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President-Elect Mary Kreinbring, in front of a Morrison engine at the ADA Library.
Letter from the President

Mary Kreinbring, MLS

My initial experience with dentistry was to serve at the Northwestern Dental School Library, where I became aware of the significance and importance of the works of such individuals as G.V. and Arthur Black. A comprehensive account of the men and women contributing to American dentistry’s accomplishments would extend beyond my allotted space in this issue. As I reflect on these two men, one can appreciate the monumental changes brought forward by their commitment to dentistry. They laid the foundations in many of the theoretical and practical requirements for the professionalization of American dentistry.

The devotion to the ideals of learning and teaching are reflected in their contribution to the dental literature. Our Academy understands and recognizes the importance that that father and son placed on professional research and literature, but also their belief in the importance of archival collections, which provide the backbone for a systematic evaluation of our progress in dental science, education and professional responsibility. Herein is the crux of the importance and basic requirement for dental history. If our profession fails to collect and maintain the records of its evolution and development, catalogue and make accessible for scholarship, and provide resources for historical assessment, then it has failed to amalgamate the empirical and rationalistic foundations of dental science.

The American Academy of the History of Dentistry conceived and provided the initiative for the establishment of a National Dental Museum. Because Academy members provided substantial resources (both financial and in collectibles), the Academy and its membership take pride in the continued success of our “oldest child”. Today, we embark on the next phase in our professional maturity, the creation of a Center for the History of Dentistry. The Executive Director and the ad hoc committee will continue to inform you of developments. I encourage your suggestions and comments.

Additionally, we have developed a new resource for our membership, the AAHDwiki. You have received instructions in the mail to set up your password and log-in. If you have misplaced these instructions, please contact our Executive Director for assistance.

It is an honor to serve as your President.
What is Past is Prologue – If Not You, Then Who? Leadership Matters.

Arthur A. Dugoni, DDS, MSD, Professor of Orthodontics, Dean Emeritus
Arthur A. Dugoni School of Dentistry, University of the Pacific

2007 Frank & Phyllis Orland Lecture
56th Annual Meeting of the American Academy of the History of Dentistry
October 2nd, 2007
San Francisco, California

President Chernin, distinguished leaders, honored guests, ladies and gentlemen. As I stand here, I am honored to be here in your presence. You represent the best of our profession. I am here today also to share with you some thoughts about dentistry and dental education in the present and in the future. I will talk about challenge, change, and commitment, about getting involved and taking risks, and about unity and teamwork.

Just a few centuries ago, nobody knew how to think about the material world, so people believed diseases were the result of sin, and that flying through the air could only be accomplished through witchcraft. The method of thinking espoused by Descartes and Bacon, and exercised by Newton and Galileo, led to modern medicine and aviation. Perhaps a new method of thinking in this decade about the way we approach and solve our challenges in today’s society will allow us to fly into the future instead of stumbling into it.

Over the past 59 years, I have had the special privilege to listen and speak with many of our dental colleagues all over this nation and even throughout the world. The more I listened and learned, the more I became convinced that we are fortunate to be part of a great profession in a marvelous country. There is a fabulous but different future ahead, perhaps an even greater golden age, but only if we are prepared to guide the forces of change with commitment, competence, and value-driven passion.

Our profession needs competent leadership, with concerned involvement, and a strong vision for the future. As leaders, you represent the very best of our profession. Are you willing to take some risks? We have all heard the sports expression, “No pain, no gain,” “No risks, no reward.” But for most of us, these are little more than words.

Perhaps George Bernard Shaw said it best:

Life is no brief candle for me, it is a sort of splendid torch, which I have got hold of for a moment, and I want to make it burn as brightly as possible before handing it on to future generations.

I am convinced that our leaders are more than able to take this torch, burning brightly, into the future.

Winston Churchill, a favorite of mine, wrote:

To every man there comes in his life that special moment when he is figuratively tapped on the shoulder and offered that chance to do a very special thing, unique to him, and fitted to his talents. What a tragedy if that moment finds him unprepared or unqualified for that work.

Ladies and gentlemen, it would be my hope that when you personally are tapped on the shoulder for that special moment of leadership, or to give back to your profession and to make a difference, that you will grab that moment – that you will take on the challenges, take some risks, and bring the status quo to its knees.

I have had the opportunity over my career to meet many different types of leaders; some from the dental world and state, national, and international
organizations; others from specialty organizations; the deans of dental schools, corporate, and business leaders, legislators, and government officials.

Let me share with you some of the positive traits that the best have in common from my experience:

- **Energy** – They transmit enthusiasm, confidence, and have a high level of energy.
- **They have a strong feeling of self-worth, and this, they project.** Do you think this could have been nurtured and fostered while we were in dental school, or the reverse – a diminished or destroyed self-worth?
- **Extraordinary stamina; usually physically fit.**
- **Able to communicate – charisma, panache, and karma.** They also have great listening skills. It is amazing what we can learn when we listen.
- **Facilitators – high consensus building skills.**
- **They look at the big picture.**
- **Their word is their bond – they are trusted because of their integrity.**
- **They are able to define and analyze situations, develop alternatives, make decisions, and take action.**
- **They are optimistic about the future.** In difficult times people too often lose the ability to face the future optimistically.

Optimism is extremely important. Let me give you an example. One day early in my career as dean, after a difficult budget meeting and serious concerns for our economic stability, I left my office and walked out into the hallway. I met a young faculty member in front of the elevator. As usual, the faculty member said, “Good morning, Art. How are you?” I usually respond with “fantastic – wonderful – I could not be better!”

However, this time I responded less than optimistically, with body language revealing serious concern: rounded shoulders, head facing down, looking at the ground, and made an inarticulate statement, such as, “There are some problems I am dealing with.” This startled the young faculty member, an oral and maxillofacial surgeon, who said, “What is the matter, Art? Is the school going to close like Georgetown, Washington University (St. Louis), Northwestern, Loyola? Am I going to lose my job?” I realized at that moment that a leader must demonstrate at all times an optimistic front and provide a sense of stability and security. Naturally, it needs to be realistic.

Leaders must be seen to be up – up front – up to date – up to their jobs – and up early in the morning. All too often, however, on the long road up, young leaders become servants of “what is” rather than the shapers of “what might be.” In the long process of learning how the system works, they are rewarded for playing within the intricate structure of existing rules, and by the time they reach the top, they are likely to be trained prisoners of the structure.

Potential leaders who have been schooled to believe that all elements of a problem are rational and technical, reducible to words and numbers, and solvable by computers are ill-equipped to move into a responsibility where intuition, communication, empathy, and listening are very powerful aids in leadership and especially problem solving.

Leadership is not tidy. It is complex, but it is not rocket science either. Decisions are made and sometimes revised or reversed, misunderstandings are frequent, and inconsistency is inevitable. Achieving a goal may simply make the next goal more urgent – inside every solution are the seeds of new problems. No leader enjoys that reality but every leader knows it. Just ask Carly Fiorina, formerly of Hewlett-Packard when she struggled to expand Hewlett-Packard and merge with Compaq. Witness, also, the events that have occurred in Afghanistan and Iraq, and the decisions and the consequences that President George W. Bush and former Prime Minister Tony Blair face or faced on a daily basis.

As leaders, one of our important roles is decision making. Some of my rules are:

1. I do not take myself too seriously – I try to find humor in every day’s activities and also, in many instances, to turn the humor and its reaction on something that I have done or not done. Let me illustrate with two personal stories:

   My granddaughter, in her sixth grade class project, was asked to write about her heroes. I was flattered to find out she had chosen me. When I asked Chrissy why she picked me, she responded, “Grandpa, I couldn’t spell Arnold Schwarzenegger!”

   One day while traveling, I decided to call one of my sons and his four-year-old son, Paul, answered the phone. Naturally, I thought he recognized my voice – all in all, I was his grandfather. I started out with, “Hi Paul, how are you? Have you been a good boy? How is your school work? Have you been helping your mother? Have you been behaving and
doing what your dad tells you?” Then I heard in the background the voice of his mother, ”Paul, who is that?” And his answer, ”I don’t know – I think it is the police.”

2. I never assume a responsibility I can delegate, but once I have delegated the responsibility, I have the responsibility to monitor, evaluate, and make sure that the delegation is on-course and that there are no barriers to accomplishing the goals that were agreed upon. Failure to monitor a delegation is abdication – it leads to crisis management.

3. I try to never make a major decision that I can put off until tomorrow, unless it is earthshaking or will result in some serious or immediate problem for the dental school or the university. I like the term “artful procrastination,” as used by Steven Sample, President of the University of Southern California, in his book, The Contrarian’s Guide to Leadership. It provides the opportunity to reflect, to think, to seek wise counsel and collaboration before making a decision that perhaps influences an event or someone’s life, and sometimes, as you know, the problem just goes away in the next day or week.

4. I believe that leaders should grow people. At Pacific, as dean and professor, I took every opportunity to do that, and I repeated often that our mission, very simply, was to grow people; and along the way we made them doctors. If we only made them doctors, we failed. We needed to grow people, connected to what was right, what was best for their profession, their patients, and their community.

5. I firmly believe that a leader must be fair, must be kind, and, of course, leaders need to demonstrate vision and take the initiative in providing those goals that will define the future of an institution. In the corner of my desk, I have a little typed saying that most people cannot read, but I looked at it whenever I had a difficult decision to make that affects someone’s life and future. It says, “Arthur, be fair. Remember, power corrupts and absolute power corrupts absolutely.” I placed this on my desk the first day I became dean in 1978.

Only by taking some risks, exploring the unknown, and stretching the envelope of the paradigms that shackles us can we accomplish our goals. Tom Watson of IBM fame stated in 1943, ”I think there is a world market for about five computers,” and later admitted that his vision was limited by his paradigms and that by living in the past, he seriously compromised the future.

The power to shape the future is earned through persistence. No other quality is as essential to success. Calvin Coolidge reminded us:

Nothing in the world can take the place of persistence. Talent will not; nothing is more common then unsuccessful men with talent. Genius will not; unrewarded genius is almost a proverb. Education alone will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent.

Persistence is the sandpaper that breaks down all resistance and sweeps away all obstacles. It is the ability to move mountains one grain of sand at a time. Let me illustrate: On June 12, 1987, President Ronald Reagan stood before the Brandenburg Gate and said, “Mr. Gorbachev, tear down this wall!”

In the years ahead, we will have the opportunity to do something as bold. We will have an opportunity to throw off the shackles that bind us to the status quo – to take major risks – to make a real difference. Or, we can continue to do what we have been doing because it is comfortable. President Reagan could have accepted the advice of George Schulz, Secretary of State, and Chief of Staff, Howard Baker to say nothing – it could have been so easy, but President Reagan took the risk and the world has been better for it.

The American Dental Association and the American Dental Association Foundation leadership have decided to take the road we must take, the one less traveled by, the one less comfortable, but the one that will ultimately take us to the other side of our “Berlin Wall” and to the creation of a $1 billion campaign to support our profession and dental education.

I am excited, I am energized – because we are on the brink of a movement that will have awesome results for our profession. Together, we are the dental profession. Together, we can set the stage for educational, practice and licensure reforms, innovation, and research that will have a major impact on the quality of the lives of our patients, open up the doors for access to care, and enlighten the public as to the benefits of a learned profession that serves mankind and improves the quality of their lives.

As we move forward into this exciting decade of promise and change, I encourage you to take on new challenges, to take some risks, and to challenge the status quo:

• the status quo of our educational systems – did we need the closure of seven dental schools to make us realize the problem?
• the status quo of our role in access to care – did we need the Indian nation in Alaska to wake us up to this problem?

• the status quo of our work force capacity – can we bring more care to more people by reinventing our work force? Did we need the New Zealand dental nurse concept being brought to Alaska to help address the access to care issue?

• the status quo of our licensure paradigms – freedom of movement has been a cry of our profession for decades

• the status quo of our health care delivery model

• the status quo of academic cheating

...to name a few.

Our work to enhance our educational system is just beginning, and we are on the cusp of a movement that is historic and unprecedented, and forever you must be a part of that movement. What we are involved with in our profession over the next few years is not a spectator sport. Is it risky? You bet it is!

But where there is no risk, there is little reward. What our dental world will look like in 50 or 100 years as a result of our efforts will depend to a significant extent on our ability to succeed in this $1 billion campaign to move mountains of doubt and apathy, and create a passion for philanthropy.

I do not have to tell you, the leaders of our profession, why a strong dental education enterprise is important. It ensures the future of our profession as a learned profession and, most important, our integrity as a profession. Mediocrity just is not good enough. The leaders of the 1960s, 1970s, and 1980s were unable or unprepared to respond to the challenges confronting dental education.

Kudos to the current ADA leadership and the ADA Foundation leadership for accepting the challenge as we move forward with our campaign to raise more than $1 billion to support dental education by promoting a culture of philanthropy and raising the awareness of our profession to the challenges facing dental education.

Are you ready to climb that mountain with me and cut it down to size, one grain of sand at a time? Today, I challenge you to celebrate the birth of a new creation – the ADA Foundation’s $1 billion campaign and to travel a new and exciting path to help us move those mountains of doubt, anxiety, and apathy.

I know what you are thinking – “Art has lost his mind – we cannot do it – he cannot do it. He is only one person.” But, as you realize, success comes in “cans”, and failure comes in “can’ts.”

Do not underestimate the power of one, or how effective you can be. A woman named Rosa Parks changed segregation laws all over the South because she dared to sit in the front of the bus. Ralph Nader started the consumer protection movement when he was in his twenties. The movement has saved thousands of lives and prevented millions of injuries. Basketball great Michael Jordan could turn a game around singlehandedly.

In every city, in every state, there are thousands of stories of the power of one. Look at Microsoft’s Bill Gates or Sam Walton who started Wal-Mart.

Some of you may recall that in April 1983, our nation failed to answer the famous congressional report, “A Nation at Risk.” I recall especially these words in the report:

If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves.

I read the report, “A Nation at Risk,” more than ten times and for me it became a cause célèbre because it challenged something I deeply love: education and educational integrity.

In the ensuing 24 years, unfortunately it has not gotten any better. I gave up 20 years ago trying to get help nationally, so I went back to the University of the Pacific and tried to make a difference – to exercise the power of one. Our team developed over 125 endowments over the past 20 years, recently completed a $65 million campaign with 49 percent of our alumni contributing, and developed a passion for philanthropy amongst our alumni who continue to support the dental school with $5 to $7 million annually. Our team created the most dynamic and giving dental alumni in history.

In a book recently published, Declining By Degrees: Higher Education at Risk, edited by Richard H. Hersh and John Merrow, with a forward by author Tom Wolfe, the following observations are made:

In our study of higher education, we found an insidious erosion of quality that we now believe places this nation at risk...The threat, it seems to us, is more serious today than it was in 1983 when the famous ‘A Nation at Risk’ warned that our schools were drowning in a rising tide of mediocrity’...

Our K-12 system, although somewhat improved from that time, continues to wallow in mediocrity...
and now higher education is suffering from the same condition. The tide continues to rise, the rot is creeping upward, and time is running out.

“The rot is creeping upward and time is running out” – and so it is for dental education as well. Aging facilities, aging professoriate, 400 unfilled positions nationally, widening discrepancy between income of educators and clinicians (and especially specialists), aging, outdated technology, and escalating costs. It has always been amazing to me that we can pay our athletes millions of dollars, and yet not provide teachers in K-12 with a living wage or university professor with salaries that reflect their dedication and responsibilities.

Annual giving to dental schools by dentists is dismal. An American Association of Medical Colleges 2004 Annual Development survey showed 66 institutions out of a total of 120 medical institutions reported the median amount of total private support for medical schools was $19.6 million - 80 times higher than private giving to dental schools. The average gift for medical school alumni was $1,106. The lack of dental school endowments, and increasing indebtedness of students, are major concerns for the future of dental education.

It is my firm conviction that great universities are built with endowments. Great dental schools and great high schools and universities can be built with endowments. Think positively about giving to each school you graduated from monthly. Just as you write a check for rent, write a check to those educational institutions that made you who you are today. Believe me – you will feel great.

Let us think for a minute how our profession could really make a difference in dental education. If just 200 members of our profession wrote a check every month for $100 to the ADA Foundation – as an example, could you afford $25 a week to preserve and enhance dental education and private practice? If you and 199 others just did that through a forty-year career, you would have provided dental education with more than $8 million.

Let us go even one step further. Suppose these 200 dentists were to place just a small amount in their wills to the ADA Foundation. Let us say that you add $25,000 as a codicil to your will; but better yet, if 150,000 dentists in this country did that, there would be available for dental education support 3 billion, 750 million dollars. I continue to urge every member of our profession to “put the ball in the basket”, and if they have not done it, to put the ADA Foundation or their dental school in their will, or better yet, both of them.

As you well know, strong, dynamic, and passionate leadership are the keys to success in any endeavor. Why? Because leaders inspire and motivate, and they make sure the followers see what is possible. Not the impossible, but the possible. They show the way – they make a difference!

Let me share some thoughts with you about making a difference. I thought I would share with you, future leaders, something that I read recently about living a life that matters and have used several times. Hopefully it may be new to you. I do not know the author, but I believe it contains a series of powerful statements and it reflects on who we are, who we have become, or who we will be.

Please realize someday, ready or not, your life will come to an end. There will be no more sunrises, no more minutes, or hours, or days, and all the things you collected whether treasured or forgotten, will pass on to someone else.

