The Music Shed

& The Business Shed

- A Creative Initiative

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Vocal Folds – not vocal chords

These are housed within the protective cartilage of the larynx and the actual size of the folds is very small – about the size of the nail on your small finger.

The skin on the vocal folds is rather like that on the back of your hand. Look at the palm – run a finger over this – it is very firm to the touch. The skin on the back of the hand moves. This is what the skin on the vocal folds does. It oscillates and when there is a voice disorder, or swelling because of infection, this mucosal wave loses its suppleness – and becomes "harder".

A little bit of science now: the relationship between the velocity and pressure exerted by a moving liquid is described by the Bernoulli's principle: as the velocity of a fluid increases, the pressure exerted by that fluid decreases. Airplanes get a part of their lift by taking advantage of Bernoulli's principle. Race cars employ Bernoulli's principle to keep their rear wheels on the ground while travelling at high speeds. The Continuity Equation relates the speed of a fluid moving through a pipe to the cross sectional area of the pipe. It says that as a radius of the pipe decreases the speed of fluid flow must increase and visa-versa.

This visa-versa is important – as the speed of flow of the fluid increase, the radius of the pipe will decrease. Simply put - Fluid = air; pipe = glottis & vocal folds.

The breathing pattern during phonation consists of rapid inspirations and prolonged (controlled) expirations. Quick in-breaths, followed by controlled long out-breaths.

So as we begin to make a sound (spoken or sung):

1. The vocal folds are gently closed by muscular forces within the larynx (the abductor muscles).
2. Air pressure increases beneath the closed folds. (Subglottic pressure).
3. Increasing air pressure begins to open the glottis. This opening begins on the underside of the glottis.
4. The glottis continues to open, from bottom to top, until air begins to escape.
5. As the air begins to flow through the glottis, its velocity increases and its pressure decreases through the Bernoulli Effect.
6. Reduced pressure in the flowing air is no longer sufficient to hold the glottis open.
7. The glottis closes again, from bottom to top.
8. As soon as the glottis is fully closed, the process begins again.
9. Repeating so many times per second as the frequency of the pitch requires.

In exhalation, the velocity of the air stream increases as it passes through the constriction of the glottal chink and the folds are sucked towards each other.

To produce a tone of constant loudness and pitch, the subglottic pressure must increase while the vocal fold tension must decrease in order to keep the pitch constant. Phonation therefore requires a fine coordination between the laryngeal and the chest wall muscles.

Richard Miller calls this the "vocal contest" – that fine coordination of airflow and phonation which is determined by cooperation among the muscles of the larynx, and the chest wall and diaphragmatic contraction, a dynamic balancing between subglottic pressure and vocal fold resistance.

In cultivated singing, thoracic, diaphragmatic and abdominal aspects of respiration must be coordinated without exaggerated activity in any one of these three areas.

No good teacher of singing can ignore breath management!