

Nearly all the changes produced by a peculiar pathological condition of the body react on the respiration, and alter it more or less. They are numerous, though not varied in character. We ought not therefore to feel surprise at the enormous number of phthisical people, when we consider the conditions to which the largest portion of society have their respiratory organs exposed. (*Here see Thesis.*)

The height and weight of the body being easily determined, it only remains to ascertain the respiratory capacity of the lungs.

The means hitherto adopted or employed for the purpose have afforded but uncertain results. To breathe into an hydraulic apparatus for the purpose of displacing a certain quantity of fluid, or to blow into a bladder whose capacity is afterwards to be estimated, were the means adopted to establish or prove the power of the lungs.

The air expired, in a natural or forced expiratory effort, differs so essentially from that which has been inspired, both in volume, density and properties, that it is impossible to ascertain the volume of air *inspired*, by the mere appreciation of the quantity *expired* (*see the same Thesis*) a person being enabled to continue the act of *expiration*, for a comparatively long period, without the least movement of the walls of the chest.

To determine the volume of air, which we introduce into our lungs by a gentle or forced inspiration, seems to us the surest means of determining the exact capacity of the pulmonic organs. We need not take into consideration the residual air which plays but a secondary part in the results of respiration. In cases of asphyxia the residual air in the lungs is the immediate cause of death by its toxic action on the system. (*See same Thesis.*)

The air can only distend the lungs in proportion to their capacity of dilatation, and the greatest efforts cannot make one atom more penetrate them, than they are capable of receiving. This dilatation of the lungs shows itself in three different directions, 1. in an antero-posterior one; 2. in a lateral one, and 3. in a vertical one. To determine with precision these three measurements, with the modifications which certain pathological conditions of the lungs may make them undergo, and especially pulmonary consumption, has been the subject of our research, and such the object which we think we have attained in the invention of the *Pneometer*. The first condition, and the most essential, was to secure a fixed and firm *point d'appui*, independent of the body, yet permitting at the same time the freest action over every part of the thorax before and behind. The second, to conjoin in one point of the instrument the three movements of the chest; the antero-posterior, lateral, and vertical or that of elevation; the third to note the irregularity of expansion in a sound lung, compared with that in an unhealthy one. The fourth, by the facility of applying the instrument to any part of the thoracic region, anterior, as well as posterior, to adapt itself to chests of all degrees of development. We have realised all these conditions in a mechanical contrivance, at once simple, sensitive, and of the greatest accuracy.

The following is a description of the instrument:—A. is a collar made of metal and covered with velvet to be placed round the neck, resting on a tablet covered also with velvet and placed under the neck. This collar serves as the *point*