Review Article

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Charlotte A. Boshart (*Speech Dynamics, Inc.*)

Contact Author

Charlotte A. Boshart
Speech Dynamics, Inc.
Char@SpeechDynamics.com

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REVIEW ARTICLE

Early Orthodontists, Their Challenges, and Their Significant Impact on Orofacial Myology

Charlotte A. Boshart, M.A., CCC-SLP

Speech Dynamics, Inc., Ellijay, Georgia

Abstract. “Knowing your history can give you the tools to shape your future.” Gloria Feldt’s insightful quote inspires us to delve into the past and learn from those who came before us. This article chronicles the journey of several individuals who shaped the field of orthodontics and influenced the formation of the specialty of orofacial myology. The early years of orthodontics were challenging. In addition to the struggle to elevate the focus of orthodontics beyond mechanics, there was the challenge to convince academia to deem it worthy of post-graduate study. Dr. Edward H. Angle left his indelible mark on orthodontics and planted seeds regarding the mutual relationship of dentition with orofacial muscles, respiration, and oral habits. In the mid-1900s, Dr. Walter J. Straub picked up the mantle. His stated quest was to identify and rectify dental relapse. His search led him to investigate allergies, oral habits, bottle feeding, and swallowing. There were others, but primarily as a result of these two men, the International Association of Orofacial Myology (IAOM) was created. Over the past 50 years, the IAOM has continued to grow, evolve, and set the gold standard for excellence in the treatment of orofacial myofunctional disorders.

Keywords: orthodontics, orofacial myology, history, Dr. Edward Angle, Dr. Walter Straub

The field of orofacial myology was born through the needs of orthodontists. During the developmental decades of orofacial myology, the 1960s through the 1980s, the focus was on the “tongue thrust swallow” and how it impacted dental mobility and stability for orthodontists and their patients. It is interesting to note that the progressive growth and expansion of the focus of orofacial myology is similar to the challenging evolution within the field of orthodontics.

Although the history of braces can be traced as far back as 500 B.C., dentistry was considered a trade until the 19th century when it shifted to being recognized as a profession. This gave way to the naissance of a variety of disciplines within dentistry, including orthodontics. Each vied for position and credibility within the field of dentistry and within the academic system. According to Leslie Will (2015), at that time “orthodontia” (as orthodontics was referred to) was considered different from other dental specialties and only focused on the mechanics of moving teeth. Most importantly, many believed that orthodontics did not warrant additional postgraduate education. She stated, “It is important to realize that dental education was evolving, and it was unclear just

how orthodontics would fit into the larger sphere of dentistry” (p. 902). In 1924, Dr. Martin Dewey, a noted orthodontist of that era, said there was so much disagreement among dental schools, universities and teachers that it was practically impossible to agree upon any one definite educational plan.

Dr. Edward Hartley Angle

Edward Hartley Angle, MD, DDD (1855-1930) is considered to be the father of modern orthodontics. In general, he significantly impacted the orthodontic academic requirements, and, in specific, coined numerous terms and techniques that continue to be used in dentistry and orthodontics today. Peck (2009) stated, “No personality central to the history of orthodontics stimulated as much progress, excitement, and polarity as Edward Hartley Angle...” He ruffled some feathers, but provided many extraordinary insights.

Dr. Angle published several ground-breaking books. Among them, his *The Angle System of Regulation and Retention of the Teeth* (1892), and his *Malocclusion of the Teeth* (1907). In his 1907 contribution, Chapters 1 and 2, Occlusion and Malocclusion, respectively, he clarified terminology and provided numerous study models and case photos. Apparently, prior to that time there were no “malocclusions,” only dental “irregularities.” He confirmed: “Malocclusion of the teeth is but the perversion of their normal relations. It

Contact Author:

Char Boshart, Char@SpeechDynamics.com

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can be studied intelligently only from the basis of the normal [occlusion]....” In addition, Dr. Angle coined and described dental classification terms that many professionals use today: Class I, Class II, and Class III, plus the divisions, etc. There have been criticisms and suggestions of other classifications, but Angle’s systematic analyses have stood the test of time (Riaud, 2019; Rinchuse, 1989). Most notably, in Chapter 4, Etiology of Malocclusion, he addressed several topics including mouth breathing and nasal obstruction, and the impact of swallowing. Following is an excerpt regarding dental impact by an abnormal oral resting posture, as well as his recognition of super-eruption of the molars: “Another habit, though more rare [than lips sucking, is] that of resting the tongue between the upper and lower incisors, or frequently protruding it; [this] more or less produces [an open bite] effect. The pressure upon the incisal edge prevents full eruption and holds the teeth in intra-occlusion, while the molars, being held apart much of the time, lengthen into positions of supra-occlusion from lack of resistance.” (Angle, 1907, p. 108).

