Volume 12

March, 1945

Number 1

Journal

AMERICAN COLLEGE OF DENTISTS

In This Issue:

The Journal Forum: What Constitutes Adequate Support of a Dental School? Harlan H. Horner, Russel W. Bunting, Charles W. Freeman, P. E. Blackerby, Jr.

Horace Wells Centennial: Northern California

American Association for the Advancement of Science: Subsection on Dentistry

..... Paul C. Kitchin

Published Quarterly for General Circulation by THE AMERICAN COLLEGE OF DENTISTS

\$3.00 a Year

75 Cents a Copy

Journal American college of dentists

Presents the proceedings of the American College of Dentists and such additional papers and comment from responsible sources as may be useful for the promotion of oral healthservice and the advancement of the dental profession. The Journal disclaims responsibility, however, for opinions expressed by authors.

Published Four Times a Year — March, June, September, December.

Entered as Second Class Matter July 13, 1940, at the Post Office at San Francisco under the Act of March 3, 1879 Copyright, 1944, by the American College of Dentists—Made in United States of America

THE RECORDER PRESS, SAN FRANCISCO, U. S. A.

Address of the Editor: JOHN E. GURLEY, D.D.S., 350 Post Street, San Francisco, 8, California

Assistant Editor:

JAMES NUCKOLLS, D.D.S., Medical Center, University of California, College of Dentistry, Parnassus and Third Aves., San Francisco, 22, California

Journal Committee: Willard C. Fleming, Harold S. Smith, W. N. Hodgkin, chairman

AMERICAN COLLEGE OF DENTISTS

Objects: The American College of Dentists "was established to promote the ideals of the dental profession; to advance the standards and efficiency of dentistry; to stimulate graduate study and effort by dentists; to confer Fellowship in recognition of meritorious achievement, especially in dental science, art, education and literature; and to improve public understanding and appreciation of oral health-service." — *Constitution, Article 1.*

Announcements

Next Meeting, Board of Regents, to be announced. Next Convocation to be announced.

Fellowships and awards in dental research. The American College of Dentists, at its annual meeting in 1937 [J. Am. Col. Den., 4, 100; Sep. and 256, Dec., 1937] inaugurated plans to promote research in dentistry. These plans include grants of funds (The William John Gies Fellowships) to applicants, in support of projected investigations; and also the formal recognition, through annual awards (The William John Gies Awards), of distinguished achievement in dental research. A standing committee of the International Association for Dental Research will actively cooperate with the College in the furtherance of these plans. Applications for grants in aid of projected researches, and requests for information, may be sent to the Chairman of the Committee on Dental Research of the American College of Dentists, Dr. Albert L. Midgley, 1108 Union Trust Bldg., Providence, R. I. [See "The Gies Dental Research Fellowships and Awards for Achievement in Research," J. Am. Col. Den., 5, 115; 1938, Sep.]

Journal

AMERICAN COLLEGE OF DENTISTS



AMERICAN COLLEGE OF DENTISTS

OFFICERS OF THE COLLEGE

1944-1945

President: ROBERT P. THOMAS, LOUISVILLE President-elect: MALCOLM W. CARR, New York Vice-President: WILLIAM J. H. BENSON, Milwaukee Secretary: OTTO W. BRANDHORST, St. Louis

Treasurer: HAROLD S. SMITH, Chicago

Regents

H. O. LINEBERGER (49), Raleigh, N. Y.

WILLARD C. FLEMING (48), San Francisco

W. H. SCHERER (46), Houston

W. N. HODGKIN (45), Warrenton WALTER H. WRIGHT (47), Pittsburgh

JOHN E. GURLEY (Editor), ex-officio

Standing Committees (1944-1945)

- Ad-Interim-The President, Presidentelect, and Secretary.
- Certification of Specialists-Earl W. Swinehart, chairman; Max E. Ernst, Wm. E. Flesher, H. E. Kelsey, D. F. Lynch, J. O. McCall.
- Education-Willard C. Fleming, chairman; Oscar J. Chase, Wm. H. Crawford, Kenneth R. Gibson, Paul E. Jones.
- History-W. N. Hodgkin, chairman; E. E. Haverstick, A. W. Lufkin, Fred E. Maxfield, J. Ben Robinson.
- Hospital Dental Service-W. Harry Archer, Jr., chairman; J. W. Kemper, S. P. Mallett, L. H. Meisburger, Howard C. Miller.
- Journalism-J. Cannon Black, chairman; W. B. Dunning, Walter Hyde, E. G. Meisel, A. E. Seyler.
- Necrology-I. B. Carr, chairman; R. W. Bunting, Julio Endelman, D. M. Gallie, Sr., R. J. Rinehart.
- Nominating-A. W. Bryan, chairman; H. E. Friesell, J. H. Ferguson, R. L. Sprau, R. C. Willett.

- Oral Surgery-Leslie M. FitzGerald, chairman; Sam H. Brock, H. L. Cartee, S. M. Moose, C. W. Waldron.
- Preventive Service-John T. O'Rourke, chairman; L. M. Childers, K. A. Easlick, C. S. Foster, G. R. Lundquist.
- Prosthetic Service-Walter H. Wright, chairman; Louis Brach, C. A. Nelson, C. G. Porter, Jack Werner.
- Relations-Paul H. Hoeffel, chairman; H. C. Jarvis, P. H. Jeserich, R. C. Leonard, A. C. Young.
- Research-Albert L. Midgley, chairman; L. E. Blauch, P. J. Brekhus, J. E. Gurley, P. J. Hanzlik, P. C. Kitchin, A. B. Luckhardt, L. R. Main, L. M. S. Miner, L. W. Morrey, Irvine McQuarrie, Fr. A. M. Schwitalla.
- Socio-Economics-George W. Wilson chairman; A. O. Gruebbel, Donald W. Gullett, Waldo H. Mork, M. Webster Prince, K. C. Pruden, E. G. Sloman, E. W. Swanson.

Board of Editors (1945)

Officers and Regents of the College, ex-officio

JOHN E. GURLEY, San Francisco, Editor JAMES NUCKOLLS, San Francisco, Assistant Editor

Contributing Editors

H. TRENDLEY DEAN (49), Bethesda (Md.) ANDERSON M. SCRUGGS (49), Atlanta H. H. HORNER (48), Chicago A. L. WALSH (48), Montreal (Canada) ALBERT L. MIDGLEY (47), Providence W. HARRY ARCHER, JR. (47), Pittsburgh WALTER J. PRYOR (46), Cleveland CHARLES F. BROWN (46), Denver WILLIAM J. GIES (45), New York L. E. BLAUCH (45), Washington (D. C.)

Volume 12

MARCH, 1945

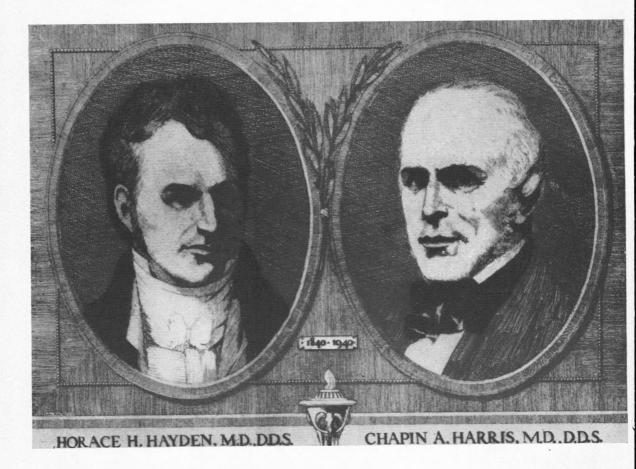
Number 1

Journal AMERICAN COLLEGE OF DENTISTS

Contents

The Journal Forum:	
What Constitutes Adequate Support of a Dental School?	
The Problem: Harlan H. Horner	1
Discussion: Russel W. Bunting, D.D.S.	
Charles W. Freeman, D.D.S.	
P. E. Blackery, Jr., D.D.S.	
Horace Wells Centennial: Northern California:	. 0
Statement by the Chairman. John E. Gurley, D.D.S.	11
Anesthesia: A Centenary Celebration Honoring the Discoverer, Horace Wells, Dentist. E. F. Soderstrom, D.D.S.	14
Appreciation to Park Commission. Reuben L. Blake, D.D.S.	18
Response to Dr. Blake. Hon. Lloyd E. Wilson.	18
Response to Dr. Blake. Robert C. Miller	19
An Acknowledgment: The Discoverer of Anesthesia, Horace Wells. J. C. Geiger, M.D.	
Remarks Concerning Anesthesia and Horace Wells. Langley Porter, M.D.	20
Invocation Highbert H Londrom Db D	22
Invocation. Hughbert H. Landram, Ph.D	23
Introductory Remarks Presiding Officer Pariania (D. D. D. C.	25
Introductory Remarks, Presiding Officer. Benjamin C. Reinke, D.D.S.	30
Addenda	2-40
American College of Dentists:	
Minutes of Meeting of Board of Regents, Chicago, October 18 and 19, 1944	
(abbreviated). Otto W. Brandhorst, D.D.S.	41
Report of Necrology Committee. John V. Conzett, D.D.S., Chairman	45
American Association for the Advancement of Science: Proceedings of the Subsection on Dentistry, Ninth Annual Meeting, Cleveland, Ohio, September 11, 1944. Compiled by Paul C. Kitchin, D.D.S., Secretary	
Editorials:	-07
	10
Old Problems and New Departures	68
Hayden and Harris	69
John V. Conzett	70
American College of Dentists: Sections and Section Officers (1944-45)	. 72

American College of Dentists



THEY LAID THE FOUNDATION FOR ORGANIZED DENTISTRY.

A task without a vision is drudgery; A vision without a task is a dream, But a task with a vision is ecstasy.

-Anonymou.

THE JOURNAL FORUM

Conducted by HARLAN H. HORNER¹ Chicago

THE PROBLEM: WHAT CONSTITUTES ADEQUATE SUPPORT OF A DENTAL SCHOOL?

Time was when proprietary dental schools met all of their operating expenses from their receipts from tuition, fees and clinics, and yielded a handsome profit to their owners. Time was also a little later in the evolution of dental education, when dental schools organized as non-profit institutions still expected to maintain themselves from their receipts from tuition, fees, and clinics, and to build up a reserve for capital expenditures.

The proprietary dental school primarily conducted as a business for the personal profit of its owners has happily disappeared entirely. The day is not far distant when all dental education in America will be under the guidance and control of well established universities or be conducted on the plane of a university discipline. A considerable number of dental schools, already established as integral units in universities, are yet expected to carry themselves through their receipts from tuition, fees and clinics.

The findings of the Council on Dental Education would indicate that it is exceedingly difficult, if indeed, not impossible, to maintain a thoroughly satisfactory program without income in addition to that derived from the conventional and time-honored sources. The accompanying table shows the distribution in percentages of the sources of income of thirty-eight dental schools in the United States for one year of record collected during the Council's survey of the schools. The schools are designated merely by number without reference to rank, but are arranged in the order of the percentage of total income from clinics.

Examination of the table in connection with the general findings of the Council throws some light upon what constitutes adequate support of a dental school.

Twenty-three schools depend upon tuition, fees and clinics for from 74.9% to 99.6% of their entire income for support. Ten of these schools are greatly in need of new physical plants and thoroughly modern equipment. Nine are housed in reasonably adequate but outmoded buildings and four are modernly housed. Nineteen of the 23 fall below the fourth tenth of all the schools in the final comparative ranking of the Council. All of these 23

¹Secretary, Council on Dental Education, American Dental Association.

JOURNAL OF THE AMERICAN COLLEGE OF DENTISTS VOL. 12, NO. I

HARLAN H. HORNER

		<i>(B)</i>		Jointh of 30	DENTAL DEL	HUOLS
	(A)	Tuition	A and B	Parent		Other
No.	Clinics	and Fees	Combined	Institution		Sources
I	54.1	45.3	99.4	0	0	.6
2	51.0	42.3	93.3	0	0	6.7
3	46.5	51.8	98.3	1.7	0	0
4	44.2	46.6	90.8	8.2	0	I.0
5	43.6	51.3	94.9	0	.I	5.0
6	42.5	48.2	90.7	0	0	9.2
7	42.3	37.0	79.3	0	5.8	14.9
8	42.I	40.6	82.7	16.3	0	I.0
9	41.0	54.8	95.8	0	I.2	3.0
IO	39.2	44.0	83.2	15.8	0	I.0
II	38.8	59.7	98.5	0	0	1.5
I2	38.4	46.4	84.8	12.8	0	2.4
13	36.8	47.2	84.0	16.0	0	0
14	36.2	27.4	63.6	31.6	.6	4.2
15	30.5	45.8	76.3	18.9	0	4.8
16	30.0	36.0	66.0	6.6	15.2	12.2
17	29.3	51.6	80.9	0	12.5	6.6
18	27.0	38.2	65.2	34.3	0	.5
19	26.9	55.3	82.2	17.0	0	.8
20	24.4	73.4	97.8	1.7	0	.5
21	24.3	28.6	52.9	43.8	•3	3.0
22	24.3	55.4	79.7	19.0	•3	I.0
23	22.9	28.0	50.9	48.6	.5	0
24	22.4	65.1	87.5	0	6.5	6.0
25	22.0	26.3	48.3	44.4	0	7.3
26	20.0	71.4	91.4	6.3	1.5	.8
27	18.1	25.6	43.7	55.4	0	.9
28	17.8	23.8	41.6	57.6	0	.8
29	17.8	31.2	49.0	31.0	0	20.0
30	17.3	22.0	39.3	58.7	0	2.0
31	16.9	78.6	95.5	0	1.5	3.0
32	16.0	58.9	74.9	22.6	0	2.5
33	15.6	84.0	99.6	0	0	.4
34	13.7	35.6	49.3	50.7	0	0
35	12.0	23.4	35.4	63.7	0	.9
36	12.0	17.5	39.5	63.7	0	6.8
37	11.6	35.0	46.6	53.4	0	0
38	8.1	16.9	25.0	75.0	0	0

Percentage Distribution of Income of 38 Dental Schools

THE JOURNAL FORUM

schools have certain deficiencies which, in the judgment of the Council, could be largely overcome with added annual income.

Sixteen schools derive from 30% to 54.1% of their income from their clinics. All but one of these 16 schools have marked weaknesses which could largely be corrected with the wise use of added funds. The one school in the 16 which appears to be adequately supported derives 34% of its income from sources other than tuition, fees and clinics.

It is urged in some quarters that it makes no difference from what sources the income of a dental school is derived provided only that it is adequate. Theoretically and academically this reasoning may be sound; but in practice it simply does not work. The findings of the Council show that in most cases the law of diminishing returns begins to operate in those schools which depend upon tuition, fees and clinics for 75% or more of their income, and in those schools as well which depend upon their clinics for 30% or more of their income.

This is merely another way of saying that modern dental education cannot be adequately supported by income from tuition, fees and clinics. We cannot charge enough tuition, impose enough fees and collect enough from the operation of clinics to sustain progressive programs of education. Perhaps, after all, it does make a difference, therefore, from what sources the total income is derived. I have invited Deans Bunting, Freeman and Blackerby to discuss the implications of this question.

WHAT CONSTITUTES ADEQUATE SUPPORT OF A DENTAL SCHOOL? RUSSEL W. BUNTING, D.D.S.¹ Ann Arbor

It is generally conceded that as a rule, all forms of education are best performed when schools are provided with ample support by outside funds. Even in academic colleges, in which the cost of operation is comparatively low, it is difficult and almost impossible to provide adequate instructional facilities on tuition and inside resources alone. In professional schools in which the operational costs are much higher, it is quite impossible. For these, endowments or State funds or financial assistance from some other sources must be provided.

In dental education a somewhat unique situation has arisen. Each dental school, as a part of its teaching program, operates a clinic in which services are rendered to patients at fees which may not only pay the expense of the clinic, but net a handsome profit as well. It has been upon this potential source of income that many dental schools in the past have been undertaken

¹Dean, College of Dentistry, University of Michigan.

RUSSEL W. BUNTING

and, throughout their history, have been wholly supported. Thus, dentistry has been able to support its educational institutions by fairly large tuitions and earnings derived from its students and the services rendered by the schools.

In many instances no other source of income has been available and if such procedure had not been followed, certain schools which have served an important function in dental education during the past fifty years would never have existed. Perhaps it was fortunate in the developmental years of dental education that the means of self support were available, for otherwise the number of dental schools would have been greatly reduced.

In more recent years, since dental education has become more firmly established, definite attempts have been made to secure university affiliation and support for dental schools, thus decreasing the necessity for excessively high tuitions and large clinic incomes. However, even today, as pointed out by Dr. Horner, over 60 per cent of all dental schools in this country are largely or entirely self supporting. The question then arises—are the majority of dental schools in this country adequately supported?

In answer to this question, it will be agreed that there are few schools that have all the financial resources which they need for full educational efficiency. In regard to the sources of financial support, it must be recognized that many schools that have been forced to finance themselves have made a real contribution and, on their own, have served a real purpose in dental education. However, those schools which are integral parts of the university from which they derive incomes that provide for their operation irrespective of their own earned income are in a much more favorable position. They enjoy certain advantages and freedom from many distracting compulsions with which the self supporting schools must contend. Of these the following considerations may be mentioned:

First. Self supported schools, as a rule, are obliged to charge higher tuition fees, thus contributing to the high cost of dental education, which is one of the major reasons for low dental school enrollments.

