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THE ABDOMINAL TYPE OF RESPIRATION AS OFTEN EMPLOYED IN SINGING.

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THE ABDOMINAL TYPE OF RESPIRATION AS OFTEN EMPLOYED IN SINGING.

BY O. J. STEIN, M.D.

My attention was directed to this subject by observing that among a certain class of singers who practiced the abdominal type of breathing, there existed a marked disproportion in development of the chest and abdomen. Not alone this, but in seeking for a causative factor for some deranged conditions of the generative organs my investigations brought me to the abnormal employment of abdominal respiration as used in their singing. As soon as I became cognizant of the fact that the over-indulgence in this form of breathing was to blame for the trouble in hand, I readily saw the irreparable amount of damage that may come to these organs of generation by following such a method; and I thereafter made it a special point of observation and inquiry in all cases of this character to observe the type of respiration employed and to inquire as to the method taught them in their singing. In one case I was told the singing teacher laid particular stress upon the forcible employment of the abdominal muscles in the expiratory act. This was done, he explains, to add force to the act and hence volume and power to the voice. And thus regardless of all consequences, ignoring one of the important elements of physics—that no two things can occupy the same space at the same time—he tells his pupils to force down these powerful abdominal muscles, displacing the contents of the abdomen, so as to press up on the diaphragm and thus add force to the act of expiration. Apparently there is but one

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object in view and that is to add strength and power to this expulsive act of respiration. But in selecting the abdominal type the teacher disregards all laws of physics, physiology and health, and as a result of exercising these muscles for the purpose indicated we are so liable to see, and in many cases where we do not see, they really exist unknown to us, the want of symmetry and proper development of the chest, the over-developed and protruding abdomen, and the train of symptoms resultant from a constant and forcible displacement of the contents of the abdomen. Like any other muscle or group of muscles under persistent exercise, there is bound to result a highly developed state of its fibers, and as a consequence we often find in these cases a very perceptive protrusion of the abdomen; and in one case that I had under observation, the muscles were so developed that in placing my hands in the attitude of palpation upon them they felt like bands of iron, so firm and strong and contracting were they. It is then only too apparent with such powerful muscles acting synchronously, pressing down through their contractive action upon the underlying organs, that everything is displaced to a more or less extent, and that this constant displacement, and often too under great force, by its pushing and crowding, drags upon and stretches the natural lines of moorage that anchor the different organs in their proper and respective places. And hence on account of the peculiar position, suspended as they are in the very center of the pelvis, the generative organs are more easily and disastrously displaced. Like its sister evil, the tight corset and girdle constrictions, many of these generative disturbances may be attributed and directly traced to these displacing forces. Only in the factor under consideration I consider the evil a still greater one, in that by the alternating contracting and relaxing action of the muscles, there necessarily results an unstable position of location in the organs much at variance with the more natural and healthy conditions, which reciprocal suc-

cessions putting the ligaments now taut, now slack, ends in such a stretched and useless condition that malposition is the only inevitable result. I am directing my remarks now more toward the uterus and its appendages, but what is true of these organs is also,

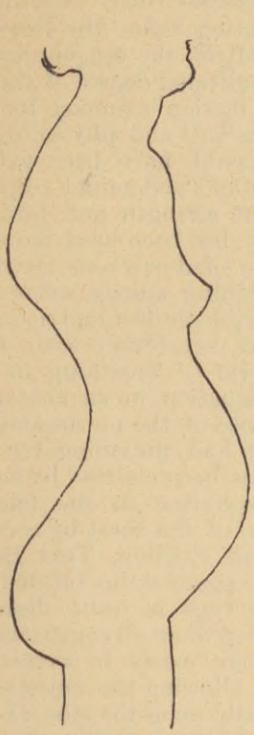

Fig. 1.—Appearance as a result of abdominal breathing.

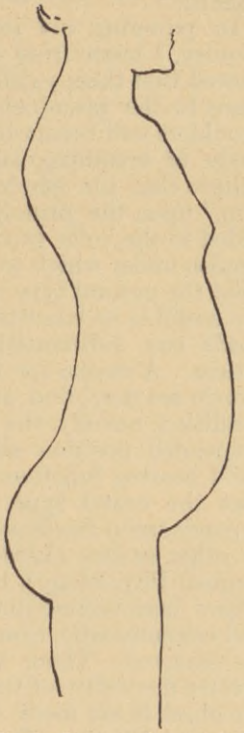

Fig. 2.—Same as figure 1, but to a less degree.

but probably to a much less degree, true of other organs in the abdomen; and particularly here I may mention the stomach. Now just imagine in what an embarrassed position this so often abused organ is placed when the singer with her herculean-like belly

muscles causes them to forcibly contract, pressing in upon all that lies underneath causing a general scattering, as it were, of everything within and crowding and cramming the much suffering stomach to adapt itself within a space not any too roomy for a chicken's gizzard.

