A little house in Pasadena

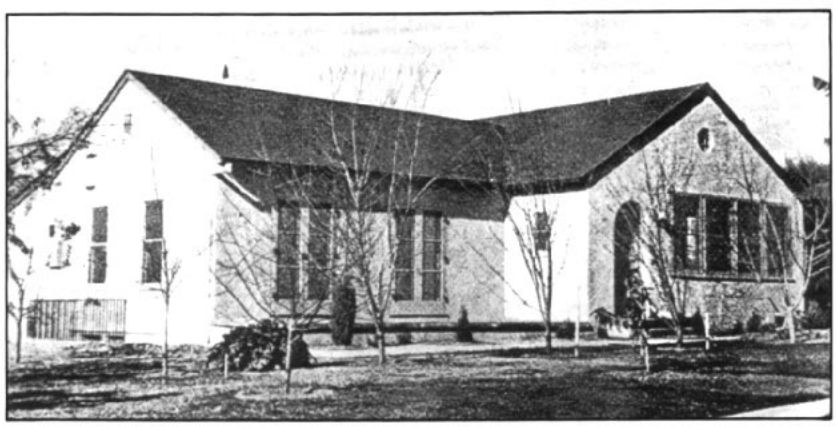
By Norman Wahl, DDS, MS

In a city famous for its Rose Bowl, Huntington Library (actually located in neighboring San Marino) and Caltech, the small, gray-stucco cottage at 550 Jackson Street could hardly be called a Pasadena landmark. In fact, its unobtrusiveness blends perfectly with the quiet, tree-lined neighborhood of which it is a part. Yet, like some long-forgotten Rose Queen yearning to tell us of her moment of fame, this antiquated little house holds within its walls a story which begs to be told.

It is 1922. In his large bungalow at the corner of the same block, Dr. Edward H. Angle greets a visitor. It is Dr. Cecil C. Steiner, one of his disciples.

"Dr. Angle, it is with much pleasure I am sent to tell you that the boys you have been teaching during the past two years have gotten together, talked the matter over and pledged themselves to contribute a suitable building for your use in the teaching of orthodontia; a building in which you will have more freedom for your work than you now have. This we gladly do as an expression of our respect and love for you . . ."[1]

Thus was erected on a corner of Dr. Angle's property, the first building ever dedicated exclusively to the teaching of orthodontia. (In keeping with the tone of the times and for the sake of consistency, the term "orthodontia" is used throughout the article in lieu of its modern counterpart, "orthodontics.") It was the first and the last of its kind. The school (and later the college) was to last only five years, but from its halls — and those of prior Angle schools — emanated the highest concentration of orthodontic leaders in history. From around the country and from such distant lands as Finland, Australia, Ireland, and Brazil came the men and women who were to become apostles of the Angle "creed."



The Angle School of Orthodontia shortly after its completion, winter of 1922-1923.

Roots

The first Angle School of Orthodontia had its humble beginnings in the summer of 1899 at Niagara Falls, N.Y., during a meeting of the National Dental Association.[2] Angle had been teaching orthodontia for 13 years in four dental colleges, but was frustrated by his inability to convince authorities of the necessity of establishing separate orthodontic departments. He had long felt that orthodontia should be looked upon as a separate branch of medicine, apart from dentistry. So the time was ripe to break with the establishment.

At the meeting, Angle was approached by four men who convinced him to instruct them at

his office in St. Louis for a three-week period that November. These were: Henry E. Lindas, Thomas B. Mercer, Herbert A. Pullen and Milton A. Watson.[3] In June of 1900 the course was repeated on a broader scale, adding seven more students (Charles B. Blackmar, Frank A. Gough, Frederick C. Kemple, Lloyd S. Louie, Sr., Grafton Munroe, F.W. Rafter and Richard Summa), using the original four as student-instructors.

At a dinner given after the first class, the members organized the first orthodontic society, giving it the name "The Society of Orthodontists." Two years later the word "American" was added.[4] In 1935, the society adopted the name it bears today: The American Association of Orthodontists (AAO).