Second. The need for school income tends to lower admission requirements in both scholastic and personal fitness of students in order to provide receipts from tuition and from the remunerative services of a maximum number of students in the clinics. It also tends to retain in the school and to graduate students of low scholastic ability who do not measure up to the highest concepts of dentistry.

Third. In self supported schools there is a tendency to accentuate those forms of clinical assignments which produce the largest profit and there is also a tendency toward quantity production. Such conditions inevitably militate against the free assignment of clinical teaching material solely for the purposes of clinical instruction. They tend to accentuate clinical practice over

THE JOURNAL FORUM

that of the basic sciences, magnifying the importance of the former to the detriment of the latter. Furthermore, there is inevitably created in the mind of the student the concept of dentistry as being primarily commercial and monetary rather than a true health service.

Fourth. It is difficult for self supporting schools to engage in research as a school function or to offer postgraduate teaching except at a high rate of tuition.

Fifth. In such schools the salary budget is often too low with the result that too few competent teachers can be provided or the faculty will be largely composed of practitioners who devote but a small part of their time or attention to teaching.

To this list others may be added, all of which are largely responsible for the findings of the Educational Council that "in most cases the law of diminishing returns begins to operate in those schools which depend upon tuitions, fees, and clinics for 75 per cent or more of their income." If these findings are true and the deductions correct, it follows then that all dental schools should strive for adequate support from sources outside their own spheres. Every effort should be made to assist self supporting schools to obtain additional outside funds either from universities or from endowments. Where there is a university affiliation, the needs of dental education should be presented to the university administration, asking for adequate support. In some instances grants may be secured from the larger foundations concerned with education, and perhaps from governmental sources. In view of the needs of dental education in the present and the future, every effort should be made to secure sufficient funds to relieve dental schools from the burden of self support to enable them to meet their obligations in providing well trained dentists for public health service.

WHAT CONSTITUTES ADEQUATE SUPPORT OF A DENTAL SCHOOL? CHARLES W. FREEMAN, D.D.S.¹ Chicago

American colleges and universities have generally operated on the basis that education should be available to those most deserving of its benefits and whose contributions to the culture and welfare of the nation are most likely to prove beneficial. Thus, college students are seldom expected to pay the full cost of their education.

If the health and welfare of the people of America require the services of well-trained dentists, it is obviously in the public interest to offer dental education to those students who will become the best health servants of the public,

¹Dean, Northwestern University Dental School.

CHARLES W. FREEMAN

and at a cost which is within their means. If the student must bear the full cost of his dental education it is obvious that many deserving and promising applicants will be denied the opportunity to enter the dental profession.

Historically, American initiative and scientific progress do not thrive on a policy of "something for nothing," and it is probably desirable and beneficial to require the student to pay a reasonable share of the cost of his education. What that reasonable share may be will be determined by each institution, its available resources, and its interest in dental education.

The clinics of a dental school serve the two-fold purpose of furnishing a laboratory for instruction and research, and a service to persons seeking dental care. While public clinics have customarily been considered havens for the underprivileged, the dental school clinics are primarily for educational purposes, and if patients are justly treated, there is no reason why they (dental school clinics) should not be self-sustaining.

The loss of educational value occurs when the clinic becomes predominantly a service clinic, either for the purpose of increasing the income or in order to serve the needy applicants. During the depression the Oral Surgery Clinic at Northwestern University agreed to accept patients for tooth extraction without charge if they were referred by responsible agencies. The result was an excess of patients, and the quality of instruction suffered, because the immediate objective became service and not education.

The cost of operating a dental school is as pertinent to the question of adequate support as is the amount and source of income. Housing and equipment are very significant costs, and it is generally accepted that dental students should be trained with equipment that compares favorably with that which he will use in practice. I once visited a small dental school abroad with inadequate and obsolete equipment. The dean explained that it was the proper equipment because his boys would probably not afford anything better in practice. I doubt if American dentistry or American students would accept that philosophy, for it does not point toward progress.

The most important expenditure, as well as the largest item in the budget, is that of teaching salaries. All administrators desire adequate or liberal salaries for the faculty, and a good dental faculty deserves higher compensation than has generally been possible. Let us look at the problem facing the dean in preparing his budget. To do this we will establish a hypothetical dental school with fifty students in each class, and for whom an average tuition rate of \$300 a year is charged. Suppose further, that the clinics are self-sustaining but making no extra income, and that a liberal university policy pays all expenses except the faculty salary from other funds.

The dean is to appoint an adequate faculty and the budget for faculty

salaries is to include all tuition income from two hundred students at \$300 a year, or \$60,000. The ratio of faculty to students in dental schools vary very much but ten students to each faculty member is about the median although it can scarcely be considered adequate. This would give a faculty of twenty. Dividing the faculty equally into four ranks with the best possible salary for each we have:

5 Professors\$4,000	\$20,000
5 Associate Professors 3,300	16,500
5 Assistant Professors 2,700	13,500
5 Instructors 2,000	10,000

\$60,000

The hypothetical dean has engaged a faculty of twenty, he has appropriated to faculty salaries the entire tuition income, and the salaries would generally be considered inadequate, and certainly his dental school is not overstaffed. The university has contributed the quarters, janitor service and general expense of upkeep of the building. Secretarial help and technicians must be employed to keep records and to conserve the time of the faculty for more productive purposes. Bulletins must be published and mailed, supplies for instruction and administration purchased, and new books for the library are essential.

The faculty should have annuity and life insurance for which the university pays part, and they should attend scientific meetings with some financial assistance from the university. Some productive research should be expected of this faculty, and this requires additional expenditures for scientific instruments, supplies and technicians.

This practical example of the cost of administering a dental school makes us wonder how these schools have survived which do not have liberal support from sources other than tuition and clinic fees.

I believe it is more important to maintain high standards of teaching than it is to reduce the cost of education to the student, or the cost of dental service to the clinic patient. In a modern dental school, however, it is not practical nor desirable to use the clinic as a source of income beyond the costs of operation nor to charge the student more than those in average circumstances can pay. The only alternative is to find some way to gain adequate support from the university or outside sources in order that dental education may be maintained on the level which American dentistry and the American public require.

P. E. BLACKERBY, JR.

WHAT CONSTITUTES ADEQUATE SUPPORT OF A DENTAL SCHOOL? P. E. BLACKERBY, JR., D.D.S.¹ Louisville

Adequate support of a dental school cannot be defined in terms of the amount of money required for the operation of the school, nor in the light of the exact percentage of total income which should be derived from tuition, clinics, etc., unless consideration be restricted to a single school whose specific needs and individual problems are available for analysis. Neither can adequacy of support be discussed in other than general terms unless there is first established an acceptable definition for an adequate program of dental education. We must first agree on what it is that we are going to support, before we can establish clearly the needs which must be met before support can be called adequate.

For the purpose of this discussion, however, it will be necessary to consider the question of adequate support from the standpoint of its application to all dental schools in general, proceeding on the assumption that the basic requirements for an adequate program of dental education in any school are clearly established and that the problem to be faced is that of determining to what extent the responsibility for providing financial support should be assigned to each of the sources from which support may theoretically be drawn.

What, then, are the various sources from which a dental school should be expected to receive support, if it is represented as an integral part of the educational program of a university? These have been listed in the introductory table as (a) clinics, (b) tuition and fees, (c) the parent institution, (d) endowment, and (e) other sources. Evaluating these in this order, it may be said that the clinics of a dental school should not constitute a financial burden to the school or the university, but neither should they be depended upon to provide a financial profit which is entirely incompatible with the basic teaching function of such clinics. A proper instructional, operating and maintenance cost in excess of that necessitated by other phases of the teaching program of the school and university, on a unit basis, may justifiably be met through clinic revenue. This would include the excess costs imposed by the higher ratio of teachers to students, the more elaborate equipment, and the more expensive materials, supplies and maintenance required in the clinical program of the dental school, as compared with the didactic and laboratory teaching programs in other divisions of the university, including the medical school. The clinics of the dental school should not have to be relied upon to

¹Dean, School of Dentistry, University of Louisville.

THE JOURNAL FORUM

support themselves fully, and certainly not to provide revenue for the support of other phases of the teaching program of the school and university.

Tuition and fees must necessarily be a relatively inflexible source of income for the dental school, being governed largely by the student-capacity of the school, the range established by other dental schools, and the policy of the university in general and the medical school in particular. On the other hand, while the tuition rate may remain constant within certain limits, the total income to be derived from tuition and fees will vary in good years and bad, and the remaining sources of revenue not yet discussed must be sufficiently flexible to compensate for these fluctuations. Furthermore, tuition and fees should not be so high as to exclude from the study of dentistry many young people who, though capable and interested, cannot meet the heavier financial requirements of a professional education imposed by too much dependence upon these sources of support for the dental school.

The role which the parent institution-the university-occupies in the support of a dental school should be the most important, not necessarily from the standpoint of actual financial participation, but in establishing adequacy. If the dental school is to be an integral part of the university, in fact as well as in spirit, it is entitled to the same degree of support from the university as is accorded its other schools and colleges. Aside from the higher tuition rate justified by the nature of the dental school's curriculum, and the clinic income which, as has been stated, should be calculated to provide for the excess costs of clinical teaching, the parent institution should assume proportionately the same responsibility for the support of the dental school that it assumes for the medical school, the engineering school, the college of liberal arts, and all other units of the university. Perhaps the only argument which can be offered against such a policy is that dental schools, up to the present time at least, have attracted less support from endowments and other sources than almost any other schools and would require, therefore, under this policy, a proportionately greater degree of support from the university.

The assistance which should be expected from endowments is probably the weakest and most inadequate segment of the foundation which comprises the support of the dental school. Needless to say, if dental education is to justify its position as an integral unit in the university program, and if the dental school is to merit the same degree of support accorded to other schools by the university, it must prove itself worthy of, and seek ardently, the support which may be derived from endowments and other sources. To accomplish this, however, the social and health significance of dentistry itself must be established more securely, through research and education, in the minds of its most critical judges—the public.

In the final analysis, the dental school cannot expect adequate support from

clinic income, tuition and fees, and university participation, without the additional aid to be derived from an endowment program comparable to that enjoyed by other schools and colleges. As demonstrated by the findings of the Council on Dental Education, the fact that the teaching functions of school clinics can be proselyted to provide funds for a large part of the school's operating budget, does not justify this practice as a substitute for efforts to secure adequate support from more legitimate sources.

> In the next issue THE JOURNAL FORUM will consider the question, Can We Teach Ethics?

HORACE WELLS CENTENNIAL: NORTHERN CALIFORNIA JOHN E. GURLEY, D.D.S., Chairman¹ San Francisco

SUNDAY P. M., DECEMBER 10, AND MONDAY, DECEMBER 11, 1944

The Centennial Committee of the American Dental Association made extensive plans for the observation of the discovery of anesthesia by our confrere of a century ago, in that an effort was made to have some sort of observation by all constituent and component societies and by the dental schools. In compliance with this desire, the two local dental schools, the city and state associations and the northern California Section of the American College of



HORACE WELLS

Dentists were brought together as sponsors of such a program under the specific planning of the Committee as named below.

In order that fitting tribute might be paid to the man and to his phenomenal humanitarian discovery, it seemed that something of lasting nature should be provided. Therefore, the date of the anniversary, December 11, was stretched to include December 10, on which day a redwood tree was planted in Golden Gate Park, San Francisco, which will stand as a living reminder of this fact and of this man, to generations yet unborn.

¹The other members of this Committee are: Hamilton Anderson, M.D., Don J. Aubertine, D.D.S., Reuben L. Blake, D.D.S., Henry Elliott, Ph.D., D. H. Grimm, D.D.S., H. B. Hambly, D.D.S., H. M. Leicester, Ph.D., N. W. Mellars, D.D.S., Compton B. Millarr, D.D.S., S. M. Moose, D.D.S., S. B. Scott, D.D.S., L. B. Taber, D.D.S., and John B. de C. M. Saunders, M.B., Ch.B., F.R.C.S. (Ed.).



(UPPER LEFT) DRS. BLAKE, AUBERTINE AND HAMBLY PLANTING THE TREE. (UPPER RIGHT) A DETACHMENT OF NAVAL OFFICERS (D. C.). (LOWER LEFT) DEAN EMERITUS PORTER SPEAKING. (CENTER) THE TREE WITH MARKER. (LOWER RIGHT) PRESIDENT SODERSTROM SPEAKING.

Nature smiled munificently that day in early winter; the spot allotted by the Park Commission was beautiful, facing south and open to the full force of the sun's rays. A representative group of professional men and women were present, including both physicians and dentists. A special detachment of Navy officers was assigned to us, thus adding color. Here men paid their respects to Dr. Wells and praised the thing he had done.²

On Monday, December 11, addresses were delivered to the student bodies of the two dental schools by the anesthetists, Dr. Wm. B. Neff and Dr. H. R. Hathaway, of Stanford and the University of California hospitals, respectively. Historical exhibits were set up in the two schools, depicting the full period of development of anesthetic agents, especially nitrous oxide. Radio stations KPO, KFRC, KQW and KYA, San Francisco, and KLX, Oakland, used a prepared transcription, telling the story to the public.³ In the evening a general meeting was held at the College of Physicians and Surgeons, at which time our guest speaker, Dr. Chauncey D. Leake, Vice-President and Dean of the Medical School, University of Texas, delivered a remarkable address in which he outlined the history of nitrous oxide with some reference to other anesthetic agents; paid his respects to Dr. Horace Wells; and finally entering upon a most inspiring and intellectual dissertation on the subject of pain, thus challenging the future as to its responsibility.

Repeating what others have said and what has been said before, "we do not go into the past to get new ideas." There is but little doubt that we have those. But, "we go into the past to find how men's minds operated." This is a most worthwhile reason, for out of it we get our answer to the query as to how we landed just where we are, and more than that we get inspiration to go on ahead. Somewhere among us will be that one or the limited few who will see similarly straight ahead and, so life and the values of life are handed on from generation to generation. All hail to Dr. Wells and to

²See Remarks and Addresses, published herewith. ³See Addendum.

men of his kind! May their memories live forever among men as their beneficences will continue in even greater effectiveness, to serve men. As Dr. Leake pointed out in his address the next great step is to find an understanding of *pain*. That man by whom it shall be found, may be somewhere among us now.

The president of the California State Dental Association, Dr. E. F. Soderstrom, was the presiding officer on the occasion of planting the tree, and Dr. Benjamin C. Reinke, President, San Francisco District Dental Society, presided Monday evening. Responses, photographs and addresses are printed herewith in order of their delivery.

SUNDAY P.M., DECEMBER 10

ANESTHESIA: A CENTENARY CELEBRATION, HONORING THE DISCOVERER, HORACE WELLS, DENTIST¹ E. F. SODERSTROM, D.D.S., Modesto

President, California State Dental Association

We are meeting today as similar ceremonies are being held in Hartford, Conn., and other cities throughout this and other countries, to celebrate the 100th anniversary of the discovery of anesthesia and also to honor its discoverer, Dr. Horace Wells, a Hartford, Connecticut, dentist who on December 11, 1844, conceived and announced to the world the blessing of surgical sleep. The ability to produce anesthesia ranks as one of the greatest of medical discoveries for prior to the time of its discovery, surgery was of limited use because of the great pain and the profound shock occasioned by surgical operations.

The word anesthesia, meaning without sensation, is a term first suggested in 1846 by that American great, in both literary and medical fields, Dr. Oliver Wendell Holmes.

The elimination of pain during surgical operations is inseparably . interwoven with the history of the human race and the efforts to solve the riddle of painless operations seemed so futile that even as late as 1832, Velpeau made the following pessimistic statement,

¹A Redwood tree was planted in Golden Gate Park as one part of this celebration. For details covering the entire program, see copy submitted herewith. "To escape pain in surgical operations is a chimera, which we are not permitted to look for in our time."

While in 1847, three years after its discovery by Wells, the German surgeon Dieffenboch, wrote these classical words regarding anesthesia, "The beautiful dream to eliminate pain has become a fact—pain, the highest consciousness of our earthly existence, its clearest conception of the imperfections of our body, it has to bow low before the powers of the human mind." The world at last awakened to the fact that pain had been conquered.

Said Samuel D. Gross, the eminent surgeon, "If America has contributed nothing more to the stock of human happiness than anesthetics, the world would owe her an everlasting debt of gratitude," and he had ample opportunity to observe in his own operating room the remarkable changes that followed the introduction of anesthetics.

LIFE OF HORACE WELLS

Horace Wells was born on a farm at Hartford, Vermont, on January 21, 1815. He descended from true New England stock and his ancestors were among the earliest settlers in Vermont state.

In 1820 Horace Wells, Sr., who was a prosperous farmer, sold his 320 acre farm at Hartford, Vermont, and moved his family to Bellows Falls, Vermont, where he conducted the first grist mill in this section. At the mill, young Horace was brought into contact with new and improved mechanical devices and this early environment had an influence which was to manifest itself throughout his life.

Young Horace attended select schools for 12 years; one year of private boys' school and the academies at Amherst, Massachusetts and Walpole, New Hampshire, all of which was considered an excellent education in those days.

Why he decided to study dentistry is unknown; however, in 1834, at the age of 19, Wells went to Boston to study by association with the leading dentists of that city, as this was six years before the first dental school, the Baltimore College of Dental Surgery, was organized. At this time without regular dental colleges and before state supervision was introduced, the only preparation was a period of apprenticeship in the office of a recognized practitioner. Even this was optional with the would-be dentist and many set themselves up as dentists with no preparation. Wells, however, tried to get the best possible education of that time after which he opened an office in Boston. During his stay in Boston he became acquainted with medical men, a fact which probably influenced him in seeking medical assistance in Boston at the time he first announced his discovery of anesthesia.

