

5.3 Malocclusion Cause-and-Effect Relationships

For years orthodontists have related these associations to the 'chicken and the egg' conundrum. However, this has led to the notion that the tongue thrust problem is unsolvable. Too often the more severe cases have been relegated to the 'too-hard' category, as Tulley seems to have done.

From the preceding discussion it appears that there exists a complex relationship between tongue thrust and certain types of malocclusion. Moreover, that there is enough evidence to suggest that certain associated conditions are likely to aid the clinician in identifying tongue thrust and whether or not it is likely to persist for longer than is optimal for that patient, bearing in mind the likelihood that a malocclusion will be the result.

To reiterate these conditions, they are:

1. Mouth breathing;
2. Digit- and pacifier-sucking;
3. Enlarged tonsils and/or adenoids;
4. A high and/or narrow anterior palatal arch;
5. Marked lip movement during swallowing;
6. Any anterior malocclusion in the deciduous dentition; and
7. Dentalisation of linguo-alveolar consonants (/s/, /z/, /d/, /t/, /l/, /n/).

It is worth noting, in particular, the strong influence of naso-respiratory dysfunction on tongue thrust behaviour. The airway protective reflexes seem to have a significant influence on tongue posture.

In summary, Scott (1969) seems to have put it best:

"Biology, unlike the classic sciences, is not a matter of what succeeds what in a constant sequence of events but of what available mechanisms are at work at any given stage of development. It is a multifunctional science in which hardly anything is the result of a single determinant. It requires a unique attitude of mind, ..."

The answer to the 'chicken and the egg' question, as to which comes first, lies in the concept that both come first.

5.4 Indications for Effective Therapy

The concept of 'habit' has been discussed, and it was revealed that some authors believe that the lingual behaviour associated with tongue thrust is beyond the reaches of treatment. Hence the debate over whether or not tongue thrust can be treated, which is based on the concept of the inability of the clinician to change subcortical neuro-motor controls.

While some authors believe that successful therapy can be achieved even at the subcortical level, it becomes more obvious that unconscious control of tongue thrust can be achieved, at the cortical level. Le Gros Clark (1958) had already stated that, "the harmonious coordination of voluntary muscles (in Man) is no longer a matter of automatic and unconscious control by lower centres".

From discussions I have had with speech pathologists (Kerr, 1985; Robinson, 1985) it is clear that these types of neurocortical methods of treatment are used on patients in Speech Therapy, Occupational Therapy, Physiotherapy, and in Special Education.

One aspect that is of great importance is that these therapeutic and educative rationales (above) have very little 'scientific' research to back up the claims for their efficacy. It seems, however, that there is enough practical evidence for their success and therefore justifiable usage.

The same applies to therapy for tongue thrust, although some authors assert that there is more than enough scientific evidence at present. The Joint Committee statement (1975), however, called for more evidence of the success of treatment for tongue thrust. Tirk (1965) has already pointed out

the difficulties that arise when attempting to provide evidence for the proof of any therapeutic measure, particularly in orthodontics. Therefore, the need for accurate diagnosis of tongue thrust becomes all the more important.

5.5 Evaluation of Hypothesis and Recommendations

The Hypothesis, as presented (1.3), appears to stand up to this critical analysis. Tongue thrust does seem to exist and can be an identifiable cause of specific types of malocclusion, especially anterior open bite. Furthermore, it seems that it would be of benefit to the orthodontist to consider the natural history and biological aspects of tongue function, especially the neuro-physiological ones. As Winders (1958) put it: "Teleological reasoning blended with a comprehensive knowledge of the basic sciences has and always will provide the initial thrust needed for scientific advancement."

However, much controversy still remains owing to the nature of the entity, and the associated factors of influence. It appears that:

(1) The technology and methods of identifying and evaluating normal and abnormal lingual and perioral muscle behaviour are still inadequate for accurate assessment, particularly in the area of neural controlling influences; and that:

(2) Further longitudinal evaluation of tongue thrust is recommended along these lines, with a view to eliminating, as many as possible, the number of factors that are likely to interfere with tongue and other muscle functions during investigation (the Heisenberg Uncertainty Principle also applies to Orthodontics, contrary to the suggestions of some authors [Proffit, 1973, 1975, 1977, 1978a, 1978b; Proffit, Kydd, Wilskie and Taylor, 1964; Proffit and Mason, 1975; Proffit, McGlone, and Barrett, 1975; and Proffit, McGlone, and Christiansen, 1965]).

Finally, and in accordance with the philosophy of Popper (Magee, 1979; Miller, 1983) and Marcus (1982), another element is recommended. There must be room for creative thought so that the demands of scientific research (unbiased observation and logical inference; analysis and classification) do not interfere with the pursuit of truth.

With each step forward, with each problem which we solve, we not only discover new and unsolved problems, but we also discover that where we believed that we were standing on firm and safe ground, all things are, in truth, insecure and in a state of flux.

K.R. POPPER

BIBLIOGRAPHY

- ABBOTT, R. 1975 Personal communication.
- ABRAMS, I.C. 1963 Oral muscle pressures.
Angle Orthod. 33:83-104.
- ACKERMAN, J.L. 1975 Diagnosis and planning treatment in ortho-
PROFFIT, W.R. dontics.
In: T.M. Graber and B.F. Swain (Eds.) Current
Orthodontic Concepts and Techniques. Vol.1.
2nd ed.
W.B. Saunders Co., Philadelphia.
- ADAMIDIS, I.P. 1983 The effects of lymphadenoid hypertrophy on
SPYROPOULOS, M.N. the position of the tongue, the mandible and
the hyoid bone.
Eur. J. Orthod. 5:287-294.
- AGIN, D.M. 1971 Non-nutritive digital sucking in the human
BLANKFORT, J.S. child.
Quoted by Subtelny and Subtelny (1973) op.cit.
- AKAMINE, J.S. 1962 Tongue Thrust in Open Bite Cases: A Time
Study of Tongue and Lip Pressures Against
the Anterior Teeth During Swallowing.
Master's Degree Thesis. Univ. Washington.
- ALEM, A. 1976 Quoted by I. Klineberg (1983), op.cit.
- ANDERSEN, W.S. 1963 The relationship of the tongue-thrust
syndrome to maturation and other factors.
Am. J. Orthod. 49:264-275.
- ANGLE, E.H. 1907 Treatment of Malocclusion of the Teeth.
Angle's System. 7th ed.
The S.S. White Dent. Manufact. Co. Phila-
delphia.
- ARDRAN, G.M. 1973 Tongue size in Down's Syndrome.
HARKER, P. J. Ment. Defic. Res. 16:160-166.
KEMP, F.H.

- ARDRAN, G.M. 1951 The mechanism of swallowing.
KEMP, F.H. Proc. Roy. Soc. Med. 44:1038.
- ARDRAN, G.M. 1955 A radiographic study of movements of the
KEMP, F.H. tongue in swallowing.
Dent. Prac. 5:252-263.
- ARDRAN, G.M. 1972a A function for adenoids and tonsils.
KEMP, F.H. Am. J. Roent. 114:268-281.
- ARDRAN, G.M. 1972b A functional assessment of relative tongue
KEMP, F.H. size.
Am. J. Roent. 114:282-288.
- ARDRAN, G.M. 1958a A cineradiographic study of bottle feeding.
KEMP, F.H. Br. J. Rad. 31:11.
LIND, J.
- ARDRAN, G.M. 1958b A cineradiographic study of breast feeding.
KEMP, F.H. Br. J. Rad. 31:156.
LIND, J.
- ARMBRECHT, G.D. 1972 A cephalometric and cineradiographic study of
thumbsuckers.
Quoted by Subtelny and Subtelny (1973)
op.cit.
- ARVYSTAS, M.G. 1977 Treatment of anterior skeletal open-bite
deformity.
Am. J. Orthod. 72:147-164.
- ATKINSON, S.R. 1966 Jaws out of balance. Part II.
Am. J. Orthod. 52:371-380.
- AUERBACH, L. 1888 Archiv fuer Physiologie.
Leipzig. 59.
- AYERS, F.J. 1977 Treatment of Ankyloglossia: report of case.
HILTON, L.M. J. Dent. Child. pp.69-71.

- BAKER, R.E. 1954 Tongue and dental function.
Am. J. Orthod. 40:927-939.
- BALLARD, C.F. 1948 The upper respiratory musculature and ortho-
dontics. Part I.
Dent. Rec. 68:1-5.
- BALLARD, C.F. 1951 Quoted by J.H. Hovell (1955) op.cit.
- BALLARD, C.F. 1952 Quoted by J.H. Hovell (1955) op.cit.
- BALLARD, C.F. 1953 The significance of soft tissue morphology in
diagnosis, prognosis and treatment planning.
Trans. Eur. Orthod. Soc. 143-175.
- BALLARD, C.F. 1962 The clinical significance of innate and
adaptive postures and motor behaviour.
Dent. Prac. 12:219-228.
- BALLARD, C.F. 1965 Variations of posture and behaviour of the lips
and tongue which determine the position of
the labial segments: The implications in
orthodontics, prosthetics, and speech.
Trans. Eur. Orthod. Soc. 67-93.
- BALLARD, C.F. 1967 The morphological bases of prognosis deter-
mination and treatment planning.
Dent. Pract. 18:63-74.
- BANDY, H.E. 1969 Tongue volume and the mandibular dentition.
HUNTER, W.S. Am. J. Orthod. 56:134-142.
- BARBER, T.K. 1975 Dental relationships in tongue-thrusting
BONUS, H.W. children as affected by circumoral myo-
functional exercise.
J. Am. Dent. Assoc. 90:979-988.
- BARCLAY, A.E. 1930 Quoted by J. Whillis (1946) op.cit.
- BARCLAY, A.E. 1936 Quoted by J. Whillis (1946) op.cit.

- BARIL, C. 1960 An electromyographic analysis of the
MOYERS, R.E. temporalis muscles and certain facial muscles
in thumb- and finger-sucking patients.
J. Dent. Res. 39:536-553.
- BARNWELL, Y.M. 1977 Bibliography: Oral myology, oral myo-
functional disorders and oral myofunctional
therapy. First of three segments.
Int. J. Oral Myol. 3(3):13-23.
- BARNWELL, Y.M. 1977 Bibliography: Oral myology, oral myo-
functional disorders and oral myofunctional
therapy. Second of three segments.
Int. J. Oral Myol. 3(4):13-23.
- BARNWELL, Y.M. 1978 Bibliography: Oral myology, oral myo-
functional disorders and oral myofunctional
therapy. Third of three segments.
Int. J. Oral Myol. 4(1):8-17.
- BARRER, H.G. 1974 Limitations in orthodontics.
Am. J. Orthod. 65:612-625.
- BARRETT, R.H. 1961 One approach to deviate swallowing.
Am. J. Orthod. 47:726-736.
- BARRETT, R.H. 1977 Myofunctional open bite: A chronology.
Int. J. Oral Myol. 3(3):7-12.
- BARRETT, R.H. 1974 Quoted by J.P. Dworkin and R.A. Culatta
HANSON, M.L. (1980), op.cit.
- BARRETT, R.H. 1978 Oral Myofunctional Disorders. 2nd ed.
HANSON, M.L. C.V. Mosby Co. Saint Louis.
- BARRETT, R.H. 1967 Problems of deglutition.
von DEDENROTH, Am. J. Clin. Hypno. 9:161-165.
T.E.A.