In 1903 Dr. Anna Hopkins, Angle's longtime secretary and a recent dental graduate of the University of Iowa, was elected the Society's first secretary. She completed one of the early Angle courses, but was never to practice orthodontia. In 1906 she became Mrs. Edward Hartley Angle.[5]

Noyes[6] writes, "The early courses were of two or three months duration, but as Dr. Angle's own concepts broadened he kept increasing the time of study. He secured the best men he could get to direct the work of the students in anatomy, physiology, histology and biology and the relation of orthodontia to rhinology. He paid these men generously for their services. This used all the fees of the students. Dr. Angle often, if not usually, contributed largely from his own funds. He never conducted the course for profit." (Between 1900 and 1909, the cost was increased from $150 to $225.)

Professional rivalry

Even so, Angle was very sensitive to possible competition from his disciples, since he continued private practice while in St. Louis. Benno Lischer,[7] who was to become one of orthodontia's leading educators, wrote about his efforts in 1900 to gain admission to the Angle School: "Unfortunately, being a resident of St. Louis, where the course was being given, I was asked to sign a contract to locate elsewhere on completion of the month's instruction. When the oracle who was giving the course, and to whom I applied in person, told me this, he added: 'You know, Lischer, I can pick the flowers in my garden myself.'" Lischer didn't sign.

Seven years later Lischer, together with Clarence Lukens, got what some would call his revenge when he opened the International School in the same town. In 1915 it was taken over by William J. Brady and Hugh Tanzey, and moved to Kansas City. In 1911 Martin Dewey, a 1903 Angle graduate and former instructor, got into the competition with his school in Kansas City. It, too, changed locations, moving first to Chicago and finally to New York City.[8]

According to Wright,[9] entrance requirements to the latter two schools were simply the possession of a DDS degree and a letter of recommendation. These schools were operated on the belief that orthodontia was a part of dentistry and that the undergraduate's education for orthodontic practice was complete except for his mechanical training. "There were neither assignments, quizzes nor examinations and, believe it or not, the diploma was granted without the candidate even having had the meager experience of placing a separation wire in the mouth of a patient."

As competitors, Dewey, Brady and Lischer had the dubious distinction of joining Angle's long list of enemies. Dental school administrators, of course, were among the first. Those of independent mind who were courageous enough to speak out against him were another group. Many of these were Angle's own disciples who broke with him after refusing to accept his nonextraction dogma. In this category were Frank Casto, Albert Ketcham and Lloyd Lourie, as well as Brady and Dewey. (Brady had been a good friend of Angle, having worked with him in Minneapolis on illustrations and appliance design.[10]) These men were branded "Angle-Phobes" and "Angle-Worms" by Angle's followers.[11]

These were times of strong opinions, dogmatism, heated discussions and a very personal attitude taken against the challenge of one's beliefs. It would seem strange to hear a professional of today speak of those whose opinions differ from his, as "enemies."

Moving spirit

In 1907, after awarding 94 diplomas, Angle moved his school to New York City. Only one class was graduated there, yet the small roster of twelve included such names as Milo Hellman, John Mershon and Frederick Noyes. The following year found the school in New London, Connecticut. Here, sessions were held in 1909 at the Munsey Building (later called the Hotel Mohican), and in 1911 at the Harbor School. Then ill health forced Angle to leave the East Coast and, so he thought at the time, quite teaching for good.

Enchanted by Southern California living on a previous visit, Dr. and Mrs. Angle, settled in Pasadena in 1916. After a lifetime at the helm of his profession, Angle was determined to devote his time to study, invention, experimentation and, thanks to Anna's gentle prodding, relaxation. In 1918 the Angles purchased a one-and-one-half story, 1909 Craftsman home at 1025

North Madison Avenue in Orange Heights. One of the largest and most costly in the neighborhood, the house dominated the entire block from its hill at the corner of Jackson Street.[12]

They established themselves in the community and became the gracious hosts to many a soirée. Angle, fascinated by Indian lore and culture, acquired an extensive collection of Southwest Indian artifacts. These were used to decorate the walls of their home and were later exhibited at the Southwest Museum. It is said that Angle knew personally a great many of the Indian chiefs.[13]

One room in the home was set up as a workshop, and it was here that Angle was his happiest — tinkering, improving, creating some of the instruments for which he held 37 patents. His ribbon arch, introduced in New London in 1916[10] was the standard of the profession for many years. Much to his consternation, it became the basis of two important modifications: the Begg appliance and the universal appliance. The edgewise mechanism was yet to come.

