

THE CANADA LANCET.

A MONTHLY JOURNAL OF

MEDICAL AND SURGICAL SCIENCE,
CRITICISM AND NEWS.

VOL. XXIII.] TORONTO, DEC., 1890. [No. 4.

Original Communications.

THE TREATMENT OF PYOTHORAX, AND THE MECHANICAL RESULTS OF OPENING THE PLEURAL CAVITY.*

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(Continued from November Number.)

But to return to our subject; the degree of expansion which would be maintained in this motionless condition of the lung would depend upon the frequency and force of the respirations, the elasticity of the lung tissue, the character and quantity of the secretion from the bronchial surfaces, and, more than all, upon the action of the glottis. Just in proportion as this is valvular, facilitating the ingress and impeding the egress of the air, just in that proportion, *cæteris paribus*, will the distention of the lung be greater.

If now we proceed to decrease the size of the wound still further, we shall find the rôle which expiration has played as a distending agency is gradually transferred to inspiration. With each progressive step the increasing difficulty with which the air finds admission through the wound results in an increased supply by the trachea, and a greater distention of the lung.

In like manner, the removal of the air from the lung, which before was accomplished by inspiration, has now become the office of expiration. As the chest contracts, the pressure of the air within it upon the lung is more and more decided as the opportunity of escape through the wound is more and more diminished, and thus the amount of air

remaining in the lung at the close of expiration constantly becomes less.

Thus we see that the lung is gradually escaping from the influence of the movements of the opposite thoracic cavity, to which it was at first entirely subjected, and is resuming its proper relations to the movements of its own side; and at last, when we reach the point of complete closure of the wound, we shall find that the quantity of air passing into, and out of the lung, exactly corresponds to the expansion and contraction of the cavity in which it is contained. There will then occur with expiration that complete collapse of the lung which took place with inspiration at the other end of the scale, and which could not occur at any intermediate point; while the maximum of inflation, which then coincided with complete expiration, is now observed at the termination of inspiration.

This change in the mechanism of the respiration is accompanied by a notable change in its physiological result. While the rising and falling of the lung was merely the result of the action of the uninjured side, not only was it of no avail in deparating the blood, but the action of the other lung was also impaired, since the crippled lung served merely as a reservoir into which its fellow breathed a portion of its vitiated air, to inhale it again at the next inspiration. But the moment the expansion and contraction of the lungs becomes synchronous on the two sides, this abnormal action ceases.

Hence, the difference in the degree of dyspnœa caused by a large and a small wound, though the play of the lung may be the same.

My views, then, as to partial collapse of the lung, may be summed up as follows:

There is a certain size of wound which results in a condition of partial and continuous inflation of the lung, to which both inspiration and expiration contribute.

A wound larger than this causes a greater degree of inflation during expiration, and a less degree during inspiration, the disparity increasing with the size of the wound.

A smaller wound causes a greater degree of inflation during inspiration and a less degree during expiration, the disparity increasing in proportion to the diminution of the wound. Complete collapse can occur only when the wound is very large, or when it has become entirely closed, with the

*Read before the Ontario Medical Association, June, 1890.