- BASHIR, A. 1978 Speech and Language.
SCHULTZ, M. In: J.H. Shaw, E.A. Sweeney, C.C. Cappuccino, and S.M. Meller (Eds.) Textbook of Oral Biology.
W.B. Saunders Co. Philadelphia.
- BAZELON, M. 1968 Sixth International Study Group in Child
COWRIE, V. Neurology in Oxford. September.
PAINE, R.
- BEGG, P.R. 1977 Begg Orthodontic Theory and Technique.
KESLING, P.C. W.B. Saunders Co. Philadelphia.
- BELL, W.A. 1970 Muscle patterns of the late foetal tongue tip.
Angle Orthod. 40:262-265.
- BELL, D. 1963 Observations of tongue thrust in preschool
HALE, A. children.
J. Speech Hear. Disord. 28:195-197.
- BELL, W.H. 1980 Surgical Correction of Dentofacial
PROFFIT, W.R. Deformities.
WHITE, R.P. W.B. Saunders Co. Philadelphia.
- BERKOVITZ, B.K.B. 1978 A Colour Atlas and Textbook of Oral
HOLLAND, G.R. Anatomy.
MOXHAM, B.J. Wolfe Medical Publications London.
- BJERREGAARD, J. 1980 The effect of the mandibular lip bumper and
BUNDGAARD, A.M. maxillary bite plane on tooth movement,
MELSEN, B. occlusion and space conditions in the lower
dental arch.
Eur. J. Orthod. 2:257-265.
- BLAKISTON 1979 Blakiston's Gould Medical Dictionary. 4th ed.
McGraw-Hill Book Co. New York.
- BLOCK, J.R. 1968 The role of the speech clinician in determin-
ing indications of frenulotomy in cases of
ankyloglossia.
N.Y.S. Dent. J. 479-481.

- BLOOMER, H.H. 1963 Speech defects in relation to orthodontics.
Am. J. Orthod. 49:920-929.
- BLOOMER, H.H. 1971 Speech defects associated with dental abnormalities and malocclusion.
In: L.E. Travis (Ed.) *Handbook of Speech Pathology and Audiology*.
Appleton-Century-Crofts, Inc. New York.
- BLUESTONE, C.D. 1979 The role of tonsils and adenoids in the obstruction of respiration.
In: J.A. McNamara, Jr. (Ed.), *Monograph 9, Craniofacial Growth Series*.
Centre for Human Growth and Development, Univ. Michigan, Ann Arbor.
- BLYTH, P. 1959 The relationship between speech, tongue behaviour, and occlusal abnormalities.
Trans. of the B.S.S.O. Dent. Pract. 10:11-20.
- BOND, E.K. 1968 Speech and its relation to dentistry. 1. Speech
LAWSON, W.A. and speech defects.
Dent. Prac. and Dent. Rec. 19:75-82.
- BOSMA, J.F. 1957 Deglutition: Pharyngeal stage.
Physiol. Rev. 37:275-300.
- BOSMA, J. 1963 Oral and pharyngeal development and function.
J. Dent. Res. 42:375-380.
- BOSMA, J.F. 1967 Human infant oral function.
In J.F. Bosma (Ed.) *Symposium on Oral Sensation and Perception*.
Charles C. Thomas. Springfield, Illinois.
- BOSMA, J.F. 1969 Evaluation of oral function of the orthodontic patient.
Am. J. Orthod. 55:578-584.

- BOSMA, J.F. 1973 Physiology of the mouth, pharynx, and esophagus.
In: M.M. Papaella and D.A. Shrumrich (Eds.) Otolaryngology.
W.B. Saunders Co. Philadelphia.
- BOSMA, J.F. 1975 Form and function in the mouth and pharynx of the human infant.
In: J.A. McNamara Jr. (Ed.) Mechanisms Controlling Craniofacial Growth. Monograph Number 3. Craniofacial Growth Series.
Center for Human Growth and Development. Univ. Mich. Ann Arbor.
- BOUCHER, C.O. (Ed.) 1974 Current Clinical Dental Terminology. 2nd ed.
C.V. Mosby and Co. St. Louis.
- BOWDEN, B.D. 1966 The effects of digital and dummy sucking on arch widths, overbite and overjet: A longitudinal study.
Aus. Dent. J. 11:396-404.
- BRADER, A.C. 1972 Dental arch form related with intro-oral forces: PR=C.
Am. J. Orthod. 61:541.
- BRAUER, J.S. 1965 Tongue thrust classification.
HOLT, T.V. Angle Orthod. 35:106-112.
- BRENNER, J.E. 1974 Thumb-sucking: Dental and psychological aspects.
N.Y. J. Dent. 40:78-80.
- BRESCIA, N.J. 1961 Applied Dental Anatomy.
C.V. Mosby Co. St. Louis.
- BRESOLIN, D. 1983 Mouth breathing in allergic children: Its relationship to dentofacial development.
SHAPIRO, P.A. Am. J. Orthod. 83:334-340.
SHAPIRO, G.G.
CHAPKO, M.K.
DASSEL, S.

- BRIGGS, C.P. 1965 Congenital aglossia and congenital cerebro-facial palsy (Moebius Syndrome): Two contrasting cases.
Trans. Europ. Ortho. Soc. 169-175.
- BROADBENT, B.H. Jr. 1975 Bolton standards. Chronologic norms in clinical application.
In: J.T. Cook (Ed.) Transactions of the Third International Orthodontic Congress.
Crosby Lockwood Staples. London.
- BRODIE, A.G. 1950 Anatomy and physiology of head and neck musculature.
Am. J. Orthod. 36:831-844.
- BRODIE, A.G. 1952 Considerations of musculature in diagnosis, treatment, and retention.
Am. J. Orthod. 38:823-835.
- BRODIE, A.G. 1953 Muscular factors in the diagnosis and treatment of malocclusions.
Angle Orthod. 23:71-77.
- BRODIE, A.G. 1954 The fourth dimension in Orthodontia.
Angle Orthod. 24:15-30.
- BRODIE, A.G. 1962 Quoted by J.A. Hoffman and R.L. Hoffman (1965) op.cit.
- BRODIE, A.G. 1971 Emerging concepts of facial growth.
Angle Orthod. 41:103-118.
- BROWNING, G.G. 1982 Updated ENT.
Butterworth Scientific. London.
- BUNDGAARD, M. 1983 An electromyographical study of the effect of
BJERREGAARD, J. a mandibular lipbumper.
MELSEN, B. Eur. J. Orthod. 5:149-156.
TERP, S.

- BURCH, J. 1980 Periodontal occlusal traumas.
In: J.W. Clark (Ed.) Clinical Dentistry. Vol.2.
Chap.36.
Harper and Row. Hagerstown.
- BURSTONE, C.J. 1975 Soft tissue factors in treatment planning.
In: J.T. Cook (Ed.) Transactions of the Third
International Orthodontic Congress.
Crosby, Lockwood, Staples. London.
- BUSHEY, R.S. 1979a Adenoid obstruction of the nasopharynx.
In: J.A. McNamara, Jr. (Ed.) Monograph 9,
Craniofacial Growth Series.
Center for Human Growth and Development,
Univ. Michigan. Ann Arbor.
- BUSHEY, R.S. 1979b Diagnosis and treatment planning of naso-
pharyngeal obstructions.
In: J.A. McNamara, Jr. (Ed.) Monograph 9,
Craniofacial Growth Series.
Center for Human Growth and Development,
Univ. Michigan. Ann Arbor.
- BZOCH, K.R. 1979 Communicative Disorders Related to Cleft
Lip and Palate. 2nd ed.
Little, Brown and Company. Boston.
- CACHEL, S.M. 1979 A functional analysis of the primate masti-
catory system and the origin of the
anthropoid post-orbital septum.
Am. J. Phys. Anthropol. 50:1-18.
- CACHEL, S.M. 1984 Growth and allometry in primate masticatory
muscles.
Arch. Oral Biol. 29:287-293.
- CANGIALOSI, T.J. 1984 Skeletal morphological features of anterior
open bite.
Am. J. Orthod. 85:28-36.

- CANNON, W.B. 1911 Quoted by W. Straub (1951) op.cit.
- CARLSON, D.S. 1978 Muscle Adaptation in the Craniofacial Region.
McNAMARA, J.A. Jr. Univ. of Michigan. Ann Arbor.
(Eds.)
- CARPENTER, M.A. (1968) A preliminary study of Passavant's pad.
MORRIS, H.L. Cleft Pal. J. 5:61.
- CASE, J.L. 1982 Myofunctional therapy and facial cosmesis:
Position paper.
Int. J. Orofacial Myology. 8:10-12.
- CASHION, L.R. 1962 A further study on hypnosis and pernicious
tongue habits.
Am. J. Orthod. 48:395.
- CATLIN, F.I. 1971 Tongue-tie.
De HAAN, V. Arch Otolaryngol. 94:548-557.
- CAUHEPE 1955 Quoted by E. Warrer (1959) op.cit.
- CHRISTIANSEN, R.L. 1979 Resting tongue pressures.
EVANS, C.A. Angle Orthod. 49:92-97.
SUE, S.K.
- CHRISTENSEN, M. 1981 An investigation of the efficacy of oral
HANSON, M. myofunctional therapy as a precursor to
articulation therapy for pre-first grade
children.
J. Speech Hear. Disord. 46:160-167.
- CHUSID, J.G. 1985 Correlative Neuroanatomy and Functional
Neurology. 19th ed.
Lange Med. Pub. Los Altos. Calif.
- CLARK, W.E. LE GROS 1958 Tissues of the Body. 4th ed.
The University Press. Oxford.
- CLEALL, J.F. 1965 Deglutition: A study of form and function.
Am. J. Orthod. 51:566-594.

- CLEALL, J.F. 1972 Circumstances limiting the development and verification of a comprehensive theory of craniofacial morphogenesis.
Acta Morphol. Neerl. Scand. 10:115-126.
- CLEALL, J.F. 1966 Head posture and its relationship to
ALEXANDER, W.J. deglutition.
McINTYRE, H.M. Angle Orthod. 36:335-350.
- COHEN, A.M. 1976 A serial growth study of the tongue and inter-
VIG, P.S. maxillary space.
Angle Orthod. 46:332-337.
- COLE, R.M. 1980 Myofunctional therapy in tongue thrust
COLE, J.E. swallowing and related problems.
In: J.W. Clark (Ed.) Clinical Dentistry. Vol.II.
Chap.12.
Harper and Row. Hagerstown.
- COOKE, M.S. 1980 Anterior open bite. Orthodontic aspects -
Part 1.
Dent. Update 7:475-481.
- COOKE, M.S. 1981 Anterior open bite. Orthodontic aspects -
Part 2.
Dent. Update 8:33-41.
- COOPER, H.K. 1963 Recent trends in the management of the
individual with oral-facial and speech
handicaps.
Am. J. Orthod. 49:683-700.
- COTTINGHAM, L.L. 1976 Myofunctional therapy. Orthodontics - tongue
thrusting - speech therapy.
Am. J. Orthod. 69:679-687.
- CULLUM, I.M. 1959 An "old wives" tale.
Brit. Med. J. 497-498.

