SCHOLAR.—Did you not say that by the opening of a valve in the parlor organ, the compressed air was admitted to the reeds above?

MASTER.—I did; and this is accomplished by the fingers of the performer, which, pressing upon the keys, open the valves in question.

SCHOLAR.—But there are no keys in the vocal organ, how then are the valves opened?

MASTER.—It is true, there are no keys, properly speaking, but there are muscles which expand or contract at will, and these correspond with the keys of the instrument by opening or closing the valve, i.e., glottis.

SCHOLAR.—In the parlor organ I see many reeds, in fact one for every different sound produced, that is to say, in two octaves of the organ there are twenty-five reeds, while in the vocal organ there is but one reed.

MASTER.—The superiority of the vocal organ over all instruments of human construction, excepting in compass and power, arises chiefly from this peculiarity, as I will endeavor to show you. The science of music has divided the great range of sounds into a scale of twelve different degrees, which you will recognize as the *chromatic scale*, or scale of semitones; but between any one of these degrees and the next, there are many shades of tone, as may be proved by placing the finger upon (say) C, 2nd string of the violin. The slightest movement, upward or downward, will produce a sound somewhat sharper or flatter than the actual C, yet be neither the semitone above nor below.

In the parlor organ, as in all keyed instruments, these intermediate shades of tone cannot be produced, the sounds can proceed only from one definite tone to another, and cannot glide or blend into one another.

A moment's reflection upon what I have said will show you that the parlor organ, being an inanimate body, is incapable of changing itself, necessitating, as you have seen, a separate reed for every separate tone it produces, the larger and heavier, vibrating slowly, produce the lower tones; the smaller and lighter, vibrating more rapidly, produce the higher tones of the instrument.

The vocal organ, on the other hand, being, as it were, an animate and sentient body, though passing but one reed, (vocal cords), is yet capable of changing that one reed from a large to a small, or *vice versa*, instantly at will, and thereby produce, not only a definite number of fixed semitones, but the whole range of intermediate sounds besides, and it is due to this power that the tones of the voice in singing may be made to glide from one to another, such as is produced upon instruments of the violin family, by gliding the finger along a string while the sound is being produced by the bow. The gliding from one sound to another, by producing all the intermediate shades of sound, (in singing called *Portamento*) is really produced by the changing of the vocal cords from a larger and more relaxed state to a smaller and more tense state, or the reverse; meanwhile the glottis or valve being open and admitting the air from the lungs, thus keeping the reed in a state of vibration.

SCHOLAR.—Will you explain the appearance and position of the vocal cords?

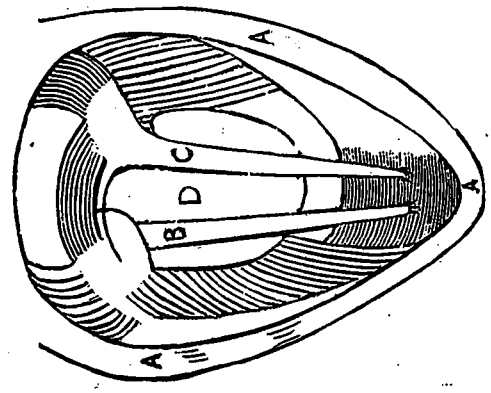
MASTER.—A learned dissertation upon the anatomy of the organs of voice would be of little value to vocal students, nevertheless, an intelligent understanding is most desirable. To make my subject as comprehensible as possible, I will confine myself to those parts of the organ only, which have immediate relation to the tone.

The *Larynx*, or "Adam's Apple" consists of five parts, or muscles, with long compound Greek and Latin names immaterial to our purpose, suffice it to say that these muscles are free to play into one another, and that through their centre is a space called the vocal tubes, that these tubes terminate in a triangular opening called the *glottis*, the lips of which are formed by the *true vocal cords*, so called from their being concerned in the production of sound. These cords are two strong, fibrous bands covered externally by a thin layer of mucous membrane; they are extended across the throat from front to back, are nearly joined in front, somewhat more separated at the back. They do not extend up and down the throat like piano strings, as some suppose. The vocal cords are approximated and made more tense, or parted and relaxed by the action of those muscles which, in themselves, constitute the *Larynx*, the air necessary to the action of respiration passing through at all times.

SCHOLAR.—If air is passing through at all times in the act of respiration, why are sounds not produced continually?

MASTER.—Because, in the act of respiration, the vocal cords are not sufficiently tightened to produce vibrations, but are in a relaxed state; you will perceive that the smallest degree of tension, which will produce a sound, will be the lowest tone in each individual voice, and that the greatest degree of tension, and approximation of the edges of the vocal cords will give the highest. To prove this, place three fingers lightly upon the throat, sound a low note, then slowly ascend the scale until you have reached the highest note you can produce; you will feel, as the notes of the scale ascend, the "Adam's Apple" and adjacent parts ascend also; if having reached your highest note, you suddenly drop to the lowest, you will perceive that the parts of the throat descend to their original position. What I desire to strongly impress upon you is that for every shade of tone produced a definite position of the *Larynx* is necessary; the best method of securing these positions belongs rather to the cultivation of the voice, which we will consider in our next lesson. Before dismissing you, I would say that, although the sound is produced at the *Larynx*, there are agencies which modify it, e'er it leaves the mouth of the singer. These are, notably, the hollow spaces in the frontal bones, between and over the eyes, in the cheek bones, which are in connection with the back part of the throat, (*the Pharynx*); these act as sounding boards, and give increased resonance, while the Pharynx by its contraction or expansion modifies the quality. Lastly the mouth may also modify the tone produced at the *Larnyx* for good or bad. In the mere production of sound, the cheeks, when distended, seem to assist in giving resonance to the voice, by performing a similar office to that of the bell of a Trombone, or other brass instruments.

The cut I here exhibit, divested of all unnecessary details, may assist you to form an idea of the vocal cords and their position.



A—Cross section of the Trachea.
B—Left vocal cord.
C—Right vocal cord.
D—The glottis.