Your wealth, fame, and temporal powers will shrivel to irrelevance, and it will not matter what you owned or what you were owed. Your grudges, resentments, frustrations, and jealousies will finally disappear. And so too your hopes, ambitions, plans, and your to-do lists will all expire. The wins and losses that once seemed so important will fade away.

It will not matter where you came from or what side of the tracks you lived on. It will not matter whether you were beautiful or brilliant. Even your gender and skin color will be irrelevant.

So what will matter? How will the value of your life be measured?

What will matter is not what you bought, but what you built, not what you got but what you gave.

What will matter is not your success, but your significance.

What will matter is not what you learned, but what you taught.

What will matter is every act of integrity, compassion, courage, or sacrifice that enriched, empowered, or encouraged others to emulate your example.

What will matter is not your competence (although it is important), but your character.

What will matter is not how many people you knew, but how many will feel a lasting loss when you are gone.

What will matter are not your memories, but the memories that live in those who loved you.

What will matter is how long you will be remembered, by whom and for what.

What will matter is the lives you touched along the way.

As you heard in my introduction, I have received distinguished alumni awards from four universities and the dental school at the University of the Pacific was named in my honor. I need to have you realize that although these are significant awards...
and deeply appreciated, what means more to me than anything else in life is when an individual says, “You made a difference in my life, you touched me.” That is when I know, and that is when you will know that you have lived a life that matters.

Living a life that matters does not happen by chance. It is not a matter of circumstances but one of choice. Congratulations. As health care professionals, you have chosen to live a life that matters: and because you have, many individuals have a better quality of life, go to bed without pain, have a beautiful smile, live longer, have healthier lives, walk a little taller. You know in your heart that you have made a difference.

To my mind, there are currently four major issues of concern for the dental profession and the public: licensure, access to care, the educational crisis, and the unmet oral health needs of this nation. As members of the team of dentistry, together we have the talent to address all of these issues. Licensure reform has already started in a big way, with actions in New York, California, at the American Dental Association, and at the American Association of Dental Examiners. I hope you will take a stand for what you believe in.

As many of you know, I have challenged the need for change on licensure issues my entire professional career, and have written extensively on the subject. My reasons for concern were not because I felt students were not well prepared for licensure examinations and I was looking for an easy way to get dental students licensed. My concern has always been one prevailing concept, and that is justice. Justice is defined as fairness – to treat individuals fairly and always with sound reason.

In the past four or five years, we have witnessed more change in licensure reform than in the previous four to five decades, including licensure by credential, and legislation to grant licensure to individuals that completed a PGY-1 program. It only took us 50 years to get this far.

How is it possible that it has taken us more than five decades to come to the realization that the examination process needed to be grounded in the principles of justice, respect, be user-friendly, and be based on the concept of licensure by or at graduation?

Wow, five decades for us to realize that patients were being dehumanized, exploited, and used for purposes that did not satisfy the basic reasons that existed for licensing – that is protection of the public and continued competency of the profession.

I propose that the educational leaders and the leaders in the licensing community develop a way to grant licensure to those individuals graduating from the United States dental schools at graduation. Would it be so hard? Would it be so difficult? Would it challenge the status quo? Would it involve some risks? Would it involve changing the paradigms that bind us? You bet! But why not? Let us find a way to give our graduates their diploma and license at the same time.

Can we afford not to change? If the business of America is justice and securing the blessings of liberty, I believe that the business of licensure equally is justice and freedom of movement for our profession. Can we challenge our paradigms about initial state licensure that were bred out of the frustrations, anguish, and abuses of an era that was based on preceptorships and an absence of educational standards or accreditation? Freed of our paradigms we may find even more rewarding solutions for our patients and our professional colleagues who continue to ask us to find a better way.

And what about access to care – we have been talking about access to care ever since I entered the profession in 1948. We are no closer today than we were then. We have talked about it, we have discussed it, we have passed resolutions in the ADA House of Delegates, but we have always looked for someone else to do it. Are there answers? Yes, there are! ADA leadership is developing the format, the protocol – will you be advocates for change?

Have we failed in our social contract with the public? 108 million Americans without dental insurance; 100 million people do not have access to fluoridated water; 30,000 oral cancer cases are diagnosed each year; and 8,000 individuals die of oral cancer. Do you believe that oral health is an essential component of a person’s well being and quality of life? Will you continue to accept that one-third of Americans are without access to oral health care? (Dr. David Satcher, Surgeon General’s report)

Our profession must turn its enormous energy and talent to create new pathways for organizing and delivering oral health care. Unless we do it, our greatest nightmare will be realized – oral health care will be delivered outside of the dental professional model. Now is not the time to accept the status quo.

Is there a need for expanding the duties of our dental assistants and dental hygienists so that each practitioner can become more productive? We need to find new ways to increase workforce capacity. Do we need to reexamine some of our tenets and beliefs with respect to the expansion of duties of our allied health professionals? Is there a need to look toward the development of a well-educated and clinically
competent mid-level practitioner to help provide appropriate care in remote and underserved areas? Will we do it or will we let the legislators do it for us? They have demonstrated in Alaska and in California that they will!

Well, we have had the opportunity to briefly look at issues concerning access to care and the potential expansion of duties of allied health professionals, but what about the bigger issues confronting this state and nation?

I cannot help but reflect back on the 1960s and recall them as a time of involvement, of idealism, of the conviction that people can make a difference, of a willingness to harness the kinetic energy of change and use it to find new solutions and new opportunities. It was a time when lives without hope discovered a dream of opportunity – a time when, in the words of John Kennedy, “We stand today on the edge of a new frontier,” and for better or for worse, the frontier changed the way we viewed the world.

Martin Luther King spoke out in 1963 on injustices and segregation with these words, “I have a dream that my four little children will one day live in a nation where they will not be judged by the color of their skin, but by the content of their character.” The deep messages of the 1960s are as important today as they were then.

In its own conflicting way, the change-riddled 1960s brought us together as a nation. Maybe the same can be true of dentistry in the decade ahead, as we adapt to change and learn to listen to the diverse opinions of young dentists, mature dentists: the generalist, the specialist, dental industry leaders, men and women of diverse backgrounds, etc.

Let us not fool ourselves with believing that we can survive this next century by maintaining the status quo. Rather than run from change, we must harness and channel its energy and then take charge of it. Is that risky? You bet it is! But where there is no risk, breaking even is the only best possible outcome.

Ours is a competitive world, a world in which the meek inherit nothing. So often, individuals take our professions and our country for granted. They think it is their birthright, their rite of passage. The fact is, both our professions and our nation are precious. Both are fragile, and both can be destroyed by complacency and apathy.

We are passing through the 2000s – a time of limitless possibility, of unparalleled affluence, but also of indifference and smugness. Homelessness, AIDS, discrimination, drugs, poverty, the crisis in oral health, and a culture that rewards cheating – are they really someone else’s problem? It is time, as professionals, that we lead this nation in the spirit of integrity, community service, education reform and involvement. It is time to fully enter society, which teaches public concern and values over private gain, and to be part of a kinder and gentler nation.

Let me challenge you beyond your scientific, business, entrepreneurial, and technological excellence. Be part of a new frontier. Work hard at work worth doing! Because of your education and your position in society, there has to be a bigger role for you. Ask yourself, who else will do it? Who else can do it? Have you ever asked yourself what kind of world you want to leave your children or grandchildren? What role will you be taking with the problems that are destroying the cities of this nation?

- The problems of homelessness, crime, substance and drug abuse that threaten the value systems of every family and integrity of every city in this country.
- The problems of the environment are well known and we even participate in some of the practices that are destroying the environment. The wisdom of the American Indian tells us, “We do not inherit the earth – we borrow it for our grandchildren.”
- As discussed, our educational system, especially K-12, is a serious concern. Our young people can no longer compete on an international level with other students in the world. It is difficult to believe that we have more than 25 million illiterate people in the United States of America. Will we continue to allow our educational system to deteriorate? Or will we, as educated and informed citizens, do something about it?
- What about the cost of government or the actions of government? Abraham Lincoln said long ago that “our nation was a government of the people, by the people, and for the people,” and certainly “by the people” is an important part of that phrase.
- Have we lost our moral compass when it comes to core values? Nationally, 75 percent of all high school students cheat; athletes fake injuries, use steroids; 85 percent of honors and advanced placement students cheat on a regular basis; pay others to write their papers and reports, etc.

According to the Josephson Institute of Ethics in Los Angeles, “Less than 2 percent of all academic cheaters get caught and only half of them get punished. So there’s almost 99 percent chance of getting away with it.” Is there no conscience operating? Do kids learn to cheat from the larger
culture that shapes their environment? – the BALCO scandal, point shaving by NBA referees, illegal video pictures of defensive signals, lack of oversight and enforcement, “greed is good,” pressure to succeed at all costs, a shredding of the social contract, etc.

I hope the years in the decade 2000 will bring us some new dreams: hopefully, the reestablishment of our personal and professional ethics as the base of a healthy culture, the reaffirmation of our value systems, the increasing concern for the preservation of our environment, and the renewed importance of the family as an integral unit of the American society.

I think that in this decade, it will be OK for you and me to take some risks, and to make some changes in the status quo. To do anything less would be to forfeit our heritage and the public’s right to the finest dental care the world has ever known.

I know that our profession has the compassion and the dedication for the type of effort that is required for us to achieve our goals both in our professional lives and in our community. There is too much at stake for you and me not to. The stakes are high for our profession, for our country, for its freedom, and, of course, for its place in the world. Let me read to you a short saying by an unknown author:

From bondage, comes spiritual faith. From spiritual faith comes courage, from courage comes liberty. From liberty comes abundance. From abundance, comes complacency. From complacency comes apathy. From apathy comes dependency. From dependency comes bondage.

Let me ask you two questions: If not you, then who? If not now, then when? Together, I believe we can move those mountains! Never underestimate the power of one.

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The History of Direct Pulp Capping

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The first method of capping exposed pulps, using gold foils, was described by Pfaff in 1756. Thereafter, numerous agents for direct pulp capping have been recommended. Until the end of the 19th century, most materials were used empirically with the idea that the pulp tissue must be irritated by etching or cauterization to heal. Later, more attention was drawn to disinfecting agents, because it became obvious that microorganisms were the reason for pulp inflammation - but these agents were cytotoxic. Since insufficient or inappropriate diagnoses were made before treatment, even necrotic pulps were capped.

The first scientific clinical study to compare different capping materials was made by Dätwyler in 1921, whereupon zinc oxide-eugenol showed the best results. One year later, Rebel performed the first animal experiments with disastrous results, so he regarded the exposed pulp as a doomed organ. In 1920 Hermann, introduced calcium hydroxide for root canal fillings. Between 1928 and 1930 he studied the reaction of vital pulp tissue to calcium hydroxide to prove that it was a biocompatible material. Since then, calcium hydroxide has been recommended by several authors for direct pulp capping, but it took until the middle of 20th century until it was regarded as the standard of care.

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Part 1: 1756-1900

Philipp Pfaff was dentist at the court of the Prussian King Friederich II in Berlin. In 1756 he published the first dental textbook in German. (Fig. 1) In this book presumably the first written description of a vital pulp capping can be found. Pfaff covered the exposed pulp with thin gold foils, whereby the foil was formed in a convex shape to avoid direct contact with the vital pulp tissue.1 Descriptions comparable to those of Pfaff can be found in the following 100 years: for example written by Koecher in 18262, Linderer in 18483 and 18514, Mackenzie in 18565, Albrecht in 18586, Taft in 18597 and King in 18718. Minor variations were reported by these authors. Mackenzie (London), for example, used flat forged lead bullets that were concave-shaped.5 At the end of the 18th century, the German dentist Friedrich Hirsch (also called Hirschfeld) treated carious teeth by cauterization with a glowing probe to desensitize the pulp, and filled the cavities with tinfoil.9 (Fig. 2) The German-American Leonard Koecher (Fig. 3), working in Philadelphia, described similar pulp cauterizations in 1826. After a flimsy contact of the exposed pulp with a red-hot wire or needle the tissue was covered with a piece of lead, and the cavity was filled with gold. Koecher recommended some principles before such a treatment should be applied: the patient should be in good general condition and without diseases or complaints, teeth should be caries-free and vital, all surrounding tissues should be healthy, the cavity must be cleaned, a seeping hemorrhage must be stopped, and the dentist must be skillful in preparation and filling. Koecher treated about 220 patients in such manner and reported a clinical success rate of 91%.2 However, at that time there was no method to verify or corroborate clinical observations with roentgenographs or histological assessments.

Around 1830, James Snell from London tried pulp capping with silver nitrate and used Mastic (resin of the pistachio tree) as a temporary filling,10 which may have been a common treatment modality at that time.11 In 1837 the dentist Callman Jacob Linderer (Berlin) and his son Joseph (still a student) published a compendium of dentistry in which they recommended the desensitization of the exposed pulp tissue with different essentials or narcotic oils. They used wax and other stoppings as a temporary filling. Some days after this first treatment the teeth were filled with gold foil.12 In a second edition of this book in 18483 and in another compendium in 18514, Joseph Linderer described a method comparable to Pfaff’s,1 covering the exposed pulp with thin convex gold foils. Subsequently the cavities were filled with amalgam.3,4 In case of suppuration, however, the pulp was removed.12

In 1848 Robinson (Great Britain) proposed to treat the exposed pulp with collodion (made from cellulose) mixed with drops of morphine, and then to fill the cavity with asbestos and saturate it with collodion.13 Harris (USA) in 1855 used a cotton pledget soaked with camphor for hemostasis after pulp bleeding instead of lead foil, which was commonly used at that time. Subsequently, a gold foil was applied to effect pulp healing. If no hard tissue formation occurred, Harris considered the treatment as failed.14 Gold was believed to have unique healing capabilities and to be necessary to produce a suitable barrier.15 Rogers (Great Britain) reported in 1857
about capping the pulp with small plates made of ivory and tin.\textsuperscript{15}

Albrecht (first German professor for dentistry in Berlin) (Fig. 4) published a dental text book in 1858. He described the local application of morphine or opium onto the exposed pulp tissue to relieve pain. By using irritating agents like wood creosote (a distillate from beech wood coal tar) and cinnamon-clove-oil the pulp could be stimulated to form reparative dentin. If the pulp was infected, Albrecht applied etching agents like zinc chloride, lunar caustic (silver nitrate) or arsenic trioxide onto the pulp tissue to induce a necrotic surface but to preserve the vital root pulp. In addition to local treatments of surrounding tissue, like rubbing the mucosa with morphine, three to four leeches on the gingiva for one to two weeks were suggested.\textsuperscript{6} Such treatments could last for 20 to 30 appointments; however, this did not lead to a preservation of the vital pulp, but to a gangrenous dissolution of the capped tissue.\textsuperscript{16}

According to observations of Taft (USA) published in 1859, vital dentin has a higher resistance against caries than non-vital. Hence, under certain conditions, an attempt could be made to keep the exposed pulp vital. Attention was paid to the patient’s general state of health, state of the oral cavity and teeth, tooth position, state of the pulp, size as well as time period of the exposure and the capability of the pulp tissue to form a “boney deposit” (reparative dentin). Furthermore, he demanded five properties of a capping material: it should not conduct heat, it should not disintegrate, it should fit the pulp easily, the handling should be easy, and it should not exert pressure on the pulp tissue.

For treatment of the infected pulp, Taft recommended the removal of caries, the prevention of trauma and the application of a substance to induce pulp healing. For pulp capping he used convex gold or lead foils, cotton pledgets with soaked collodion or gutta-percha dissolved in chloroform or ether. The cavity was restored with a gold inlay.\textsuperscript{7, 17} Furthermore, Taft described the treatment of the exposed pulp with nitric acid for tissue cauterization. This type of treatment was suggested by Wright (USA).\textsuperscript{19}

In 1859, Underwood (London) gave a lecture about pulp capping methods that were accepted as states of the art at that time, such as the use of tannin, tannin acid, zinc chloride, creosote, silver nitrate, alcoholic solution of camphor, and essence made of Henbane (Hyoscyamus niger). All these materials were labeled as “escharotics”, substances that lead to sloughing when applied on vital tissue. The purpose for this treatment was to necrotize the pulp tissue superficially (to transform it to a “leather coating or cap”) and to keep the subjacent pulp vital. If possible such dressings should be changed three to four times a day over a period of two to three weeks by the patients themselves before the cavity was filled by the dentist. If necessary, a thin disk made of horn was applied onto the sloughed pulp tissue.

Beside these chemical substances Underwood described a battery-operated device (Cauterium actuale) invented by Harding and made by Coxeter (Great Britain), to heat a thin wire. With this glowing wire the superficial pulp tissue was cauterized without hurting the subjacent pulp. An adverse effect of this treatment was a marked “ossification” of the pulp. Underwood himself capped the exposed vital pulp with quicklime (calcium oxide) mixed with morphine (ratio 4:1 up to 5:1) for one day to induce a superficial necrosis and to desensitize the exposed area. Comparable lime compounds were used by Mackenzie (morphine mixed with a mastic solvent and calcium oxide or plaster) and Perkins (application of quicklime in the morning and at night).\textsuperscript{20} The treatment outcome was not described by Underwood and therefore the aim of the pulp capping with calcium oxide at that time to induce the forming of reparative dentin was questioned.\textsuperscript{21} The use of such lime compounds had nothing to do with the present calcium hydroxide, neither in composition nor in application. The use of lime-based medications can be considered uncommon, as further descriptions of such lime compounds could not be found in the literature.

