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Dr. Arne Foster Romnes

Dedication

In lieu of the regular "Message" I would like to dedicate this column to the memory of Dr. Arne Foster Romnes who died on July 28, 1974, following a short illness. A gifted educator, skillful clinician, and respected practitioner, Dr. Romnes participated in the formation of the Academy and was a staunch supporter of the principles and ideals for which it stands.

As a graduate of Northwestern University Dental School in 1931, Arne joined the faculty and progressed through the academic ranks. His first year at school was spent teaching Prosthetics and in 1933 he joined the Operative Department where he taught for 41 years. From 1952 to 1964 he was Professor and Chairman of the Department and maintained a standard of excellence in operative procedures which was respected throughout the world. During this period he also maintained a busy private practice serving many of the most prominent people in the Chicagoland area. Thus, he divided his time between academics and a practice oriented career. While many have attempted to do this, few have succeeded to the same degree as did Dr. Romnes. One-hundred percent effort was given to both endeavors and he never jeopardized one job to meet the demands of another. This disciplined approach characterized all of his professional activities. No lecture was ever presented without meticulous preparation of notes and visual aids. Many aspiring dental educators have been able to profit immeasurably by carefully observing the preparation and method of presentation which Dr. Romnes used in his school lectures and the seminar programs which he gave throughout the country.

As President-elect and President of this Academy, Dr. Romnes displayed his organizational ability and leadership qualifications. The Academy prospered and his many friends rallied to support his efforts. This was in 1963 and 1964, a

period when gold foil was taught in virtually every school and a requirement on many State Boards.

The activities of the Gold Foil Academy were well known and the educational contributions made during the clinical and lecture sessions at the various schools was significant.

In 1964, Dr. Romnes suffered a serious stroke which removed him from his professional activities for almost a year. Overcoming the problems associated with this serious affliction, however, he returned to private practice and teaching. Throughout this period he retained his interest in and loyalty toward the American Academy of Gold Foil Operators as well as the other organizations to which he was dedicated. While the direction of this Academy passed on to new leaders. Dr. Romnes attended all the meetings and maintained an active role on committee projects and offered sound advice at the many executive sessions. He encouraged and supported all of his successors and maintained close personal contact with the many friends he developed through association within the Academy.

A number of these friendships extended beyond professional limits and carried over into the sport world. Arne loved golf, football, and fishing. He would always find time for a fishing trip to Canada with his buddies. Even the Indian guides came to appreciate his warmth and good humor and would look forward to his annual return and the talk of his fishing prowess and guiding abilities. While Arne didn't always catch the biggest or most fish, no one could top his stories or the pleasure which he enjoyed from this type of fellowship. Our professional colleagues will not be alone in mourning the loss of one of their distinguished leaders for this will be shared by all of the people who were touched by this great man. The many contributions which Arne Romnes has made to the profession will remain as a testimonial to a life which will live on in the hearts and minds of his family and friends.

An Arne F. Romnes memorial fund for students has been established at Northwestern University Dental School to provide the opportunity for needy students to pursue the course of study leading to a degree in dentistry.

Clifford H. Miller

J. B. Veale, Jr.

The Beginning of Wisdom is the Ability to Call Things by Their Right Names . . .CONFUCIUS

Probably one of the biggest problems facing the individual practitioner of dentistry today is that of placing things in the proper perspective for consideration. The fact is that most dentists are still basically too shy about the vocalization of dentally-related problems. We have been brainwashed to think it unnatural or shameful to be anything but idealists.

The realism of trying to cope with the complexities of a dental practice in this day and time is making more of us acutely aware that we had best take a stand, or prepare to be stacked into neat little regimented piles by those who are more bureaucratically oriented.

The situation is somewhat reminiscent of an old joke concerning a businessman, who, having paid out $1,000 for a parrot he was assured could speak five different languages, gave instructions to the pet shop to deliver the bird to his home that very afternoon.

Arriving home that evening full of anticipation, he asked his wife whether the bird had been delivered. Yes, it had. "Where is he?" asked the businessman.

"In the oven," his wife replied.

"My God, in the oven!" said the business man. "Why, that bird speaks five languages."

"Well, said his wife. "Why didn't he speak up?"

The moral is that though not many of us speak five languages, if we dentists wish to avoid a roasting, we had better be a little more outspoken with the one we have. Unless we do learn to speak up regarding those things which are important to our present as well as our future, our prospects may not be much better than those of the bird!

I do not suggest that it isn't of the utmost importance to preserve and promote the idealism so vital to our professional outlook, but I do contend that unless our feet are planted solidly on a foundation of realism, then all the

Dr. Veale *graduated from the University of Texas Dental School and practices in Pampa, Texas. He is affiliated with the Edward H. Angle Orthodontic Society, Tweed Orthodontic Society and the American Association of Orthodontists. He has held office as President of the American Association of Dentists, Vice President of the Texas Dental Association and Editor of the Texas Dental Journal.*

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rhetoric in the world aimed at the preservation of those ideals will be wasted.

We are in imminent danger of collectively clinging so tenaciously to a set of ethical ideals which we are constantly reminded are our "obligation to the consumer", that we assign our individual determination of future rights and goals over to the care of others whom we might consider to be motivated and acting in our behalf, only to often find later that we have misplaced our trust.

That the problem is not one held exclusively by dentistry is illustrated well by a passage in Isabel Paterson's book, "The God of the Machine"*, opening the chapter, "The Humanitarian with the Guillotine," she wrote:

"Most of the harm in the world is done by good people, and not by accident, lapse or omission. It is the result of their deliberate actions, long persevered in, which they hold to be motivated by high ideals toward virtuous ends. . . ."

Every individual at some time or another has the feeling that there should be some centralized authority which can control human energy and run things more properly. Through the centuries every type of authority has been tried and all have failed for the simple reasons that only an individual can generate human energy, and only he can control the energy which he generates. The failure to understand these simple facts has resulted, at different times in the civilized history of man, in complete stagnation of human progress even in such fields of basic need as food, clothing and health. No progress can be made through force . . . free men simply do not respond!

The message which I deliver, therefore, is oriented to the recognition and development of the individual human being . . . in this case, the individual dentist. Though largely ignored as a significant factor by our people planners, the voluntary good will of the dentists of this nation is an absolute necessity to progress in better dental health. To discuss welfare and responsibilities of our profession as a whole, instead of speaking of the individuals of which it is composed, is a simplification and a fantasy . . . to believe that the dental profession as a unit is capable of any action not endorsed, or at least tolerated by the individual members, is to completely ignore human nature, and can only serve to mislead in the long run. It is in the other direction we must seek. The ADA, or any other organization, will find that when that day arrives that their actions no longer are truly representative of the members, or that, in their zeal to serve the collective, they have, instead, sacrificed the individual, then there will be a realization that a disastrous misdirection of purpose has been allowed.

If we, as a profession, wish to make the most of the pool of human energy which constitutes our potential strength, it is necessary to reckon with the independent nature of the individuals with whom we deal. What will it profit us to create the greatest health machine on earth if, in the process, we destroy the will of the individual dentist to deliver it?

It is a worthwhile exercise to keep before us the visions and ideals toward which we aspire as a group. To constantly remind ourselves of the ultimate goal of achieving the ability to offer to the world that measure of good dental health which the world chooses to accept. However, I am enough of a realist to believe that one of the prime functions of this organization must be to advance the dentist. I am enough of a realist to know that every man will produce at his best when one of his goals is self-improvement. I certainly find no fault with a man

*Isabel Paterson, *The God of the Machine* (Caldwell, Idaho: the Caxton Printers, Ltd., 1964) p. 247

whose personal ideas and ambitions are to do good unto others. But, as a realist, I feel strongly that no man has the right to give away that which is not his to give. Neither do I hold with those whose contentions are that governments or organizations may so act.

