

to allow the grain to pass out in small quantities into the aperture of the upper mill-stone, which brings it within the sphere of their action.

Innumerable are the experiments which have been made, particularly by Reaumur and Spallanzani, with a view to ascertain the force of compression exerted by the gizzard on its contents. Balls of glass, which the bird was made to swallow with its food, were soon ground to powder: tin tubes, introduced into the stomach, were flattened, and then bent into a variety of shapes; and it was even found that the points of needles and of lancets fixed in a ball of lead, were blunted and broken off by the power of the gizzard, while its internal coat did not appear to be in the slightest degree injured. These results were long the subject of admiration to physiologists; and being echoed from mouth to mouth, were received with a sort of passive astonishment, till John Hunter directed the powers of his mind to the inquiry, and gave the first rational explanation of the mechanism by which they are produced. He found that the motion of the sides of the gizzard, when actuated by its muscles, is lateral, and at the same time circular; so that the pressure it exerts, though extremely great, is directed nearly in the plane of the grinding surfaces, and never perpendicularly to them; and thus the edges and points of sharp instruments are either bent or broken off by the lateral pressure, without their having an opportunity of acting directly upon those surfaces. Still, however, it is evident that the effects produced upon sharp metallic points and edges, could not be accomplished by the gizzard without some assistance from other sources; and this assistance is procured in a very singular, and, at the same time, very effectual manner.

On opening the gizzard of a bird, it is constantly found to contain a certain quantity of small particles of gravel, which must have been swallowed by the animal. The most natural reason that can be assigned for the presence of these stones, is, that they aid the gizzard in triturating the contained food, and that they, in fact, supply the office of teeth