

HEAD AND NECK 1

I am going to talk about the head and neck, and have a detailed look at all these structures involved in either the head going forward and up, or being pulled back - or depressing the larynx, or not depressing the larynx.

Look first of all at the underside of the skull - the back of it, the jaw at the front and the bump of bone which is called the External Occipital Protuberance on to which the major part of the neck muscles attach. Right underneath the skull is the Foramen Magnum, the big hole through which the spinal cord passes out and down the spine. Lying beside and towards the front of the foramen are two smooth areas for articulation with the first vertebra of the spine - the articular facets of the atlanto-occipital joint. Just in front of the Foramen Magnum is a little lump of bone called the pharyngeal tubercle which is right in the centre. It is from this point, directly in front of the Foramen Magnum, that the whole of the Pharynx - the throat mechanism - is suspended. That is an important point to remember.

The drawing also shows the back of the nasal apertures, the jaw joint, and the jaw itself. The two big neck muscles - the sternomastoids - attach on to the mastoid processes and pass down to attach on to the front of the sternum. Just in front of the mastoid process is the styloid process, a spike of bone, which is an important position, as its base lies in the same plane as the atlanto-occipital joint itself. Also on that plane, which Dart calls the coronal plane of balance, and embedded in the bone of the skull directly above the base of the styloid process, are the three Semi-circular canals, filled with tiny hairs and fluid, each placed in one of the planes of movement - vertical, horizontal, and transverse. One on either side of the head, these are responsible for detecting the movement of the head in space.

Attached to the styloid process, whose bony spike is like an indicator to the structures to which it is attached, showing them the degree of tilt, the degree of movement or the relative position of the head to the neck, are all the structures which are concerned with speech and vocalisation.

We can say that the Coronal plane of balance is an axis passing through the atlanto-occipital joint which permits and detects the movement of the head on the spine. Coming from a point on that axis is the styloid process; a point of bone which links the movement that takes place in the head and neck to the structures concerned with voice.

Lying directly underneath the line of the jaw is a U-shaped bone which fits around the upper part of the trachea. This is called the Hyoid bone. This forms the upper part of the alimentary tract as well as the bony root of the tongue. There is a direct muscular connection between that bone and the styloid process.

Forming the front wall of of the vocal mechanism or larynx is a shield of cartilage called the thyroid. That too has a direct connection to the styloid process. There is also a ligamentous connection from the inside of the vertical part of the jaw, where there is a little pointer of bone, up to the styloid process.

The final connection is from the pharyngeal tubercle. The muscular bag of the throat itself is suspended from this.

There is one other connection which passes from the styloid process to the whole of the length of the side of the tongue. Again, movements of the head relative to the neck and movements of the tongue are quite directly related.

The pharyngeal tubercle, the point of suspension of the pharynx, gives origin laterally to three muscles which form the back of the throat. The front of the throat is formed by the bony supports of the hyoid or the thyroid cartilage or the ligament which joins the two together. So the complete ring of the throat bag is in front supported by tough material, and the back consists of the muscles suspended from the pharyngeal tubercle.

The hyoid bone can be felt directly under the angle of the jaw. If you put your finger right up as high as you can and then swallow, the hyoid bone is the hard bit that you feel moving just there. Lower down you can feel the thyroid cartilage, which is linked to the hyoid bone by a semi-circular ligament.

The open upper end of the throat opens into the two nasal passages and the mouth cavity.

The head then is balanced on the neck and its movement is sensed by the semi-circular canals in all three planes: that movement is then indicated by the styloid process and its connections to the tongue, the jaw, the hyoid bone and to the thyroid cartilage itself.

Now there are several other muscular connections between the skull and the vocal apparatus. On either side of the hyoid bone is a sling arrangement, and a muscle passes through that sling from the mastoid process and attaches on to the front of the jaw. The root of the tongue, the thyroid cartilage, the vocal mechanism, and the lungs hanging down below these are suspended by the sling arrangement of that muscle which is called digastricus. That arrangement is rather like a parachute; the larynx is like the basket under the balloon, which is the globe of the skull: the muscles between the

larynx and the skull are like the strings between the basket and the balloon, and it depends on how these strings are pulled whether the larynx is moved forwards and down or back and up. The whole vocal mechanism should be freely slung from the base of the skull and the underside of the jaw. It is the movement between the head on the neck and the jaw on the head that finally gives the resting position for the larynx, the windpipe, and the lungs that are hanging down from it.

