

the neck bend with more facility forwards than backwards; while those in the lower half of the neck bend more readily backwards: hence, in a state of repose, the neck naturally assumes a double curvature, like that of the letter S, as is well seen in the graceful form of the swan's neck. By extending the neck in a straight line, the bird can, while flying, carry forwards the centre of gravity, so as to bring it under the wings; and when resting on its feet, or floating on the water, it can transfer that centre backwards, so as to bring it towards the middle of the body, by merely bending back the neck into the curved form which has just been described; and thus the equilibrium is, under all circumstances, preserved by movements remarkable for their elegance and grace.*

Another advantage arising from the length and mobility of the neck is, that it facilitates the application of the head to every part of the surface of the body. Birds require this power in order that they may be enabled to adjust their plumage, whenever it has, by any accident, become ruffled. In aquatic birds, it is necessary that every feather should be constantly anointed with an oily secretion, which preserves it from being wetted, and which is copiously provided for that purpose by glands situated near the tail. The flexibility of the neck alone would have been insufficient for enabling the bird to bring its bill in contact with every feather, in order to distribute this fluid equally over them; and there is, accordingly, a farther provision made for the accomplishment of this object in the mode of articulation of the head with the neck. We have seen that, in fishes, and in most reptiles, this articulation consists of a ball and socket joint; a rounded tubercle of the occipital bone being received into a hemispherical depression in the first vertebra of the neck. In the mammalia the plan is changed, and there are two ar-

* The great mobility of the neck enables the bird to employ its beak as an organ of prehension for taking its food; an object which was the more necessary in consequence of the conversion of the fore extremities into wings, of which the structure is incompatible with any prehensile power, such as is often possessed by the anterior extremity of a quadruped.