diaphragm, when, from any cause, a difficulty arises in dilating the chest.

In Birds the mechanism of respiration proceeds upon a different plan, of which an idea may be derived from the view given of the lungs of the *Ostrich*, at L. L., Fig. 377. The construction of the lungs of birds is such as not to admit of any change in their dimensions; for they are very compact in their texture, and are so closely braced to the ribs, and upper parts of the chest, by firm membranes, as to preclude all possibility of motion. They in part, indeed, project behind the intervals between the ribs, so that their whole mass is not altogether contained within the thoracic cavity. There is no large muscular diaphragm by which any change in the capacity of the chest could be effected, but merely a few narrow slips of muscles, arising from the inner sides of the ribs, and inserted into the thin transparent membrane which covers the lower surface of the lungs. They have the effect of lessening the concavity of the lungs towards the abdomen at the time of inspiration, and they thereby assist in dilating the air-cells.* The bronchia, or divisions of the trachea (T,) after opening, as usual, into the pulmonary air-cells, do not terminate there, but pass on to the surface of the lungs, where they open by numerous apertures. The air is admitted, through these apertures, into several large air-cells (c c c,) which occupy a considerable portion of the body, and which enclose most of the large viscera contained in the abdomen, such as the liver, the stomach, and the intestines;† and there are, besides, many lateral cells in immediate communication with the lungs, and extending all down the sides of the body. Numerous air-cells also exist between the muscles, and underneath the skin; and the air penetrates even into the interior of the bones themselves, filling the spaces usually occupied by the marrow, and thus contributing ma-

* Hunter on the Animal Economy, p. 78.

† It was asserted by the Parisian Academicians, that the air gets admission into the cavity of the pericardium, in which the heart is lodged. This error was first pointed out by Dr. Macartney. See Rees's Cyclopædia.—Art. *Bird.*