After being in Boston a short time he moved to Hartford, Connecticut, where a notice appeared in the Hartford, Connecticut *Courant* of April 4, 1836, announcing the opening of his office for the practice of dentistry, and also a testimonial by a patient who stated that he had employed Dr. Wells while in Boston in an operation on his teeth.

He soon succeeded in building up a fine practice in Hartford. His ingenuity led him to invent and construct most of his dental instruments and the judgment and dexterity with which they were used soon made him popular so that he quickly took rank among the first in his city well known for his skillful dentistry.

On July 9, 1838, he married Miss Elizabeth Wales of Hartford and in August of the following year their only child, Charles Thomas Wells, was born.

From an article by the American Academy of Dental Science, 1876:

"On the evening of December 10, 1844, Dr. Horace Wells, a practicing dentist of Hartford, Conn., attended in that city a chemical lecture by Mr. G. Q. Colton, during or after which the lecturer administered to Mr. Samuel A. Cooley and others the nitrous oxide gas. Mr. Cooley, on being brought under the influence, became unusually excited, and, during his consequent activity, sustained severe bruises, of which fact he was unconscious until after recovery from the effects of the gas. His asseverations of want of knowledge of any pain while in the unconscious condition took strong hold on the mind of Dr. Wells, and he immediately expressed his belief that teeth could be painlessly extracted during the inhalation of this agent. So strongly was he thus impressed that the next day he requested Mr. Colton

to provide some of the gas for him, which he took himself, holding the bag in his lap, and while under its influence underwent the extraction of a molar tooth at the hands of Dr. John M. Riggs, a fellow-dentist of Hartford. Upon his recovery Wells exclaimed in high glee, 'A new era in tooth pulling!' The exclamation was prophetic. So elated were Drs. Wells and Riggs at the success of their experiment that they immediately turned their attention to the extraction of teeth by the aid of this agent, and continued to devote themselves, in conjunction, to this subject for several weeks almost exclusively. Dr. Wells used the gas freely during the whole time of his dental practice, and Dr. Riggs employed it constantly 'as people demanded it, which they ordinarily did,' until 1847, when he began to employ chloroform in its stead. Wells, however, was not content to demonstrate the availability of nitrous oxide as an anesthetic in dentistry alone, but carried it into general surgery. The first recorded case of this character occurred on August 17, 1847, being the extirpation of a large scirrhous growth by E. E. Marcy, M.D., then of Hartford. The case is reported at length in the Boston Medical and Surgical Journal, September 1, 1847. The gas was administered by Dr. Wells, and its operation was entirely satisfactory. The second case was the amputation of a thigh, occurring January 1, 1848; the surgeon, Dr. P. W. Ellsworth, and the gas was given by Dr. Wells. This case was also reported in the above periodical. The last we shall mention was the removal of a fatty tumor from the shoulder, January 4, 1848; S. B. Beresford, M.D., the operator, and the gas administered, as before, by Horace Wells."

The following is from Wells' Day Book of December 30, 1844:

"On making the discovery, I was so elated respecting it that I expended my money freely, and devoted my whole time for several weeks, in order to present it to those who were best qualified to investigate and decide upon its merits, not asking or expecting anything for my services, well assured that it was a valuable discovery. I was desirous that it should be as free as the air we breathe."

From an article, "Horace Wells," American College of Dentists, 1944:

"In addition to his work with nitrous oxide Dr. Wells carried on experiments with sulphuric ether and chloroform. However, he was convinced that nitrous oxide was the superior anesthetic. In 1848, just four years after the discovery of anesthesia, he was in New York experimenting with chloroform and while inhaling its vapors and being under its influence, he lost his life and thus ended the career of one of America's outstanding dentists and the world lost one of its greatest benefactors."

APPRECIATION TO THE PARK COMMISSION REUBEN L. BLAKE, D.D.S., San Francisco

As you have seen in the program, this auspicious occasion has been sponsored by five organizations and it is in behalf of those organizations that I address my few remarks to the Park Commission of the City of San Francisco.

When the idea of planting a tree was originated by Drs. Hambly and Anderson of our committee it was presented to the Park Commission for their permission to do so. To this, they promptly and graciously acquiesced. They shared our belief that the planting of a tree with a suitably inscribed tablet at its base would be an appropriate memorial for one who has contributed so much to the welfare of mankind.

Incidentally, this temporary sign will later be replaced by a large natural stone with a similar inscription carved upon it and which could not be ready for this occasion.

As San Francisco is the metropolis of Northern California and our Golden Gate Park is one of the garden spots and showplaces of our nation, in fact, of the world, it seems a logical spot for the placement of something perpetual as a reminder to our people for many generations to come.

To my good friend, Mr. Byron Mobbs, a Park Commissioner, who first introduced the subject to the Park Commission and to Mr. Julius Girod, Superintendent of this beautiful Golden Gate Park, who gave us his courteous and complete cooperation and who, by the way, selected this nice redwood tree and this delightful spot for its planting and to the other members of the Park Commission may I extend our thanks and sincere gratitude for making this occasion possible this afternoon.

RESPONSE TO DR. BLAKE

HONORABLE LLOYD E. WILSON, Chairman, Park Commission1

It is a great pleasure to me to be able on behalf of the Board of Park Commissioners to respond to the gracious remarks of Dr. Blake.

¹Mr. Wilson was unavoidably absent, but he prepared this statement for publication. We have many requests to place memorials in the Park in one form or another and most of them must be denied. In this particular instance the nature of the occasion is such that it seemed to us that the public interest would best be served by granting the request and so today a memorial tree is planted in honor of Horace Wells, the discoverer of anesthesia.

Others will speak appropriately of the discoverer himself and of his accomplishment and my function is to welcome you to this great Park and to assure you that the memorial tree will receive proper attention through the years.

It might well be the start of more memorial trees pointing to outstanding chapters of world history and progress, and perhaps, in the future, school children may be taught something of the world's outstanding achievements here in the beautiful surroundings of an open air school.

We are honored to have this distinguished gathering in Golden Gate Park today and I hope that you may individually and collectively return often.

RESPONSE TO DR. BLAKE ROBERT C. MILLER¹

Superintendent, California Academy of Sciences, San Francisco

In the unavoidable absence of Mr. Wilson, I have been asked to accept the tree that you are planting today in commemoration of the one hundredth anniversary of the discovery of anesthesia by Horace Wells.

This is an extremely fitting memorial in a fitting place. On every warm and sunny day this meadow is visited by multitudes of people who come here for rest and recreation. Hundreds of people, and in due course many thousands, will see this tree, will read the plaque which sets forth the reason for its planting, and will rest within its shade.

You have selected a durable memorial. The redwood trees are the oldest and largest of living things in the world today. There are redwoods growing in this state which antedate our civilization. This little tree that you are planting here may grow to a majestic height and endure for centuries to come, symbolizing the manner

¹Speaking for Mr. Wilson.

in which the work of a scientific man may, from a small, obscure beginning, grow and develop and expand into a structure of enduring benefit to mankind.

On behalf of the Board of Park Commissioners of San Francisco, I am honored to accept this tree and to express to the five organizations here represented appreciation and thanks.

AN ACKNOWLEDGMENT THE DISCOVERER OF ANESTHESIA: HORACE WELLS J. C. GEIGER, M.D.¹ Director of Public Health, San Francisco

There is probably no intelligent or thoughtful person at the present time who does not consider anesthesia (insensibility to pain produced at will) one of the greatest and most wonderful of modern blessings—one of the greatest gifts of science, and its discoverer as perhaps the first of all the benefactors of humanity.

One has only to imagine the unspeakable suffering following battles, the agony of operations, the throes of childbirth, all of which are now eliminated or ameliorated by means of this blessed agency, and then give thanks that this tremendously important discovery was made before his time.

While the exhilarating and stupefying effects following the inhalation of fumes of sulfuric ether and of nitrous oxide gas have been known for a considerable period and several minor surgical operations made painless by the aid of sulfuric ether fumes were performed by Dr. C. W. Long, of Jefferson, Georgia, as early as 1842, it is apparent that he attached little surgical significance to such experimental work, nor made any attempt to follow it up to possible greater and more important results. Thus it now seems to be generally recognized by medical and scientific authorities that Horace Wells, a dentist in Hartford, Conn., was the real discoverer of the great principle of anesthesia and its enormous value and importance to surgery.

Horace Wells was born in Vermont in 1815 and was practicing

¹Dr. Gieger was ill and unable to attend the exercises, but he presented this for publication.

dentistry in Hartford as early as 1838. On December 10, 1844, there was an exhibition of the effects of the so-called Laughing Gas preceded by a short lecture given by a Dr. Colton who then and for many years after made these entertainments his sole occupation. Wells was present searchingly watching every movement of those taking the gas. One subject, exhilarated by the effects of the gas, fell and injured himself but had no knowledge of it and felt no pain. Wells was tremendously impressed and reasoning from analogy was led to believe that the inhaling of any exhilarating gas sufficient to cause a great nervous excitement would so paralyze the system as to render it insensible to pain or nearly so: for it is well known that when an individual is very much excited by passion he scarcely feels the severe wounds which may at the time be inflicted.

The next morning Horace Wells had one of his own teeth extracted while under the influence of the gas. He felt no pain and after this he and his associate, Dr. Riggs, used the gas frequently for the painless extraction of teeth. During the next year, 1845, Wells went to Boston in order to interest the medical men of that city in his discovery. He arranged with Dr. Warren of the Massachusetts General Hospital to use the gas to assist in a surgical operation, but it is supposed that the gas supply was not continued long enough for the patient cried out and the students at the clinic booed and jeered. Wells, who was an extremely sensitive man, returned home quite disheartened.

In 1846, Dr. William Morton, for a short period associated with Wells, was able to demonstrate successfully the use of sulfuric ether as a means of anesthesia, and credit was generally given to him and to his associate, Dr. Jackson, as being the discoverers of anesthesia. Wells, however, was clearly the first to expound the principle of inducing artificial sleep for the performance of operations, and his experiments with nitrous oxide antedated those of Morton with ether. Sulfuric ether was first discovered in the 13th century by Raymondus Lullius. In the 16th century Von Hohenheim, experimenting on fowls, found that "sweet vitrio" had a soporific effect and recommended the use of this "white water" in painful diseases. Morton, therefore, did not discover ether, but did discover its effect on humans, and since Wells was the first to make use of the principle of inducing artificial sleep for the performance of operations, to him should go specific thanks for being the discoverer of anesthesia—a great man, tragically misunderstood.

REMARKS CONCERNING ANESTHESIA AND HORACE WELLS LANGLEY PORTER, M.D.¹

Dean Emeritus, University of California Medical School San Francisco

Birth! Death! Pain! Throughout time these universal mysteries have concerned man and puzzled him. The mystery of Birth is hallowed by the delights of comradeship, love and parenthood. The mystery of Death, man has accepted as inevitable. The best he has been able to do is sometimes to wrest a few years more from the Grim Reaper.

Pain, however, he has refused to accept as always inevitable. For centuries human beings accepted the mystery of pain by attributing it to a manifestation of evil Gods delighting themselves with man's suffering, or to benign Gods who used pain to mortify man's flesh and to exalt his spirit.

Plague, pestilence and famine, battle and torture—all brought their daily quota of pain to our forebears who peopled the earth. Fortunately, deeply ingrained in the soul of man, is a belief that God helps those who help themselves. Hence humanity's persistent battle against pain. In this way surgery was born. But, as with most human devices, the beginnings of surgery were clumsy, and while it attempted to prevent death and future pain, it brought infinite suffering to those poor humans whom surgeons helped, or strove to help.

Among operators who inflicted pain that relief might follow, none did a more thorough or a more harrowing job than the dentists whose followers today celebrate the great man of their profession, Horace Wells, who, one hundred years ago, found ways to lessen pain and

¹Speaking for Dr. Geiger.

to make operations on man's body endurable. Wells, Morton and Jackson, too, are all names to be honored here today.

Alas! Because of human frailty, differences, rivalries, jealousies disturbed the way of discovery. Means to ease suffering brought with them discord and spiritual pain. Pains and discords that lasted through several generations.

Thanks to many dentists, many physicians and other scientists, anesthesia and other pain alleviators came into being. These things have been so developed that no longer is mankind fearful of the dentist or of the surgeon. Our principal speaker today, Dr. Chauncey Leake, who himself has done much to improve pain deadening drugs and procedures, in his own inimitable way will tell you all about it.

Today we find ourselves gathered to plant a tree, a living, abiding memorial in honor of the man who gave us release from so much physical suffering. The loveliness of trees set in such a landscape as has been created here, is amongst the greatest influences that ease emotional discomfort and spiritual pain. So it is appropriate that the memory of Horace Wells should lastingly be celebrated in this park.

We are here by the courtesy of the Commission that develops and cherishes this great and beautiful civic estate. As a group interested in establishing this living memorial we thank the Commission for the opportunity to participate here in this ceremony, and as citizens of San Francisco we express our pride in Golden Gate Park, and our gratitude to all, past and present, who have contributed to create it, for the beauty of the vistas that delight our eyes, and the landscape artistry which in its tranquil beauty brings so much contentment to us and bids us forget all our pain of whatever kind.

INVOCATION

REV. HUGHBERT H. LANDRAM, Ph.D. Executive Secretary, San Francisco Council of Churches

Eternal God, our Father, and the Father of all mankind, who bestowest Thy mercy in all ages and at all times upon them that love and serve Thee, we pray that we may be sensitive to Thy presence and Thy spirit in our exercises today and tomorrow. May they find favor in Thy sight, and may those who have planned, and those who participate, have the assurance of Thine approval, and take fresh courage to go forward in their high calling.

We have come to pay homage to the pioneering spirit and accomplishment of the sensitive and compassionate young dental surgeon whose chief desire was to serve Thee "by doing as much good in the world as possible," and especially by preventing the suffering of his patients and of all who experience pain.

We thank Thee that, endowed with intellectual merit and modesty, and with a scientific spirit, he combined ingenuity, dexterity, and judgment in such an effective manner as to lay humanity under heavy obligation to him and to his memory. He proved his convictions concerning anesthesia by submitting himself to the crucial experiment, and unselfishly released his successful discovery for all who would use it to prevent pain and suffering, desiring that it be "as free as the air we breathe."

We thank Thee for the devotion of the men and women of the profession to which we give special honor during this celebration. May we join them in taking renewed inspiration to help alleviate pain and suffering from every area of life, in war and in peace. Like Horace Wells, let us hope and pray that "no selfish motive may ever influence us to go contrary to the principle" of "doing as much good as possible" for our fellow men.

May this tree and this tablet prove to be not only memorials, but may their dedication cause many who see them in the years ahead to pause and consider the enduring values of a life of unselfish service, and to rededicate themselves to the abolishment of pain from every human relationship.

We would make our prayer in the spirit of Him who symbolizes the life of creative service to one's fellows, and unto Thee will we give the honor and the glory forever, world without end. AMEN.

[At this point the tree was planted, following which Dr. Chauncey D. Leake spoke briefly.]

MONDAY MORNING, DECEMBER 11, 1944 THE DISCOVERY OF NITROUS OXIDE ANESTHESIA WILLIAM NEFF, M.D.¹ Associate Clinical Professor of Surgery (Anesthesiology) Stanford University, School of Medicine

Whenever we reflect upon the beginning of anesthesia we are impressed with the fact that the idea of relieving pain has occupied the minds of men from early antiquity. So, too, we look with interest, and a certain degree of wonderment, upon the numerous methods suggested through the ages for producing insensibility to pain and the inadequacy of them all.

Equally mysterious to us are the reasons why so long a period elapsed between the initial preparation of certain chemical compounds and the discovery of their anesthetic properties. Furthermore, it is no less difficult for us to understand why, after the anesthetic possibilities of the agents were once suggested, that the idea lay dormant for another span of years before receiving practical application.

Let us today review the history of the first general anesthetic agent, nitrous oxide.

Nitrous oxide was first prepared by Priestly, the discoverer of oxygen, in 1772. Thirty-six years elapsed before Sir Humphry Davy in 1808 stated that nitrous oxide might possibly be satisfactory for the control of pain in operations wherein no great effusion of blood occurred. Then another thirty-six years went by until the first deliberate attempt to produce pain relief for a surgical procedure with nitrous oxide was made by Horace Wells.

On the eleventh of December, 1844, the first public demonstration of anesthesia with nitrous oxide, discovered by Priestly and whose anesthetic possibilities were suggested by Davy, was made by Horace Wells in Hartford, Connecticut.

The documentary evidence regarding the discovery of anesthesia

¹Address delivered as a part of the Centenary Program, to the Student Body, Medical Center, University of California, San Francisco. A similar address was delivered by Dr. H. R. Hathaway to the Student Body of the College of Physicians and Surgeons, but not submitted for publication.

has been reviewed hundreds of times and even now historians are not in agreement as to whom the credit for the discovery of anesthesia should be given. The speaker will attempt to refrain from a discussion of the minute details by which the proponents of the claims of each of the contenders for the great honor support their followers. Rather let us consider certain facts which have not received the emphasis that their importance demands. Firstly, Horace Wells after turning the idea over in his mind decided to deliberately attempt to produce insensibility to pain by loss of consciousness with nitrous oxide for an operation upon himself.

Secondly, having witnessed to his own satisfaction the success of the experiment, he tried to establish anesthesia as a rational procedure in dentistry.