- CUNNINGHAM, P.D. 1969 Electromyography of genioglossus and genio-
BASMAJIAN, J.V. hyoid muscles during deglutition.
Anat. Rec. 165:401.
- DARWIN, C. 1872 The Expression of Emotions in Man and
Animals.
In: Encyclopaedia Britannica, 1958.
- DAVENPORT, H.W. 1977 Physiology of the Digestive Tract. 4th ed.
Year Book Med. Pub. Inc. Chicago.
- DELLOW, P.G. 1976 The general physiological background of
chewing and swallowing.
In: B.J. Sessle and A.G. Hannam (Eds.)
Mastication and Swallowing.
Univ. Toronto Press. Toronto.
- DEVESEN, A. 1985 One in Every Hundred - Schizophrenia Part 1.
The Science Show. ABC Radio.
- DILLON, C.F.S. 1945 Orthodontic diagnostic procedures.
Am. J. Orthod. 31:458-479.
- DODD, B. 1984 Down's syndrome and tongue size.
LEAHY, J. Med. J. Aust. p.748.
- DOTY, R.W. 1951 Influence of stimulus pattern on reflex
deglutition.
Am. J. Physiol. 166:142-158.
- DOTY, R. 1968 Neural organisation of deglutition.
In: Handbook of Physiology, Section 6, Ali-
mentary Canal, Volume 4 (C.F. Code, Ed.),
pp.1861-1902.
American Physiological Society. Washington.
- DOUGLAS, B.L. 1954 Surgical correction of ankyloglossia.
KRESBERG, H. N.Y.S. Dent. J. 20:477-479.

- DUBNER, R. 1978 The Neural Basis of Oral and Facial Function.
 SESSLE, B.J. Plenum Press. New York.
 STOREY, A.T.
- DuBRUL, E.L. 1980 Sicher's Oral Anatomy. 7th ed.
 C.V. Mosby Co. St. Louis.
- DUNN, G. 1964 Clinical Aspects of Oro-facial Muscle
 Function.
 Unpublished Masters Treatise. Univ. of Syd.
- DWORKIN, J.P. 1980 Tongue strength: its relationship to tongue
 CULATTA, R.A. thrusting, open-bite, and articulatory
 proficiency.
 J. Speech Hear. Disord. 45:277-282.
- ECCLES, J.C. 1973 Quoted by N.R. Thomas (1976) op.cit.
- ECKERT-MOBIUS, A. 1962 Quoted by R. Frankel (1980a) op.cit.
- ENCYCLOPAEDIA 1985 Anatomy (Biological). 15th ed. Vol.14. p.926.
 BRITANNICA Encyclopaedia Britannica Inc. Chicago.
- EPKAR, B.N. 1977 Surgical-orthodontic correction of open-bite
 FISH, L.C. deformity.
 Am. J. Orthod. 71:278-299.
- ESKEW, H.A. 1949 Congenital aglossia.
 SHEPARD, E. Am. J. Orthod. 35:116-119.
- ESPIR, M.L.E. 1976 The Basic Neurology of Speech. 2nd ed.
 ROSE, F.C. Blackwell Scientific. Oxford.
- FAWCUS, R. 1975 The relationship between speech disorders and
 oro-facial abnormalities.
 Proc. Brit. Paedod. Soc. 5:29-31.
- FEIGIN, R.D. 1981 Otitis Media.
 SPECTOR, G. In: R.D. Feigin and J.D. Cherry (Eds.) Text-
 book of Pediatric Infectious Diseases. Vol.I.
 W.B. Saunders Co. Philadelphia.

- FELDSTEIN, L. 1950 An instrument for measuring muscular forces acting on the teeth.
Am. J. Orthod. 36:856-859.
- FINDLAY, I.A. 1960 An analysis of myographic records of swallowing in normal and abnormal subjects.
KILPATRICK, S.J. J. Dent. Res. 39:629-637.
- FISCHER, H. 1969 Finger, tongue, and lip-habits in children.
Dent. Surv. 35-37.
- FISHMAN, L.S. 1969 Postural and dimensional changes in the tongue from rest position to occlusion.
Angle Orthod. 39:109-113.
- FLANAGAN, J.B. 1963 Twenty-four hour pattern of swallowing in men.
LEAR, S.C. I.A.D.R. Abs. 165:76.
MOORREES, C.
- FLETCHER, G.G.T. 1981 The Begg Appliance and Technique.
Wright P.S.G. Bristol London Boston.
- FLETCHER, S.G. 1970 Processes and maturation of mastication and deglutition.
ASHA Rep. 5:92-105.
- FLETCHER, S.G. 1974 Quoted by R.B. Pierce (1978) op.cit.
- FLETCHER, S.G. 1961 Tongue-thrust swallow, speech articulation, and age.
CASTEEL, R.L. J. Speech Hear. Disord. 26:201-208.
BRADLEY, D.P.
- FLETCHER, S.G. 1968 Lingual function and relative length of the lingual fenum.
MELDRUM, J.R. J. Speech Hear. Res. 11:382-390.
- FLUHRER, A.V. 1950 Some original investigations into pressure habits as etiological factors in dentofacial abnormalities.
Am. J. Orthod. and Oral Surg. 36:37-57.

- FOGEL, B. 1974 Therapy can curb tongue-thrust swallowing.
J. Am. Dent. Assoc. 89:1038-1045.
- FOWLER, H. 1969 Quoted by J.D. Subtelny (1970) op.cit.
- FRANKEL, R. 1966 The theoretical concept underlying the treatment with function regulators.
Trans. Europ. Orthod. Soc. 233-250.
- FRANKEL, R. 1980a A functional approach to orofacial orthopaedics.
Br. J. Orthod. 7:41-51.
- FRANKEL, R. 1980b Lip seal training in the treatment of skeletal open bite.
Eur. J. Orthod. 2:219-228.
- FRANKEL, R. 1983 A functional approach to treatment of skeletal open bite.
FRANKEL, C. Am. J. Orthod. 84:54-68.
- FRIED, L.A. 1976 Anatomy of the Head, Neck, Face, and Jaws.
Lea and Febiger. Philadelphia.
- GARDINER, J.H. 1960 Congenital partial aglossia.
Dent. Prac. 10:83-87.
- GARLINER, D. 1971 Myofunctional Therapy in Dental Practice.
Bartel Dental Book Co. Inc. Brooklyn, N.Y.
- GARLINER, D. 1976 Myofunctional Therapy.
W.B. Saunders Co. Philadelphia.
- GARLINER, D. 1980 The modern myofunctional therapeutic concept.
Int. J. Orthod. 18:21-23.
- GARLINER, D. 1982 The current status of myofunctional therapy in dental medicine.
Int. J. Orthod. 20:21-25.

- GARLINER, D. 1984 Facts that every mother should know when choosing an artificial nursing system for her child.
Int. J. Orthod. 22:18-20.
- GELLIN, M.E. 1978 Digital sucking and tongue thrusting in children.
Dent. Clin. North Am. 22:603-619.
- GERSHATER, M.M. 1972 The proper perspective of open bite.
Angle Orthod. 42:263-272.
- GIANELLY, A.A. 1971 Biological Basis of Orthodontics.
GOLDMAN, H.M. Lea and Febiger. Philadelphia.
- GINGOLD, N.L. 1974 Oral habits and preventive orthodontics.
N.Y. J. Dent. 44:148-149.
- GODA, S. 1968 The role of the speech pathologist in the correction of tongue-thrust.
Am. J. Orthod. 54:852-859.
- GODFREY, K. 1985 Personal communication.
- GOLDBERGER, J.M. 1978a Tongue Thrust Correction. 4th ed.
The Interstate Printers and Publishers, Inc.
Danville, Illinois.
- GOLDBERGER, J.M. 1978b Tongue thrust in adults.
Dent. Serv. April:34-40.
- GOLDEN, A. 1978 Patterns of child rearing in relation to thumb sucking.
Br. J. Orthod. 5:81-85.
- GOSS, R.J. 1978 The Physiology of Growth.
Academic Press. New York.
- GOTTLIEB, E.L. 1977 Editorial.
J. Clin. Orthod. 11:83-84.

- GOULD, M.S.E. 1964 A study of pressures exerted by the lips and cheeks on the teeth of subjects with normal occlusion.
Arch Oral Biol. 9:469-478.
- GRABER, T.M. 1958 Extrinsic factors.
Am. J. Orthod. 44:26-45.
- GRABER, T.M. 1972 Orthodontics, Principles and Practice. 3rd ed.
W.B. Saunders Co. Philadelphia.
- GREENE, S.R. 1980 Personal communication.
- GREULICH, L. 1972 Speech therapy and orthodontia.
Aust. Orthod. J. Oct:66-72.
- GUERIN, R. 1984 Unpublished material delivered at a lecture on mouth breathing.
Aust. Soc. Dent. Child. S.A. Branch, 3rd Country Meeting.
- GWYNNE-EVANS, E. 1948 The upper respiratory musculature and orthodontics. Part II.
Dent. Rec. 68:5-21.
- GWYNNE-EVANS, E. 1951 The organisation of the oro-facial muscles in relation to breathing and feeding.
Br. Dent. J. 91:135-142.
- GWYNNE-EVANS, E. 1954 The orofacial muscles; their function and behaviour in relation to the teeth.
Trans. Eur. Orthod. Soc. 20-35.
- GWYNNE-EVANS, E. 1956 Clinical types.
Dent. Prac. 6:222-235.
- TULLEY, W.J.
- HAAS, A.J. 1965 The treatment of maxillary deficiency by opening the midpalatal suture.
Angle Orthod. 35:200-217.

