in the shape and disposition of their upper disks, that the true scales, also osseous, of the *Acanthodes sulcatus*, (fig. 3, a,) a Ganoid of the Coal Measures, can scarce be distinguished from them, even when microscopically examined. It is only when seen in section that the distinctive difference appears. The true scale of the *Acanthodes*, though considerably elevated in the centre, seems to have been planted on the skin; whereas the scale-like shagreen of the dog-fish is elevated over it on an osseous pedicle or footstalk (fig. 5, a) as a mushroom is elevated over the sward

* From Murchison's Silurian System.