Let us dwell for a while upon this endeavorer to deliberately produce unconsciousness for the first time. Regardless of the merits of any anesthetic publicly demonstrated later, regardless of the lack of success which Wells might have had with certain subsequent demonstrations, the courage required to first deliberately render the patient unconscious resulted in the discovery of anesthesia. The fact that nitrous oxide remained an anesthetic limited almost entirely to dentistry until the time of Andrews in 1868, when oxygen-nitrous oxide mixtures were established, does not detract from the importance of Wells' discovery. The extreme flexibility of ether as an anesthetic compared with the limitations of nitrous oxide for use in general surgery was recognized early. The credit for the discovery of the anesthetic properties of any new drug, no matter how valuable it might prove to be, cannot rightly be considered as important as the discovery of the phenomena of anesthesia itself.

After we have studied Wells' background somewhat, including his early desire to study for the ministry, we become more impressed than ever with the difficulties which he had to overcome before he could resolve to attack the problem of pain relief by deliberately rendering the patient unconscious. The other personalities in the picture possess more aggressive characteristics and one cannot fail to be inclined toward the belief that it would not be less difficult for

Wells' contemporaries to take a chance in producing unconsciousness with the hope that the process would be reversible. How much more difficult for the more timid Wells. Nevertheless, Wells publicly demonstrated the power of nitrous oxide to effect relief of pain in oral surgical procedures while others emphasized its shortcomings such as insufficient potency and inadequacy for general surgical operations. They demonstrated the means of overcoming these deficiencies, in part at least, by the use of other more potent drugs. It is not for us to try to minimize the value of the introduction of the more potent, and therefore the more flexible, anesthetics, ether and chloroform. Without them no extensive surgery would have been possible until the time of Andrews when the admixture of oxygen with nitrous oxide increased its usefulness a hundred fold. The individuals concerned in the introduction of ether and chloroform deserve great credit and the addition of oxygen to nitrous oxide marked the beginning of a new era in anesthesia. While nitrous oxide without the addition of oxygen might not have been satisfactory for general surgery it is readily understandable why its use in dentistry became increasingly popular. Operative dentistry was limited to dental extractions which were rapidly performed. Under such circumstances, wherein the operative procedure was quickly consummated plus the fact that there are no reflexes to be overcome in the oral cavity anterior to the posterior pharyngeal wall, we can the better understand Andrews' reference to the extensive use of nitrous oxide by the dentists.

NITROUS OXIDE ANESTHESIA THEN AND NOW Old Techniques

The early technique for the administration of nitrous oxide was the inhalation of the gas by means of a face mask and breathing bag. The mask was quickly withdrawn and the operation, practically always limited to the rapid extraction of teeth and alveolar fragments, was performed before the patient awakened. Many dentists would extract 26 teeth in one minute. If the patient would tend to awaken before the operation was consummated the face mask was reapplied and the procedure repeated.

The dentist usually made his own gas which contained impurities usually harmless in themselves, being nitrogen and water, but they physically interfered with the production of narcosis. Nitrogen interfered because it is not an anesthetic but occupies space in the inhaled atmosphere thus reducing the amount of nitrous oxide received by the patient. The water in the N₂O would freeze when the flow of gas was increased thereby shutting it off completely. Under certain conditions of manufacture a highly toxic impurity, nitric oxide, would be formed but fortunately this was not a frequent occurrence.

In spite of the drawbacks of impurities in the gas added to the physiological difficulties encountered by reason of anoxia and carbon dioxide accumulation the rise of nitrous oxide in dentistry grew in favor. By restricting themselves to the rapid drawing of teeth, wherein the period of anesthesia was consequently very short, accidents resulting in loss of life were not numerous. Such accidents as did occur were more likely to be due to apoplexy as a result of an increase in the patient's blood pressure attendant upon this technique.

Usually no form of preanesthetic medication was employed. When any drugs were used, instead of the sedatives which are in common use today, stimulation with such drugs as strychnine and caffeine (in the form of coffee enemas) was the accepted procedure. All of this tended to render the induction of anesthesia more difficult.

In 1868, when Andrews introduced, against strong theoretical opposition, oxygen as a diluent for nitrous oxide, thereby making nitrous oxide suitable for prolonged surgical operations, its employment in dentistry was not materially changed.

It was around 1890 that first mention is made of a nasal inhaler. The introduction of the nasal inhaler made possible the continuance of the N_2O anesthesia for more prolonged dental operations and only then could the benefits which Andrews had made possible for general surgery be realized for oral surgery as well. Even after the nitrous oxide-oxygen mixtures administered with a nasal inhaler

were in common use the preanesthetic administration of stimulants remained a common practice until comparatively recent times.

Thirty years ago the dentist received his instruction in the use of gas mainly from the salesman of gases or gas machines. Later short intensive courses of instruction in gas anesthesia were offered by capable instructors to physicians and dentists. There followed a period of over-enthusiasm for nitrous oxide and oxygen both in oral and general surgery. During this time the attempt was made to produce more profound anesthesia by the restriction of oxygen in the gas mixture. The number of known anesthetic accidents increased and a far greater number wherein the patient lived but irreparable cortical nervous system damage occurred. A recent monograph entitled "Untoward Effects of Nitrous Oxide Anesthesia," gives a very good accounting of the hazards involved when nitrous oxide anesthesia is deepened by the restriction of oxygen. Too often patients have received permanent injury because of the anesthetist's overzealous desire to use nitrous oxide "without a drop of ether." Many anesthetics for oral surgery have been ruined by the anesthetist attempting to get the patient under by blasting the nitrous oxide through the nasal inhaler only to find it of no avail. Actually the cold waft of nitrous oxide produces a momentary constriction of the nasal mucous membranes which is quickly followed by marked congestion. The result is a vigorous effort by the patient to breathe through his mouth. It is very difficult to understand how more satisfactory anesthesia can be obtained by a moderate flow of the gases and most of us have had to learn "the hard way."

Present Usage

Preliminary medication prior to anesthesia is now based upon the use of psychic and somatic sedatives rather than stimulants as of old.

It is more generally realized that where increased depth of anesthesia is required the addition of a more potent drug is indicated and that the restriction of oxygen is harmful.

So today when we reflect on the development of the gift made to us by a man whose purpose, I believe, was to aid humanity, even though he could hardly help from also realizing that the dentist who could relieve pain would also pull more teeth, we think of nitrous oxide among anesthetics as Henry VIII remarked about his wives, "The first of them was the best of them."

> Monday Evening, December 11, 1944 BENJAMIN C. REINKE, D.D.S. President, San Francisco District Dental Society Presiding

INTRODUCTORY REMARKS

Members of the San Francisco District Dental Society and Guests:

We have met this evening to celebrate the One Hundredth Anniversary of the Discovery of Anesthesia by Dr. Horace Wells, Dentist. This meeting, being one of a series of meetings throughout the country, is probably the last of such meetings held today due to our geographical location—the Far West. We have gathered together not only to commemorate the discovery, but also to honor the man; and we as dentists can justifiably feel proud that one of our profession was the discoverer of the greatest boon to mankind.

Because of the importance, seriousness and solemnity of the occasion, it is fitting and proper that we have invited several distinguished and honored guests to be present.

It is our pleasure on this occasion to present to each one of you representing various institutions, a photograph of a painting of Dr. Horace Wells, by Charles Noel Flagg. And also a copy of the proceedings of the Centenary Celebration as arranged by the American Dental Association held in New Haven, Conn.

It is now my pleasure to present to you the President-elect of San Francisco District Dental Society, Dr. Compton B. Millarr, who will introduce our guests and who will make the presentations.

(The following guests were introduced:

- Library, Stanford University, Medical School, Dr. L. R. Chandler, Dean. Library, University of California, School of Medicine, Dr. Francis Scott Smyth, Dean.
- Library, College of Physicians and Surgeons, a School of Dentistry, Dr. E. G. Sloman, Dean.

Library, University of California, College of Dentistry, Dr. W. C. Fleming, Dean.

City Health Department, Dr. J. C. Geiger, Director.

Mechanics Library, Dr. Joseph D. Hodgen, Trustee, Mechanics Institute. Library, City and County of San Francisco, Mr. Robert Rea, Librarian.)

(Dr. Reinke speaking:)

I now take pleasure in presenting a member of the National Committee, Dr. Don J. Aubertine. He is also Chairman of the Horace Wells Centenary Committee for Northern California.

(Dr. Aubertine previewed briefly the national radio program supported by Du Pont Company, "The Cavalcade of America," which on this occasion was given under the specific title, "The Discovery of Anesthesia." Dr. Aubertine had set up a radio so that the audience might witness the presentation.)

INTRODUCTION OF DR. LEAKE

Tonight I have the very happy privilege of welcoming back to San Francisco a man who is an old friend to many of us. Dr. Chauncey D. Leake holds the degree of Doctor of Philosophy; and for many years conducted research in the field of Anesthesia, developing the volatile anesthetic Vinyl-ether. He formerly was Professor of Pharmacology at both the University of California Medical School and the College of Dentistry. Dr. Leake has recently been called to Texas, where he is now Vice-President and Dean of the Medical School of the University of Texas. It affords me great pleasure to introduce Dr. Leake.

(Dr. Leake proceeded to deliver a very splendid address and lecture consisting of three parts:

1. History of the Development of Nitrous Oxide.

2. Tribute to Dr. Wells.

3. A Dissertation on Pain.

He spoke under the title, "No More Pain.")

THE HORACE WELLS CENTENNIAL

ADDENDUM No. 1 Radio Transcription

"THERE SHALL BE NO PAIN"1

Subject and Purpose: A transcribed dialogue between interviewer and Doctor concerning the discovery of anesthesia. Prepared to commemorate the 100th Anniversary of this discovery by Dr. Horace Wells.

Auspices: Prepared and presented by the California State Dental Association and the San Francisco District Dental Society.

For Broadcast: Sunday, December 19, 1944; Monday, December 11, 1944.

Production Details: Transcription contains no music. Transcription is NOT "cleared" on the record. Time: 12.35.

ANNOUNCER: From the four corners of the world—when anguish and suffering rack the human body, comes the plea—give me an anesthetic relieve me of my pain!

War has brought to most every home in our land, the appreciation, the thankfulness, that our loved ones who came face to face with the brutality of war, can, in the hour of need, be given an anesthetic!

This month, in every State in the Union, fitting commemorations are being held on the 100th anniversary of the discovery of anesthesia. Of all the contributions which science has made to society during the past 100 years, the discovery and application of anesthesia can by far be considered the most important. The wizards of chemistry, mechanics and electricity have showered the world with the products of their genius. Their inventions and discoveries have added to the comfort and prosperity of our lives—yes, added years to life itself. Yet few, if any, of our luxuries, such as the radio, the automobile, the airplane, can compare with the luxury of an anesthetic when administered to a pain-racked body. What have you to say on this matter, Doctor?

DOCTOR: Do you know that just one hundred years ago, our grandparents and great grandparents who required an operation, were forced to face the ordeal without the benefit of anesthesia?

ANNOUNCER: It doesn't seem possible. I suppose that not many major operations were performed in those days.

DOCTOR: Well, no, not many, for few could have survived one. Only in cases of direct necessity was surgery resorted to, and then with fear and misgivings.

¹All details in this transcription were arranged by Dr. Harry B. Hambly, Chairman, Public Relations Committee, San Francisco District Dental Society. ANNOUNCER: I expect that at least half of our listeners have undergone either a major or a minor operation of some kind, and have experienced the merciful magic of an anesthetic.

DOCTOR: Imagine, if you can, the removal of an appendix, the setting of a fractured leg or jaw, a tonsil operation for your child—any one of numerous operations which happen daily, without first rendering the patient's nervous system insensible—either generally or in the localized area.

ANNOUNCER: Can you tell us, Doctor, how the first anesthetic was discovered?

DOCTOR: It is not commonly known that the use of nitrous oxide as a general anesthetic was given to humanity by a member of the dental profession. Credit for its use in alleviating surgical pain, has been awarded Dr. Horace Wells, a Hartford, Conn., dentist. He it was who first declared the truth of anesthesia in 1844, just 100 years ago.

ANNOUNCER: How did Dr. Wells happen to discover this?

DOCTOR: As you know, nitrous oxide is a gas. It was first prepared by an Englishman by the name of John Priestly, way back in 1772.

ANNOUNCER: How was the discovery made?

DOCTOR: Probably by mere chance. For centuries, physicians experimented with hundreds of different methods to alleviate pain. Sleep sponges, soaked with various kinds of drugs and impossible solutions which gave off fumes that the patient was forced to inhale, were, in all probability, the forerunner of modern anesthetics. Although the sleep sponges were neither scientific nor practical, their use may have had something to do with Priestly's discovery. At any rate he found that by mixing nitric oxide with moist iron filings, he could produce a crude form of gas which he called nitrous oxide.

ANNOUNCER: Then Priestly discovered the gas, but apparently didn't realize its anesthetic value.

DOCTOR: Apparently not.

ANNOUNCER: How were the peculiar properties of the gas discovered?

DOCTOR: Students in natural science, medicine, and chemistry found the inhalation of this peculiar gas very amusing. Frequently, during the course of the following thirty or forty years, students in the classroom, or lecturers in the concert halls, would give demonstrations of nitrous oxide to the amusement and amazement of the audience. But during these thirty or forty years—just think, during that long period—the discovery and application of its use to relieve human suffering was hidden from mankind.

ANNOUNCER: I suppose it was while Dr. Wells was a student in dental college that he learned of nitrous oxide?

DOCTOR: No, he did not learn of it in dental college. There were no dental colleges in those days. In fact, Wells moved to Boston in 1834 to study dentistry five years before the first dental school, the Baltimore College of Dental Surgery, was founded. Wells, like all dental students of his time, learned his profession as an apprentice in the office of an older practitioner. When he completed his training, he returned to Hartford, Conn., to practice. It was there, he became interested in the anesthetic effect of nitrous oxide.

ANNOUNCER: Tell us about it.

DOCTOR: In December, 1844, a Professor G. Q. Colton gave a series of lectures on chemistry and natural philosophy in Hartford. He popularized his talks and amused his audience by subjecting a few willing subjects in the crowd to the effects of "laughing gas." Dr. Wells and his wife attended one of Dr. Colton's lectures and Wells could not resist the temptation to experience the effects of inhaling this peculiar substance. From all accounts, Wells enjoyed the experience immensely, but his wife was mortified by his ridiculous antics while under the influence of the gas.

ANNOUNCER: I suppose the dignified doctor made quite a spectacle of himself—somewhat as the subjects who are "mesmerized" on the vaudeville stage do?

DOCTOR: I suppose so. However, the experience, even though it was humiliating to his wife, started Wells thinking. Not only did Wells inhale the nitrous oxide himself, but he watched others do likewise. One of his friends, a prominent, dignified Hartford business man, presented a very lively exhibition of running and jumping and knocking himself about while under its strange influence. After the effects had worn off, Dr. Wells asked his friend if he had hurt himself. His friend replied that he had not—that in fact, until he rolled up his trousers he didn't know that he had cut and bruised his legs.

ANNOUNCER: I suppose then Dr. Wells began to see the possibility of a practical application of the gas.

DOCTOR: Right. In fact, at the end of the lecture, he asked Prof. Colton whether he thought it might be possible to so deaden the nerves with nitrous oxide that a tooth could be extracted without pain. Prof. Colton replied that although he had been giving his demonstrations for over a year, he had never thought of using it in surgery. Dr. Wells persuaded the professor to bring some of the gas to his office the next day because he—that is, Dr. Wells wished to experiment on himself, by having one of his own teeth extracted while he was under the influence of the nitrous oxide gas.

ANNOUNCER: How could Dr. Wells extract his own tooth while he was anesthetized?

DOCTOR: He couldn't. Therefore, he had to persuade a dentist friend of his, a Dr. Riggs, to perform the operation for him. Dr. Riggs was not easily persuaded. He believed that it was neither right nor safe to make such an experiment; that it was fraught with danger, and that Dr. Wells might injure his health and, in fact, might lose his life.

However, Dr. Wells' fearlessness and confidence broke down all objections. He sat in the operating chair, took the bag of gas in his hands and, at the possible risk of his life, inhaled the contents until he was insensible.

ANNOUNCER: What a dramatic moment that must have been! Those three men alone in the dental office, two of them watching their companion slowly sinking into unconsciousness. The ordeal must have been harder on Dr. Riggs than it was on Dr. Wells.

DOCTOR: Yes, Dr. Wells was insensible, but Dr. Riggs had to steel himself to operate on an apparently dying man. But his courage did not fail him. He extracted the upper third molar and stepped back to await results. Slowly Dr. Wells regained his senses. On recovery, he exclaimed, "I did not feel so much as the prick of a pin. A new era in tooth-pulling has come. It is the greatest discovery ever made!"

ANNOUNCER: And what a discovery! I imagine Dr. Wells was hailed by the entire medical and dental world as one of mankind's greatest benefactors!

DOCTOR: Unfortunately, he was not. As far as his own peace of mind was concerned and as far as his future happiness and success in dental practice were concerned, he would have been much better off had he never witnessed Prof. Colton's demonstration. After he had convinced himself of the anesthetic value of nitrous oxide, by experiments on himself, he then used the gas on twelve or fifteen patients from whom he extracted teeth without pain. Elated with his success, he went to Boston and asked permission to demonstrate before the Cambridge Medical Society.

Unfortunately his demonstration was a failure. The anesthetic failed to work. Wells, writing about the incident later, said, "The gas bag was by mistake withdrawn much too soon, and he was but partially under its influence when the tooth was extracted." The patient, a young boy, made an outcry when the tooth was withdrawn. The students and spectators denounced Wells as a faker and gave him no further opportunity to prove himself or his discovery.

