

the pushing forward of the long oblique ribs by the action of the scaleni and the intercostals.

There is another action of the ribs that must be considered, a rotation on their long axis. At the level of the 7th rib in the mammary line an increase of one inch was noted in the breadth of the thorax, in forced inspiration, showing the outward rotation of the rib itself to be very considerable, while in the mammary line the 8th rib is raised two inches. The extent to which these various muscles enter into the respiratory act varies a good deal according to circumstances.

According to Dr. George H. Fitz, the thoracic form of breathing is found in all individuals, independent of sex, who wear clothing that limits the free action of the abdominal walls, which have to be free for the unhampered action of the diaphragm. Before his investigations on the subject, one of the favourite theories for the predominance of this type of respiration among women was, that nature had thus provided for the necessities of child bearing. It would seem from his observations to be more due to the corset than to the Curse of Eve. The abdominal form predominates in all races and individuals independent of sex who are untrammelled by constricting clothing, and either form can be cultivated to an extraordinary degree by a training of the co-ordination of various groups.

We are all familiar with the experiment in which the upper part of the thorax is contracted so that a hat is placed between it and a strap that had been tightly buckled about the expanded chest; also, with the other in which the abdominal walls are shoved out before the contracted diaphragm in inspiration, and the liver and other abdominal viscera displaced upward till the abdominal aorta can be felt or even seen pulsating through the anterior abdominal wall, all by relaxing this muscle and contracting the transversalis, internal and external obliques. These two experiments may be said to illustrate the extremes of thoracic and abdominal breathing.

Great lung capacity is usually associated with extreme development of both methods of breathing, but it was to find out if there was any relation between the configuration of the thoracic cage, and chest mobility or capacity, whichever it may be called—that the present investigation was undertaken. Is the broad, flat chest more likely to show a large capacity than the narrow deep one—or vice versa?

I must confess to a preconception that the broad one favoured a high record for capacity. It seemed self evident that the forward movement of a broad chest must greatly overbalance the rotation of the ribs and the broadening of a narrow one. I had in mind several cases of unusually large capacities in men having chests of that type, and others