At this point, we must decide just how practical it is to change our basic approach to the delivery of oral health and still preserve the impetus given to this delivery by the ability to practice in freedom. If we do not preserve for the individual his right to practice in freedom, we then sacrifice the reality of our knowledge of good individual dentistry to the illusion of trying to deliver the same quality of care on an assembly line basis.

Let us be careful not to emulate the man who offered to give up his right arm to become ambidextrous!

We must not fall into the currrent vogue of belief that change, per se, is desirable. Most often we merely end up with a new set of problems, a new class of rulers or a new set of injustices. To institute vast and occasionally irreversible changes is quite often a risky or even dangerous undertaking. What better example can we use than that wonder drug of the "sixties" which was introduced universally without adequate foreknowledge . . . Thalidomide. Let us make sure that in the rush to force our health care on the masses that we don't deliver instead a dental equivalent to Thalidomide!

The greatest danger which faces us, as individuals and as a profession, is the altruistic principle of self-sacrifice under the guise of kindness, generosity or charity. It is a truly dangerous idea to our future if we believe that the needs of some men constitute a first mortgage on the lives of others, and that everything should be sacrificed to that vague entity known as the public interest. The ancient Aztec priest had sure knowledge of "the common good" when he thrust his knife and delivered the bleeding human heart of a sacrificial victim to his pagan god. I speak in the same context when I caution against the unwitting sacrifice of ambition, drive and energy of the individual dentist to the vague spectre of "universal public interest."

In the final analysis, there will be no progress except through the more effective utilization of individual energies. I do not believe it is true that selfless service to our patients is our only goal, that concern for the needy is our only motive and that the public interest is our only justification for practice.

Regardless of the circumstances, when he accepts a patient for treatment, the dentist accepts a responsibility for that patient, and, regardless of the circumstances, when one of our professional organizations accepts us as members, they must accept some semblance of responsibility for our well-being and our future as individuals.

If we accept the principle of mob rule without rights to individuals or minorities, then we lose our identity. We no longer question the fact of enslavement of our profession, but only who shall enslave it. Instead of a battle for professional freedom, it becomes a battle over the choice of masters. Can you imagine an organization such as the United Auto Workers saying that they are the servants of General Motors? Of course not. No more than they are the servants of General Motors are we the servants of the public interest.

I am sure that at some time or another we have all deplored the leadership tactics of John L. Lewis or some other labor bosses, but we've never had to wonder who they were working for!

The public has no more of a "right" to our services than you have a "right" to walk into a showroom and take a new automobile. Each, however, must be made fully available to anyone who wishes to seek and offer fair exchange for them. I doubt that the average automobile mechanic would any more demand our sacrificial services than he would expect to render his own on that basis.

This is the opposite of the concept of total service which, in the words of the altruists, means unrewarded, self-sacrificial, unilateral giving. Oddly enough, this "service to society" theme is being echoed most loudly by many of those who will suffer most visibly from it. Intellectually bankrupt and deceptively shy, we furtively work for our self-interest, but we become ashamed to say so. Let's get away from the concept of unrewarding service. If we do not, we merely become the servants of those for whom we work and who consume our products, and their welfare our only concern. Then, why shouldn't they dictate the terms and conditions of our work? We dentists are *not* the servants of our patients. We are traders in a free society like everyone else, and we should bear our title proudly considering the importance of the service we render.

In pursuing his own career, a doctor has to consider the welfare of his patients in order to be successful, but that relationship is not reversed. We cannot sacrifice the dentists' interest, desires or freedoms to whatever the patients or their politicians might decide their welfare to be. We fear *not* to conform to that which we have been told is so! I offer the following quote from Jack Nevin, "The opposite of bravery is not fear, it is conformity, going along with the crowd, doing the popular thing, fitting in with the group, avoiding conflict and unpleasantness."

How many men do you personally know of original unquestioned integrity and high ideals, who have chosen to serve this profession on a basis of conformity rather than challenge?

The advocates of the partnership in health laws are assuming that the people now should demand our services . . . not as a charity, but as a right. To accept this course becomes a matter of professional suicide. The profession's existence depends on a recognizance of certain facts. You cannot give a person health . . . dental health, mental health or physical health. We may teach him to acquire it, we may make it available, but we cannot give it to him.

The long-range effects of some well-meaning but often short-sighted people are all around us, if we choose to recognize them. An official of the Shamrock Oil and Gas Company recently related the story of a hypothetical gathering of bureaucrats about twenty years ago who were called together to find ways of *eliminating* the abundance of energy the United States once had.

The oil company chief said that bureaucrats would have proposed several courses of action to reduce the energy surplus. The proposals from such a conference might include the following recommendations:

1. Set a ceiling price for natural gas so low that no other fuel can compete with it and gas will be used for everything.
2. Ban the burning of coal with high sulfur content and restrict strip mining for coal.
3. Turn the administration of atomic power plants over to a Federal agency that makes licensing such operations almost impossible.
4. Keep prices for crude oil artificially low while other costs go up.
5. Require automobiles to have inefficient engines.

6. Let environmental objections block the Alaskan pipeline and offshore petroleum exploration.

7. Blame a conspiracy among major oil companies for the results of all of the above actions.

Those policies, whether or not planned by mythical bureaucrats, will produce an energy shortage, and that is exactly what *has* happened.

Now, the same great minds which have solved such knotty problems as the energy crisis, the housing shortage, highway construction, mass transit, postal system, the shortages of teachers and engineers and others too numerous to mention or nauseous to recall, are poised to help us out of our dilemma . . . they are going to solve the health care crisis!

The health professions are currently being treated to a news media version of lynch-law, but the excesses of the media and media people have become so commonplace that we seem to have lost our capacity for outrage. The most contemptible feature of their routine performance is the self-righteousness with which they wield their double standard. They merrily exploit and connive at the violation of grand jury and congressional secrecy, confidential private conversations, lawyer-client relations, and military discipline, receive and make public stolen governmental and private documents, broadcast self-serving slander, unsupported gossip, unchecked rumor and accusations. They blast ahead without worry about what the consequences may be in terms of institutional disarray, National security, or personal tragedy. They transform deserters, rioters, subverters, turn-coats, draftdodgers, and American-haters into innocent victims and folk heroes, and they continue, in this their standard pattern, at the same moment that they are filling column after column with the most fulsome cluck-clucking heard this side of Elmer Gantry, about the "breakdown of morality" in American society and government, and the horrible sins and crimes of the scoundrels in the Nixon White House. They denounced the President for not telling, immediately, everything about everybody,— in the very same breath that they lobby for a shield law that will exempt a media-person from telling anything about anybody. They sang the praises of President Eisenhower when he ordered his aides to refuse to testify to Joe McCarthy's Senate Committee, with the same vigor that they condemned President Nixon for suggesting that direct personal discussion with the President should be immune from scrutiny by Ervin's Committee.

And yet, how many leaders of our health professions have chosen to publicly speak out against some of the flagrant abuses of the truth which the media have chosen to exploit?

Are we so totally without defense of our own rights as individuals, or are we so thoroughly indoctrinated and intimidated by the modesty of false idealism, that we find it too embarrassing to reply, publicly? Must we forever retire to the privacy of our own house of delegates to reluctantly and barely pass a resolution amending our ADA constitution to state that one of the objectives of that association will be to promote the interest of its own members? And that only after it had been amended to "make it less objectionable?"

It is totally useless for a flock of sheep to convene and pass a resolution which favors vegetarianism if the neighboring wolf is still a meat eater.

The resolution to which I refer was the Louisiana Resolution, 1972, which

was passed last year by the ADA House of Delegates. But only after meeting the objections of some dewy-eyed delegates that "a professional organization which promoted the interests of its own members would lose esteem in the eyes of the public!"

It is my feeling that if the public knew we belonged to an organization which did not hold our interests and welfare to be of some merit, we might just as easily lose esteem, but for stupidity, not avarice!

