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AN INSTITUTE FOR TRAINING RESEARCHERS

A training program for researchers in dentistry has been initiated and promoted by the American College of Dentists through its Committee on Research. The College has been aided in this project by a grant from the National Institute of Dental Research. This unique plan to acquaint young investigators with the concepts, methodologies, and newer techniques of research will be furthered by the establishment of an Institute for Advanced Education in Dental Research.

The first session of the Institute will be held later this year, and will be limited to ten trainees: five in biophysics, and five in growth and development. The 1963 Institute will divide the month of training into two sessions—August 12 to 24, and November 11 to 23; a divided session was necessary this first year due to scheduling difficulties. The Institute will be conducted at the Airlie Foundation, Warrenton, Virginia. This location is close to Washington and the National Institutes of Health, allowing access to libraries and demonstration material.

Essentially, the purpose of the Institute is to bring promising dental researchers into intimate contact with senior scientists who have and are making significant contributions to dental research. By making this contact sufficiently prolonged and informal, it is hoped to broaden and deepen the understanding of these younger workers in vital and pressing dental problems, and in some of the currently most fruitful ways to attack these problems. The expectation is that these junior investigators, after a period of training and orientation in specialized fields, will apply these generalities, resources, and techniques to their own research thus enhancing and broadening the direction of their individual enterprises.

The Institute, in the formative period, will concentrate on two promising and uniquely related aspects of a growing armory of new research tools. One of these attacks the problem of growth and development; the other deals with the biophysics that is playing an increasing role in the study of living matter. Later, according to needs and interest, other areas will be included.

The senior investigators who will constitute the faculty will be: Wallace D. Armstrong, University of Minnesota (physiological chem-
istry); M. W. Krogman, University of Pennsylvania (anthropology); Samuel Prazasinsky, University of Illinois (orthodontics); and Ralph W. G. Wyckoff, University of Arizona (physical chemistry and biophysics).

The Institute will be administrated by a Steering Committee from the American College of Dentists (the members of the College Committee on Research). Thomas J. Hill, Cleveland, will serve as Executive Secretary to care for administrative detail.

This development by the College will be followed keenly by all those interested in the promotion of dental research, and will be reported on from time to time in the JOURNAL. It could well be that this Institute will become to dentistry what the Marine Biological Laboratory at Woods Hole, Massachusetts, is to biology.

T. McB.

JOURNAL PAPER WINS AWARD

The American Association of Dental Schools, by virtue of a continuing grant of $1,000.00 from the Columbia Dentoform Corporation of New York, has initiated an annual awards presentation to stimulate dental educators to prepare and publish papers on original developments and contributions to dental teaching. The awards are: first, $500.00; second, $300.00; and third, $200.00.

These will be given at the annual session of the Association, and will be known as the Columbia Dentoform Awards for Original Contributions to Dental Teaching. The awards were presented for the first time in March of this year to authors of manuscripts published in 1962. The Board of Editors of the Association reviewed the periodicals in the dental field and selected the winners.

Of interest to JOURNAL readers should be the announcement that the paper "Teaching Machines in Dental Education" by James D. Harrison, which appeared in the December 1962 issue of the JOURNAL OF THE AMERICAN COLLEGE OF DENTISTS received first award. Incidentally, two Fellows of the College—Isaac Schour and Edward J. Forrest—received the second award for their paper "Challenges and Opportunities in Dental Teacher Education."

Policies for the selection of 1963 awardees have been approved by the Association. Editors of dental periodicals will be asked to publish information about the Awards. Similar information will be provided to the administrative head of each member institution of the Associa-
tion; also, to the librarian at each institution. Authors, as well as dental editors, will be asked to submit copies of papers thought worthy of consideration to the editor of the *Journal of Dental Education*; the Board of Editors of that journal will review the papers submitted and make the selections.

This is a worthwhile venture that should encourage the publication of more papers on dental teaching methods and experiments. The project is more fully explained in, and your attention is directed to, the editorial "Dental Teaching—A Changing Profession" by Marion W. McCrea, in the current issue (June 1963) of the *Journal of Dental Education*.

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**JOHN E. GURLEY, 1882-1963**

Dr. John E. Gurley died on February 27, 1963. Dr. Gurley, 81, had served the American College of Dentists as Regent, President, Historian, and was Historian Emeritus at the time of his death.

A native of Iowa, Dr. Gurley graduated from the University of California School of Dentistry in 1908. He began practice in San Francisco and was still active up to the time of his death. Dr. Gurley was appointed to the staff of the University of California School of Dentistry in 1911 and served as Assistant Professor, Lecturer in Dental History, and was a Consultant in recent years.

Dr. Gurley was honored in 1952 when the University of California Dental Alumni Association dedicated its annual meeting to him, and again in 1959 when the California State Dental Association named him "Dentist of the Century." He was a pioneer in dentistry for children, was nationally known as an authority on the history of dentistry, and authored two books on the subject, *Professional Ethics in Dentistry* and *The Evolution of Dental Education*.

He was past president of the San Francisco Dental Society, the California State Dental Association, the American College of Dentists, the American Society of Dentistry for Children, and the 1938 Dental Congress.

The above is factual and informative and might be paralleled by other great men in dentistry. However, what distinguishes John Gurley is the feeling he was able to present to his own and the following generations of dentists. All professions have an image of the
person the profession feels best represents it in the eyes of the public and the other professions. John Gurley was a good dentist, technically skilled, and a continuing student. He was an active and contributing member of his community, personally generous, and devoted to high standards and ideals. He was a great influence on his colleagues and the students whom he taught. His historical concern for the honor of dentistry was outstanding and his contributions were many and important.

John Gurley was the image of all we hope that dentistry is and will be. One can say no more.

WILLARD C. FLEMING

EXCELLENCE

We reject the notion that excellence is something that can be experienced in only the most rarified strata of higher education. It may be experienced at every level and in every serious kind of higher education. And not only may it be experienced everywhere, but we must demand it everywhere. We must ask for excellence in every form which higher education takes. We should not ask it lightly or amiably or good naturedly; we should demand it, vigorously and insistently. We should assert that a stubborn striving for excellence is the price of admission to reputable educational circles, and that those institutions not characterized by this striving are the slatterns of higher education.—John W. Gardner, President of the Carnegie Foundation, in a recent book titled “Excellence.”
Dentistry at the Turn of the Twenty-First Century

LON W. MORREY, D.D.S.

A prophet is without honor in his own country and when I finish with my predictions concerning twenty-first century dentistry, you and I may have one thing in common. We may agree that a Chicago prophet is without honor in St. Louis—especially on February 23, 1963. One thing we will not have in common—that is the matter of time. It has taken me much longer to prepare these predictions than it will take you to hear them. For that I exchange my congratulations for your condolences.

In its recent study of dental activities in America, the Commission on the Survey of Dentistry in the United States recommended some 75 activities, or projects, or programs, which it believed would prove beneficial to the public and the profession. These 75 recommendations were incorporated in four main departments: dental education, dental research, dental practice and dental health.

I cite some of these recommendations for two reasons: first, to enable us all to look at dentistry through the eyes of the experts who know the various aspects of dentistry as it is practiced today, and second, mention of the experts' recommendations triggers my thoughts on the subject assigned me: "Dentistry at the Turn of the Twenty-first Century," which some of you, I hope, will live to see.

Patrick Henry once said, "I know of no way of judging the future but by the past." I subscribe to that sage observation. All of us are aware of the great changes that have taken place in our nation's social philosophy during our lifetime—changes which today are going on about us at an ever increasing rate. Awareness of those changes permits us to venture certain predictions concerning dentistry and the manner of its practice by the turn of the next century. It goes without saying that the Commission on the Survey of Dentistry took these social changes into full account in making their numerous recommendations.

Dr. Morrey is Editor Emeritus of the American Dental Association.
This essay was presented at the meeting of Section Representatives, American College of Dentists, St. Louis, February 22-23, 1963.
Dental Education

Under this heading the Commission made some 22 recommenda-
tions ranging from one concerning the improvement of the quality
of dental student entrants, to one pointing toward an improvement
in the quality of the present dental school accreditation program.
Other recommendations concerned the recruitment of more and bet-
ter teachers, the improvement of curriculums, an expansion in the
dental teaching facilities, the training of dental personnel, the use of
federal funds for education, and the problems associated with the
licensing of dentists to practice.

I agree with the recommendations of the Commission and believe
that many of them will be effectuated by the end of this century. I
see many changes in dental education by the year 2000. By then den-
tal education will no more resemble the dental education of today
than the dental education of today resembles dental education at the
beginning of this century. University administrators, in order to
save time, money, and energy, and in order to bring about closer
liaison between medicine and dentistry will require medical and
dental students to take most of the basic science courses in a body.
Further savings in teaching will be made possible by the extensive
use of television. Still further savings will be made by operating den-
tal schools on an eleven month, rather than the present eight month,
a year basis.

By the year 2000 curriculums will have been altered greatly to
conform to the newer knowledge provided by an ever growing num-
ber of dental researchers. Courses in all aspects of preventive dentistry
will have at last come into their own, taking precedence over courses
in restorative dentistry. This is not to say that instruction in the
fabrication of restorative appliances will be neglected, as even with
the public's newer knowledge of preventive dental measures America
will still have far too many dental cripples demanding restorative
service. It is to say, however, that courses in the mechanical fabrica-
tion of restorative appliances from inlays through crowns, and
bridges to partial and complete dentures, will be redesigned to fit
the needs of dental laboratory technicians more than those of the
general practitioner of dentistry.

By the end of this century many, if not all, American dental
schools will provide training courses for dental laboratory tech-
nicians. In addition, all dental schools will provide special courses for dental assistants, not only for the education of the assistant but for the education of the dental student. Additionally, more courses and more efficient courses for dental hygienists will be in operation. Thus by the turn of the century the dental graduate will not only have received a more extensive education than students of today, but he will enter the profession equipped to utilize the trained auxiliary personnel which the dental schools have placed at his disposal.

Within the next generation or so dental school administrators will have discovered that a rich reservoir of dental student material has gone too long untapped. I refer to women. The changes in the nature of dental practice which are contemplated for the foreseeable future will make dentistry an ideal occupation for qualified members of the fairer sex.

By the year 2000 segregation in dental schools will have been relegated to the dark, distant past. Qualified colored students will cease to be the rarity that they are today in all but two of America's dental schools. By then, also, segregation will no longer exist within the profession itself. All qualified dentists, irrespective of race, creed or color, will be eligible for membership in the component and constituent societies of the American Dental Association.

By the year 2000 or shortly thereafter the education of dental students will have become so thorough and so standardized, and the education of dental examiners, politicians, and the public will have become so broadened, that the present problems of reciprocity will no longer prevail. All states will recognize the findings of the National Board of Dental Examiners.

By the turn of the century the cost of dental education will have risen so high that only the youth of the wealthy will be able to finance their training in the customary cash and carry manner. To overcome that situation school administrators will have adopted what has long since become part and parcel of the American way of life: “Go now and pay later.” Funds obtained from various sources such as: the federal government, philanthropic bodies, insurance companies, and the alumni will be loaned by the school to deserving, qualified students. Once established in practice the dentist will repay the loan in a specified time at a reasonable rate of interest. Eventually each school student “building and loan” fund becomes self-sustaining.
The Commission's 14 recommendations concerning dental research range from one advocating better evaluation of pharmaceutical preparations to one advising an extension of research into the fields of social science and education. Sandwiched in between are others recommending an improvement in the communication of research findings, an increase in dental school research personnel and facilities, and an increase in federal funds for dental research.