Dr. Angle experienced significant challenges during his book publishing years. He wanted orthodontics to be recognized as a full and independent branch of dentistry. At the time, he was unable to convince dental schools to form orthodontic departments. So, he opened the Angle School of Orthodontia in St. Louis, and from 1900 to 1911 he produced many outstanding orthodontists with his rigorous, new curriculum. He included anatomy, histology, zoology, and art. He focused on excellence of instruction, had his students perform clinical work and take a comprehensive test, among many other quality-oriented academic pursuits.

Because of the Angle School, the demand for such schools increased, and many other schools opened to fill the need for orthodontic specialists. However, most of these schools lacked the thorough foundation of the Angle School and relied solely on training the mechanics of orthodontics. These inferior schools were viewed with disapproval by the profession and collective efforts were made to bring orthodontic specialty training into university dental schools. Thus, post graduate studies were initiated.

To appreciate the culture and lifestyle during this part of history, a bit of retrospective context is needed. America was significantly different in the early 1900s when compared to modern days. Only 14% of homes had a bathtub, only 8% had a telephone, and a 3-minute call from St. Louis to New York City cost \$8. The equivalent in today’s dollars would be around \$176. Also, the average life span in the United States was 49 years of age. Dentistry and crooked teeth,

although important, may not have been at the top of the general public’s concerns. In addition, the strains of two World Wars had a significant impact on orthodontics. Though people wore braces in the 1940s, it usually involved melting down and piecing together whatever people could find. Even braces in the 1950s didn’t show much change, though the practice became more common and orthodontists became increasingly skilled in wrapping teeth with metal (JDC Committee, 2021).

Following in Angle’s footsteps, several notable professionals focused on malocclusions, the oral stage of swallowing, oral muscle imbalances, and cranio-facial bone growth. In her landmark 2011 article, Christine Stevens Mills provides names and their notable contributions from 1918 through 1958. For example, in 1918 Rodgers recommended exercises to develop tonicity and proper muscle function, and in 1924 Truesdell and Truesdell proposed that dental deformities were due to incorrect swallowing. And Tulley, in 1956, was the first to conduct electromyography and cinefluorography research on myofunctional disorders. He concluded that malocclusions are frequently found in those who swallow with teeth apart. Although a bonafide specialty, orthodontics continued to be in a state of flux from the 1940s to the early 1970s. Not only did they struggle with bracing materials, but there was great concern on how to effectively move teeth and combat the possibility of relapse. Remarkably, even within today’s field of orthodontics, retention and stability continue to be a challenge, (Littlewood, at al., 2021).

Dr. Walter J. Straub

Of all the orthodontists in the mid-1900s, Walter J. Straub, DDS, MS (1893-1966) had the greatest impact on what would become the specialty of orofacial myology. From the 1940s through the early 1960s, he focused on the etiology of malocclusions and abnormal swallowing, and ultimately published his theories and findings as well as a comprehensive treatment program for the tongue thrust swallow. As we study Dr. Straub, his accomplishments and contributions, it is important to also keep in mind the personality and motivations of the man that directly influenced two of the four primary founders of the International Association of Orofacial Myology (IAOM). Not only did he extensively train Richard H. Barrett and William E. Zickefoose, he shined an exceptionally bright light on the components of orofacial myology that continue to be essential parts of the analysis and therapeutic protocols of today.

The heart and giving nature of Dr. Straub was expressed by Dr. William S. Parker in his friend's printed memorial: "Walter was known to all of us because of his lifelong and wholehearted dedication to helping children. He devoted much of his life to contributing to the profession through lecturing and research. Walter was a warm, kind, generous, enthusiastic person who will remain very much alive in our memory. Walter Straub was truly a fine man, who will be sorely missed by all of us," (1966 Online Memorial). Dr. Straub lived to be 73 years of age.

Dr. Straub was a native of San Francisco and graduated from the University of California, School of Dentistry. After practicing general dentistry for several years, he returned for graduate training in orthodontics. In total, he practiced for 47 years, 34 of them in orthodontics. As little is written about Dr. Straub and specific dates, it is estimated he began seeing orthodontic patients around 1931 and retired around 1965. No doubt, he experienced many of the orthodontic developmental changes that occurred during those decades.