But Angle's sabbatical was short-lived. In 1917, a young dentist who had once studied under the master and whose name was James Angle, appeared at the door of the Angle home. He had intended only to pay his respects but, whether it was Angle's fascination with the name or the young man's thirst for knowledge, the short visit evolved into a teaching session of several weeks. Thus did the 62-year-old Angle once again, and for the last time, take up teaching.[4]

Several small groups of students were trained in Angle's home during the years 1920 and 1921. No clinical facilities were available, and the little workshop served as a classroom. From this informal setting emerged three more orthodontic greats: Spencer Atkinson, George Hahn and Cecil Steiner. They remained to become the mainstays of Angle's teaching staff.

While Mrs. Angle did no formal teaching, she nevertheless had a profound influence on the students. Her gentle and understanding nature was in sharp contrast to the iron-handedness of her husband. Many is the student who was saved from the brink of defeat by the kind encouragement of "Mother Angle."

The groups began to hold monthly meetings at the Angle home, at which finished cases were shown and problems discussed. In June, 1922, they founded a formal association and gave it the name it bears today: The Edward H. Angle Society of Orthodontia (commonly called the Angle Society). This was the first time since 1906, when he bolted from the American Society of Orthodontists over a personal dispute, that Angle assumed the leadership of a professional organization.

Dr. and Mrs. Angle in Pasadena, circa 1920. Courtesy Mrs. George W. Hahn.

A home at last

Recognizing the inadequacy of the teaching facilities, the group, along with some of Angle's former students and friends, raised the sum of $6,800 to construct a suitable building. In 1922 such a sum was enough to build a much larger house. However, when we consider that the builder was Peter Hall, who had done many of the high-quality Craftsman homes for architects Greene and Greene,[12] we may assume that Angle's devoted followers wanted only the best.

In his welcoming address at the inaugural meeting of the Angle Society, Dr. Angle expressed his unbounded pleasure. "Such a surprise! Such a joy! And so it had come, after many years of waiting and longing and hoping and striving, and, too, from my own dear students whom I have taught, coaxed, scolded, criticized and encouraged![1]"

At the school's dedication ceremony on January 9, 1923, Angle exhibited, within the confines of dignity, a flair for showmanship. Along with recent graduates and members of the dental

Dr. Atkinson with his skull collection, 1958. Courtesy University of Southern California Archives.

profession, he invited personal friends, many of whom were prominent in the business and professional community, as well as representatives of the local press. Talks were given by a prominent rhinologist and a psychologist. Former students exhibited treatment records of their most remarkable cases, while an orchestra played musical interludes.[14]

But the "star" of the show was Angle himself who, with the aid of stereopticon slides, showed the dangers to one's health and the disfigurement caused by malocclusion. Explaining to the lay audience that orthodontia was the science of straightening teeth, he emphasized that it was a profession in itself, distinct from dentistry.[14] Six years were to pass before Angle would see his dream of separate licensing come even partly true.

The following day, a small group of students which had been gathering for several weeks, began their studies. In February of the following year (1924), under a charter from the State of California, the school was incorporated as the Angle College of Orthodontia.

The building was designed in the shape of a "T", so that its end section which housed the clinic, could receive the northern light from Pasadena's seldom-overcast sky. In those smog-less days, the student operator, in a rare moment of relaxation, could enjoy a view of the San Gabriel Mountains. Each end of the clinic was provided with student benches for necessary filing, soldering, or adjustment of the appliances.[15]

The large central section, with a "hipped" (beveled) ceiling, was separated from the clinic by heavy sliding doors, so that it could be blocked off for lectures and meetings. It opened to the outside through an arched doorway on its east wall.