ANNOUNCER: That was unfortunate.

DOCTOR: But all the initial steps had been taken. Wells had made his discovery. He had the ability to notice and make the right conclusions; he had experimented further, demonstrating he was correct; he had brought his discovery to the attention of many others who would go further and spread the news to many more. He was not content to demonstrate the value of nitrous oxide as an anesthetic agent in dentistry only, he also hook part in carrying it into general surgery. As many cases on record show that it was Wells himself who administered the gas for these subsequent operations. *He* was the real discoverer, the man who saw, demonstrated and proclaimed. *He* furnished the spark that lighted the way to many new discoveries and inventions based upon his original genius. Horace Wells did not achieve great personal success in spreading the knowledge he had gained, nor did he enjoy a financial reward; but on that day December 11, 1844, modern anesthesia was given to the world, and nitrous oxide gas became the fore-runner of all other anesthetics, and of all the developments in the science of anesthesia.

ANNOUNCER: How long was it before Dr. Wells received professional recognition for his discovery?

DOCTOR: He spent the rest of his young life (he was only 33 when he died) endeavoring to prove that nitrous oxide was all that he claimed it to be. Not until Wells died, did he receive the honor due him for awakening the medical and dental world to the value of anesthesia. Twelve days before his death, however, in January of 1848, the Paris Medical Society^{*} and the French Academy recognized his claim as the discoverer of anesthesia. They elected him an honorary member of their Society and bestowed on him the honorary title of doctor of medicine.

And today, one hundred years later, thousands on thousands of men, women and children, and even animals, are escaping the pain and agony of surgical operations because of Dr. Wells' discovery of the use of nitrous oxide in relieving pain. Men and women, the world over, who have never heard his name nor know of these events, are benefited by his genius. Nitrous oxide is especially useful for the extraction of teeth, relief of pain prior to childbirth as well as in many other cases. During the past ninety years its manufacture and administration have been constantly and steadily improved. It can be successfully administered to most patients, although your dentist or physician can advise you as to whether nitrous oxide or some other anesthetic is best suited for your particular case.

ANNOUNCER: I believe as you do, Doctor, that the discovery and application of anesthesia is one of the greatest contributions of science to humanity. Not only has the beneficent action of anesthesia relieved human suffering, but it has also made possible those delicate and prolonged operations on the human body which it would be *absolutely impossible* to perform otherwise.

To those who may not know—in 1852, the Connecticut Legislative Assembly gave homage to Wells as the discoverer of anesthesia, and proof was presented of this to a committee in Congress.

In 1864 the American Dental Association acknowledged his discovery and in 1870 the American Medical Association so honored him.

The Army Medical Museum holds his memorial bust-and year after

THE HORACE WELLS CENTENNIAL

year new honor and tribute have been given this dentist. In 1933 at the Chicago World's Fair a bronze tablet was unveiled in his honor.

DOCTOR: This year, December 11, 1944, marks the 100th Anniversary of this discovery by Wells. The California State Dental Association, the San Francisco District Dental Society, and numerous public officials have joined in this Commemoration in fitting ceremony at Golden Gate Park in San Francisco, where a memorial tree has been planted.

War brings sufferings—to this discovery of anesthesia and its application to human welfare, in war or peacetime, every citizen can be truly grateful. All tribute to Dr. Horace Wells—the dentist—the humanitarian!

ADDENDUM No. 2

Statements have come to hand from two sources outside the United States: one from France and the other from Australia. They are included in this because it seems that they add to the significance of the Centennial Celebration.—Ed.

The following notation came to Dr. Francis Scott Smyth, Dean of the College of Medicine, University of California:

> OFFICE OF THE CHIEF SURGEON EUROPEAN THEATER OF OPERATIONS

APO 887

Jan. 12/1945 ccw/wkd 27 December 1944

Dean of Medicine, University of California, Berkeley, California. Dear Sir:

Inclosed is an article on "The Centenary of Horace Wells' Use of Nitrous Oxide in Dentistry" as celebrated by the Federation Dentaire Nationale de France, and attended by several American dental and medical officers, including Lieutenant Colonel William B. Ryder, Jr., formerly of the University of California.

For the Chief Surgeon:

CHARLES C. WEESNER, Captain, Mac. Medical Pro.

The Centenary of Horace Wells' Use of Nitrous Oxide in Dentistry

On the 9th and 10th of December, the Federation Dentaire Nationale

de France celebrated the Centenary of Horace Wells' first use of nitrous oxide in a dental operation.

On Saturday morning at the Ecole Odontotechnique there were demonstrations of nitrous oxide anesthesia, which included the anesthesia for facialmaxillary operation.

Saturday afternoon there was a commemorative meeting. The first paper was by Dr. Henri Vilain, president of the Society and who had had his training at the University of Pennsylvania. He gave a résumé of the trials and difficulties of Wells in the development of nitrous oxide anesthesia in dentistry and in the recognition of his place as the discoverer of anesthesia. Dr. Vilain concluded from the evidence in his paper that Wells had the undisputable right to that title.

There was then a short greeting to the French Dental Federation by Lieutenant Colonel William B. Ryder, Jr., of the United States Army Dental Corps, in civil life a member of the University of California dental staff. This was then translated by Dr. Holly-Smith, former president of the American Dental Society in France, who went on further to extoll the blessing to humanity which had developed from this conception of Horace Wells.

Professor Bernard, member of the Academy of Medicine, gave the principal address which extolled the advantages of nitrous oxide anesthesia from the viewpoint of a physiologist.

Dr. Morris B. Sanders, anesthetist of the American Hospital and of the French Red Cross Hospital of Paris, introduced Major F. E. Davis, USAMC, by saying a few words concerning the modern development of anesthesia from the humble beginnings of the 1844-1846 period as exemplified by the organization of anesthesia in the Army of the United States. In the Army the specialty of anesthesia seems to have "come of age." Many were the extremely favorable comments on anesthesia and on the anesthetists, made in general and in field hospitals alike by both the surgical staff and the wounded men.

Major Davis, assistant of Lieutenant Colonel R. M. Tovell, senior consultant in anesthesia in the ETO, closed the afternoon session with a few remarks on the education of anesthetists in the Army, which was followed by a film prepared by Dr. I. W. Magill of London on the Technique of Endotracheal Intubation during general anesthesia. As the instructions were in English, they were translated during the showing of the film by Dr. Mare Maroger, whose anesthetic training was in a large part carried out at the French Hospital of New York City. On Sunday there were a series of demonstrations of nitrous oxide analgesias and anesthesias, this time at the Ecole Dentaire de Paris. At the end of the morning a palm was placed on the statue of Horace Wells which is located at the Place des Etats-Unis.

In the afternoon there was a scientific session at which there were three papers read: "A Century of Analgesia and of Anesthesia by Nitrous Oxide," by Dr. Maroger; "Nitrous Oxide Anesthesia of Short Duration," by Dr. Amiot; and "Nitrous Oxide Anesthesia of Long Duration," by Dr. Lavoine.

The papers of Maroger and Amiot were of special interest to Americans as Maroger represented a Frenchman with an American training in anesthesia, while Amiot is known for his contributions to anesthesia. Amiot worked on the problem of closed circuits with carbon dioxide absorption about the same time as Denis Jackson and Ralph Waters and since the advent in France of cyclopropane, he has worked on an anesthesia apparatus based on volumetric methods.

A CENTENARY¹

The interval which may separate the initial steps and the final consummation of any one phase of human endeavour seldom bears any relation to the labours involved. More often it is found that the final result arose from the efforts of some individual who possessed an imagination and a desire to achieve a goal. Hard work is not enough. Courage and imagination pay far better dividends.

The work of Florey and his co-workers on penicillin, Banting and Best on insulin, are examples of imagination, courage and industry and if we look back in retrospect to December 11, 1844, we are reminded of an example of courage and imagination, the outcome of which has had untold benefit to mankind.

On that memorable occasion Horace Wells, a dentist, took a step forward into the unknown and demonstrated that man's pain and sufferings could be withheld completely and that subsequently a return to normal was possible. Wells did this without the aid of previous knowledge and investigation of preceding scientists, and after having seen only one demonstration of the characteristic effects of the inhalation of nitrous oxide. This demonstration had been arranged as a form of entertainment by a chemist. A member of

¹Editorial, Dental Journal of Australia, 16, 385; 1944, Nov.

THE HORACE WELLS CENTENNIAL

the audience who acted as a subject for the demonstration injured himself, but felt no pain whilst under the influence of the inhalation of the gas but, as its effects were dissipated, the presence of the injury was very painfully demonstrated to him.

The spark of imagination kindled in the mind of Wells the desire to explore the possibility of utilizing nitrous oxide to relieve patients of the indescribable torture of surgical operations.

Others knew of the properties of nitrous oxide, which had first been manufactured by Priestly one hundred years or more before Wells' experiment. Why had it not been put into use as an anesthetic agent? The answer to this question can be none other than that Wells alone possessed the imaginative genius which showed him the way, and the courage to assume all the risk of experiment personally and to endanger his own life to demonstrate to mankind that there was something which could destroy physical pain. He did this and lost a tooth. He might have lost his life!

Having satisfied his own mind, he then proceeded to demonstrate and proclaim to all his colleagues the value of his method and used it extensively in his own practice. That all his demonstrations were not completely convincing matters little now, although it did then, for Wells was a sensitive person and could not withstand the vicissitude of his surroundings. His life ended on January 25, 1848, at the early age of thirty-three.

In America, the dental profession on December 11 will pay tribute to their own Horace Wells, the acknowledged discoverer of anesthesia.

Ecce Homo!

AMERICAN COLLEGE OF DENTISTS

MINUTES OF THE MEETING OF THE BOARD OF REGENTS, CHICAGO, OCTOBER 18 AND 19, 1944 (Abbreviated) OTTO W. BRANDHORST, D.D.S., Secretary St. Louis

FIRST SESSION

The Board of Regents met in the Stevens Hotel, Chicago, Ill., Wednesday evening, October 18, 1944, at 5:15 p. m. (seven present). The minutes of the meeting, February 1944, as submitted by mail, were approved.

The secretary's report on minutes was received.

The secretary's report on ad-interim activities and decisions was accepted.

The secretary's report on the state of the College indicated a total membership of 1178, which included 22 Honorary fellowships. He reported the following deaths:

Percy Ash, Australia. July 21, 1944.

Leo M. Baughman, Los Angeles, Calif. February 21, 1944.

E. Fred Briggs, Bangor, Me. March 31, 1944.

R. K. Brown, Ann Arbor, Mich. March 28, 1944.

Stanley W. Clark, Chicago, Ill. April 1, 1944.

W. N. Cogan, Washington, D. C. October 4, 1943.

C. T. Fleetwood, Seattle, Wash. May 1, 1944.

Frederic E. Haberle,

Amos I. Hadley,

John D. Hertz.

Adjournment, 6:15 p.m.

SECOND SESSION

(Joint meeting of Regents and Representatives of Sections)

The joint meeting of the Board of Regents and representatives of Sections was held in the Stevens Hotel on Wednesday evening, October 18, 1944, at 7:30 o'clock.

President Fixott presented his address. He expressed disappointment in not having the honor of presiding over a convocation, though realizing that conditions simply would not permit. He suggested an increased membership but not for the sake of numbers. He stated

42 MINUTES OF THE MEETING OF THE BOARD OF REGENTS

that: "The American College of Dentists was not an organization for entertainment, nor for the self-aggrandizement or glory of its members. Its success is not to be measured by splendor, nor spectacular display but rather by the genuineness of its good fellowship, by its breadth of vision, by the height of its inspiration, by the tolerance of its opinions, by the impetus it was given through its membership to a recognition of the value of the highest professional ideals and by its contributions to the upbuilding and welfare of the dental profession." He cautioned that "we must never become satisfied with the mere 'pointing with' pride to the high purpose of the College. Our strength lies in our sincerity of the purpose and in our actions."

The address was referred to the Board of Regents, who later ordered it published and presented at the meetings of the Sections when fellowships were conferred.

The following committee reports were presented:

Certification of Specialists	Oral Surgery
Education	Preventive Service
History	Prosthetic Dental Service
Hospital Dental Service	Research
Journalism	Socio-Economics
5	

Dr. Arthur H. Merritt reported on the William J. Gies Endowment Fund for the Journal of Dental Research.

A general discussion followed the presentation of the reports. Adjournment, 10:45 p. m.

THIRD SESSION

The Board of Regents convened at 11:00 p. m., Wednesday, October 18, 1944, to hear suggestions from Drs. A. L. Midgley and Wm. J. Gies on ways and means of developing a better medicodental relationship. Reprints of articles written by them were ordered distributed to "key" organizations, in the hope that unified action might result.

Dr. Gies also reported for the New York Section on the matter of rescinding the resolution on plural membership passed in 1937 and also the selection of local censors.

Adjournment, 11:45 p.m.

FOURTH SESSION

The fourth session of the Board of Regents convened on Thursday morning, October 19, 1944, at 8:30 a. m. (9 present).

The secretary presented the report of James C. Thompson & Co., tellers of the election, whereupon President Fixott declared the following duly elected:

President-elect-Malcolm W. Carr.

Vice-President-William J. H. Benson.

Secretary-O. W. Brandhorst.

Treasurer-H. S. Smith.

Regent (5 years)-H. O. Lineberger.

The matter of the selection of local censors was again discussed, due consideration being given to suggestions received from individuals, sections and those who had served as local censors during the past year.

The following decisions were made:

(a) That local censors serve for a term of three years.

(b) That they be selected from list (twice number needed) submitted by officers of Sections.

(c) That names of local censors be kept secret as requested by majority of those serving.

(d) That chart on eligibility and a work sheet for nominators be developed and included with nomination blank when mailed.

It was voted to submit the question of rescinding the resolution on plural membership, adopted in 1937, to the membership for their decision by mail ballot. This resolution reads as follows:

"Resolved, that the American College of Dentists will not admit to membership any person holding membership in any similar honorary dental organization. Fellows of the American College of Dentists, who are also members of a similar honorary dental organization are requested to consider the propriety of early withdrawal from one or the other."

The secretary was instructed to dispose of the durable equipment owned by the College as a result of grants-in-aid in research, in accordance with bids presented for same.

The treasurer's report showed a balance of \$9,560.63 in the Continental Illinois National Bank and Trust Company of Chicago, in addition to government bonds amounting to \$7,000 par value.

MINUTES OF THE MEETING OF THE BOARD OF REGENTS

44

The editor reported that four issues of the *Journal* had been published during the year. He also outlined plans for coming issues, which were approved.

REPORTS OF SPECIAL COMMITTEES

The Journal Committee presented a comprehensive report dealing with acceptance of advertising and a possible business manager for the *Journal*. Report accepted.

The By-laws Committee presented a progress report, no formal report being planned for the present.

The 25th Anniversary Committee recommended that while this was our 25th Anniversary year, conditions suggested postponement of any plans for celebration. Postponement approved.

The report of the Survey Committee, which dealt with new plans and suggestions for College activities, was ordered submitted to the Regents for study and consideration at the February, 1945 meeting.

It was decided to ask the Sections to confer fellowship again for the Regents upon those who had been duly elected and found it possible to attend a national meeting. It was voted to confer fellowship *in absentia* upon those who could not attend a Section meeting, with the understanding that such persons would present themselves at a subsequent meeting to be invested with cap and gown.

The Board of Regents approved the request of Fellows in the Kansas City, Missouri, area to organize the Kansas City Mid-West Section of the College.

The following persons were elected to the respective offices:

Editor-John E. Gurley, San Francisco, Calif.

Assistant Editor-James Nuckolls, San Francisco, Calif.

Contributing Editors: H. Trendley Dean, Bethesda, Md. (5 years); Anderson M. Scruggs, Atlanta, Ga. (5 years); Chas. F. Brown, Denver, Colo. (2 years, unexpired of James Nuckolls).

The report of the Budget Committee, indicating a net balance for the coming year of \$1,793, was approved.

President Fixott installed the new officers and called upon Dr. R. P. Thomas to present his Inaugural address. It was ordered published and sent to the Section officers for use in induction ceremony.

Adjournment, 3:30 p.m.

AMERICAN COLLEGE OF DENTISTS Report of Necrology Committee JOHN V. CONZETT, D.D.S., Chairman¹

Each year we must record the names of some who have finished their labors on this terrestrial sphere and have gone on to the land we know only according to our faith or belief. If our faith is large, all inclusive and definite, then we have confidence that those, our associates, have found a place where they may rest from earthly labors and assume those in store for them and us. We will miss them, but we thank them for the heritage left to us. We record their names with brief biographical data and with our expression of appreciation of their labors and their association.

PERCY ARTHUR ASH

Sydney, Australia

1870-1944

Graduated, University of Pennsylvania, 1903. Member, Australian Dental Association, Fellow of the Federal Institute of Accountants, Fellow of the Institute of Arbitrators, London, England.

LEO M. BAUGHMAN

Los Angeles, Calif.

1887-1944

Graduated, University of Southern California College of Dentistry, 1918. Member, Los Angeles County Dental Society, Southern California State Dental Association, American Dental Association.

E. FRED BRIGGS

Bangor, Me. 1874-1944

10/4-1944

Graduated, University of Maryland, 1903. Member, Maine Dental Society, American Dental Association, Penobscot Valley Dental Society; President, Maine Dental Society.