By the early years of the upcoming century all of these recommendations will have become realities to a greater or lesser extent. By then the etiology and mechanism of dental caries will have been definitely determined. Furthermore, by then a simple, inexpensive and entirely effective method of preventing the disease will be in universal use—something even more effective than fluoridation—although long before the end of this century most American communities will have adopted fluoridation. By the twenty-first century researchers will have solved the riddle of saliva, and some of the riddles of periodontal disease, oral cancer, and cleft lip and palate. Consequently it is highly possible that the funds required for dental research during the first quarter of the next century will be less than those needed today.

The closer rapport between the dental profession and the manufacturers of dental pharmaceuticals which is just now beginning to be observed, will have become, by the end of the next generation, more firmly established to the great advantage to the public as well as to the profession and the purveyors of dental pharmaceuticals.

By the year 2000 researchers will have perfected the art of endodontics so thoroughly that the few teeth which will require such treatment will rarely experience subsequent infection. Plastic material will have been so perfected that it will replace gold and porcelain for inlays, and crowns, and to some extent, silver amalgam for fillings.

Research in equipment and office architecture will have completely transformed the operatory from a disconcerting chamber of weird wiring and mad machinery into a pleasant, quiet, relaxing studio.

The Commission's recommendation that research be extended into the fields of social science and education will have been effectuated by the American Dental Association. Research by the Association in those areas will have been perfected to such an extent that
accurate information will be always available on all subjects of a dento-socio-economic nature.

**Dental Practice**

The Commission's 17 recommendations concerning dental practice range from one counseling greater recognition by dentists of the pre-eminence of preventive dentistry, to one advocating more extensive training and more extensive use of dental auxiliary personnel. Other recommendations in this category concern the establishment of a sound basis for determining fees, the development of hospital dental internships, the extension of dental health measure programs, the development of procedures that will assure the continued qualification of practitioners, and better rapport between state dental licensing boards and the National Board of Dental Examiners.

Predictions concerning the future of dental auxiliaries were presented briefly under the section on dental education. Suffice it to say that the next generation of dentists will have accepted the dictum that to operate an efficient dental office the dentist must not only be efficient himself but he must be assisted by efficient auxiliaries. By the year 2000 the one-man dental office will be as antiquated as the one-horse shay.

Thirty-seven years from now hospital dental departments, dental internships, and dental residencies will be a commonplace rather than the exception which they are today. So, too, will dental health insurance plans. Numbering less than a half dozen in the nation today, they will become, by the end of this century, as prevalent and as desirable as Blue Cross and Blue Shield.

By the turn of the century serious consideration will be given to measures which will assure that practitioners maintain their competence to practice. What the nature of these measures will be, I am not prepared to predict, but I feel certain that in time both the profession and the public will not be content to accept the passage of one examination in a lifetime as assurance of a lifetime competency. The profession's studies in the field of social science will demonstrate the need for, and bring about, the establishment of a basis for determining fees plus some mechanism to discipline members whose services are in no way commensurate with their fees.

The Commission's recommendation concerning the profession's attitude toward preventive dentistry will have become a reality. The
care of most successful dental practices by the end of the first quarter of the next century will be preventive dentistry—not only for children but for adults as well. Because dental caries will have been largely eliminated by the newer anticariogenic measures, emphasis of treatment will be transferred from the reconditioning of the hard tissues to the treatment of the disturbances of the soft tissues. Periodontics will predominate in most practices. The need for endodontics will be materially lessened, although endodontic treatment will be materially improved. General practitioners will be much more proficient in oral diagnosis and in recognizing oral symptoms of systemic disturbances. Oral cytology will be routine and more family dentists will become skilled in orthodontic procedures and provide such service—particularly interceptive orthodontics as a part of their preventive service.

Dental Health

As might be expected dental health, because of its scope, drew more recommendations from the Commission than any of the other areas; 24 to be exact. They ranged from one suggesting the establishment of a National Voluntary Council on Dental Health, to one advising the establishment by state societies of dental service corporations. Others among the 24 advocated greater promotion of fluoridation, the development of dental epidemiological studies, the expansion of dental care programs for the homebound, aged, and chronically ill, more and better training for public health personnel, the earmarking of grants-in-aid funds for public dental health, and the development of incremental dental care programs for children.

I predict that by the time the twenty-first century rolls around most of the Commission's recommendations concerning dental public health will have become realities. It is in this field, including the field of socio-economics, that the greatest change in dental practice will occur. If these changes are guided by the profession they will prove beneficial to both the public and the profession. Without such guidance everyone dentally concerned will suffer as they have suffered in Great Britain and in many European countries.

The soil was prepared and the seed of social change was sown in this country more than a quarter of a century ago during the days of the great depression. The seed took root and the sprouting plant was cultivated and nourished by society. Now after 25 years the
plant has begun to bud. If, during the next quarter of a century, society employs the same type of husbandry that it has used in the past, the buds of public health dentistry will blossom into full bloom. I do not believe, however, that the public dental health plant will take the form now found in Britain. Group dental health programs, group dental service, will grow rapidly during the next several decades and by the end of the century will have become firmly established and accepted as a form of dental practice in this country. For the most part, however, such programs will not be operated or directed by government. They will, as Mr. Lincoln once said, "be of the people, by the people and for the people." Such programs will consist of dental service corporation projects operated by or in cooperation with dental societies, hospital dental service, nursing home dental service, and dental health insurance programs, functioning under the direction of the dental profession. Community-wide preventive dental programs such as water fluoridation or a similar measure, and incremental dental care programs for children or a similar program, will be operated by governmental agencies. Private practice will continue to be the backbone of dentistry in this country, but the private practitioner, faced with the growing number and type of group dental service, will no longer have a monopoly on dental practice.

Finally, the unpleasant, unwarranted condition which presently hangs like a pall over both the profession and the public will no longer prevail. I refer to demands of the so-called denturists for licensing and two-level dentistry. Germany learned from sad experience that two-level dentistry is unsound and not in the public's interest. Guided by Germany's experience, guardians of the public health in America will strengthen dental practice acts so thoroughly by the turn of the next century that denturists and two-level dentistry will exist only in memory.

CONCLUSION

Dentistry, like other facets of society, will continue to experience change in the future just as it has experienced changes in the past. For the most part the changes will be beneficial and for the most part they will be the results of the dental profession's own efforts.

Insofar as the general practitioner is concerned—he who belongs to the great army that comprises the bulk of the profession—the
changes, the improvements, the innovations that will occur in dental education will only be of academic interest. Once the dentist of the future, like the dentist of the past, has been graduated he will be content to let the problems of education rest on the shoulders of the educator.

The same is true of the changes in research, except insofar as they affect the dentist's work-a-day world. Change in dental practice will be of vital concern to all members of the profession, but, judging from the past, most of the changes in the future will directly benefit the practitioner, his practice, and his patients.

It is with changes in the broad fields of dental public health and socio-economics that the dentist will be most concerned, because such changes can affect the health of his patients and his own professional competence and economy. Furthermore, some of these changes will not be wrought by the profession itself, as in the case of dental education, dental research and dental practice. They will be shaped, in part, by influences outside the profession.

It is imperative, therefore, that dentistry keep well advised and well abreast of the social changes that are taking place, that it maintain a wholesome attitude toward those changes, and a firm, united stand insofar as those changes may affect the practice of dentistry and the dental health of the public; not only a firm stand, but a firm hand in directing those changes for the betterment of the nation's health. Certainly that is not too much to ask. Certainly it should be no great task. Certainly the influence of 100,000 specialists in a particular field of the nation's health should be able to influence and to direct impending changes in the best interest of both the public and the profession.
Leadership and the College

PHILIP E. BLACKERBY, JR., D.D.S., M.S.P.H.

I am grateful for the privilege of serving this year as your President. Even in the few months since I took office in Miami, it has been a rich experience which has filled me with confidence in the future of the College, and of dentistry. I have become more than ever conscious of the College's tremendous potentialities for effective leadership in our profession, and I have a great sense of pride over the College's past record of service and its fine reputation today.

As I have moved somewhat further into my role as President, my hopes for the current year have crystallized in the form of two principal goals:

1. to stimulate a greater degree of participation by the membership, in the affairs of the College, through more adequate communication between the members and the Officers and Regents, and
2. to facilitate the leadership role of the College, at all levels, through the
   Officers and Regents
   Committees
   Journal and Reporter
   Annual meeting
   Sections
   Individual Fellows (both directly and indirectly)

To summarize these aspirations I would like to repeat a few lines from my inaugural address, which I believe have a direct bearing on this theme:

"Our responsibility, in fact, is greater than that of the main body of the profession because of the very nature of the College and its membership structure. Leadership is the principal criterion of eligibility for Fellowship in the College [Fellowship is really synonymous with leadership]—so we must expect far-above-average performance on the part of the College in dentistry's efforts to meet the challenges and problems that confront the profession now and in the future. Our contribution must be one of dynamic leadership—a pooling

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Dr. Blackerby is the president of the American College of Dentists.
These remarks constituted the introductory paper at the meeting of Section Representatives, American College of Dentists, St. Louis, February 22-23, 1963.
and purposeful focusing of all the resources of the College in well-guided activities devoted to the advancement of dentistry and the dental health of the public. . . . Every member of the College has made an important contribution to dentistry and, in accepting the honor of Fellowship, he has committed himself to continue the leadership role he has demonstrated his ability to fulfill. For 'to rest on achievement is a denial of creativity and an invitation to stagnation.'"

This meeting of Section Representatives has several objectives, as I see it:

(1) to facilitate communication between the Fellows and the Officers and Regents—for a better informed membership, and thus a more effective membership;
(2) to stimulate interest in, and perhaps offer some guidance for, the development of more activity on the part of the Sections;
(3) for the Section representatives here to take back to their Fellow-members at home the broader understanding of the College, its purposes and its functions, that we hope you will have acquired here when this meeting closes, and
(4) to make the College a more effective instrument for the advancement of dentistry and the improvement of dental health services for the public.

The College has achieved a very fine reputation; it enjoys the respect not only of dental organizations everywhere, but also of many non-dental groups, both lay and professional. For example, the recent meeting of the College’s Committee on World Relations, held during the Midwinter Sessions of the Chicago Dental Society, attracted a full attendance of its membership, including such prominent and busy persons as: the President and Immediate Past-President of the ADA; the Secretary, and the Assistant Secretary for International Relations, of the ADA; the U. S. Treasurer of the FDI; the Immediate Past President of the American Society of Oral Surgeons; and the President, President-Elect and Secretary of the College.

Yes, the College enjoys a great prestige and universal respect, but to the average Fellow, the College is not as meaningful as it should be to its members. From letters and comments that have come to me as President, I am inclined to believe there is a degree of vagueness about the College in the minds of many of our Fellows—an inade-
quate conception of the real significance of the College, of what it is and what it does. I have tried to analyze the reasons for this lack of understanding and appreciation, on the part of some Fellows, and I believe the following are contributing factors:

1. As an organization, the College is somewhat intangible and ethereal, by comparison with the more mundane ADA or state dental society, for example;
2. A Fellow's contacts with the College are relatively infrequent and indirect;
3. He doesn't tend to think of the College as an operating organization, especially at the Section level;
4. The College doesn't derive its vitality from political or economic forces operating within the profession—as does the ADA or a state society;
5. It has customarily refrained from assuming an official public position on national issues;
6. It tends toward the inspirational, rather than the material, the idealistic rather than the practical.