It was broadly accepted in the middle of the 19th century that a healthy vital pulp is important for the long-term conservation of a tooth, and that the exposed pulp is able to form hard tissue.\textsuperscript{22} However, while the prevailing opinion was that the pulp must be irritated by etching or cauterization to form reparative dentin, as there were no appropriate materials to achieve this goal.\textsuperscript{17} The treatment of the exposed pulp was long, complicated and challenging. This may become apparent by a description of direct pulp capping by zur Nedden (Germany) in 1861. The carious dentin was treated with sodium hydrogen carbonate (NaHCO$_3$, baking soda) for neutralization.
and then the cavity was wiped out with eau-de-Cologne because this should have an “analectic effect” (to heal and to form hard tissue) to the pulp tissue.

After pulp exposure, the tissue was cauterized by electricity or silver nitrate. Silver nitrate solvent or a paste made of arsenic was applied to induce eschar. This eschar was covered with small plates made of horn or ivory, and the cavity was temporarily filled with wax, mastic or gutta-percha. The aim of the superficial etching was to induce the production of reparative dentin by the subjacent vital pulp. To achieve this aim, according to zur Nedden, two days after exposure the eschar has to get loose from the pulp surface. At the next appointment, the temporary filling was removed and the pulp was covered by loose cotton pledge, a small cap and another temporary filling. After one to two weeks the pulp was once more treated with a tannin solvent or collodion and capped with horn or lead. The cavity was filled with gutta-percha. After 6 to 12 months, the exposure side should be closed with reparative dentin so that the gutta-percha could be removed, and the cavity was filled with gold.

In the same manner zur Nedden treated infected, aching pulps. For pain relief he recommended the application of tannin and opium onto the pulp tissue, the taking of potassium iodine, applying of potassium iodine onto the gingiva and the supporting of blood-letting from gums and from the skin behind the ears. Zur Nedden had also the opinion that additional treatments, like a foot-bath, could support pulp healing.23

In 1855, Stanislas Sorel (France) introduced zinc oxide chloride cement as new construction cement — but also as a dental filling material.24 Zinc oxide chloride cement was a precursor of zinc oxide phosphate cement and was also well known in dentistry as “os artificial”. The use of “os artificial” for dental purposes was propagated by Keep and Metcalf in the USA.25 Subsequently, this acid cement was recommended by several authors for direct pulp capping, in the USA by Richardson 186126 and Atkinson 1868,27 in Germany by Frcke 1863.28,29 According to Atkinson27 this treatment of the exposed pulp became very popular and was identified in Germany as “Atkinson’s method”.28 The success of this kind of pulp capping was dubious because in most cases a pulp necrosis occurred.28, 30 To avoid failures, von Langsдорff (Germany) recommended to cap the pulp (after a pretreatment with creosote) solely with the zinc oxide powder, mixing the cement powder with minimal liquid or protecting the pulp with a piece of paper before the cement was applied.25,31

In 1869, Francis (New York) described his method to protect the pulp by laying a small circular piece of smooth note-paper onto the pulp before zinc oxide chloride cement was applied. In a second appointment one week to one month after pulp capping, the cement was prepared and the cavity was filled with gold. Francis wrote that one year after pulp capping, he observed reparative dentin. In contrast to many of his colleagues, Francis understood that in order to keep the pulp vital, as little irritation as possible should occur during all dental procedures.32

A similar method was reported by Henriette Hirschfeld in 1874 (the first licensed female dentist in Germany with a private practice in Berlin). She capped exposed dental pulps with stamp paper moistened with carbolic. Carbolic has distinct antiseptic and hemostatic effects but this kind of treatment resulted in severe damage of the pulp tissue and caused failure of the capping.33 The use of carbolic or carbolic acid (phenol) for disinfection can be traced back to the reports of Joseph Lister (Great Britain) who treated surgical wounds with carbolic dressings around 1867.18 At the same time, Leber and Rottenstein (Germany) detected the existence of parasites (Leptothrix buccalis) on the tooth surface, in caries-affected dentin and dentinal tubules;34 thereafter also in dentistry more attention was drawn to disinfecting agents.18

In 1871, King asserted (comparable to Taft in 18597) four key characteristics of a capping material: it should not be irritating to pulp tissue, it should not disintegrate, it should be in direct contact with the pulp without pressure, and it should not conduct heat. Within these imperative dictates, King was in opposition to many of his colleagues. Nevertheless, he favored a paste made of zinc oxide chloride and 20% carbolic acid, and held the (incorrect) opinion that this compound has no detrimental effect to the pulp tissue.8

Jack (USA) proposed a complex pulp capping method in 1872. Initially, the cavity was wiped with carbolic acid, followed by the application of tinctures containing aconite, calendula, glycerin or chloroform. The cavity was brushed with gutta-percha dissolved in chloroform, or serosa from ox caecum was fit to the exposed pulp. On top of this, a small plate made of tin or lead was positioned. The plates were dipped in gutta-percha dissolved in chloroform before finally the cavity was filled with “Hill’s stopping” (gutta-percha mixed with calcium oxide, silica and feldspar). This temporary filling was left on for three years.35 There were no evidenced-based dictates at that time, which complicated the problem of finding an appropriate pulp capping material. Treatment
outcomes were more or less randomly identified.

In 1874 Adolph Witzel (Germany) (Fig. 5) accentuated the need for transferring the principles of surgery from Lister concerning the prevention of microbial infection to dentistry. Witzel refrained from the broadly accepted doctrines of Albrecht for the therapy of direct pulp capping because according to his own observations this kind of treatment never resulted in pulp healing but always led to a complete necrosis of the tissue. Rather, Witzel recommended disinfection of the cavity the cavity for 15-30 minutes with a solution of creosote and tannin, and capping of the pulp with a cement blend of carbolic acid, zinc chloride and zinc oxide. The cavity was subsequently filled with amalgam. It was already obvious that to keep the pulp vital it was not only necessary to work under aseptic conditions, but also to place a leak-proof filling. In 1875 Woodhouse (USA) clearly pointed out that the pulp will be doomed if saliva can penetrate the filling.

Cravens (USA) proffered creative concepts in pulp capping in the 1870s. He had the opinion that dentin-like material would be the best to keep the pulp vital. The mineral content of dentin is mainly calcium and phosphorus, so Cravens used a calcium-phosphate-powder, which was mixed with lactic acid to low viscosity. The result was a soluble calcium lactic phosphate, which was applied onto the exposed pulp tissue. This was covered by oiled paper and the cavity was filled with zinc oxide chloride cement. The entire treatment was performed under rubber dam isolation. Following the formation of reparative dentin several weeks later, the cavity was filled with gold. In the USA the pulp-capping agent was brought to the market by the S.S. White company with the trade name “Lacto-Phosphate of Lime”. (Fig. 6) Unfortunately, at that time no further efforts were made to search for more dentin-like capping materials.

Again, in 1879, Witzel pointed out that an infection with microorganisms was the cause for failures in pulp capping, and the reason for pulp inflammation. Hence, only healthy, non-infected pulps should be capped. After caries excavation Witzel assessed the pulp sensibility with cold water before the pulp was capped.

In 1879, Parreidt (Germany) recommended “Carbolgypse” for direct pulp capping. “Carbolgypse” was a mixture of aqueous solution of carbolic acid (5%) with plaster. Parreidt removed carious dentin with edged hand excavators that were disinfected with carbolic acid (5%). After the pulp was exposed the cavity was wiped with carbolic acid. “Carbolgypse” was mixed and applied onto the pulp without any pressure. Parreidt assured that he had a success rate of 75% after 8 months.

In 1881, Scheff (Vienna) reported quite positively about the use of iodoform paste for direct pulp capping. In his view, the iodoform paste was superior to a previously used arsenic paste. One month after capping 15 pulps with iodoform, 11 of these patients were without signs or symptoms. This was a success rate of 73% that was not achievable with arsenic paste. The same positive view was held by Hagelberg (Berlin), who reported a success rate of 92.7%, four months after pulp capping with iodoform paste.

At a meeting of the British Dental Association in 1883, Harding discussed his method of direct pulp capping as follows: swabbing the cavity with carbolic acid, which will arrest the bleeding, applying a small piece of blotting paper coated with carbolized resin, and finally covering this with a layer of Fletcher’s zinc oxide sulfate.
cement.\textsuperscript{18} The alkaline zinc oxide sulfate cement was brought to the market by Fletcher as “artificial dentine” in Great Britain in 1874.\textsuperscript{32} Shortly after, the use of Fletcher’s cement for direct pulp capping was recommended in Germany by W. D. Miller (Berlin).\textsuperscript{8} In 1888 Weiser (Austria) quoted a success rate of 92% for pulp capping with “artificial dentine”.\textsuperscript{43}

Around 1880, transparent celluloid pulp cap materials were brought to the market in Great Britain to replace the metal caps as suggested by Mitchell.\textsuperscript{18} Furthermore, capping material made of asbestos were offered that were filled with Fletcher’s cement.\textsuperscript{30} Hunter (USA) used an unusual mixture, which included one pint of Sorghum molasses and one pound of droppings from English sparrows for pulp capping in 1883 and claimed a 98% success rate.\textsuperscript{44}

In 1885, Árkövy (Hungary) published a classification of pulpal diseases, which was the first codification of pulpal diagnosis and treatment.\textsuperscript{45} One year later Witzel highlighted the importance of a correct diagnosis as the basis for choosing the right treatment modality for success. Beside the extent of the pulp exposure, its location was also important. If a pulp horn was capped, the prognosis was much better than after capping the coronal pulp near the root canal entrance. Distinct hemorrhage and pain were contradictions for pulp capping, because for a successful treatment, the pulp tissue must be healthy or only slightly inflamed.\textsuperscript{46}

Comparable to Taft in 1859\textsuperscript{7} and King in 1871\textsuperscript{8}, Witzel postulated four preconditions for a successful capping as follows: the exposed pulp should not have contact with necrotic tissue, the pulp tissue should not be etched or irritated by the capping material, the capping material should be antiseptic, be applied in a pressureless manner and a definite filling should be made directly after capping without pressure.

According to Witzel in 1886, suitable capping materials were iodoform phenol ether, iodoform collodion, morphine phenol or iodoform cement paste and metal caps.\textsuperscript{36} (Fig. 7) These are completely different materials than those he had recommended 12 years prior.\textsuperscript{16} For example, a healthy exposed pulp should be swabbed with iodoform phenol ether and covered with iodoform collodion. Thereupon a small gutta-percha disc (Hill’s stopping) was bonded and, if possible, a slightly heated metal cap added.\textsuperscript{46} As an alternative, a pulp capping with iodoform cement (introduced by Skogsborg, Sweden, in 1882\textsuperscript{47}) was recommended. But the formation of reparative dentin was rarely observed by Witzel. An aching pulp, pulp tissue with hemorrhage, or the observation even of a single drop of pus were regarded as contraindications for direct pulp capping by Witzel.\textsuperscript{46} Thus, he was less optimistic regarding the success rate of pulp capping procedures in 1886\textsuperscript{46} than in 1874\textsuperscript{16}. Unfortunately, Witzel’s very important findings were well known but barely regarded by the day’s clinical practice.\textsuperscript{43, 48}

In 1883 Walkhoff (Germany) proposed to demineralize ivory and to mix the extracted cartilage with dry iodoform. The powder was then stirred with chlorophenol to form a paste that could be used for root canal filling, as well as a pulp capping agent. According to Walkhoff, the use of rubber dam is not always necessary during pulp capping.\textsuperscript{49} Even affected pulps could remain vital with this treatment as long as a leak-proof filling was placed that prevented thermal stimulation.\textsuperscript{50} In 1888, Walkhoff also defined requirements for an usable capping material: non-irritating for the pulp, antiseptic and disinfecting capacity, minor thermal conductibility, good adhesion to tooth structure and easy application.\textsuperscript{51}

Schild (Vienna) suggested in 1898 capping the pulp by simply mixing two common capping materials, namely iodoform and Fletcher’s cement with eugenol. Isolated with a rubber dam, the cavity was disinfected with Lysol and the tissue was etched with carbolic acid before the mixture was applied.\textsuperscript{52} W. D. Miller (Berlin) emphasized that the
treatment should be performed under aseptic conditions (rubber dam, sterile instruments) in cases where pulp exposure can be expected. After applying a rubber dam the cavity was excavated from the periphery to the center of the lesion. Before the excavation was completed, the dentin was disinfected with carbolic acid, cinnamon oil, Lysol etc. If the pulp was exposed, the tissue should be treated with carbolic acid (5%) or sublimate (1% HgCl₂) and capped with Fletcher’s zinc oxide sulfate cement. The cavity was filled with phosphate cement only or with phosphate cement and gold.53, 54

In 1890, Hugenschmidt (Paris) suggested to rinse out the cavity with sterile water, swap the dentin with sublimate, and to cap the pulp with lanolin (wool fat) mixed with iodoform or Salol (C₁₃H₁₀O₃, phenyl salicylate).55 Two years later Hartmann (Germany) introduced thymol (C₁₀H₁₆O₅OH) for direct pulp capping. Thymol crystals were placed on the exposed pulp tissue and the cavity was filled only with a cotton pledget. Saliva dissolved the thymol and diluted it. The treatment took several days, and the thymol was replaced daily. If the patient was free of signs and symptoms the pulp was covered with glass wool and the cavity was filled.56, 57

Wessler (Sweden) presented “Pulpol” as a direct pulp capping agent in 1894. This commercial zinc oxide-eugenol cement was composed of oil of cloves (eugenol content 80%-90%) and zinc oxide powder. For pulp capping, the cement was mixed to a soft paste and directly applied onto the exposed tissue. Wessler found out that the eugenol also had a pain-relieving effect on the pulp.18 In the same year Anthony (USA) recommended dissolving gutta-percha in chloroform and to mix it with oil of cloves, tannin and carbolic acid. This putty compound was applied on the exposed pulp tissue.58

The introduction of “Formagen” by Abraham in 1896 for pulp capping resulted in positive reaction in professional circles at the end of the 19th century.59 Formagen was formalin cement containing liquid eugenol and a lime powder made by burning marble. Powder and liquid were saturated with formaldehyde gas.50 The cement was prepared to a low viscosity and applied onto the exposed pulp after wiping the cavity with carbolic acid. A metal cap could be added to protect the pulp from pressure.59 However, this procedure did not keep the pulp tissue vital, and in fact it was a devitalization method. Previously, in 1900, Dalma (Hungary) not only disapproved all capping materials containing formaldehyde, brominealdehyde, and trichloroaldehyde but also those with eugenol, oil of cloves etc. because of their toxicity to the pulp tissue. Dalma recommended instead the use of β-naphthol-camphor mixed with copper iodide. He referred to Stovel (USA) who described the use of hydronaphthol for direct pulp capping in 1897.29

In 1899 Árkövy indicated that the scientific basis for healing of the injured pulp did not exist. Furthermore, in most cases there was an insufficient assessment of the pulpal status and pulps were being capped without knowing the histopathological status of the pulp tissue. Beside an exact diagnosis Árkövy accentuated the need for maintaining aseptic conditions (rubber dam, perfect excavation etc.) during pulp capping.61

At the end of the 19th century a wide variety of different materials for direct pulp capping were recommended: gold caps, lead caps, gold foil, zinc oxide sulfate cement, zinc oxide chloride cement, phosphate cement, gutta-percha, gutta-percha solved in chloroform, little pieces of paper soaked with carbolic acid, adhesive tape, asbestos, cork, zinc oxide paste, iodoform paste, amnion, isinglass, small pieces of rubber dam, waxed paper, small plates of celluloid or mica. Most of these materials required a high degree of skill in their use. In fact, it was thought that direct pulp capping was more difficult than the placement of a gold foil restoration.53, 54

This desire of many dentists to keep the pulp vital through various means can be explained by the therapeutic options available at that time. First, before local anesthetics were established, for a patient the extirpation of the inflamed pulp of a multirooted tooth was clearly more painful than the extraction.62 Local anesthetics were introduced by Braun (Germany) in 1905.63 Secondly, besides the tremendous pain caused by extirpation of the pulp, there was no technique for a solid and durable root canal filling. For example Witzel thought that it will be impossible to fill the narrow and curved root canals in molars64, and therefore to save a tooth the pulp must be “conserved” somehow.65

**Part 2: 1900-1953**

At the end of the 19th and beginning of the 20th century, the pulp diagnostic was improved by Euler and Árkövy, and authors like Neuber, Preiswerk and Witzel demanded an exact indication before direct pulp capping. It became obvious that inflamed pulp tissue could not be kept vital.17 In general it was recommended to cap only freshly exposed pulps without inflammation, and to keep the tissue vital. In all other cases the pulp tissue should be devitalized or extirpated66, although, Gysi (Switzerland) (Fig. 8) and Miller (Germany) (Fig. 9) published their observations indicating that under special conditions (e.g. to confine an inflamed pulp...
horn) the human pulp is able to form hard tissue even without any capping agent.67, 68

A gold standard in pulp capping procedure did not exist at the beginning of the 20th century. How broad the unsteadiness concerning an adequate pulp capping agent was apparent by reading in a textbook edited in 1909 by Scheff in Vienna. In this book, Walkhoff recommended to use solely Fletcher’s cement (according to Miller), formaldehyde gelatin (according to Preiswerk), copal resins or iodoform paste for direct pulp capping.69 In the same volume, Sachs (Germany) described methods to cap exposed pulp with iodoform collodion (according to Witzel), zinc oxide chloride cement (according to Baume), zinc oxide carboxyl paste covered by zinc chloride cement (according to King), a platinum cap filled with zinc oxide, carboxyl and oil of cloves (according to Jack), zinc oxide sulfate cement (according to Fletcher), collodion, copal ether or carbolized resin covered with zinc chloride cement (according to Holländer), iodoform cement (according to Scheff), iodoform cements (according to Skogsborg and Tanzer), Formagen (according to Abraham), blotting paper moistened with carbolic acid and covered with zinc oxide iodoform and Fletcher’s cement (according to Witthaus) as well as platinum or stannous caps fixed with Fletcher’s cement and covered with phosphate cement. In spite of the detailed description of the particular methods, Sachs strictly advised against direct pulp capping. Instead the exposed tissue should be devitalized because the success of direct pulp capping was considered rare. According to Sachs, the treatment failure was mainly caused by both pressure in the pulp and the presence of infection.59

Because of high rates of failure in direct pulp capping after etching the tissue with various agents like carbolic or zinc chloride, Szabó (Hungary) suggested in 1902 thermal coagulation with annealing instruments to slough the pulp surface (ignipuncture) and to induce healing.70 This method had been state-of-the-art 50 years prior.

