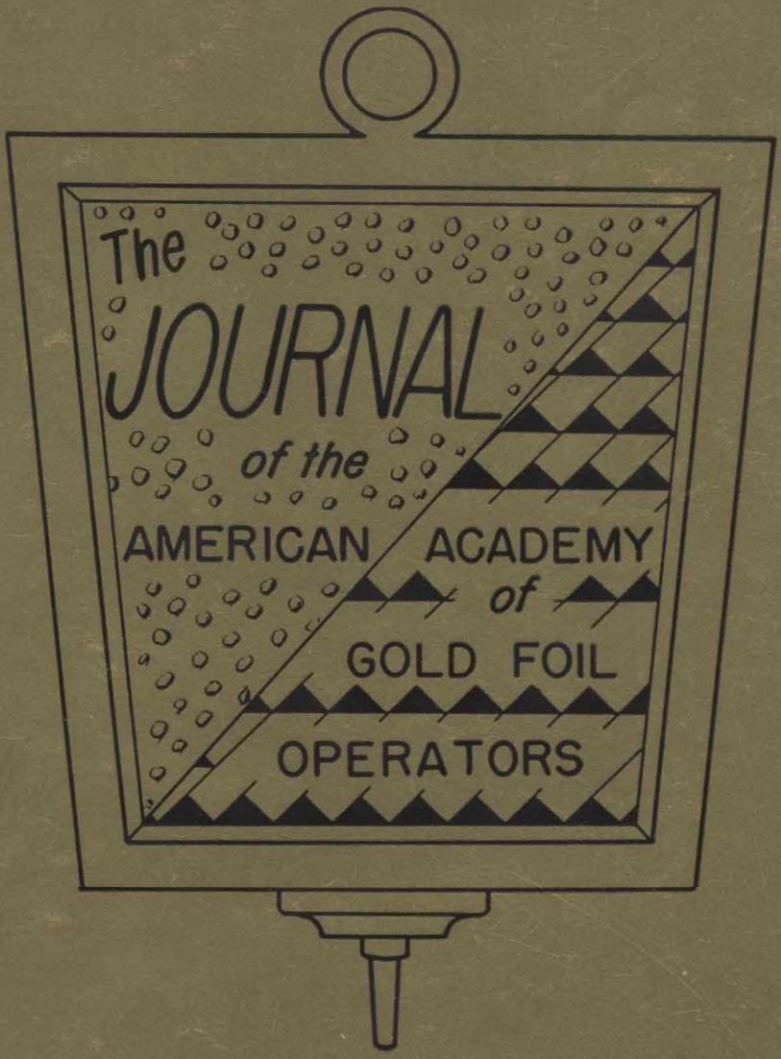
Vol. 3 No. 1



MAY 1960

THE JOURNAL OF THE AMERICAN ACADEMY OF GOLD FOIL OPERATORS

The *Journal of the American Academy of Gold Foil Operators* is published biannually by the American Academy of Gold Foil Operators. The opinions expressed in this publication by individual authors do not necessarily express the views of the Academy, unless they are based upon reports adopted by the organization.

The Academy reserves the right to reject, condense, revise and edit any article submitted for publication if it does not conform to the standards and objectives established by the Editorial Board.

In order to be considered for publication all articles must be submitted typewritten and double spaced, at least three months prior to the date of publication. Papers presented before any of the Academy meetings will become the property of the Academy and will be published in the *Journal* as time and space will permit.

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THE PRESIDENT'S MESSAGE

Annealing is the process by which gold foil is tempered and rendered malleable. This process was applied upon the formation of our organization eight years ago. We have been influenced and our lives enriched far more than we realize by those whom we have met during that time in which we have shared a common interest. Before the various groups became one we had been conditioned by tempering and made malleable by becoming capable of extending our knowledge in different directions through our associations together. True, we have been tried in the fire at various and sundry times, but we have always come out victorious. An analogy may be drawn, then, between the formation of our group and the properties inherent in gold foil, that material which plays so important a part in our lives. We have learned the necessity of coherence.

We have indeed filled a cavity, a void, in dentistry by keeping alive the art of manipulating this material of our choice. Whatever may have been the instrumentation, we are proud of our accomplishment. We have plugged away and the results have been most rewarding.

For what we have received in knowledge and inspiration from those who have gone before us, we are indebted. This debt we can repay by our faithfulness in performing the tasks which lie ahead of us. Perhaps we have learned patience and skill from one, forbearance from another, and fortitude from still another.

Dr. Albert Schweitzer, writing on the power of influence, says in part, "One other thing stirs me as I look back to my youthful days, the fact that so many people gave me something or were something to me without knowing it. They entered my life and became powers within me. Much that I should otherwise not have felt so clearly or done so effectively was felt or done as it was, because I stand, as it were, under the sway of these people. . . . A thought that became an act sprang into us like a spark and lighted a new flame within us. . . . If we had before us those who have thus been a blessing to us and could tell them how it came about, they would be amazed to learn what passed over their lives into ours." There is great value in expressing gratitude to those around us, and we too often fail to do so.

Alfred Tennyson said:

> I am a part of all that I have met;
> Yet all experience is an arch wherethrough
> Gleams that untraveled world whose margin fades
> Forever and forever when I move.
> How dull it is to pause, to make an end,
> To rust unburnished, not to shine in use!

So we would bring out the necessity for burnishing. No better way can be found than to work each day to attain the objectives set forth by the Academy of Gold Foil Operators.

Herbert D. Coy
501 East Franklin Street
Richmond 19, Virginia

OFFICERS 1959-1960

President

Herbert D. Coy

Described by some as "the voice crying in the wilderness," Dr. Herbert D. Coy has performed an inestimable service to the dental profession with his battle cry of "Better Dentistry!" His strong convictions and sincerity have served as continual stimulants to his colleagues.

Since the early 1930's when he carried considerable equipment and gave demonstrations of a new casting procedure to dental societies over this country, Dr. Coy has been an ardent clinician, lecturer, and essayist. He has given freely of his time and energies to disseminate technics and philosophies gained during his many years of practice.

His affiliations with professional and scientific societies are legion. He has been a member of the American Dental Association since his graduation from Creighton University, College of Dentistry, in 1914. He is a Life Member and a Past-President of the Woodbury Gold Foil Study Club, a charter member of the American Academy of Gold Foil Operators, a member of the American Academy of Restorative Dentistry, a member of the Executive Council of the International Association for Dental Research, an honorary Life Member of the Japan Dental Association, a Fellow of the American College of Dentists, a Fellow of the International College of Dentists, etc.

Dr. Coy's papers have been published extensively from 1932 to the present.

From 1948 to 1958 Dr. Coy served as Professor of Operative Dentistry at the Medical College of Virginia, School of Dentistry, in Richmond, and at present is engaged in private practice in that city. He is also a member of the City Council, President of the Kiwanis Club, a member of the Official Board of the Centenary Methodist Church, and President of the Richmond Chapter of the Sons of the American Revolution. He is a Past-President of the Iowa State Dental Board of Examiners. He now serves as Consultant to the Walter Reed Army Medical Center and to the Veterans Administration.

Our Academy is honored to have a colleague of Dr. Coy's zeal, devotion, and stature serving as this year's President.

President-Elect

Robert B. Wolcott

Robert B. Wolcott, D.D.S., Marquette University, School of Dentistry, 1941. American Dental Association; International Association for Dental Research; American Association for the Advancement of Science; American College of Dentists; Great Lakes Gold Foil Study Club; Past-President, John C. Metcalf Gold Foil Seminar; Captain, United States Navy.

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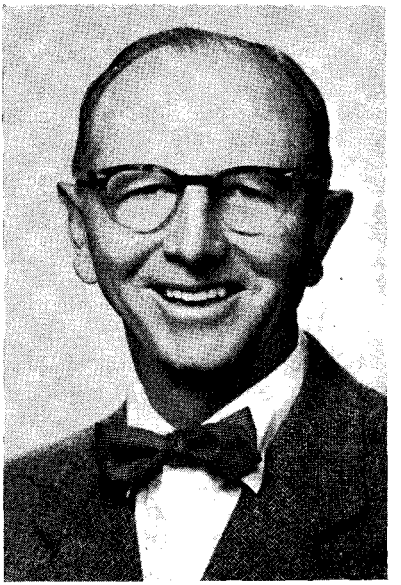
Charles C. Latham, D.D.S., University of Southern California Dental School, 1923. American Dental Association; Southern California State Dental Association; Past-President, San Diego County Dental Society; American Academy of Periodontology; San Diego Academy of Medicine; Staff Member, Coronado Hospital; Staff Member, Rockfield Field Army Hospital; Assistant Director, John C. Metcalf Gold Foil Seminar; Past-President, Rotary Club.



Charles C. Latham

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FORTHCOMING EVENTS

1960

October 13. School of Dentistry, College of Medical Evangelists, Loma Linda, California. A one-day meeting similar to the one presented at the Interim Meeting at Marquette University, School of Dentistry, in Milwaukee, Wisconsin, on February 5, 1960, has been tentatively planned.

October 14 and 15. Los Angeles, California. The Ninth Annual Meeting of the Academy to be held at the University of Southern California, College of Dentistry, 925 West 34th Street. Headquarters for the meeting will be the Mayfair Hotel. Details and preliminary program will appear in the next issue of the *Journal.*

October 17-20. Los Angeles, California. American Dental Association Meeting. Requests for hotel reservations should be made on the application form directly to the American Dental Association Housing Bureau.

1961

February 3. Interim Academy Meeting. A one-day meeting to be held at Loyola University, School of Dentistry, preceding the Chicago Mid-Winter Meeting.

A COMPARATIVE STUDY OF THE PHYSICAL PROPERTIES OF VARIOUSLY MANIPULATED GOLD FOIL MATERIALS*

William S. Kramer,** D.D.S., M.Sc.; Thomas R. Trandall,† D.D.S.; and Warren L. Diefendorf,‡ D.D.S.

Introduction

Gold foil has long been regarded as a superior restorative material. Its use in dentistry has been restricted because of the skill and time required for its manipulation. If less time and patience were required for the placement of foil restorations, the use of gold foil would undoubtedly be more frequent than we find it today.

In an effort to overcome these deterrents to the use of this excellent material, several innovations have been advocated.[1] Two of the more promising efforts in this direction have been the reintroduction of crystalline mat gold and the marketing of a high-frequency, low-intensity electronic condenser. If investigation proves their merit, such efforts to popularize gold foil restorative work are commendable and deserve encouragement.

The purpose of this study was to assess, in objective fashion, the merits of the use of mat gold and the electronic condenser, by comparing the physcial properties of variously prepared specimens of gold foil. The following objectives were outlined:

1. To determine for both electronically and pneumatically condensed specimens:
   a. The comparative surface porosities of mat gold and fibrous rolled gold foil using photomicrographs subsequent to minimal burnishing polishing procedures.
   b. The comparative surface hardness (Vickers) of mat gold and fibrous gold foil.
   c. The density comparisons of homogeneous specimens by means of specific gravity determinations.

The subjective opinion of the gold foil operator, while valuable, is not a reliable means of determining the desirability of

*This study was supported in part by a part-time research fellowship grant number FD-135 from the Department of Health, Education and Welfare, Public Health Service, National Institutes of Health. The opinions and assertions expressed here are the private ones of the authors and do not necessarily reflect the views of the Department of Health, Education and Welfare.

**Formerly Professor of Operative Dentistry, presently Professor of Pedodontics and Chairman of the Department, University of Nebraska, College of Dentistry, Lincoln, Nebraska.

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using mat gold or the electronic condenser. Although clinical results, at the time of placement, may seem entirely satisfactory, only a scientific investigation of the physical properties of the gold thus manipulated should be relied upon in deciding whether these changes should be advocated. It was hoped that this study would yield such information.

Review of the Literature

Mat Gold

We are informed by the manufacturer that mat gold is a nearly 1000 fine electrolytic deposit made cohesive by the nature of the extremely pure metal itself as well as by its finely divided, interlocked, fern-like crystalline structure.[2] Its mechanical strength is the result of a special molding and heat treatment process which renders it easy to manipulate.[3] Work done by Koser and Ingraham [4] and Myers [5] indicates that mat gold is quite practical for building the bulk of Class I and Class V preparations. Koser and Ingraham state that mat gold should not be used on the surface of restorations because its crystalline-like structure apparently does not weld into as homogeneous a mass as cohesive type golds; therefore, there is a greater tendency to surface pitting. Myers believes that the fern-like crystalline structure of mat gold prevents it from effectively withstanding fracture during the burnishing procedures of polishing. A research memorandum from the Williams Gold Refining Company, Incorporated [3] reports the following data concerning mat gold, gold foil, and cast gold:

	Brinell Hardness	*Density*
24 K cast gold	27	19.6030
Plugged gold foil	43	17.4260
Plugged mat gold	68	19.9978

High-Frequency Welding

Koser and Ingraham made Knoop hardness determinations on several specimens of gold foil welded by the pneumatic condenser and the electronic condenser.[4] In their comparison, they determined that the Knoop values were slightly higher in those specimens prepared by high-frequency welding than in those condensed by the pneumatic condenser.