In essence, Dr. Straub's research and speculations reached from dentition into related areas of cranio-oral-nasal functions that, at that time, theoretically impacted dental malocclusions and the ability to correct and maintain them. He investigated and concluded that bottle feeding was a major cause of the "perverted tongue thrust swallow," in addition to mouth breathing, low tongue resting posture, and allergies. He wasn't the first to state many of these dental influences and maladies, but he connected the concepts and shared his conjectures in a more comprehensive way than had been done before. Following is an overview of Dr. Straub's journal articles that provides a progressive window into his quest to determine the causes of malocclusion and dental relapse and remedies for those causes. His publications started in 1944 with a detailed look at allergies. In 1951, he progressed to a description of the "perverted tongue thrust swallow," then penned his trilogy in 1960, 1961, and 1962 on the evaluation and treatment of his preferred finalized term, the "tongue thrust swallow."

His first article "Frequency of Allergy in Orthodontic Patients" was an excellent start to his quest. It covered two interesting topics. First, he wrote a literature review of a variety of allergies and their potential effects and reasons an orthodontist need be informed and concerned. Dr. Straub stated, "The importance of an understanding of the various allergic manifestations among which are nasal allergy, dento-facial changes, gingivitis and delayed skeletal maturation, by the

orthodontic practitioner is obvious, and it cannot be overemphasized that additional clinical observations are required in order to enable him to study these characteristics for a sound approach to successful treatment of young patients," (Straub, 1944, p. 338).

Second, Dr. Straub reported a study on orthodontic patients and nasal allergies that was conducted at his alma mater, the University of California, College of Dentistry (Parker, n.d.). In summary, of the 104 orthodontic patients, 41 (39.4%) had allergies; 13 (12.5%) were borderline and 50 (48.1%) were negative for allergies. Of the 41 patients with chronic nasal allergy, all displayed wither an overjet, a narrow dental arch, and/or a receding mandible. Straub (1944) concluded: "In the light of the foregoing study, an allergic tendency as an influencing agent in the growth of the face must be taken into account as an important factor in nasal, sinus, facial and jaw growth" (p. 341). There was no mention of swallowing at this time, but clearly Dr. Straub's focus was to investigate the causes of malocclusions and deal with them.

Seven years later, his focus shifted and he submitted "The Etiology of the Perverted Swallowing Habit." The article began with the following: "The everyday observation of the orthodontist into the etiology of malocclusion has caused the desire to investigate more thoroughly the cause of the perverted swallowing habit. It is strange that very little appears in the literature regarding a habit that occurs with such frequency and causes such severe malocclusions. However, Truesdell and Truesdell in 1937 advanced several theories on the cause of the perverted swallowing habit, although nothing has been published statistically to substantiate any theories on the cause of it" (Straub, 1951, p. 603). He began by examining articles that detailed the normal swallowing components, including intra-oral suction, negative pressures, peristalsis, as well as the timing of a swallow. The remainder of the article detailed and discussed the statistics and descriptions of 237 of his patients with perverted swallowing habits that he saw from June, 1943, to December, 1950. Although there were other factors, he concluded that because all 237 of them were bottle-fed as babies, this was the primary contributor to the perverted swallowing habit and thus the associated cause of dental malocclusions.

Almost a decade later, in his desire to share knowledge about the tongue thrust swallow and associated topics, he wrote a trilogy of articles published in the *American Journal of Orthodontics* from 1960 to 1962. They are: Malfunction of the Tongue, Part 1 (Straub, 1960), Malfunction of the Tongue, Part 2 (Straub, 1961), and Malfunction of the Tongue, Part 3 (Straub, 1962). He

shared his tongue thrust treatment protocol in Part 3. In Part 1, he detailed normal and abnormal swallowing characteristics, supplied numerous photos of a variety of malocclusions, and discussed bottle feeding. In Part II, he focused on craniofacial bone growth (primarily referencing a steep mandibular plane), plus a variety of malocclusions related to the causal effects of a tongue thrust swallow and bottle feeding. Then, in the first paragraph of Part 3, he explicitly emphasized a change in terminology: “We now prefer the term “tongue-thrust swallowing” which describes the process, is readily acceptable to both parent and child, and does not carry the unfavorable implications of the terms reverse, perverted, and abnormal” (p. 487). In addition to his detailed swallowing evaluation procedures and thumb sucking extinguishing methods, he shared his explicit tongue thrust treatment protocol.