- HAAS, A.J. 1977 Let's take a rational look at myofunctional therapy.
Int. J. Oral Myol. 3(3):24-27.
- HACKWORTH, H.B. 1965 Lingual articulatory function in tongue thrust.
Angle Orthod. 35:241-243.
- HALLER, A. 1762 Quoted by J.F. Bosma (1957) op.cit.
- HANDELMAN, C.S. 1976 Growth of the nasopharynx and adenoid
OSBORNE, G. development from one to eighteen years.
Angle Orthod. 46:243-259.
- HANNUKSELA, A. 1983 The effect of atopy on the dentition.
Eur. J. Orthod. 5:279-285.
- HANSON, M.L. 1967 Some suggestions for more effective therapy
for tongue thrust.
J. Speech Hear. Disord. 32:75-79.
- HANSON, M.L. 1976a Tongue thrust: A point of view.
J. Speech Hear. Disord. 41:172-184.
- HANSON, M.L. 1976b The Joint Committee's statement on myo-
functional therapy - Pros and cons.
Int. J. Oral Myol. 2:13-19.
- HANSON, M.L. 1978 Oral myofunctional therapy.
Am. J. Orthod. 73:59-67.
- HANSON, M.L. 1979a An introduction to oral myofunctional dis-
orders.
Int. J. Oral Myol. 5(1):5-9.
- HANSON, M.L. 1979b Treatment of oral myofunctional disorders:
Organismic and other approaches.
Int. J. Oral Myol. 5(3):9-12.
- HANSON, M.L. 1981 Toward more effective therapy for tongue
thrust.
Int. J. Orthod. 19:7-12.

- HANSON, M.L. 1977 In support of therapy for tongue-thrust.
ALBRIDGE, U.L. J. Pedod. Fall:77-89.
- HANSON, M.L. 1982 Tongue thrust and malocclusion: A longitudinal study.
ANDRIANOPOULOS, M.V. Int. J. Orthod. 20:9-18.
- HANSON, M.L. 1969 Tongue-thrust in preschool children.
BARNARD, L.W. Am. J. Orthod. 56:60-69.
CASE, J.L.
- HANSON, M.L. 1970 Tongue-thrust in preschool children. Part II:
BARNARD, L.W. Dental occlusal patterns.
CASE, J.L. Am. J. Orthod. 57:15-22.
- HANSON, M.L. 1973 Effects of form and function on swallowing
and the developing dentition.
COHEN, M.S. Am. J. Orthod. 64:63-82.
- HANSON, M.L. 1970 Tongue-thrust in preschool children. Part III:
HILTON, L.M. Cinefluorographic analysis.
BARNARD, L.W. Am. J. Orthod. 58:268-275.
CASE, J.L.
- HANSON, T.E. 1975 A follow-up study of a longitudinal research
HANSON, M.L. on malocclusions and tongue thrust.
Int. J. Oral Myol. 1:21-28.
- HARDEN, J. 1984 A study of changes in swallowing habit result-
RYDELL, C.M. ing from tongue thrust therapy recommended
by R.H. Barrett.
Int. J. Orthod. 22:12-17.
- HARMAN, K.A. 1966 Quoted by S. Weinstein (1967) op.cit.
- HARRINGTON, R. 1963 The relation of oral-mechanism malfunction
BREINHOLT, V. to dental and speech development.
Am. J. Orthod. 49:84-93.

- HARVEY, W. 1628 An anatomical disquisition on the motion of the heart and blood in animals. Of the motion, action, and office of the heart. In: The Works of William Harvey, M.D. Translated from the Latin by Robert Willis (1847). Chap.V:31-32. London Sydenham Soc. London.
- HARVOLD, E.P. 1968 The role of function in the etiology and treatment of malocclusion. Am. J. Orthod. 54:883-898.
- HARVOLD, E.P. 1972 Experiments on development of dental malocclusion. Am. J. Orthod. 61:38-44.
- HARVOLD, E.P. 1975 Centric relation: A study of pressure and tension systems in bone modelling and mandibular positioning. Dent. Clin. North Am. 19:473-484.
- HARVOLD, E.P. 1981 Primate experiments on oral respiration. TOMER, B.S. Am. J. Orthod. 79:359-372. VARGERVIK, K. CHIERICI, G.
- HARVOLD, E.P. 1973 Primate experiments on oral sensation and dental malocclusions. VARGERVIK, K. Am. J. Orthod. 63:494. CHIERICI, G.
- HARYETT, R.D. 1970 Chronic thumb-sucking. A second report on treatment and its psychological effects. HANSEN, F.C. Am. J. Orthod. 57:164-178. DAVIDSON, P.O.
- HARYETT, R.D. 1967 Chronic thumb-sucking: The psychologic effects and the relative effectiveness of various methods of treatment. HANSEN, F.C. Am. J. Orthod. 53:569-585. DAVIDSON, P.O. SANDILANDS, M.L.

- HEDGES, R.B. 1965 A cinefluorographic study of tongue patterns
 McLEAN, D.C. in function.
 THOMPSON, F.A. Jr. Anglo Orthod. 35:253-268.
- HELLMAN, M. 1931 Open bite.
 Int. J. Orthod. 17:421-444.
- HELM, S. 1985 Psychosocial implications of malocclusion: A
 KREIBORG, S. 15-year follow-up study in 30-year-old Danes.
 SOLOW, B. Am. J. Orthod. 87:110-118.
- HEUERMAN, S. 1753 Quoted by J.F. Bosma (1957) op.cit.
- HIEMAE, K. 1978 Intro-oral food transport: The fundamental
 THEXTON, A.J. mechanism of feeding.
 CROMPTON, A.W. In: D.S. Carlson and J.A. McNamara (Eds.)
 Muscle Adaptation in the Craniofacial Region.
 Monograph 8, Craniofacial Growth Series.
 Centre for Human Growth and Development.
 Univ. Michigan, Ann Arbor.
- HOFFMAN, J.A. 1965 Tongue-thrust and deglutition: Some anatom-
 HOFFMAN, R.L. ical, physiological, and neurological consider-
 ations.
 J. Speech Hear. Disord. 30:105-120.
- HOLDSWORTH, W.G. 1970 Cleft Lip and Palate. 4th ed.
 Grune and Stratton Inc. New York.
- HOLMBERG, H. 1979 Cephalometric radiographs as a means of
 LINDER-ARONSON, S. evaluating the capacity of the nasal and naso-
 pharyngeal airway.
 Am. J. Orthod. 76:479-490.
- HOPKIN, G.S. 1957 Speech and the orthodontist.
 McEWEN, J.D. Dent. Prac. 7:313-326.
- HORTON, C. 1969 Tongue-tie.
 CRAWFORD, H. Cleft Palate J. 16:8-23.
 ADAMSON, J.
 ASHBELL, T.

- HOTZ, M. 1983 Orofacial development under adverse conditions.
Eur. J. Orthod. 5:91-103.
- HOVELL, J.H. 1955 Recent advances in orthodontics.
Brit. Dent. J. 98:114-122.
- HOWLAND, J. 1979 The winning team: Orthodontics and myofunctional therapy.
Int. J. Oral Myol. 5(3):13-14.
- HUBER, E. 1931 Evolution of Facial Musculature and Facial Expression.
Johns Hopkins Press. Baltimore.
- HUGGARE, J. 1985 Morphology of the first cervical vertebra in children with enlarged adenoids.
Eur. J. Orthod. 7:93-96.
- INGERVALL, B. 1981 The value of clinical lip strength measurements.
Am. J. Orthod. 80:496-507.
- JANSON, T.
- INGRAM, T.T.S. 1956 Quoted by G.B. Hopkin and J.D. McEwen (1957) op.cit.
- JACOBS, R.M. 1967 Effects of altered anterior occlusal relationship on perioral muscular forces.
Angle Orthod. 37:144-146.
- JACOBS, R.M. 1969 Muscle equilibrium: Fact or fancy.
Angle Orthod. 39:11-21.
- JACOBS, R.M. 1966a The analysis of perioral muscular accommodation in your subjects with malocclusion.
Angle Orthod. 36:325-334.
- BRODIE, A.G.
- JACOBS, R.M. 1966b Tonic and contractile components of the oral vestibular forces in young subjects with normal occlusion.
Am. J. Orthod. 52:561-575.
- BRODIE, A.G.

- JANN, H.W. 1960 Tongue thrusting as a frequent unrecognised cause of malocclusion and speech defects. N.Y. State Dent. J. 26:72.
- JANN, C.R. 1964 A longitudinal study of articulation, deglutition, and malocclusion. WARD, M. J. Speech Hear. Disord. 29:424. JANN, H.W.
- JENKINS, G.N. 1978 The Physiology and Biochemistry of the Mouth. 4th ed. Blackwell Scientific Pub. Oxford.
- JOHNSTONE, A.S. 1942 Quoted by J. Whillis (1946) op.cit.
- JOINT COMMITTEE 1975 Position statement of tongue thrust. ON DENTISTRY AND J. Am. Dent. Assoc. 90:594. SPEECH PATHOLOGY-AUDIOLOGY
- JONAS, I. 1983 The effect of the perforated vestibular screen SCHLENTER, W. on nasal respiration. MANN, W. Eur. J. Orthod. 5:59-65.
- JONES, D.V. 1961 Volume of a swallow. WORK, C.E. Am. J. Dis. Child. 102:427.
- JORGENSON, R.J. 1983 Dentition: Genetic Effects. March of Dimes (Ed.) Birth Defects Foundation. Birth Defects: Original Article Series, Vol.19, No.1. Alan R. Liss Inc. New York.
- KAHN, M. 1903 Quoted by R. Dubner et al. (1978) op.cit.
- KAWAMURA, Y. 1976 In: B.J. Sessle and A.G. Hannam (Eds.) Mastication and Swallowing. (p.142) Univ. Toronto Press. Toronto.
- KENT, K. 1982 The effects of dental abnormalities on speech production. SCHAAF, N.G. Quintessence Int. 12:1353-1362.

- KERR, D. 1985 Personal communication.
- KETTY, N. 1974 Ankyloglossia with psychological implications.
SCIULLO, P. J. Dent. Child. pp.43-46.
- KLEIN, E.T. 1952 Pressure habits, etiological factors in mal-
occlusion.
Am. J. Orthod. 38:569-587.
- KLINEBERG, I. 1983 Occlusion: An Introduction to Some Physio-
logical, Clinical and Technical Considerations.
University of Sydney Printing Service.
- KLINEBERG, I. 1985 Personal communication.
- KORKHAUS, G. 1960 Present orthodontic thought in Germany. Jaw
widening with active appliances in cases of
mouth breathing.
Am. J. Orthod. 46:187-206.
- KORTSCH, W.E. 1965 The tongue, implicated in Class II mal-
occlusion.
J. Wis. Dent. Soc. 41:261-262.
- KRONECKER, H. 1880 Quoted by W. Straub (1951) op.cit.
FALK, F.
- KYDD, W.L. 1957 Maximum forces exerted on the dentition by
the perioral and lingual musculature.
J. Am. Dent. Assoc. 55:645-651.
- KYDD, W.L. 1963 Tongue and lip forces exerted during deglu-
AKAMINE, J.S. titation in subjects with and without an anterior
MENDEL, R.A. open bite.
KRAUS, B.S. J. Dent. Res. 42:858-866.
- KYDD, W.L. 1964 Frequency of deglutition of tongue thrusters
NEFF, C.W. compared to a sample population of normal
swallowers.
J. Dent. Res. 43:363.