One of the great advantages offered by electronic condensation is the alleviation of patient discomfort during malleting procedures. Hargreaves [6] reported that the traumatic effects on the periodontal structures of dogs' teeth, which were subjected to post-mortem histologic examination, were less noticeable in those teeth in which the gold was malleted with high-frequency,

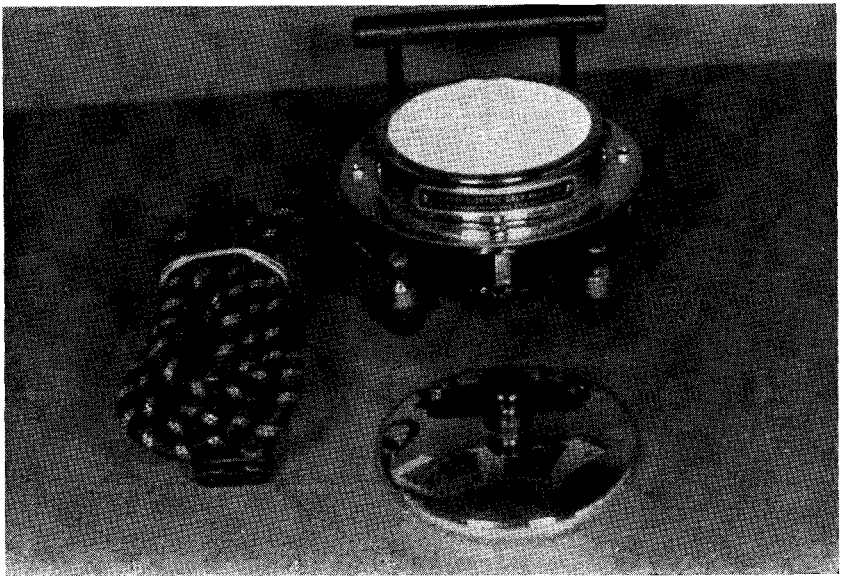


Figure 1

low-intensity condensation than in those teeth which had been filled using the pneumatic condenser. It is also obvious that the danger of damaging cavity margins through indiscriminate or unskillful malleting is lessened when using low-intensity condensation.

Methods and Materials

Thirty-five cavity preparations were prepared in ivorine blocks. Each ivorine block (16 mm. x 12 mm. x 10 cm.) contained five cavities which had been machined by a drill press to a diameter of 5 mm. and a depth of 2 mm. Five preparations were made for each material studied and for each method of condensation used. Each block was cushioned with two thicknesses of woven cotton to simulate the physiologic resiliency of periodontal structures. All the gold was annealed for five minutes on an electric annealer (Figure 1).

Five different specimens of each of the following combinations were prepared for study:

Series 1—Pneumatic condensation of fibrous cohesive gold foil

Series 2—Pneumatic condensation of crystalline mat gold

Series 3—Pneumatic condensation of mat gold covered with a ½ mm. veneer of cohesive gold foil

Series 4—Electronic condensation of fibrous cohesive gold foil
Series 5—Electronic condensation of crystalline mat gold
Series 6—Electronic condensation of mat gold covered with a ½ mm. veneer of cohesive gold foil
Series 7—Hand condensation of crystalline mat gold.

Condensing procedures were standardized as much as possible and carried out with attention being given to several considerations. The pneumatic condenser was an assembly belonging to one of the authors (WSK) which, after long use and careful adjustment, was set for a constant frequency and magnitude proved compatible with teeth and supporting structures (Figure 2).

A series of twelve test samples was made before the experiment was begun in order to determine the most effective frequency and magnitude for the electronic condenser. Four different impact intensities were tested at high, medium and low frequencies. It was found that at a frequency of 3600 vibrations per minute and at a setting of "6" for magnitude, the hardest sample was obtained. Figure 3 illustrates the Electro-Mallet and the settings used.

Standardization of Procedures

Careful attention was given to lines of force and finger pressure exerted in all samples condensed so that results would be

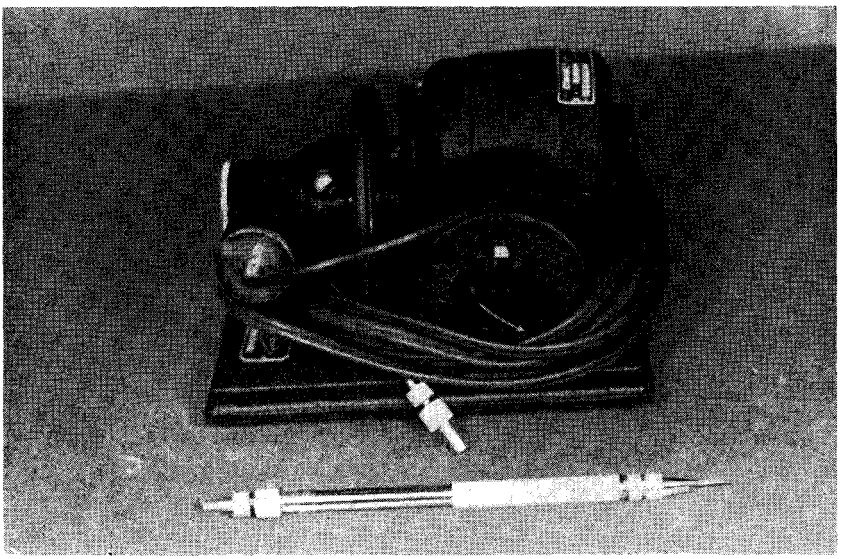


Figure 2

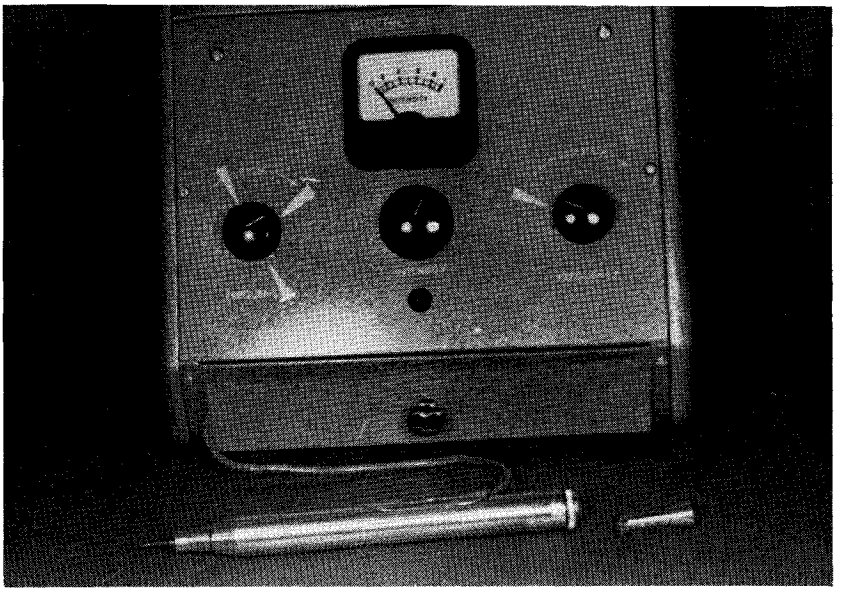


Figure 3

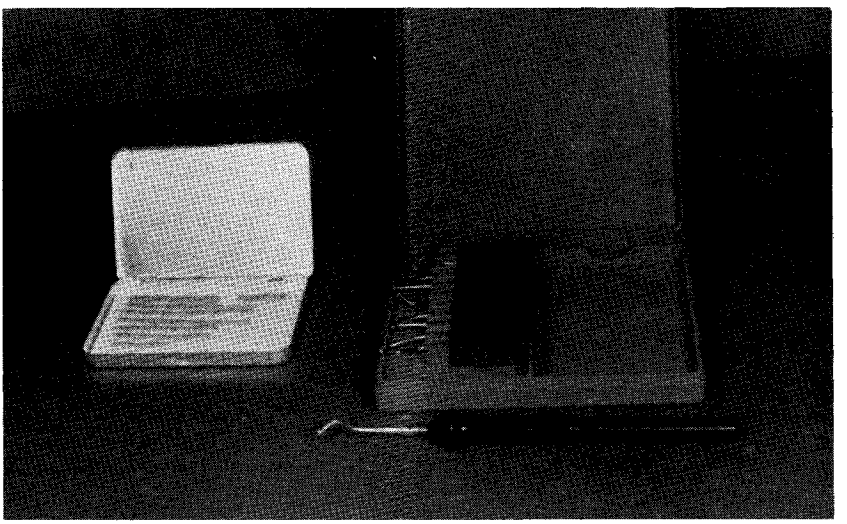


Figure 4

as consistent as possible. Cantles of mat gold were cut to conform to the circular cavity outline, and principles of concave building form were carefully carried out. The same Woodbury condenser point was used for both the pneumatic and the electronic condensers. Hand-rolled pellets, size 1/48th, of number four fibrous gold foil were used throughout. The series of mat gold specimens was built only by hand condensation, employing a modified pen grasp and using single vibratory thrusts of approximately fifteen pounds' pressure. The instrument used was the hand condenser and circular point provided by the manufacturer. (Figure 4).

All specimens were polished with fine magnesium oxide on rotating rubber and wax metal polishing lathes until the surfaces of the gold samples were free from serration marks.

Photomicrographs

Photomicrographs at a magnification of 400X were obtained of the surface of each specimen.

Hardness Testing

A Vickers testing machine loaded with a 1 kilogram weight was used to make the hardness determinations for each sample. Five indentations were made at uniformly symmetrical locations on each sample. The indentation made by this machine is a pyramid rather than a sphere; the square outline of the indentation is extremely well defined and, being square, can be measured accurately across the diagonal corners. The hardness value is given by the relation $H = P/A$ where P is the load in kilograms and A is the area in square millimeters of surface indentation. In obtaining measurements of the indentation, a microscope attachment measuring the diagonals of the square impression (Figure 5) reads directly to 0.001 mm. on a large micrometer drum. The measurements were taken without moving the test piece. The impressions are knife-edged indentations, thus eliminating eyestrain, and readings are taken entirely from a digit counter mounted on the ocular. No calculations are involved.

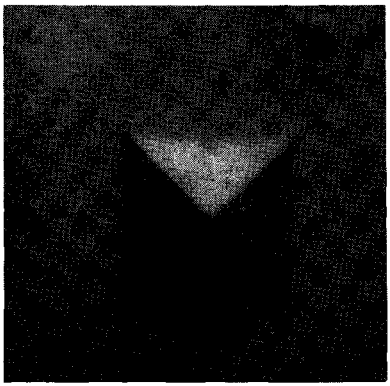


Figure 5

The time taken for the application of the load can be adjusted by the oil control valve of the dashpot. In this study the valve was set so that the period was thirty seconds.

This machine is so constructed that it may be used as a Brinell tester, and is supplied with 1 mm. and 2 mm. balls and ball holders. In this work it was felt that the pyramidal diamond point was superior to the ball because the tapering point allows for more exact penetration than a sphere under this comparatively light load. Other advantages of this form of indenter are (1) impressions, irrespective of size, are geometrically similar; (2) deformation of the diamond indenter is practically nil; and (3) the hardness numeral on homogeneous material is unaffected by variation in loads.

Density Determinations

For density determinations a pygnometer was used first, incorporating a capillary displacement scale. Standard deviation calculations were so variable with this technic that it was abandoned.

The Westphal Balance was then used for determination of specific gravity of the various test samples. Since this apparatus is primarily used to determine specific gravities of liquids, certain modifications were employed.

The balance was placed upon a level table, and a thin wire with a basket was attached to a hooked weight at the end of the lever arm (Figure 6). A beaker of water was positioned so that the

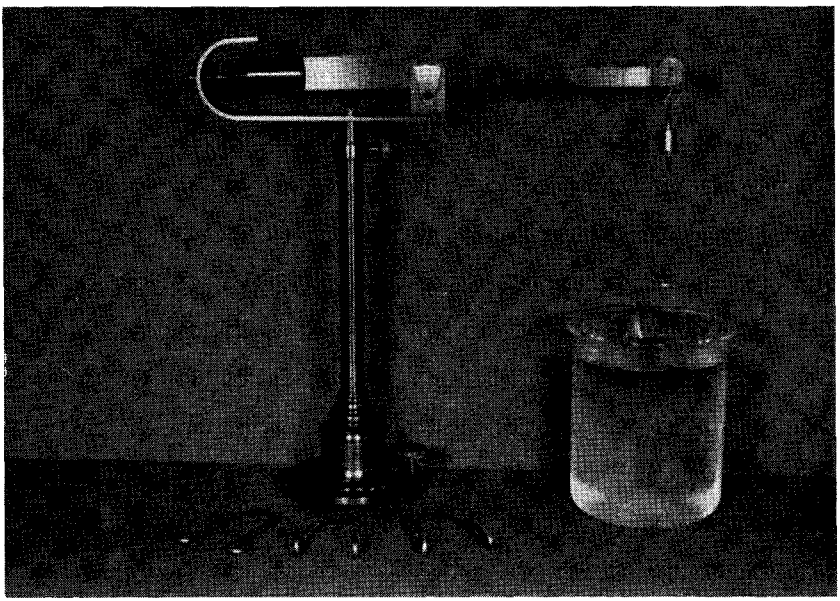


Figure 6

basket was submerged. The surface tension on the wire can be assumed as non-measurable. Weights were added to offset the opposite lever arm; thus balance was established with the basket submerged in water minus the sample of gold.

