

panded into flat plates; as is exemplified in the bones of the skull, in the shoulder blade, and still more remarkably in the bony shield which surrounds the body of the tortoise. On the other hand, where a system of levers is wanted, as in the limbs, which have to sustain the weight of the trunk, and to confer extensive powers of locomotion, the bones are modelled into lengthened cylinders, generally somewhat expanded at the extremities, for greater convenience of mutual connexion.

In the form, the structure, and the arrangement of these levers, which allow of the regular and accurate application of the moving power, and are calculated, in circumstances so various, to give effectual support to the fabric, and also to execute a great diversity of movements, we discern most palpable manifestations of profound design, and the most exquisite refinements of mechanic skill. All the scientific principles of architecture and of dynamics are more or less exemplified in the construction of this part of the animal fabric. Levers of various kinds are most artificially combined in the formation of the fins of fishes, the wings of birds, and the limbs of quadrupeds. The power of the arch in resisting superincumbent pressure is exhibited in various parts of the osseous systems of vertebrated animals; such as the human foot, the spine, the pelvis, and more especially in the vaulted roof of the skull, and in the carapace, or upper shell, of the tortoise.

The construction of these levers evinces that a minute attention has been bestowed on every condition by which mechanical advantage could be gained. In the more perfect developments of structures, such as those which obtain in the higher orders of mammalia, and also in the class of birds, all the long bones are hollow cylinders, and their cavity is largest in the middle of their length. This is shown in Fig. 172, which represents a longitudinal section of a human thigh bone, and in Fig. 173, which is a similar section of the humerus, or bone of the arm. The walls of these bones consist of a dense and compact substance, formed by the close cohesion of the osseous plates. These walls are of