The west wall was adorned with a mural created by Angle's lifelong friend and former faculty member, Edmund H. Wuerpel. A smaller room was used for photographic developing and the storage of slides and skulls. (Atkinson had his own collection of some 1,400 skulls.) The basement contained equipment for furnishing heat, hot water, and compressed air.[15]

Life at the school

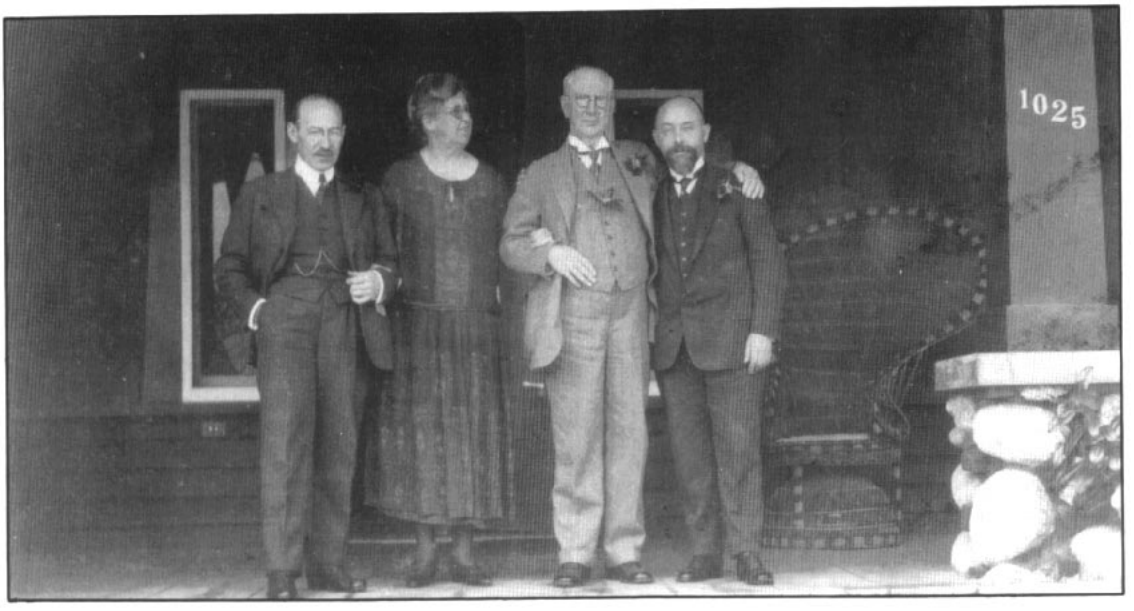
"The courses begin," states the official **Announcement**,[16] "on January 2 and June 1 of each year and continue two years. During the first year students are in actual attendance at the school; during the second, in their own private practices, but reporting to the school regularly on all the work they are doing." Hours were Monday through Friday, 8:00 to 12:00 and 1:30 to 5:00. And busy hours they were.

Prior to admission, the prospective student was thoroughly grilled in the basic sciences, either by Dr. Angle or one of his staff. "I receive as students only those who have thoroughly mastered the knowledge of ... the growth, development, and functioning of the denture.... They must not only know the structures microscopically, and the names of the bones and muscles of the head, face and neck, but they must be able to visualize each part in growth, development and function and all in their functional correlations.[17]"

Each applicant received a personal reply, in which Angle laid down his requirements in no uncertain terms. In a letter to Brodie,[18] Angle wrote, "... you will be expected to know the anatomy, embryology and histology of the head and neck (exclusive of the brain) far, far better than the average dental student knows these subjects on graduation. There will be no exceptions made and no 'just slipping in.'" He also expected the applicant to be reasonably familiar with history, general science, and English literature, as befitting a man proposing to enter a learned profession.