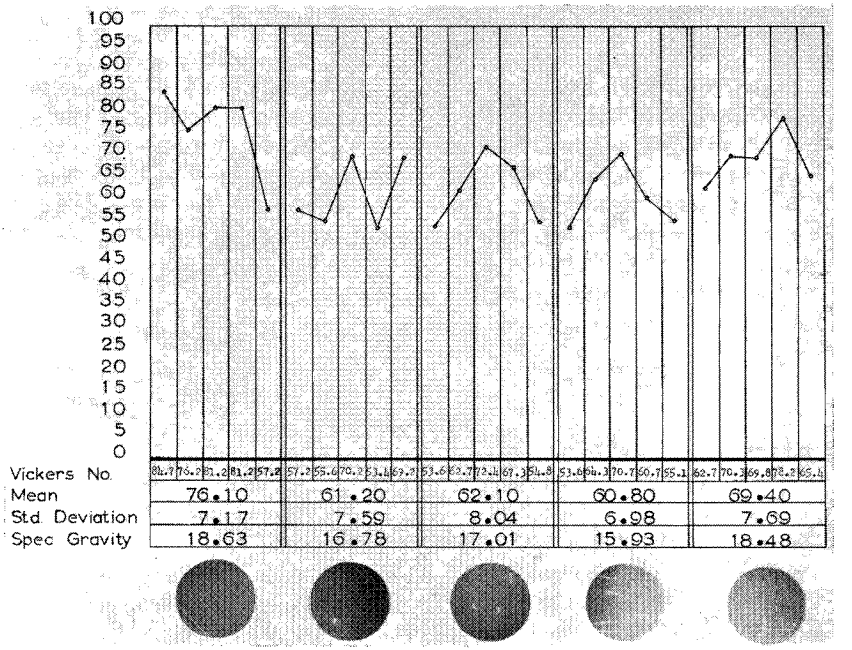
The sample of gold was placed in the basket and submerged. The measuring weights, all in grams in denominations of 5 (e.g., 0.5 gm., 0.05 gm.), were added to the calibrated lever arm. When balance was established, the submerged sample's new weight was determined by multiplying the amount of weight added to the rider bar by the distance from the fulcrum. Specific gravity is weight in air divided by loss of weight when submerged in water. Since temperature influences the accuracy of these determinations, all test results were corrected for temperature.

Results

The results of the testing procedures can best be presented by graphic representation (Charts I-VII). Each chart records the information derived from the series of specimens prepared according to the heading of the chart. Each vertical column in a chart represents the data for each of the five specimens thus condensed. The five Vickers hardness numbers which were recorded are plotted for each specimen showing the variation in hardness found in various parts of the same sample. The horizontal line of figures under the graph gives the specific hardness number recorded for each test made as represented on the graph above. The mean hardness figure is calculated for each specimen and is recorded in the next line. Directly below the mean hardness figure appears the standard deviation calculated for hardness for each specimen. The bottom line of figures records, for each specimen, the specific gravity determination for that particular sample. At the base of each column is a photomicrograph of that particular sample which gives evidence of the representative surface porosity for the sample.

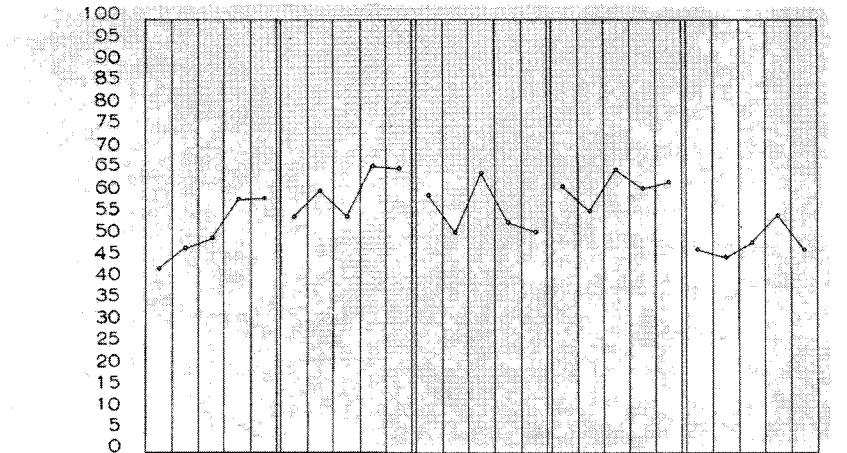
Chart VIII is a summarization of Charts I through VII with the data recorded so that comparisons between series may be more readily made. The solid-white vertical bars represent the values recorded for specific gravity for each specimen. The cross-hatched extensions of these solid bars (both bars emanating from the same base line) illustrate the mean hardness determinations for each sample. The exact figures for these values are recorded beneath the bar graphs along with an identification of the series of specimens.

Chart 1
Fibrous Gold Foil (Pneumatic Condenser)



Vickers No.	84.7 76.2 81.2 81.2 57.2	57.2 55.6 70.2 53.4 69.7	53.6 62.7 72.4 67.3 54.8	53.6 64.3 70.7 50.7 55.1	62.7 70.3 69.8 78.2 65.4
Mean	76.10	61.20	62.10	60.80	69.40
Std. Deviation	7.17	7.59	8.04	6.98	7.69
Spec. Gravity	18.63	16.78	17.01	15.93	18.48

Chart 2
Mat Gold (Pneumatic Condenser)



Vickers No	43.6 47.7 49.8 55.1 59.1	51.8 60.6 51.2 66.0 65.5	59.2 52.1 61.2 53.5 51.9	62.0 55.8 65.2 61.5 62.9	47.5 46.2 48.3 55.1 47.5
Mean	51.60	60.20	55.90	61.40	48.80
Std. Deviation	5.66	5.63	5.61	3.47	3.52
Spec. Gravity	15.19	16.77	16.68	15.75	17.72

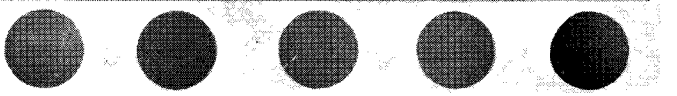
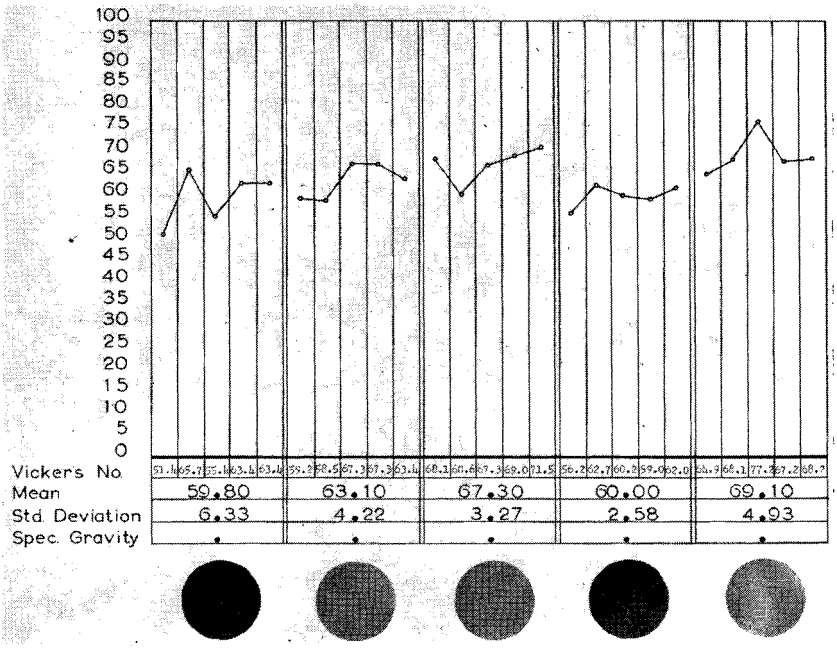


Chart 3

Mat Gold With Fibrous Gold Veneer (Pneumatic Condenser)



Discussion

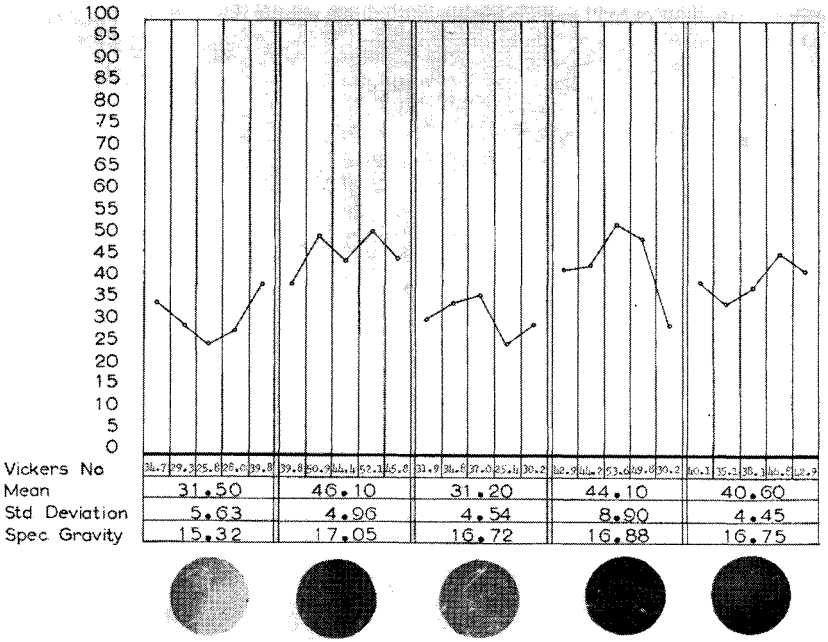
In order to relate the findings in this study to a basis for comparison, an incidental test was made to determine the Vickers hardness of two cast gold inlays and two silver amalgams. These specimens, mounted in ivorine blocks, were each tested five times in the same manner as the foil specimens. The results were:

	Tests					Mean
	1	2	3	4	5	Hardness
Inlay A (type A Gold)	135	117	103	91	127	114
Inlay B (type A Gold)	102	123	108	95	99	105
Amalgam A	90	93	94	103	93	94
Amalgam B	76	72	105	100	96	89

Hardness

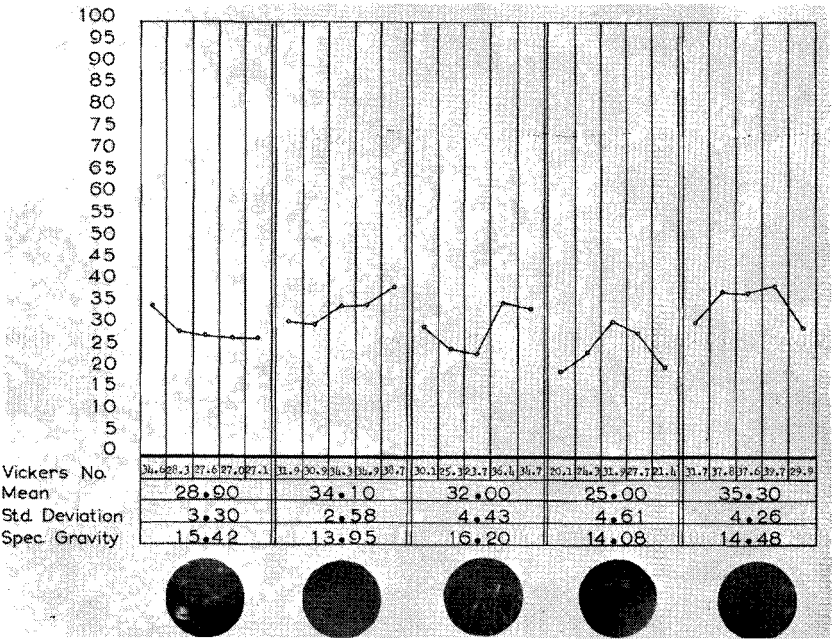
From the data illustrated by Charts I-VII it can be concluded that, although large standard deviations were found, the relative hardness of the materials tested is evident and the methods of condensation have a direct effect on these hardness values. As can be noted above, though, the deviations in hardness in various parts of the inlays and amalgams are at least as large as those encountered in the foil specimens.