Social conscience is not the synonym for stupidity.

All of this leads the mind, quite naturally, to the events of this past year concerning unionism of both medical and dental groups.

In the typical type of knee-jerk response of such organizations, the American Dental Association has recently issued all kinds of statements, and bulletins, and unleashed speakers by the dozens, and thoroughly inundated its membership with information showing the futility of marching in picket lines, the illegality of collective bargaining for self-employed, the dire consequences of strikes, and so forth.

In typical, and predictable, fashion they have completely missed the main reason that the membership turns to such concepts — it is, very simply, that they seek the security of a group which will be, unquestionably, unashamedly and openly on their side of the table when the chips are down.

These men aren't seeking pay increases, shorter hours, more coffee breaks or cleaner restrooms — most can provide all these if needed by simple changes in their routines or offices — no, what they seek is the security of knowing, while they tend to those activities which are important to their personal ambitions and practices, that association employees are not busily destroying professional futures, as they seek their own advancement or goals.

As an example, consider the series of problems many of our colleagues have experienced with the Aetna Insurance Company's dental policy. I have never seen the policy, but am informed that it has many disappointments for the policy holder in its methods of compensation. I have never submitted a claim under it, but am assured by those who have that there are qualifications and restrictions which are not in the best interests of dentistry. The House of Delegates of the ADA considered and passed resolutions aimed at the problem — but their subsequent actions have been feeble. The sheep have passed a resolution, but the wolf has obviously not agreed to it!

Surely, for example, the American Dental Association, representing over 90% of all dentists in the U.S. could, by the awesome power granted it by just such numbers, act to force insurance companies such as Aetna Insurance Co. to sell policies better designed to serve both the public and the profession.

In the absence of such action — and this is just an example, not the whole story — I predict that unions, guilds, or whatever name you wish to call them, will eventually supplant the ADA as the representative of its members in all matters pertaining to their benefit or protection as professionals.

ADA will continue to be a scientific research and educational leader in its field, but will surely suffer a steady erosion, as the lack of concern for its membership becomes recognized.

As preservation becomes paramount, a union of dentists will emerge. It will serve no scientific purpose, nor be of value in advancing scientific knowledge,

but will be able to become the balance of power between the ADA and the government, third parties, unions and such other groups as may arise. It will be openly and frankly pro-dentist, and as such, not suffer from loss of esteem, but rather benefit from respect of purpose.

I don't think it is news to anyone that the principle of vertical membership in the ADA and state and local components is being challenged in the courts. The integration of interlocking membership has now become so complete that attendance at small study clubs is now dependent on participation in the master organization.

There is little doubt that the suits will be judged in favor of the individuals who are challenging the right of the ADA to compel them to pay dues to it, so that they might belong to their local county society, or to attend a class reunion at their state meeting. The arguments have been heard before by the courts, in the American Medical Association, and have been decided in favor of those who would choose for themselves to what organizations they would belong, or to whom they would pay dues. The only real question is how long the ADA can stall off the final accounting. The time has come when each individual should re-examine precepts, re-evaluate goals, and renew his efforts on behalf of denistry, and it is well beyond the time when our professional organizations should demonstrate their responsibility to the dentist-members.

According to philosopher George Santayana, "Fanatacism consists of redoubling your efforts even when you have forgotten your purpose."

I submit to you that some of our efforts in our organizations have become so fanatical in their sacrificial approach to the dental health care of this nation that we have forgotten that one of the purposes of our organizations must be to encourage and promote the well-being of the provider of that care. In the same vein that "what is good for general Bullmoose is good for the country," I firmly belive that what is good for the individual dentist will prove to be ultimately best for American dentistry.

I close with a prayer used by Peter Marshall, the well-remembered Chaplain of the Senate of the United States:

> *"Our father in heaven, give us the long view of our work and our world. Help us to see that it is better to fail in a cause that will ultimately succeed, than to succeed in a cause that will ultimately fail . . ."*
>
> *Amen*

Lyle E. Ostlund, D.M.D.

Improving the Marginal Fit of Cast Restorations

Rarely do castings fit their preparations with the same marginal intimacy as the wax patterns fit their dies, even though the dies from which dental castings are waxed are accurate replications of the prepared tooth. This is understandable because of difficulties encountered in compensating for the needed expansion factors and because of difficulties in controlling wax stability during pattern removal and investing. It is possible that these two variables must be considered as inherent problems in cast restoration techniques, and must be corrected for in cavomargin finishing procedures, providing that the casting-tooth discrepancy at the margin is not greater than two to four thousandths of an inch[1] (approximately 50 to 100 microns), depending on the hardness of the alloy used, its elongation factor and its burnishability.

Carefully detailed techniques in cavity preparation margin finish, accuracy in impression registration, die formation, and waxing and casting procedures eliminate most factors that are adverse to the accuracy of fit, but no matter how careful and detailed the procedure, there are factors that require some form of relief of the internal surface of the casting if preparation-casting adaptation is to be optimal. This internal relief can be accomplished by grinding, painting the internal of the die with a layer of lacquer, electrochemical milling, or acid etching.

The problems in cast restoration fabrication that create the need for internal relief of the casting can be grouped into two general categories: casting flaws on the interior of the pattern, and the need to provide space to accommodate the cementing media and other linings placed in the cavity preparation prior to cementation.

One of the objectives in waxing dental patterns is to adapt the wax closely to the die so that the internal surface of the pattern is an accurate expression of

Dr. Ostlund *is a general practitioner in Everett, Washington and is on the faculty of the University of Washington as Associate Professor in Restorative Dentistry as well as Lecturer in Continuing Dental Education. He is affiliated with the Hampson-Ferrier Gold Foil Study Club and the Cast Restoration Study Club.*

Photomacrographs in this article were made by Cliff Freehe, Department of Dental Photography, University of Washington, Seattle.

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the preparation, not only at the cavo-surface margin but also of the internal detail. When this kind of adaptation to all of the preparation detail is accomplished, it can be reasonably assumed that such detail will be forthcoming in the casting. In fact, it is the closeness of fit that is desirable to make a restoration finishable. However, upon cementation and subsequent finishing procedures, visible cement margins often become apparent, presumably because no provision has been made for cement film thickness, approximately 35 microns in dimension.[2] Inasmuch as no accommodation has been made for this cement layer to cushion the restoration from its preparation, the casting cannot come into the same contact relationship with the tooth as existed before cementation. Affording internal relief, with the exception of a narrow band around the cavosurface margin, will allow space for the cement, yet not effect the external fit. This procedure will allow the cement to be pinched off at the sharp

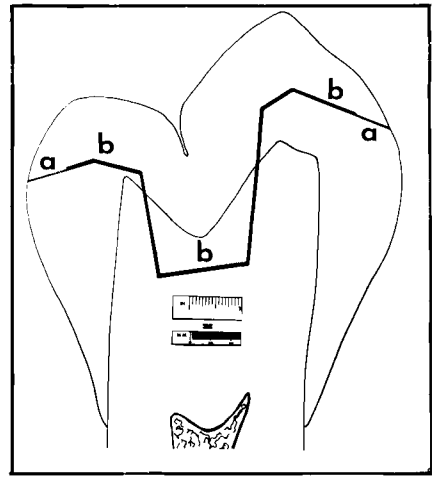


Figure 1. *Schematic buccolingual section of lower premolar with cusp-covered mesioclusodistal inlay restoration. (a) Internal margins near cavosurface unetched denoted as single light line. (b) Bold line on internal of casting acid etched to accommodate cement thickness.*