These characteristics tend to make it somewhat difficult for the average Fellow to visualize an active role for himself in the College, or to see clearly the opportunities for activity by his Section—or to have a clear understanding and appreciation of the day-to-day operating pattern of the College.

This may help to explain why some Fellows, especially in areas where the Sections have been relatively inactive, may feel isolated and apart from the affairs of the College.

It may also explain why some Fellows tend to develop misunderstandings in regard to the College. For example, during the past year Fellows have asked me a good many provocative questions about the College—questions that fall into two general categories:

1. the organizational structure of the College, and
2. the operating pattern of the College

In the first category, the following are examples:
1. Why is the College taking in so many new members each year?
2. Why should the College have foreign members?
3. Why shouldn't dentists be permitted to apply for Fellowship, as in the medical specialty groups?
4. Isn't the College taking in a good many new members who
   a. aren't really qualified for Fellowship?
b. are too young?
c. are too old?
d. are nominated primarily on the basis of friendship?
5. How are Officers and Regents selected?
6. How are committee members chosen?
7. Doesn't the College have too many committees?
8. What is the financial situation of the College?
—and so forth. These are questions that obviously must be answered at the Officers and Regents level since they are matters of policy for the College.

These are the kinds of questions that suggest the need for a better informed membership—for more adequate communication between the Officers and Regents and the Fellows.

But this must be a two-way communication effort, of course—for no matter how hard the Officers may try to keep the members informed, the Fellows themselves must do their part by reading, listening, attending meetings, and otherwise demonstrating a sustained interest in the affairs of the College.

This is one of the reasons for this meeting—and some of the discussion will be directed toward just such questions as those I have quoted.

Then there is the other kind of questions—those of a broader and more provocative nature, dealing with the responsibilities of the College to the profession, and to the public—with some of the implied challenges calling for the kind of leadership the College is inherently equipped to provide. These include such questions as:

What can the College do about:

a. Promoting fluoridation
b. Expanding prepayment plans
c. Meeting the dental manpower needs
d. Facilitating recruitment
e. Increasing dentist productivity
f. Encouraging broader utilization of auxiliary personnel
g. Meeting the problems of specialization
h. Controlling proprietary journalism

Also, what is the College's role in:

a. Continuing education
b. Support of the Fund for Dental Education
c. Interpreting the Survey of Dentistry
d. Improving the public image of dentistry

e. Promoting international relations

Here, again, are examples of complex problems which face the profession in general, as well as the College—and these, too, will find a place in the discussions of this conference. These suggest the need for action programs by the College—at the Section level as well as nationally. During this conference we have allowed plenty of time for, and we invite, your active participation, your questions and your suggestions—both now and following the conference—so that we may find ways of making the College increasingly useful to the profession and to society.

In conclusion, I would like again to repeat from my inaugural address, a quotation which I believe illustrates rather well what I am trying to say about the importance of your active participation in the affairs of the College: "... The greatness of a [profession] may be manifested in many ways—in its purposes, its courage, its moral responsibility, its cultural and scientific eminence, in the tenor of its daily work. But ultimately the source of its greatness is in the individuals who constitute the living substance of the [profession]."

W. K. Kellogg Foundation
Battle Creek, Michigan

Education is a simple process. It begins when two people of different life experiences meet and talk. It is this communication between those who are willing to learn from one another which is the essence of the educational experience. The structural design and organizational setting of this exchange, necessary as they may be, are of secondary importance and of themselves productive of no miraculous results—Walter Bauer. Reflections on Some Current Trends in Medical Education in America. Brit. M. J. 2:1444, 1956.
Dentistry and Social Consciousness

LUTHER L. TERRY, M.S., D.Sc.

Society confers upon every member of the health professions, at the time it grants to him the privilege of practice, a dual but inseparable obligation: First, to serve to the best of his ability the people entrusted to his care, and second, to serve with the same dedication and purpose his community, his country, and the broader society of mankind. This is as it should be. For the value of a profession, as of a man, is measured not by what it expects to receive but by what it is prepared to give. And where the health scientist, because of his specialized training, has knowledge for the benefit not of his patients alone but of all men, he is obliged by the ethics of his profession and the responsibilities he holds as citizen to work in every way he can for the application of that knowledge.

You men here assembled have demonstrated a marked awareness of professional and social responsibility. Separately and collectively, you have sought the good of your profession and your fellow men. Alert to the challenges imposed by an evolving society, you have assessed their meaning and their worth, attempting, where adaptations in professional attitudes and practices prove necessary, to guide these developments in directions which ethics and morality dictate.

I commend you for your efforts. They are efforts which are models for us all. For if the complexities of modern life do not permit the perpetuation of outmoded patterns and techniques of practice, neither do they allow the disengagement from social responsibility which has sometimes been the choice of the health practitioner.

That both dentists and physicians are so much concerned with their relation to the community and to society is, to my mind, evidence of an awareness that we have in some measure fallen short of our assigned responsibility. Certainly medical and dental schools are

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making a more intensive effort to instill in the practitioners of the future a real sense of social consciousness. Their attempts to see to it that their students are exposed to patients representative of a broad spectrum of society, that they are made aware of the needs of people they might not ordinarily see in their offices—will have great influence. So, too, will the departments of social dentistry often proposed by your thoughtful educators. But I would venture to suggest that without the reinforcement which the examples set by those already in practice can provide, the schools' task will be all the harder.

Nor is it possible to wait upon the new graduate, the young practitioner. Too many of the problems of the distribution of health services demand our actions now, as scientists and as citizens. Too much of the type of health care which we are pledged to practice is directly dependent upon our personal involvement in community life.

The revolutions—social, economic, scientific—which have so greatly enhanced and so greatly complicated our ability to provide health services require no cataloging here. You are as familiar with them as I. But I would emphasize their results—a vastly more sophisticated people, one taught, and rightly so, to seek the full benefits which progress has made possible; a people who live longer and because they do so are more frequently the victims of chronic diseases and disabilities.

In adapting to this changing pattern, the health professions have accepted a different view of their patients and their own roles in health care. We have learned that we can no longer look upon the patient simply as a heart case or an abscessed molar. We must see him as a whole being, one subject to disorders which may have multiple causes. And so we have partially erased the sharp lines which once separated our different disciplines. And we have sought to bring the professions together in the integration of health services.

We have come a long way toward this goal; it is not yet within our grasp. I think of some hospitals in this country—equipped with machinery to make man marvel, staffed by personnel skilled in vocations our fathers could not even envision. And I am aware that a visitor from another planet, touring these facilities, might well question whether earthlings have mouths. For he would find in many of these institutions, even today, neither a dental staff nor provision for their work.
Where the cause lies is not important. I suspect that both dentists and physicians are at fault—the one oriented by his training to office practice, and able to treat most of his patients there; the other oftentimes less than cognizant of the information which a thorough oral examination can reveal. My concern is for the patients in these hospitals, who, with the denial of dental services, are denied also a truly integrated care.

A second similar situation is perhaps even more to our reproof—our failure to meet the need for comprehensive health care among those who can seek service neither in the hospital nor the office. Huge numbers—probably the majority—of the aged and the chronically ill do not require hospitalization; they are often happiest and best cared for in their own homes or in nursing homes. What they do require is professional service—and frequently a great deal of it. But bedridden or homebound, they cannot come to us.

We have much to learn about these people and how we can care for them. We do know that they need and that they deserve our attention, and we have found in special service programs, planned and operated in the community, an efficient and effective means of providing it. As yet, many of these programs are experimental; the services offered are frequently of limited scope. Only a very few include dental care. And I would ask you: Why? It is true that the problems of arranging dental care outside the office are complex, but it seems to me that they are not also unsurmountable.

I can think of no more commendable innovation in dental education than the programs undertaken by a dozen or so dental schools, in cooperation with the Public Health Service, to teach the care of handicapped patients—the aged, the mentally ill, the crippled children. Because their students will leave school with experience in special patient care which was not provided for most dentists now in practice, they will be better prepared to give service where it is so urgently needed. Would it not be possible for local dental societies to sponsor similar training for their members? They could make no more worthwhile contribution, for until today's practitioners are prepared to participate in community service programs, a necessary health service will continue to be omitted from them.

It was, I would say, with problems such as these in mind that the president-elect of the American Dental Association, Dr. James P. Hollers, recently urged dentists to step beyond the four walls of their
offices and accept a greater responsibility for treating "a patient called society." I would reiterate his call today, for it is in meetings such as this that the response will be engendered, and I would extend it to all of the health professions. Prodding and stimulating and guiding the development of service programs is as much a responsibility of the health scientist as is his participation in them. For the absence of these programs in even one community where they are needed constitutes a waste of the knowledge and the skills at his command. And anything less than full use of the resources available to this nation for the protection of its citizens is an extravagance neither it nor we can afford.

You in dentistry are, I know, keenly aware of how small in comparison with the numbers who are in need of your services are the numbers for whom you actually provide care. I know, too, what splendid efforts you have made to overcome indifference to oral health. It surely does not diminish your achievements thus far to point out that they were accomplished without the aid of a good many dentists. For there are in dentistry, as in all of the health sciences, too many practitioners who pay too little attention to their responsibilities as educators to the public.

I consider Children's Dental Health Week an outstanding example of what a profession can do if it will to focus attention upon health problems. It is an endeavor which every dentist should support with his personal participation. But it seems to me essential that this week, and others like it, be considered as no more than a culmination, a high point in a year of daily effort by every practitioner to teach the public what it needs to know.

Health education must be a continuing process, not one undertaken for a few days or weeks. By the same token, it must be extended to all people. Certainly those who do not seek professional services are as much in need of counsel as those who do. Each of us has countless opportunities—at the meetings of civic clubs, of parent-teacher groups—to speak out on preventive health practices. I propose that we do so.

I propose further that all the health scientists work together, supplementing each other in health education, not just in their own disciplines but in all. Public indifference to the measures available for its protection—vaccines, tests for the early detection of cancer, fluorides—is a problem for all, and so its solution will require a
united effort. It is not enough that the dentist educate for oral health; he has also an obligation to promote the preventive measures of medicine. It is not enough that he keep abreast of his own profession; he should also know something about the whole field of health. This holds for every practitioner in every discipline. For it is only with a concerted and continuous effort by each practitioner in each science that the measures we know to be beneficial will win public acceptance.

We have learned in the case of fluoridation in particular a bitter lesson. National agencies and societies, however great their effort, cannot alone persuade the public of the worth of this measure, of the benefit it can be for their children. We in the Public Health Service have committed ourselves anew to fluoridation. We have strengthened our efforts to win its adoption. We intend to strengthen them still further. And I would expect that the national societies of dentistry will do no less. But in the long run, the key man in fluoridation may prove to be the health scientist in the community—particularly the dentist but also the physician. It is they who are on the scene when the issues are debated, and it is they who should take a forceful stand when referendums are held, when city councils are making their decisions. No disinterested neutralism will win the day.

Perhaps as demanding of intensive effort is the education of the public to the steps which must be taken against the imminent and increasingly serious shortage of health manpower. There was introduced early in the present session of the Congress legislation which would provide federal funds to aid in recruitment and training to increase our supply of health personnel.

