

Orthodontics in 3 millennia. Chapter 10: Midcentury retrospect

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Late in orthodontics' second millennium, we paused to retrace the path that brought us to be practitioners of "the latest and the best" as Angle might have put it. What we thought was state of the art proved to be only a stepping stone along that path. The best was yet to come. (*Am J Orthod Dentofacial Orthop* 2006;130:253-6)

If we were to look back from the vantage point of the mid-20th century, we would see that it had been more than 200 years since Fauchard tied in his first *bandeau*. It was another century before the word *orthodontosie* was coined (by Lefoulon). Another 60 years passed before we had an orthodontic school or association (thanks to Angle). Thirty years later, we had the first cephalometer (Broadbent's). Then it took only 17 more years before Downs brought out the first practical cephalometric analysis. Progress seemed to leap in logarithmic bounds, so that today we wonder how we'll ever keep up with new developments.

On the eve of the dawn of new technologies, orthodontists were still using gold bands made by crimping strip material to the teeth and soldering together the ends, gold archwires in straight lengths, ligature wire on a spool, brass separators, and hand-soldered attachments and facebows. Gold was phasing out, although Wilkinson was still offering precious metals.

Proprietary schools had given way to university programs, now 18 months long on average,¹ and the MD degree had been replaced by the MS. We had evolved from "mouth mechanics" to somatic scientists: dogmatism and empiricism had given way to objectivity and the scientific method, related sciences had been integrated into our curriculum, and our focus had changed from tooth "regulation" to holism. Orthodontists were now ready to face the challenges of the coming half century.

But were they ready to be . . .

BOARDED IN ORTHODONTIC HISTORY?

If there is an American Board of Orthodontic History in our future, the following could very well be Phase I. If you have paid attention to the previous 9 chapters, you should have no trouble completing the following quiz. Answers can be found at the end of the chapter. You need answer only 65 questions correctly to pass.

Multiple choice

1. The first writer to recommend early extraction of a deciduous tooth was: A, Pliny; B, Celsus; C, Plato; D, Pierre Fauchard.
2. The modern expansion arch is derived from: A, Fauchard's *bandeau*; B, the jack screw; C, the expansion plate; D, the lingual arch.
3. Pierre Fauchard: A, wrote *The Surgeon Dentist: A Treatise on the Teeth*; B, has been called "the Father of Orthodontia"; C, repositioned teeth with a "pelican"; D, all of the above.
4. *The Natural History of the Human Teeth* (1771), the first clear statement of orthopedic principles, was written by which nondentist? A, Joachim Lefoulon; B, Alexis Schange; C, C. F. Delabarre; D, John Hunter.
5. Which of the following is not true of Joseph Fox? A, He was the first to classify malocclusion (1803); B, he wrote *The Natural History and Diseases of the Human Teeth* (1814); C, he opposed the removal of deciduous teeth; D, he was one of the first to observe that the mandible grows mainly by distal extension beyond the molars.
6. During the early 19th century, which of the following causes of underbite was considered the least likely? A, Heredity; B, imitation; C, breathing difficulties; D, finger habits.
7. By 1918, who had recognized the importance of myofunctional habits as a causative agent in mal-