Chart 4
Fibrous Gold Foil (Electronic Condenser)



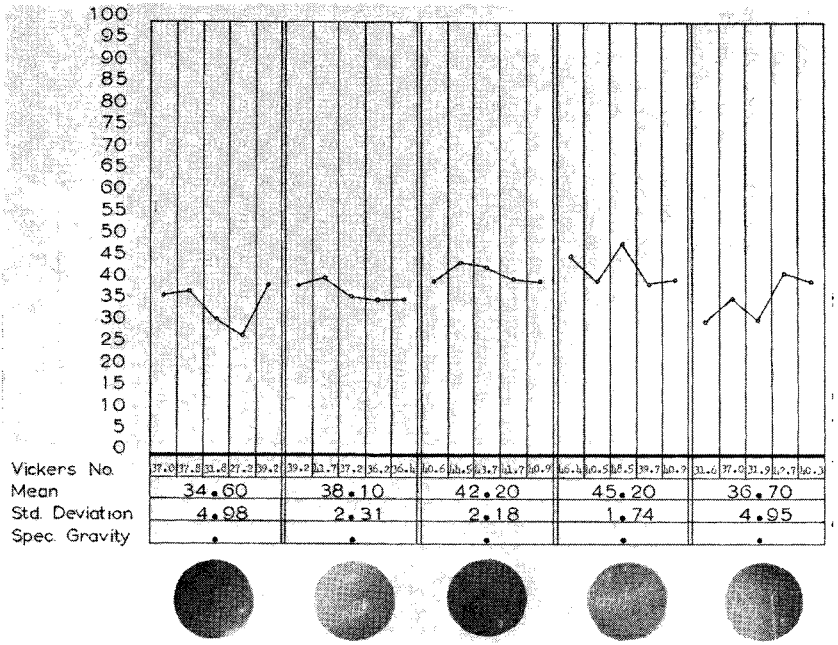
Vickers No	34.7 29.3 25.8 28.0 39.8	39.8 50.9 44.4 52.1 45.8	31.9 31.6 37.0 25.4 30.2	40.9 41.7 53.6 49.8 30.2	40.1 35.2 38.3 46.5 42.9
Mean	31.50	46.10	31.20	44.10	40.60
Std Deviation	5.63	4.96	4.54	8.90	4.45
Spec Gravity	15.32	17.05	16.72	16.88	16.75

Chart 5
Mat Gold (Electronic Condenser)



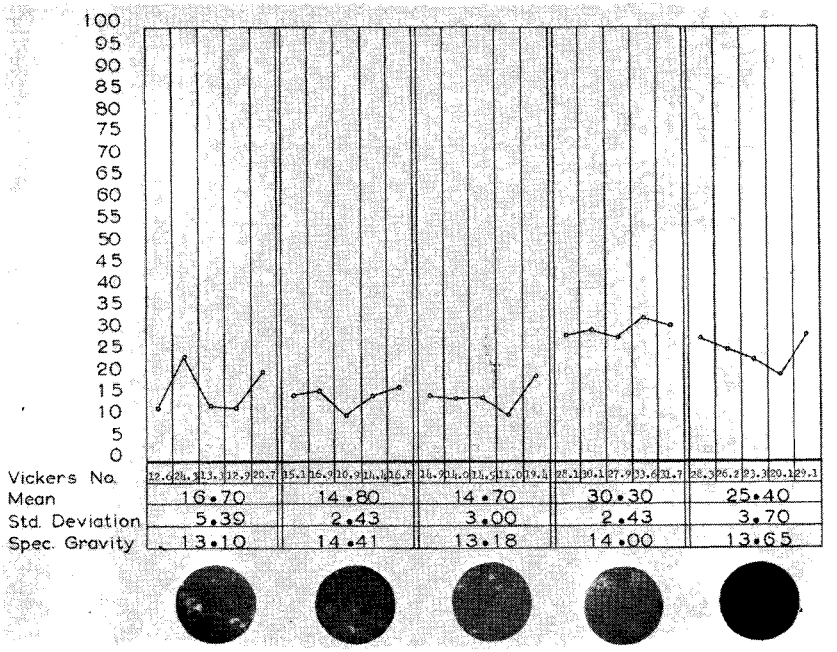
Vickers No.	34.9 28.3 27.6 27.0 27.1	31.9 30.9 34.3 34.9 38.7	30.1 25.3 23.7 36.4 31.7	20.1 24.3 31.9 27.7 21.4	31.7 37.8 37.6 39.7 29.9
Mean	28.90	34.10	32.00	25.00	35.30
Std. Deviation	3.30	2.58	4.43	4.61	4.26
Spec. Gravity	15.42	13.95	16.20	14.08	14.48

Chart 6
Mat Gold With Fibrous Gold Foil Veneer (Electronic Condenser)



Vickers No.	37.0 37.8 33.8 27.2 39.2	39.2 32.7 27.2 36.2 36.4	40.6 44.5 43.7 41.7 40.9	46.4 40.5 48.5 39.7 40.2	31.6 37.0 31.9 42.7 40.3
Mean	34.60	38.10	42.20	45.20	36.70
Std. Deviation	4.98	2.31	2.18	1.74	4.95
Spec. Gravity					

Chart 7
Mat Gold (Hand Condensation)



Vickers No.	12.6 28.3 31.1 32.9 20.7	35.1 16.9 16.9 31.1 16.7	16.7 14.9 21.5 21.0 19.1	28.3 30.1 27.9 33.6 31.7	28.3 26.2 23.3 20.1 29.1
Mean	16.70	14.80	14.70	30.30	25.40
Std. Deviation	5.39	2.43	3.00	2.43	3.70
Spec. Gravity	13.10	14.41	13.18	14.00	13.65

Chart 8

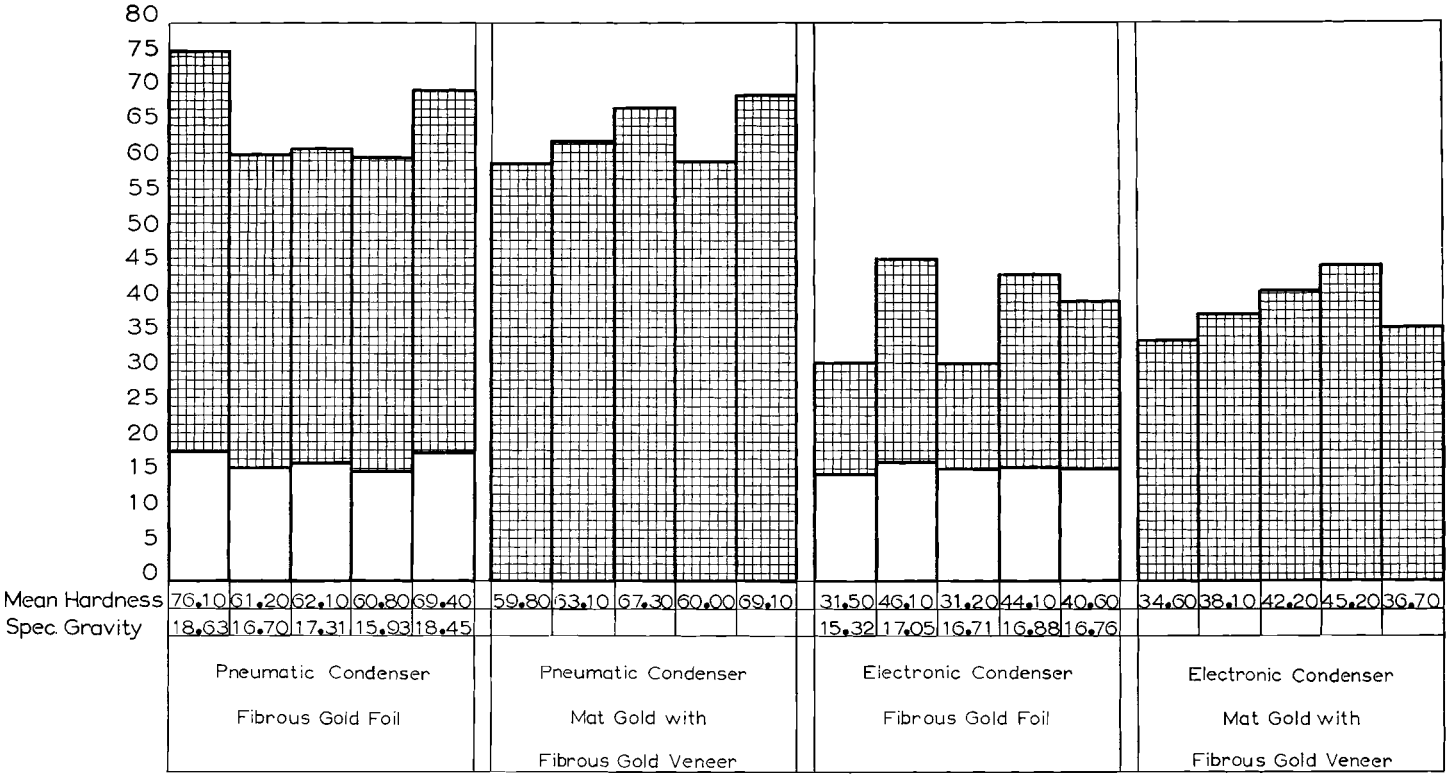
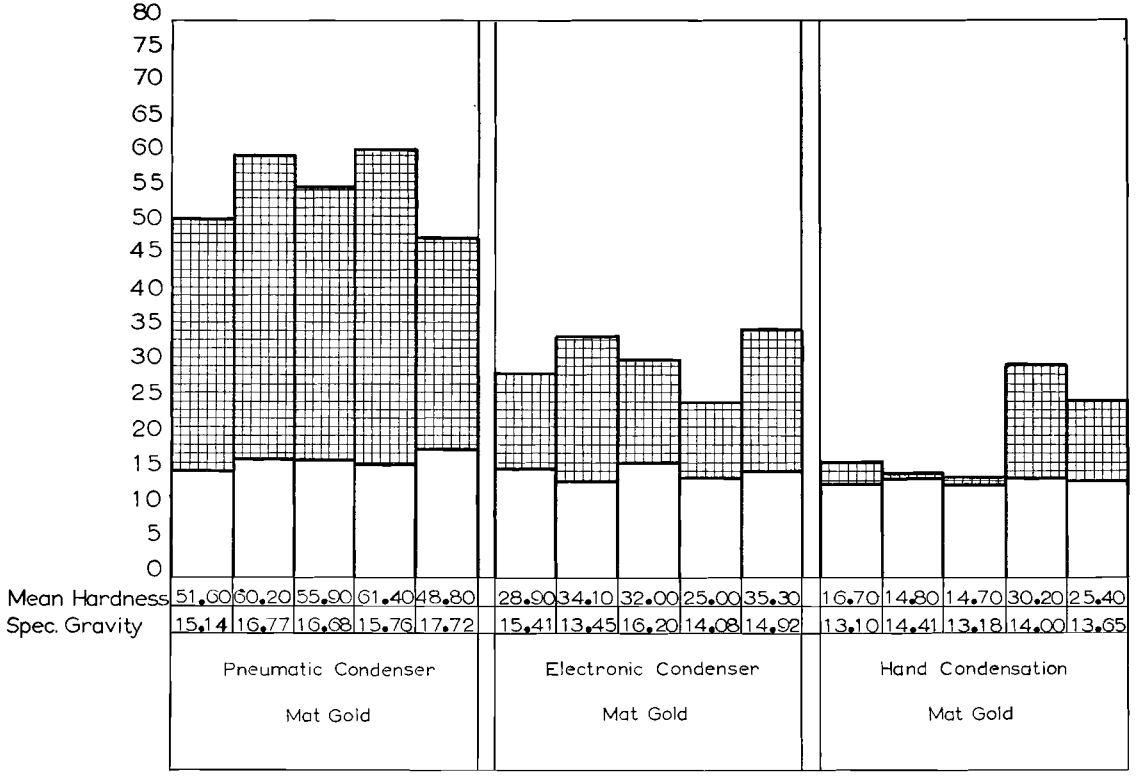


Chart 8 Cont.



In toto and veneer, fibrous foil, when condensed with the pneumatic condenser, exhibted the hardest surfaces. Mat gold condensed with the pneumatic condenser had a harder surface than any of the samples condensed electronically. The mat gold, condensed with hand instruments only, yielded the softest samples of the series.

Hardness is only one measurable physical property of gold foil. It is, nevertheless, an objective measurement which can help us to understand the effectiveness of our material, instrumentation, or technic. Hardness, *per se*, may not be of critical value in evaluating the effectiveness of a particular gold foil restoration in carrying out its intended mission—that of preserving the tooth restored. The need for hardness in a particular gold foil restoration rests with the judgment of the operator. The luster or clinical appearance of the foil, however, is no criterion of hardness; so the operator must beware of making hardness judgments of his own work in this subjective fashion. The importance of this part of the study lies in making the operator aware of his shortcomings in this respect. If he is unconcerned about hardness in a particular gold foil situation, then some of the more desirable attributes of those technics which produced softer specimens may overshadow the requirement for hardness.

In reflecting on the differences in hardness between electronically and pneumatically condensed specimens, one must keep in mind that pellet size and technic were the same for both. As Koser and Ingraham point out, condensation by higher frequency produces principally a surface welding of the foil.[4] This difference might be overcome by employing very thin laminations of foil when using the electronic condenser. This project, however, was not designed to ascertain these variations of procedure.