This measure, The Health Professions Educational Assistance Act of 1963, would go far toward making possible expansion of training facilities which minimum manpower goals—doubling of the number of dentists graduated annually, the training of half again as many physicians—make necessary. As proposed, the bill would earmark a specific sum for the construction of dental schools. It would provide also for the renovation and expansion of existing schools. And, through aid to students, it would enable the health professions to better attract capable students now barred by the length and expense of training.

Similar bills have been introduced many times in the past; the national health associations have spoken in their favor; but none of
these measures have become law. Until the people fully understand the need for the legislation, until they are shown clearly its purpose, they will not demand action of the Congress. And this I propose to you as another area in which the practitioner in the community can supplement and speed the work of his professional associations.

At the same time, I would emphasize one point: The need to increase our health manpower force must not be permitted to imperil the standards of quality which have been set for its members. The recruitment of students of high caliber is an obligation upon us all, one owed to our profession as well as to society. I know that many of you have given particular attention to this problem—and I urge you to continue your efforts in the future.

To suggest, in a time when the demands upon him are so great, that the health scientist give greater devotion to his social responsibilities may appear to be asking more than he can give. But I do ask it. The welfare of society requires it. And I ask still more: that in his absorption with the problems of his own people that he not neglect the broader community of mankind. All of our professions owe to other nations, to those of Europe in particular, an incalculable and lasting debt. Once students to them, we have become partners. As they have taught us, so we must teach others. We must share our knowledge and our competence with the emerging nations, which so much need our assistance and our cooperation. And we must demonstrate to those where the health professions are young the ethics and the standards that will be expected of them.

Our action in a situation here at home will be considered by many as a test of the way in which we honor our obligations. There are a great many professional people among the thousands of Cuban refugees who have found sanctuary in our country. They came here seeking freedom and new lives, expecting to take up the work left behind in their homeland. In some cases, they have been able to do so. Professional business and trade groups have acted swiftly to assist in finding jobs for their Cuban counterparts. The majority of the refugee physicians, retrained in courses sponsored by the American Medical Association, have found professional employment. Only a very few of the 200 refugee dentists, however, are employed professionally—these in clinics where they provide care for other refugees.

I realize that the dental profession has encountered particularly taxing problems in its efforts to assist these dentists. They may re-
quire extensive retraining in order to measure up to your standards. Complex legal questions will have to be resolved before they can be licensed to practice. But I believe that we, in our ingenuity, can make a place for them.

As many of you know, the Public Health Service and the American Dental Association are together seeking ways in which more, hopefully all, of the dentists can be assured a future in their profession. But the problem is not one for government alone. A primary responsibility rests with the dental profession—with its social conscience. I ask that you strengthen your efforts to see to it that sound training and practice opportunities are made available to these people.

The refugees' plight underscores a point to be remembered in all our work with the peoples of other lands. If we are to be of real assistance, we must think in terms of their experience, not our own. We must be able to see their problems as they are, not as we think they are, and begin our efforts from that point.

In closing, I would urge that each of us in the health sciences adopt the same attitude toward our obligations here at home. It is time that we weighed what we have done for society against what we could have done. And where we find shortcomings, we must begin again. Our opportunities are great, and there are few among us who have met them in full.

Department of Health, Education, and Welfare
Public Health Service
Washington 25, D. C.

UNDERSTANDING THE "SURVEY"

The willingness of Americans to change their methods when new and better ones are presented is one of our great national virtues. The fact that our schools, colleges, and social institutions are highly decentralized and therefore susceptible only to controls or recommendations accepted voluntarily is an equally important part of our national character.

To understand the Survey of Dentistry, therefore, one must understand the constant desire of Americans to investigate and to improve upon the services they enjoy, and to appoint voluntary, nongovernmental bodies to suggest the ways and means by which such improvements can be made.—Byron S. Hollinshead. J. Am. Col. Den. 26:165, June 1959.
Retrieval of Dental Research Data

SHLOM PEARLMAN, D.D.S., M.S.

The original version of this essay was presented at a meeting of the Medical Library Association, Chicago, June 6, 1962, and was published first in the "Bulletin of the Medical Library Association" (51:33-40, Jan. 1963).

Dr. Pearlman read this paper, in but a slightly different form, at the Pan-American Conference on Dental Journalism and Documentation, Miami Beach, October 27, 1962; it appeared in the "Transactions" of the American Association of Dental Editors (24:53-59, 1962).

What Dr. Pearlman, who is secretary of the Council on Dental Research of the American Dental Association, has to say about research, libraries, and retrieval of data, should not be confined to parochial groups: so another version of his paper is presented here.

Dental editors and librarians should be deeply concerned with the growing problems of communication and documentation. Each group should recognize that there is joint responsibility in this situation, and that the solutions will require joint effort. A third group is the large body of people who produce the raw material that editors and librarians must cope with—the research workers who keep turning out the reports that the other two groups are required to process.

Much of what I will discuss is already well known to editors and librarians. In fact, I feel very much like the student in the well-known story, who presented his doctoral dissertation and sat back to hear what his professors would say about the results of his long years of work. The comment of one critic has become a classic: "The presentation we have just received from this young man is unique. It contains a great deal that is new and much that is very good. Unfortunately, what is good is not new, and what is new is not good."

Research is concerned primarily with the development of new information, which it accomplishes by a variety of methods, all of which are directed toward the disclosure of new findings. Verification and confirmation of these disclosures converts them into sci-
Scientific facts—and the word "fact" to a scientist bears a relative rather than an absolute connotation. Facts alone are of little value to society. It is only when they are organized into what we call knowledge that they begin to come meaningful and to play a role in the development of civilization, culture, and humanity. The further organization of knowledge into patterns, hypotheses, theories, and concepts provides the basis for the imaginative mind to conceive of and conduct more research. And so the wheel comes full circle, and moves us a little farther along the road out of barbarism.

Dental publications serve the vital purpose of recording and disseminating research findings and new information. Dental editors, moreover, are the keepers of the gates through which this information passes. It is the dual responsibility of dental editors to control not only the volume of flow—which I shall speak of later on—but also the character and quality of the information that will be released through their journals. The second of these considerations, quality, is by far the more critical, since the first is entirely under its control. I believe that the number of published articles could be cut in half if editorial responsibility for critical evaluation of manuscripts were discharged conscientiously, and no important information would be lost in the process.

Dental publications constitute the medium through which information is presented for organization into knowledge. In this picture the library also is unquestionably an important organ. The library is the instrument expressly designed for the collection, organization, storage and retrieval, and transmittal of information. Without the library, research would never have advanced beyond the empirical process of independent probing, conducted by individuals, separate and separated, for whom each disclosure is new and each fact is performed interpreted individually and individualistically. It is a well-known fact that the most sophisticated research is conducted only in coordination with the most sophisticated systems for handling information, and that, in the words of the song, "You can't have one without the other."

In dentistry, we have seen a remarkable upsurge of research activity, particularly during the past decade. The emergence of the research philosophy in the profession is more than a resurgence of curiosity: it is, I believe, a genuine recognition of the simple fact that the life and future of dentistry and all it exists for depend upon
the urgency with which we delve into the fundamental aspects of the problems which we are dedicated to solve for society. The lonely star of the individual explorer, probing empirically, independent and separate, has given way to the ascendency of the team approach, to organized centers of investigation, to "systems" research, to the coordination of all available facilities and talents for the large-scale attack, in breadth as well as in depth.

The resulting outburst of information has created an exploding situation in the publication and library fields, which I hardly need to delineate for you. Senator Hubert H. Humphrey of Minnesota summarized the situation well in his statement which appeared in the Congressional Record, March 8, 1962, pages 3396 to 3398. In outlining the information crisis as elucidated by the Senate and House Subcommittees on Appropriations and the Senate Government Operations Subcommittee, he noted the following facts.

Four thousand medical journals throughout the world publish over a quarter of a million articles in more than 30,000 issues every year. Over 38,500 research projects, currently underway, are registered with the Science Information Exchange. Since 1946, Excerpta Medica, the leading abstract service, has published over a million abstracts, but there is no master index for ready access and retrieval of these pieces of information. A research worker today may have to rely on an abstract which summarizes an article published, perhaps two years ago, based upon research that was completed three years ago, but which may have first been discussed in a seminar five years ago.

Citing an unpublished report, Senator Humphrey noted that cancer researchers have stated that already science may possess clues to the conquest of one or more types of cancer, but the information may be buried so deep in the literature that it cannot be found.

Senator Humphrey's statement includes this excerpt from Conrad Zirklé, speaking at a Symposium on Biological Communication in October, 1960:

Innumerable scientific discoveries are buried in our libraries, and many will be exhumed, but only after they have been discovered anew, and discovered independently. Many of our scientific discoveries now might just as well not be made.

For some years now I have been investigating the history of biology. In every field in which I have done any research, I have always found a number of precursors, that is, men who did the work earlier but who were ig-
nored. Over and over again I have found forgotten work that could have advanced our science by many years—perhaps by many generations.

Today approximately 1 million scientific papers are published each year. When placed end to end they will reach to utter confusion.

I might say that this defect is apparent in dental research as well as elsewhere. Often attempts are made to justify it on the grounds that there is no such thing as repetition in research, since no two investigators will conduct a study in exactly the same way and, at worst, one will confirm the findings of the other. I find little substance in this line of argument when the later research is reported as new and original, or when the author states that “a thorough search of the literature” revealed nothing pertinent, or at least failed to reveal the original investigation which may have been conducted 50 years previously.

On the other hand, Dr. David E. Price is quoted by Senator Humphrey as follows:

It is said that it is easier to repeat research than to dig it out of the literature. It is said that, if a scientist properly searches the literature in preparing for his research or in connection with the different steps of his work, he will not have time to carry out the research project itself. If these charges are true, then we seem to be strangling ourselves to death, or to be traveling in circles.

In view of this situation, dental scientists, especially novices, must be warned to be over-cautious and humbly conservative in referring to their findings. Otherwise, they too will produce much that is good but not new. Their choice is between humility and humiliation: once published, a poor paper cannot be retracted, although if the explosion continues it may stand a better chance of becoming lost more quickly, allowing a better possibility for re-establishing a reputation within a reasonable time. Librarians are in a position to tell the research worker about this information explosion and to explain to him some of the hazards, such as this one, which it presents to him. Editors have a responsibility to edit—to screen submitted articles through a body of qualified consultants and to reject statements or even entire manuscripts that do not measure up to high standards.

The hazard of claiming originality for work that is not original is only one of the dangerous aspects of the literature mess. The research worker runs into a very practical and realistic problem when he makes application for a research grant. As you know, some 1,300 to 1,500 people in the United States are estimated to be engaged in
dental research today, to the extent of a substantial portion of their time. Nearly all of the support for their research comes from grants, and most of the grants are provided by the United States Public Health Service through the National Institute of Dental Research. When a grant application is received, it is sent for review to a Study Section, which examines the application and evaluates it for scientific merit. Many applications are recommended for disapproval because of failure to satisfy the Study Section in one or more important criteria, which include the competence of the investigator.

The Study Section—there are more than 30 of them evaluating applications for the National Institutes of Health alone—are made up of a selection of top scientists in each particular field. These men, collectively, have a broader knowledge of their field and a far wider familiarity with the literature than any single scientist is likely to achieve in one lifetime. It follows, then, that if a grant applicant fails to mention a certain report of 50 years ago, someone on the Study Section is likely to be familiar with it. If this report has an important bearing on the proposed research project, the Study Section may recommend disapproval of the application because the applicant, evidently knowing nothing about this key reference, is obviously not prepared to do a careful and meticulous piece of work on the research project itself. After all, would it be fair to hand over a sizable piece of the public’s money to a group of people who don’t know enough about the background of the field they propose to explore?

