ON THE RESPIRATORY SOUND, NORMAL AND ABNORMAL.

MM. A. Boudet and A. Chauveau (*Revue Mensuelle de Médecine et de Chirurgie*, March, 1877) availed themselves of a somewhat rare opportunity of experimenting on a horse suffering from pneumonia; and they believe their experiments to possess especial interest, as demonstrating the fundamental principles upon which the explanations of the chief respiratory sounds heard over the walls of the chest rest.

The experiments were made in the Veterinary School at Lyons so long ago as 1862, but by some inexplicable oversight they are only now published. The subject was a young and vigorous mare attacked with pneumonia of the left side, attended with such alarming symptoms that death was thought imminent. All over the right side there was considerable increase of the natural respiratory murmur; no sound with expiration. On the left side, over the upper half, there was also exaggerated inspiratory murmur; over the lower half this murmur was completely abolished, and replaced by a double tubular blowing sound. The inspiratory part of the tubular sound was longer and softer than the expiratory portion, which was louder but shorter.

Auscultation of the trachea showed that the inspiratory and expiratory sounds heard over this tube, though louder, possessed exactly the same characters as the tubular sounds heard over the consolidated lung.

The experiment was commenced by making an incision in the trachea in the middle of the neck, about 20 centimetres long. The lips of this wound in the trachea could be separated by the index finger of each hand, so as to make a large opening in the tube, more than equal to its transverse diameter; this opening gave free passage to the air during inspiration and expiration, and allowed no air, or only an insignificant quantity, to pass by the larynx. The entrance of blood and mucus into the trachea and bronchi, as a consequence of this operation, and the distress of the animal, the convulsive efforts at breathing, the loud mixed râles which accompanied them, completely prevented the authors from continuing their intended comparison of the breath sounds before and after the operation. The next day, however, finding to their surprise the animal not only alive but better, and the physical signs precisely the same as before the operation, and uncomplicated by râles of any kind, they were able to go on with their experiments. 1. On listening over the hepatized portions of lung with the *trachea closed*, they heard the sounds already described; with the *trachea opened*, the inspiratory tubular sound disappeared, and the expiratory sound was much shorter and weaker. 2. Exactly the same phenomena were observed on auscultating the trachea below the incision, when this was *opened* or *closed*. 3. On auscultating the sound lung and the sound portions of the diseased one, no alteration was observed in the natural respiratory murmur, whether the trachea were opened or closed; if anything, the murmur was a little increased in intensity at the moment when the trachea was opened. 4. Sounds were artificially produced in the trachea by introducing into it a caoutchouc tube through the lips of the tracheal wound, and blowing through a membranous reed fixed to its free extremity, thus imitating, as near as possible, the conditions under which the voice is produced, with the view of comparing the conducting power of the healthy and the hepatized lung. Over the hepatized portion of the left lung, the sounds were heard with the greatest clearness. Over the healthy portions of lung, the transmission of the sounds was wholly arrested.

These experiments were several times repeated, with the same results. Subsequently, when there arose profuse bronchial secretion, the tracheal sounds would suddenly cease to be heard over the hepatized lung; at the same time, there would be noticed entire absence of the tubular or any breath sound; but if the animal coughed and expectorated, all the tracheo-pulmonary acoustic phenomena returned as clearly as before.

From these experiments MM. Bondet and Chauveau draw the following conclusions: 1. In the horse, healthy lung tissue is a very bad conductor of sound; it, indeed, completely interrupts the sounds produced in the trachea. 2. The normal inspiratory murmur originates in the lung-tissue itself; it arises where it is