At the level of the larynx the throat splits, and the back part becomes the oesophagus or food pipe, and the front part, surrounded by the cartilage shield, becomes the trachea or windpipe.

The important thing to get clear is the connection between the axis of balance and its relationship with the vocal mechanism. Were it not for that very direct link between the two, Alexander would not have evolved his Technique. It is only because of the close connection between voice and head balance that Alexander was able to discover what he did. By releasing his own vocal mechanism and getting 'correct' head balance, he was then able to go on from there.

The Coronal Plane of Balance is the line on which the balancing mechanisms of the semi-circular canals are situated, and also the bony points of the styloid processes, and the pharyngeal tubercle in the mid-line directly in front of the foramen magnum from which the three constrictor muscles of the throat are suspended.

The SUPERIOR, MIDDLE, and INFERIOR Constrictor muscles form the semi-circular back wall of the throat. They are smooth, involuntary muscles controlled by the autonomic nervous system, and they perform the the final part of the act of swallowing. Just try and swallow the spittle that is in your mouth. You can press your tongue up against the roof of your mouth and the spittle goes back, but then you have to leave the swallowing to happen by itself. That is where the three constrictor muscles acting under the autonomic nervous system take over to complete the swallowing. If you try to swallow two or three more times you find you can't: this is because the constrictor muscles respond reflexly to stretch, and as you have just got rid of the spittle in your mouth, which was just enough to stimulate them to stretch, there is nothing more for them to respond to. It is possible for you to go through the first action involved in swallowing, but there is nothing there to trigger of the reflex mechanism that completes the action. The back wall of the throat consists of the three constrictor muscles suspended from the pharyngeal tubercle.

Now to look at the front wall of the throat - there is the underside of the jaw, the U-shaped hyoid bone right up in the angle between the jaw and the throat, and the thyroid cartilage.

Running from the middle of the underside of the jaw to the hyoid bone is the tendon which joins the two together and gives rise to a fan-shaped muscle called mylo-hyoid which forms the floor of the mouth. 'Mylo-' comes from the latin word meaning to mill or to grind. There is another smaller muscle lying deep in the floor of the mouth which supports mylo-hyoid and is called genio-hyoid. These two muscles connect the jaw to the hyoid bone.

The next part of the front of the throat is formed by the thyro-hyoid ligament which connects the hyoid bone to the thyroid cartilage. Then comes the thyroid cartilage itself which contains the vocal lips and sits on the cricoid cartilage which forms the thickened upper part of the trachea.

Inside the thyroid cartilage, and coming up from its front edge is the epiglottis. This closes down so that the tube going down to

the lunge is shut off, and the remaining part from the mouth down the back wall of the throat is open for the passage of food. From the epiglottis downwards what has been a single cavity divides into two, and becomes a) the respiratory mechanism, and b) the digestive tract.

(Regarded physiologically, some of the tricks that voice-users adopt in order to get a certain shape in the structure to get resonance or whatever, involve using the apparatus almost exactly as it is used for eating. W.M.C.)

The muscles of the oesophagus work autonomically in response to the stretch that the food passing down them causes. The epiglottis closes in response to food being passed to the back of the mouth for swallowing.

Now to consider the tongue; this is an arch-shaped sheet of fibrous tissue attached in the mid-line to the hyoid bone, passing up from the floor of the mouth into the mouth cavity. It is composed of muscle fibres which lie in all three planes - horizontally, length-wise and vertically: this meshwork of fibres form the Intrinsic muscles of the tongue.

The muscular fleshy body of the tongue is supported, strengthened and moved by the Extrinsic muscles of the tongue.

The first extrinsic muscle of the tongue is stylo-glossus, which runs from the styloid process, along each side of the body of the tongue. The styloid process is at the point of pivot of the head, and so every movement of the tongue is related and reported back to the semi-circular canals on the coronal plane of balance; every movement of the tongue therefore affects head balance.

From the side of the hyoid bone passing upwards to merge with the fibres of the intrinsic muscles is a muscle called hyo-glossus. The third and last extrinsic muscle of the tongue is genio-glossus, which passes up from the angle of the front of the jaw to merge with and fan out into the underside of the belly of the tongue.

The whole musculature of the tongue lies within the muscular framework of the pharynx.