ROBERT KENNARD BROWN

Ann Arbor, Mich.

1893-1944

Graduated, School of Dentistry, University of Michigan, 1919. Member,

¹The other members of this Committee are (1943-44): A. L. Martin, P. V. McParland, R. H. Volland and M. L. Ward. Since this report was arranged, Dr. Conzett has himself passed to his reward.

REPORT OF NECROLOGY COMMITTEE

Michigan State Dental Society, American Dental Association, International Association for Dental Research.

STANLEY W. CLARK

Chicago, Ill.

1887-1944

Graduated, Northwestern University Dental School, 1916. Member, Chicago Dental Society, Illinois State Dental Society, American Dental Association.

CLINTON T. FLEETWOOD Seattle, Wash. 1891-1944

Graduated, North Pacific College of Oregon, 1917. Member, Seattle District Dental Society, Washington State Dental Association, American Dental Association. President, Seattle District Dental Society, Washington State Dental Association.

FREDERIC E. HABERLE

Chicago, Ill.

1893-1943

Graduated, University of Iowa School of Dentistry, 1919. Member, Chicago Dental Society, Illinois State Dental Society, American Dental Association, Chicago Association of Orthodontists, American Society of Orthodontists. President, Chicago Association of Orthodontists.

AMOS I. HADLEY

Boston, Mass.

1869-1943

Graduated, Harvard Dental School, 1891. Member, Massachusetts Dental Society, American Dental Association.

JOHN DICKEY HERTZ

Stamford, Conn.

1870-1943

Graduated, Pennsylvania College of Dental Surgery, 1893. Member, Stamford Dental Society, Connecticut State Dental Association, American Dental Association, American Academy of Periodontology, New York Academy of Dentistry, First District Dental Society of New York, New England Dental Society, Western Fairfield County Dental Society, Delta Sigma Delta Fraternity. President, Connecticut State Dental Society, Western Connecticut Fairfield Dental Society, Stamford Dental Society.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

PROCEEDINGS OF THE SUBSECTION ON DENTISTRY, NINTH ANNUAL MEETING, CLEVELAND, OHIO, SEPTEMBER 11, 1944 Compiled by PAUL C. KITCHIN, Secretary of the Subsection¹ Ohio State University, Columbus, Ohio

The general meeting of the association scheduled for Cleveland in December, 1943, was cancelled early enough in the year to prevent any attempt on the part of the Subsection Executive Committee to arrange a program. This committee consisted of Dr. T. J. Hill, 1945, Dr. B. Holly Broadbent, 1943, and Dr. Paul C. Kitchin, 1944.

On consultation with Dr. F. R. Moulton, Permanent Secretary of the A. A. A. S., it was decided that, for the Cleveland meeting planned for September, 1944, rather than hold an election for the committeeman's place expiring in 1943, the Subsection Secretary should select someone to serve for the 1944 meeting. Since the symposium topic for the 1944 meeting was "Dental Caries and Fluorine," Dr. H. Trendley Dean was appointed to the Executive Committee to serve. Dr. Hill was chairman of the Cleveland meeting.

Since the term of office of the Subsection Secretary expired in 1944, necessary preparations were made for the election of a secretary for the period 1945-48 inclusive. The secretary prepared a list of the Subsection members who are fellows of the A. A. A. S. and mailed it to all members with the request that each Subsection member name a candidate for the office of secretary. The returns resulted in a list of seven names, each of which was the choice of a number of members. Inquiry was made of each nominee so chosen as to his willingness to accept the secretaryship if elected. All answered in the negative but after some correspondence one was willing to become a nominee. His name was placed on a postcard ballot and sent, together with a letter concerning the Cleveland meeting, to each of the 267 Subsection members. There were 141 ballots returned and 139 were affirmative for the nominee, Dr. Isaac Schour. His name was sub-

¹No meeting was held in 1942 or 1943.

47

PAUL C. KITCHIN

mitted to the Council of the A. A. A. S. for their approval as Secretary of the Dental Subsection for the four year period 1945-1948.

The program of the 1944 Cleveland meeting was a symposium of ten selected papers on the subject "Dental Caries and Fluorine." There was a capacity audience at both the morning and afternoon sessions. They were held in the Lattice Room of the Statler Hotel which accommodates 250 to 300 persons.

The affiliated and associated dental organizations of the A. A. A. S. were officially represented at the meeting by the following persons:

Lt. Comdr. J. S. Restarski (D.C.), U. S. Navy, for the American Dental Association.

Dr. T. J. Hill, for the American College of Dentists.

Dr. H. Trendley Dean, for the International Association for Dental Research.

Dr. Paul C. Kitchin, for the American Association of Dental Schools.

The death of three Subsection members occurred during the past year. They were:

Dr. Robert K. Brown, Ann Arbor, Michigan; April, 1944.

Dr. Stanley W. Clark, Chicago, Illinois; April, 1944.

Capt. Arthur H. Yando (D.C.), U. S. Navy; March, 1944.

The following new members were added to the Dental Subsection list in 1944:

Archie A. Albert, 84 Broad Street, Pawtucket, Rhode Island; Nd44.

Keith L. Buechele, 607 North Grand Avenue, St. Louis, Missouri; NdNp44.

A. F. Douglas, Florida State Hospital, Chattahoochee, Florida; Nd44.

Bert R. Elliot, 304 Medford Building, Medford, Oregon; NdNpL44. George Vernon Fisk, 818 Medical Arts Building, Toronto 5, Ontario,

Canada; Nd44.

Donald Werden Gullett, 107 Blythwood Road, Toronto, Ontario, Canada; NdK44.

Robert Leslie Heinze, I Hanson Place, Brooklyn 17, New York; Nd44. Fredrick William Herms, P.O. Box 594, Imola, California; NdL44.

Donald A. Keys, University of Nebraska, College of Dentistry, Lincoln, Nebraska; Nd44.

N. Kobrin, 7802 Fifth Avenue, Brooklyn 9, New York; NdI44.

John W. Knutson, Minnesota Department of Health, University Campus, Minneapolis, Minnesota; Nd44.

Frank M. McCarthy, First National Bank Building, Olean, New York; NdN44.

Alexander Novak, 136 East 57th Street, New York 22, New York; NdN44.

Walter J. Pelton, U. S. Public Health Service, Washington 14, D. C.; Nd44.

Clarence Edward Rutledge, 2500 Bissell Street, Richmond, California; Nd44.

George B. Scott, 1213-14 Missouri Theater Building, St. Louis, Missouri; Nd44.

Richard Spector, 1167 Colgate Avenue, New York 59, New York; NdC44.

Lester H. Steinholtz, 2174 Davidson Avenue, New York 53, N. Y.; NdC44.

Gordon R. Winter, 81 Front Street, Binghamton, New York; Nd44.

By action of the Council of the A.A.A.S. fifteen members of the Dental Subsection were made Fellows of the Association in 1944. Those so honored were:

S. S. Arnim, Dental School, Medical College of Virginia, Richmond, Virginia.

F. A. Arnold, Jr., National Institute of Health, Bethesda, Maryland. Carl Breitner, 745 Fifth Avenue, New York, New York.

Charles F. Deatherage, 716 Ridgely Building, Sprinfield, Illinois.

F. C. Elliot, 1018 Blodgett Avenue, Houston, Texas.

Harold Hillenbrand, 100 West North Avenue, Chicago, Illinois. W. N. Hodgkin, Warrenton, Virginia.

William Lefkowitz, 33 West 42nd Street, New York, New York.

Harold J. Leonard, 630 West 168th Street, New York, New York.

W.J. Pelton, U.S. Public Health Service, Washington 14, D.C.

Celia Rich, 1112 Bonine Dillon Bldg., Nashville, Tennessee.

Sidney Sorrin, 745 Fifth Avenue, New York, New York.

Robert M. Stephan, 5600 Dorchester Avenue, Chicago, Illinois.

George W. Wilson, 604 North 16th Street, Milwaukee, Wisconsin.

Philip W. Woods, 4664 Homer Avenue, S. E., Washington 20, D. C.

Since the first published membership list of the Subsection on Dentistry² there have been a number of gains and losses which have

²See Footnote No. 1, J. Am. Col. Den., 9, 229; 1942, June.

PAUL C. KITCHIN

just about balanced each other. The previous publication applied to the year 1941, and was a list of those A. A. A. S. members who had included an interest in dentistry (Nd) in their three choices of sections allowed each member. Subsequent to that time the Section Secretary has contacted each one of those who had not indicated dentistry as his primary interest, that is wherever the (Nd) following the individual's name was not the first section listed in his series of interest. It many cases these were dentists who had joined the A. A. A. S. previous to the time of the establishment of the Dental Subsection (1935). When the implication of the order of section listings following their names was explained all but a few made dentistry their primary section choice. For purposes of Subsection elections, annual program announcements, and efforts to build up membership and hold those already enrolled in the A. A. A. S., the Subsection on Dentistry membership list has been considered to be made up of those whose primary interest has been specified as dentistry (Nd). The complete membership as taken from the official listing prepared by the Association and furnished to the Subsection Secretary for 1944 appears at the end of this report.

Following are the abstracts of the papers making up the symposium on Dental Caries and Fluorine, presented before the Subsection on Dentistry in Cleveland, September 11, 1944. The entire symposium will be published in book form by the American Association for the Advancement of Science.

THE EPIDEMIOLOGY OF FLUORINE AND DENTAL CARIES¹ H. TRENDLEY DEAN Senior Dental Surgeon, U.S.P.H.S. Bethesda, Maryland

Т

Prior to six or seven years ago dental research in fluorine centered largely on one or the other of the various phases of endemic dental fluorosis. The effects of using domestic waters containing excessive amounts of fluorides were thoroughly studied; fluoride domestic

¹This is an abstract covering three papers on epidemiology: H. T. Dean on the United States, Robert Weaver on the British Isles and India, and T. Ockerse on South Africa.

A. A. A. S.: SUBSECTION ON DENTISTRY; 1944

waters containing less than one part per million, being below the mottled enamel threshold, were considered of no dental or public health significance and unfortunately little attention was paid to them.

The recent epidemiological studies reporting wide differences in dental caries experience (prevalence) associated with the use of fluoride domestic waters in the 0.0 to 1.0 part per million range opened up a broad field undreamed of a few years ago. The present day concept of the relation of fluorine to dental health now ranges quantitatively from inadequate, through optimal, to excessive amounts. These unprecedented disclosures point strongly to a new advance in environmental regulation through chemical control, a pressing challenge to the best scientific leadership in dentistry, sanitary engineering and water chemistry.

In these studies a total of 7257 white urban school children, age 12-14 years, of 21 cities of four states were examined. All children had been continuously exposed throughout life to the variable under investigation (the common water supply). Study of the intensity of dental caries attack, as shown by the dental caries experience of the population, disclosed striking differences. Children using domestic waters containing as little as one part per million of fluoride experienced only about a third as much dental caries as comparable groups using a water that contained no fluoride. Briefly, 847 children continuously using a domestic water containing more than 1.4 p. p. m. of F. averaged 2.4 decayed, missing or filled teeth per child; 1403 children of cities whose water supplies contained between 1.0 and 1.4 p. p. m. of F. showed 2.9 affected teeth per child. In the 1140 children of cities whose public water supplies contained 0.5 to 0.9 p. p. m. of F. an average of 4.2 teeth per child showed evidence of past or present dental caries attack, while in the 3867 children of cities whose common water supplies contained less than 0.5 p. p. m. of F. an average of 7.4 teeth per child showed evidence of having experienced dental caries.

Most outstanding of those differences was in the upper incisors. In the 3867 children residing in cities whose water supplies contained less than 0.5 part per million of F., 3106 out of 30528 surfaces showed evidence of dental caries experience, or a rate of 10.2 per 100 surfaces. In sharp contrast the 3390 children, residents of cities wherein the public water supply contained 0.5 p. p. m. of F., or more, disclosed only 292 out of 26818 with caries experience, or a rate of 1.1 per 100 surfaces. When comparisons are made between children using fluoride free water and those using waters containing a part per million or more of F., the contrast is even greater, differences of as much as 20 to 1 or more being observed.

Other studies in England, South Africa, and India report similiar findings respecting the influence of small amounts of fluorides on the amount of dental caries in the community.

Much investigative work naturally remains to be done before serious thought can be given to a recommendation for its universal application. Fortunately the amount of fluoride necessary to markedly inhibit dental caries attack is so low that the disfiguring complication of mottled enamel found among users of higher fluoride waters is eliminated. In fact, there is apparently little, if any, advantage to be gained in further caries reduction by using a water containing more than one part per million of fluoride. Moreover, low fluorination would not involve adding anything not already present in water supplies now used daily by several million people in this country and the optimal amount suggested, namely, one part per million, is considerably less than hundreds of thousands of people have been using for many years. For instance, the city of Colorado Springs has been using a public water supply containing approximately 2.5 parts per million of F. for probably sixty years. The public water supplies of Amarillo and Lubbock, Texas, are considerably higher.

On the basis of the order of the epidemiological events and knowledge from laboratory studies one seems fully justified in inferring that the inhibitory agent is the fluoride present in the water supply. On the basis of concomitant variation, the evidence is particularly impressive; the fluoride variable cannot be changed in quantity without affecting the phenomenon (dental caries prevalence), fluoride seemingly constituting an indispensable condition of this particular phenomenon.

A. A. A. S.: SUBSECTION ON DENTISTRY; 1944

In order to transfer the benefits of this naturally occurring phenomenon to a public health control measure of widespread usefulness, serious thought and consideration are now being given to demonstration studies designed to test the effectiveness of this measure. Will the addition of one part per million of fluorine to a fluoridefree domestic water markedly reduce the amount of dental caries in a community to a level comparable with that observed when this amount of fluorine occurs naturally in a domestic water? A large amount of presumptive epidemiological and direct laboratory evidence is encouraging.

As knowledge advances it becomes apparent that the fluoride content of the domestic water is destined to play an important role in dental hygiene.

Even at this stage of the development, there seems much justification for classifying domestic water supplies into one or the other of three groupings:

1. Those carrying naturally the *optimal* concentration of fluoride (F) i.e., about 1.0 part per million, no treatment being required.

2. Those carrying an *excessive* concentration of fluoride requiring the removal of the excess in order to protect the population against endemic dental fluorosis (mottled enamel), or,

3. Those *deficient* in fluorine to which fluoride might be added to bring its concentration up to the optimal in order to lessen the amount of dental decay in the community.

From an epidemiological viewpoint, it does not seem essential that the mode of action of the fluorine be completely known before setting up the demonstration studies. The practical application of Jenner's observation of the protective influence of vaccinia virus in smallpox prevention rested on the purest of empirical grounds for a century. For generations scurvy and malaria were effectively controlled before either their etiology or the mode of action of the prophylactic agent was known. The history of preventive medicine is replete with instances where observed natural phenomenon was utilized as a basis for far-reaching control measures. The relation of fluorine to dental health as observed in Nature has proved remarkably consistent.

PAUL C. KITCHIN

II

EPIDEMIOLOGICAL ASPECTS OF ORAL LACTOBACILLUS COUNTS IN FLUORIDE AND NON-FLUORIDE AREAS

PHILIP JAY

School of Dentistry, University of Michigan and

F. A. ARNOLD, JR.

National Institute of Health, United States Public Health Service

Lactobacillus counts were determined on 4000 saliva specimens obtained from 7 to 14-year-old children residing in fluoride and non-fluoride areas.

The water supplies of Elmhurst, Maywood, Aurora, Joliet and Galesburg, Illinois, are derived from wells containing more than one p. p. m. of fluoride. The well water of Elgin, Illinois, contains approximately 0.5 p. p. m. of fluoride. Comparative studies were made between the above communities and Evanston, Oak Park, Waukegan and Quincy, Illinois, and Escanaba, Michigan, using fluoride-free waters.

Bacteriologic examinations were conducted on 7 to 9 and 12 to 14year-old children in Waukegan, Illinois, and Escanaba, Michigan, for three consecutive years. Both of these cities used Lake Michigan water until after the second survey was made, when Escanaba changed to well water containing approximately 0.5 p. p. m. of fluoride.

The most striking differences in the lactobacillus counts between the fluoride and non-fluoride areas were those noted in the ranges of 0 to 100 and in those counts over 20,000.

In the areas using over 1 p. p. m. of fluoride those in which the counts were in the 0-100 range, averaged 37.4% of the population as compared to 16.1% in the non-fluoride area. Elgin, Illinois, with 0.5 p. p. m. of fluoride has 21.2% in that range.

The higher-than 20,000 counts averaged 27.5% for the areas using over 1 p. p. m. of fluoride and 52.4% for the non-fluoride areas. Elgin fell in between with 38.8%.

Repeated cross-sectional surveys in Waukegan, Illinois, and Escanaba, Michigan, revealed the frequency distribution of high and low counts to be remarkably constant. The 0-100 counts for

A. A. A. S.: SUBSECTION ON DENTISTRY; 1944

Waukegan in 1942, 1943 and 1944 were 15%, 14%, and 16% respectively. The counts of over 20,000 in Waukegan for those years were 55%, 56% and 58%. Out of 238 children from whom specimens were obtained both in 1942 and 1943, 47 showed a significant change in counts. The counts had gone up in 27 and down in 20.

The 0-100 counts for Escanaba in 1941, 1942 and 1943 were 16%, 10% and 16% respectively. Counts of over 20,000 were obtained from 56%, 57% and 49% of the population during those years. Out of 234 children who were examined twice in Escanaba the counts changed in 41. The counts increased in 21 and decreased in 20.