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- occlusion? A, Calvin Case; B, Alfred Rogers; C, Norman Kingsley; D, Eugene Talbot.
8. Norman Kingsley (select one): A, was the first American to use rubber bands to move anterior teeth back after initially extracting teeth; B, added an inclined plane of vulcanite (which he invented) to his mechanism to "jump the bite"; C, perfected a gold obturator and artificial velum of soft rubber (1859), for which he was honored, but his fame as a dentist was nearly overshadowed by his talents as an artist and sculptor; D, both B and C.
 9. One of first to suggest endocrine glands as a possible cause of oral deformities was: A, John Farrar; B, E. C. Angell; C, Eugene Talbot; D, Henry Baker.
 10. Which of the following is not true of Calvin Case? A, He was the first to attempt bodily movement and the use of light (.016 and .018 in) wires; B, he was one of the first to use Class II elastics; C, he was firmly opposed to extraction; D, he was noted for his contributions to the prosthetic correction of cleft palate.
 11. Which of the following was not a feature of the Angle-Case controversy? A, They had opposing views on extraction; B, Angle used standardized appliances, whereas Case used a different type of appliance for each patient; C, In diagnosis, Case stressed facial esthetics in contrast to Angle's reliance on occlusion; D, They were opponents in the Great Extraction Debate.
 12. The "Big Four" of orthodontics are generally recognized to be: A, Fauchard, Kingsley, Ketcham, and Case; B, Angell, Ketcham, Dewel, and Tweed; C, Angle, Case, Dewey, and Ketcham; D, Case, Brodie, Dewey, and Hunter.
 13. The *American Journal of Orthodontics and Dentofacial Orthopedics* began life in 1915 as: A, *The American Orthodontist*; B, *The International Journal of Orthodontia*; C, *The Angle Orthodontist*; D, *Dental Items of Interest*.
 14. All of the following are true of Edward Angle except: A, he founded the first orthodontic journal; B, he wrote the first book devoted exclusively to orthodontics; C, he opened the first orthodontic school; D, he organized the first orthodontic association.
 15. Angle gave formal instruction in: A, St Louis; B, New York City; C, New London, Conn; D, all of the above.
 16. Angle's classification of malocclusion: A, is based on the relationship of the maxillary to the mandibular first molars; B, remains the most widely accepted classification of malocclusion; C, has never been challenged; D, both A and B.
 17. Which of the following is not a requisite for a group to call itself a profession? A, an educational system; B, a specialty board; C, a society; D, a journal.
 18. Before 1910, orthodontics was taught in dental schools as a branch of: A, oral surgery; B, prosthetics; C, operative dentistry; D, pedodontics.
 19. The 3 leading proprietary orthodontic schools operating during the early 20th century were: A, Angle, Washington-St Louis, and International; B, International, Dewey, and Angle; C, Harvard-Forsyth, International, and Dewey; D, Dewey, Angle, and Columbia.
 20. Benno Lischer: A, coined the terms *mesiocclusion*, *distocclusion*, and *neutrocclusion*; B, was the first to use the term *cephalometrics* (1922); C, was a founder of the International School of Orthodontia; D, all of the above.
 21. Which of the following was not a cause of the rift between Edward Angle and Martin Dewey? A, The opening of the Dewey School of Orthodontia; B, Dewey's stance as a nonextraction advocate; C, Dewey's editorializing against Angle's efforts to establish a state specialty board (in Arizona); D, none of the above.
 22. Which of the following is true of the non-Angle proprietary schools? A, Entrance requirements were a DDS degree and a letter of recommendation; B, they operated on the belief that orthodontics was a part of dentistry, like crown and bridge or prosthetics; C, they were responsible for the awakening of the universities to the possibilities of orthodontics; D, all of the above.
 23. Who was not associated with the opening of a university graduate orthodontic department in the early 1920s? A, Joseph Johnson; B, LeRoy Johnson; C, Leuman Waugh; D, John Mershon.
 24. Curriculum II was: A, a preceptorship program sponsored by the American Association of Orthodontists; B, an elective track in orthodontics offered to undergraduate dental students; C, the second graduate program inaugurated by the University of California, San Francisco; D, the brainchild of Frederick Noyes.
 25. The institution that most successfully carried on Angle's concepts of orthodontic teaching was: A, the University of Illinois; B, Northwestern University; C, the University of California, San Francisco; D, the University of Southern California.
 26. The founding director of the University of Southern California graduate orthodontic department

- was: A, Allan Brodie; B, James McCoy; C, Spencer Atkinson; D, George Hahn.
27. The AAO preceptorship program: A, was set up to provide a source of orthodontic preceptors; B, allowed orthodontists to train in populated areas close to dental schools; C, helped to counteract the accusation that the AAO was limiting the supply of trained orthodontists; D, was inaugurated in 1970.
28. The last society to emerge from a fellowship of Angle's followers was the (using the current name): A, Edward H. Angle Society of Orthodontists; B, American Association of Orthodontists; C, Pacific Coast Society of Orthodontists; D, Eastern Association of Graduates of the Angle School of Orthodontia.
29. Rodriguez Ottolengui was: A, a novelist who gave impetus to the science of forensic dentistry; B, the first non-Angle-graduate president of the American Society of Orthodontists; C, a 40-year editor of *Dental Cosmos*; D, A and B only.
30. The *American Journal of Orthodontics and Dentofacial Orthopedics*: A, was initially edited by Edward Angle; B, had 3 physicians attending its birth; C, was a spin-off of the *Journal of Oral Surgery*; D, A and C only.
31. Which of the following does not apply to Albert Ketcham? A, He pioneered dental radiography and presented the first comprehensive data on root resorption; B, he was one of the distinguished group of Angle's "enemies"; C, he established an annual award that now bears his name; D, he was elected president of the first American Board of Orthodontics.
32. Albin Oppenheim: A, chaired the orthodontic department at the University of Southern California; B, reintroduced headcaps into the United States; C, found that root resorption was unavoidable in orthodontic treatment; D, B and C only.

True/false—Characteristics of 19th-century orthodontics

33. Treatment was frequently started in the mixed dentition. A, True; B, false.
34. Orthodontists generally recommended against extraction of teeth. A, True; B, false.
35. Tooth esthetics was the primary objective of treatment. A, True; B, false.
36. Biological problems were of secondary importance. A, True; B, false.
37. Standardized appliances were on sale at supply houses with adequate instructions on how to use them. A, True; B, false.