Brodie[19] was given 30 essay-type questions in his first quiz (anatomy) and, after five grueling hours, was only on the twentieth question when time was called. "We were examined the same way in histology, embryology, dental anatomy, and orthodontia, and at the end of that week we were a sad looking group of men." Only two of his group of six had passed.

The sequence of instruction carefully led the student from a study of the normal, emphasizing the "line of occlusion" (The ... "line with which, in form and position according to type, the teeth must be in harmony if in normal occlusion.[20]") to the abnormal, then to case analysis. In addition to Atkinson, Hahn and Steiner, instruction was given by Drs. Charles Boyd, Howard Furby, F. Ishii, Jess Linn and William



Dr. and Mrs. Angle playing host to Drs. Oppenheim and Grunberg during the 1926 meeting of the Angle Society. Courtesy Mr. and Mrs. L. Richard Wernecke.

Wilson. Visitors to the school during this period included two European graduates, Dr. Albin Oppenheim (Vienna) and Dr. Joseph Grunberg (Berlin), who spoke at the 1926 meeting of the Angle Society.

Any thought the student had of sitting back while his instructors "fed" him information was quickly dispelled, when he found himself the recipient of questions and more questions. But they had a purpose. They were designed to make him use the facts he had learned, in the process of reasoning and drawing conclusions. Brodie[19] said of his teachers, "They were our guides on this voyage of discovery." Dr. Matthew C. Lasher,[21] a 1924 graduate, calls Angle "one of the finest teachers I ever came across. He never asked, 'What do you know?' He asked, 'What *don't* you know?'"

The technical aspect of the training included a thorough grounding in the history of orthodontic mechanisms, through Angle's expansion arch E, his pin-and-tube appliance (1910), and culminating in the ribbon arch (1916). Filing, soldering, and wire bending had to be mastered before the student was permitted to do any appliance manipulation. "... the thought and care that had gone into the working out of that one technique was amazing. We were shown how to hold the file, how to hold the piece of wire, how to sit or stand, yes, even how to breathe on the final strokes.[19]"

Nothing aroused Angle's ire more than a dirty workplace and it wasn't long before the beleagured student felt like a West Point plebe. Every table, every sill, every corner had to be spotless. "As a result of this a person could go into that clinic five minutes after an impression was taken or a case poured and he would be unable to tell which chair or which bench had been used. Plaster work, filing, soldering, writing and studying were all done on the same bench top and that bench top was varnished and kept polished.[19]"

Words of wisdom

Prominently displayed on the wall of the lecture hall were the words, "There is only one *best* way." For those who held the notion that they could improve on his methods, Angle had this to say: "If you do not care to sacrifice the time to learn the best way, it would be far better to stay clear of my appliances." But if a student could muster the courage to approach him with a problem, Angle might say, "Never be outwitted when coming down the pike." In other words, there is a way around every difficulty and it is your job to find it.[19]

In studying the lives of great teachers and the caliber of disciple which they produced, the question often arises: Was this teacher able to attract the best raw material to start with, or was there something about him that fired his followers to pursue greatness? A dental dean once asked a recently-graduated Angle man, "What is there about this man Angle that enables him to take you ordinary guys, who were just mediocre students, and just average dentists and make you over into men full of enthusiasm and energy and eager to study and work?[6]"

Because, according to Noyes,[6] "Dr. Angle was devoted heart and soul to orthodontia and he succeeded to a remarkable degree in inspiring his students with his enthusiasm." Brodie[19] was convinced that the discipline which was maintained throughout the course was one of the main contributing factors to its success. And the thorough "going over" that one received at the

Dr. Angle in a rare moment of relaxation, with Arthur Reed, Pasadena, Calif., May 1926. Courtesy Dr. J. Arthur Reed.

outset made this possible. "... the best way to get them started on the right track," according to Angle, "is to make them all-fired humble right at the start. Make them acutely conscious of their shortcomings ... make them mad enough to want to prove you a liar.[19]"

Angle's influence, however, was not limited to graduate dentists. Dr. Fred J. Angel,[22] then a patient and protégé of Steiner's, recalls: "During my last summer in high school, Dr. Steiner introduced me to Dr. Angle and during the next three summers, I studied with him and worked in his laboratory at his home in Pasadena. I also attended some of the lectures at the school.