- KYDD, W.L. 1962 Tongue pressures exerted on the hard palate during swallowing.
TODA, J.M. J. Am. Dent. Assoc. 65:321-330.
- LANIER, B. 1979 An approach to the medical management of chronic mouthbreathing.
TREMBLAY, N. In: J.A. McNamara, Jr. (ed.), Monograph 9, Craniofacial Growth Series.
Centre for Human Growth and Development, Univ. Michigan, Ann Arbor.
- LARSSON, E.F. 1985 The prevalence and the etiology of the initial dummy- and finger-sucking habit.
DAHLIN, K.G. Am. J. Orthod. 87:432-435.
- LAWSON, W.A. 1968 Speech and its relation to Dentistry. II. The influence of oral structures on speech.
BOND, E.K. The Dent. Prac. and Dent. Rec. 19:113-118.
- LEAR, C.S.C. 1962 Quoted by W.J. Tulley (1969) op.cit.
- LEAR, C.S. 1965 The frequency of deglutition in man.
FLANAGAN, J.B. Arch Oral Biol. 10:83-99.
MOORREES, C.F.
- LEAR, C.S.C. 1969 Buccolingual muscle force and dental arch form.
MOORREES, C.F.A. Am. J. Orthod. 56:379-393.
- LEECH, H. 1958 Clinical analysis of oro-facial morphology and behaviour of 500 patients attending an upper respiratory clinic.
Dent. Pract. 9:57-68.
- LEWIS, J.A. 1965 Tongue thrust in infancy.
COUNIHAN, R.F. J. Speech Hear. Disord. 30:280-282.
- LIGHTOLLER, G.H.S. 1925 Facial muscles. The moliolus and muscles surrounding the rima oris with some remarks about panniculus adiposus.
J. Anat. 60:81-85.

- LINDER-ARONSON, S. 1970 Adenoids - their effect on mode of breathing and nasal airflow, and their relationship to characteristics of the facial skeleton and the dentition.
Acta Otolaryngol. Suppl. 265:111-126.
- LINDER-ARONSON, S. 1974 Effects of adenoidectomy on dentition and nasopharynx.
Am. J. Orthod. 65:1-15.
- LINDER-ARONSON, S. 1975 Effects of adenoidectomy on the dentition and facial skeleton over a period of five years.
In: J.T. Cook (Ed.) Transactions of the Third International Orthodontic Congress.
Crosby, Lockwood, Staples. London.
- LINDER-ARONSON, S. 1979 Respiratory function in relation to facial morphology and the dentition.
Brit. J. Orthod. 6:59-71.
- LINDER-ARONSON, S. 1983 Re: "The relation between nasorespiratory function and dentofacial morphology".
Letter to the editor - Am. J. Orthod. 83:443-444.
- LINDER-ARONSON, S. 1983 A longitudinal study of the development of the posterior nasopharyngeal wall between 3 and 16 years of age.
Eur. J. Orthod. 5:47-58.
- LEIGHTON, B.C.
- LINDQUIST, B. 1971 Bruxism in children.
Odont. Rev. 22:413.
- LONG, J.M. 1963 A cinefluorographic study of anterior tongue-thrust. Reviews and abstracts.
Am. J. Orthod. 49:865.
- LOPEZ-GAVITO, G. 1985 Anterior open-bite malocclusion: A longitudinal 10-year postretention evaluation of orthodontically treated patients.
Am. J. Orthod. 87:175-186.
- WALLEN, T.R.
- LITTLE, R.M.
- JOONDEPH, D.R.

- LOWE, A.A. 1976 Quoted by R. Dubner et al. (1978) op.cit., pp.295 and 354.
- LOWE, A.A. 1980 Correlations between orofacial muscle activity and craniofacial morphology in a sample of control and anterior open-bite subjects.
Am. J. Orthod. 78:89-98.
- LOWE, A.A. 1985 Tongue posture at rest and incisor position.
Am. J. Orthod. 87:165.
- LOWE, A.A. 1979 Tongue and jaw muscle activity in response to
JOHNSTON, W.D. mandibular rotations in a sample of normal and anterior open-bite subjects.
Am. J. Orthod. 76:565-576.
- LOWE, A.A. 1984 Associations between anterior temporal,
TAKADA, K. masseter, and orbicularis oris muscle activity and craniofacial morphology in children.
Am. J. Orthod. 86:319-330.
- LOWE, A.A. 1983 Muscle activity during function and its
TAKADA, K. correlation with craniofacial morphology in a
TAYLOR, L.M. sample of subjects with Class II, Division 1 malocclusions.
Am. J. Orthod. 84:204-211.
- LOWE, A.A. et al. 1977 Quoted by R. Dubner et al. (1978) op.cit., p.354.
- LUBIT, E.C. 1976 Treatment of an open-bite malocclusion complicated by clefts of the maxilla and mandible.
Angle Orthod. 46:294-302.
- LUFFINGHAM, J.K. 1966 Quoted by W.J. Tulley (1969) op.cit.
- McCURDY, J.A. 1977 The tonsillectomy-adenoidectomy dilemma.
Am. Fam. Physician. Sept:137-141.

- McGLONE, R.E. 1967 Lingual pressures associated with alveolar consonants.
PROFFIT, W.R.
CHRISTIANSEN, R.L. J. Speech Hear. Res. 10:606-615.
- McMINN, R.M.H. 1974 Functional Anatomy of the Digestive System.
HOBDELL, M.H. Pitman Medical. London.
- McNAMARA, J.A. Jr. 1973 Neuromuscular and skeletal adaptations to altered function in the orofacial region.
Am. J. Orthod. 64:578-606.
- McNAMARA, J.A. Jr. 1981a The development of occlusion and facial balance.
In: H.G. Barrer (Ed.) Orthodontics, the State of the Art.
Univ. Penn. Press. Pennsylvania.
- McNAMARA, J.A. Jr. 1981b Influence of respiratory pattern on cranio-facial growth.
Angle Orthod. 51:269-300.
- McNAMARA, J.A. Jr. 1984 A method of cephalometric evaluation.
Am. J. Orthod. 86:449-469.
- McWILLIAMS, B.J. 1985 Unresolved issues in velopharyngeal valving.
Cleft Palate J. 22:29-33.
- McWILLIAMS, B.J. 1984 Cleft Palate Speech.
MORRIS, H.L. B.C. Decker, Mosby. Philadelphia.
SHELTON, R.L.
- MAGEE, B. 1979 Popper.
Fontana/Collins. Glasgow.
- MAGENDIE, F. 1822 A Summary of Physiology. (Translated from the French by John Revere.)
Straub Publ. Baltimore.
- MALKIN, D.P. 1985 Faces: Impaired craniofacial growth and dyslexia.
Int. J. Orthod. 23:20-26.

- MARCUS, A. 1982 Scientific method - chance and error.
Editorial, Dent. Update. Sept:417-418.
- MARKS, M.B. 1965 Allergy in relation to orofacial dental
deformities in children: A review.
J. Allergy 36:293-302.
- MASON, R.M. 1974 The tongue thrust controversy: Background
PROFFIT, W.R. and recommendations.
J. Speech Hear. Disord. 39:115-132.
- MASSENGILL, R. Jr. 1974 Tongue-thrusting patterns and the lower
QUINN, G. incisors.
HALL, A.S. Am. J. Orthod. 66:287-293.
BOYD, D.
- MATHEWSON, R.J. 1966 Ankyloglossia: A review of the literature and
SIEGEL, M.J. a case report.
McCANNA, D.A. J. Dent. Child. 33:238-243.
- MELSEN, B. 1979 Sucking habits and their influence on swallow-
STENSGAARD, K. ing pattern and prevalence of malocclusion.
PEDERSEN, J. Eur. J. Orthod. 1:271-280.
- MENDEL, 1962 Quoted by M.L. Hanson and U.L. Albridge
(1977) op.cit.
- MILLER, A.J. 1979 Neuromuscular changes following altered
respiration.
In: J.A. McNamara, Jr. (Ed.) Monograph 9,
Craniofacial Growth Series.
Centre for Human Growth and Development,
Univ. Michigan, Ann Arbor.
- MILLER, D.W. (Ed.) 1983 A Pocket Popper.
Fontana Paperbacks.
- MILLER, A.J. 1984 Experimentally induced neuromuscular changes
VARGERVIK, K. during and after nasal airway obstruction.
CHIERICI, G. Am. J. Orthod. 85:385-392.

- MILLS, J.R.E. 1982 Principles and Practice of Orthodontics.
Churchill Livingstone. Edinburgh.
- MILNE, I.M. 1970 Cinefluorographic study of functional adaptation of the oropharyngeal structures.
CLEALL, J.F. Angle Orthod. 40:267-283.
- MINIFIE, F.D. 1973 Normal Aspects of Speech Hearing and Language.
HIXON, T.J. Prentice-Hall. Englewood Cliffs, New Jersey.
WILLIAMS, F.
- MISCHLER, W.A. 1984 Comparison study between three tooth positioners.
DELIVANIS, H.P. Am. J. Orthod. 85:154-158.
- MITCHELL, A.G. 1957 Spoken English.
Macmillan and Co. Ltd. London.
- MOLLER, E. 1966 The chewing apparatus. An electromyographic study of the action of the muscles of mastication and its correlation with facial morphology.
Acta Physiol. Scand. 69: Suppl. 28.
- MOLLER, E. 1976 Human muscle patterns.
In: B.J. Sessle and A.G. Hannam (Eds.) Mastication and Swallowing.
Univ. Toronto Press. Toronto.
- MONTGOMERY, R.L. 1981 Head and Neck Anatomy with Clinical Correlations.
McGraw-Hill Book Co. New York.
- MOORE, K.L. 1977 The Developing Human: Clinically Oriented Embryology. 2nd ed.
W.B. Saunders Co. Philadelphia.
- MORLEY, M.E. 1970 Cleft Palate and Speech.
Churchill Livingstone. Edinburgh.

- MOSHER, H.P. 1927 X-ray study of movements of the tongue.
Laryngoscope 37:235-239.
- MOSS, J.P. 1975 Function - fact or fiction?
Am. J. Orthod. 67:625-646.
- MOSS, J.P. 1980 Unpublished material delivered at a lecture on
functional appliances.
Australian Society of Orthodontists, N.S.W.
Branch. Sydney.
- MOSS, M.L. 1962 The functional matrix.
In: B.S. Krause and R.A. Riedel (Eds.) Vistas
in Orthodontics.
Lea and Febiger. Philadelphia.
- MOSS, M.L. 1964 Vertical growth of the human face.
Am. J. Orthod. 50:359-376.
- MOSS, M.L. 1968 The primacy of functional matrices in oro-
facial growth.
Dent. Pract. 19:65-73.
- MOSS, M.L. 1968 The role of the functional matrix in
RANKOW, R.M. mandibular growth.
Angle Orthod. 38:95-103.
- MOSS, M.L. 1969 The primary role of functional matrices in
SALENTIJN, L. facial growth.
Am. J. Orthod. 55:566-577.
- MOSS, M.L. 1971 Differences between the functional matrices
SALENTIJN, L. in anterior open-bite and in deep overbite.
Am. J. Orthod. 60:264-279.
- MOYERS, R.E. 1964a The infantile swallow.
Trans. Eur. Orthod. Soc. 40:180-187.
- MOYERS, R.E. 1964b Tongue problems and malocclusion.
Dent. Clin. North Am. 529-539.