Another important factor in hardness is the fact that in gold foil building procedures it is the strain hardening of the metal which produces hardness in the finished product. According to Skinner,[7] the suddenness of the delivered blow is an effective factor in producing this strain hardening. Skinner's contention appears to be borne out by this study. The clearly defined individual blows of the pneumatic condenser are more sudden in their effect than the indistinct vibrations with high-frequency condensation.

Density

As can be seen in Chart VIII, density (specific gravity) values were in the same range for the fibrous gold both pneumatically and electronically condensed and the mat gold pneumatically condensed. Electronically condensed mat gold exhibited noticeably lower specific gravity values, and the hand-condensed mat gold was the least dense of all the series.

Density values, of course, are a reflection of the amount of gold foil which the operator is capable of building into a given volume of space. This amount, in turn, obviously affects the quality of cavity seal produced by the restoration in that, after deformation of the cavity (dentin) walls has occurred, the introduction of more foil will produce a denser restoration. In certain respects this attribute assumes more importance than hardness. It is comforting to know that electronic condensation performs well in this respect when used with fibrous foil. This study reveals that in those situations where mat gold is condensed pneumatically for building bulk, the density and cavity seal achieved by the mat gold are about the same as those achieved by the fibrous gold foil veneer which covers this bulk.

Porosity

Porosity is a problem which plagues the gold foil operator. Because of the burnishing action of the polishing procedures, many restorations exhibit little porosity at the time of finish. Later, when wear in the mouth has destroyed this thinly burnished layer, the true situation reveals itself, and we can see evidences of porosity in many of these older restorations. Minimal burnishing procedures were employed in preparing the specimens in this study. The photomicrographs in Charts I-VII show that there are smoother, less pitted surfaces in the samples condensed by the pneumatic condenser and that there is less variation regardless of the type of gold used for filling. The surfaces of the series condensed electronically show an increase in porosity in all fibrous specimens and an even greater increase in mat gold samples. The mat gold condensed with hand instruments shows the most extreme evidence of surface porosity. Marginal adaptation as seen in the photomicrographs appeared to be inversely related to the amount of porosity in a specimen.

Although significant variances of properties were noted, we must assume that under analogous placement procedures in the mouth we could expect to find an even greater variance of end product; i.e., forces, magnitudes, etc., can be standardized only within limits when working under practical clinical conditions.

Conclusions

In a research project such as this, it is rather easy to standardize procedures in order to make objective comparisons. It is, of course, obvious that when working under clinical conditions, no such standardization and control can be established. Technic and instrumentation are tremendously influential in the final results obtained by any given operator. The findings in this study are valid to the extent that direct comparisons in these different methods and materials could be made with the

assurance that the specimens were prepared under controlled and standardized procedures.

It should be emphasized that the findings here relate only to the particular conditions described. It is entirely conceivable that, using different settings, another operator might produce results which would differ. For instance, an operator intimately familiar, through long clinical use, with electronic condensation might produce results with this method which would exceed his results with the other methods.

(*The authors wish to express their appreciation to Donald C. Haack, Associate Professor of Engineering Mechanics, University of Nebraska, for his helpful suggestions and advice during this experiment; and to Robert McShirley, of McShirley Products, Glendale, California, for making available the Electro-Mallet used in this study.*)

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Editor's Note: Since few operators have access to testing equipment, one of the authors, Dr. William S. Kramer, has volunteered his services in making hardness determinations of samples submitted by members of the Academy. Dr. Kramer will make hardness tests and submit the results to the member. The specimens should be clearly identified and should specify the type of gold and the method of condensation employed. If enough specimens are received for testing, a report to the Academy will be made listing the results and the variations encountered. Please submit all samples to Dr. William S. Kramer, College of Dentistry, University of Nebraska, Lincoln 8, Nebraska.

THE VALUE OF THE RUBBER DAM IN OPERATIVE DENTISTRY*

Michael J. Murray, D.D.S., Omaha, Nebraska

The oral surgeon about to make an incision into the soft tissues of the oral cavity prepares his hands by scrubbing them with soap and running hot water for at least ten minutes. He pays particular attention to the cleansing of areas around the fingernails. He dries his hands with a sterile towel and applies rubber gloves. He then drapes his hands with another sterile towel and proceeds to the operating table. There a sterile field has been prepared for his surgery. Sponges and suction pumps (or aspirators) are used to keep the field of operation free of contamination by the patient's saliva.

The careless dentist, preparing to make an incision into the hard tissues of a diseased tooth, rinses his hands with water for about thirty seconds, dries them on a not-too-fresh towel and proceeds to perform the operation. He contaminates his fingers by dipping them into the saliva of the microbe-laden oral cavity. He prevents his mouth mirror from becoming fogged by wiping it over his patient's cheeks and tongue. He pushes the tongue aside with the contra-angle, a procedure which contaminates the contra-angle. And so, the careless dentist proceeds to operate.

The comparison is exaggerated and, of course, should not be applied to anyone present. However, it comes close to the truth and concerns many in the profession. It is so true that it has caused many of the more observant and thinking members of our forefathers to search for a reasonable solution. They recognized that the danger of infecting the healthy tissues of the oral cavity by the transplantation of virulent germs from the unclean fingers and instruments of a careless dentist was a problem of vital importance. Obviously, it was impractical for the dentist to spend fifteen minutes scrubbing his hands and applying rubber gloves in order to acquire the proper cleanliness for an operation which in itself would not require much more than the same amount of time. These men knew that a correct and suitable field for surgery of the tooth could be described as "Surgical Cleanliness," and should be obtained at the beginning and maintained throughout the treatment or the operative procedure.

These dentists were aware that the microorganisms which caused the lesions in the oral cavity were anaerobic in type. Therefore, they reasoned that the removal and elimination of all saliva from the area was imperative in order to produce a germ-free field of operation (for the placement of treatments and restorations in ailing teeth).

* Presented before the Eighth Annual Meeting of the American Academy of Gold Foil Operators, September 11, 1959, New York, New York.

The Rubber Dam and the Profession

In 1864 Dr. Sanford C. Barnum, of New York, introduced the use of the rubber dam in dentistry, and thereby presented to our profession the answer to this vexing problem.

Its adoption by certain members of the profession resulted in a greater standardization of the methods for operations. Those who became proficient in its use were soon convinced that successful treatments, improved cavity preparations, and better restorations were possible with a clear field of vision. They reasoned that "if the dentist could but see what he was doing, he might the better do what he was seeing."

As a result of the great advances in dental operations, the status of dentistry as a profession improved during this period. However, the profession did not attain the eminence it deserved because of the diffculty in the procurement of rubber dam as well as the poor instruction in and lack of understanding of its use.

Just before the turn of the century, under the espousal of Dr. Greene Vardiman Black and others who envisioned the merits of its adoption by the profession, new instruments were developed; a thinner and a better rubber dam was manufactured; a greater variety of rubber dam clamps was devised; and a simpler and more universally accepted technic for its application was adopted. All these improvements were made available to the profession.

Dentists who accepted and adopted the use of the rubber dam expressed a desire to become proficient in the use of gold foil. Then, as now, excellent operators existed in all parts of the country. Communications and travel were difficult, so the advancements made by those pioneers were difficult to disseminate. However, Dr. Black had become aware of the progress being made throughout the country. He also knew that problems were being solved and efforts were being duplicated by men who were not aware of the progress made by others. With his wonderful genius to organize, to systematize, and to teach, Dr. Black soon gathered the best results obtained by others, added to them his own vast experience and fund of knowledge, and then developed his methods of operation.

Dr. Black's technics, which were presented to the dental profession about 1899, greatly simplified the building of gold foil restorations, and made it possible for the average dentist to employ the rubber dam and gold foil in his practice.

His basic principle for the fabrication of a successful gold foil restoration was the procurement and maintenance of a dry field of operation, which required the proper use of the rubber dam. Those who followed his teachings of gold foil procedures soon became cognizant of the fact that the maintenance of a clean and dry field of operation in all other phases of restorative den-

tistry was imperative if the dentist was to be successful in his efforts toward rendering a more pleasant and successful service for his patients.

Many who availed themselves of the benefit of Dr. Black's teachings were instructors in dental schools. They returned to their respective schools and began to teach (and to advocate) the use of the rubber dam in all phases of operative dentistry. As a result of these efforts, at least seventy-five percent of the dentists graduated since 1900 have been taught the application and trained in the use of the rubber dam.

Reasons for Using the Rubber Dam

What are the virtues of the routine use of the rubber dam, and what is its value in present-day operative dentistry? Twenty-five years ago Dr. James Mark Prime [1] listed fifty-seven reasons for its use. McGehee, True and Inskipp [2] mention twenty pertinent reasons in their excellent textbook. Most of the books on operative dentistry contain a chapter on the use of the rubber dam.

I shall list only a few of the reasons I consider important:

First. It provides an area which may be made and kept surgically clean.

Second. By damming back the saliva and tissue, it provides a better view of the cavity and reveals its true condition, as dehydration of the clean tooth allows the operator to discern between healthy and diseased tissues.

Third. It keeps the tongue, cheek and gingival tissues away from the field of operation.

Fourth. It protects the patient's soft tissues from contamination by unclean instruments and also protects the dentist from infecting his hands in the unclean saliva of the patient.

Fifth. It protects the mouth from caustic drugs, and provides a surgically sterile field for the greater effectiveness of medications used in treatments.

Sixth. Due to the existence of a field that is not contaminated by saliva, pulp capping with calcium hydroxide is feasible when small mechanical exposures are encountered.

Seventh. It saves time by the elimination of the psychological reaction of patients who think they must expectorate about every three minutes. It prevents them from indulging in conversation which might waste the dentist's valuable time.

Eighth. Its use is imperative in the placement of gold foil restorations; also, in all endodontic procedures.

Ninth. Silicate cement and amalgam are restorative materials produced by chemical action. Permeation by saliva during the solidification of restorations made of these materials interferes with proper setting. It may cause expansion or shrinkage

and the subsequent dissolution of the material. The use of the rubber dam makes possible better building, better marginal adaptation, better edge strength, better contouring, better finishing of a restoration, and allows the operator to make a better subgingival cavity preparation.

Tenth. Inlay wax is adapted better to the cavity walls, and the pattern is drawn more easily from a tooth which has been lubricated with a fine oil rather than saliva. Cavity margins are visible and bevels readily established. The absence of saliva bubbles on wax gives smoother castings. A dry cavity allows a uniform setting of the cement and permits a good gingival seal. The penetration of saliva into the cement at the gingival margin causes a breakdown in its composition. Burnishing and finishing of all gold margins are accomplished with greater efficiency.

Eleventh. It is of inestimable value in pedodontics as its use establishes discipline and greatly enhances patient management. It is most helpful in periodontics, as its application provides a better field for vision and the application of treatment procedures.

Twelfth. Its use gives the dentist a feeling of great self-satisfaction, knowing that he is doing everything within his ability and knowledge to provide for his patient the best prospect of a lasting service.

Arguments Against Its Use

An honorable professional man is one whose purpose is to provide each of his patients with the best possible service for the abnormality presented. Why, then, has he so often neglected the routine use of an instrument which has been accepted and proved in the hands of recognized leaders in the field of operative dentistry for the past fifty years?

There are many reasons, excuses and explanations for avoiding the use of the rubber dam. Let us examine a few of these:

The principles upon which dentists build their practices are taught in the schools. The use of the rubber dam in dentistry is taught by many schools with the same "tongue in the cheek" attitude that instruction in gold foil is given: "This is something you must be able to do that you may pass your state board examinations." Lack of proper equipment and sufficient instruction in its use are two of the great causes of avoidance. More basic clamps and varied thicknesses of the rubber dam should be added to the students' armamentarium. The assistant and operator should be taught to work as a team in its application, and every modern technic for its application and aid in its adaptation should be made available. The line of reasoning behind the teaching should be changed from "this is something you must do that you may pass your state board examinations" to "this is some-

thing you should do that you may provide a better service for your patient and develop into a better operative dentist."

Some patients do object to its use. The Air Force headquarters of the Strategic Air Command is located in Omaha. We are privileged to serve as dentists for many of the wives of the officers stationed there. We see many beautifully cared for mouths, but we also see many young women who seem models of American beauty until we examine their dentition. In their mouths we find discolored silicate cements, teeth darkened by unprotected and unfinished amalgam restorations, the clasps of removable appliances, etc. All these services combine to produce a result that causes many to say, "I am ashamed to open my mouth"; in other words, "I am ashamed of my dentistry." We explain the advantages and the use of the rubber dam to those who have never seen the rubber dam. Of course, most of them come in thoroughly briefed by way of the bridge table. Seldom do they offer an objection to its use. Remarks vary from "That's the longest time I haven't said a word in twenty years" to "My, what a sanitary way to practice dentistry." Invariably they want to know if it is something new and why that good dentist at home, who always goes to conventions, had not heard about it. The percentage of transfers who want to be referred to a dentist in the new locality who uses the rubber dam is gratifyingly high.

