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BREATHING IN SINGING.

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THE importance of correct breathing habits in singing is universally acknowledged, but the precise relation of breathing to singing has not as yet, I think, been definitely pointed out. A statement of this relation may, I believe, prove not only interesting to the voice physiologist, but also of practical utility to the voice trainer and the professional singer.

Many writers on voice training have given a considerable amount of attention to the difference between ordinary breathing and breathing in singing. I may refer to some of the more important of these. Herr Emil Behnke[1] says on this subject:—

"Breathing goes on regularly while the voice is silent, but in "speaking and singing both inspiration and expiration have to be "regulated according to the nature of the phrases to be spoken or sung. "If the speaker does not know how to take breath, and how to control "the expiration, his delivery will of necessity be jerky and uncertain. "But in the singer it is even more important that he should be able to "fill his lungs well, and having done this, to have absolute command "over his expiration; because while the speaker can arrange his "sentences, his speed, and his breathing places very much at his own "pleasure, the singer is bound by the music before him. It must,

[1] "The Mechanism of the Human Voice," p. 17.

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" therefore, be his aim to cultivate a proper method of breathing with " the object of first getting, with the least possible fatigue, the largest " possible amount of air, and then of controlling the exit of that air in " the most scrupulously careful manner, so as to prevent even the " smallest fraction of it from being wasted. Yet how seldom is breathing " systematically practised as an indispensable preliminary to the pro- " duction of tone! I have no hesitation in saying that the subject is, in " many instances, dismissed with a few general observations. Pupils, of " course, take breath somehow, and teachers are glad to leave this " uninteresting part of the business, and to proceed to the cultivation of " the voice."

Behnke here insists on the importance of purity of tone, and on the necessity of making the most of every particle of air expired. His statements leave the impression that the more vocal work that can be done with a given amount of air, so much the better, all expiration beyond *voicing* requirements being so much waste.

Hullah,[2] in treating this question, says:—

" The action of the lungs during speaking or singing would seem to " differ from their action when the voice is at rest chiefly in this—that " in the latter condition (as we have seen) inspiration and expiration are " made at, or nearly at, equal intervals of time, whereas in the former, " *in*spiration should be made as quickly and *ex*piration as slowly as " possible. The first of these acts, rapid inspiration, though demanding " some care, is not hard of attainment. The second, deliberate and " controlled expiration, is somewhat more so. Both will be rendered " easier if we consider that the animal economy is as well cared for " when expiration is the cause of sound as when it is not. Every " particle of air, therefore, which a speaker or singer (in action) exhales " silently, is wasted—is something taken from the force and volume and " ease of his utterance. As the sound of the violin reaches the ear the " instant the bow of the skilful violinist touches the string, so should the " voice, at the instant expiration—the *bowing* of the vocalist—begins; " no interval of time being left during which air may escape from the " lungs without being turned to account in the production of sound. " Many speakers, and even singers, disregard this; having taken breath " they give some of it out again *before* their utterance commences, " obviously with a loss of power."

The point that Hullah states so emphatically here—that silent exhalation is waste—is just the point I wish presently to examine. What he calls loss of power, viz., giving out breath before utterance commences, is really, in the case of many people, a safety-valve to prevent breathiness and impurity of tone.

Sir Morell Mackenzie,[3] writing on voice production, says:—

" As regards the blast, the great object to be aimed at is that no air " shall be wasted or expended unproductively. Just the amount " required for the particular effect in view must be used. Too strong a " current tends to raise the pitch, a result which can only be prevented

[2] "The Speaking Voice," 2nd edition, p. 30.
[3] "Hygiene of the Vocal Organs," p. 119.

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"by extra tension of the vocal cords, which of course entails unnecessary "strain. Or the air may be sent up with such velocity that some of it "'leaks' through before the glottis has time to intercept it, or with such "violence as to force the lips of the chink a little too far apart. In either "case so much motive power is thrown away, and, besides, the brilliancy "and fulness of the tone are lost. The *coup de glotte*, or exact corre- "spondence between the arrival of the air at the larynx and the adjust- "ment of the cords to receive it, is a point that cannot be too strongly "insisted on. Neither books nor dissection can teach this; the sole "guide is the *muscular sense*, helped and enlightened by a competent "instructor.

"Madame Seiler strongly condemns the system of training the voice "at its maximum of intensity, the lungs being inflated to their utmost "capacity, and the accumulated breath discharged at the glottis as "from the mouth of a cannon. She, on the contrary, maintains that by "practice in singing at slight breathing pressure, or *piano*, and aiming at "purity and sweetness, rather than mere loudness of tone, more complete "control of the organs is acquired, and much less risk of physical injury "is incurred. The breathing should be so much under control, and so "entirely transformed, as it were, into sound, that the flame of a candle "at a distance of a few inches from the performer's mouth should not "flicker as he sings. The power of so exactly regulating the emission "of the breath is a good test of whether the voice is being properly "used or not. It is a point very strongly insisted on by Garcia, if not "originally propounded by him."

Mackenzie, like the two former authors, lays stress upon the fact that purity of tone depends upon the play of a certain amount of air upon the vocal cords; upon the passage of a definite quantity of air through the glottis, anything in excess of this tending to impurity of tone. In connection with this quotation I may here point out in passing that a tendency to breathiness, the strong inclination to leakage, shows that some need of the system requires to be satisfied.