- MOYERS, R.E. 1973 Handbook of Orthodontics. 3rd ed.
Year Book Med. Pub. Inc. Chicago.
- MULDER, J.W. 1976 Velopharyngeal Function and Speech.
Van Gorcum. Assen/Amsterdam.
- MURRAY, J.M. 1982 The use of hypnotherapy in treating tongue
thrusting problems in dentistry.
J. Am. Soc. Psychosom. Dent. Med. 29:42-43.
- NAHOUM, H.I. 1977 Vertical proportions: A guide for prognosis
and treatment in anterior open-bite.
Am. J. Orthod. 72:128-146.
- NASH, F.E. 1963 Tongue-tie.
Lancet. 7306:521.
- NEFF, C.W. 1966 The open-bite: Physiology and occlusion.
KYDD, W.L. Angle Orthod. 36:351-357.
- NEGRI, P.L. 1965 Influence of the tongue on development of the
CROCE, G. dental arches.
Dent. Abst. 10:453.
- NEMETH, R.B. 1971 Quoted by T.M. Speidel, R.J. Isaacson, and
F.W. Worms (1972) op.cit.
- NEPOLA, S.R. 1969 The intrinsic and extrinsic factors influencing
the growth and development of the jaws:
Hereditary and functional matrix.
Am. J. Orthod. 55:499-505.
- NOVE, A. Quoted by G. Dunn (1964) op.cit.
- O'RYAN, F.S. 1982 The relation between nasorespiratory function
GALLAGHER, D.M. and dentofacial morphology: A review.
La BANC, J.P. Am. J. Orthod. 82:403-410.
EPKER, B.N.
- OSTER, J. 1953 Mongolism.
Danish Science Press. Copenhagen.

- OVERSAKE, C.P. 1970 Quoted by M.L. Hanson and M.S. Cohen (1973)
op.cit.
- OVERSAKE, C.P. 1975 Investigation of the efficacy of a treatment
program for deviant swallowing and allied
problems.
Int. J. Oral Myol. 1:87-104.
- OVERSAKE, C.P. 1976 Investigation of the efficacy of a treatment
program for deviant swallowing and allied
problems. Part II.
Int. J. Oral Myol. 2:1-6.
- OWMAN-MOLL, P. 1984 Effect of oral screen treatment on dentition,
INGERVALL, B. lip morphology, and function in children with
incompetent lips.
Am. J. Orthod. 85:37-46.
- PALMER, M.F. 1948 Orthodontics and the disorders of speech.
Am. J. Orthod. 34:579-588.
- PANCHERZ, H. 1984 A cephalometric analysis of skeletal and
dental changes contributing to Class II
correction in activator treatment.
Am. J. Orthod. 85:125-134.
- PASCUAL, A. 1975 Taking therapeutic advantage of function and
tongue position in class III malocclusions.
Trans. Eur. Orthod. Soc. 241-249.
- PAUL, J.L. 1973 Effect of mouth breathing on dental
NANDA, R.S. occlusion.
Angle Orthod. 43:201-206.
- PAVLOV, I.P. 1927 Conditional Reflexes. An Investigation of the
Physiological Activity of the Cerebral Cortex.
Trans. and ed. G.V. Anrep.
London.

- PEARSON, G.H.J. 1948 The psychology of finger-sucking, tongue-sucking, and other oral "habits".
Am. J. Orthod. 34:589-598.
- PEAT, J.H. 1968 A cephalometric study of tongue position.
Am. J. Orthod. 54:339-351.
- PENFIELD, W. 1950 The Cerebral Cortex of Man.
RASMUSSEN, T. Macmillan and Co. New York.
- PENZER, V. 1970 Quoted by M.L. Hanson and M.S. Cohen (1973)
op.cit.
- PENZER, V. 1980 Letter to the editor.
Int. J. Orofacial Myology 6:13.
- PIAGET, J. 1962 Plays, Dreams, and Imitation in Childhood.
W.W. Norton and Co. New York.
- PIERCE, L. 1969 Cinefluorographic and sound analysis of
SOENTGEN, M.L. deglutition.
BRENMAN, H.S. J. Dent. Res. I.A.D.R. Abstracts 404:141.
MACKOWIAK, R.
FRIEDMAN, M.H.F.
- PIERCE, R.B. 1978 Tongue Thrust: A Look at Oral Myofunctional
Disorders.
Cliff Notes Inc. Lincoln, Nebraska.
- PIERCE, R.B. 1980 The role of myofunctional therapy in speech
pathology.
Int. J. Orofacial Myology 6(4):11-13.
- PLAINFIELD, S. 1977 Myofunctional therapy for complete denture
patients.
J. Pros. Dent. 38:131-137.
- POSEN, A.L. 1972 The influence of maximum perioral and
tongue force on the incisor teeth.
Angle Orthod. 42:285-309.

- POSSELT, U. 1958 Occlusal relationship in deglutition and mastication.
Trans. Eur. Orthod. Soc. 301-315.
- POUND, E. 1977 Let /s/ be your guide.
J. Pros. Dent. 38:482-489.
- POYNTER, F.N.L. 1961 A Short History of Medicine.
KEELE, K.D. Mills and Boon. London.
- PRINCIPATO, J. 1985 Nasal airway assessment and management of the orthodontic patient.
Am. J. Orthod. 87:158.
- PROFFIT, W.R. 1972 Lingual pressure patterns in the transition from tongue thrust to adult swallowing.
Arch Oral Biol. 17:555-563.
- PROFFIT, W.R. 1973 Muscle pressures and tooth position: A review of current research.
Aust. Orthod. J. Feb:104-108.
- PROFFIT, W.R. 1975 Muscle pressures and tooth position: North American whites and Australian aborigines.
Angle Orthod. 45:1-11.
- PROFFIT, W.R. 1977 The proper role of myofunctional therapy.
J. Clin. Orthod. 11:101-115.
- PROFFIT, W.R. 1978a Equilibrium theory revisited: Factors influencing position of teeth.
Angle Orthod. 48:175-186.
- PROFFIT, W.R. 1978a The facial musculature in its relation to the dental occlusion.
In: D.S. Carlson and J.A. McNamara, Jr. (Eds.) Muscle Adaptation in the Craniofacial Region. Monograph 8, Craniofacial Growth Series.
Center for Human Growth and Development. Univ. Michigan. Ann Arbor.

- PROFFIT, W.R. 1969 Linguopalatal pressure in children.
CHASTAIN, B.B. Am. J. Orthod. 55:154-166.
NORTON, L.A.
- PROFFIT, W.R. 1968 Generalised muscular weakness with severe
GAMBLE, J.W. anterior open bite.
CHRISTIANSEN, R.L. Am. J. Orthod. 54:104-110.
- PROFFIT, W.R. 1964 Intraoral pressures in a young adult group.
KYDD, W.L. J. Dent. Res. 43:555-562.
WILSKIE, G.H.
TAYLOR, D.T.
- PROFFIT, W.R. 1975 Myofunctional therapy for tongue-thrusting:
MASON, R.M. Background and recommendations.
J. Am. Dent. Assoc. 90:403-411.
- PROFFIT, W.R. 1975 Lip and tongue pressures related to dental
McGLONE, R.E. arch and oral cavity size in Australian
BARRETT, M.J. Aborigines.
J. Dent. Res. 54:1161-1172.
- PROFFIT, W.R. 1965 Lingual pressures against anterior and lateral
McGLONE, R.E. areas of the palate during speech and
CHRISTIANSEN, R.L. swallowing.
J. Dent. res. I.A.D.R. Abstract No.89:91.
- PROFFIT, W.R. 1970 The tongue and oral morphology: Influences
NORTON, L.A. of tongue activity during speech and
swallowing.
ASHA Reports 5:106-115.
- RAKOSI, T. 1982 An Atlas and Manual of Cephalometric Radio-
graphy.
Wolfe Medical Pub. Ltd. London.
- RAMFJORD, S.P. 1961 Bruxism, a clinical and electromyographic
study.
J. Am. Dent. Assoc. 62:21.

- RAMFJORD, S. 1983 Occlusion. 3rd ed.
ASH, M.M. W.B. Saunders Co. Philadelphia.
- RAMPP, D.L. 1979 Tongue Thrust: A Diagnostic and Treatment
PANNBACKER, M. Program.
Modern Education Corp. Tulsa, Oklahoma.
- RANLY, D.M. 1980 A Synopsis of Craniofacial Growth.
Appleton-Century-Crofts. Norwalk, Connecticut.
- RAY, H.G. 1954 Consideration of tongue thrusting as a factor
SANTOS, H.A. in periodontal disease.
J. Periodontol. 25:250.
- REANEY, P.J.R. 1976/77 Speech as affected by dental abnormalities.
School Dental Service Gazette (N.Z.) 59-60.
- RICKETTS, R.M. 1958 Respiratory obstructions and their relation to
tongue posture.
Cleft Pal. Bull. 8:4-5.
- RICKETTS, R.M. 1962 Vistas in Orthodontics.
Henry Kimpton. London.
- RICKETTS, R.M. 1968 Respiratory obstruction syndrome.
In: Forum on the Tonsil and Adenoid Problem
in Orthodontics.
Am. J. Orthod. 54:485-514.
- RICKETTS, R.M. 1969 The evolution of diagnosis to computerised
cephalometrics.
Am. J. Orthod. 55:795-803.
- RICKETTS, R.M. 1982 The biologic significance of the divine
proportion and Fibonacci series.
Am. J. Orthod. 81:351-370.
- RIEDL, D. 1981 Personal communication.
- RIVIERE, H.L. 1983 Anatomy and Embryology of the Head and
Neck.
Boston Pub. Co. Teston, Virginia.

- RIX, E. 1946 Deglutition and the teeth.
Dent. Rec. 66:103-108.
- RIX, R.E. 1948 Deglutition.
Trans. Eur. Orthod. Soc. 1947-48:191-202.
- RIX, R.E. 1953 Some observations upon the environment of
the incisors.
Dent. Rec. 73:427-441.
- ROBINSON, A. 1983 The relationship between dentistry and speech
pathology in the management of ankyloglossia.
Aust. Soc. Dent. Child Newsletter. Sept:5-7.
- ROBINSON, A. 1984 Personal communication.
- ROBINSON, V. 1943 The Story of Medicine.
The New Home Library. New York.
- ROGERS, A.P. 1918a Exercises for the development of the muscles
of the face, with a view to increasing their
functional activity.
Dent. Cosmos. 60:857-876.
- ROGERS, A.P. 1918b Muscle training and its relation to ortho-
dontia.
Int. J. Orthod. 4:555-577.
- ROGERS, A.P. 1939 Evolution, development, and application of
myofunctional therapy in orthodontics.
Am. J. Orthod. and Oral Surg. 25:1-19.
- ROGERS, A.P. 1950 A restatement of the myofunctional concept
in orthodontics.
Am. J. Orthod. 36:845-855.
- ROGERS, J.H. 1961 Swallowing patterns of a normal-population
sample compared to those of patients from an
orthodontic practice.
Am. J. Orthod. 47:674-689.