In 1907 Hentze (Germany) called attention to a very important point: erroneously, the general opinion was that if the patient did not complain about pain after direct pulp capping, the tissue must be healthy or cured. Hentze recognized rightly that the pulp did not survive the usual treatments like “corrosion, burning, toxication”. In fact, the tissue became necrotic without any symptoms. This concept can be traced back to two errors: incorrect diagnoses, and misuse as well as misunderstanding of the concept of disinfection. Agents used for disinfection of necrotic tissue are noxious for vital tissues. Thus, Hentze strictly refused agents like carbolic, morphine, phenol, tannin, creosote, iodoform, chlorophenol etc. and recommended instead zinc oxide-eugenol for direct pulp capping.71

Black (USA) (Fig. 10) published a list of indications and contraindications for direct pulp capping. For him a direct pulp cap was only indicated in children before the growth of the roots was completed or only when the pulp was minimally exposed with hand instruments. A contraindication was a pulp exposure by caries after complete root formation and exposures with burs. Overall, Black had his doubts whether direct capping would result in the retention of vital tissue.72

Howe (USA) held the view in 1919 that the formation of reparative dentin was not influenced by microorganisms, but rather by the state of the pulp tissue. In his eyes a healthy pulp could withstand a bacterial infection, so Howe opposed chemical,
thermal or mechanical interventions on the pulp because these could lead to a reduction of the natural tissue defense. In fact it was important to remove carious dentin and disinfect stained dentin with Dakin’s solution. Dakin’s solution is sodium hypochlorite 0.5% introduced in Great Britain during the First World War for treating infected wounds. Probably, Howe described the use of sodium hypochlorite for cleaning cavities. Until about 1920, the knowledge about pulp healing after direct pulp capping was solely empirical. The first truly scientific comparison of different capping methods was published by Dätwyler (Switzerland) in 1921, based on an initiative by Hess. Dätwyler examined 110 teeth of patients; all of them were treated at the dental clinic in Zürich. The pulps were capped with iodoform chlorophenol, zinc oxide-eugenol, thymol paraffin, or the tissue was cauterized and capped with zinc oxide-eugenol. The sensibility of the teeth was evaluated six to nine months after direct capping. In addition, 16 teeth were extracted and the pulps were analyzed histologically. Good results were obtained after direct capping with zinc oxide-eugenol only, or after additional cauterization. Capping with thymol paraffin and iodoform chlorophenol resulted in less success. According to Dätwyler, even hyperemic pulps could by kept vital with zinc oxide-eugenol or cauterization and zinc oxide-eugenol application. But this can be cast into doubt. While Witzel in 1879 presumed that only animal research in dogs or sheep could give information about pulp healing but he also thought that this type of research could be too difficult. The first animal experiments that evaluated direct pulp capping were performed by Rebel (Germany) in 1922 on cats and dogs. He examined seven different capping materials common at that time: Gysi’s Triopaste (a mixture of paraformaldehyde, tricresol and creoline), eugenol, thymol, idoform-chlorophenol, terpestrol (spirits of turpentine), formaldehyde gelatin and Vuzin paste (a derivate of quinine). All these materials were more or less strong antiseptics and cytotoxic. Rebel divided the animals into several groups. In the seven experimental groups, the capping materials were applied onto the exposed pulp and covered with a gold foil. Gutta-percha or Fletcher’s cement served as subbase and the cavities were filled with phosphate cement. In the control group the exposed pulps were solely capped with a gold foil (without any of the pulp capping agents mentioned). The gold foil was covered with gutta-percha or Fletcher’s cement and the cavities were filled with phosphate cement. All pulp cappings were done under rubber dam isolation. In a second control group, the pulps were exposed but not further treated, and the cavities not filled. A histological evaluation was performed already 3 h, 6 h, 3 d, 10 d, 17 d and 8 weeks after treatment. Vital pulp or a hard tissue formation were found in none of the examined specimens. Also, Rebel could not detect any bacteria, but this is doubtful in light of the fact that the cavities were filled with phosphate cement only, or even left open in one group. He did not believe that the exposed pulp had the capability to heal or that an injured odontoblastic layer can recover. The hard tissue formation after direct pulp capping reported in other publications seemed to Rebel not to be a sign of healing but a degenerative process that cannot be influenced by the dentist. On the basis of his animal study, Rebel reached an incorrect conclusion: “The exposed pulp is a doomed organ.” This statement was popularized by many authors, and the influence of Rebel was so strong that
this sentence was an incontrovertible paradigm for decades, with consequences until today. Thus, further efforts to use direct pulp capping techniques were discouraged, particularly in Europe. Of course, Rebel was right that pulp healing after capping with the materials he used was less than likely because all these agents were cytotoxic; but the conclusion drawn by Rebel from his histological evaluations was too general. An appropriate medicament was simply lacking. Dentists did not make a differentiation between methods to keep the tissue vital or to devitalize the pulp, and often inflamed pulps were capped, which had not the slightest chance to heal.

In 1920 Hermann (Germany) (Fig. 11) described for the first time the use of calcium hydroxide to fill root canals. In his dissertation he clearly demonstrated the antibacterial effect of calcium hydroxide in infected root canals without any adverse reactions. The aim of Hermann was not to find a new agent for direct pulp capping or pulpotomy but a method for "biological root canal treatments". He refused the disinfectants used for root canal treatment at that time (similar or identical agents were used for pulp capping) because they were cytotoxic. To prove biocompatibility of calcium hydroxide, Hermann performed the first successful vital pulpotomy around 1930, and could show that it is well suitable to keep the pulp tissue vital without impairing its function and to induce hard tissue formation. The first studies about the use of calcium hydroxide for direct pulp capping and pulpotomy in the English literature were by Zander, who published his results in 1939. Zander himself referred to Hermann's publications.

The use of calcium hydroxide did not prevail everywhere. Grove (USA) published his methods for direct pulp capping in 1928, blending Chloralhydrate (the first synthetic barbiturate) with thymol. This liquid was mixed with the powder of cement and applied onto the exposed pulp. The cavity was filled with white copper cement.

In an incidental finding, Dätwyler (1921) noted that dentin chips can promote the hard tissue formation in the pulp. In his histological examinations, Dätwyler could show that dentin chips which get into the pulp by chance were completely surrounded with reparative dentin. The tissue was free of inflammation. Hence, the use of dentin chips for direct pulp capping was proposed by several authors like Neuwirth, Hellner and Feldmann in the years 1928 to 1932. The dentin chips could be obtained by drilling dentinal walls of the same tooth whose pulp was capped (autogenous), another tooth of the same patient (autotransplant), an extracted tooth from another patient, or from animals. There were some problems with the dentin chips, however, as they could contain microorganisms. If the chips were not further treated they could become infected. However, disinfection of the chips with 10% formalin, while arresting infection, also adversely affected the healing process.

A further development of the dentin chip method was the pulp capping with ivory chips introduced by Müller (Switzerland) in 1938. The advantage of ivory compared to dentin was that no human tissue was needed. The extraction and storage was much easier. Moreover, pure sterile ivory chips underwent a different preparation, being mixed with vaseline, with iodoform and a resin solution or mixed with the antiseptic Vioform (0.5 %) and a resin solution.

Münch in 1931 made the suggestion to mix "lime" with vitamins for pulp capping. The agent was offered on the market as Pulpatekt, and was a compound made of different calcium salts, vitamins and chlorphenol camphor for disinfection. The add-on of chlorphenol camphor proved to be adverse, so it was later omitted. Instead, sterilized bone marrow of calves embryos was added. Also in 1931, Schröder (Germany) developed an agent called Tiranal for treating deep carious lesions (indirect pulp capping). His idea was to medicate carious hard tissue with a well-diffusing liquid, to transform the softened dentin of a solid compound that need not be removed because it is not a culture medium for microorganisms and does not disintegrate further. Tiranal was made from silica tetramethylester, chloramine and soluble resins. Four years later, Flohr (Germany) suggested using Tiranal for direct pulp capping. Either the pulp tissue was sloughed with phenol and the cavity was swapped with Tiranal,
or Trianal was applied as medication on the pulp for two to three days, changing it daily. Then blotting paper soaked with Trianal was put onto the pulp and the cavity was filled with a cement. Flohr also introduced a preparation called Vitapulp in 1936. He was afraid that Hermann’s calcium hydroxide could induce tissue necrosis due to the alkaline pH value. By adding calcium salts, Flohr lowered the pH value of calcium hydroxide and mixed it with dentin chips. To avoid direct contact and pressure to the pulp tissue Flohr additionally covered the exposure with a small piece of blotting paper before Vitapulp was applied.

The medicament Citronellol was invented by Bernhard (France) before the 2nd World War. Citronellol is an aliphatic terpene which can be found in certain plants. Bernard mixed Citronellol with Niaouli (an essential oil, *Melaleuca viridiflora gaertner*), zinc oxide and plaster. At first, the exposed pulp was covered for two to four days with a cotton pledget soaked with a Citronellol-Niaouli-oil-mixture. Subsequently, the pulp was capped with the described paste.

A disadvantage of calcium hydroxide is the fact that it is an aqueous non-hard-setting paste. Hence, Champion (Switzerland) was convinced that calcium hydroxide was not suitable as a definitive root canal filling material as suggested by Hermann. Therefore, Champion developed a hard-setting calcium hydroxide preparation called Endoxyl in 1941. Endoxyl was composed of two pastes containing calcium hydroxide, calcium gluconate and calcium glycerin phosphate, which could be used for root canal fillings as well as direct pulp capping.

In 1953 Castagnola (Switzerland) compared the results of direct pulp capping with materials mainly from the 1930s and 1940s and calcium hydroxide using histological evaluations and comparing previous data from the literature. These medicaments were: zinc oxide-eugenol, dentin chips, ivory chips, Pulppekt, Vitapulp, Trianal, Endoxyl, Citronellol, secondary calcium phosphate (CaHPO₄), as well as the antibiotics sulfonamide, penicillin, streptomycin and combinations of sulfonamide, penicillin and streptomycin (in different concentrations). In all comparisons, calcium hydroxide clearly had the best results.

At the beginning of the 1950s, the use of calcium hydroxide for direct pulp capping was still not generally accepted – nearly 25 years after the first reports. Currently, calcium hydroxide is used globally as a pulp capping agent and has been the standard for the past 50 years. Its use is well-documented and its margin of safety for pulp capping is clinically acceptable.

In spite of the positive experience with calcium hydroxide, the contemporary literature supports many newer materials for pulp capping, such as dentin adhesives, mineral trioxide aggregate, collagen, chondroitin sulfate, hyaluronic acid, calcitonine, ammonium hydroxide, barium hydroxide, magnesium hydroxide, aluminum hydroxide, strontium hydroxide, albumin, isobutyl-cyanoacrylate, N-butyl-cyanoacrylate, caboxylate cement, tricalcium phosphate, α-Tricalcium phosphate, tetracalcium phosphate, hydroxylapatite, Cavit, Teflon, Ledermix, bioactive ceramics, enamel matrix proteins, various growth factors, herbs, propolis (resinous substance from bees), etc. The dental pulp has probably been brought into contact with the most and widest variety of materials for medical reasons of any tissue of the human body. Except for mineral trioxide aggregate all of these materials show less promising results than calcium hydroxide and are not recommended for pulp capping routinely at this time.

With the advent of bioinductive pulp capping materials such as MTA, the future of pulp capping as a predictable, viable treatment modality appears bright. What still eludes the dental practitioner is the clinical inability to discern the exact histopathological status of the dental pulp in a tooth that has been challenged with caries, trauma or previous restorative procedures. Only historical reflections gleaned in the future will write the next chapter on the history of pulp capping.
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Deciduous Tooth Extraction & Folkloric Beliefs in the Samsun Region

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This study was designed to investigate the methods of deciduous tooth extraction applied to children, and the effects of parents’ educational status and place of residence on the way deciduous teeth are regarded in folklore in Samsun city and neighboring villages. Using questionnaires, this study tried to determine the type of superstitions held by parents living in the city and neighboring village. The questionnaire inquired about methods used to extract their deciduous teeth, what parents had done with them, and their preferred extraction methods. A significant relationship was established between the age at which the parent first visited the dentist and the method used to extract their child’s deciduous teeth. Folk beliefs are not related to place, namely urban or rural living, but are concepts handed down through tradition; the educational status of parent is likewise irrelevant to the holding of folk beliefs among parents in this sample.

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Introduction

Some beliefs in social folklore, especially “superstitious beliefs,” arise from fear, helplessness or coincidence. These give rise to behaviors which are completely independent of science or religion and which are as old as human history. Personal tendency, ill-informed parents, grandparents and religious leaders are effective in the formation of these superstitions, which although they can display common aspects, may vary among different social groups.

Superstitions played an important role in everyday life in the Middle Ages. The fact that people were very afraid of losing teeth, is an indication of how important teeth were. Therefore, loss of teeth played an important role in superstitions. Tooth loss because of periodontal destruction as known today, was associated with death in ancient times1 and it was believed that one of the family members would die.2 Because the presence of teeth at birth is most unusual, this was also associated with superstition. While some parents evaluated the situation as a sign of disease3 or disaster4 they related it to the fate of the baby.5 In some communities, the comments were according to the sex of the baby born with teeth; males were thought to have a splendid future, but for females it was taken as an ominous sign.6,7 In China, for example, when the baby born with teeth starts to bite, it was believed that the mother will die if the baby was female, or the father will die if the baby was male.5 The Turkomans of Central Asia believed that the baby with teeth would behave badly to his/her father. 8

Tooth eruption is an important event in all communities. Teeth were considered to be responsible for the frequent health problems seen in early childhood, problems which it was believed could be solved by facilitating tooth eruption.1 In some communities it is believed that clothes hanging in the garden while the mother is breast-feeding her baby or while the mother is pinching her own thumb will result in difficulty with cutting teeth.1 In others, it is believed that the warmer the mother’s milk, the hotter the baby's palate will become and that this will facilitate the event; the person witnessing the tooth eruption must tear his/her clothes to help the process.5 Another folk belief was that the gingival swelling seen during the initial tooth eruption was due to a tooth named “false tooth” and that this would result in diarrhea and malaria in the baby; hence, it must be extracted.9

Tooth eruption, one of the most important indicators of the child’s biological development, is welcomed with ceremonies in urban and rural areas as part of the conventional culture today just as in the past. These ceremonies are based on different beliefs, but the ones related to nourishing the child attract particular attention. In the ceremonies arranged to celebrate tooth eruption, as teeth have the major role in the crushing, grinding and digesting food, there are wishes to sanctify food, to raise the baby's earning capacity and to increase abundance along with desires for an easy, strong and correct tooth eruption. Ceremonies related to tooth eruption have psychological and social importance, as well.10-13 During the ceremonies, objects like scissors, mirrors, clocks, pens, books and bread, each representing a specific type of work, are placed in front of the child, giving rise to comments about the occupation the child will choose in the future. It was believed that the child would choose an occupation according to the object he/she had chosen during the ceremony.14

Normally, the deciduous teeth are expected to erupt five months after birth. There are various views about cutting the first tooth. Because the lower teeth face upwards, they are considered to represent the child praying to God and therefore as a sign of a good future. In contrast, the upper teeth facing

Table 1. Frequencies (f1), percents (f1%), means and analysis results ($\chi^2$) for the parents based on tooth extraction method by place of residence.

<table>
<thead>
<tr>
<th>Tooth extraction method</th>
<th>Village</th>
<th>City</th>
<th>Generalization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f1</td>
<td>f1%</td>
<td>f1</td>
</tr>
<tr>
<td>Dentist</td>
<td>14</td>
<td>(12,73)</td>
<td>52</td>
</tr>
<tr>
<td>Dental technician</td>
<td>11</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Empirical methods</td>
<td>85</td>
<td>77,27</td>
<td>187</td>
</tr>
<tr>
<td>Chi-Square ($\chi^2, df : 2$)</td>
<td>95,69 $^a$</td>
<td>203,52 $^a$</td>
<td>-</td>
</tr>
</tbody>
</table>

$^a$ P<0.01
downwards are considered as pointing to the earth, a sign of a bad event and that the child would not live long. If the person who first saw the baby’s teeth erupt bought a white-colored gift, it was believed that the child’s teeth would be white.