The three year 0-100 counts averaged 15% for Waukegan and 14% for Escanaba. The counts of over 20,000 averaged 56% for Waukegan and 54% for Escanaba. In view of the fact that the dental caries attack rates of these two cities were both in the 800 range, the similarity in the percentage distribution of lactobacillus counts is significant.

It is also notable that sugar rationing began immediately after the 1942 Waukegan survey with no apparent effect on the lactobacillus counts during the succeeding two years. Since a direct relationship between high sugar consumption and high lactobacillus counts has been proved it would seem that sugar rationing did not result in a marked reduction in sugar consumption or else that there was a marked compensatory increase in the use of other carbohydrates. The fact that caries continues to be active in only a small percentage of patients on diets which are sugar-free but high in starch would indicate that the stability of the lactobacillus counts in Waukegan is evidence that the consumption of sugar was not drastically curtailed.

The percentage of high counts in Escanaba on Lake Michigan water was 56 in 1941 and 57 in 1942. The water supply was changed shortly after the 1942 survey. In 1943 only 49% of the Escanaba group had counts of over 20,000. This was 6% lower than any previous value for Waukegan and Escanaba but cannot be considered significant unless future surveys should reveal a continued

PAUL C. KITCHIN

decline in the high counts in Escanaba while Waukegan remains unchanged.

Further epidemiologic evidence was obtained that lactobacillus counts are related to total caries experience and not to the presence of open dental cavities. The teeth per 100 children showing dental caries experience in Joliet, Elgin and Oak Park numbered 377, 445 and 725 respectively. The fluoride values for these areas were 1.3 p. p. m., 0.5 p. p. m., and 0. The number of teeth with untreated cavities were approximately the same in the three communities, namely 205, 217, and 210. The lactobacillus counts, however, varied directly with the total caries rates, and inversely to the fluorine intake. The percentages of counts over 20,000 were 27 for Joliet and 33 and 44 for Elgin and Oak Park. Conversely the 0-100 range was 26% for Joliet and 16% and 12% for Elgin and Oak Park.

III

The Chemical Differences of Caries Susceptible and Immune Teeth and a Consideration of Food Sources of Fluorine

> WALLACE D. ARMSTRONG Laboratories of Applied Biochemistry and Dental Research University of Minnesota, Minneapolis, Minn.

The composition of the enamel and dentin of sound teeth and the sound enamel and dentin of carious teeth was not found to differ with respect to calcium, phosphorus, magnesium and carbonate contents. With respect to fluorine a significant difference in fluorine content was found between the enamel of sound and carious teeth but not with regard to the dentin. The mean results of fifty analyses each of sound enamel and enamel of carious teeth together with the standard deviation of the means follow: Enamel of sound teeth, 0.0111 \pm 0.0020%; enamel of carious teeth, 0.0069 \pm 0.0011%. These results would be expected to occur by chance I in 5,000,000 times. The fluorine content of the enamel and dentin of moderately mottled teeth was found to be respectively 0.0250% and 0.0415%. The fluorine content of the enamel of markedly mottled teeth was found to be respectively 0.0333% and 0.0361%. The amount of fluorine in the dentin of the latter teeth was 0.0504%.

56

A. A. A. S.: SUBSECTION ON DENTISTRY; 1944

Evidence is available that the lower fluorine content of the enamel of carious teeth is not secondary to the carious process. This finding is the only significant difference in composition yet discovered between caries susceptible and immune teeth and furnished an early line of evidence for the beneficial role of fluorine in the preservation of the integrity of the teeth.

Food prepared with water not containing exceptional quantities of fluorine usually represents a negligible source of fluorine. The only natural food product which contributes appreciable amounts of fluorine to the daily intakes is certain teas. Certain special foods which contain bone of adult animals have in the past contained considerable fluorine. The fluorine content of the daily ration adequate in all respects for the nutrition of the adult and prepared in Minneapolis was found to vary from 0.19 to 0.32 mg. fluorine per day. Practically all foods contain traces of fluorine and this fact has prevented a study of the effects of total fluorine deficiency in animals.

IV

EXPERIMENTAL CARIES AND A DISCUSSION OF THE MECHANISM OF CARIES INHIBITION BY FLUORINE HAROLD C. HODGE and REIDAR SOGNNAES School of Medicine and Dentistry, University of Rochester

About a dozen experiments on the rat have now shown conclusively that large amounts of fluorine given in the diet or in the drinking water continuously during the experimental period markedly reduce the caries incidence in rats fed the coarse corn cariesproducing diet. In high doses fluorides are apparently as effective in reducing rat caries whether given in solution in the drinking water or mixed in a solid diet. Fluorides apparently act optimally when given during the period on the caries-producing diet, although some effect is gained when the fluorides are given prior to but not during the coarse corn diet. This proposition has been tested by giving a) pregnant rats fluorides, b) continuing the administration during lactation, c) giving fluorides by dropper to the pups during the period the molar teeth are forming and erupting and d) giving fluorides after the teeth had erupted and the crowns were fully formed. In none of these special methods of administration were the fluorides

PAUL C. KITCHIN

as effective as when given during the period on the caries-producing diet. Fluorides are most effective against rat caries when given by mouth; less so by topical application or by stomach tube and apparently ineffective when injected. Within limits the caries inhibiting action increases with increases in the amount of fluoride given.

Dale, Lazansky and Keyes have recently shown that fluorides are quite effective in cutting down the incidence of dental caries in the teeth of the Syrian hamster. This is important because hamsters develop dental caries on fine ground diets as well as on the coarse diets. Furthermore, hamster teeth are much more like human teeth in that they have enamel covered cusps and shallower occlusal grooves. In addition, hamster caries develops on all surfaces of the teeth and therefore resembles human caries also in this respect. A study of hamster caries and fluorine deserves much greater attention.

At present the lack of evidence prevents the formulation of an adequate statement of the mechanism of the reduction in caries by fluorine. A tentative hypothesis is offered. Fluoride is adsorbed or bound in combination in the tooth tissues and on the tooth surface thereby (a) lowering the solubility of the tooth mineral, (b) in some way hindering those processes by which protein and calcified material are dissolved and (c) changing the salivary milieu as shown by lower lactobacillus acidophilus counts. There are probably some systemic actions of fluorides partly responsible for the caries inhibition; these are unknown at present.

V

Non Dental Physiological Effects of Trace Quantities of Fluorine

F. J. McCLURE Senior Biochemist, National Institute of Health Bethesda, Maryland

Dental and osseous tissues are more sensitive to fluorine and retain fluorine to a greater extent than any other body tissues. The presence of fluorine in tooth and bone tissues is universal and seems explained by their very great chemical affinity for it. The sources of this fluorine are in general, certain foods and drinking waters which contain trace quantities. When present in bones and teeth in

A. A. A. S.: SUBSECTION ON DENTISTRY; 1944

trace quantities fluorine is compatible with normal physiological processes. These is no proof in this tissue-fluorine relation, however, that either osseous or dental tissues have a physiological requirement for fluorine. Fluorine is not a proven essential element for the proper functioning of either osseous or dental tissues or for any other body tissues or body function.

The intensity of the harmful effects of fluorine on osseous and dental tissues, is largely proportional to the quantity of fluorine which they retain. Any fluorine exposure, therefore, which suggests the retention of appreciable quantities of fluorine in the body would appear to contain the threat of a health hazard. Recent evidence has shown, however, that there is a very efficient elimination of fluorine by way of the urine, and also some loss of fluorine by way of body sweat and possibly through the insensible cutaneous perspiration. The results of these fluorine metabolism studies are interpreted as being strongly indicative that quantities of fluorine up to 3.0 or 4.0 mg. ingested daily are perhaps better than 90.0% eliminated by the human adult organism. The hazard of cumulative toxic bone fluorosis surrounding most domestic fluoride waters now seems greatly reduced by the observation that a remarkably efficient excretion of fluorine is a normal kidney function.

It is not to be implied, however, that all health hazards otherwise suggested by prolonged exposures to fluorine via water or industrial exposure are entirely obviated by these observations of an efficient body fluorine elimination. Other aspects of the public health problem of fluorine exposure obviously require further study. One such problem, for example, relates to the retention of fluorine by young children as compared to retention by adults.

The possibility of some skeletal dysfunction resulting from exposure to fluoride domestic waters has had some recent study by way of an epidemiological survey of the incidence of bone fractures in groups of high school boys and young adult selectees of the Armed Forces of the United States. The results of this survey indicate that no unusual degree of bone fractures was related to the continuous exposure to fluoride domestic waters containing up to 2.0 p. p. m. or even 4.0 or 5.0 p. p. m. fluorine. No effect of fluoride waters on

PAUL C. KITCHIN

height and body weight was noted among young men and high school boys. Young adult men exposed to fluoride waters containing 2.0 to 5.2 p. p. m. fluorine gave no indication of renal injury.

The results of experimental-animal fluoride studies suggest a number of adverse effects (in addition to dental injuries) which might be connected with the domestic use of fluoride waters. Aside from certain indications of skeletal defects, other physiological impairments suggested by these studies have never appeared under actual conditions of exposure to fluoride domestic waters. By and large the failure of any of these effects to appear seems explained by the fact that most cases of clinical and experimental non-dental fluorosis have been produced by quantities of fluorine which greatly exceed average quantities ingested from most fluoride-bearing drinking waters. It is not to be denied, however, that epidemiological studies of the non-dental effects of fluorine, as ingested in fluoride domestic waters, are extremely few in number and very limited in scope.

Finally it may be noted that the first specific symptom of fluorine injury to the child is the appearance of the hypocalcified enamel known as mottled enamel. This specific dental lesion related to fluorine in drinking water, does not appear in endemic proportions among large population groups providing the fluorine concentration of the drinking water does not exceed 1.0 p. p. m. At this time it seems highly improbable that prolonged ingestion of fluorine via drinking water of this fluorine concentration, i.e., 1.0 p. p. m., will bring about adverse physiological effects. It is unlikely that there is any other impairment of the body's physiological functioning below the fluorine concentration necessary to produce the dental lesion.

VI

TOPICAL APPLICATIONS OF FLUORIDES AS A METHOD OF COMBATTING DENTAL CARIES

B. G. BIBBY Dean, Tufts Dental School, Boston

The studies designed to test the effectiveness of topical applications of fluorides in controlling dental caries have been analyzed and compared. In five of the six studies considered the occurrence

A. A. A. S.: SUBSECTION ON DENTISTRY; 1944

of new caries was reduced by from 26% to 50% as the result of from 2 to 15 fluoride applications. It is concluded that topical applications of fluorides will reduce the activity of dental caries in young people and that this procedure has considerable potential value as a method of combatting dental caries.

VII

A DISCUSSION OF THE POSSIBILITY OF REDUCING DENTAL CARIES BY INCREASING FLUORINE INGESTION¹

FRANCIS A. ARNOLD, JR. Dental Surgeon, U. S. Public Health Service

Observations made at Bauxite and Benton, Ark., indicate: First, it is not essential for fluorides to be continuously present in the diet for more than the first eight years of life in order that caries be inhibited. Second, the inhibitory action of fluorine may be dependent on the presence of optimal quantities in the diet during the formative period of the teeth, presumably increasing the fluoride content of the enamel and dentin. Third, there is a markedly lowered prevalence of proximal caries in the superior incisors of the Bauxite children, even though these teeth erupted into a "fluoride-free" environment.

Studies made at Garrettsville, Ohio, where the domestic water supply was changed from 0.1 p. p. m. F. to 0.7 p. p. m. F., indicate that even over a four-year period of exposure to the drinking water of increased fluoride content there has been an incremental increase of 1.5 carious teeth per person per year. This increase is greater than reported in the literature for comparable age groups in "fluorine-free" areas. Observations made at Maywood, Ill., give no indication that dental caries experience has been reduced in children who changed from a "fluoride-free" Lake Michigan water to Maywood water (1.2 p. p. m. of F.) after about four years of age. The above studies (Garrettsville and Maywood) produced no evidence that the dental caries process has been abated to any degree in teeth which were formed on "fluoride-free" water but exposed to an increased fluoride water during post-eruptive life.

Results obtained at Courtland, Va., and Bartlett, Texas, on a small

¹From Dental Research Section, Division of Physiology, National Institute of Health, Bethesda, Maryland.

PAUL C. KITCHIN

number of adults whose teeth showed fluorosis present evidence that teeth which are formed while an individual is using a domestic water of increased fluoride content have an increased "life expectancy." A comparison of the number of teeth lost per individual in the 20 to 49 year age group shows an average of 1.9 for the Courtland and Bartlett people, while the "Standard Rate" reported in the literature is 7.5 for a similar age group.

The evidence presented together with results of other epidemiological studies, indicates that dental caries can be reduced by increasing the fluoride content of the diet at least for the first eight years of life. Domestic water supplies are strongly suggested as the medium by which dietary fluorides may be increased, however, before any general recommendation of this sort can be made, it will be necessary to study directly the results of such a procedure. It will require 12-15 years before a final answer is clearly delineated. In this interim it is suggested that the dental profession might consider the possibility of increasing fluorine ingestion during the formative period of the teeth by daily supplements to the diet of fluoride in "fluoride-free" areas.

The observations herein reported indicate that it is necessary to increase fluoride ingestion only during the formative period of the teeth. Little if any beneficial effect, as may be brought about by increasing fluoride ingestion, can be expected to occur in people who are more than 5 or 6 years of age at time such therapy is instituted.

VIII

FLUORINE AND THE PUBLIC WATER SUPPLY

ABEL WOLMAN

The Johns Hopkins University, Baltimore, Maryland

At present the probable state of mind of the officer responsible for water supply control with respect to the problems posed at this symposium would be one of "watchful waiting." He would probably confess under duress that there are no inherently theoretical difficulties to be met in the addition of fluorides. Given sufficient epidemiological basis to warrant balancing of equities and conveniences in such application, the technical proficiency is available by which to guarantee a reasonably continuous and relatively undeviating dosage.

A. A. A. S.: SUBSECTION ON DENTISTRY; 1944

In broad policy it could be anticipated that any decision to supplement the water with fluoride would have to rest upon strong certification as to the necessity of so doing by the municipal and state health officers. Such certification naturally would presuppose more extended field studies and more confirmatory data than are at present available. The full scale experiments in Kingston and Newbergh, in New York State, and in Brantford, Ontario, Canada, after some years should produce important values helpful toward any ultimate general adoption of supplementation of water for the prevention of dental caries.

At this stage of available information the present writer maintains the position already well stated by Dr. Dean at the Cleveland 1943 meeting of the American Water Works Association. There is still no reason to modify these dicta, although there are many reasons in this, as in every other scientific endeavor to keep the mind of the water works official open to the possibilities in this field of public health endeavor. Dr. Dean's words are as follows: "Much investigative work, however, is necessary before serious thought can be given to a recommendation for its general application . . . it is well to emphasize again that the conversion of this observed natural phenomenon into one of general usefulness necessarily requires that specifically planned epidemiological studies clearly demonstrate the safety of low fluorination as it might relate to other aspects of the community's general health."

Membership List of the Subsection on Dentistry of the American Association for the Advancement of Science for 1944

	////
Robert G. AgnewNd39	Alfred J. AsgisNdQ43
James E. AiguierNd40	Stanley Bagnall NdQ36
Archie A. AlbertNd44	Guy P. Bannister Nd43
Bert G. Anderson Nd42	Henry L. Banzhaf NdQ33
Edmund Applebaum Nd36F38	Louis G. BarrettNd42
J. L. T. Appleton Nd22F33	Henry A. BartelsNd29F29
†S. S. Arnim Nd40	Harry BearNd38F39
†Francis A. Arnold, JrNd43	Frank E. BeubeNdQ38

†Made A.A.A.S. Fellows in 1944.

[‡]Subsection Membership consists of those A.A.A.S. members whose primary interest, as indicated by their choice of Sections, is with the Dental Subsection (Nd).

Samuel BirenbachNd41J. Cannon BlackNd41Robert E. BlackwellNd41J. R. BlayneyNd33F33Theodor BlumNd17F33Charles F. BodeckerNdF29F38Carl O. BoucherNdH43Ewing P. BradyNdCQ33F38Otto W. BrandhorstNd36F39Carl BreitnerNd42B. Holly BroadbentNdHF27F39George B. BroadhurstNd440David W. BrockNdK41Allan G. BrodieNdH36F41*Robert K. BrownNd42Alvin W. BryanNd33F39Maurice BuchbinderNd42Keith L. BuecheleNdNp44R. W. BuntingNdQ24F33Harvey J. BurkhartNd40F43Ralph R. ByrnesNd32Lester R. CahnNd35F38David K. CampbellNd33Cristobal CaraballoNdIC40Malcolm W. CarrNd34F39Jacob F. CartNd40Frank M. CastoNd42F42Herman R. ChurchillNd37F38Roland S. ClaflinNd042*Stanley W. ClarkNdC36John Vincent CoganNd41Martin L. CollinsNd40M. I. ConnerNd40Thomas J. CookNd42F43Edgar D. CoolidgeNdC33F39Ivan R. CottrellNd428F32Ivan R. CottrellNd41Gerald J. CoxNdC28F33	H. Trendley Dean Nd34F38 †Charles F. Deatherage Nd42 John W. Desmond Nd40 Oliver H. Devitt Nd41 Moses Diamond NdHI42 George B. Diefenbach Nd42 John W. Dobson Nd43 A. F. Douglas Nd44 George C. Douglass Nd40 William F. Doyle Nd43 Eudore Dubeau NdO36 Lawrence J. Dunn Nd41 William B. Dunning Nd29F43 William E. Durbeck Nd43 Kenneth A. Easlick Nd40F43 Bion R. East Nd42F43 Bert R. Elliott NdNpL44 †F. C. Elliott Nd35 George R. Ellis Nd33 Milton B. Engel Nd41 Herbert Ernst Nd41 Leigh C. Fairbank Nd42 Sidney B. Finn Nd42 Alton K. Fisher NdH43 George V. Fisk Nd44 John J. Fitz-Gibbon Nd40F42 Willard C. Fleming NdQF42 John T. Flynn Nd43 Sadi B. Fontaine Nd40 L. S. Fosdick Nd23F38 C. S. Foster Nd40 Lewis Fox Nd42 Morris Freeman NdF43 F. C. Friesell Nd27 Arthur B. Gabel NdBA33F42 C. Fred Ganun Nd41 William M. Gardner NdO30	
Ivan R. Cottrell	C. Fred Ganun	
William H. Crawford NdQ42F42	Matthew H. GarvinNd42	

*Deceased.