"At that time, he was perfecting the edgewise appliance, so he had me filing brackets, grinding out those little grooves under the wings. I suppose he wanted to find out what kind of fingers I had, whether I had the makings of an orthodontist. I don't think he had tried anything like that before on anyone so young."

Angel later studied under Brodie and ultimately took over Steiner's practice.

To the clinic — finally

Only after surviving the rigors of discipline, theory, technique, and case analysis, was the aspiring orthodontist allowed admission to the clinic. Each student was assigned a patient. No particular number of patients had to be treated. Brodie[19] said some treated five; others ten. Lasher[21] remembers treating only one or two. Whatever the number, all cases had to be completed.

In the way of supplies and materials, nothing was too good for Angle's charges, but by today's standards, they were indeed primitive. They had no acrylics, no alginates, no light wires, no model trimmers (except the human kind), and no preformed bands. Gold or platinum strips of band material were pinched on the teeth and soldered, although they did come with brackets attached. Edgewise brackets (Angle's "Latest and Best" mechanism), announced to the profession during the June 2, 1925, meeting of the Angle Society in Berkeley, California,[10] were probably used in the clinic soon after that.

Impressions were taken in plaster and, because undercuts prevented removing the stony mass in one piece, the operator was obliged to score the material and pry it off, piece by piece. And, since no small amount of heat was generated during the set, the hapless patient often wondered whether he would succumb first to a stab wound or to fried gums! The poured impression was later trimmed by hand with a plane, a saw, or a huge file.

For their carefully-supervised treatment, the patients paid no fee. For this finest of instruction, the doctor-students paid no tuition, although they did have to buy their supplies. For assisting Angle in his teaching, the instructors received no salary. Nevertheless "... the school owes nothing, but has money in the bank with which to meet its small expenses, money which has wholely come in donations from its grateful graduates imbued with the true spirit of the science.[16]" "Poverty never kept a man out of the school and more than once Dr. Angle advanced money out of his own pocket to enable a student to pay his living expenses.[19]"

All work and no play ...

Despite his stern visage, Angle was a firm believer in relaxation therapy. Accordingly, the browbeaten pupil was occasionally given a respite in the form of a beach party or a corn roast in the nearby Arroyo Seco. His host was not at all the stern taskmaster he knew from school. It was a Dr. Angle completely stripped of his dignity — wearing outlandish costumes, posing for pictures, or leading a raucous song.[19] After all, could a man who despised mediocrity put into his play any less fervor than that which he put into his work?

As a lanky teenager, Fred Angel[22] wasn't about to miss out on a feast. "You know, Dr. Angle loved sweet corn. He used to have the students over to dinner under his big oak tree. He's say, 'Dr. Seraphim, let's go out and get some sweet corn.' (In celestial hierarchy, the Seraphim are the highest order of angels.) So he'd have the chauffeur get out his old Pierce Arrow — or Packard, I'm not sure which — and

we'd go out in the pasture and pick corn. He didn't eat much else, but he sure could put away the sweet corn."

A close friendship developed between Angle and his eye-ear-nose-and-throat physician, Dr. James Ross Reed. Dr. Reed's two older sons were virtually adopted by the childless Angles and it was a rare weekend that didn't see one of the youngsters cavorting around the Angle property. The eldest, James, Jr., was treated at the school.[13]

The second son, James Arthur, also remembers the corn roasts. "The old man used to take me out to Monrovia. We'd go through the cornfields and he'd pick the corn he wanted. He got the best corn around. Then we'd go back to his house and have a big corn broil. And he was never stern. To me, he was very warm and very kind. He was like my own grandfather.[13]"