This study was designed to investigate the methods of deciduous tooth extraction in children in Samsun, Turkey, and its neighboring villages, and of the influence of living in a city or nearby village and the parents’ educational status on the importance/significance of deciduous teeth in folklore.

**Methods**

This study was carried out in Samsun, a Turkish coastal city of over 300,000 on the Black Sea, and the neighboring villages. A total of 500 subjects were divided into two groups; one consisted of 250 (122 female and 128 male) patients’ relatives referred to the Departments of Pedodonty and Oral and Maxillofacial Surgery of the Faculty of Dentistry, Ondokuz Mayis University; and the other group consisted of 250 individuals (120 female and 130 male) with children living in three neighboring villages. Of the patients referred to the faculty clinics, those living in the city were selected for study. A standard questionnaire was designed, including questions about age, sex, educational status, age at which the parents first visited the dentist and the procedure performed, the method of extraction of their deciduous teeth and what they had done with those teeth, and which method they had preferred for the extraction of their child’s deciduous teeth. Completing the questionnaire was optional and anonymous. Assistance was given to those who were not able to read and write.

Living in the city or village and the educational status were used as the factors. The effect of the method of deciduous teeth extraction in the parents, the age at the first visit to the dentist and the extraction procedure performed on their child, either by a dentist or dental technician or by empirical methods, were assessed. The influence of the parent-child age difference on the method of deciduous teeth extraction in the child was evaluated.

For the analysis of tooth extraction data, patients were categorized into three groups: those referred to the dentist, those referred to the dental technician and those who preferred empirical methods. Methods applied by the parents, the village chief or neighbors using a rope, pulling by hand or with pliers were accepted as empirical approaches. Data were analyzed by using a chi-square independence test. Rank correlations were used to determine relationships between discrete and continuous variables; Spearman correlation was used for rest of the variables.

**Results**

Average age of the parents living in the city was 40.86 (±9.00) and of the parents living in the villages as 49.03 (±14.70).

**Individuals Living in the City**

Although a positive correlation was found between the tooth extraction method applied to the parent and their child, the situation did not have statistical importance. There was a negative correlation between the parent/first child age difference and the tooth extraction method applied to the child, but this was not statistically significant.
Although a positive correlation ($r = 0.06$) was found between the age of the parent at the first visit to the dentist and the method of tooth extraction applied to their child, this situation was not significant.

### Individuals Living in the Village

A positive correlation was determined between the tooth extraction method applied to the parent and their child ($r = 0.28$) ($p < 0.01$). There was a negative relationship between parent/first child age difference and the tooth extraction method applied to the child ($p > 0.05$). An important and positively directed correlation ($p < 0.05$) was determined between ($r = 0.11$) the age of the parent at the first visit to the dentist and the method of tooth extraction applied to their child.

### General Findings

A positive correlation ($r = 0.30$) ($p < 0.01$) was determined between the age of the parent at the first visit to the dentist and the method of tooth extraction. Significance was determined between the age of parents’ first dentist visit and the method of tooth extraction applied to their child ($r = 0.11$). It was found that women visited the dentist earlier than men. The relationships between place of residence or gender and the methods used for tooth extraction by the parents were found to be insignificant ($p > 0.05$).

A negative correlation ($r = -0.11$) ($p < 0.05$) was observed between the parent/first child age difference and the tooth extraction method applied to the child. The region in which the parents lived and their educational status did not affect the method of tooth extraction applied to the child ($p > 0.05$). Table 1 shows the frequency distribution of the parents’ tooth extraction method between individuals living in the city and villages, and Table 2 shows the frequency distribution of the effect of parents’ educational status on the method of deciduous tooth extraction.

Most extracted deciduous teeth were reported to be discarded (women 56%, men 55.71%); the second method of disposal was throwing them onto the roof (women 22%, men 19.05%). Table 3 presents the end of extracted deciduous teeth. Reasons for throwing onto the roof include: “so that the new teeth will erupt quickly, beautifully and strongly,” and the belief that “crows will take the discarded teeth away and bring golden teeth or new teeth instead”.

An individual living in the city threw the teeth onto the school roof and wished for education for his child. Poems like “you get the bone teeth, give the iron teeth” or “crow get the old teeth, give the new teeth,” speaking to the birds and especially to the crow was observed during the action of throwing onto the roof.

In our study, it was observed that teeth were also thrown into the animal shelters like a chicken-coop or a barn. Surprisingly, throwing the teeth into coops to increase the egg yield of chickens was encountered in the group living in the city at a rate of 0.08%, but not in villages. Mostly in rural areas, teeth were placed under a pregnant cow (village 15.45%, city 0.8%) or thrown into the barn (village 10%, city 0.8%) or hung by individuals living in villages around the cow’s (8.18%) or child’s (%0.91) neck to ward off “the evil eye”.

Individuals were observed to keep teeth in their trousseau chest (0.40%), under a pillow (1.71%), or to save them to place in their grave when they die. Furthermore, two individuals - a university graduate and someone who could not read and write, were determined to keep the teeth under their pillow, believing that the tooth fairy would bring money.

In this study, some individuals were recorded as burying teeth in the ground (%9.16); one of them who lived in the village based this on the belief, “comes from soil, goes to soil.”

### Discussion

In developed communities, individuals start visiting a dentist during childhood. In societies that have not yet experienced widespread educational achievement, including higher adult literacy rates, health literacy likewise fails to develop and as a result the doctor-patient relationship remains asymmetrical. This situation has been observed especially among individuals living in rural areas. People with limited resources and minimal health literacy, apply their own medical treatments using ancestral methods. The temporary nature of deciduous teeth restricts the relationship between the dentist and the patient, and even makes it unnecessary.

Our study indicated that individuals living in both cities and villages primarily prefer the dentist for tooth extraction, but referral to a dental technician occurs twice as often in villages compared to the city. The reasons for this situation include: difficulty contacting a dentist in rural areas; the insufficient number of dentists working in rural areas; dental technicians serving in rural areas where the dentists do not work voluntarily; and closeness of people to dental technicians because of family relationships. Furthermore, the present study demonstrated that highly educated individuals and
people living in cities went to a dentist at a younger age.

The significant relationship between the parent’s age at the first dentist visit and the method of deciduous tooth extraction of the child indicates the positive effect of the earlier dental visit of parents on their child. Ease of contact and the higher number of dentists in the city were the reasons for referral to the dentist at a younger age for the city dwellers. By contrast, the villagers tended to use empirical methods for tooth extraction because of limited access to care, including the difficulty reaching a dentist and the insufficient numbers of dentists employed in health institutions in rural areas.

There is a negative relationship between the educational status and superstitions held by those with low literacy skills. Superstitions are more common in societies with lower levels of educational achievement. For example, a study performed in Nigeria indicated that 53.7% of individuals believed that deciduous teeth were evil and had to be destroyed,\textsuperscript{15,16} and most of the people who held this opinion were poorly-educated.\textsuperscript{17} According to another Nigeria-based study, people believed that children in whom the above teeth erupted first were evil, and it was the older and/or poorly educated individuals who held this belief.\textsuperscript{18}

In our study, it was observed that the parents’ educational status did not affect the tooth extraction method applied to their children, while the higher percentage of dental technician referrals were for those individuals who could not write and read. High referral to those using empirical methods was attributed to a person’s sense of “courage,” as the result of the spontaneous decrease in capability of the bone support lacking deciduous teeth. This problematic situation reflects the fact that no parallel exists between the elevation of educational status and oral health literacy in Turkey, and should be evaluated in terms of health policy and not solely on the basis of individual autonomy.

In villages, it was determined that older parents referred their children less frequently to the dentist. People who had children at a younger age were observed to be more conscious about oral health. There was no such ‘age-effect’ on the dental care decisions taken by people living in cities; this perhaps indicates that more oral health literate parents lived in cities. In a study by Aderinokun (1991), superstitions were more frequently observed in older individuals; in our study, this was indeed the case as parents who had children at an older ages did not consider their childrens’ oral health important.\textsuperscript{18}

People have always been afraid of things which they could not explain and have interpreted these as a sign of a disaster. A tooth falling out spontaneously is also an event with unknown reason. Individuals tried to prevent this “disaster” by hiding or burying

<table>
<thead>
<tr>
<th>Table 3. Frequencies (f), percents (f%), means and analysis results ($\chi^2$) of the end of extracted deciduous tooth</th>
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<tbody>
<tr>
<td><strong>End of tooth</strong></td>
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<td>11</td>
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<tr>
<td><strong>Chi-Square ($\chi^2, df : 2$)</strong></td>
</tr>
</tbody>
</table>

$^a$ P<0.01

$^c$ 0: discarded; 1: roof; 2: under pillow; 3: under a pregnant cow; 4: anywhere; 5: trousseau chest; 6: in the ground; 7: barn; 8: coop; 9: bottom the wall; 10: cow’s neck; 11: child’s neck
In time, the aim of burying teeth changed, and one expected good things to happen. The tooth of a child which had fallen out was buried under the footprints of a horse (which has an important place in Turkish culture), namely the wish was for the replacement tooth to be white like the horse’s teeth. Likewise, in our study, burying of teeth in the ground with the thought of “comes from soil, goes to soil” was evaluated as the reflection of religious beliefs.

In Western societies, placing three pieces of bread under the bride’s bed, or eating food that had been nibbled by mice was thought to enable good and beautiful teeth for their children. This situation is related to the desire for having as beautiful teeth as a mouse’s. Among the Gagavuz people, an Orthodox Christian Turkish community, help is requested from crows for the health of the teeth that replace deciduous teeth. They wrap up the deciduous teeth in a bread ball and, while leaving it in an open area for the birds to take, they say “Crow, Crow you get the bone teeth, give me the iron teeth.”

In Kars, in the northeast of Turkey, extracted deciduous teeth are thrown to the chimney saying “Wolf and birds, get my rotten teeth, give me iron teeth,” or thrown onto the roof of the house saying “I want my teeth to be strong like dog teeth and white like lamb teeth,” and wishes are made for the new teeth.

The belief in the power and holiness of certain animals, held by different societies, led to more intensive superstitions about particular animal species. Among Turkish nomads, lambs, wolves, dogs and crows, which take away their food, were particularly cited in folklore, as these were a part of daily life. Therefore, wishes for the future were made involving these animals which affected their lives. Shamanism, the first religion of the Turks, was also responsible for these superstitious beliefs about certain animals. For example, giving alms or giving seeds to birds were reported in the Turkish societies.

Beliefs about throwing teeth onto roofs have been encountered in different societies. Among the reasons for throwing the extracted teeth in our study were: beautiful, fast, strong and early eruption of teeth, and the wish for a golden tooth. In our study, one of the parents was observed throwing the deciduous teeth onto the roof of a school, wishing his child would become educated. The roof was thought to be preferred, as people believed it to be nearer to God and, because it is above ground level, it is a high place from which birds may easily take the thrown teeth. There are also studies reporting that extracted teeth are thrown into the furnace or oven.

Many in Turkish society also believe in “the evil eye.” Blue beads are used in the homes, offices, cars and clothes of many Turkish families. Many materials are used to avert the evil eye. In our study, teeth was not observed to be used to avert the evil eye by those living in the city; but among the villagers, teeth were seen around children’s or animals’ necks for this purpose.

There are countless superstitions about tooth change. A new tooth is desired to replace each tooth which falls out. Therefore, societies hid teeth which dropped out in various places and made wishes for new teeth. While Western societies hide teeth in a hole in a chair or a wall or in a mouse hole, in our study, teeth were determined to be hidden under the pillow or in the trousseau chest for luck, for the tooth fairy to bring money and new teeth, and to prevent erupting teeth from falling out. The trousseau chest is especially important for the girls who will get married. When they leave the family, they take their valuable belongings to their new home. Placing a girl’s teeth in this chest indicates their importance. The same is observed with people keeping their teeth so that they may be buried with them.

In Turkish society, many hold a relationship between children’s deciduous teeth and their animals, which are their source of income, as they wished that the young animals to be born would be female. They therefore believed the pregnant cow might give birth to a female calf if the extracted teeth are thrown into the barn. In our study, people living in villages placed the deciduous teeth under the pregnant cow or threw them into the barn wishing the calf to be born to be female. Interestingly, in cities, but not in villages, people were reported as throwing deciduous teeth into coops so that the chickens would lay more eggs. These habits can be viewed as a reflection of the differing economic concerns of urbanites and rural people. In conclusion, superstitions about deciduous teeth, like many other folk beliefs, are concepts handed down from tradition, and cut across all strata of Turkish society, irrespective of the educational status. However, these beliefs remain harmless parts of the cultural inheritance, unless they have a serious adverse effect, such as deterring necessary oral health treatment.
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John Hunter (1728-1793) was one of the greatest surgeons of the eighteenth century and one of the greatest comparative anatomists of all time. His legacy was a museum of over 1300 specimens and anatomical preparations in the Hunterian Museum of the Royal College of Surgeons in England, and a wealth of publications on a large variety of subjects, including two books on the teeth, gingival tissues, and their diseases.

In 1761 he developed tuberculosis and joined the army as a surgeon, hoping to travel abroad, and served during the Seven Years’ War. He treated gunshot wounds at the siege of Belle-Isle (an island off the coast of France), and in Portugal’s war against Spain.

He returned to London to practice, but success was slow due to the presence of a large number of celebrated physicians and surgeons. He joined a dentist, James Spence, as a surgeon and was in this partnership for some five years. During this time, Hunter learned a great deal about the oral cavity and its diseases, and this knowledge was instrumental in the publication of his two books on the teeth and their diseases. During these years he also gave lectures on anatomy and operative surgery and carried out research on animals.

In 1767 he was honored by being elected as a Fellow of the Royal Society. In 1768 he became surgeon at St. George’s Hospital and also published his famous treatise on venereal disease. As he was becoming better known, he built a spacious house with a theater to accommodate audiences for his lectures; and a museum to display his many...
specimens. His publications were extensive and included such diverse topics as “Observations and Reflections on Geology”, “Observations on the Animal Economy”, “Treatise on the Blood, Inflammation and Gun-shot Wounds”, as well as collections of essays.

Hunter had a generous character and helped to further the careers of friends and students. He had an extensive correspondence with Edward Jenner, and helped to arrange Jenner’s Fellowship in the Royal Society. At this time, it was Jenner’s study of the cuckoo that was considered to be of greater merit than his discovery of vaccination.

Some of the outstanding men of the age were patients of Hunter, including David Hume and Benjamin Franklin.

In 1771 he married Anne Home, the sister of one of his students. She was an attractive, gregarious and highly talented young lady, and arranged many soirées where artists, writers and musicians would attend. The famous composer Joseph Haydn wrote six canzonettas set to original poems that Anne Hunter had written.

Hunter’s two books on the teeth were: The Natural History of the Human Teeth (1771) and A Practical Treatise on Diseases of the Teeth (1778). They were the first books to treat the teeth and their diseases scientifically; were well illustrated, and helped to raise the status of the dental profession in the eighteenth century. He gave the teeth the names by which they are known today (incisors, cuspids, bicuspids, molars) and emphasized the destructive nature of plaque and tartar.

Several excerpts from the original works follow, demonstrating the scientific attitudes of John Hunter applied to clinical problems.

Part I: The Natural History of the Human Teeth

The importance of the teeth is such that they deserve our utmost attention, as well with respect to the preservation of them when in a healthy state, as to the methods of curing them when diseased. They require this attention not only for the preservation of themselves, as instruments useful to the body, but also on account of other parts with which they are connected, for diseases in the teeth are apt to produce diseases in the neighbouring parts, frequently of very serious consequences, as will evidently appear in the following treatise.

One might at first imagine that the diseases of the teeth must be very simple, and like those which take place everywhere else in the bony parts of our body; but experience shows the contrary. The teeth, being singular in their structure and some other circumstances, have diseases peculiar to themselves. These diseases, considered abstractedly, are indeed very simple; but by the relations which the teeth bear to the body in general, and to the parts with which they are immediately connected, they become extremely complicated. The diseases which may arise in consequence of those of the teeth are various, such as abscesses, carious bones, &c., many of which, although proceeding originally from the teeth, are more the object of the surgeon than of the dentist, who will find himself as much at a loss in such cases as if the abscess or carious bone were in the leg or any other distant part. All the diseases of the teeth which are common to them with the other parts of the body, should be put under the management of the physician or surgeon, but those which are peculiar to the teeth and their connexions belong properly to the dentist...