Moreover, if the 50-year-old reference, possibly buried in some specialized bulletin that went out of print 30 years ago—and which the Study Section member remembers only because he had a chance conversation with the author 40 years ago—if that reference shows that the author attacked the self-same problem and came up with a negative result, the grant applicant is vulnerable to the charge that he is only going to waste time and money on an idea that was tested and discarded before he was born. It may not matter that the original work was done with crude equipment and in a superficial way, while the present applicant has at his disposal new facilities for precise measurement and has planned a profoundly exacting experiment that could result in a decisive scientific evaluation of the question. He is likely to lose the grant simply because his preliminary planning did not include an evaluation of the lost report.
Dental librarians can do a great deal to help the dental research investigator to avoid pitfalls like these. But before they can help him they have to educate him. They have to tell him about the facilities that have recently become available for searching the literature and retrieving information. If, as Dr. Price implies, it takes too much of the scientist's time to sift through indexes and abstracts, when his special talents could be applied to better use in the laboratory or the examining room, the librarian can do an extremely important job in the whole research picture by relieving him of that kind of work.

The librarian can often help the budding dental scientist with such simple things (simple to the librarian, perhaps) as setting up a good reference file for his personal use. The librarian's special experience in cataloguing can be invaluable to the young man or woman who just doesn't know where to start. It can prevent him from developing a cumbersome, complicated, and poorly organized filing system which in ten years will be virtually impossible to use effectively but too valuable to throw away.

For much of his work, a punch-card system may be very helpful in retrieving information on a cross-reference basis. Here is where the librarian's experience can really be useful to him, and eventually to the library, because if the investigator can establish a reliable punch-card file he will do a lot of work independently, often in literature that is not received in the dental library, and he will make his file available to the librarian who may want to use it.

Part of the confusion in today's literature comes from the fact that the titles of articles do not tell enough about what they contain and are often entirely misleading. The librarian can help to remedy this situation at the point of origin, by letting people know about the trend toward developing titles around certain universally recognized key words, and by offering to work directly with an author on devising a critically specific title for his paper.

But the opportunity to exert a force for improvement in this area knocks loudest at the door of the editor's office. The editor has the ultimate right to reject a meaningless title and to insist upon a title that tells what the article contains.

What service does the editor render, for example, by permitting titles like "Sugar in Saliva" or "Quo Vadis?" to be entered into indexes of scientific literature? The indexer will have to read each
article before he can tell what broad category it belongs to, and he may have to waste more time on it before deciding on the specific subject or subjects that it discusses. How much more meaningful is a title like “Isolation and measurement of salivary monosaccharide by chromatography and an anthrone method”? or, for a philosophical essay, “Better dental practice and education require more extensive and fundamental research”? The latter, though a little longer and less histrionic, is certainly more informative than “Quo Vadis?” Key words like “isolation, measurement, salivary, monosaccharide, chromatography, anthrone,” and words like “dental, practice, education, research” leave no doubt as to the specific content of the article and how to index it for future retrieval.

The converse of this matter of specificity is worth mention, because if I have any complaint against librarians it lies in this area. There is a story about the young man who got his first job in a country store. His first customer asked if he had any Corn Flakes. He looked over the stock and said, “No, ma’am!” After the customer left, the storekeeper said to the boy, “You know, you missed the whole point of salesmanship there. If we have no Corn Flakes you should have said, ‘I’m sorry, ma’am, we’re out of Corn Flakes just now. But I can let you have some Shredded Wheat, Puffed Rice, Grape-Nuts’—and so on. Remember that whenever you’re out of what the customer wants.”

Later on in the day, a customer came in and asked for a certain kind of paper, a paper that is used in one specific part of the house and not elsewhere. The boy was out of stock on it, but, remembering the boss’ advice, he said, “No, ma’am. But we have wax paper, sandpaper, flypaper and tar paper, if they’ll be of any help!”

When someone asks the library for material on a specific subject, it is surprising how often the over-zealous librarian will come up with all sorts of vaguely related material that only serves to waste the fellow’s time and to make him form unmentionably nasty opinions of librarians in general, regardless of personality, good intentions, or good looks.

I admit freely that many requests for information are received in such vague terms that the librarian has to try her hand at extrasensory perception techniques before she can do anything at all. Even in our office we get such requests as, “I’m giving a talk on research next week. Please send me all available information as I need
it for my address to the Parent-Teachers Association.” We have a lot of educating to do.

Coming back to the serious scientist, the librarian can do other things for him that will help and educate him at the same time. He can be told about some of the rapid scanning publications like B. A. S. I. C. (Biological Abstracts’ Subjects In Context), which are just coming into use, and he can be shown how to use them effectively. This development, I find, is a remarkable improvement over the regular index, and it represents one of the most important uses of computers in this early stage of their development.

At the Western Reserve University Center for Documentation and Communication Research in Cleveland they have the world’s first large-scale operating computerized system for storage and retrieval of information. One of the Center’s programs is a project of the American Society for Metals. About 100,000 coded abstracts of books and articles on metallurgy are already stored on computer tape. I understand that the whole “library” can now be searched in about 8 hours, or an effective search time of 24 minutes per question, depending on how many questions have to be answered during the search. Up to 30 questions can be asked at a time. It would take a group of top notch librarians many years to sort through these 100,000 abstracts to get answers to similar questions. And the system is growing at the rate of perhaps 30,000 to 35,000 abstracts per year.

The machine prints out the numbers of all pertinent abstracts, and after the staff evaluates their applicability, as a check for the further improvement of the system, the abstracts themselves are printed out and mailed to the inquirer.

Computers are wonderful but they have their limitations, of course. A story “currently going the rounds in Washington” tells of the Pentagon scientists who spent years programming a computer with all the available information from books, articles, and speeches about war, conflict, social and economic developments, and every conceivably related information down through the whole recorded history of man. When they were ready, the Chief of Staff asked the computer one question: “What are the chances that there will be another war?” The computer worked through the material for two months (equivalent to 2,000,000 years of human calculation) and then printed out the answer: “YES.” The Chief of Staff asked the machine: “Yes, what?” And in three seconds the machine answered
"YES, SIR!" I thought this story rather pointless until I reflected on it for a while.

There are one or two additional points I should like to include in these remarks. Dental research today needs the participation of competent scientists in all of the basic sciences. Most of these scientists are not in dental institutions and have little notion of the profundity and scope of the fundamental problems of dentistry. We are doing our best to attract such people into dental research and to interest them in the challenging opportunities that our problems present for study and investigation. When we do locate a promising man—perhaps in a liberal arts college at some distance from the university—and get him enthused about a dental project, he needs all the help he can get to fill in his dental background. Quite logically, he may write to the dental library for information. Sometimes, his knowledge of the dental field will be so scanty that he may make broad, non-specific requests of the type I mentioned a moment ago.

I implore librarians and all concerned to be kind to this man. Indulge him as you would indulge a beloved child. We need him and we welcome him to our ranks. If he comes to your library to make direct use of your collection, make him feel he is a part of the family. After you get him settled on his immediate needs, let your dental research people know he is in the building. Offer to introduce him to a dental investigator who may be working in an area close to his own.

So often these people, whom we want so desperately to help us solve the fundamental problems of dental disease, fail to obtain funds from granting agencies because they do not demonstrate to the reviewing body that they are aware of what has been published about their specific problem in the dental literature. Dental librarians can serve in the role of "marriage-brokers," so to speak, if they will help to bring the dental and non-dental scientist together; and a librarian may get considerable personal satisfaction when the progeny of these marriages begin to appear in the literature and to grow into new laboratories and expanded facilities within her own institution.

These are some of the ideas that come to mind when I think of research dental libraries, and dental editors. I hope that some of these remarks may have immediate practical value for you, and that others will stimulate you to make something more practical out of them.
For my part, I am grateful for the opportunity to speak frankly with you about some areas in which we carry mutual responsibility. Accurate information is the very core of progress and advancement. Research workers develop it, editors transmit it, and librarians collect and organize it. Together we share a most important responsibility, one which can pay off handsomely in terms of progress and maturation within the dental profession, and in terms of health and happiness for the whole human race.

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Chicago 11, Illinois

THE APPLICATION OF KNOWLEDGE

In addition to the functions of finding and communicating knowledge, the university has the too often neglected responsibility of encouraging the application of knowledge. We are concerned here with the frequently observed lag between the discovery of knowledge on the one hand, and its application in the professions on the other. The sociologist’s knowledge of group dynamics may be imparted to his students for years before there is much direct application of that knowledge to the management of a large corporation. Biologists knew that human blood could be typed for almost a generation before blood transfusions came into general practice in medicine.

The university has a special responsibility for this function. Faculties in the basic disciplines are concerned with the discovery of truth, and faculties in the several professional schools are concerned not only with its discovery but also with its application. A concept of the university as a total institution should include the function of encouraging systematically the transition from discovery to application. I say this is a special responsibility, for no other institution in our society is concerned with the total range of knowledge and values which sweeps across the humanities, the natural sciences, and the social sciences into professional areas as diverse as social work and business, or law and dentistry. The transmission of knowledge and value from one field in which it has been discovered to another in which it may be applied, thus becomes a peculiarly important opportunity and responsibility of the university as a total institution.—Edward H. Litchfield, on the occasion of his inauguration as Chancellor of the University of Pittsburgh. Pitt, May 1957.
A Future Society of Dental Teachers and Research Fellows

ALVIN F. GARDNER, D.D.S., M.S., Ph.D.

DENTAL EDUCATION TODAY

The teaching of dentistry includes the imparting of knowledge by the dental teacher and the obtaining of skill and aptitude by the dental student. In a didactic survey of dentistry with a pretense of full coverage of the subject, the teacher must include examples of new knowledge related to dentistry not presently in textbooks, and new views which differ from older concepts. The subject matter should be representative rather than complete and comprehensive, in the hope that in this way the dental student will be prepared to educate himself further. A didactic survey should be adjusted to present-day dental school curriculum and needs.

Dental teaching is of greater value where the spirit of inquiry and investigation are stressed. Undergraduate dental students and graduate dental students should engage in dental research either by joining a group or investigating a problem of their own choice. Research is therefore best where teaching is a main activity. Applied clinical research in dentistry should be undertaken by students during their clinical practice. Research is based on complete individual responsibility and independence.

Because of the unknowns and abstractions in dental knowledge, special skills are needed in the study of oral disease processes. The scope of dental knowledge and insight is far ahead of the mental capacity of the hard-working dental student, and is beyond the ability of an individual to encompass in our present-day dental curriculum. This is unfortunate; however, it remains a truism.

There should be an attempt made to have the strictly dental subjects related, integrated, or correlated with the basic sciences. Basic science and clinical departments may thus participate in correlated teaching to students of dentistry.

The duty of the teacher of dentistry is to try to broaden his per-

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spective by developing a more general view of dental education. The duty of the student is to force himself out of a complacent attitude and not be timid about completely grasping and understanding the basic principles or insights into dentistry. In the present age of complexity the student is perplexed and timid about coming to grips with these basic principles.

The complexity of dental science characterizes our period of time. The student feels the need for a multitude of simple maps and direction finders in order to obtain his knowledge. There is currently no digest or compendium which sets forth the principles and problems whose interactions are the daily bread of the dental student in his pursuit of the study of dentistry.

