

SUMMARY — Method for Teaching Normal Speech to Persons Born Deaf

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1. The musculoskeletal body is a mechanical device, a unified **framework of forces**. To operate as a system such device must be governed by hierarchically organized levels of control which integrate concurrent forces and resultants through **nodes** of their intersections (or **centers of mass**).

2. Although the system of force frame nodes in our body is complex and ordinarily hard to locate, there is one subframe that is relatively simple and self-standing and constitutes so sensitive an organ, that we can feel the most minute changes in its muscular configuration: the **tongue**. Moreover, the tongue is a free floating mass surrounded by radially entering muscles that execute its movements and the exact behavior of the forces controlling the tongue is readily analyzable when referred to a constant—the center of mass of the forces acting on it (fig. 1). The centers of mass of tongue functions can be located through specific techniques applied to the oral mechanism at minimal energy states. In everyday life we spontaneously switch between the chief nodes of respiration, feeding, speech and other faculties of the oral system, as if shifting gears (fig. 2).

3. Deaf speech currently appears to be built on the chief lingual nodes (centers of mass) of respiration, feeding (and perhaps of crying), rather than on that of speech. This is possible because, as it has been generally accepted, speech seems to be evolutionarily derived from respiration, feeding and to an extent from gesticulation, of which the deaf are perfectly capable. However, the speech frame with its central node is located at a higher level of frame architecture.

4. With the appropriate technique and sequence of steps the chief lingual nodes of respiration and/or feeding can be easily located and starting from these we can access the chief node of speech, which resides at a higher energy level and generates a more complex frame of organization. Unimpeded passage between the nodes of feeding and speech is evident in the ease we can alternate between feeding and speech or even combine the two behaviors. Once the master speech node is engaged normal articulation automatically follows; that is how infants start speech—in analogy to switching gears.

6. My role in this project is to describe the method for locating the speech node. Built on this material a computer based visual learning program can be developed, including interactive physiological feedback in training the student. The feedback would derive from quantitative measurements of superficial facial and neck muscle activity. It is a fact that, arising from the mechanical unity of the body, various states and actions of the oral mechanism generate corresponding electrically measurable **unique** responses in the superficial muscles of the face, jaw, neck, etc. I am prepared to provide a rigorously testable mapping of the correspondences between the actions of speech production and associated externally quantifiable muscle activities. In addition I can also personally demonstrate real-time capabilities available through the control of the speech node, such as authentic pronunciation of all languages.