Part II: The Diseases of the Teeth and the Consequences of Them

The most common disease to which the teeth are exposed is such a decay as would appear to deserve the name of mortification. But there is something more; for the simple death of the part would produce but little effect, as we find that teeth are not subject to putrefaction after death, and therefore I am apt to suspect, that during life there is some operation going on which produces a change in the disease’s part. It almost always begins externally in a small part of the body of the tooth, and commonly appears at first as an opaque white spot. This is owing to the enamel’s losing its regular and crystallized texture and being reduced to a state of powder, from the attraction of cohesion being destroyed, which produces similar effects to those of powdered crystal. When this has crumbled away, the bony part of the tooth is exposed; and when the disease has attacked this part, it generally appears like a dark brown speck. Sometimes, however, there is no change of colour, and therefore I am apt to suspect, that during life there is some operation going on which produces a change in the disease’s part. It almost always begins externally in a small part of the body of the tooth, and commonly appears at first as an opaque white spot. This is owing to the enamel’s losing its regular and crystallized texture and being reduced to a state of powder, from the attraction of cohesion being destroyed, which produces similar effects to those of powdered crystal. When this has crumbled away, the bony part of the tooth is exposed; and when the disease has attacked this part, it generally appears like a dark brown speck. Sometimes, however, there is no change of colour, and therefore the disease is not observable till it has made a considerable hole in the tooth. The dead part is generally at first round, but not always, its particular figure depending more on the place where it begins than on any other circumstance. It is often observed on the hollow parts of the grinding surface of the molars, and there looks like a crack filled with a very black substance. In the incisors the disease usually begins pretty near the neck of the tooth, and scooping process goes on enlarging the cavity, commonly across the same
part of the tooth, which almost divides it into two. When such a diseased tooth gives way, the mischief is occasioned by its body breaking off...

This decay of the teeth does not seem to be so entirely the effect of accident as might be imagined; for it sometimes takes place in them by pairs, in which case we may suppose it owing to an original cause coming into action at its stated time.

Once the shell of the tooth has given way to the cavity, the cavity itself soon becomes diseased in the same way. That the disease spreads thus rapidly over the cavity as soon as the tooth has given way does not depend simply on the exposure; for if a sound tooth be broken by accident, so as to expose the cavity, no such quick decay ensues...

How far a rotten tooth has the power of contaminating those next to it, I believe, is not yet completely ascertained; some cases seem to favour this idea, and many to contradict it. We frequently see two teeth rotten in places exactly opposite to each other, and as one of them began first to decay, it gives a suspicion that the last disease was infected by that which received the first morbid impression.

Few or no symptoms are produced by this disease besides the above appearances till the cavity of the tooth is exposed: however, it oft en happens that a tenderness, or a soreness upon touch, or other external infl uences, takes place long before; but when the cavity is exposed, then pain and other symptoms often begin, which are generally very considerable...

That is should be more severe than what is generally produced by similar infl ammations in other parts of the body, may, perhaps, be accounted for when we consider that these parts do not readily yield...

Although suppuration cannot easily take place within the cavity of a tooth, yet it oft en happens that the infl ammation which is extended beyond it is so great as to produce suppuration in the jaw at the bottom of the socket where the diseased tooth is, forming there a small abscess, commonly called a gum-boil...

But as this seems to be the principal way in which the gums are affected, I suspect that the same symptoms may arise from various causes, as I have oft en seen the same appearances in children evidently of a scrofulous habit, and have also suspected the same cause in grown people; they likewise frequently appear in persons who are in all other respects perfectly healthy.

When the gums first begin to have a tenderness, we may observe it first on their edges; the common smooth skin of the gum is not continued to its very edge, but becomes at the edge a little rough like a border, and somewhat thickened. The part of the gum between two teeth swells, and often pushes out like luxuriant flesh, which is frequently very tender.

The infl ammation is oft en carried so far as to make the gums ulcerate, so that the gums in many cases have a common ulcer upon them, by which process a part of the teeth is denuded. This is oft en on one part only, often only on one jaw, while in some cases it is on the whole gums on both jaws.

In this case it oft en happens that the alveolar process disappears, after the manner above described, by taking part in the infl ammation, either from the same cause, or from sympathy. In such cases there is always a very considerable discharge of matter from the inside of the gum and alveolar process, which always takes the course of the tooth for its exit.

In many of these cases we find that while the gums are ulcerating in one part, they are swelling and becoming spongy in another, and hanging loose upon the teeth; and this oft en takes place where there is no ulceration in any part.

The treatment proper in this disease, where the gums become luxuriant from a kind of tumefaction, is generally to cut away all the redundant swellings of the gum.

**Of the Extraneous Matter Upon the Teeth**

There are parts of the tooth which lie out of the way of friction, viz. the angles made by two teeth, and the small indentation between the tooth and gum.

Into these places the juices are pressed, and there stagnate, giving them at first the appearance of being stained or dirty. A tooth in this stage is generally clean for some way from its cutting edge towards the gum, on account of the motion of the lips upon it, and the pressure of the food, &c. It is also pretty clean close to the gum from the motion of the loose edge of the gum upon that part; but this circumstance is only observable in those who have
their gums perfectly sound, for in others this loose edge of the gum is either lost, or no longer retains its free motion.

If art be not now used, as the natural motion of the parts is not sufficient, the incrustation increasing covers more and more of the teeth. As mastication generally keeps that part clear which is near to the edges and grinding surfaces, and as the motion of the lips in some measure retards its growth outwards, it accumulates on the parts above mentioned till it rises almost as high as the gum; its growth being now retarded in that direction, it accumulates on the edge next to the gum, so that in time it passes over the gum, of which it covers a greater or less portion.

When it has increased so much as to touch the gum (which very soon happens, especially in the angle between the teeth), it produces ulceration of that part, and a train of bad consequences. Often the gums, receding from this matter, become very tender and subject to hemorrhage.

The alveolar processes frequently take part with the gums, and ulcerate, so that the teeth are left without their support and at last drop out similarly to the diseases of these parts already described. All our juices contain a considerable quantity of calcareous earth, which is dissolved in them, and which is separated from them upon exposure, which continues mixed with the mucus; so that the extraneous matter consists of earth and the common secreted mucus.

The disposition of the juices of the mouth to abound so much with earth, seems to be peculiar to some people, perhaps to some constitutions; but I have not been able to ascertain what these are. We find persons who seem to have nothing particular either in constitution or way of life so subject to this accumulation that the common methods of prevention, such as washing and brushing the teeth, have not the desired effect. This accumulation is very apt to begin during a fit of sickness, when the extraneous juices are allowed to rest; and perhaps the juices themselves may have at this time a greater tendency to produce the incrusting matter.

It may also arise from any circumstance which prevents a person from eating solids, whereby the different parts of the mouth have less motion on each other. Lying-in women are instances of this; not to mention that the assistance of art in keeping the teeth clean is commonly wanting under such circumstances.

The adventitious substance, as was said before, is composed of mucus, or animal juices, and calcareous earth; the earth is attached to and crystallized upon the tooth, and the mucus is entangled in these crystals.

As the cause of this incrustation is not either a known disease of the constitution or of the parts, but depends on a property of the matter secreted, simply as inanimate matter, the remedy of course becomes either mechanical or chemical.

References


“When a Wife Worries”: A 1916 Silent-Era Comic Movie Parody About Teething

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For the five hundred years which preceded the 20th century, teething among children was not viewed as a dental issue but as a potentially serious medical condition. Many early palliative remedies, including blistering of various body parts, bleeding, applying leeches to gum tissues and cauterizing the back of the head, were often violent.

Ambroise Pare (1517-1590), the famous French surgeon, introduced a teething treatment which included the lancing of babies’ gums. John Hunter (1728-1793), a British anatomist and surgeon, was known to use this procedure as many as ten times on one ailing infant. In the mid 1800s, a device known as a “teether,” made of coral, was used to expedite the eruption of baby teeth.

By the late 1890s, mothers were dosing their teething children with Mrs. Winslow’s Soothing Syrup. This popular patent medicine, designed to quiet the fretful little sufferer, was a nostrum which was heavily laced with alcohol. In 1839, 5,016 deaths among young children in England and Wales were attributable to teething. By 1910, the figure had declined to 1,600, which was still a staggering number. However painful that teething still may be, it is no longer diagnosed and treated as a pathological condition. Rather, it is viewed as a natural part of a child’s growth and development which can be treated with mild topical remedies.

In 1916, a review of an early silent movie parody, which presents a comic twist on the event of teething, was printed in a book entitled Caricature: Wit and Humor of a Nation in Picture, Song and Story (Leslie-Judge Company, New York). In a two page article, three photographic movie stills appear with an accompanying description. The story line was presented in a one-reel 10-minute, comedy silent film, entitled, “When A Wife Worries.” Released on May 9, 1916, it was produced by “Joker,” a unit of Universal Studio and Independent Motion Picture Company (IMP) in North Hollywood, California.

To date, we have been unable to locate a copy of this movie or to find any additional published detailed information about it. Because the film which was used in that era contained nitrate (an extremely unstable and flammable substance), as many as 75 per cent of silent movies have since perished.

“When a Wife Worries,” had two main actors: Victor Potel and Jane Bernoudy. Victor Potel was born in Lafayette, Indiana on October 12, 1889. He began his career with Essanay Studios in Chicago.
in 1910. Subsequently, he held minor roles in movies which emphasized “good clean fun.” His salary was $5 per day. Although he typically played supporting, not leading, roles, his stereotypical image as a gawky, slapstick character actor brought him fame.

Potel was 27 years old when he played a part in the above-mentioned short production. During the 1920’s, he gradually worked his way up to achieve parts in feature films. In this milieu, he created memorable bit characters such as Alkali Ike, Slippery Slim and Lank (of the Hank and Lank film series). Between 1910 and 1947, he appeared in 431 motion pictures. 57-year-old Victor Potel died in Hollywood on March 8, 1947, after a brief illness.

Jane Bernoudy, born in New Castle, Colorado, on August 19, 1893, was well-suited to her first career choice as a Western actress. We can surmise that she had grown up in a working cattle ranch and had the skills of a typical cowboy. When Jane became of age, she started performing in movies that involved horseback riding, roping and shooting at Indians, activities which she referred to as “Western Stuff.” As early movie producers began to move away from Western themes, she looked for work in the Joker branch of Universal Studios, which specialized in comedy movies.

One day, a trusted director advised her, “Capitalize on your funny face. If you are willing to queer yourself up with a fantastic get-up, I can find work for you.” She knew that she could either be offended by his raw comments, or look past them and follow his suggestion. As much as she had wished to be cast in roles that defined her as “pretty,” she knew that she was far from being a natural beauty. Therefore, she followed the director’s advice and became “funny looking.”

In this film, to project an exaggerated appearance, she wore a white, string-like ribbon hanging down from her forehead, a frilly housemaid’s cap, and a card of diaper-sized safety pins attached to the left side of her shirt waist. She also developed and utilized a range of dramatic facial expressions. These individual characteristics became her professional persona.

Although she was never to become a well known actress, Jane Bernoudy performed in 38 short comedic silent films, between 1913 and 1919. She died at age 79 in Conoga Park, California.

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*Figure 1 –* Jane Bernoudy, the Maid, is disgusted, yet curious about the antics of Baby’s doting Father (Victor Potel), a clown-like caricature, and Mother (Doris Fellows), a loving maternal figure, as they attempt to determine the “exact date when the first tooth” of their precious offspring will erupt. The Maid looks on with disapproval as the parents attempt to interact with a disinterested Baby.
Figure 2 - While Baby cries in preparation for a morning bath, the Maid, who has just noticed that “the famous first tooth” has erupted, intently summons Mother to share the discovery.

Figure 3 – After a frantic telephone call is made to Father, he rushes home and pontifically reads what he assesses to be “the proper mode of procedure in such cases.” With great authority and fanfare, Father announces his intention to “read up” on teeth and to visit a doctor, post-haste, to “get the best expert medical advice on the subject.” During this momentous milestone, Mother looks trustfully at Father, the Maid leans closer with increasing interest, and Baby remains peacefully indifferent.
Who Deserves the Credit for Discovering Ether’s Use as a Surgical Anesthetic?

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Mr. Gallucci was the winner of the 2007 Bremner Award, and is a student at OHSU School of Dentistry.

This paper discusses the controversy based around the discovery of inhalation anesthesia. Although many contributors claim to be the discoverer, deeper research into the events leading to anesthesia can award credit to a select few. It can be determined that anesthesia in animals was discovered by Paracelsus back in the fifteenth century and that the first person to demonstrate ether’s use as a surgical anesthetic was Dr. William Morton in 1846.

Before the mid-nineteenth century, pain was always associated with surgery. It was a time when surgical instruments were large, inefficient, and dull, creating dreadful operations where patients would feel every nerve severed with each stroke of the knife. The pain from surgical operations was enough to cause mental trauma for the remainder of patients’ lives.

Since ancient times, many unsuccessful attempts were made to find a cure for alleviating the pain of surgery. The earliest methods included religious techniques of scaring off demons and praying for the touch of God to cease suffering. Plants and herbs were also considered and the use of roots, berries, and seeds became the prominent method of treating pain. Of all the initial anesthetics tried, the most effective were the following drugs: alcohol, marijuana, and opium. Opium was also converted into its more potent form, morphine, and injected into the bloodstream as early as the nineteenth century. Although several methods were found useful to a certain degree, none were effective enough to deaden the extreme agony of surgical operations.

The medical world was in dire need of discovering an effective anesthetic to diminish this excruciating pain. Many further attempts led to disappointment and the search continued. During this blind search, the chemical to finally prove to be an effective surgical anesthetic was already identified - ether. Valerius Cordus did not make the first published account of the discovery and synthesis of the ether until 1561, but he may have discovered it as early as 1540. Even earlier claims on the discovery of ether are Raymundus Lullius in the thirteenth century and Paracelsus in the sixteenth century. Paracelsus made ether in search for an agent to alleviate pain and revealed that it was a successful anesthetic for animals. If he were to have extended his experiments to include humans, he may have been the founder of anesthesia using ether. Instead, the discovery and publications by these men were not utilized until the mid-nineteenth century, when ether’s use as a surgical anesthetic was discovered.

Many events led up to the discovery of ether as an anesthetic, with multiple individuals contributing some component to the first public use. These contributions evolved into several claims...
on the discovery, creating a fierce controversy. Only by evaluating each individual’s involvement in the development of anesthesia can the true discoverer be determined.

In 1799, Humphrey Davy, an assistant of the scientist Thomas Beddoes, began experimenting with nitrous oxide inhalation, mostly on himself. He recognized a reduction in pain and that the chemical was safe to inhale. In 1800, he published his experiments, noting that “as nitrous oxide in its extensive operation appears capable of destroying physical pain, it may probably be used with advantage during surgical operations…” Davy soon lost interest in nitrous oxide and its effects and abandoned his research, not realizing the potential of the chemical. Davy was still acknowledged as the first person to recognize the analgesic properties of nitrous oxide.

With the discovery of nitrous oxide’s analgesic properties, a similar chemical, ether, soon after became recognized as an anesthetic also. In 1805, Dr. John C. Warren used inhalation of ether to treat the pain of pulmonary inflammation. In 1818, Michael Faraday, a student of Humphrey Davy, was the first to notice the “soporific nature” of ether and its anesthetic possibilities. In the Quarterly Journal of Science and the Arts, Faraday wrote that ether, when inhaled in a mixture of air, had similar anesthetic effects to nitrous oxide. Unfortunately, the evaluation of ether’s uses was slow and its effects were not applied to surgical anesthesia until a later time.

As the search for an anesthetic continued, Henry Hickman, a general practitioner, operated painlessly on animals using the inhalation of carbon dioxide as an anesthetic in 1824. Due to the narrow-mindedness of the era, Hickman did not convince any doctors to try the gas on humans, but did contact King Charles of France in 1828. He claimed that he had discovered a method of suppressing pain during operations by the means of carbon dioxide inhalation. His claim was opposed, causing him to discontinue his research. Hickman still deserves credited for being the first to prove, by experimentation on animals, that pain from surgical operations could be suppressed by the inhalation of gas.

It was not until more than a decade had passed before William E. Clarke, a young student of chemistry at the Rochester Collegiate Institute, reintroduced the concept of gas inhalation for anesthesia. Ether and nitrous oxide were both widely used for “laughing-gas parties,” due to the euphoria and comical actions they generated. Clarke was known to attend and host these “ether frolics,” preferring to inhale ether over nitrous oxide. Another key player in the discovery of ether’s anesthetic properties, William Morton, was a guest at some of the parties Clarke threw, suggesting that Morton’s ideas developed from Clarke’s early observation that ether induced the repression of pain when inhaled. Using this observation, in January of 1842, Clarke administered ether via a towel to a woman as one of her teeth was pulled by Dr. Elijah Pope, a local dentist. It is believed that he administered the ether to the woman because she was resistant and uncooperative. Attempting to cease her defiance so Dr. Pope could extract the tooth, he kept the towel over her mouth until she became unconscious. The tooth was successfully extracted without pain. Clarke believed that the unconsciousness produced was from her hysteria and not the ether, since he had never seen inhalation cause complete unconsciousness. Thus, Clarke did not promote further experimentation on ether. Although neither Clarke nor Dr. Pope published a record of the event, Clarke told his colleagues about the affair, becoming the first person to use ether as an anesthetic on record.