The dentist often offers the excuse, "My patients cannot afford to pay me for that much time" or "I am too busy to spend the time it takes for its application and removal." I know of many extremely busy dentists who, with the help of trained auxiliary personnel, apply the dam in less than two minutes. Many assistants are capable of removing the dam upon the completion of the operation. These dentists believe that the use of the dam is a time-saving device in their busy day. Whether or not the patient can afford the extra time spent in the placing of the rubber dam, I believe that it is within the province of each of us to decide if we are going to build our operative practices up to a principle or down to a fee. Basically, most of our patients want to retain their teeth. It behooves us as professional men to discuss with them the basis for sound restorative procedures. If all phases of the services to be rendered are intelligently and truthfully discussed before the operation, there would be no justifiable objection to a reasonable fee for all operative procedures.

Present-Day Status of the Rubber Dam

Over twenty-five years ago Dr. Charles E. Woodbury told my graduating class that ninety percent of us were better dentists as senior students than we would be five years after graduation. He knew that we would soon break discipline and would be influenced into following the patterns established by our predeces-

sors. He knew that the first break in the line of reasoning taught us by our dental educators would be followed by other short cuts, improvisations, substitutions, and unacceptable procedures, which had been proved impractical by men of the stature of Black, Woodbury, and Ferrier.

Dr. Black [3] states that the object to be attained by the use of the rubber dam is to keep the tooth dry and clean during the excavation of the cavity, its treatment and the placing of the restoration. Its use enables the operator to better expose and bring the surfaces into view. Ingress of saliva, mucus or any foreign substance contaminates the cavity wall and prevents a perfect operation.

Dr. Charles E. Woodbury [4] wrote, "A good application of the rubber dam is the first requisite for a convenient and successful operation." One can see perfectly what one is doing. Most important of all is the definiteness with which all lines and grooves are brought out. Many moist carious areas appear sound and perfect, but will, when thoroughly dry, show the apertures through which the microorganisms of decay have entered.

Dr. Walden I. Ferrier [5] wrote, "The day the rubber dam was introduced to the profession marked a new era in the study of decay in the human teeth and made possible a method of operation that, in the light of long experience, has proved to be so nearly perfect that the surface upon which we operate is insured against the progress or recurrence of the disease for the lifetime of the patient."

Conversation with supply men in the Omaha area has revealed that 90% of the dentists in the city routinely used the rubber dam during the first year after graduation, but that this figure decreased to 20% after the third year and to 10% after the fifth year. This decline is taking place in a city that has the reputation of purchasing more rubber dam than the combined amount sold in two of our greater metropolitan areas; in a city which is surrounded by dental schools where the use of the rubber dam is taught and advocated.

However, correspondence with Mr. W. P. Keith, Jr., of the Hygeia Rubber Company, revealed that since 1952 we have had an increase of 51.2% in the use (sale) of the rubber dam in the United States. In 1952, the New England states bought 23.8% of the rubber dam manufactured. The West (all states west of a line through Montana to Arizona) purchased 33.3%, and the rest of the United States purchased the remaining 42.9%. Last year, 1958, the New England states purchased 30% of the 151.2% manufactured. The 151.2% represents the amount sold in 1952 over previous years as a basis for comparison. The New England states, therefore, had an increase of 26% in the use of the rubber dam over 1952. The West purchased 63.5% of the 151.2% or an increase of 91% since 1952; the rest of the United States bought 57.7% of the 151.2%, an increase of 34.5%.

The detail men from supply houses noted one pertinent fact: once a man discontinues the use of the rubber dam, he seldom resumes its use. Many, however, are converted by joining study clubs. Mr. Keith concurred with this observation and remarked that while an increase of young dentists in some areas was instrumental in the increase in number of rubber dam sales, by far the great determining factor was the formation of gold foil and other operative study clubs in the areas of increased consumption.

Conclusions

What is the future for the use of the rubber dam by practicing dentists? First, we must work through the schools. I cannot understand why certain dental colleges demand the isolation of a tooth for endodontic procedures, knowing that contamination of the pulp canal by saliva will certainly cause a failure of the endodontic treatment, but permit the student to prepare and restore that same tooth while it is bathed in saliva.

For both the full-time teachers and the senior dental students I would suggest an externship in the offices of selected general practitioners where they may observe technics and usages of the rubber dam in a day's work and, what is more important, the results of its continued and careful usage over the years.

I propose the formation of many new study clubs such as those fostered by the American Academy of Gold Foil Operators. Let us make contact with these new dentists as soon after graduation as possible, for they are going to be influenced by those with whom they associate. Let us guide them along that path which leads to a better service and a greater self-satisfaction.

Although we may not be our brother's keeper, is it not important that they be counseled by those of us who have something of great value to offer? It is our obligation, our duty and our privilege to help them to render the best operative dentistry in the world with all the finest equipment and training available to the world's finest people—our patients.

717 Medical Arts Building

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INTERIM ACADEMY MEETING

The 1960 Interim Academy Meeting was held on Friday, February 5, at Marquette University, School of Dentistry, Milwaukee, Wisconsin.

The morning session consisted of presentations by Dr. William S. Kramer, of Lincoln, Nebraska, on "Gold Foil in Pedodontics," and by Dr. John H. Mosteller, of Mobile, Alabama, on "Eighteen Years' Experience with Gold Foil in the South." A motion picture made by Dr. Lester E. Myers, of Omaha, Nebraska, entitled "The Class V Gold Foil" was also projected.

The afternoon was devoted to chair and table clinics on various gold foil procedures. The chair clinics on Class II, III, IV and V gold foil restorations were presented by the following clinicians:

Dr. Lionel U. Bergeron, *Somersworth, New Hampshire*
Dr. Marion S. Bowen, *Tulsa, Oklahoma*
Dr. B. K. Braum, *Edina, Minnesota*
Dr. William P. Burch, *Elmhurst, Illinois*
Dr. James E. Chapin, *Omaha, Nebraska*
Dr. Paul T. Dawson, *Chicago, Illinois*
Dr. Theodore R. Ferguson, *Chicago, Illinois*
Dr. Herbert F. Gillard, *Houston, Texas*
Dr. William F. Hemphill, *Omaha, Nebraska*
Dr. J. Warner Henderson, *Hood River, Oregon*
Dr. Wilfred J. Kemmet, *Milwaukee, Wisconsin*
Dr. Michael J. Murray, *Omaha, Nebraska*
Dr. John W. Olson, *Rush City, Minnesota*
Dr. Donald K. Phillips, *Nebraska City, Nebraska*
Dr. William O. Pugsley, *Fremont, Nebraska*
Dr. V. W. Schaefer, *St. Cloud, Minnesota*
Dr. John F. Stewart, *Omaha, Nebraska*
Dr. Theodore L. Taylor, Jr., *Madison, Wisconsin*
Dr. William M. Walla, *Fremont, Nebraska*
Dr. Kenneth C. Washburn, *Chicago, Illinois*
Dr. Wilburn H. Wilson, *Tulsa, Oklahoma*
Dr. Benjamin F. Wrbitzky, *Hutchinson, Minnesota*

Table clinics on "Instrumentation, Cavity Preparation and Condensation of Class III and Class V Gold Foils" were presented by members of the Denver Gold Foil Study Club. Those who participated were Dr. Michael T. Hori, Dr. A. Myron Lawson, Dr. Edgar D. Miller and Dr. Anton C. Zeman, Jr.

The 106 members and guests in attendance represented 21 states, including Alabama, California, Colorado, Illinois, Indiana, Iowa, Maryland, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New York, Oklahoma, Oregon, Pennsylvania, Texas, Virginia, Washington, Wisconsin, and Wyoming, and from Australia, El Salvador and British Columbia.

The entire program was presented primarily for the benefit of the dental students of Marquette University.

ACADEMY MEETING AT SETON HALL UNIVERSITY

On Thursday, September 10, 1959, a one-day meeting was held at Seton Hall University, College of Dentistry. This special meeting preceded the Annual Meeting of the Academy in New York, and was designed for the benefit of the dental students in that University.

The program consisted of three essays in the morning and chair clinics in the afternoon. The essayists, Dr. Paul T. Dawson, Chicago, Illinois; Dr. Henry A. Merchant, Omaha, Nebraska; and Dr. Charles M. Stebner, Laramie, Wyoming, presented excellent papers entitled "The Lingual Approach of the Class III Gold Foil Restoration," "Etiology and Therapeutic Treatment of Class V Lesions" and "Gold Foil as a Service."

The chair clinics on Class III, IV and V gold foil preparations and restorations were presented by these clinicians:

DR. RALPH A. BOELSCHE, *Houston, Texas*
DR. PAUL T. DAWSON, *Chicago, Illinois*
DR. HERBERT F. GILLARD, *Houston, Texas*
DR. HENRY A. MERCHANT, *Omaha, Nebraska*
DR. CARL R. OMAN, *New York, New York*
DR. CHARLES M. STEBNER, *Laramie, Wyoming*
DR. JAMES P. VERNETTI, *Coronado, California*
DR. WILLIAM M. WALLA, *Fremont, Nebraska*
DR. RALPH J. WERNER, *Menomonie, Wisconsin*
DR. ALFONSO DICERBO, *1959 Graduate, Columbia University*
DR. RUSSELL GAROFALO, *1959 Graduate, Columbia University*

The Academy sincerely hopes that the students who attended these sessions derived value through their observations of the procedures employed. It is also the Academy's hope that they will continue to render a high degree of service to their patients.

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ADDITIONAL STUDY CLUBS

Since the last issue of the *Journal* in September, 1959, the Editor has received information relative to two additional study clubs: the Loma Linda Gold Foil Study Group and the New England Study Club of Dentistry.

The Loma Linda Gold Foil Study Group has been operating for approximately three years. The group meets once a month at the College of Medical Evangelists, School of Dentistry, and has as its instructor Dr. Harold E. Schnepper.

The New England Study Club of Dentistry held its first meeting on May 4, 5 and 6 at the Tufts University School of Dental Medicine, Boston, Massachusetts. The program consisted of essays and table clinics on the rubber dam and gold foil manipulation presented by Dr. George W. Ferguson, Dr. José E. Medina, and Dr. Charles M. Stebner, who is serving as the Director of the Club. Dr. D. Jackson Freese, of Concord, New Hampshire, deserves commendation for his efforts, enthusiasm and zeal in promoting and organizing this much needed club in New England.

THE FRANK J. TONE MEDAL AWARD

Reginald V. Williams

Reginald V. Williams, President and Director of Research of the Williams Gold Refining Company, Incorporated, Buffalo, New York, was named as recipient of the 1959 Frank J. Tone Medal Award. The Medal is awarded annually by the Niagara Frontier Section of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

The Medal was established in 1956 by F. Jerome Tone and Franchot Tone to honor the memory of their father, Dr. Frank J. Tone, pioneer industrialist of the Niagara Frontier. It is awarded to a person who has made outstanding and important contributions to the science and practice of metallurgy. The recipient must be a resident of the Niagara Frontier community.

Mr. Williams was born in British Columbia, and his early years were spent in Western Canada and the Klondike Region. He attended Upper Canada College in Toronto and was graduated from Kansas University in Lawrence, Kansas. He also attended the University of Buffalo, from which college he received a chemical degree.

Mr. Williams has been a leader in research and development in the field of precious metals metallurgy for the dental profession and industry throughout his entire career. He holds several patents on alloy compositions of precious metals. He is particularly known in the dental profession for his work on the perfection of the complex gold-platinum alloy system used in wire form for dental applications, particularly in orthodontics. In 1923, after several years of research, he introduced high-frequency induction melting to the dental industry, and thus obtained the first truly homogeneous precious metal alloys to assure uniform and reliable service in their use. Ten years ago Mr. Williams designed and introduced a small induction melting apparatus for use by the dental profession. This machine is now in use by dentists and dental technicians throughout the world. It is a great timesaver as it reduced the process of melting and casting dental alloys to less than a minute's time.

In 1947, in recognition of his numerous contributions to and research for the betterment of dentistry, the Eighth District Dental Society of the State of New York made Mr. Williams an honorary member of their Society. To date he is the only non-dental member elected to the Society.

In December, 1945, Mr. Williams received an award from the United States Navy, Bureau of Ordnance, for outstanding performance in connection with research and development of a bi-metal alloy used in proximity fuses. At present, Mr. Williams is engaged in the development of semi-conductors and transistor alloys for various electronic manufacturers involved in National Defense.

Mr. Williams is a member of long standing of many societies, including the American Chemical Society, American Electro-Chemical Society, American Institute of Mining, Metallurgical and Petroleum Engineers, American Society for Testing Materials, the Institute of Metals of London, the American Society for Metals, and the Chemist Club of New York City.