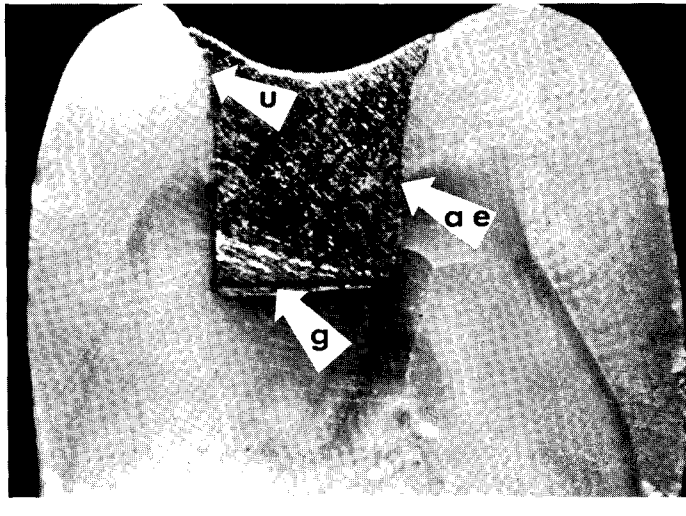


Figure 2. *Photomacrograph of buccolingual section of lower premolar with cemented mesioclusodistal restoration. (u) Unetched cavosurface margin at occlusal bevel allowing complete closure of margin. (ae) Acid etched buccal wall to accommodate cement, approximately 0.01 mm in depth. (g) Relief over pulpal for thermal barrier, ground with abrasive disc, approximately 0.2 mm in depth.*

delineation between the casting and the tooth margin as the restoration is finally set to place and finishing commences (see Figures 1 and 2).

This relief should exceed slightly the space needed for cement thickness. It should also allow for any other intermediary, such as cavity varnish or cavity medicament. The relief should be uniform in thickness and not be so great as to destroy the quality of strength that is necessary to retain the cemented restoration, inasmuch as cement strength diminishes approximately one-third as the thickness of cement increases from 20 to 140 microns,[3] a fact to consider before grinding indiscriminately the internal surfaces of castings or painting the internal surface of the die with thick layers of lacquer of unknown dimension. Furthermore, relief should not destroy any of the intricate cavity details engineered into the preparation; such features are deemed as essential to resistance to displacement (see Figure 3).

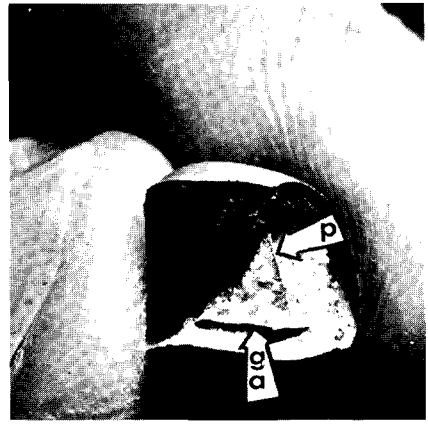
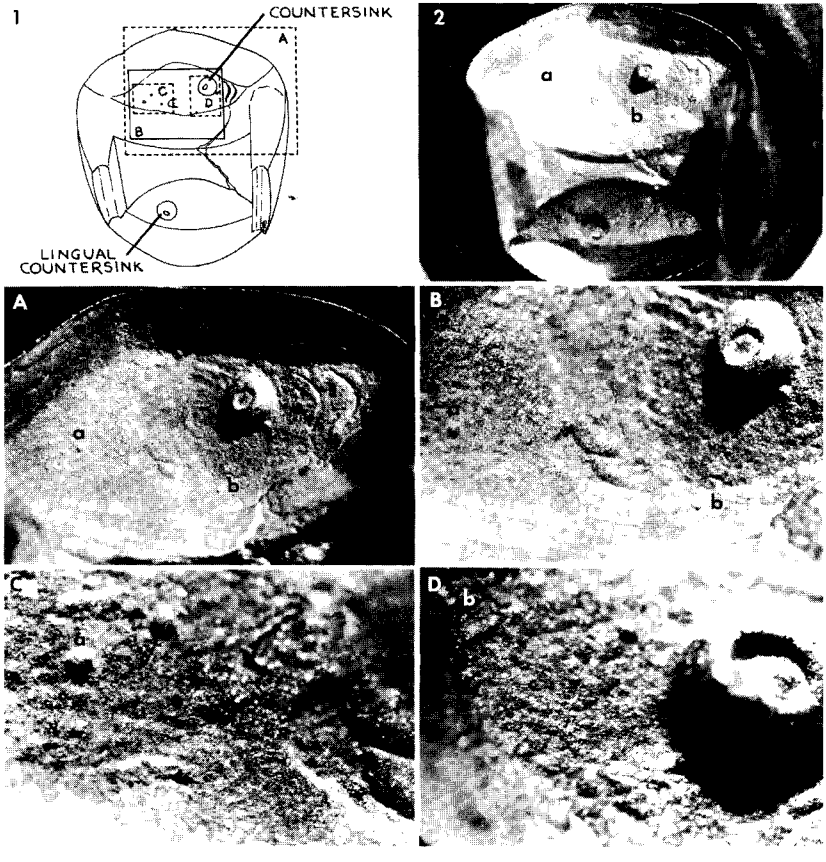


Figure 3. *Internal detail essential to retention is retained after etching. (p) Linguopulpal and (ga) acute gingivoaxial line angles are sharply defined as instrumented into the preparation.*

Compensating for cement film thickness, by relieving the entire internal surface of the casting with the exception of the cavo-surface margin, also serves the purpose of helping to eliminate casting flaws, some of which border on microscopic discrepancies. Because many flaws are microscopic they are not recognizable by unaided vision. However, under low magnification with a binocular dissecting microscope, it is not uncommon to see flaws in the nature of bubbles, even in vacuum invested patterns.[1] If these bubbles congregate in line and point cavity angles, the casting cannot be easily set into its crushable stone die (see Figures 4-1 and 4-2). Furthermore, bubbles collecting in line and point details are not as readily seen as those bubbles free-standing on smooth surfaces, and likely will not be removed.

Other than microscopic flaws on the internal surfaces of castings, there are wax pattern flaws that, although not microscopic, cannot be seen. Slight undercuts, and imperfections that result from rotary and hand instrumentation in cavity preparation, do not allow the wax to shear cleanly as it passes over these irregularities on the vertical walls. Rather, the wax smears and streaks drastically when it warms (see Figure 5). These markings in the withdrawn pattern do not reflect the true wall form, but are cast nonetheless into the restoration unknowingly and cannot be recognized as errors unless, upon trying and removing the casting from its stone die the die is abraded (see Figure 6). Rather than relying on such "hit and miss" techniques, the simple and routine method of etching the interior of castings will do much to eliminate imperfections without destruction of necessary internal details, and will make complete and final placement of restorations easier, even those with a complex inner design. It will also improve casting-tooth margin relationships (see Figure 7).