Dr. Crawford W. Long was the next person to utilize ether as an anesthetic. Many reputable doctors believed in mesmerism as an anesthetic, but Long thought that its effects were from a “strong imagination and weak minds.” He refuted the concept of mesmerism and searched for a realistic anesthetic. Long heard of a public demonstration on the anesthetic effects of nitrous oxide and was an avid participant in “ether frolics,” hosting many. At the parties, Long witnessed users taking falls and blows; incidents that should have created pain, but did not. In 1839, a youth named Wilhite forced a black boy to inhale ether until insensibility at an “ether frolic” and told Long about it. Using this information and his previous observations, Long concluded that anesthesia was produced by the inhalation of ether, similarly to nitrous oxide, and could be applicable in surgical operations. On March 30, 1842, Long administered ether to a patient, James Venable. He poured ether on a towel and held it to Venable’s nose and mouth until he was unconscious, then removed a tumor from his neck with the patient feeling nothing. Three of Long’s previous classmates witnessed the operation along with the principal of the academy. Long recorded the operation in his ledger, billing Venable $2.25 for the procedure. Long successfully administered ether to several patients after Venable, but discontinued using it when his family and colleagues discouraged its use because of its perceived danger. Long didn’t publish his discovery because there were too few patients in
his rural town to create enough evidence for ether's anesthetic properties and he wanted strong support for such a radical claim. He also feared rejection and accusation of endangering patients with the drug. It took until 1849, when ether was widely utilized as an anesthetic, for Long to publish his claim on the discovery. Long is recognized as the first man to use ether for surgical anesthesia for other than dental operations.

Unaware of Long's success, Dr. Horace Wells, a dentist, was also searching for an effective anesthetic. Wells attended a "laughing-gas" demonstration that used nitrous oxide and noticed, just as Clarke and Long did, that participants were injuring themselves but experienced no pain. This led Wells to experiment with the nitrous oxide as an anesthetic. Wells also considered ether, which he knew to have similar effects, but selected nitrous oxide, believing it to be safer. Wells first tried nitrous oxide on himself as an anesthetic when he had Dr. John Riggs pull his tooth out. Wells felt nothing during the extraction and discovered nitrous oxide to be an effective anesthetic.

Desiring reputable support before publishing his findings, Wells contacted Dr. Charles Jackson through his previous partner, Dr. William Morton. Jackson refuted the idea and told him to halt the experiments. Still determined to gain support, Wells contacted Dr. John Warren at the Massachusetts General Hospital asking to publicly demonstrate the effects of nitrous oxide. In January of 1845, with Dr. Warren's consent, Wells performed a dental extraction with the use of nitrous oxide inhalation in front of a medical class, but administered too little gas. The patient was only brought to a daze and moaned during the extraction. Failing, the class taunted him as he left the building. In February of 1845, Wells attempted another demonstration in Hartford, but trying to prevent the criticism he previously experienced, he administered too much nitrous oxide and the patient almost died. Wells continued to use the gas in his practice, but gave up and pursued other fields, where he also found himself unsuccessful. Though unsuccessful, Wells deserves credit for conceiving the idea of anesthesia and publicizing the possibility of its use.

Supposedly unaware of the previous developments in anesthesia, in 1844 Dr. William Morton, a dentist, was seeking a method for alleviating the pain caused by his newly invented process for making artificial teeth. In an attempt to temporarily deaden the nerve of a tooth, Morton approached his colleague Dr. Charles Jackson, who Morton had witnessed using ether topically to anesthetize adjacent tissues, for help. Jackson had already discovered the anesthetic properties of ether in 1841, but didn't test it further for that function. Jackson perceived these properties when he accidentally inhaled chlorine gas. He inhaled ether to balance the chemical effects, which alleviated the pain. He only knew the chemical to provide local relief, so he treated patients topically. When Morton approached Jackson with his problem, Jackson first suggested to try topical ether, but then recommended ether vapor instead. Morton used this suggestion and tested the vaporous chemical on a dog in his lab, putting its head into a jar of ether until it became unconscious. He had successfully anesthetized the animal. Morton then tested the ether's effects on himself and his colleagues and found it to create excitement, not submission. Wanting to change the stimulatory effects of ether and develop a more efficient way of administering the vapors, he contacted Jackson again for advice and a gas-bag to administer the vapors. Jackson helpfully told him to use pure sulfuric ether and to use a glass flask with a glass tube that would control the fumes and mix air with the ether. He claimed that the apparatus would work better than the gas-bag, which would dissolve when in contact with ether. Morton tested the pure chemical on himself, administering it with a handkerchief, and it worked.

In June of 1846, Morton told his new partner that he needed to supervise the dental office because he had discovered something which would allow him to extract teeth without pain and that it was not nitrous oxide. Working in entire secrecy to prevent someone from stealing his idea, he gave no details when speaking of his findings and disguised the ether's identifiable smell with the oil of oranges. On September 30, 1846, Morton administered his disguised sulphuric ether with a handkerchief to successfully extract a tooth from a patient without pain. Morton then made arrangements with Dr. John C. Warren to publicly anesthetize one of his patients during a surgery. On October 16, 1846, Morton had a glass apparatus constructed based on Jackson's previous specifications and used it to anesthetize Dr. Warren's patient, Gilbert Abbott. It was the first successful public demonstration to prove the efficacy of ether's use as a surgical anesthetic.

Morton patented his secret agent after utilizing ether in multiple other cases. Initially, Jackson did not have trust or confidence in Morton and thought it was unethical to put a patent on the beneficial ether, but on October 23, 1846, Jackson contacted Morton demanding credit for the discovery since his contributions made it successful. Jackson wanted his name on the patent for credit, but gave all of the rights to Morton to keep his reputation...
clean since Morton’s experiments were considered dangerous and reckless. Morton agreed to include Jackson on the patent and to compensate him with a fraction of the award for his contributions. Since jealous colleagues betrayed Morton and claimed ether to be dangerous, Morton figured that Jackson’s reputation would provide support for his chemical agent.

Initially, Warren supported the discovery, but when he found out that it was patented, he threatened to discourage it. He found it unethical to conceal such a discovery, so he stated that he would not endorse its use unless he knew the chemical agent and could modify the delivery apparatus. Knowing that the loss of Warren’s support would be devastating to his discovery, Morton relaxed the patent, releasing the identity of the agent and allowed Warren to modify the apparatus. Warren once again endorsed the agent and the public widely approved of Morton’s “new” anesthetic.

The general acceptance was what led to the major controversy over the discovery of ether as a surgical anesthetic. When Jackson found the public accepting the anesthetic, he demanded an increase in compensation for his contributions. When Morton rejected Jackson’s demand, Jackson claimed that he had not just given advice to Morton on its use, but was entirely responsible for the discovery of ether’s use as a surgical anesthetic. Jackson told his colleagues in Paris that he was the discoverer and didn’t even mention Morton’s name. He even wrote a letter to the Acadamie des Sciences, requesting that only his name be acknowledged for the discovery. Jackson claimed that he gained knowledge of ether’s anesthetic properties in 1841, recommending its use to others, but not applying it to surgery himself. He also claimed that all of the ideas that led to Morton’s successful public demonstration were due to his contributions. This included Jackson suggesting to Morton the use of sulfuric ether as the chemical and to use a glass apparatus to control and dilute the ether while administering the drug instead of administering it with a handkerchief or gas-bag. Although Jackson was a reputable scientist, his claims were not completely supported since he previously tried to claim credit for other inventions, such as the telegraph and guncotton.

After Jackson’s request for a larger reward, Morton too claimed himself as the only discoverer. He refused Jackson’s claim to any part of the discovery, stating that it was he, not Jackson, who thought ether’s properties would be useful for a surgical anesthetic. He claimed that Jackson couldn’t have researched ether for this use because it took four years from his supposed research until Morton successfully demonstrated the anesthetic. If Jackson had known ether was an efficient anesthetic that early, he would have announced it sooner. With the two men both attempting to receive full credit for the discovery, the patent became unenforced and no financial reward was presented.

The controversy continued and Morton persistently attempted to gain credit for the discovery from Congress. He created a new patent for an improved ether inhaler design with the help of Augustus A. Gould and continuously contacted Congress to convince them that he was the original discoverer. The Congress never gave Morton recognition for the discovery, but eventually found his original patent, which was already unenforced, to be invalid since it was literally protecting a new use for an old compound. Morton, after abandoning his successful dental practice for an unrewarding discovery, died a beggar.

During the controversy between Jackson and Morton, other contributors claimed to be the discoverer of ether’s anesthetic properties as it became publicly accepted. Once Dr. Horace Wells became aware of Morton’s patent, he asserted his prior claim on discovering surgical anesthesia, stating that Morton’s patent was no more than what he had discovered eighteen months before him. In December of 1846, Wells wrote a letter to the Hartford Courant claiming that the agents he experimented with in 1844 were nitrous oxide and sulfuric ether. Wells stated that he chose to continue with nitrous oxide over the ether because it was less harmful. Wells’ colleague, Dr. Marcy, testified that Wells suggested the first use of ether in surgery because he had used it himself, with Wells’ recommendation, to perform an operation in 1845 with successful anesthesia. Responding to Wells’ claim, Morton offered a reward if the patient would come forward to verify the operation, but the patient did not. Wells also claimed to have told Jackson and Morton about anesthesia with nitrous oxide and ether in the meeting he initiated to gain support for his experiments. Morton and Jackson both refuted Wells’ idea that nitrous oxide could be used as an anesthetic, stating that it could not produce insensibility to pain. Morton and Jackson still became exposed to the concept of gas inhalation causing anesthesia from the meeting.

In 1847, Wells supported his claim by documenting his earlier use of nitrous oxide. He gathered affidavits from patients and colleagues attesting his entitlement to the discovery of anesthesia and the analgesic effects of nitrous oxide, but was discredited because he was addicted to the drug, along with ether and chloroform. Besides
his addiction to drugs, he had a weak claim in the controversy because he used nitrous oxide instead of ether and didn’t follow through with his discovery. Wells eventually anesthetized himself with chloroform and severed his femoral artery, becoming the first person to commit suicide under the effects of inhalation anesthesia.

Crawford Long also placed his claim on the discovery of ether’s anesthetic use in surgical operations when the patent was published. In 1846, four years after Long had successfully utilized ether in an operation, he read of Morton’s claim. Before Long announced his prior experiments, he waited to see if anyone else would declare experiments preceding his. When no other claims were revealed, Long published in the Southern Medical and Surgical Journal his discovery with witnesses to verify his claim. Many local doctors supported the fact that he used ether at the time he stated and that he received no encouragement or information regarding the chemical from others. Long stated his belief that when Morton and Wells were in his area, they gained knowledge of his use of ether for surgical anesthesia, providing them the entire concept. Morton immediately rejected his claim on the basis that he did not publish his findings until he read of the patent.

Long argued that he did not publish his discovery because he wanted to test etherization in a number of cases for evidence, but the surgeries he performed were not frequent and significant enough to provide a strongly supported publication. The rural town he practiced in provided no opportunities to talk to colleagues about it or hospitals to test it in. However, when Long came in contact with other local doctors in 1843, he advised them to use ether for surgical anesthesia with no attempt to conceal any of the chemical’s properties. Long stated that even though he discovered ether’s use in surgery, he was discouraged by his colleagues and family, leading him to discontinue its use.

Even though Morton refuted Long’s claim, when Jackson contacted Long in 1852 about his use of ether as an anesthetic during the period between 1842 and 1846, he concluded that Long indeed was the first to use it surgically. Jackson still claimed himself as the first to recognize ether’s analgesic properties in 1841. With Jackson supporting Long’s new claim, Morton was further discredited and any reward for the discovery became unattainable.

The last individual to come forward with a claim on the discovery of ether’s use as a surgical anesthetic was William E. Clarke. Clarke had moved to Chicago and came in contact with Dr. Henry Lyman, who had published Artificial Anaesthesia and Anaesthetics. When Clarke read of the history of anesthesia in his book, especially the experiments of Dr. Crawford Long, he revealed details of the dental operation where he administered ether to anesthetize the patient. Clarke did not publish his claim promptly after discovering the anesthetic because he was uncertain of what caused the unconscious state in the patient. Believing that the patient’s hysteria caused her unconsciousness, Clarke abandoned the use of ether for surgical anesthesia, unaware of its potential. However, once Lyman contacted him and explained ether’s anesthetic use, he realized that he was the first to use ether as a surgical anesthetic and made his claim on the discovery.

After evaluating each contributor’s case, certain recognition can be given for the roles they played in the discovery of ether’s use as a surgical anesthetic. Paracelsus, in the fifteenth century, was the first to discover the analgesic properties of ether in animals, but not to the extent of vapor inhalation. Humphrey Davy, from his experiments in 1800, was the first to recognize the analgesic properties of nitrous oxide when inhaled. Michael Faraday, experimenting in 1818, was the first to recognize that vaporous ether, when inhaled, created similar effects to nitrous oxide and could be used as an anesthetic in humans. Henry Hickman deserves credit for being the first to prove, by experiments on animals in 1824, that pain from surgical operations could be suppressed by gas inhalation. With the use of ether as an anesthetic during his dental operation in January of 1842, William E. Clarke deserves credit for being the first person to use ether vapors as an anesthetic in a surgical operation. Crawford W. Long’s use of ether as an anesthetic during his tumor extraction operation on March 30, 1842 provides him credit as the first person to use ether inhalation as a surgical anesthetic for other than dental operations. Dr. Horace Wells deserves recognition for making the first attempt to publicly demonstrate the effectiveness of vapor inhalation as a surgical anesthetic. His failure to succeed with his demonstration in January of 1845 also led him to be recognized as the first person to commit suicide under the effects of inhalation anesthesia. Although Dr. Charles Jackson did not discover the anesthetic properties of ether, he deserves credit for being the first to suggest an apparatus that would administer the ether in a controlled manner. He was essential to Dr. William Morton’s achievement as the first person to successfully demonstrate ether’s use as a surgical anesthetic. By spreading the knowledge of ether’s anesthetic use successfully to other professionals with his demonstration, Morton can be credited as...
the official discoverer of anesthesia. Although Dr. John C. Warren only performed the operation in Morton's demonstration on October 16, 1846 and did not discover the anesthetic, he still deserves credit as the first person to publicly operate on a patient anesthetized by ether vapor inhalation.

While the controversy over the discovery of ether's anesthetic properties continued, it was not long before more superior anesthetics were discovered. Nitrous oxide, Wells' proposed anesthetic, became widely used because of its safer properties. Chloroform became a common anesthetic due to its high efficiency and less volatile properties, but was still considered toxic. A safe, stable chemical for inhalation anesthesia was not available until 1956, when Halothane was introduced. It became the most prominent anesthetic administered via inhalation and is the least toxic chemical for this use. Short-acting anesthetics have also been introduced and are generally administered intravenously.

Since then, isoflurane, sevoflurane, and desflurane have become the common inhalants for anesthesia. The advancement of anesthetics since the discovery in the mid-nineteenth century has allowed doctors to perform painless surgery on patients with tremendous control and safety, but the original discoverers and their contributions will never be forgotten. They evolved one of the most desired dreams in the medical profession into reality, eliminating the dreaded agony of surgical operations.

References


August 3, 1859, 26 dentists gathered in Niagara Falls, NY to form a dental organization using the American Medical Association as a model. Various state societies existed at the time, which made it possible for delegate representations to plan to establish a national organization. The national group (ADA) was founded to protect the interests of dental surgeons, who were concerned with the increased number of untrained and unscrupulous persons all over the country who were promising miracle cures. The group also hoped to establish professional standards, advance dental science, improve knowledge of the profession, and establish better communication among dental surgeons.

At the initial meeting, the delegates selected a committee to draft a constitution, and selected five members to prepare a scientific program for the next meeting, which was to take place in July 1860 in Washington, DC. The group also selected W. W. Allport as the first president. During 1859-60, meeting details of organization were established and a constitution and bylaws were adopted. The outbreak of the Civil War forced the ADA to abandon plans for its Annual Meeting in 1861, but professional activities continued. The 100th anniversary meeting of the ADA took place in New York City in September 1959, and the United States issued a commemorative stamp on Dental Health for this occasion. This is the only American commemorative stamp honoring dentistry. The first day of issue was September 14, 1959.

(Scott 1135)
Dental Trade Cards XXIV

by Theodore P. Croll, DDS
& Ben Z. Swanson, Jr., DDS

DENTAL SNUFF circa 1890, Lithograph. 31/8” X 5”.
In the 1870s and 1880s, Dental Chewing Gum and Dental Snuff were developed and marketed by Dr. Robert Withers Morgan, an 1881 graduate of the Baltimore College of Dentistry. Many medical and dental benefits were claimed for these products. Dental Snuff is still being produced today, but no claims for therapeutic value are advertised. Christen and Christen reported about Morgan and his life’s work (Christen A.G., Christen J.A., Robert W. Morgan, DDS: U.S. Army Dental Corps, founder and creator of dental snuff. Journal of the History of Dentistry. 50[1]:3-7, March 2002).

Using **DENTAL SCOTCH SNUFF**, these brush-toting naked cherub-children are carrying maxillary molar hygiene to the extreme. This marvelous oral remedy not only “relieves Tooth-ache,” but also “cures Scurvy, neuralgia etc.” For people of the era who used snuff, they “ought to dip the DENTAL!” More claims included “prevents Decay, preserves and whitens the TEETH.” Today, 125 years later, manufacturers are still striving to find a product that can live up to such claims.
“Trattenbach: October 1914”
antique Austria-Hungary postcard, clearly dated October 1914, was signed by the Viennese painter and commercial artist Stephan Mautner (1877-1944). Created in vivid water colors, it depicts two men drinking beer at a corner table in a tavern located in Trattenbach, a small alpine village in Lower Austria, about 55 miles southwest of Vienna. The man on the left is leaning his head against his left palm and staring forward, appearing to be in deep contemplation. He wears the typical gray and green uniform of an enlisted man in the Austrian-Hungarian Army. The older, ruddy-complexioned, balding man on the right is wearing multiple layers of clothing and a red yarmulke (skull cap) on the back of his head, a sign that he is Jewish. He has a dark bandana carefully wrapped around his face, to support what must be an active dental infection in his left cheek. His left eye is drooping as a result of this malady. This poor fellow is intently staring at the soldier. Just four months earlier (June 28, 1914), Gavrilo Princip, a Serbian from nearby Bosnia-Herzegovina, had killed Archduke Franz Ferdinand, heir to the Austro-Hungarian throne, in Sarajevo. One month later, Austria-Hungary declared war on Serbia, which led to the beginning of World War I (1914-1918).