Demise

After perfecting the edgewise appliance, Angle felt that his next goal should be to bring about legislation controlling the practice of orthodontia. Anticipating the criticism, however unjust, which might result while the college was in progress, he closed its doors in 1927, after issuing his last two diplomas to Brodie and Charles B. De Pertuis.[23]

Never again was Angle to teach. Never again was there to be a College of Orthodontia. However, Brodie and Hahn are recognized as the two disciples who came closest to strictly promulgating Angle's teachings. Hahn trained several orthodontists in his Berkeley office shortly after the demise of the College. It was even called the "Angle Course." Among this number was Charles Tweed, who had already received a letter of acceptance from Angle. He is, therefore, considered to be an Angle graduate.

Brodie, as first department head of graduate orthodontia at the University of Illinois, perpetuated Angle's precepts throughout his 36-year tenure and trained over 250 graduate orthodontists, fifteen of whom became heads of other orthodontic departments.[24] In contrast to Hahn, who continued to use the ribbon arch until his retirement in 1964, Brodie was Angle's chief spokesman for the introduction of the edgewise arch.

Angle was unsuccessful in getting his licensure bill to pass the California legislature. Among others, it was opposed by the American Society of Orthodontists, the organization he helped found. He did, however, live to see a similar bill, introduced by Charles Tweed, become law in Arizona.[8] Thus, in February, 1929, Arizona became the first state to license orthodontists separately from dentists.[25] (The law was repealed six years later.[8]) On August 11 of the following year, Angle died at his summer home in Santa Monica, not long after he had announced to his wife that "I've finished my work.[25]"

Shortly after her husband's death, Mrs. Angle rented out the large house on Madison Avenue and moved into the school building.[27] It was to be her home until her death in 1957. The clinic was partitioned off into three rooms, at least one of which was used as a bedroom. The lecture room served double duty as living room and meeting hall.

As honorary chairman of the Angle Society's executive committee, she played host to the Society's Southern California Section until the mid-fifties, when the membership outgrew its small quarters. Then the "West Point of Orthodontia" passed into oblivion. It became just another little house on another little street in a quiet neighborhood of Pasadena.

Epilogue

Of an estimated 183 graduates (author's estimate, from all four schools), 25 became AAO presidents, 11 became orthodontic department heads, and three became dental school deans: Allan G. Brodie, Frank M. Casto and Frederick B. Noyes.

Only two survive: Matthew C. Lasher, in Rancho Mirage, California and Cecil C. Steiner, in Longview, Washington.

The first five directors of the American Board of Orthodontics (ABO), Albert H. Ketcham, Alfred P. Rogers, Lloyd S. Lourie, Sr., B. Frank Gray and Martin Dewey, were Angle graduates.

The first seven recipients of the annual Albert H. Ketcham Memorial Award, the most prestigious in orthodontics, were Angle graduates.

Both James, Jr., and J. Arthur Reed, like their father, became physicians. After serving in WWII, Arthur became Anna Angle's ophthalmologist.

Arthur's son, James A. Reed, DDS, was treated by Dr. Spencer Atkinson and now practices orthodontics in Santa Barbara, California.

Both Angle's and Atkinson's skull collections are on display at the University of the Pacific School of Dentistry in San Francisco.[28]

The Angle collection of American Indian artifacts now reposes in the Galleries of the Claremont Colleges in Claremont, California.[29]

A replica of Dr. Angle's workroom, originally housed at the University of Illinois Department of Orthodontics, is now on display at the National Museum of American History in Washington, DC.

Dr. Edward H. Angle.

Each succeeding owner of the school building (there have been four) has known about its past. The present occupants have restored the outside walls to their original gray-stucco finish. An enclosed porch, added in the '40s or '50s, now occupies the southwest corner of the "T". The clinic section has been converted into two bedrooms separated by a sitting area, while some of the windows, reflecting the times, are barred.

But much of the sturdy structure stands unaltered by time. The sliding doors, the hipped ceiling, the arched doorway — they all remain, as does the sign, if only in the mind's eye, which says:

There is only one best way

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