Mr. Curwen,[4] whose powers of observation and reasoning were of the very keenest description, and whose faculty of specializing seemed to be unbounded in any subject to which he turned his attention, makes a distinct advance on all those authors I have quoted, and what he says is so pertinent to the subject of my paper that I give it in full:—

"The singer's purpose necessitates a larger use of breath than is "needed for ordinary respiration. Professor Huxley shows that if a "pair of lungs holds, when filled in the ordinary way, two hundred and "thirty cubic inches of air, they can be made to hold, by means of a "deep inspiration, three hundred and thirty—that is, not far from half "as much more. Now, for every muscular effort, as that of working or "of running, as well as of public speaking and singing, more fresh "blood is required—that is, blood newly purified by the oxygen breathed "into the lungs. Hence it is that in preparing for any strong effort of "the body we naturally fill the lungs. The greater the muscular effort "the larger the demand for oxygen in the lungs. A man is strong, not

[4] "The Teacher's Manual," p. 163.

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" merely in proportion to the size of his bones and muscles, but chiefly " in proportion to his power of taking plenty of *good* air into his lungs. " ' If a man can breathe well,' says Dr. Taylor, ' he can generally work " ' well ; if short winded, though he may have the muscles of an Ajax, " ' he will be left behind to a certainty in the race of life.' It is on this " account most needful that the singer should be practised in these " exercises of chest filling.

" But it is not only for the muscular effort he is making that the " singer needs to fill the air cells of his lungs so well ; he has often to " sing long passages or long tones in one breath, and must, therefore, " know how to lay in a good store, and that habitually. *The ordinary " breathing processes are not sufficient for the singer.* He must not be " surprised if his teacher requires from him a much fuller and freer " use of all the muscles of diaphragm, ribs and chest. He may take " comfort, however, from this consideration, that many an one has been " cured of incipient consumption by singing exercises. This has been " well known to voice trainers, even before the principles of the ' move- " ment cure ' were developed. But remember always that it is not the " foul air of a close room which gives oxygen to the blood, but the " fresh air of a room well ventilated.

" There is another great distinction between ordinary breathing and " the breathing of a singer. It is that, in ordinary breathing, the " expiration, or ' breathing out,' is done by simply ' letting fall ' the ribs " and diaphragm with very little muscular effort, whereas, in the singer's " breathing, the chief art lies in giving out the breath *gradually.* To " do this the muscles which govern the breath have laid upon them a " new and unaccustomed work, that of *not allowing* the walls of the " chest to collapse, and of controlling the economical dealing out of the " breath. As the muscles have in this a new task to perform, peculiar " to the singer's wants, they will need special and careful drill, not " violent or long sustained, but frequent. That extra one hundred cubic " inches of air, of which Professor Huxley speaks, must be *easily* drawn " into the lungs and carefully and steadily let out."

The advance Mr. Curwen here makes over the other authors quoted is that he recognizes and marks prominently the fact that a singer, like a runner or a public speaker, requires a greater amount of air for the needs of the system. This is the point I would emphasize, viz., that for the extra muscular exertion of singing the singer requires an extra supply of fresh air for the system—*i.e.*, the total amount of air *respired* in a given time in singing requires to be greater than in an equal period of inactivity. Had Mr. Curwen advanced a step further he would have touched the problem I am dealing with in this communication. What he did not see was this, that the very act of singing a pure tone militates against this increased respiration by interfering seriously with the amount of air expired in a given time.[5] Here then is the singer's difficulty—to obtain sufficient air for his *vital* needs while using the proper amount for his *voicing* needs.

[5] This is observed still more strikingly if one tries to sing during the act of walking along a road or up a steep hill. In these cases the muscular energy required is greater than in singing, and the walker gets out of breath so much the more readily than the singer.

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The fact that requires emphasis is this, that pure *voicing* requires (or allows) only a very small quantity of air to leave the lungs in a given time, and so interferes considerably with the freer respiration that the act of singing demands. If a singer were to *expire* air only when *voicing* he would soon sing himself blue in the face. A singer out of breath is a singer that did not get out enough of breath. The vital air required is large in amount, the air allowed to pass in *voicing* is very small, and between these two necessities the singer is in a dilemma.

I believe I can best illustrate this struggle between the needs of the vital organism and the requirements of voicing in pure tones by narrating the case that brought the problem first under my notice.

A man had tracheotomy performed for disease of the larynx. An opening about one-sixteenth of an inch in diameter allowed air to pass into and through the larynx. Breathing was carried on through the tracheotomy tube. When the man wished to speak, he placed his finger over the opening of the tube so as to force a certain amount of air through the larynx, at the same time allowing a large amount of the expired air to pass out of the tube by the side of his finger. The small quantity of air that passed through the minute opening in the larynx was quite sufficient for *voicing* purposes. When, however, he closed up the tracheotomy tube and endeavoured to breathe (*i.e.* to obtain his *vital* air) through the small opening he nearly choked in a few seconds. The opening was too small as well for expiration as for inspiration.[6]

This case illustrates very clearly what is also shown by the candle-flame experiment, that voicing requires very little air, far less than normally passes through the larynx in ordinary expiration. If, therefore, a singer were to rely on the act of *voicing* to get rid of the usual quantity of air in his lungs, he would soon find himself out of breath. "Smuggle in the breath" is a well-known saying among many singers. "Smuggle out the breath" would be as good a rule.

The practical application of all this is that singers should breathe as much as possible, that since the purest musical tone is produced without any excess of voicing air, the lungs should not only be filled often, but also as completely emptied as possible before an inspiration. In other words, we are brought to see the physiological reason for a good rule laid down by one of the best voice trainers, viz., "Take breath whenever there is an opportunity." This was the rule Mrs. Stapleton said that she received from her trainer, Mr. Welsh, who laid so much stress on correct breathing that he drilled his pupil in this art for three months before he allowed her to sing a single note.

[6] I may state that there was no flap forming a valve and preventing inspiration; the opening was perfectly patent.

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