Following is a summary plus a few specifics of Dr. Straub’s treatment protocol and techniques. Throughout its development, the number of tongue thrust therapy lessons vacillated between 7 and 20. His 1962 Part 3 article listed 16 lessons. In Lesson 1, he provided swallowing instructions: Occlude teeth, put the tongue-tip against the roof of the mouth and hold the elastic, and suck. Coupled with this information were instructions to repeat lists of phonetically similar words to place the tongue in the appropriate swallowing position. For example: Tact, tight, tot, taunt, treat, then swallow; light, lit, lent, then swallow; straight, strict, strut, start, then swallow. Also, he was also a proponent of gargling to “strengthen the muscles in the back of your throat” and to properly place the tongue for swallowing, (p. 494). In analysis, this type of speech-to-swallow positioning may not fulfill the desired swallowing response. Instead, the speech-oriented tasks emphasize use and carryover of the swallow and indirectly assumes the individual’s swallowing components are correct. Several of the lessons beyond Lesson 1 continue to use word series, then narrow the targets to “ch” and “k” speech sounds. A few swallowing components are added in subsequent lessons, such as teeth together, find the spot and squeeze, and slurp. The sequencing of the tasks within the 16 lessons are incongruent and, in some cases, difficult to follow. There are many activities, steps, and homework for the patient to do. With that said, it was a well-meaning, thoughtful start to a novel specialty. Also, it is important to note how Dr. Straub’s tongue thrust therapy program was formulated. He explained on page 487, “[This series of tongue thrust lessons] were developed over a 20-year period of time through the contributions and suggestions of many dentists, orthodontists, teachers of cerebral palsy victims, speech therapists, and lay persons interested in the problem.”

To fairly interpret Dr. Straub’s program formulation methods and length of time, a little lifestyle retrospect might be beneficial. First, there was no internet and no instantaneous creation of a Word document, email, or texts. Professional journals either arrived through the mail or were accessed via lengthy library visits. Communication was either accomplished by phone, via physical contact, or the US mail, and composing documents was achieved by handwriting or typewriter. Needless to say, the processes of researching, writing, communicating and collaborating were laborious and extremely time-consuming during those days.

Regarding the development of Dr. Straub’s therapy program, his collective effort of involving a variety of individuals may have been misguided. However, the difficulty and novelty of creating a swallowing therapy approach in the 1950s and 60s, along with his obvious belief in the importance of gathering input from a variety of sources, coupled with his zeal and sense of urgency to rectify dental relapse issues explains and excuses the cumbersome nature of his protocol.

In addition to exploring Dr. Straub’s personality and motivations, it is important to speculate how the readers of the day may have interpreted his information and therapy suggestions. Following are a few impressions, plus a few questions that may never be answered. One of the first tenets in authorship is to determine the reader of the piece, know them, and write to them (Enrooth; online). In Dr. Straub’s 1962 Part 3 article, his intended reader or readers is unknown. Therefore, who are the intended implementers of the lessons and techniques? Orthodontists? Associated dental personnel? Speech therapists? The answer is not stated; however, it was published in the *American Journal of Orthodontics*. Perhaps the expectation was for orthodontists to either implement therapy or recruit and train tongue thrust therapists. As we know, the field of orthodontics was evolving during the 1960s and early 1970s. The question is, were they open to adding an unsubstantiated swallowing therapy piece to their regimen?

Although Dr. Straub’s Parts 1 and 2 articles primarily contained photos of malocclusions believed to be caused by a tongue thrust swallow and bottle-feeding, his tongue thrust therapy program in Part 3 was his *coup de grâce*. His exceptionally detailed, unstructured, and unsubstantiated program overshadowed what could have been his primary focus — systematic research of orofacial myofunctional disorders. This investigation could have been done to establish the mutual involvement of the tongue and malocclusions and the rationale and efficacy of doing

tongue thrust therapy. His 1944 article about allergy began with that premise.

Similar to the early days of orthodontics when lesser quality orthodontic schools exploded on the scene, so did numerous untrained tongue thrust therapists hang out their shingles after Dr. Straub's Part 3 article. As mentioned in 2011 (p. 15), Mills states: "During the early and middle 1960s the concern with tongue thrust swallowing and myofunctional therapy assumed fad proportions. It appeared tongue thrusters were being diagnosed in 'epidemic proportions.'"

When Dr. Straub's therapy program was published and was not as well received and effective as he had hoped, some readers maintained belief in the therapy and results, some were skeptical, and others dismissed the entire premise. We know this through the words of Richard ("Dick") Barrett, one of the principal founders of the IAOM. By happenstance, both Dr. Straub and Mr. Barrett presented seminars to the same body of orthodontists, three years apart. We have an exact account of Barrett's presentation to that large group of orthodontists in 1961.

Dr. Straub, however, spoke first to the biennial meeting of the Pacific Coast Society of Orthodontists, the second largest component of the American Association of Orthodontists, on February 24, 1958. He presented information from his pre-published articles (1960, 1961 and 1962) as stated on page 404 (1960), page 596 (1961), and page 486 (1962). Among other things, he outlined the characteristics of the perverted swallow and his tongue thrust therapy program.