The Tone Medal Award was presented to Mr. Williams at the annual Award Meeting which was held in the Hotel Stuyvesant in Buffalo on November 18. The presentation was made by William W. Stevens, Carborundum Metals Company, Chairman of the Niagara Frontier Section of the sponsoring society. The 1957 recipient of the Tone Medal was Dr. Clifford C. Furnas, Chancellor of the University of Buffalo. Mr. Joseph H. Brennen, Chief Metallurgist of the Carbide Metals Company of Niagara Falls, received the 1958 Tone award. The first award of the medal was made posthumously to Dr. Frank J. Tone in 1956.

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TEXTBOOK ON GOLD FOIL

The technics in gold foil procedures advocated by Dr. Walden I. Ferrier, an eminent authority on Operative Dentistry, are now available in a book titled *Gold Foil Operations.*

The material in this book, describing the restoration of each classification of cavities, was originally published as a chapter in Dr. C. N. Johnson's book, *Textbook of Operative Dentistry,* published in 1938, but now out of print. The illustrations for his book have been reviewed by Dr. Ferrier, and several are completely new.

Anyone desiring additional information may write directly to the distributors, The University of Washington Press, Seattle 5, Washington.

PICTORIAL REVIEW OF ANNUAL MEETING

PROCEEDINGS OF EIGHTH ANNUAL MEETING

Charles C. Latham,* D.D.S., Coronado, California

The Eighth Annual Meeting of the American Academy of Gold Foil Operators was held on September 11 and 12, 1959 in New York City. The scientific program was presented at Columbia University, School of Dental and Oral Surgery, and the business meetings were conducted at the Park-Sheraton Hotel.

Dr. James P. Vernetti, President of the Academy, called the meeting to order; Reverend Robert B. Reeves delivered the invocation; and Dean Gilbert P. Smith extended greetings and welcomed the Academy to Columbia University. Dr. Vernetti introduced Dr. Herbert D. Coy, Program Chairman, who presided over the scientific phase of the meeting.

Dedication

The 1959 Annual Meeting in New York City was dedicated to the Departments of Operative Dentistry of the Eastern dental schools. The deans were so advised prior to the meeting.

Attendance

During the course of the two-day program 141 members and guests registered for the meeting. They represented 27 states, including Alabama, California, Colorado, Connecticut, Illinois, Iowa, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. In addition to these states, Brazil, Canada, El Salvador, France, Italy and The Netherlands were also represented.

Didactic Program

During the morning of Friday, September 11, Dr. Lawrence R. Ludwigsen, with the assistance of Mrs. Rosaline Brink, demonstrated the efficiency of a chairside assistant in the placement of Class V gold foils. The demonstration was conducted by the use of television [1] and kodachrome slides. Dr. John Tocchini, Dean of the College of Physicians and Surgeons, narrated the entire procedure which was very well received by all those in attendance.

Following the television presentation, Dr. Michael J. Murray delivered a paper on "The Value of Rubber Dam in Operative

* Secretary-Treasurer, 1958-1959.

[1] Appreciation is expressed to the North American Phillips Company for the financial help it provided to defray a portion of the expenses connected with the television presentation.

Dentistry," and Dr. Rex Ingraham delivered another on "The Value of Gold Foil in the Teaching of Clinical Dentistry and Material Aids in the Placement of Foil Restorations." Because they contained information of great value and interest to the audience, both of these presentations were enthusiastically received.

Clinical Program

During the afternoon of Friday, September 11, and the morning of Saturday, September 12, chair clinics were conducted, demonstrating the preparation and condensation of Class II, III, IV and V gold foil restorations. The following clinicians participated in this portion of the program:

Dr. Kinley K. Adams, *Salem, Oregon*
Dr. José Amaya y de Vincente, *San Salvador, Central America*
Dr. Ernest R. Ambrose, *Montreal, Quebec, Canada*
Dr. Gordon T. Ballantyne, *Portland, Oregon*
Dr. Carl L. Boyles, *Houston, Texas*
Dr. William E. Cody, *Denver, Colorado*
Dr. Ray A. Collins, *Front Royal, Virginia*
Dr. Roy M. Cumming, *Detroit, Michigan*
Dr. Paul T. Dawson, *Chicago, Illinois*
Dr. Paul L. Deines, *Lincoln, Nebraska*
Dr. Theodore R. Ferguson, *Chicago, Illinois*
Dr. Lyle W. Furst, *York, Nebraska*
Dr. Herbert F. Gillard, *Houston, Texas*
Dr. Irving H. Goulard, Jr., *Arcadia, California*
Dr. A. Ian Hamilton, *Seattle, Washington*
Dr. Emmett R. Hansen, *Omaha, Nebraska*
Dr. Gunner L. Hellberg, *Bellingham, Washington*
Dr. Harry M. Kavanaugh, *Detroit, Michigan*
Dr. M. Olin Loomis, *Seattle, Washington*
Dr. Ronald E. R. Lovell, *Waban, Massachusetts*
Dr. Lawrence R. Ludwigsen, *San Francisco, California*
Dr. Merle B. McGee, *Pittsburgh, Pennsylvania*
Dr. Kenneth N. Morrison, *Seattle, Washington*
Dr. John H. Mosteller, *Mobile, Alabama*
Dr. Michael J. Murray, *Omaha, Nebraska*
Dr. Harold E. Nelson, *Midvale, Utah*
Dr. Frank D. O'Neill, *Chula Vista, California*
Dr. Ralph E. Plummer, *Seattle, Washington*
Dr. Harry Rosen, *Montreal, Quebec, Canada*
Dr. John T. Ryan, *Seattle, Washington*
Dr. Harold E. Schnepper, *Rialto, California*
Dr. Mark Shulman, *Los Angeles, California*
Dr. Harold W. Sidwell, *Villisca, Iowa*
Dr. Charles M. Stebner, *Laramie, Wyoming*
Dr. John F. Stewart, *Omaha, Nebraska*
Dr. William M. Walla, *Fremont, Nebraska*
Dr. Kenneth C. Washburn, *Chicago, Illinois*
Dr. Ralph J. Werner, *Menomonie, Wisconsin*

Social Program

The social hour and banquet held at the Park-Sheraton Hotel in New York City was attended by 117 members, ladies and guests.

After a delightful dinner, President James P. Vernetti spoke briefly on the progress of the Academy during the past year. He then introduced the members and guests seated at the head table and proceeded with the business meeting.

Business Meeting

Treasurer's Report

As of September 1, 1959 the treasurer, Dr. Charles C. Latham, reported the following financial status of the Academy for the year 1958-1959:

Balance on Hand, October 31, 1958	$ 6,192.41
Total Receipts to September 1, 1959	5,937.49
Total	$12,129.90
Disbursements, October 31, 1958 to September 1, 1959	4,575.07
Balance on Hand, September 1, 1959	$ 7,554.83

Program Committee

Dr. Herbert D. Coy, Chairman, expressed his appreciation to the many clinicians, essayists and others who had participated in the Eighth Annual Meeting. The Academy accepted his report and extended its congratulations to Dr. Coy and his Committee for the excellent and well-organized program.

Necrology Committee

The Secretary of the Academy read a letter from Dr. Daniel F. Haselnus, Chairman, who reported that there had been no deaths during the preceding year.

Study Club Committee

Dr. Douglas J. Sutherland, Chairman, reported that requests regarding sample constitution and suggested outline for use in the formation of a study club had been received from a group in Las Cruces, New Mexico, and from one headed by Dr. T. R. Ferguson of Chicago. The information requested was forwarded.

Literature Committee

This Committee, under the chairmanship of Dr. Herbert F. Gillard, attempted to stimulate the use of gold foil and rubber dam during the year. A number of letters were sent to members of the Academy detailing our responsibilities to dentistry and encouraging the preparation of suitable articles for publication in this *Journal* or in others.

The Committee also contacted one of the feature writers of *Reader's Digest Magazine* concerning the publication of a story on the history of gold foil. The Committee was unsuccessful,

but it recommended that additional contacts be made with other feature writers of nationally known magazines.

State Board Committee

Dr. Charles M. Stebner, Chairman, reported that the examiners of the Northeastern State Boards had been invited to attend the Eighth Annual Meeting. The Committee recommended that this procedure be followed for every meeting of the Academy, and, whenever possible, that the invitation be extended by a personal contact.

School Committee

The Committee submitted a report on the objectives and activities during the past year. Dr. William H. Silverstein, Chairman, sent letters to the staffs of the Departments of Operative Dentistry of the Eastern Dental Schools inviting them to attend the Annual Meeting of the Academy, as well as a party in their honor sponsored by the Academy. The Committee hoped that the exchange of ideas and technics might prove beneficial to all concerned, and that this meeting might encourage future gatherings of staff members from the different schools for the exchange of ideas.

The Committee also contacted the Visual Education Committee for a list of visual aids for possible use by schools.

History Committee

Under the chairmanship of Dr. Robert C. Millard the Committee attempted to obtain historical data on the various Gold Foil Study Clubs known to the Academy. The Committee felt that this information would be of value for future reference.

In order to standardize the necessary information a questionnaire was prepared and sent to the study clubs. Approximately one-half of the questionnaires have been returned.

The Committee also recommended that (1) the Committee for 1960 be requested to complete the survey, (2) those clubs not officially registered request questionnaires from the Committee, (3) the Secretary keep the Committee informed of the formation of new clubs, and (4) the Study Club Committee make an effort to organize clubs in areas not already represented.

Visual Education Committee

The Academy's Secretary read the report of this Committee. Under the chairmanship of Dr. Harold E. Schnepper the Committee compiled and catalogued a mimeographed report on visual aids available throughout the nation. The information was derived from a questionnaire sent to schools and leading practitioners. The Committee felt that this source of information

might be useful to the Academy and to newly organized study clubs.

The Committee also approved the script and production of a film on the Class V gold foil by Dr. Gerald D. Stibbs and sponsored by Morgan, Hastings and Company.

Dr. Schnepper's report also recommended that at least three films on the Class III gold foil be made: one by Dr. Harry A. True on the inconspicuous approach; a second by the Woodbury group from the Midwest; a third by the Northwest group. It was also suggested that these films could be sponsored by various gold foil manufacturing companies, but co-owned and regulated by the Academy.

The Committee also recommended that cataloguing of slides and films on rubber dam should be filed with the Visual Education Committee, and that a central headquarters should be established where films, movies, charts, etc., can be kept for the Academy and made available to its members when and where needed.

Dental Research Committee

Dr. Robert B. Wolcott, Chairman, presented a comprehensive report on the activities of this Committee during the past year. (1) A list of more than 100 volunteer Academy members who had expressed their willingness to contribute their technical skill in preparing specimens for investigation was compiled. It is intended that this list shall be made available to investigators who have launched a program of foil research and are in need of clinical specimens. (2) A large number of specimens were prepared by two members, Dr. James P. Vernetti and Dr. Charles C. Latham, for Mr. Ralph W. Phillips, who is undertaking a program of evaluating the comparative adaptation and porosity of various restorative materials. Radioisotopes are being used to evaluate these properties. (3) The Committee, with the assistance of Mr. Duane Taylor of the National Bureau of Standards, developed a new die to be made available shortly for pilot studies. (4) A project has been outlined by one of the members for submission to the Bureau of Medicine and Surgery (U. S. Navy) for approval. Generally speaking, this study will deal with the effect of various gold foil procedures upon adaptation and porosity, and also with the effect of prolonged tooth separation upon the periodontium. Numerous specimens will be requested of the membership if this project is approved. (5) An investigation has been initiated by Dr. Douglas W. Kerr designed to ascertain the general attitude of dentists to gold foil. It is anticipated that this study will be conducted during the forthcoming year and will require the cooperation of study clubs throughout the country. (6) Dr. Arne G. Nielsen has proposed a study which will determine the mobility of teeth as they are affected by various placement technics. These technics will in turn be evaluated for their effect upon the periodontium.

The Committee also announced that Dr. William S. Kramer had submitted an article on some physical properties of gold foil and mat gold to the *Journal.* Dr. Kramer's report appears on page 8 of this issue.

Editorial Board

Dr. José E. Medina, Chairman of the Board and Editor of the *Journal,* expressed the Board's opinion that the publication of the *Journal* should be continued indefinitely. (Council had voted previously to publish only two more issues.) It was further suggested that a rotating Board be established in order to provide continued interest among the membership. Dr. Medina also recommended the addition of a Consulting Editor to the Board to assist in the publication of the *Journal,* the appointment to be left up to the discretion of the Editor.

Dr. Ralph A. Boelsche, Business Manager of the *Journal,* reported on the excellent cooperation received from dental manufacturing companies as evidenced by the seven full-page advertisements appearing in the issues in 1959. Dr. Boelsche also recommended that a revision of the fee schedule for advertising and discount rates where advertising agencies are concerned be considered for the following year.