38. Headgears and palate splitting were still to come. A, True; B, false.
39. Because treatment goals were limited, more emphasis was placed on prevention. A, True; B, false.
40. The better-qualified orthodontists had the MD degree as well as the DDS. A, True; B, false.
41. There were only 3 universities offering graduate programs in orthodontics. A, True; B, false.
42. The mechanical aspect was given far greater attention than the study of occlusion. A, True; B, false.

Matching—Women in orthodontics

Select the most appropriate description to match each of the following names:

43. Eda Schlencker
44. Josephine Abelson
45. Anna Angle
46. Genette Harbour
47. Jane Bunker
48. Guilhermena Mendell
49. Elizabeth Richardson
50. Carlotta Hawley
- A, The first woman to head a university orthodontic program (1915).
B, A founding coeditor of the *Angle Orthodontist*.
C, The first female director of the Dewey School clinic.
D, The daughter of a famous orthodontist, who did well in her own right.
E, The first woman graduate and first woman instructor at the Angle School (1902).
F, A founding member of the European Orthodontic Society (1907).
G, The first woman orthodontist in Los Angeles (1911).
H, The first woman to be board certified in orthodontics (1933).

Matching—Growth research

Select the most appropriate contribution to match each of the following names:

51. Frédéric Blandin
52. Joseph Fox
53. John Goodsir
54. John Hunter
55. Milo Hellman
56. Melvin Moss
57. Albin Oppenheim
58. Harry Sicher
59. Wingate Todd
60. Julius Wolff

- A, Discovered the osteoblast.
- B, Formulated the law of transformation of bone.
- C, Advocated gentle forces, applied intermittently.
- D, Developed the sutural theory of bone growth.
- E, Elaborated the functional matrix theory.
- F, Observed that the ramus grows backward.
- G, Discovered that the pterygoid process pushes face forward.
- H, Established the index of maturation for hand and wrist.
- I, Challenged Angle's concept of first molar as key to occlusion.
- J, Contended that mandibular growth occurs almost entirely distal to the deciduous teeth.

Matching—Pioneers in cephalometrics

Select the most appropriate contributions to match each of the following names:

- 61. B. Holly Broadbent
 - 62. William Downs
 - 63. Milo Hellman
 - 64. Robert Ricketts
 - 65. Paul Simon
 - 66. Cecil Steiner
 - 67. T. Wingate Todd
 - 68. Charles Tweed
- A, He related the cranium in 3 planes of space and developed gnathostatics as a diagnostic medium.
 - B, He began his career as a surgeon and developed an index of maturation for the hand and wrist.
 - C, He is credited with designing the first practical cephalometer and analyzing the headfilms of more than 1000 children over a period of 5 years.
 - D, He adapted techniques of physical anthropology to orthodontic research and diagnosis, calling attention to periods of acceleration and retardation in facial growth.
 - E, He developed computer-driven cephalometric diagnostics and resurrected the divine proportion.
 - F, His was the first cephalometric analysis that could be applied clinically; on graph paper, a patient's conformity with the ideal could be seen as a set of "squiggles."

- G, His analysis incorporated arch length and other measurements to help determine whether extractions were necessary; it helped "popularize" cephalometrics.
- H, He observed that, in normal occlusions, the mandibular incisors were "upright" over basal bone; from this, he developed a triangle to determine the need for extractions.

True/false—Functional appliances

- 69. Andresen's activator—an accidental outgrowth of his retainer—became the first widely accepted functional appliance. A, True; B, false.
- 70. Alfred P. Rogers, as part of his efforts to discourage deleterious oral habits, invented the monobloc. A, True; B, false.
- 71. The function regulator, developed by A. Martin Schwarz, made the oral vestibule the "operational basis" for his treatment. A, True; B, false.
- 72. Like most functional appliances, the Herbst depends heavily on patient cooperation. A, True; B, false.
- 73. The development of functional appliances occurred almost exclusively in Europe during the first half of the 20th century. A, True; B, false.
- 74. Norman W. Kingsley, with his removable inclined plane, was the first to use forward positioning of the mandible in orthodontic treatment. A, True; B, false.
- 75. Karl Häufl was an Austrian pathologist and periodontist who was a staunch advocate of the "Norwegian system." A, True; B, false.

Answers: 1B, 2A, 3D, 4D, 5C, 6A, 7B, 8D, 9A, 10C, 11D, 12C, 13B, 14B, 15D, 16D, 17B, 18B, 19B, 20D, 21B, 22D, 23A, 24B, 25A, 26C, 27C, 28A, 29D, 30B, 31C, 32D, 33B, 34B, 35A, 36A, 37B, 38B, 39B, 40A, 41B, 42A, 43H, 44C, 45B, 46G, 47F, 48E, 49A, 50D, 51G, 52J, 53A, 54F, 55I, 56E, 57C, 58D, 59H, 60B, 61C, 62F, 63D, 64E, 65A, 66G, 67B, 68H, 69A, 70B, 71B, 72B, 73A, 74A, 75A.

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