- RONNERMAN, A. 1978 Facial and dental arch morphology in children
THILANDER, B. with and without early loss of deciduous
molars.
Am. J. Orthod. 73:47-58.
- ROSENBLUM, P.E. 1963a Orofacial muscle activity during deglutition as
revealed by physiographic cinematography.
Angle Orthod. 33:162-177.
- ROSENBLUM, R.E. 1963b A continuing study of orofacial activity in
normal occlusion and severe class II mal-
occlusion subjects. Reviews and abstracts.
Am. J. Orthod. 49:868-869.
- ROSS, R.B. 1978 Cleft Lip and Palate.
JOHNSTON, M.C. R.E. Krieger. Huntington. New York.
- ROTH, G.I. 1981 Oral Biology.
CALMES, R. C.V. Mosby Co. St. Louis.
- ROZNER, L. 1983 Facial plastic surgery for Down's syndrome.
Lancet 1320-1323.
- RUBIN, R.M. 1979 Facial deformity: A preventable disease?
Angle Orthod. 49:98-103.
- RUBIN, R.M. 1980 Mode of respiration and facial growth.
Am. J. Orthod. 78:504-510.
- RUSHMER, R.F. 1951 Quoted by H.W. Davenport (1977) op.cit.
HENDRON, J.A.
- SAADIA, A.M. 1980 Functional jaw orthopedics: An understanding.
WHITE, G.E. J. Pedod. Summer:309-346.
TSAMTSOURIS, A.
- SAFIRSTEIN, G.R. 1983 Open-bite. A case report (1965-1982).
BURTON, D.J. Am. J. Orthod. 83:47-55.
- SALAAM, A. 1982 A general semantics approach to the practice
of dentistry.
Quintessence Int. 7:793-800.

- SCAMMON, R.E. 1930 The Measurement of Man.
HARRIS, M.A. Univ. Minnesota Press. Minneapolis.
JACKSON, C.M.
PATTERSON, D.G.
- SCHLOMER, R. 1984 The influence of thumb sucking and pacifier
use on the deciduous dentition.
Fortschr. Kieferorthop. 45:141-148.
- SCHMUTH, G.P.F. 1983 Milestones in the development and practical
application of functional appliances.
Am. J. Orthod. 84:48-53.
- SCHULHOF, R.J. 1978 Consideration of airway in orthodontics.
J. Clin. Orthod. 12:440-444.
- SCOTT, D.B. 1944 The Physiology of the Oral Musculature.
Thesis. University of Rochester.
- SCOTT, J.H. 1961 The role of the soft tissues in determining
normal and abnormal dental occlusion.
Dent. Prac. 11:302-308.
- SCOTT, J.H. 1969 The doctrine of functional matrices.
Am. J. Orthod. 56:38-44.
- SCOTT, J.H. 1971 Introduction to Dental Anatomy. 6th ed.
SYMONS, N.B.B. E. and S. Livingstone. Edinburgh.
- SECTOR, I.I. 1961 Tongue thrust and nail biting simultaneously
treated during hypnosis: A case report.
Am. J. Clin. Hypnosis 4:51-53.
- SESSLE, B.J. 1976 Mastication and Swallowing.
HANNAM, A.G. Univ. of Toronto Press. Toronto.
- SHAWKER, T.H. 1984 Tongue movement during speech: A real-time
SONIES, B.C. ultrasound evaluation.
J. Clin. Ultrasound 12:125-133.

- SIERSBAEK-
NIELSEN, S.
SOLOW, B. 1982 Intra- and interexaminer variability in head posture recorded by dental auxiliaries. *Am. J. Orthod.* 82:50-57.
- SIMPSON, M.McF. 1976 Lip incompetence and its relationship to skeletal and dental morphology - an electromyographic investigation. *Brit. J. Orthod.* 3:177-179.
- SINGER, C. 1962 *A Short History of Medicine.* 2nd ed. Oxford at the Clarendon Press.
- UNDERWOOD, E.A.
- SMITH, H.W. 1953 Quoted by N.R. Thomas (1976) op.cit., p.37.
- SOLOW, B. 1979 Craniocervical angulation and nasal respiratory resistance. In J.A. McNamara, Jr. (Ed.) *Naso-respiratory Function and Craniofacial Growth.* Univ. Michigan. Ann Arbor.
- GREVE, E.
- SOLOW, B. 1980 Rhinomanometric recording in children. *Rhinology* 18:31-42.
- GREVE, E.
- SOLOW, B. 1977 Soft-tissue stretching: A possible control factor in craniofacial morphogenesis. *Scand. J. Dent. Res.* 85:505-507.
- KREIBORG, S.
- SOLOW, B. 1984 Airway adequacy, head posture, and craniofacial morphology. *Am. J. Orthod.* 86:214-223.
- SIERSBAEK-
NIELSEN, S.
GREVE, E.
- SOLOW, B. 1971 Natural head position in standing subjects. *Acta Odontol. Scand.* 29:591-607.
- TALLGREN, A.
- SOLOW, B. 1976 Head posture and craniofacial morphology. *Am. J. Phys. Anthropol.* 44:417-436.
- TALLGREN, A.
- SOLOW, B. 1977 Dentoalveolar morphology in relation to craniocervical posture. *Angle Orthod.* 47:157-164.
- TALLGREN, A.

- SOSA, F.A. 1982 Postpharyngeal lymphoid tissue in Angle Class I and Class II malocclusions. *Am. J. Orthod.* 81:299-309.
- GRABER, T.M.
MULLER, T.P.
- SPEIDEL, T.M. 1972 Tongue-thrust therapy and anterior dental open-bite. A review of new facial growth data. *Am. J. Orthod.* 62:287-295.
- ISAACSON, R.J.
WORMS, F.W.
- STACK, B.C. 1977 TMJ. dysfunction from a myofunctional prospective. *Int. J. Oral Myol.* 3(1):11-26.
- FUNT, L.A.
- STANLEY, E.O. 1980 Tongue thrust in breast-fed and bottle-fed school children: A cross-cultural investigation. *Int. J. Oral Myol.* 6(1):6-17.
- LUNDEEN, D.J.
- STEELE, C.H. 1968 Forum on the tonsil and adenoid problem in orthodontics. *Am. J. Orthod.* 54:485-514.
- FAIRCHILD, R.C.
RICKETTS, R.M.
- STOREY, A.T. 1965 Laryngeal sensory units initiating reflex swallowing. *J. Dent. Res. I.A.D.R. Abstracts* 91:59.
- STOREY, A.T. 1976a Interactions of alimentary and upper respiratory tract reflexes. In: B.J. Sessle and A.G. Hannam (Eds.) *Mastication and Swallowing.* Univ. Toronto Press. Toronto.
- STOREY, A.T. 1976b What mechanisms contribute to the coordination of tongue movements during mastication and swallowing? In: B.J. Sessle and A.G. Hannam (Eds.) *Mastication and Swallowing.* Univ. Toronto Press. Toronto.
- STOUGH, S. 1980 Personal communication.

- STRANG, R.H.W. 1943 A Textbook of Orthodontia. 2nd ed.
Lea and Febiger. Philadelphia.
- STRANG, R.H.W. 1958 A Textbook of Orthodontia.
THOMPSON, W.M. Lea and Febiger. Philadelphia.
- STRAUB, W.J. 1951 The etiology of the perverted swallowing
habit.
Am. J. Orthod. 37:603-610.
- STRAUB, W.J. 1960 Malfunction of the tongue. Part I. The
abnormal swallowing habit: Its causes,
effects, and results in relation to orthodontic
treatment and speech therapy.
Am. J. Orthod. 46:404-424.
- STRAUB, W.J. 1961 Malfunction of the tongue. Part II. The
abnormal swallowing habit: Its causes,
effects, and results in relation to orthodontic
treatment and speech therapy.
Am. J. Orthod. 47:596-617.
- STRAUB, W.J. 1962 Malfunction of the tongue. Part III.
Am. J. Orthod. 48:486-503.
- STRICKER, G. 1979 Psychosocial aspects of craniofacial disfigure-
CLIFFORD, E. ment.
COHEN, L.K. Am. J. Orthod. 76:410-422.
GIDDON, D.B.
MESKIN, L.H.
EVANS, C.A.
- SUBTELNY, J.D. 1954 The significance of adenoid tissue in ortho-
dontia.
Angle Orthod. 24:59-69.
- SUBTELNY, J.D. 1965 Examination of current philosophies associated
with swallowing behaviour.
Am. J. Orthod. 51:161-182.

- SUBTELNY, J.D. 1970 Malocclusions, orthodontic corrections and orofacial muscle adaptation. *Angle Orthod.* 40:171-201.
- SUBTELNY, J.D. 1980 Oral respiration: Facial maldevelopment and corrective dentofacial orthopedics. *Angle Orthod.* 50:147-164.
- SUBTELNY, J.D. 1975 Open bite treatment: The why of success or failure.
MUSGRAVE, K.S. In: J.T. Cook (Ed.) Transactions of the Third International Orthodontic Congress. Crosby, Lockwood, Staples. London.
- SUBTELNY, J.D. 1964 Open-bite: Diagnosis and treatment.
SAKUDA, M. *Am. J. Orthod.* 50:337-358.
- SUBTELNY, J.D. 1966 Muscle function, oral malformation, and growth changes.
SAKUDA, M. *Am. J. Orthod.* 52:495-517.
- SUBTELNY, J.D. 1962 Malocclusion, speech and deglutition.
SUBTELNY, J.D. *Am. J. Orthod.* 48:685-697.
- SUBTELNY, J.D. 1973 Oral habits - studies in form, function, and therapy.
SUBTELNY, J.D. *Angle Orthod.* 43:347-383.
- SULLIVAN, P.G. 1981 Skull, jaw, and teeth growth patterns.
In: Human Growth. Vol.2. Postnatal Growth. F. Falkner and J.M. Tanner (Eds.). Plenum Press. New York.
- SUZUKI, N. 1981 The articulatory characteristics of the tongue in anterior openbite: Observation by use of dynamic palatography.
SAKUMA, T. *Int. J. Oral Surg.* 10:299-303.
MICHI, K.
UENO, T.
- SVED, A. 1948 The treatment of malocclusion. *Am. j. Orthod.* 34:549-578.