In the absence of such a guide, students study their courses under the influence of various traditions, strong or weak personalities, local circumstances, improvisations, habits, or simply coast along the downward slope of least resistance. The remarkable changes of the last 25 years pose new difficulties to the dental student. He must now undertake and apply the study of biology to the oral regions. Oral cancer must be diagnosed and treated early if the dental profession is to retain its rightful place in the society of professional endeavor. No longer may the dental student be timid about coming to grips with this new philosophy or insight into dentistry. He must lose his timidity, replace it with aggressiveness and hard work. Only by these means can he gain an insight into the types of problems which he encounters, and attain the goals of the dental profession.

Most dental educators are aware that, for any given course in the four years of dental school, it would be to the student’s advantage if every other course had come previously. However, we still follow the tradition of teaching one course at a time. This approach may of necessity become obsolete in the years to follow. Introductory material should precede each new subject discussed. The purpose of the study of dentistry is to learn the technique for recognizing oral disease, to interpret the signs and symptoms of oral disease in terms of anatomy, biochemistry, physiology, pharmacology, microbiology, and pathology. Laboratory and seminar periods should be emphasized in dental education, since much can be gained there that is impossible to learn by didactic means.

Dentistry should be integrated with biochemistry, microbiology, pharmacology, anatomy, pathology, and physiology. The lectures
in any course in the didactic curriculum are merely a didactic sur-
vey. The textbooks in all clinical and basic science fields should be
reviewed each year and adjusted to the latest dental school curricu-

lum. All dental students should be held responsible for textbook
and journal assignments because they emphasize aspects not covered
in lectures. The dental student requires much supervised study in
the basic sciences before he can be expected to apply this fundamen-
tal knowledge to his clinical dental practice. Because the study of
basic dental sciences appears staggering to some students, this does
not excuse the student for neglecting it. However, to oversimplify
the basic dental sciences and bring the false security of inadequate
knowledge instead of truth to the student will only be fatal to his
progress.

Dental education and practice cannot be allowed to result in
total mechanization, dispensing with the mind and the individual,
since we will then have reached the termination of future progress in
dental education.

A SOCIETY OF DENTAL TEACHERS AND RESEARCH FELLOWS

How is it possible for the problems of dental teaching and research
which face the dental profession today to be overcome in the years
ahead?

To begin with, dentistry needs a more creative path into its teach-
ing. It must add enticement and imagination to dental teaching.
Dentistry must develop dental scholars who will be judged by their
deeds not by their degrees. Dentistry should develop an aversion to
the preparation of a mass production of dental mediocrity.

To overcome these problems we must start with the training of
future dental teachers and researchers. The following is a plan to
meet the problems facing dental education today.

The dental profession should develop a society of dental teachers
and research fellows. The fellows could be trained at several (two
or three) strategic centers in the United States in cooperation with
dental, medical, education, and graduate schools of universities.

The dental fellowships could be financed and shared in by philan-
thropic individuals who would have a fervent faith in this plan.
This society could also be endowed by state and federal governments,
industry, private enterprises, dental societies, funds, foundations,
institutions, academies, and other available sources that could be mustered.

An impressive return on the investments made in this society would readily be forthcoming in a proud report by the leaders of the dental profession in a short span of years.

Such a society would be a unique experiment in United States dental education. The indoctrinated dental school graduate with his shiny “Doctor of Dental Surgery” or “Doctor of Dental Medicine” degree should be told upon entering the dental fellowship program that his aim will be knowledge and wisdom, not the glamour of fame. He should further be told that he will not be expected to seek a near, but rather a distant objective.

All of the achievements or discoveries by these dental fellows would be regarded as but a fragment of a larger pattern which is the dental profession. The dental fellow should not be fully satisfied with his accomplishment.

The society of dental teachers and research fellows should not develop into a factory system. It should provide the profession with scholars and gifted dental graduates. These scholars will pass on their knowledge to dental students throughout the United States.

The dental fellows should be picked for membership in this society because they give rare promise of original work. During the tenure of their fellowship, they should be freed from the usual clock-punching requirements of graduate study. They should be turned loose for approximately three years to pursue whatever branches of dentistry, as well as the arts, that they prefer.

The strategic university centers providing the facilities for dental teacher and research fellows should put at their full disposal all classrooms, libraries, and laboratories. Several fellowship centers could be established; one in the Eastern, one in the Midwestern, and a third in the Western region of the United States. The dental fellows should receive $5,500.00 per year, tax-free if single, $6,500.00, tax-free, for married men and women.

One of the many objectives of this dental fellowship program should be the providing of an opportunity for each dental fellow to permanently enrich the lives of the other fellows. Other objectives should be to broaden the minds of already intelligent men. In such a society something must rub off from one dental fellow on another. The mixing of many dental disciplines during the three
years of the fellowship will remain a memorable experience to all
dental fellows.

To establish this type of program and society would require ap-
proximately a $900,000 endowment. This is not an insurmountable
figure when one considers the millions of dollars per year expended
for fellowships and research grants in the United States. If each mem-
ber of the dental profession donated a few dollars, the program could
be established in one year. Thereafter, foundations, dental societies,
and philanthropic individuals or groups could carry on for future
years.

The development of the society would be an ideal means of prep-
aration for those who are to serve the dental profession in the United
States. At the same time, it would be an ideal school for dental fel-
lows who would have no other chance to deal with the secret gleams
of their own minds. There is a breath-taking charm in a dental fel-
lowship system that allows a young dental graduate to pursue a den-
tal subject whose development is strikingly neglected.

To accomplish this end additional resources should be available
to dental fellows for research equipment and travel related to the
advancement of research projects. If a fellow feels the need to spend
a period of time at a foreign institution to enrich his research ex-
perience, he should be free to travel abroad.

Dental fellows should not be required to earn specified degrees or
fulfill a page-long curriculum of specified didactic, laboratory, or
seminar courses. The principles of education should be made avail-
able to all fellows through the graduate school of education of the
strategic university at which the society may be established. No more
than six fellowships should be established at each of the strategic
centers, particularly during the embryo years of the society.

This plan for a future society of dental teachers and research fel-
lows can be accomplished by organization of all dental schools, dental
societies, and dental academies or other groups to generate the en-
ergy required to start a campaign.

Although difficult to accept, the problems in dental education may
not be the irrelevant basic dental education problems; instead the
problem may lie more appropriately with insufficient dental research-
ers and teachers. Their leadership in dental education and research
may be the strategic problem confronting the profession today.

The result of this program of developing the society should be an
astonishing campaign to raise dental academic standards. Hard-hitting emphasis should be placed on a strong basic dental education utilizing order and logic with classroom and clinical discipline. The dental fellows will develop future classrooms and clinics filled with students on the basis of ability and motivation. Out of the range and variety of dental activities and experiences only a limited number of basic ones can be selected for use in the dental classroom and clinic. By whatever pulling and prodding is necessary, the members of the society of dental teachers and research fellows should aim to give our dental students a tremendous dental education.

The society would consist of clinical and basic science workers in the various fields of dentistry. They would work and live together providing this cooperation, so that a true appreciation of oral biology would be realized at the termination of their fellowship. The dental fellow will also have an opportunity to collaborate with medical scholars, clinical and basic science workers in medicine and biology, as well as with experts in the field of education.

After the successful completion of the fellowship, and initiation into the society, the dental scholar will then be expected to undertake a lifetime career of teaching and the pursuit of basic dental research for an extended term rather than engage in limited teaching and research projects. The future fellows of this society will not need to depend on possessions to satisfy them even though they live in the midst of greater material plenty.

Their satisfaction should be derived from accomplishments and deeds. The satisfaction should come from the challenge to their ability, by creating something of value through well-designed dental teaching and research. The dental fellow's deep satisfaction will be derived from pleasing the most demanding individual of all—himself. The dental fellow will readily realize that his work in dental education and research is a true extension of himself. He will, therefore, devise ways to conduct his teaching and research in a better and more efficient manner. In this way he will find happiness in his endeavor for the remainder of his professional life. This type of happiness comes from within the fellow and is not dependent upon others. It will lead to a solid happiness because it is based upon a quiet, strong contentment concerning dental teaching and research. The future dental teacher and research fellow should develop into
a happy breed of individual. He will not represent the bored, tired, miserable and listless individual; rather he will represent the alive and keen individual constantly in tune with the busy world.

There are few other fields of endeavor, as dental teaching and research, in which one can experience the satisfaction of accomplishment. The results of the fellow's advances in dentistry will be readily seen, even though at times they may not always be appreciated.

The original organizers of this society should be members of the dental profession and educational institutions who are aware of and realize the need for preparing teachers and researchers. These are the individuals—men of vision—who will be instrumental in forming the society in cooperation with a university. By their actions they will be doing so much to improve the quality of dental care in the United States, and other parts of the world as well.

The dental profession is often asked, “Are we getting anywhere in dental research?” The answer depends on what you have in mind. In terms of dollars we have already received far more than anyone would have expected 20 years ago. In terms of training and developing younger members of the profession to advance the cause of dental research we have not advanced much in the past 20 years. It is the breed of individual which the society will develop that should inherit the dental profession.

**Dental School Guidance and the Society**

A well-conceived and well-executed guidance program could be established in every dental school in the United States. Each school could appoint a guidance committee which is the profitable way to resolve the dilemma of wasted talent which definitely confronts us today. Guidance with its “pursuit of excellence” is essential to the success of this society of dental teachers and research fellows. Dental seniors should be selected by the committee on guidance of their respective schools in an effort to help the decision making senior student resolve the problem of whether to enter the society. If every guidance committee could select one qualified student every year and send him on to undertake the fellowship program at one of the strategic centers, this program would be a success.

In the history of dental education, guidance systems have been an
unheard of venture. However, in the history of American education, the services of Counselors from elementary school through college have never been more highly valued. Guidance systems in schools have been considered so essential that the National Defense Education Act of 1958 made grants to states to promote their guidance programs. Perhaps some of these funds could be obtained to initiate guidance programs in United States dental schools so that the potentialities of all students should be discovered early in their dental education. In this way selected students can be prepared for the program of the society. Countless dental students, probably the large majority, need aid from guidance counselors to help select their particular area of dentistry or dental teaching and research. It is true that many dental students go through four years of dental college without matching their true abilities, while other dental students know what they want early in their dental education and feel able to reach their goals without assistance other than financial help from their parents.

The counselors should interview every member of the senior class, talk with parents, and look over scores on intelligence and dental achievements. These achievements plus aptitude and general grasp, or the capacity to comprehend advanced courses and research, should be taken into consideration in the final selection of the fellow. Too great emphasis should not be placed upon grades earned during the four years of dental school. Grades alone should receive only minimal consideration by counselors when selecting students for the society.

Since counselors are unheard of in all or most dental colleges in the United States, the individuals appointed to this position must be freed from the start from handling numerous miscellaneous matters. The counselors should spend their time only in the pursuit of the few superior students who are satisfactory material for the society. In this manner dental guidance will assume the full responsibilities placed upon it by dental educators. Dental guidance will be the key to supplying the personnel for the newly created society.