Figures 4-1 and 4-2. (above) *Schematic drawing of photomacrograph 4-2 of casting outlining areas of greater magnification. Although vacuum invested, bubbles of varied sizes in Figure 4-2 are visible at (a) and (b). Magnification approximately 12X. A. Enlarged photomacrograph of schematic drawing area "A," Bubbles (a) and (b) are 65 μ and 35 μ, respectively. Magnification approximately 20X. B. Area "B magnified approximately 35X. C. Magnification approximately 65X showing bubble at (a) distinctly. D. Magnification approximately 65X showing bubble at (b) and investment surrounding it. The bubble immediately adjacent to the buccal countersink can be seen by the naked eye, whereas the bubble at (a) is borderline, and that at (b) cannot be seen except under magnification.*

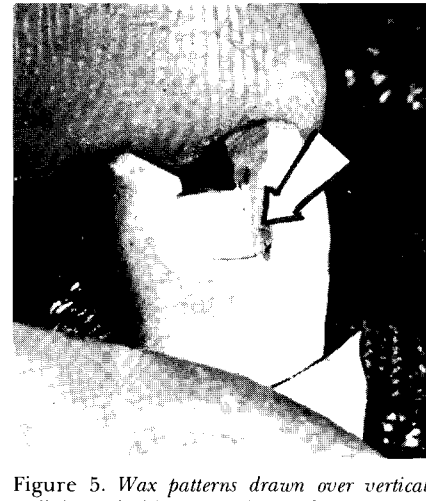


Figure 5. *Wax patterns drawn over vertical wall irregularities cause internal casting imperfections.*

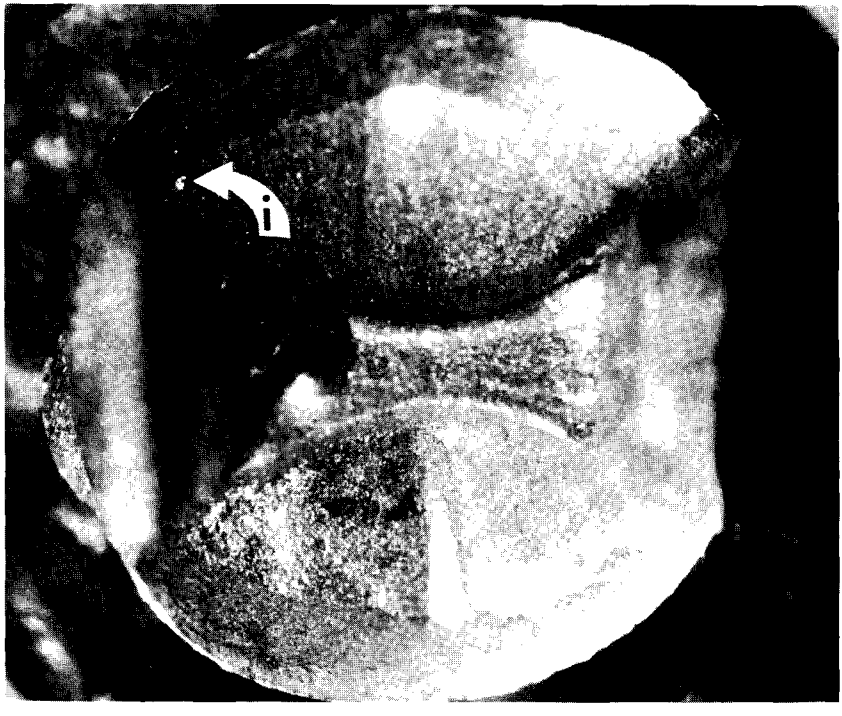


Figure 6. *Undisclosed investment left in buccoproximal line angle will be dislodged during acid-etching.*

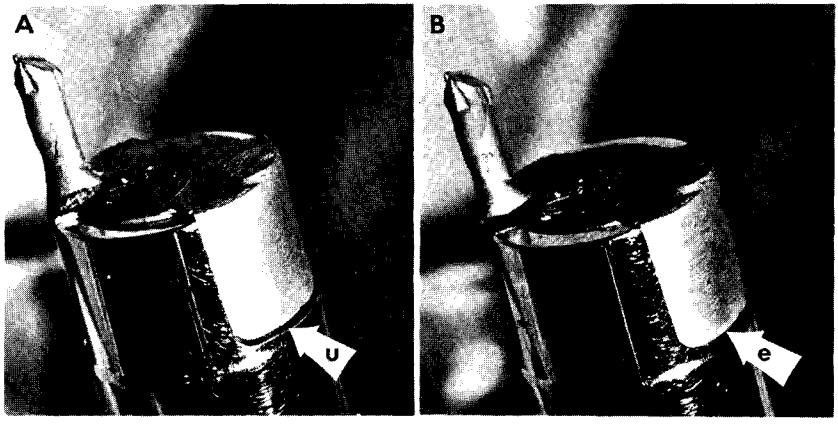


Figure 7. *Castings made on steel dies using varied techniques and investments all failed to seat completely unless grossly overexpanded. Those castings failing to seat fully were too tight on the axial surface just gingival to the axiopulpal line angle. In "A," the unetched casting had a gingival margin opening of 0.3 mm. In "B," the same casting etched to a depth of approximately 35 millimicrons seated completely at the gingival margin.*

The use of acid to relieve dental castings is not a new idea. Originally, aqua regia was used. However, to be effective, it should be freshly mixed just prior to its use.[5] In searching for an etching solution that could be mixed in quantity and stored for periods of time, yet remain stable and effective, a solution labelled as "Etching Solutions for Non-Ferrous Alloys" with the following formula was found:[6]

Distilled Water .....6 parts
Hydrochloric Acid .....5 parts
Nitric Acid .....1 part

The acids referred to must be of reagent quality and concentrated. The resulting mixture can be stored in either glass reagent bottles with ground glass stoppers, or in polyethylene containers for long periods of time without untoward deterioration.[7] It must be emphasized that this solution and its gases are extremely irritating to living tissues, and corrosive to most metals, and as such should be used in a ventilating hood or where there is adequate movement of air.

In the use of this solution as an etchant for cast restorations, it is imperative to understand that the solution attacks with equal vigor any exposed surface of metal, and therefore all surfaces that are to remain unattacked must be protected. A suitable protective coating, easily applied and removed, is dental sticky wax. Preferably its color should have high contrast with the metal to be etched, so that its placement can be easily directed and seen. It should also have a high melting point inasmuch as the acid solution is maintained at a temperature well above normal room temperature during the etching period, and any softening of the wax might release the wax from the casting at the critical cavomargin with disastrous results. To assure that the wax adheres to the casting, the casting must be dry and grease-free. For most Class II and IV inlays, and all

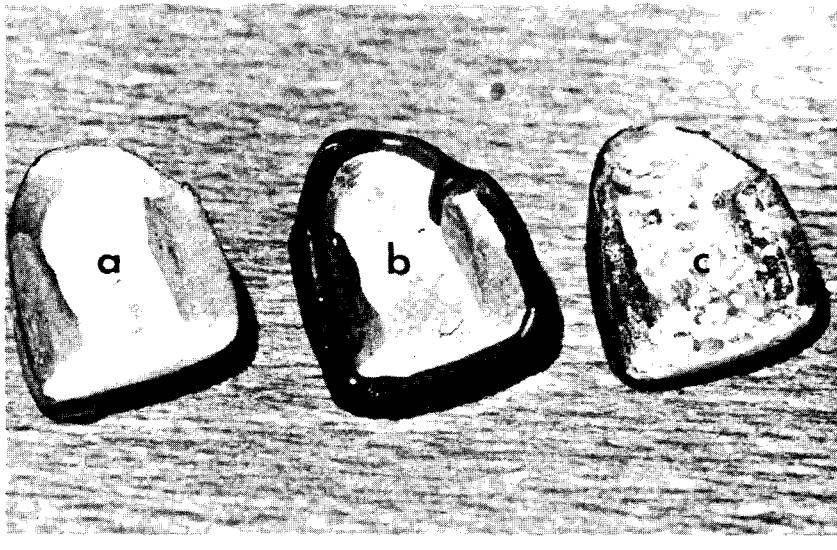


Figure 8. *Casting (a) as it appears after pickling and before etching. Center casting (b) with margins and external surface covered with sticky wax prior to immersion in etching solution. Etched casting (c) appears mottled as a result of crystal structure of alloy. Margins appear the same as castings on far left.*

crown types, whether single restorations or multiple retainers for fixed partial dentures, the sticky wax is applied to the entire external surface of the restorative unit first, and then a narrow collar is applied around the entire internal of the casting about 0.75 mm wide (See Figure 8).