+

Wm. J. GiesNdC16F23
John O. Goodsell Nd36
Bernhard GottliebNd43
James D. Grace
Louis I. Grossman Nd36F39
G. A. Grubb
Donald W. Gullett NdK44
Donald W. Gullett NdK44 John E. Gurley NdQ32F43
William H. Hake Nd42
T. A. Hardgrove Nd40
R. Wendell Harrison Nd26F33
G. F. Haynes NdQC40
Robert Leslie Heinze Nd44
Robert Leslie Heinze Nd44 Samuel Hemley NdH36 Chester J. Henschel NdBC43
Chester J. Henschel NdBC43
Frederick W. HermsNdL44
Thomas J. HillNd36F36
Harold Hillenbrand NdK28
William N. Hodgkin Nd40 Murray M. Hoffman Nd40
Murray M. Hoffman Nd40
George M. Hollenback Nd36
Houghton Holliday NdB35
Percy R. Howe NdCF35F35
Malvern D. Huff NdKI35
Philip JayNd31F38
Leland R. Johnson Nd40 A. M. Jozefczyk Nd40
A. M. JozefczykNd40
Theodore Kaletsky Nd38
S. L. Katz
Donald A. KeysNd44
Thomas B. King
Paul C. Kitchin NdFG28F39
N. KobrinNdI44
N. Kobrin
John W. Knutson
Harold W. Krogh Nd42F42
William F. Lasby Nd40
Harry C. Lawton Nd40
William Lefkowitz Nd38
Maxwell J. LentzNd43

Harold Judson Leonard Nd37
Samuel J. Lewis
E. Alan Lieban
Ashley W. Lindsay NdQH32
H. O. Lineberger Nd32
H. O. Lineberger
Arthur S. Litten Nd33L37
Virgil LoebNd29F33
Jack Loop Nd41
P. C. Lowery Nd32
P. C. Lowery
Arthur F. Luhr
G. R. LundquistNdHF32
Roland LynnNdG43
Richard S. Manly NdC42
Harry MaethNd43
Herbert I. Margolis NdHF42
Howard M. Marjerison NdQ41
John MauerNdIK40
John O. McCallNd33F33
Frank M. McCarthy NdN44
M. W. McCrea Nd41
William A. McFarlane Nd41
E. G. Meisel Nd32F43
Henry A. MerchantNdL38
Howard J. Merkeley Nd42
Arthur H. Merritt Nd32F39L40
John V. Mershon Nd41
Albert L. Midgley Nd32F43
Leroy Miner Nd34F39
Obed H. MoenNdE41
Obed H. MoenNdE41 George R. MooreNdFH31F38
Mary M. Moore Nd42
Norman A. Moore Nd40
Isaac Neuwirth NdN25F33
Mendel Nevin
Alexander NovakNdN44
Frederick B. Noyes. NdF30F39
Harold J. Noyes Nd38F41
11a1010 J. 190905

Balint Orban Nd41F43
F. D. OstranderNd43
Samuel R. ParksNd42
†Walter J. Pelton Nd44
John L. PetersNd18
Harold W. Peterson NdB41
Katherine A. PolevitskyNd42
Wendell Postle
Weston A. PriceNdC99F42
James M. PrimeNdFH34
Hermann Prinz Ndo8F33
G. P. J. Pritchard Nd41
Charles M. Proctor Nd33
Samuel RabkinNd42
Dorothea F. RaduschNd42
Robert D. RayNdF40
Louis H. RenfrowNd43
Ernest C. ReockNdIK40
†Celia RichNd28
Frank A. Richison Nd43
Sidney E. RiesnerNd40
Roy James RinehartNd34
Hamilton Robinson Nd38F38
J. Ben Robinson Nd41F43
Alfred P. RogersNd42F42
Ruth Rogers NdQ41
Arne F. RomnesNd42
Theodor RoseburyNd37F38
Meyer L. RosoffNdL34
C. E. RudolphNd40F43
Clarence E. RutledgeNd44
Ricardo S. SalazarNdQ36
J. A. SalzmannNdK36
David C. SchiffNdo7 Carl A. SchlackNd42F43
Carl A. SchlackNd42F43
Isaac SchourNd34F34
Isaac SchourNd34F34 Joseph SchroffNdCB36
George B. ScottNd44
Leon SegatNd43
George C. Sharp Nd29L32

Edwin M. ShortNd43
Harry SicherNd42 Charles SiegelNd33
Charles SiegelNd33
Norman S. SimmonsNd42
E. W. Skinner NdB31F33
Ernest SlomanNdK40F41
Charles M. Smith NdQI40
Clifton A. H. Smith Nd41
E. H. Smith Nd41
T. Sidney SmithNd32
Marion M. SniffenNdIQ42
Sidney SorrinNd35 Richard SpectorNdC44
Richard Spector NdC44
Harvey Stallard Nd28F33
Frank C. StarrNd41
Frank C. StarrNd41 Sherwood R. SteadmanNdG42
Lyon P. StreanNd43
M. Russell Stein Nd43
Lyon P. StreanNd43 M. Russell SteinNd43 Lester H. SteinholtzNdC44
Robert M. Stephan NdC36
Richard H. Stucklen NdH42 Alexander Sved NdHA33
Alexander SvedNdHA33
C. H. Swanson NdI43
C. H. Swanson NdI43 A. Porter S. Sweet NdH43
Earl SwinehartNdHI36
Loren B. Taber NdL17 David Tanchester NdQ33
David Tanchester NdQ33
Bernerd O. A. Thomas NdFQ42
John R. Thompson NdHF41
Fredus Alex. Thurston Nd21
Samuel TolmachNd40
Edwin G. VanValeyNd32
R. S. VinsantNd40
John S. VoylesNd36
Edward C. Wach NdC 20
Henry I. WachtelNdK41
Henry I. WachtelNdK41 Alfred WalkerNd32F42 Donald A. WallaceNdCF43
Donald A. WallaceNdCF43
Joseph WalshNd33 Marcus L. WardNdB24F33
Marcus L. WardNdB24F33

A. A. A. S.: SUBSECTION ON DENTISTRY; 1944

L. M. Waugh NdGH33F39 B. W. Weinberger NdLH19F25	Gordon R. WinterNd44 Jacob M. WisanNd43
Joseph P. WeinmannNd41	†Philip W. WoodsNd40
Charles A. Wiethoff Nd40	Walter H. WrightNdF33F41
Joseph H. WilliamsNd36	*Arthur H. YandoNdI41
R. C. Willett NdH38	Daniel E. Ziskin Nd43
†George W. Wilson Nd40	Robert ZugsmithNd32

Total membership for 1944-267.

Number of members who are Fellows of the A.A.A.S.-82.

In addition to those whose official 1944 Association records denote a primary dental interest there are 18 persons who named some other field as primary with dentistry as a second interest. The list of these is as follows:

- W. D. Armstrong, Medical Science Building, University of Minnesota, Minneapolis 14, Minnesota. NNd44
- Lieut. Saul M. Bien, D. C. 0521951. 645 Madison Avenue, New York City. CNd42

Harold J. Cronin, 51 Atwater Road, Springfield, Massachusetts. INd43

William E. Hahn, 47 Holmehurst Avenue, Catonsville 28, Maryland. NNd44

Harold L. Hansen, Chatham Center, New York. CNd36F39

Milo Helman, 57 West 57th Street, New York, New York. HNd24F31

John Kemper, 1313 East Ann Street, Ann Arbor, Michigan. MNd41

Frances Krasnow, 422 East 72nd Street, New York, New York. CNdP23F28

S. A. Lovestedt, Mayo Clinic, Rochester, Minnesota. FNd44

E. C. McBeath, School of Dental and Oral Surgery, Columbia Medical Center, 630 West 168th Street, New York, New York. NNd44

Guy S. Millberry, Route 2, P. O. Box 181, Los Gatos, California. KNdQ13F15

Philip Person, 220 Rogers Avenue, Brooklyn, New York. NNd44

Albert Reissner, 694 East 40th Street, Brooklyn, New York. NpNd43

Harold Rider, 2644 Dwight Way, Berkeley, California. CNdP42

Benjamin Schwartz, 1884 Monroe Avenue, Bronx, New York, New York. ENd42

- H. F. Sommers, Hamilton Bank Building, 5439 Harford Road, Baltimore, Maryland. KNd40
- John Steiner, Miner Laboratory, 9 South Clinton Street, Chicago, Illinois. CNdP41

R. K. Thompson, 1835 Eye Street, N. W. Washington, D. C. NNd44

EDITORIALS

OLD PROBLEMS AND NEW DEPARTURES

Half a century ago and less no particular thought was given to that which we came to know later as vocational education. One "getting an education" was primed full of so-called cultural subjects and with these he was supposed to be smart enough or intelligent enough to make his own living. Or to put it another way, he was drenched with those subjects which might tend to give him a fuller appreciation of life, but as for making a living, well, that was his business and not that of an educational institution. It is within the mind and time of the writer that appeal was made to drop Greek and Latin and substitute physics and chemistry. What a wail of despair! You will have no educated men!

But what has happened? Whether it could or could not be done, it was, and it may well be doubted that our cultural qualities are any the worse. We do need to appreciate "life" and the things of life, in fact it may be true that if man is lacking in one attribute more than another, it is in the "fine art of appreciation." But did he possess it to any fuller degree in years gone by or under that other educational tuition? Have the "sciences" and the "more useful arts," or perhaps the "utilitarian subjects" failed in any degree in bringing about an understanding of "life," or in educating men?

It has been pointed out that "a college education should not deal with either 'how to live' or 'how to make a living,' but with both 'how to live' and 'how to make a living'."¹ With this there must be complete concurrence, at least as far as it goes. There are many factors involved in one's thorough education, the college or the university providing only a part. However it is a large part, and they do provide a sort of "center of gravity" for men's minds, in that so many of us must manifest so great an amount of loyalty and express so much appreciation to that institution which has helped us to learn how to make a living and to find our places among men.

¹Sills, Kenneth C. M.: The Useful and Liberal Arts and Sciences. American Scholar, 13, 402; Autumn, 1944.

EDITORIALS

But this idea of making a living and in living among men is one which is very exacting and which requires many adjustments. Some adjustments may be compromises and which of course are always possible—one or the other must fit into the other or the one. But from the standpoint of a particular one there must be willingness to cooperate and to coordinate based upon understanding. The mere matter of compromising in order to maintain or to bring about harmony is not always the proper thing to do. To turn the other cheek merely because the one was slapped may be cowardly, but to follow that principle correctly is a manifestation of heroism. This must be based upon knowledge and understanding.

It makes no difference whether one thinks in terms of the group or the individual, life is individual in every aspect; therefore, each of us must gain his own knowledge, develop his own understanding and make his own adjustments.

To that end then *The Journal Forum* has been instituted. It is to be hoped that it may serve a useful purpose.

HAYDEN AND HARRIS

These two names are well known within the field of dentistry. They are names to conjure with. They were men who saw clearly ahead. The following triplet well illustrates their minds:

> A task without a vision is drudgery; A vision without a task is a dream, But a task with a vision is ecstasy.

So these men, understanding the value of organization and organized instruction and leadership, organized the first dental school in the world and we today are enjoying the results of their efforts. It is appropriate that these two should head the list of the "immortals in dentistry" and have their names inscribed on our Mace.

It is appropriate that their pictures might occupy a front page in this issue of *The Journal* as we, too, consider in *The Forum* the effective methods of financing dental education.

EDITORIALS

JOHN V. CONZETT

John Conzett's life was closed as it had been lived—in quietness, in hopefulness and in confidence.

Several years ago he retired from active practice that he might enjoy for a time the fruit of his labor. Unfortunately he was taken ill some time before his passing, but even in that his Christian character was thoroughly demonstrated.

John Conzett exemplified the definition of a dentist in every detail—a professional gentleman through his personality, and a dentist both through his personality and his technical ability. He understood the meaning of the terms professionalism, ethics, and morality. He was a Christian gentleman whose character no one dared question.

John Conzett was a teacher. It was he who in the early days of the introduction of the principles and practices of the revered G. V. Black, took that message to dentists, graduate and undergraduate, teaching them the new day in operative dentistry. He was one of the very first, if not the first, to adopt the teachings of Dr. Black. The profession owes a debt of gratitude to Dr. Conzett for this work.

John Conzett's life demonstrated fully how it is that one can get by giving. His life was lived for the other fellow, including the fellows of his profession. He was one of the organizers and founders of the College through which he was able to demonstrate in this professional environment the possibility of *realism* through *idealism*. He was an idealist, but he knew, too, that there is much of reality before one can realize his ideal. He knew that the *ideal* was a blueprint by which the *real* must be shaped.

He has gone on now where his goal will be more nearly attained, leaving a memory of him which will obtain as long as there are left among us men who knew him. The history of the profession when properly told will find a prominent place for his name.

SECTIONS AND SECTION OFFICERS, 1944-45

Section

Kentucky-

Chairman, Frank B. Hower, 814 Heyburn Bldg., Louisville. Secretary, R. E. Myers, 129 E. Broadway, Louisville.

Northern California-

Chairman, Howard B. Kirtland, 1114 March St., San Luis Obispo. Secretary, R. L. Blake, Butler Bldg., San Francisco.

Maryland-

Chairman, Myron S. Aisenberg, 618 W. Lombard St., Baltimore. Secretary, Ethelbert Lovett, 515 Medical Arts Bldg., Baltimore.

New York-

Chairman, Geo. C. Douglass, 80 Hanson Place, New York. Secretary, Lowrie J. Porter, 41 E. 57th St., New York.

Minnesota-

Chairman, B. G. DeVries, 705 Med. Arts Bldg., Minneapolis. Secretary, Harry C. Lawton, 704 Lowry Bldg., St. Paul.

New England-

Chairman, John E. Tyler, 311 Main St., Worcester, Mass. Secretary, Francis H. Daley, 15 Bay State Rd., Boston, Mass.

Wisconsin-

Chairman, Arthur C. Rohde, 324 E. Wisconsin Ave., Milwaukee. Secretary, Adelbert J. Noetzel, 536 Wisconsin Ave., Milwaukee.

Colorado-

Chairman, I. R. Bertram, 966 Metropolitan Bldg., Denver. Secretary, Chas. F. Brown, 524 Mack Bldg., Denver.

Pittsburgh-

Chairman, H. E. Friesell, Univ. of Pittsburgh, School of Dent., Pittsburgh. Secretary, E. G. Meisel, 121 University Place, Pittsburgh.

Iowa-

Chairman, John G. Hildebrand, 207 Black Hawk Bldg., Waterloo. Secretary, L. M. Fitzgerald, 718 Roshek Bldg., Dubuque.

Illinois-

Chairman, Fred W. Gethro, 180 N. Michigan Ave., Chicago, Ill. Secretary, Leland R. Johnson, 55 E. Washington St., Chicago.

St. Louis-

Chairman, Earl J. Poe, Paul Brown Bldg., St. Louis. Secretary, Arthur H. Jones, Paul Brown Bldg., St. Louis. Oregon-

. Chairman, M. M. Bettman, 528 Medical Arts Bldg., Portland. Secretary, E. E. Starr, 1935 S. E. 23rd St., Portland.

Texas-

Chairman, A. L. Frew, 4105 Live Oak St., Dallas. Secretary, A. L. Nygard, 1232 Med. Arts Bldg., Dallas.

Florida-

Chairman, Gordon B. Tison, 505 W. University Ave., Gainesville, Fla. Secretary, E. L. Thompson, U. S. N. Air Station, Box 8, Jacksonville.

Indiana-

Chairman, V. H. Hilgemann, Fairfield Ave., Ft. Wayne. Secretary, Frank C. Hughes, 1121 W. Michigan Ave., Indianapolis.

Washington, D. C .---

Chairman, Harold W. Krogh, 1835 Eye St. N. W., Washington, D. C. Secretary, Doran S. Thorn, 1726 Eye St. N. W., Washington, D. C.

Southwestern-

Chairman, Bert Boyd, 610 S. Broadway, Los Angeles, Calif. Secretary, F. E. Hogeboom, 3780 Wilshire Blvd., Los Angeles, Calif.

New Jersey-

Chairman, Jos. R. Walsh, 67 S. Clinton St., E. Orange, N. J. Secretary, G. Victor Boyko, 64 Hamilton St., Patterson, N. J.

Kansas City-Mid West-

Chairman, Chastain G. Porter, 255 Plaza Bank Bldg., Kansas City, Mo. Secretary, Carl W. Sawyer, 1108 E. 10th St., Kansas City, Mo.