The Academy expressed its appreciation to the Editorial Board for its achievements during the formative years of the *Journal.*

Membership Committee

The membership of the Academy has been increasing gradually throughout the past several years. The Chairman of the Committee, Dr. Austin S. Neeb, reported that as of September, 1959 the roster contained the names of 399 members, including 290 active, 105 associate and 4 honorary. This total included the names of the following applicants who were elected to membership during the Eighth Annual Meeting:

NEW ACTIVE STATUS

DR. CHARLES BOWMAN ARMSTRONG, *San Diego, California*
DR. LIONEL U. BERGERON, *Somersworth, New Hampshire*
DR. FRANK CLARENCE BLAIR, *Long Beach, California*
DR. MARION S. BOWEN, *Tulsa, Oklahoma*
DR. FRANCIS JOHN BROWN, *Genoa, Nebraska*
DR. WILLIAM PAUL BURCH, *Elmhurst, Illinois*
DR. EDWARD A. CAIN, JR., *New York, New York*
DR. ROBERT GABRIEL FODOR, *St. Louis, Missouri*
DR. HARVEY FORBES, *Kansas City, Missouri*
DR. D. JACKSON FREESE, *Concord, New Hampshire*
DR. GUILHERME SIMOES GOMES, *Sao Paulo, Brazil*
DR. J. WARNER HENDERSON, *Hood River, Oregon*
DR. MERLE W. HUNT, *Battle Creek, Nebraska*
DR. ROBERT THOMPSON LABARRE, *Charlottesville, Virginia*
DR. RUSSELL W. LENTZ, *Portland, Oregon*

DR. OLIVER ELDON LOCKHART, *Ogden, Utah*
DR. JOSEPH B. MATTERN, *Denver, Colorado*
DR. JOE PATRICK MCLOUD, *Tulsa, Oklahoma*
DR. BERNARD J. MILLER, *Sheridan, Oregon*
DR. JOHN H. MOSTELLER, *Mobile, Alabama*
DR. WESLIE B. OWEN, *Hereford, Texas*
DR. JOHN L. SEBERG, *Fullerton, Nebraska*
DR. ROBERT PERRY STEED, *Coronado, California*
DR. JOHN FINCH STEWART, *Omaha, Nebraska*
DR. THEODORE LINN TAYLOR, JR., *Madison, Wisconsin*
DR. RALPH TERRACE, *Short Hills, New Jersey*
DR. WILLIAM PAUL VETTER, *Coronado, California*
DR. U. CLAYTON WEIGHT, *Eugene, Oregon*
DR. PHILLIP TURNER WILLIAMS, *Atlantic, Iowa*
DR. DONALD LEROY ZEILER, *Pittsburgh, Pennsylvania*

NEW ASSOCIATE MEMBERS

DR. BILLY CONRAD BEST, *Lincoln, Nebraska*
DR. CLAYTON L. BOHN, *Bethesda, Maryland*
DR. ROBERT CHERRY BROCKLEY, *Lincoln, Nebraska*
DR. LEE A. COUNSELL, *Chelsea, Massachusetts*
DR. CASWELL J. FARR, *Bellingham, Washington*
DR. ALBERT N. HERR, *Camp Lejeune, North Carolina*
DR. VERNON W. RINNE, *Lincoln, Nebraska*
DR. JULIAN JOHNSON THOMAS, JR., *Bethesda, Maryland*
DR. RICHARD PALMER WESTIN, *Seattle, Washington*

Seven associate members—Dr. Joseph R. Evans, Norfolk, Virginia; Dr. Wade H. Hagerman, Jr., F.P.O., New York; Dr. J. C. A. Harding, San Diego, California; Dr. Arne G. Nielsen, Gales Ferry, Connecticut; Dr. Max Oppenheim, Philadelphia, Pennsylvania; Dr. Albert T. Ridder, North Platte, Nebraska; and Dr. Richard R. Troxell, F.P.O., New York—requested changing to active status. Three active members—Dr. J. Raymond Gill, San Francisco, California; Dr. William S. Kramer, Lincoln, Nebraska; and Dr. John M. Wark, Vancouver, British Columbia, Canada—requested associate membership. One member, Dr. Beryl Ritchey, Colorado Springs, Colorado, submitted his resignation. These requests were approved by the Academy.

Constitution and Bylaws Committee

Three weeks prior to the Annual Meeting, the Secretary of the Academy, Dr. Charles C. Latham, mailed copies of the proposed amendments to the entire membership of the Academy. The proposed changes were presented at the Annual Meeting and were adopted by the Academy.

Nominating Committee

Dr. Kenneth V. Randolph, Chairman of the Nominating Committee, submitted the following names for offices:

DR. ROBERT B. WOLCOTT.....*President-Elect*
DR. CHARLES C. LATHAM.....*Secretary-Treasurer*
DR. JOHN C. BARTELS.....*Executive Council*

The Academy unanimously elected these members to their respective offices.

Adjournment

After the committee reports, President James P. Vernetti presented appropriately inscribed certificates to Dr. Paul A. Dawson, Dr. Rex Ingraham, Dr. Lawrence R. Ludwigsen, Dr. Henry A. Merchant, Dr. Michael J. Murray, Dr. Charles M. Stebner and Dr. John Tocchini for their contributions to the Eighth Annual Meeting.

In recognition of his many contributions to the Academy during the previous year, Dr. James P. Vernetti was presented a President's Certificate. At this time, Dr. Vernetti expressed his appreciation to the officers and committee members who had served so diligently during his term.

Dr. Herbert D. Coy was then installed as President for 1959-1960. Dr. Coy paid tribute to Dr. Vernetti for his fine accomplishments. He then introduced Dr. Charles C. Latham, the Secretary-Treasurer, and Dr. Robert B. Wolcott, the President-Elect. The meeting was adjourned at 10:20 P. M.

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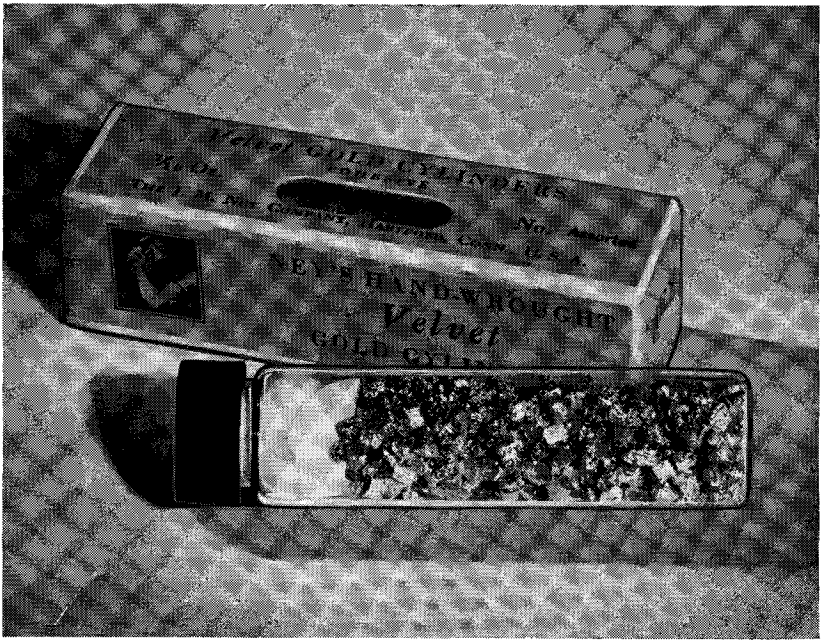

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Ney Gold Foil has been hand beaten since 1812, and this hand method still produces the highest quality gold foil for dentistry.

Ney's Foil is available in sheet form (made up in books), and in ropes and cylinders. Ney Ropes are hand rolled (not rolled on a mandrel) which lightly crushes the foil, making build-up faster. Books contain 1/10 of an ounce, cylinder and ropes are available in 1/10 oz. and 1/40 oz. packages. Three types of Foil are available: COHESIVE, SOFT and SPECIAL B. COHESIVE and SOFT are standard thickness, #4 Foil (4″ square weighs 4 grains). SPECIAL B is heavier, #5 Foil, weighing 5 grains per 4″ square. The varied working properties of these Foils meet practically every requirement for foil fillings. Further information will be sent on request.

THE J. M. NEY COMPANY
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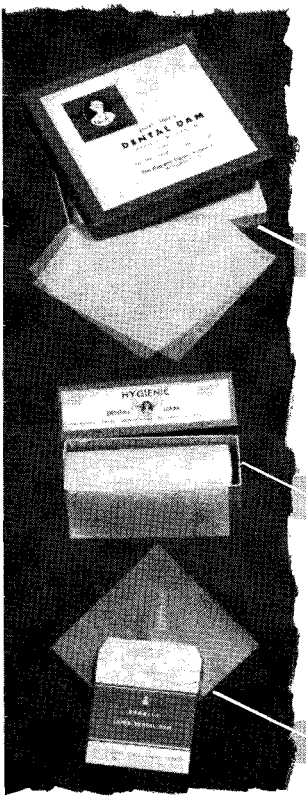

in cuts and thicknesses to meet the requirements of every gold foil operation

★ READY CUT DAM

Available in:
5" squares — 52 pieces per box
6" squares — 36 pieces per box
Light or Dark Color
Thin, Medium, Heavy or Extra Heavy Gauge (Extra Heavy—Dark only)

★ DAM IN ROLLS

Available in:
½ sq. yd. roll — 5" or 6" wide
1 sq. yd. roll — 5" or 6" wide
Light or Dark Color
Thin, Medium, Heavy or Extra Heavy Gauge (Extra Heavy—Dark only)

★ STERILE DAM

Each piece individually packaged to keep it sterile until used.

Available in:
5" squares — 30 pieces per pkg.
6" squares — 30 pieces per pkg.
Light or Dark Color
Medium Gauge only

GAUGES & TOLERANCES

Thin	— .005" ± .001"
Medium	— .0075" ± .001"
Heavy	— .010" ± .001"
Ex. Heavy	— .0125" ± .001"

STRONG, TEAR-RESISTANT Hygienic Latex Dam, together with modern accessories (from other manufacturers), now combine to render the recognized advantages of the rubber dam readily available for easy application by all. See your dealer or write us. New technics for application of the rubber dam would be welcome for our file.

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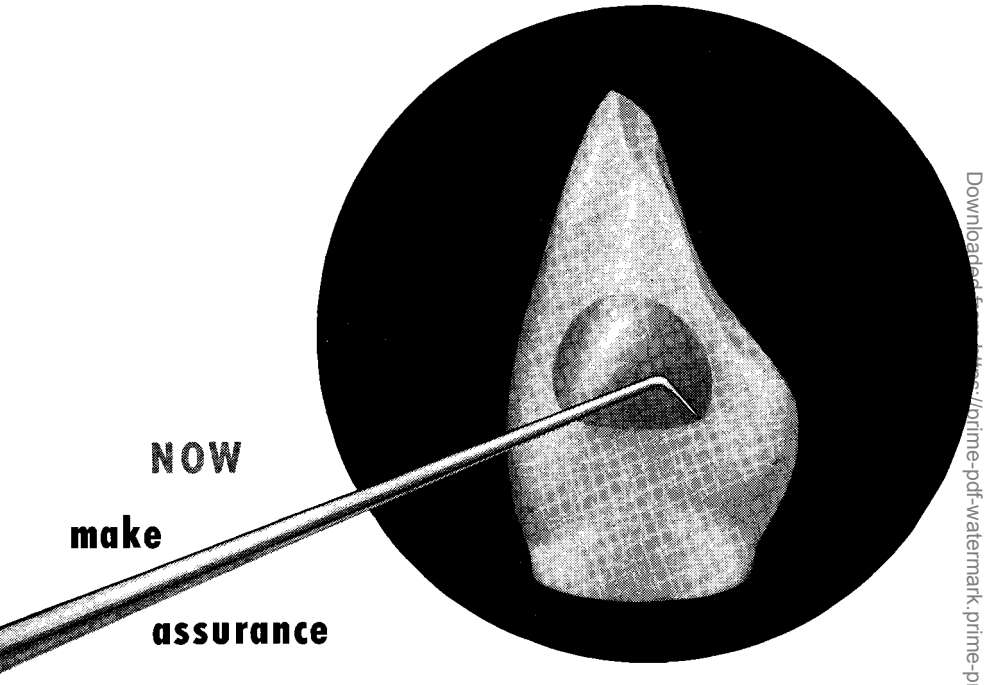

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An exclusive process, culminating *over 100 years* of experience, combines in them extras never dreamed of before. Responding instantly to the plugger, they pack easily and rapidly into a dense, resistant filling having great edge-strength and unsurpassed hardness. They do not balk at the plugger, but follow it pliantly, going true to the mark the very first time they are condensed to place.

Never before such wonderful cohesiveness, such perfect softness. Never before such instant responsiveness!

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Please send, through my dealer, 1/40 oz. of "M-H" Extra Pliable Cylinders—price, **$2.65.**

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Dealer.....

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(retains its original color)

BETTER THAN FOIL
(by virtue of its density)

BETTER THAN 24K CAST INLAYS
(superior in hardness)

BEST MAT GOLD

Williams Mat Gold is a .999-Fine crystalline deposit that is unusually cohesive. Exclusive Williams processing (due to the phenomenon of "cold welding") enables it to take on great strength under simple manipulation. For **properly condensed** gold fillings, wherever indicated, use Williams Mat Gold.

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