Control of the wax coverage just internal to the cavosurface margin of the casting is critical to the effectiveness of etching, marginal fit, and retention of the restoration. If the wax were not confined to a narrow collar of approximately three-quarters of a millimeter and allowed to run onto the axial surfaces of the casting, these areas would not be relieved, and as such the casting would conceivably be held up on the unetched axial area. On the other hand, a necessary part of casting retention is the concept of the restoration's impinging on the tooth preparation, particularly at the cavomargin and slightly interior to it. As a result of a collar about 0.75 millimeters that masks out the cavosurface margin and slightly beyond, the etchant cannot attack this decisive area, essential to both marginal integrity and to frictional fit, so that in its final set position the casting intimately hugs and grips its counterpart in the preparation. This allows a maximal closure of the margin and aids in resistance to displacement, both to tipping forces and to tensile stresses on the casting.

After the casting has been satisfactorily coated, a small portion of the nonferrous etching solution is poured into a wide mouth test tube with enough solution to cover only the casting or castings. This test tube is then placed in a water bath whose temperature can be held constant and at the suitable level. Chemical activity can be controlled on a time/temperature basis, activity increasing with a rise in temperature. For most gold restoration alloys, it has been found that enough relief is provided by allowing the castings to etch for ten minutes at 46°C (115°F). As the accompanying chart shows, different dental alloys etch at different rates, presumably on the basis of the metals comprising the alloy (see Figure 9). Furthermore, it has been found that the newly rolled ingot of gold will not etch as rapidly as a cast ingot of the same alloy. This is possibly the result of surface irregularities due to the graininess of the casting investment in the casting mold.

As this layer is attacked and dissolved away, the underlying stratum is exposed where subsurface porosity is likely (and because of its porosity, chemical attack is more pronounced). Therefore, depending upon the type of alloy being etched and the amount of relief desired, the time/temperature relationship can be varied to deliver the desired result. Once this relationship has been established, it can be duplicated time and again with consistent results, an important factor to the precise marginal fit of the restoration.

As chemical activity commences, the solution begins to yellow. If castings are inadvertently left for an unduly long time, the solution changes from yellow to reddish-brown, and even to brown-black. Fortunately, the solution is self-limiting in its action if used in small quantities, a few milliliters. As it attacks the casting, the acid mixture forms complex metallic salts which diminish its acid activity until it is no longer effective as an etchant.

After the prescribed length of time, the casting is removed from the used solution, the solution discarded and the internal etched surface of the casting is scrubbed under cold running water with a soft toothbrush and soap. It is important that cold water be used to prevent the wax from becoming warmed and then smeared onto the etched surface, making the removal of the etched

SURFACE THICKNESS REDUCTION OF DENTAL CASTING METAL USING NON-FERROUS METAL ACID ETCHANT* (0.001″ = 25.4μ)

METAL SPECIMEN	IMMERSION TIME (MINS)	BATH TEMP F°	SURFACE AREA EXPOSED (MM^2)	AMOUNT OF ETCHANT (ML)	AM'T ETCHED (INCHES)
MODULAY+	10 MINS	116°	70 MM^2	1.0 ML	0.0006 IN
MODULAY×	10 MINS	116°	140 MM^2	2.0 ML	0.0015 IN
MODULAY	15 MINS	116°	90MM^2	2.0 ML	0.0008 IN
MODULAY	20 MINS	116°	80MM^2	2.0 ML	0.0012 IN
MODULAY	30 MINS	116°	80 MM^2	4.0 ML	0.0019 IN
MODULAY	45 MINS	116°	60 MM^2	6.0 ML	0.0029 IN
MODULAY	60 MINS	116°	70 MM^2	7.0 ML	0.0032 IN
MODULAYϕ	10 MINS	116°	70 MM^2	5.0 ML	0.0013 IN
SPEYER 21δ	10 MINS	116°	70 MM^2	5.0 ML	0.0016 IN
SPEYER 21	15 MINS	116°	72 MM^2	5.0 ML	0.0023 IN
SPEYER 21	30 MINS	116°	80 MM^2	5.0 ML	0.0040 IN
ADERERσ	10 MINS	116°	80 MM^2	5.0 ML	0.0015 IN
ADERERπ	10 MINS	116°	80 MM^2	5.0 ML	0.0003 IN

*LANGE'S HANDBOOK OF CHEMISTRY, 5th ED., 1944, Pg. 791

\+ ROLLED PLATE, TYPE II, BHN. 92 (JELENKO)
ϕ CAST PLATE (JELENKO)
δ ROLLED PLATE, TYPE III, BHN 105
σ CERAMCO GOLD
π CERAMCO WHITE
× BOTH SIDES OF PLATE ETCHED

Figure 9

material from within the casting difficult. As scrubbing commences, the casting should be rotated at quarter (90°) turns so that metal salts are removed from the total intricacy of the interior of the casting.

Upon removal of all chemical residue, the etched surface should have the brightness and color of a newly pickled casting. At this point, the wax is removed by heating the casting to a dark red color at a temperature high enough not only to melt the wax but also to burn off all carbon residue. The casting is immediately plunged into fresh pickling solution. If a brown or black discoloration remains, it is indicative of the incomplete removal of metallic salts during scrubbing of the casting following etching. It is essential to remove this discoloration, particularly if it approaches the cavosurface margin of the casting. Inasmuch as this stain represents a foreign substance on the metal surface, it could conceivably leach out after cementation and shorten the longevity of the restoration. In order to completely remove this contaminating substance and its objectionable color, the casting is repeatedly heated and plunged into the pickling bath until no contaminant remains.

For the slight inconvenience and time spent etching each casting as a routine part of the laboratory procedure before the patient arrives, it still remains as a worthwhile technique. It has not only improved restoration-tooth margin fit, but has expedited chairside procedures and has minimized the necessity for "remakes" as well. Beyond these, it has made for a consistency of results that gives one the confidence that at the appointed time the restoration will be seated satisfactorily and efficiently. No other method has proven to be as versatile and effective (See Figure 10).

