

ther by the application of any force to one side of the spine, and restores it to its former state, when the force has ceased to act. The extent of motion in each joint is but small; but being multiplied in the whole series, the resulting effect is considerable. The cavity itself is filled with a gelatinous, but incompressible fluid substance, which constitutes a spherical pivot for all the motions of the joint.

This singular kind of articulation would appear framed with a view to allow of motion in all directions. Here, however, the motions are restricted by the extension of the spinous processes (s, s, in the preceding figures,) which in fishes are of great length; so that they effectually prevent all flexions either upwards or downwards, and limit it to those from side to side. It is precisely these latter kind of motions which are wanted in the fish, for striking the water laterally, with the broad vertical surface of the tail. Processes of a similar form and appearance, (f, f,) and which impede any flexion downwards, are generally also met with in the lower surface of the spine, and more especially in the hinder portion of the column. These are the *inferior spinous processes*, and, like the superior, they also form an arch, through which there passes the continuation of the abdominal aorta, or great artery which proceeds down the back. The number of vertebræ is very various in different fishes: in some they are multiplied exceedingly, as in the shark, where there are more than two hundred.

There are few parts of the structure of animals that exhibit more remarkable instances of the law of gradation than the spine of fishes, in which we may trace a regular progress of development from the simplest and almost rudimental condition in which it exists in the *Myxine* and the *Lamprey*, to that of the most perfect of the osseous tribes. Its condition, in the former of these animals, presents a close analogy with some structures that are met with in the molluscos, and even in annulose animals. So near is the resemblance of the spinal column of the myxine, more especially, to the annular condition of the frame-work of the vermes,