The society will provide dental teachers and research fellows to all dental schools in the United States. In time the (future) dental teacher and research fellow, regardless of the location of his dental school, may have similar skills and academic knowledge. That is how it should be.
The society of dental teachers and research fellows should tackle the shortage of dental teachers and researchers with burgeoning success by establishing the proposed fellowships. These fellowships will aim to make dental professors out of qualified dental students. The recruiters in this program should be dental faculty members throughout the country. They should help nominate qualified seniors for the hard-eyed committee of dental guidance counselors.

Potential professors of dentistry can be adequately trained regardless of their diverse backgrounds. The individuals selected may be sons of novelists or barbers, may be individuals who have quit work in industry to study dentistry, and many more from refugees to one-time-truck farmers and war veterans. These individuals would never become dental teachers unless recruited for this endeavor by the guidance counselors.

Dental students can become interested in research and teaching and diverted from other aspects of dental practice. On dental campuses the dental teacher and research fellowship should rapidly become a domestic dental version of the Rhodes Scholarship and a peak of dental academic distinction.

The key to this effort will be dental recruiters. Professors in dentistry have an opportunity to concentrate on stirring dental students to first-rateness, a real sense of the truth. The result may well be that many dental students may soon want to emulate these professors and become dental teachers themselves. The unusual bright, small group of dental fellows should be devoted to what they are doing, and will want to keep on doing it. Dental intellectual activity should become fashionable, and furthermore it promises a living as well.

Barring a major social upheaval, there seems to be no end in sight to the increased demand for dental-educated fellows. The demand will surely become greater, and there is little hope that the ratio of supply and demand will be satisfied.

The increased demand for dental teachers can be met by the formation of such a society. The dental profession desperately requires gifted dental teachers, dental researchers, professional men, and scholars. This is a problem with a remedy, provided alert individuals join the movement.

In conclusion, it is not meant to be treason to advance this simple
reason for a future society of dental teachers and research fellows. Instead, for the progress the dental profession desires, every professional man, teacher, researcher, and student unite and generate the combustion necessary to initiate a program similar to this proposed society, thus turning the wheel of dental progress.

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THE NEXT STEP

It has become increasingly clear over the years that a change must be made in the traditional approach to dental practice—no longer can we go on ignoring everyone else and confining ourselves to our small offices for years at a time. We cannot survive in that manner any longer either socially or economically; and we are rapidly approaching the point where we cannot survive technically either.

What is the answer to this dilemma? It can only lie in the development of a greater social consciousness within our profession, in the development of a stronger professional association, in the development of an enthusiasm for our own personal contribution to our profession and to our society. It can only come about through a willingness to change individually for the benefit of the group, through recognition that we cannot stand still in a changing world. We must be more interested in practice efficiency, not merely on an individual basis, but in terms of the whole profession, so that the mass of society benefits. Make no mistake about the need to adapt to the fickle masses. They control our lives, both personal and professional.—G. C. Swann. Presidential address, Alberta Dental Association. J. Canad. D. A. 27:645, No. 10, 1961.
Newer Concepts on the Mechanisms Of Hard Tissue Destruction

REIDAR F. SOGNNAES, D.M.D., Ph.D.

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The 129th annual meeting of the AAAS was held at Philadelphia, December 29-30, 1962. The dental program was co-sponsored by the Section on Dentistry, Medicine, and Zoology; the American College of Dentists; the American Dental Association; and the International Association for Dental Research, North American Division.

Dr. Sognnaes has prepared excerpts from the symposium under the above title. For many years the proceedings of the annual meeting of the AAAS Section on Dentistry have been published in the Journal.

The four-session symposium on hard tissue destruction organized by AAAS' Section Nd (Dentistry) for the 1962 Philadelphia meeting served as a logical sequence—the other side of the coin, as it were—to a previous Nd symposium which dealt with the constructive aspects of hard tissue biology ("Calcification in Biological Systems," AAAS Publication No. 64, Washington, D. C., 1960).

A variety of disciplines and tools have been applied to the study of a whole range of mineralized structures, corals, shells, antlers, bone, ivory, cementum, dentin, and enamel. The primary purpose of the symposium was to examine the conditions under which these solid substances are subject to destruction by various biological organisms, boring sponges, barnacles, mussels, snails, octopuses, worms, algae, and fungi, as well as the giant cells of bone resorption and the bacteria of tooth decay. Beyond the morphological and cellular level of observation, the symposium finally served to delineate remaining areas of ignorance regarding the specific chemical agents which lead
to the disruption and dissolution of the inorganic salts and organic matrices of mineralized structures (glandular secretions and various extracellular and intracellular metabolites, acids, chelators, enzymes, and combinations of chemical and physical factors). These problems are now being explored with the tools of molecular biology focused on unifying basic issues pertinent to decalcification of a variety of biological tissues.

The titles of the topics (23 presentations) and the names of the speakers (36 authors and co-authors) have been recorded previously in the 1962 program issue of Science (138:1139, Dec. 7, 1962). While no single conceptual scheme or master plan for biological decalcification mechanisms emerged, there came to light many examples of curious similarities, both in the approaches to and observation on the destructive processes in widely separate systems.

ROCK AND SHELL BORING

Rock boring is widespread among marine organisms in search of housing and food. The tools for boring are possessed by a variety of filamentous green algae, some marine fungi, certain sponges, worms, and sea urchins, a genus of barnacles, certain gastropods, and many bivalve molluscs. Among the substances bored into are not only relatively soft sedimentary rock, but also densely mineralized calcareous products of animal secretion, notably coral skeletons and shells of molluscs.

The habit of boring confers a measure of protection and it may also provide nutrition, as in the case of fungi, which bore into bivalve shells utilizing the energy present in the organic (conchiolin) basis of the shell; and in the case of the snail and octopus which bore through oyster and abalone shells to reach the proteinaceous flesh below. The mode of boring appears to include the use of a chemical agent as well as mechanical means.

The bivalve molluscs are most ideally fitted for boring and no less than seven superfamilies of bivalves have independently become borers. The anterior end of the body may penetrate deeply. Thus protected, water containing food and oxygen is drawn in at the posterior end.

The true mussels (Mytilacea), which include the numerous species of date mussels (Lithophaga) are restricted to calcareous rock, being particularly common on coral reefs. Boring is assisted by a calcium-
dissolving secretion by the animal, whose own shell is being protected from decalcification by a thick periostracal, horny covering.

The rock borers are of supreme importance in the economy of coral reefs. They are among the major agents of erosion, countered by the exceptional powers of calcification possessed by reef-building corals.

The destruction of corals by boring sponges occurs primarily at the base of the coral reefs. At the same time, new growth occurs nearer the surface so that there is a constant remodeling of the corals through this interplay of destruction and reconstruction.

The boring snails which are a threat to oyster beds have the capacity to rasp off the periostracum of the oyster shell, then softening the minerals by a glandular secretion followed by further rasping by the radula. It was shown by electron microscopy and microradiography that there is a sub-surface leaching out of minerals, an etching that is, as part of the boring mechanism. Yet as far as could be determined, the glandular secretion presumed responsible for this demineralization has a neutral pH. (In vitro experiments showed that the snails cannot be made to bore into non-living shells unless some oyster meat is placed under the shell, in which case the organic metabolites would invite the snail to take on the task of dissolving the shell minerals and bore its way into the underlying protein.)

It appears that the major groups of boring organisms have representatives which have evolved a decalcification mechanism to facilitate the search for food, protection, or a substratum.

**Tooth Destruction**

Teeth and tusks, suspended in their bony alveolar sockets within the jaws, combine the full spectrum of vertebrate hard tissues: enamel, dentin, ivory, cementum, and bone, and are subject to mechanisms of eruption, shedding, resorption, attrition, erosion, abrasion, and caries, as well as to postmortem destruction by subteranean saprophytes ("The ivory houses shall perish . . .," Amos 3:15).

Within certain limits, destruction of the dental hard tissues is a normal physiological process, accompanying masticatory function, growth, and aging. But in the absence of the lubricating action of the saliva, rapid wear of the teeth can take place even with regular function and food habits.
Extreme wear may occur as a result of the combination of mechanical and chemical influences. Thus, excessive wear reported in sheep teeth has been attributed to decalcification by organic acids from herbage, combined with freshly expressed juices of grasses and clovers containing enzymes capable of acting on the organic portion of the teeth (proteolysis).

Experimental caries research in rodents utilizing in part germ-free systems, strongly indicate that dental caries is of bacterial origin caused by a gram-positive streptococcal infection and transmissible between animals. In the presence of such infection, only fluoride and reduction of carbohydrate intake have been found to give significant protection to the teeth. Examination of the initial carious lesion of enamel by means of polarized light and soft x-rays (microradiography) indicate that there is a differential demineralization extending deeply into the subsurface structure of enamel to a depth of about 1,000 microns. Thus, there is already considerable subsurface demineralization of enamel before the proteolytic destruction of the organic matrix takes place. From a biochemical point of view, it is only at a late stage in the lesion before microorganisms actually invade the tooth substance. Electronmicroscopy of enamel caries sectioned by means of a diamond knife have shown that the substance between the minute enamel rods (prisms) are primarily involved. Yet, the destruction is not entirely a one-way process. There is evidence of recrystallization of dissolved minerals, and the inorganic salts remaining within partially destroyed enamel have been found to contain a very high proportion of fluoride.

Incipient carious lesions of enamel, remarkably similar to those formed in vivo, have been produced by purely chemical systems containing a reactant (acid) capable of dissolving hydroxylapatite and an organic polymer to protect the external enamel surface. These in vitro lesions have been explained by the dynamics of the heterogeneous system consisting of an acidic solution and a calcium phosphate solid involving chemical phase transformation, equilibria, and kinetics. The enamel dissolution appears to be a “first order” diffusion controlled reaction which can be inhibited by protective deposits, salts of the reaction products, on the apatite surfaces. In equilibrium with acid solutions, there has been established the existence of dicalcium phosphate on the surface of enamel, bone, and
MECHANISMS OF HARD TISSUE DESTRUCTION

synthetic hydroxylapatite, as well as the presence of calcium fluoride on the surface of fluorapatite.

In contrast to dental caries, the so-called idiopathic dental erosion is characterized by a much lesser subsurface demineralization and by the absence of bacterial invasion of the tooth substance. Consequently, one cannot detect the beginning of such erosion by any change in visual opacity which is so typical of the early “white spot” formation in dental caries. Histological examination suggests that dental erosion is not necessarily devoid of surface deposits of bacteria-laden mucus, though the lesion may look clean to the naked eye. Occasionally, these superficial deposits may be separated from the tooth surface by a thin cuticular membrane, which stains orthocromatically with toluidine blue, presumably originates from saliva, and possibly may be of protective significance. Electron-microscopic examination of dentinal erosion has shown the presence of deposition of extremely large crystals which appear to block the dentinal tubules and thus may explain the failure of bacterial invasion of the tooth substance.

Even after death, the teeth are subject to destruction by biological organisms. Postmortem changes have been observed in human teeth of prehistoric, ancient and recent times. The histological observations indicate that the commonest postmortem change consists in large irregular canals which penetrate the dentin and cementum, a condition not known to occur in teeth during life. The microscopic pattern of the postmortem destruction is suggestive of invasion by fungi capable of removing calcium phosphate and collagen virtually simultaneously, but incapable of attacking dental enamel. Postmortem changes are rarely found in the enamel and were limited to localized areas of decalcification or erosion of the enamel surface, possibly caused by algae.