In pursuing my investigation upon the lines of inquiry, I learn from most all of the singers interviewed that there exists a manifested degree of abhorrence to the prominence of motion assumed by the shoulders and bosom in the normal and physiological mode of breathing and hence I have been led to believe that the employment of "abdominal respiration," upon the principle that strength and force is added to the voice production, has been used more as a guise under which to parade a fad or a new method. That the natural type of breathing among women is the costal is an admitted physiologic fact and scarcely needs any substantiation in connection with this article. A reason for this form of breathing in the female sex may find an explanation in an anatomic condition, namely, the existence of the uterus and its suspended position allowing and providing for its child-bearing function. It has been claimed by some that the costal type of respiration in the female depends upon the constriction of the chest by corsets or other causes (Landois and Stirling, Text Book Human Physiology), but this again seems refuted by others maintaining that this type is quite distinct and characteristic, even in sleep when all constrictions are removed. Then, too, there exists in women a greater flexibility of the ribs, allowing the muscles of the chest to act more efficiently upon the ribs (Landois and Stirling, Text Book Human Physiology). In my mind the whole subject hinges upon the recognition that respiration consists of but *one* active movement and that is the inspiratory one. The act is a muscular one under the influence of the central nervous system. The muscles involved are the diaphragm, the two sets of elevators (levatores costarum

longi et brevis), the saw-tooth muscles of the back (serratus posticus superior) and the intercostal (intercostales external, et intercartilag.) The stimulus coming from the center of respiration in the medulla oblongata causes the muscles in question to contract. The diaphragm through its nerve, the

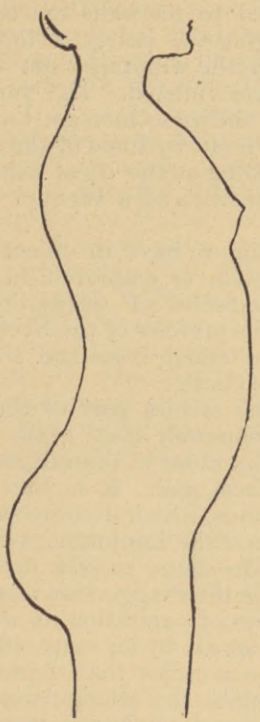

Fig. 3.—Appearance as a result of costal breathing.

phrenic, contracts and consequently on account of its dome shape descends, causing an increase in the vertical diameter of the chest. The levatores through their branches of the dorsal nerves, and the serratus through the cervical nerves, likewise contract and

arising as they do from the spine as their fixed point and passing obliquely downward and forward to the ribs, they necessarily raise the ribs, which movement is of a rotary as well as elevatory nature. Thus the lateral and antero-posterior diameters of the chest are increased. In short, the chest is an air chamber; the muscles attached to its walls are endowed with the power of enlarging the cavity of the thorax so as to draw air through the windpipe into the lungs, which therefore become inflated. The lungs have not in themselves any ability to increase their capacity, but are merely blown out by force of the air which rushes into them according as the chest expands in order to prevent the formation of a vacuum (Holmes' Voice Physiology).

Now presuming we have in object an exaggerated form of inspiration as employed in singing, we set the accessory muscles of inspiration in operation. And these are the muscles of the hyoid bone, the sternum, upper ribs, collar bone and a few less important ones of the chest.

Now comes the second part of the respiratory act, which is non-muscular and hence purely passive. The cavity of the chest is diminished simply by the weight of the chest wall. It is the elastic recoil of the chest and lungs, which diminishes the cavity and by the relaxation of the diaphragm, which again resuming its dome-like shape presses up and against the lungs. But as in the exaggerated inspiration we have accessory muscles of expiration, in which the chest is squeezed, so to speak, by an extra effort. This extra effort lies in the muscles that depress the ribs, like the internal costals, the triangularis sterni, serratus posticus inferior and quadratus lumborum, and also by contraction of the abdominal muscles, which retaliate upon the diaphragm which had by its contraction and consequent descent pressed out the belly muscles. It is this fact that the abdominal muscles, being accessories to the expiratory act, are so often taken advantage of, and on account of the ready control one

has over them and the power they contain, that their use is so shamefully abused. The mere fact of these muscles being accessories does not admit of their forcible use and hence abuse. One might say then that the levator ani should be forcibly used, for it is also an accessory muscle of expiration.

In following the drift of argument that I have I do do not wish to be interpreted in advocating so called clavicular breathing, a form of breathing accredited to many singers, wherein the shoulders are prominently elevated. It is a very pernicious habit of respiration and should always be discouraged. The very first point of counter argument heard from singers and teachers when confronted with the evil effects following the employment of the abdominal type of respiration is the ill appearance presented by one using clavicular respiration; thus at the very outset disregarding the great difference between costal breathing and shoulder breathing. In fact, elevating the shoulders has but little influence in dilating the chest, as they raise the ribs only to a comparatively small extent, because their power is mostly exerted over the upper ribs which have little freedom of motion and hence the effort is greater than the result warrants.

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