Germany and other nations joined Austria-Hungary in fighting against the Allies: the United Kingdom, France, Russia and the United States. The paper under the soldier’s right hand may contain an ominous message about the armed conflicts yet to come. It is likely that the contemplative soldier had just received orders assigning him to the Serbian front. During the late 1800s, anti-Semitism became a powerful force in European politics, especially in Germany, Austria-Hungary and France. Many anti-Semitic writers claimed that Jews were inferior to Germans and to other chosen people of northern Europe, collectively called “Aryans.” The older man with a dental problem could have said to his drinking mate, “I feel for you buddy, but how would you like to be a Jew with a toothache?”

This commercial, unmailed "Offizielle Postkarte" measures 3.5 x 5.5 inches.

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In 1919, a 40-year-old dentist who had secured his DMD from Harvard some fourteen years earlier, was admitted to Harvard’s medical school, on track for an MD. He was allowed to enter in the third-year class, and a few months before his graduation a clinic for the students was being held in the amphitheater of the Peter Bent Brigham Hospital. It was a most important clinic, being given by two of Great Britain’s most distinguished surgeons. “As the demonstration was proceeding, one surgeon in glancing up at the assembled students paused in disbelief and firmly grasping the arm of his partner, pointed directly at one of the students. These two British surgeons ‘with greater haste and dignity’ rushed up and physically dragged ‘the quiet, black haired little dentist’ down the stairs of the amphitheater. The lecturing surgeons present this dentist as the one who had taught the British surgeons the very technical skills that they were demonstrating.”

The “black haired little dentist” was Varaztad H. Kazanjian, who had been lauded as the greatest plastic and maxillo-facial surgeon in the world! This remarkable, fascinating and eminently readable book is the story of how he rose from the ranks of refugees fleeing the genocide of the Armenians by the Turks; how he worked long and hard hours in a wire mill in Worcester, Massachusetts; and how he ultimately devoted his time to the study of dentistry. His fame derived, however, from the outstanding dental, surgical and prosthetic work he performed on mutilated British soldiers on the Western Front in World War One.

When Dr. Kazanjian arrived in America in 1895, he went directly to Worcester, home to the greatest concentration of Armenians in the country. Most of his countrymen worked in a wire mill that supplied miles of wire for the barbed-wire fences that were dividing the West. But this life was not enough for the young immigrant and, in 1901, he enrolled in high school; this to be followed in 1902 by matriculation to Harvard’s dental school, from which he was graduated in 1905. While still a student, Kazanjian treated patients with cleft palates, constructing for them excellent prostheses. This early interest in the treatment of unusual facial and jaw deformities, writes Dr. Deranian, gave Kazanjian’s future life its singular direction. In 1909, his superb abilities led to his being appointed Demonstrator of Prosthetic Dentistry on the Harvard faculty.

When World War One broke out in Europe, it became quickly apparent that the British army had insufficient medical personnel to care for the great number of wounded soldiers. Thus, in 1915, a volunteer company of Harvard medical alumni, including three dentists, with Kazanjian as the chief dental officer, went to France to lend a hand.

Trench warfare was common throughout the Western Front and this led to an inordinate number of facial wounds. So long as a soldier was deep in the trench, he was relatively safe. But as soon as he lifted his head to shoot his rifle, he was apt to be hit squarely in the face. The problem was the none of the British physicians knew how to handle these
cases, save for covering the wounds with bandages. Into the breach stepped Dr. Kazanjian and with amazing dexterity, fueled by ingenuity, he developed wonderful techniques which restored these maimed men to a degree of normality. It is no wonder that he was soon referred to as The Miracle Man of the Western Front.

Upon his return to America and earning his MD degree, Kazanjian limited his practice to plastic and reconstructive surgery, becoming the most noted specialist of this field of medicine in the world. It was not until 1940 that Harvard created the first chair of Plastic Surgery and it was Dr. Kazanjian who was chose to become the first professor of this field. During his long years of practice (he continued until well into his 80s) he treated many well known individuals, most notable among them Sigmund Freud. Kazanjian died in 1974 at the age of 95, having garnered many medals and other honors as well as the thanks of the world of medicine.

It is fortunate, indeed, that the author of this wonderful book, himself of Armenian descent, personally knew Dr. Kazanjian, and thus was able to bring the character of this unusual individual to life. More than that, though, is the fact that Dr. Deranian is a top-notch historian of dentistry, and a fine writer. He spent almost twenty years researching the life and work of Kazanjian and the book is a tribute to his talent. As a biography, it can be read and enjoyed by everyone, even those without a medical background. But for a dentist or physician, it is an exciting journey through the life and work of a unique individual who shared their skills and interests.

The book is copiously illustrated, almost every page having pictures either of Kazanjian’s life, of the terrible travails of the British soldiers on the front, of the work done to return them to semi-normal life, and the ingenious devices invented and constructed to aid the unfortunates. Every chapter is followed by copious notes, and these are in addition to the extensive bibliography of primary sources, works in the field, comprising books, newspaper articles and articles culled from professional journals. It is a work of great scholarship, one deserving a place among the outstanding books in the fields of medical and dental history.

— Malvin E. Ring, DDS, MLS, FACD
Professor emeritus, School of Dental Medicine,
State University of New York at Buffalo
Author of Dentistry: An Illustrated History

*Miracle Man of the Western Front*
may be ordered from

Chandler House Press
P.O. Box 20100
Worcester, MA 01602

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Dr. Curt Hamann, CEO and Medical Director of SmartPractice, teamed with Dr. Ben Swanson, esteemed dental historian and “dental collector extraordinaire,” to create a visual extravaganza of dentistry postcards. This book is a veritable celebration of dentistry worldwide, as pictured on original postcards dating back into the late 19th century, when the “Golden Age” of postcards began. This easy-reading volume is packed with fascinating facts about dentistry’s history. The pages sparkle with superbly photographed color images of postcards from Dr. Swanson’s spectacular collection.


These represent a small sampling of the rich content of this attractive work. Besides the enjoyment any dentist or others in the profession will derive from this book, it will also be a delightful diversion for all of dentistry’s patients as it graces the bookshelves and magazine tables of reception rooms everywhere.

—Theodore Croll, DDS

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From the Archives: Vol. 1, No. 6 & 7

BULLETIN OF THE HISTORY OF DENTISTRY

issued monthly
American Academy of the History of Dentistry

EARLY DENTAL ADVERTISING ON DISPLAY

Fourty-two photographs of early dental advertisements, about half of Dr. Harold L. Faggart's collection, will constitute a display entitled "Dental Advertisements in Philadelphia Newspapers," at the 94th session of the American Dental Association, in Cleveland, September 28 to October 1.

Dr. Faggart has typed copies of all dental advertisements appearing in Philadelphia newspapers from 1738 to 1867.

The earliest advertisement was by William Whitebread in 1738. Dr. Tomb, a physician practicing dentistry, was the second earliest advertiser. Some well known names appear in these notices, such as Robert Woolfenden in 1767; John Baker in 1779; James Cardette in 1784; Leonard Koecker in 1813; L. S. Parmly in 1820; A. Plantou in 1824; J. F. B. Flagg in 1842.

PLASTIC SURGERY 100 YEARS AGO

The pioneer plastic surgeon Gurdon Buck is the real subject of a small book entitled Plastic Surgery at the New York Hospital One Hundred Years Ago (Paul B. Hoeber, Inc. 1953) by Herbert Conway, M. D., and Richard B. Stark, M. D. For a period of fifty years beginning in 1837, Dr. Buck was surgeon on the staff of the same hospital. He began the performance of oral plastic operations in the 1860's, and his work was supplemented through prosthetic appliances by the famous dentist Thomas Brian Cuning.

HISTORY OF DENTISTRY IN IRELAND

A lecture by R. A. Cohen to the dental students of Queen's University, Belfast, deals with the development of dental education and the British Dental Association in Ireland. This account is published in the Journal of the Irish Dental Association 10:7-13 May-June, 1953.

ROBERT ABBE AND ORAL PLASTIC SURGERY

Some of the operations illustrated and referred to in "Robert Abbe and His Contributions to Plastic Surgery" (Plastic and Reconstructive Surgery 12:41-58 July, 1953) are of interest to the historian of oral surgery. Abbe was born in 1851 and died in 1928.

FIFTIETH ANNIVERSARY OF BELGIAN JOURNAL

In celebration of its fiftieth anniversary, Revue Belge de Stomatologie, in its June issue, published a historical sketch of that journal by Dr. R. Douniau.
UNPUBLISHED LETTER FROM JOHN GREENWOOD TO GEORGE WASHINGTON

The following letter owned by Northwestern University Dental School has not been published earlier:

New York Jan 11 1799

Sir

Your letter of the 6th ult with the two enclosed Bills, containing fifteen dollars came safe to my hands for which I return you Thanks. I will rite and let you know if I remove from here and where to— as I mean to perform for you in my present professional line when I have done with every other person —

I am Sir your very humble

Servant

John Greenwood

Lt G. George Washington Es

P.S. I never make any Charge against you either in a book or Otherways.

On the reverse is the following endorsement said to be in the handwriting of George Washington:

From

Mr. Jn. Greenwood
11th Jan. 1799

EARLY VIRGINIA DENTISTS DISCOVERED

The history committee of the Virginia State Dental Association, headed by William N. Hodgkin, have been busy recovering the names of Virginia dentists of the post-Civil War period. One hundred names of dentists not previously noted elsewhere were found. (Bul. Virginia D. A. 30:33-34 June, 1953).

HISTORICAL SIGNIFICANCE OF DENTAL PERIODICALS

A paper on "The Historical Significance of Dental Periodicals" will be presented by George B. Denton at the meeting of the Association of Dental Editors, September 26, Hollenden Hotel, Cleveland.

DENTAL ORGANIZATIONS IN THE PHILIPPINES

Dr. Wilfredo V. Pormento contributed a "Brief History of Dental Societies in the Philippines" to the April number of the Journal of the Philippine Dental Association (6:11-15).
ERROR IN AUGUST BULLETIN

The letter from John Greenwood to George Washington in the August issue of the Bulletin was mistakenly designated as not previously published. It had been published in B. W. Weinberger's *An Introduction to the History of Dentistry in America*, vol. 2, p. 330, without indication of its source.

FATE OF THE FONZI MANUSCRIPT

The publication of several hitherto unpublished documents pertinent to the history of dentistry was suggested at the annual meeting of the Academy last year. Among these manuscripts was one by Giuseppangelo Fonzi, the inventor of individual porcelain denture teeth. The work was written in French and titled *Treatise on Odontology*.

According to Guerini, who wrote *Life and Works of Giuseppangelo Fonzi* in 1925, this manuscript with other objects belonging to the Italian dentist was still in possession of the Fonzi family at Orsogna in the Province of Chieti, Italy, and examined by Guerini. Only a few excerpts from the book were published by Guerini, however.

Recently, an interesting article was published by Arturo Mingoli, titled "Invenzione dei denti porcellanici di Giuseppangelo Fonzi," *Clinica Odontoiatrica* 8:201-218 July 31, 1953, with several illustrations. Relative to the Fonziana in question, Mingoli wrote:

Guerini, in order to intensify his knowledge of the life of Fonzi, went to Orsogna (Province of Chieti) where the relatives of Fonzi always had resided.

He received specific information and saw many documents, original manuscripts of Fonzi's, publications—all attesting irrefutably to the enormous work of his adventurous life and, above all, the claim which he had to be considered the inventor of porcelain artificial teeth.

Part of this precious material was acquired by Guerini as well as a large number of artificial teeth made by Fonzi. Guerini wished to acquire besides—without question of price—Fonzi's desk and a locked coffer, the key to which was lost—a coffer which undoubtedly contained objects and personal records of Fonzi and which the relatives had never ventured to open.
But Guerini's insistent request was not acceded to. This was a veritable calamity, because all was destroyed at the same time as the Fonzi dwelling during a bombardment suffered by the countryside of Orsogna in the recent world war.

It was Guerini's intention to give these objects, as well as a portrait in oil of Fonzi, to the Museum of Saint Martin of Naples, so that these relics would be exhibited as a permanent record and memorial of this great Italian inventor.

The loss of this manuscript and other evidences pertaining to the early history of dental porcelain may well illustrate, not only the destructiveness of war, but also the necessity of securing the wide publication of historical documents if a complete record is to be preserved.

Dr. John E. Gurley has suggested to the editor of the Bulletin that the publication of such documents would be a worthwhile project for cultural dental organizations such as the American College of Dentists.

NEW JERSEY'S PLAN FOR SECURING HISTORICAL DATA
In order to insure the preservation of historical material, the New Jersey State Dental Society, at its annual meeting, April 1953, adopted the plan recommended by its Committee on Library and History, of which Milton B. Asbell is chairman. The plan consists of four measures: 1) to house the historical records in the office of the society; 2) to inventory all material and to make annual records of additions; 3) to appeal to the membership to contribute material; and 4) to appoint historians for components and counties to collect material.

SOUTH CAROLINA CORRECTS ITS ORGANIZATION DATE
The organization date on the seal of the South Carolina Dental Association, appearing on the cover of its Journal, has been changed from 1870 to 1869. The editor, R. E. Cristmus, reports that the society's historian, N. W. Macaulay, is authority for the statement that the first meeting of the society was held in Columbia, November 10, 1869.

HISTORY OF DENTAL ETHICS

RECOLLECTIONS OF PAINLESS PARKER
A Sourcebook of Dental Medicine
Being a Documentary History of Dentistry and Stomatology from the Earliest Times to the Middle of the Twentieth Century.

by Gerald Shklar, DDS, MS & David A. Chernin, DMD, MLS
864 pages, hardcover

The aim of this book is to make available to the profession of Dental Medicine and other interested parties the extensive literature of the past dealing with the diagnosis, description, causes, treatment and prevention of oral diseases. Drs. Shklar and Chernin are presenting the original texts concerning the diagnosis and management of oral diseases ranging from ancient Egypt through the world of the 20th Century.

Many of the basic texts of the past have already been translated into English, French and German from the original Sanskrit, Greek, Latin and Arabic. However, a number of important texts have never before been translated into English. The authors are presenting all these materials to the English-reading professionals in medicine and dental medicine in this 864-page reference book.

Price: $90. Available from: Maro Publications
Maro Pub. Ltd., P.O. Box 145, Waban, MA 02468
www.maropub.com

Limericks With A Smile:
Dental, Oral and Facial Limericks of Yesterday and Today

by Joan A. Christen & Arden G. Christen

The authors have compiled 188 previously-published limericks related to dental, oral and facial themes; plus they offer an additional 384 personally-composed limericks. The humorous verses in this collection are at once bawdy, whimsical, ludicrous and cynical, and though simple in format, they communicate in few words their strong, sometimes paradoxical message. 159 pages with complete index.

Price: $20, postage paid. Available from:
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Indianapolis, IN 46240-3541 (US check only)

Intriguing and Eccentric Characters and Stories from the World of Dentistry

By Arden G. Christen & Joan A. Christen

In this 230-page book, the authors have glimpsed into the lives of 32 dental characters: professionals who range from the noble to the bizarre. Introducing this work is a chapter on one of the most memorable and controversial characters of all time, Dr. Painless Parker (1872-1952). All of these fascinating individuals have left indelible marks on their chosen profession. The stories from this collection may be inspiring or infuriating, ingenious or absurd, credible or questionable – but seldom are they dull.

Price: $20, postage paid. Available from:
Dr. Arden G. Christen, 7112 Sylvan Ridge Road,
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A Little Treatise on the Teeth:
The First Authoritative Book on Dentistry (1563)

by Bartholomæus Eustachius

One of the greatest anatomists of all time, Eustachius’ major studies remained unknown until their eventual Dutch translation and publication in 1714. Eustachius contributed substantially to the development of dental science. His conceptual advances concerning tooth development and function, based on anatomical dissections, were further buttressed by detailed plates of the musculature of the face, floor of the mouth, the neck, the tongue, and the roots and crowns of the teeth. In addition to giving us the first clear description of the dental pulp and root canal, Eustachius also conceived of the periodontal membrane as a gomphosis.

This volume presents the first direct English translation from the original Latin Libellus De Dentibus, and maintains the Latin and English texts on facing pages. Eustachius' observations are an illuminating precursor to 21st-century medical science, and still represent a timely and relevant reference for any practicing dentist.

Price: $60. Available from: Maro Publications
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Dr. Marc B. Ehrlich
1371 Beacon Street
Brookline, MA 02446 USA

Fax: (617) 278-6593

Checks (mailed applications only) should be made payable to the AAHD. All registration forms must be accompanied by payment, which may be made by credit card, US Money Order, US Bank Draft or check drawn on US Bank. Registration forms not accompanied by appropriate payments as outlined will not be considered as confirmed until full payment is received.