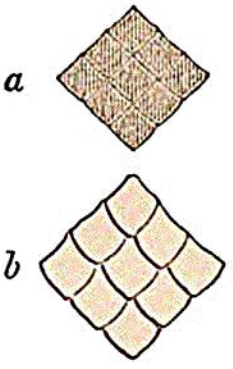
on its stem; and the base of the stalk is found to resemble in its stellate character that of a shagreen point of the prickly type. The apparent scale is, we find, a bony prickle bent at right angles a little over its base, and flattened into a rhomboidal disk atop.

Fig. 3.



a. *Scales of Acanthodes sulcatus.*
b. *Shagreen of Scyllium stellare, (Snout.)*
(Mag. eight diameters.)

In small fragments of shagreen, (fig. 2, *b*) which have been detected in the bone-bed of the Upper Ludlow Rocks, (Upper Silurian,) and constitute the most ancient portions of this substance known to the palæontologist, the osseous tubercles are, as in the minuter spikes of the ray, of the upright thorn-like type; they merely serve to show that the placoids of the first period possesssed, like those of the existing seas, an ability of secreting solid bone on their cuticular surfaces; and that, though at least such of them as have bequeathed to us specimens of their dermal armature possessed it in the form farthest removed from that of their immediate successors the ganoid fishes, they resembled them not less in the substance of which their dermoskeletal, than in that of which their endoskeletal, parts were composed. For the internal skeleton in both orders, during these early ages, seems to have been equally cartilaginous, and the cuticular skeleton equally osseous. In the ichthyolitic formation immediately over the Silurians, — that of the Lower Old Red Sandstone, — the Ganoids first appear; and the members of at least one of the families of the deposit, the Acanths, — a family rich in genera and species, — seem to have formed connecting links between this second order and their placoid predecessors. They were covered with true