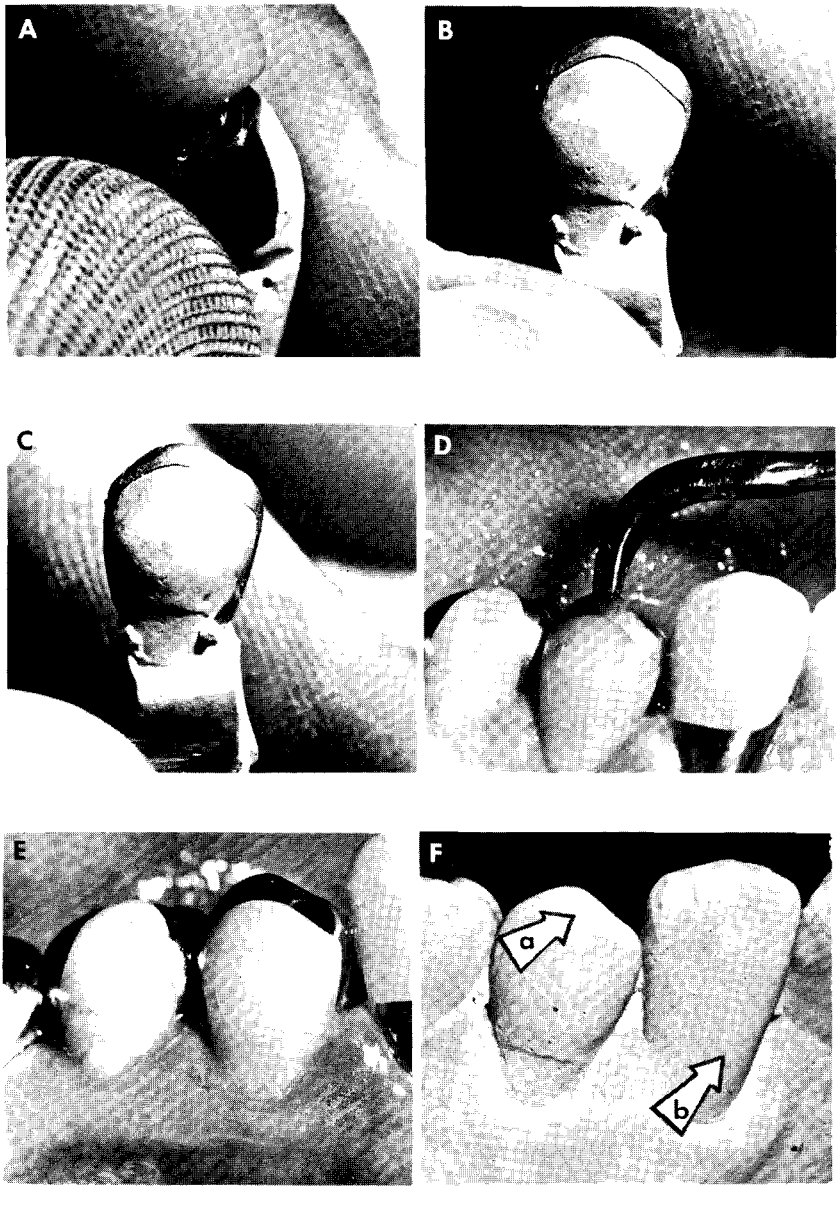


Figure 10. *A. Wax margins burnished and polished to an intimate adaptability to the die margin. B. Casting on die with open margins at gingival and occlusal considered as unacceptable for finishing procedures. C. Casting etched for 10 minutes at 116°F. giving a relief of approximately 0.0015 inches (35μ), closing margins considerably. D. Without any further adjustment other than proximal polishing the etched casting-tooth relationship is acceptable and ready for cementation-finishing procedures in one uninterrupted operation. E. With minimal finishing at margins, casting-tooth fit has no discernible discrepancies. F. Stone model poured from a hydrocolloid impression taken immediately following finishing procedures. Inlay margins at (a) appear as faultless as gold foil margins at (b).*[8]

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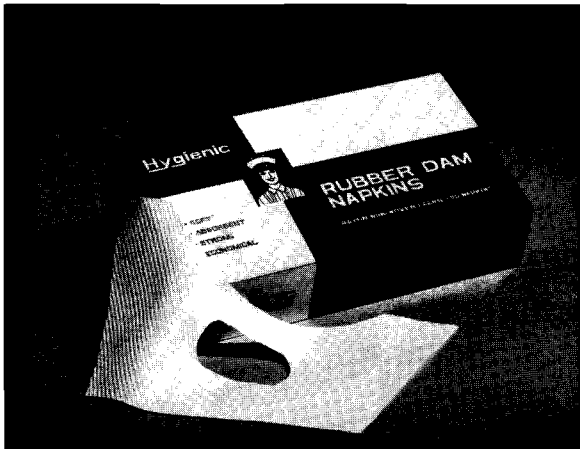

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Eighteen Years as The Voice of the Profession in Dental Pre-Payment

California Dental Service was founded May 31, 1955 by the dental profession to provide Californians with a voluntary prepayment mechanism which would provide a quality dental service consistent with the highly ethical standards of the dental profession.

The central theme of California Dental Service during the past 18 years has been removal of financial barriers between individuals (or the consumer, as they are so commonly termed today) and proper dental care. You are aware of dental needs as they exist in the American population today. You know that 95% to 98% of the people have dental needs and that 45% of the populace visits a dentist each year and only an estimated 25% have complete dental services provided. The major reason cited for not having necessary services performed is lack of money.

The past 18 years California Dental Service has grown from a fledgling organization, with one group to administer, to an organization comprising well over 1200 group programs providing dental benefits to an excess of 2¼ million people.

Contrary to what you might think, those covered are not just union groups. They represent groups which make up the typical community — teachers, bankers, small businesses, large businesses such as McDonnell Douglas, Lockheed, North American Rockwell and many others.

California Dental Service is a success today, primarily because of one factor — professional support. I have been closely associated with thirteen presidents and other officers from the California Dental Association, and eleven from the Southern California Dental Association. Without exception, all of them have been fully committed to California Dental Service. This does not mean that only CDS programs were acceptable to the exclusion of others, for it has never been the intention of the dental profession that CDS should write all of the

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Dr. Dixon *is Executive Vice President of the California Dental Service and serves on a number of Task Forces for National Health Insurance. He has presented papers on dental prepayment before many prestigious groups, both state and national, and at the 57th Annual Session of the Federation Dentaire Internationale in 1969. In 1971, he lectured in Australia on the dental service plan system in the United States. Subsequently, the Australian Dental Association adopted this system.*

This paper was presented before the Academy of Operative Dentistry, October 1973, Houston, Texas.

prepayment programs. There are some 180 different companies writing dental insurance in California. California Dental Service was and is intended to be the voice of the profession and has set the pace for other systems of dental prepayment.

Dental prepayment to date has largely been confined to the West. Of the 18 million covered nationwide, over 50% are west of the Rocky Mountains where there is less than 15% of the U.S. population. This growth has taken place:

1. Because of public demand for a method of budgeting the cost of dental care.
2. Because of the tax advantage of a dental care program as a company benefit which in essence represents a wage increase not subject to tax.
3. Because the American public is fully cognizant of the advantages of banding together to obtain the benefits of mass purchase, including all types of health care.
4. Because a large costly dental treatment plan is a financial catastrophe to many families and there is a desire to insure this cost by spreading it over all members of the group.

The Articles of Incorporation of California Dental Service state the objective of the corporation to be: to provide Californians with a voluntary prepayment mechanism which would provide a quality dental service. To the casual observer, it would seem that the motive for its formation was honorable and most certainly humanitarian.

However, if you were to ask a member of the early Dental Care Committee or a member of the first California Dental Service Board of Directors the reason for the formation of California Dental Service, his answer would invariably be "to serve as a defense mechanism against closed panels," for just months before the corporation was formed in 1955 the dental associations in the States of Washington, Oregon and California were approached by the International Longshoremens and Warehousemens Union (who had some $750,000 earmarked for dental care) to provide dental benefits for the children of the eligible members of that union. Simultaneously, several closed panel group practices on the West Coast approached the ILWU to obtain this program. What was the significance of this to the practicing dentist? It would mean complete abrogation of the free choice principle, which would result in removing patients from Dr. Smith's private office and placing them in a clinic where the patient would be assigned a dentist to care for his needs.

This, of course, had great emotional impact on the members of the profession and consequently the not-too-altruistic reason of forming California Dental Service to fight the closed panel was the basis on which CDS was sold to the membership in California. Needless to say the recorded history of this early ILWU-PMA negotiation as it related to the formation of CDS makes extremely interesting reading. Nevertheless, as a result of this negotiation a very fine model children's program began for the members of this group, which still is in effect today.

Five years elapsed after this first dental care program became a reality, during which period there were many requests for information regarding dental care benefits, but few groups had sufficient funds to bring a program into reality.

In the year 1960, however, things began to happen which were to set the course for dentistry in the West for one decade and probably several.

> *The Retail Clerks in the Southern California area negotiated 1¢, 3¢ and 5¢ per hour with the Food Employers Council for the years 1960-61-62 which is a far cry from 10¢ an hour negotiated last month by UAW. These funds were earmarked for dental benefits and were available initially to 35,000 employees increasing over a two-year period to 1/4 million people.*

Again, the negotiations of this program make interesting reading, but it will suffice to say that a program developed for the Retail Clerks in which the dental profession had little voice. It was badly fragmented — the Los Angeles Clerks went exclusively to a large closed panel clinic; some of the outlying areas developed partially acceptable program and others completely unacceptable; one local of the Clerks in a rural area actually developed an arrangement with a local advertising dentist.

In retrospect, this was probably not the worst thing to happen for it forced the leaders of dentistry statewide to realize the danger and weakness of the profession when there is a lack of unity in approaching common problems.

It was at this time that the dental profession in both Northern and Southern California joined together as equal partners in full support of the statewide California Dental Service.