Three and a half years later, during the August 6-10, 1961 biennial meeting of the Pacific Coast Society of Orthodontists, Dick Barrett spoke to the same group. He presented his "One Approach to Deviate Swallowing" (Barrett, 1961). To his credit, his paper was judged to be the best and was published as the lead article in the October 1961 issue of the *American Journal of Orthodontics*. Following are excerpts from Barrett's presentation/article that reflect the tongue thrust tenor of the times within the orthodontic community. Barrett began, "It is a cardinal sin in public speaking to begin with a negative statement, so I will state positively that in this presentation I am not going to discuss the specific techniques of therapy for reverse swallowing. I would like to discuss some of the circumstances underlying such treatment," (p. 726). Barrett had been a speech therapist and myofunctional therapist and had worked with hundreds of cases prior to this event and understood the need for a credible foundation as a base to

treatment. He continued: "I invite you to join me in a glaring second look at this shared problem. Many speech therapists, and some orthodontists, are still admiring the trees and have not yet entered the forest. Others of us have ventured ahead, bearded this monster, and, led in many cases by Dr. Walter Straub, have begun a slow investigation of the terrain. Most of our progress to date in the treatment of deviate deglutition has been the result of an urgent and immediate need for answers; some of us have felt that we had to solve this problem, and quickly. There has been also an air of frenzy, almost desperation, in the attitude of some orthodontists scurrying about in search of someone to help them combat excessive tongue pressures. A few orthodontists in this country feel that tongue retraining is unnecessary, and so they ignore the whole area. It will be the purpose of this article to look at portions of this philosophical jungle and to suggest a course of action which might open a trail down which the small aspect of orthodontics could travel in comfort and safety," (p. 727).

For thirty years, Dr. Straub keenly observed and connected oral-facial-functional components together, came up with causal suppositions and a tongue thrust therapy program. Hanson and Mason (2003) say that Dr. Straub was the Paul Revere of deglutition. To add to that description, one could say Dr. Straub was the Johnny Apple Seed of tongue thrust therapy. He planted his information and therapy techniques across the United States and internationally. "Straub's influence has been pervasive. He stirred a large segment of his profession from lethargy regarding management of oral habits. He added many original contributions to the practical literature, some valid, some misleading, some erroneous, but all with definite assurance," (Hanson & Mason, 2003, p. 24).

Bill Zickefoose, a speech pathologist and a founder of the IAOM, expressed dedication for Dr. Straub and the perpetuation of orofacial myology: "Walter Straub and I had not only become colleagues but close friends. When Walter told me he was retiring to Reno he said, 'Bill it is now up to you.' Walter's wife called to inform me that Walter had died [in 1966]. It devastated me for I had lost a good friend and there was still so much to do. There was so much adversity concerning 'Myofunctional Therapy' at the time and so many doubted Walter because of it. That is when my determination increased exponentially. I wanted to prove to Walter his work was not in vain. Walter died before I could prove they were wrong" (Mills, 2011, p. 8).

Enter the next generation: orofacial myologists. As evidenced in his 1961 article, Barrett understood the

issues of the dichotomy. He had been trained and inspired by Dr. Straub, and more importantly, studied the components of orofacial myology, generated his own therapy protocol that emphasized muscle capability training, implemented his approach with hundreds of clients, and freely shared his knowledge with orthodontists and other like-minded speech pathologists, including Marvin L. Hanson, William E. Zickefoose, and Daniel Garliner. As a former student of Barrett, in her glowing tribute, Elnita Ostrom Stanley states: "You, sir, are one of the great teachers and one of the great human beings of a generation and of many generations," (1979, p. 5).

Six years after Dr. Straub passed, in 1972, a small but determined group of individuals, including Dick Barrett, Bill Zickefoose, Marv Hanson, and Galen Peachey, met in a nondescript Chinese restaurant in San Francisco, California, and organized what is today the most successful, principled association that certifies orofacial myologists, the International Association of Orofacial Myology (IAOM). The IAOM has not only stood the test of time, it has grown, flourished, and expanded the purview of orofacial myology.

This exposé was written for those in attendance at the 2021 IAOM convention and celebration of the 50th Anniversary of the origination of the IAOM. As professionals, we owe a great deal to those who went before us. They experienced the challenges, and have taught us and inspired us through their knowledge, dedication and persistence. As in the orthodontic field, the founders of the IAOM had the forethought and initiative to originate a body of devoted individuals to carry on the work that was started so long ago and that continues to this day to positively influence so many.

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