- SWINEHART, E. 1942 A clinical study of openbite.
Am. J. Orthod. Oral Surg. 28:18-34.
- SWINEHART, D.R. 1950 The importance of the tongue in the develop-
ment of normal occlusion.
Am. J. Orthod. 36:813-830.
- TAKADA, K. 1984 Canonical correlations between masticatory
LOWE, A.A. muscle orientation and dentoskeletal
FREUND, V.K. morphology in children.
Am. J. Orthod. 86:331-341.
- TAYLOR, C. 1983 Personal communication.
- THE MACQUARIE 1983 Macquarie Library. Sydney.
DICTIONARY
- THEXTON, A.J. 1973 Some aspects of neurophysiology of dental
interest. Part I. Theories of oral function.
J. Dent. 2:49-54.
- THEXTON, A.J. 1976 To what extent is mastication programmed
and independent of peripheral feedback?
In: D.J. Anderson and B. Matthews (Eds.)
Mastication.
John Wright. Bristol.
- THOMAS, N.R. 1976 Mastication and swallowing in perspective.
Chairman's summary.
In: B.J. Sessle and A.G. Hannam (Eds.)
Mastication and Swallowing.
Univ. Toronto Press. Toronto.
- THOMPSON, D'A.W. 1961 On Growth and Form. Abridged edition. J.T.
Bonner (Ed.)
Cambridge Univ. Press.
- THUER, U. 1985 Application in children of a new method for
JANSON, T. the measurement of forces from the lips on
INGERVALL, B. the teeth.
Eur. J. Orthod. 7:63-78.

- THUROW, R.C. 1975 The survival factor in orthodontics.
In: J.T. Cook (Ed.) Transactions of the Third
International Orthodontic Congress.
Crosby, Lockwood, Staples. London.
- THUROW, R.C. 1977 Atlas of Orthodontic Principles.
C.V. Mosby Co. St. Louis.
- TIMMS, D.J. 1965 Cybernetic concept of orofacial behaviour.
Angle Orthod. 35:231-236.
- TIRK, T.M. 1965 Limitations in orthodontic treatment.
Angle Orthod. 35:165-177.
- TOMES, C. 1873 The bearing of the development of the jaws
on irregularities.
Dental Cosmos 15:292-296.
- TRAVIS, L.E. (Ed.) 1971 Handbook of Speech Pathology and Audiology.
Appleton-Century-Crofts Inc. New York.
- TRUESDELL, B. 1937
TRUESDELL, F.B. Deglutition: With special reference to normal
function and the diagnosis, analysis and
correction of abnormalities.
Angle Orthod. 7:90-99.
- TSUI, M. 1980 Nasopharyngeal Conditions and Dentofacial
Morphology.
Unpublished Masters Thesis. Univ. of Sydney.
- TUERK, M. 1959
LUBIT, E.C. Ankyloglossia.
Plast. Reconstr. Surg. 24:271-276.
- TULLEY, W.J. 1952 The problem of etiology.
Trans. Eur. Orthod. Soc. 198-213.
- TULLEY, W.J. 1962 Some thoughts on prognosis and treatment
planning.
Quoted by Hoffman and Hoffman (1965)
op.cit.

- TULLEY, W.J. 1964a The tongue: That unruly member?
Dent. Pract. 15:27-38.
- TULLEY, W.J. 1964b The influence of the soft tissues in perspective.
Trans. Eur. Orthod. Soc. 40:188-198.
- TULLEY, W.J. 1969 A critical appraisal of tongue-thrusting.
Am. J. Orthod. 55:640-650.
- TULLEY, W.J. 1973 Prevention of malocclusion and dentofacial anomalies.
Int. Dent. J. 23:481-488.
- TULLEY, W.J. 1980 Time and tide.
Am. J. Orthod. 77:241-257.
- VAN DER LINDEN, F.P.G.M. 1966 Genetic and environmental factors in dentofacial morphology.
Am. J. Orthod. 52:576-583.
- VAN RIPER, C. 1963 Speech Correction: Principles and Methods. 4th ed.
Prentice-Hall Inc. Englewood Cliffs, New Jersey.
- VARGERVIK, K. 1984 Morphologic response to changes in neuromuscular patterns experimentally induced by altered modes of respiration.
Am. J. Orthod. 85:115-124.
- MILLER, A.J.
CHIERICI, G.
HARVOLD, E.
TOMER, B.S.
- VIG, P.S. 1973 Some observations on the production of dental fricatives and on the development of speech.
J. Int. Assoc. Dent. Child. 4:31-38.
- VIG, P.S. 1975 The biological significance of the intermaxillary space: Its application to orthodontics.
In: J.T. Cook (Ed.) Transactions of the Third International Orthodontic Congress.
Crosby, Lockwood, Staples. London.

- VIG, P.S. 1974 The size of the tongue and the intermaxillary
COHEN, A.M. space.
Angle Orthod. 44:25-28.
- VIG, P.S. 1981 Quantitative evaluation of nasal airflow in
SARVER, D.M. relation to facial morphology.
HALL, D.J. Am. J. Orthod. 79:263-272.
WARREN, D.W.
- VIG, P.S. 1980 Experimental manipulation of head posture.
SHOWFETY, K.J. Am. J. Orthod. 77:258-268.
PHILLIPS, C.
- WALKER, A. 1978 Functional anatomy of oral tissues: Masti-
cation and deglutition.
In: J.H. Shaw, E.A. Sweeny, C.C. Cappuccino,
and S.M. Meller (Eds.) Textbook of Oral
Biology.
W.B. Saunders Co. Philadelphia.
- WALKER, D.G. 1962 The tooth, the bone, and the muscle.
Dent. Practit. 12:383-387.
- WALLACE, A.F. 1963 Tongue-tie.
Lancet 7204:377-378.
- WALLEN, T.R. 1974 Vertically directed forces and malocclusion:
A new approach. J. Dent. Res. 53:1015-1022.
- WALTHER, D.P. 1954 Skeletal form and the behaviour pattern of
certain orofacial muscles.
Trans. Eur. Ortho. Soc. 55-71.
- WARD, M. 1961 Articulation variations associated with
MALONE, H. visceral swallowing and malocclusion.
JANN, G. J. Speech Hear. Disord. 26:334-341.
JANN, H.
- WARMAN, E. 1981 Pedodontic patients with functional speech
WEIDMAN, B. problems of articulation.
KOLMAN, L.M. J. Dent. Child. Sept-Oct:376-379.

- WARREN, D.W. 1984 A quantitative technique for assessing nasal airway impairment.
Am. J. Orthod. 86:306-314.
- WARREN, D.W. 1984 Analysis of simulated upper airway breathing.
LEHMAN, M.D. Am. J. Orthod. 86:197-206.
HINTON, V.A.
- WARRER, E. 1959 Simultaneous occurrence of certain muscle habits and malocclusion.
Am. J. Orthod. 45:365-370.
- WASHINGTON, A. 1983 Personal communication.
- WASSON, J.L. 1980 Achieving functional occlusion with orthodontics.
In: J.W. Clark (Ed.) Clinical Dentistry, Vol.2. Chap.30.
Harper and Rowe, Pub. Hagerstown.
- WATSON, R.M. 1968 Nasal resistance, skeletal classification, and
WARREN, D.W. mouth breathing in orthodontic patients.
FISCHER, N.D. Am. J. Orthod. 54:367-379.
- WATSON, W.G. 1982a The functional matrix revisited.
Editorial, Am. J. Orthod. 81:71-73.
- WATSON, W.G. 1982b Clinical alteration of the growing face: The
Michigan Symposium through the eyes of the
editor.
Editorial, Am. J. Orthod. 82:430-433.
- WATSON, W.G. 1982c Functional appliances questioned.
Editorial, Am. J. Orthod. 82:519-521.
- WEBER, F.N. 1980 Preventive and interceptive orthodontics.
In: J.W. Clark (Ed.) Clinical Dentistry, Vol.2,
Chap.23.
Harper and Row. Hagerstown.
- WEINSTEIN, S. 1967 Minimal forces in tooth movement.
Am. J. Orthod. 53:881-903.

- WEINSTEIN, S. 1963 On an equilibrium theory of tooth position.
HAACK, D.C. Angle Orthod. 33:1-26.
MORRIS, L.Y.
SNYDER, B.B.
ATTAWAY, H.E.
- WEISS, C.E. 1980 Clinical Management of Articulation Dis-
LILLYWHITE, H.S. orders.
GORDON, M.E. C.V. Mosby Co. St. Louis.
- WEISS, C. 1972 A remedial program for tongue thrust.
VAN HOUTEN, J. Am. J. Orthod. 62:499-506.
- WENZEL, A. 1985 Cranial morphology and head posture in
HOJENSGAARD, E. children with asthma and perennial rhinitis.
HENRIKSEN, J. Eur. J. Orthod. 7:83-92.
- WERLICH, E.P. 1962 The prevalence of variant swallowing patterns
in a group of Seattle school children.
Thesis, Univ. of Washington.
Quoted by R.H. Barrett and M.L. Hanson
(1978) op.cit.
- WHILLIS, J. 1930 A note on the muscles of palate and the
superior constrictor.
J. Anat. 65:92.
- WHILLIS, J. 1946 Movements of the tongue in swallowing.
J. Anat. 80:115-116.
- WHITMAN, C.L. 1961 Diagnosis and management of ankyloglossia.
RANKOW, R.M. Am. J. Orthod. 47:423-428.
- WILDMAN, A.J. 1964 Patterns of deglutition.
FLETCHER, S.G. Angle Orthod. 34:271-291.
COX, B.
- WILLIAMS, P.L. 1980 Gray's Anatomy. 36th ed.
WARWICK, R. (Eds.) Churchill Livingstone. Edinburgh.

- WILSON, H.E. 1975 The mentalis muscle, its anatomy and clinical significance.
Trans. Eur. Orthod. Soc. 141-148.
- WINDERS, R.V. 1956 An electronic technique to measure the forces exerted on the dentition by the perioral and lingual musculature.
Am. J. Orthod. 42:645-657.
- WINDERS, R.V. 1958 Forces exerted on the dentition by the perioral and lingual musculature during swallowing.
Angle Orthod. 28:226-235.
- WINDERS, R.V. 1968 Quoted by J.P. Dworkin and R.A. Culatta (1980) op.cit.
- WINITZ, H. 1969 Articulatory Acquisition and Behaviour.
Appleton-Century-Crofts. New York.
- WOODWIDE, D.G. 1979 The channelization of upper and lower anterior face heights compared to population standard in males between 6 to 20 years.
Eur. J. Orthod. 1:25-40.
- LINDER-ARONSON, S.
- WORMS, F.W. 1971 Open-bite.
Am. J. Orthod. 59:589-595.
- MESKIN, L.H.
- ISAACSON, R.J.
- YIP, A.S.G. 1971 Cinefluorographic study of velopharyngeal function before and after removal of tonsils and adenoids.
Angle Orthod. 41:251-263.
- CLEALL, J.F.
- YOSHIDA, K. 1982 EMG approach to assessing tongue activity using miniature surface electrodes.
J. Dent. Res. 61:1148-1152.
- TAKADA, K.
- ADACHI, S.
- SAKUDA, M.