While all was not to be smooth sailing, as most of you know, there is no doubt that in spite of the many pressures brought on them over the years, the officers of the two California dental associations did not at any time waiver in their full support of California Dental Service.

While "nothing is as powerful as an idea," it is also true that nothing makes reality more real than men of like minds.

As stated previously, these past ten years have seen California Dental Service grow from a fledgling organization with one group to administer to an organization comprising over 1200 groups providing dental benefits to over 2¼ million people. This represents over 10% of the population in California. In 1960, 1/100 of1 % of California's population were receiving benefits through CDS.

The Plan

There are dentists in the State of California who receive much of their income from prepaid dental programs and in certain areas it will reach as high as 90%. As incomes from dental care programs have increased, you can imagine that the objective of CDS in the mind of the average dentist is becoming a little more principled. Instead of thinking that CDS is that "something or other" that we dentists set up to stop closed panels, he is beginning to regard it as the organization that is permitting him to improve the oral health of his patient. He is providing complete care on all patients without having to fight the battle of economics. He is providing more services as prepayment lends itselt to quadrant and arch dentistry. He experiences fewer broken appointments. He is using auxiliaries much more effectively and is therefore producing more. Utilization has increased from 25% of the population receiving

complete care, to 54% receiving complete care through California Dental Service. Not only are more people receiving complete regular periodic care, but they are receiving three times as much care.

Some of the more recent dental school graduates, who have known prepayment since they first set up their practices, and who have a particular flair for organizing their time, are accomplishing some fantastic goals not only in production but in the provision of quality services.

Rather than fearing the manpower problem today because of prepayment, I personally believe prepayment to be another answer to the manpower program — as it permits a dentist to maintain a higher standard of care more easily and to produce more.

Fee Concept

It has long been the policy of the dental associations in California that all programs administered by California Dental Service be based on usual, customary and reasonable fees. The Table of Allowances program is an acceptable variation of usual and customary since the dentist is still allowed to charge his usual fee and the patient is responsible for the difference in the Table amount and his fees. Very early in CDS history, guidelines for acceptable programs were developed by the CDS board and supported by the dental associations. They are as follows:

(a) Programs should encourage the highest quality that it is possible to provide.

(b) They should encourage prevention and elimination of oral disease.

(c) Programs should encourage regular, periodic care and should be as comprehensive as finances of the group will permit, which is why some groups must purchase Table of Allowances programs.

These standards have been maintained since the inception of CDS.

Professional Supervision

Yes, the profession is involved in California Dental Service. The unique element in the service concept is its program of professional supervision. This incorporates professional review of cases by consultants and fee evaluation by review committees. Basically, it is the profession's interest in quality care and the supervisory role of the profession which set it apart from all other methods of prepayment. In California, the profession strongly believes that its involvement in prepayment is not just for the exclusive benefit of the dentist but also to insure that patients are provided the best dental services available.

Dentistry in California is a $450 million industry annually. California Dental Service will pay out $85 million for dental services rendered this year. We are now concluding a $55 million contract with the State of California for the Medi-Cal program. These figures indicate bigness and vastness, and this is not the feeling we want to leave withyou.

Prepayment has grown, in response to the consumer who has desired a method of budgeting the cost of dental services. CDS has grown because of the desire of the dental profession to have their own mechanism to respond to that need. The original resolutions authorizing the formation of California Dental Service came from the California and Southern California Dental Associations.

The resolutions pertaining to program format and fee concept came from the Association. The review system and peer review mechanism existing in the State of California are all creations of the California Dental Association. The system of determining customary and reasonable fees in accordance with one's ability and training has been cranked through the House of Delegates of the California Dental Association.

Yes, the economics of dentistry has changed in the far West. Nineteen out of 20 dentists will say that these changes have been good for dentist and patient alike. Nineteen out of the 20 will also tell you that the only effective voice they have in dental prepayment today is through the California Dental Service.

DDPA

Delta Dental Plans Association was formed in 1966 under the sponsorship of the American Dental Association to increase the availability of dental services to the public by encouraging the expansion of dental prepayment plans administered through dental-society approved, non-profit service corporations.

Today there are 37 service corporations and 40 constituent societies that are members of DDPA. Only six states are not represented in Delta Dental Plans Association by at least one type of membership.

The first multistate contract was written in 1967, with the North-West International Association of Machinists providing dental benefits for IAM members in an eight-state area of the Rocky Mountains and Pacific Northwest. Other national accounts followed in rapid succession: McDonnell Douglas, North American Rockwell (now Rockwell International), TRW Systems, Litton Medical Products, Delux Check Printers, and Lockheed Aircraft. The National Delta System (DDPA) now provides group dental coverage to some 5 million people throughout the United States.

The Delta System, through its close relationship between the organized profession and its offspring service corporations, has made two accomplishments possible, seldom, if ever, achieved by other types of prepaid health care. These are: (1) Structuring uniform benefits for group dental care programs in terms of actual dental services, as opposed to indemnity dollars, and (2) The ability to provide programs to consumer groups with workable, built-in cost and quality control mechanisms.

For the first time a prepayment entity — DDPA — the Delta System — backed by the dental profession — can deliver dental care covering *all* basic care, with optional prosthodontic and orthodontic services available. Under the dental profession's definition of necessary care, benefits provided stress preventive care, including examinations, diagnosis, prophylaxis, endodontics, periodontics, restorative and oral surgical procedures as a basic minimum.

In closing, I wish to reiterate, as I have many times in the past — the dental service corporation movement was not created to put dentistry into the insurance business — but rather to insure dentists remain in "dentistry's business."

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ANNOUNCEMENT

International Symposium on Operative Dentistry

An International Symposium on Operative Dentistry will be held at the University of Nijmegen Dental School, Nigmegen, the Netherlands, from April 16-18, 1975. The title will be "A Symposium on Amalgam and Tooth Colored Restorative Materials: the Status of Research and Clinical Practice." This Symposium will be aimed at promoting interaction between clinicians and researchers in the field of operative dentistry and it is anticipated that a registration fee of $50 US will be charged. The dates of this Symposium are immediately after the meeting of the International Association of Dental Research in London and it is anticipated that members of the Academy of Operative Dentistry and the American Academy of Gold Foil Operators may be interested in attending both the IADR meeting and the Symposium in the Netherlands.

A printed booklet, containing the Symposium proceedings, is to be published by a joint editorial board and mailed to participants. A number of European restorative organizations in addition to the Academy of Operative Dentistry are supporting the philosophy and intent of this Symposium.

ACADEMY OF OPERATIVE DENTISTRY RESEARCH PRIZES

HOLLENBACK MEMORIAL PRIZE

A memorial to the late George M. Hollenback has been established by the Academy of Operative Dentistry. Dr. Hollenback is to be honored for his many years of distinguished research, the results of which have had so beneficial an effect on improving the quality of dental practice. The memorial is to consist of a prize, called the Hollenback Memorial Prize, to be given annually for research that has contributed substantially to the advancement of restorative dentistry. For this prize, research of a broad range is to be considered, spanning the investigative spectrum from fundamental to applied, and encompas-

sing all levels of investigation from the prevention of dental disease to the development of improved materials and techniques for treatment. There are no geographic or occupational limits on eligibility for the prize and it is to be accompanied by a monetary reward.

Operative Dentistry Research Award

The Academy of Operative Dentistry has also established an award for dental students. The award, called the Operative Dentistry Research Award, is designed to give recognition to achievement in research at the undergraduate level, and is to be given annually to the undergraduate dental student whose research is judged to have contributed most to the advancement of operative dentistry. This prize also includes a monetary reward.

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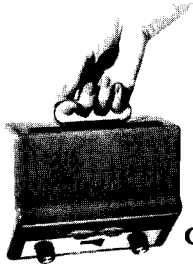

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