**Resorption of Antlers, Bones and Teeth**

As a normal consequence of resorptive processes, the shedding of antlers and teeth represent the only instance in which there is a natural loss *en bloc* of mineralized vertebrate tissues. The shedding of antlers is considered as one step in the normal growth process. Thus, the shedding is incident to the growth of the new antler, that is a transition between the destructive (bionegative) and the constructive (biopositive) part of the cycle. Antler shedding is under
general systemic control. Unlike teeth, both antlers are shed at the same time. The process is associated with a fall in the level of testosterone in the blood at the conclusion of the reproductive period. Osteoclasts resorb the bone of the Haversian lamellae along the junction of the living bone (at the skull pedicle) and the dead bone of the antler base during a remarkably brief period of only 48 hours. In addition to the control by sex hormones, there is some evidence that some factor(s) of the pituitary gland tend to stimulate both shedding and regrowth of antlers.

Eruption and shedding of teeth is accompanied by extensive resorption and remodeling of the alveolar bone of the jaw. In a mutant strain of rats in which the incisors fail to erupt (i.e., strain) the eruption could be stimulated by administration of parathyroid hormone which induced resorption of the dense obstructing bone.

Pathological resorption of alveolar bone, which accompanies loosening and loss of teeth, was shown to be associated with circulatory disturbances in the periodontal region, caused in part by infections, in part by functional stresses.

In the life cycle of the skeleton, the resorption and construction of bone is part of the same system serving to continuously remodel the skeleton and providing large surface areas for exchange reactions between body fluids and bone mineral.

Among rarefying disease of the human skeleton, the one most common disorder is osteoporosis, often superimposed upon physiological atrophy of bone of old age.

Combined techniques of histology, autoradiography and microradiography were utilized to study resorption in cortical bone. Among the findings reported with this analysis was the apparent indication that in osteoporosis, the amount of resorptive surface relative to resting surface is increased. Human cases of osteoporosis, investigated by metabolic balance, radioisotope, and tetracycline techniques, suggest that the metabolic functions of the skeleton as a chemical “warehouse” are performed by the 1 per cent of the bone that is reactive or exchangeable, and that this is not significantly abnormal in patients with osteoporosis. The deficiency is in the insufficient amount of the other 99 per cent that is the so-called non-reactive, non-exchangeable, stable, or structural bone.

Recent work was interpreted to indicate that extreme dietary deficiencies of calcium and protein, various endocrinopathies, and
many degenerative vascular system disorders, produce premature or accelerated aging of bone, and that osteoporosis appears as a result.

With regard to the mechanism of resorption, the multinucleated giant cells (osteoclasts) situated in typical Howship's lacunae generally have been considered the sole culprits of destruction. Yet it was shown that the osteocytes of deeper areas of bone (well removed from bone surfaces) responded by resorbing the walls of their lacunae in a number of systemically accelerated resorptive states (brought about, for example, by the administration of parathyroid extract, cortisone, and the intravenous infusion of EDTA). This phenomenon was termed "osteolysis." If substantiated, these findings may represent the first step in delineating such a definite function for the osteocyte.

Two reports explored the degree to which resorbability is dependent upon the precise characteristics of the tissues being resorbed.

In one study, the authors reported the results of experiments in which devitalized pieces of bone were implanted subcutaneously. The finding suggested that bone matrix need not be calcified in order to undergo resorption, as long as it was calcified at some time in the past. Resorption of the implants was associated with the presence of an osteoclast-like cell, which appeared to be related to (or possibly identical with) foreign body giant cells. Histochemical studies demonstrated obvious similarities in enzyme reactions in these multinucleated cells, with the exception of acid phosphatase which appeared more highly concentrated in the bona fide osteoclasts.

In another study the author examined sites of preferential resorption in normal young rats, and in comparable animals in which resorption had been stimulated by administration of parathyroid extract. In the latter group, the acceleration of resorption appeared to represent an exaggeration of this process in areas normally characterized by resorption. Combined histological, autoradiographic, and microradiographic analyses indicated that neither the age, degree of calcification (excepting uncalcified matrix, which was not studied), histological organization, or chemical variations in the resorbable matrices were critical in determining sites of preferential resorption.

New information emerged regarding the ultrastructural characteristics of the osteoclasts. Electronmicroscopic observations on osteoclasts in undecalcified preparations illustrated morphological differences in the cell membrane at the cell-bone interface, presumably
related to functional differences in cellular activity. Among the most interesting findings was the observation that typically striated collagen fibers, evidently denuded of their inorganic crystallites, were present within the infoldings of the ruffled cell membrane juxtaposed to the resorptive bone surface. In terms of the mechanism of bone resorption, this may indicate that solubilization of the crystallites may precede lysis of the collagen component of the organic matrix.

Several *in vitro* studies dealt with biochemical aspects of bone destruction, including experimental resorption in tissue culture. When cranial vaults of immature mice were incubated in roller tubes, the addition of a number of substances to the culture medium, including parathyroid extract, vitamin D and vitamin A, evoked an appreciable resorptive response, provided the oxygen tension of the medium was kept at a high critical level.

In tissue slices of resorbing bone, lactic acid rather than citric acid was found to be more concentrated in the supernatant end product of the system.

While there is no question that bone cells can produce citrate, some question was raised as to whether significant concentrations of citrate accumulate and also whether parathyroid hormone influences this accumulation. It was suggested that the rate of operation of the Krebs cycle is controlled by the entry of metabolites through the pyruvic acid-oxidase complex to acetyl coenzyme A and through the condensing system or "citrogenase." There appears to be no real accumulation of metabolic citrate since the reactions of the Krebs cycle follow in sequence. If more citrate is produced in the cell, more is oxidized. The real consequence of increasing the flow through the bottleneck is a greater production of CO₂.

As yet, there is not sufficient data to establish which of the two enzyme systems between pyruvate and citrate is the actual controlling factor. The fact that lactate, which accumulates in large amounts, is the major end product suggests that the crucial point in the sequence (the site of hormone action) is in the pyruvic acid-oxidase complex.

Tentatively, it was proposed that an excess of parathyroid hormone induces an increased production of CO₂ from glucose or metabolites of glucose by cells in bone.

Resorption induced by parathyroid extract *in vivo* and *in vitro* provides a convenient experimental system for further studies on
the chemical alterations responsible for dissolving the mineral of calcified tissues. The tools for making the next step toward understanding these destructive processes at the chemical level are now at hand and will undoubtedly be exploited with increased imagination and vigor by representatives of many fields of science.

Grateful acknowledgement is made to the National Institute for Dental Research for a grant which made it possible to invite a number of speakers from abroad to participate in this symposium.

For the next four year period (1963-66) Dr. Seymour Kreshover, Scientific Director of the National Institute of Dental Research, was elected (to succeed Dr. R. F. Sognnaes) as the new Secretary of AAAS’ Section on Dentistry. Dr. Paul Boyle, Dean, School of Dentistry, Western Reserve University, Cleveland, was elected (to succeed Dr. Ned B. Williams, University of Pennsylvania) as Vice President and Chairman for the Cleveland meeting, December, 1963.

THE ART OF READING

There are disturbing signs which point to a weakness in our democratic society serious enough to lose our freedom for us. Everyone is seeking the easy and pleasurable way, and the professional educators have uncritically accepted the charming belief that learning can be accomplished without diligence, concentration, hard work, and even sweat. The art of reading for adults has taken the course of an outline of history, an outline of philosophy, digests of magazine articles, pictures instead of words. The avenues of escape are the most heavily traveled in our land; who-done-it books, movies, television programs, westerns, horror and sex. One cursory glance at any magazine rack at the corner drug store ought to confront us with the terrible question—how free can any people be whose minds feed on such food?—Rabbi Levi A. Olan. The Dentist as a Citizen. J. Am. Col. Den. 26:246, Sept. 1959.
MINUTES OF THE MEETING OF THE
BOARD OF REGENTS
APRIL 5 AND 6, 1963

The Board of Regents of the American College of Dentists met in the Central Office, St. Louis, Friday and Saturday, April 5 and 6, 1963, President Blackerby presiding. All members of the Board were present.

The minutes of the Board of Regents meetings of October 25, 26, and 29, 1962 at Miami Beach were approved. The report on these minutes was received. The death of Historian Emeritus John E. Gurley was recognized with a period of silence in his memory. The following resolution was adopted:

Whereas God in his infinite wisdom called John E. Gurley from this life to life everlasting; and
Whereas Dr. Gurley has been a Fellow of the American College of Dentists almost since its inception, and
Whereas he has served the College as Regent, President, Editor and Editor Emeritus, committeeman and counselor in various capacities, and
Whereas, his influence has guided this organization on its road to high professional ideals;
Therefore, be it resolved that we record our sorrow in his passing and extend to his family our sympathy in their bereavement, assuring them of our acknowledgement that the American College of Dentists, the dental profession and the world at large has benefitted immeasurably by his having been among us.

Reports on various items of interest were received from the Officers and Regents. Favorable reference was made to the meeting of the Section Representatives held in St. Louis on February 22 and 23, 1963.

Treasurer Pierson reported a balance of $3,184.08 in the checking account in the First National Bank, Lincoln, Nebraska, as of April 3, 1963; long term government bonds in the amount of $40,000.00 and $44,000.00 in short term Treasury bills are being held.

The Secretary reported the deaths of the following Fellows since the Miami Beach meeting:

<table>
<thead>
<tr>
<th>Name</th>
<th>City, State</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alvin B. Anderson</td>
<td>Knoxville, Tenn.</td>
<td>January 22, 1963</td>
</tr>
<tr>
<td>John S. Ashbrook</td>
<td>Highland, Fla.</td>
<td>February 6, 1963</td>
</tr>
<tr>
<td>Gerald I. Brandon</td>
<td>Baltimore, Md.</td>
<td>January 24, 1963</td>
</tr>
</tbody>
</table>

These Minutes have been compiled and summarized by Secretary O. W. Brandhorst; the detailed Minutes are on file in the Central Office.

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Lyman J. Briggs (Honorary)  Washington, D. C.  March 25, 1963
C. H. Burmeister  Cincinnati, Ohio  January 8, 1963
Martin L. Christensen  Oshkosh, Wisc.  November 18, 1962
John S. Dohan  Montreal, Canada  December 13, 1962
Frederick J. Feeney  Lawrence, Mass.  September 24, 1962
Harry M. Fisher  St. Louis, Mo.  December 21, 1962
John E. Gurley  San Francisco, Calif.  February 27, 1963
Elmer A. Jasper  Chicago, Ill.  February 1, 1963
Lester E. Kalk  Chicago, Ill.  January 6, 1963
James A. McCartney  Shreveport, La.  April 2, 1963
Hugh A. McElrath  Murray, Ky.  March 8, 1963
Ray A. Maddox, Sr.  Abilene, Texas  February 3, 1963
H. Alder Sebold  Middletown, Ohio  January 28, 1963
C. Carroll Smith  Waterbury, Conn.  March 27, 1963
Phillip A. Traynor  Wilmington, Del.  December 5, 1962
Robert D. Wyckoff  Navy  October 9, 1962

The Board devoted considerable time to reviewing the procedures of the Section Representatives' meeting and considering the suggestions and recommendations of the delegates. The actions of the Board of Regents on these various matters and further suggestions for guidance have been communicated to the Section officers.

Reference committees of the Board were established to review the various activities of the Board. The following committees were designated: Future Development of the College; College Finances; Central Office Facilities and Personnel; Budget; Specialties and General Practice; Survey of Dentistry; Communications; History; and Operation Bookshelf. The chairman of each committee later reported to the Board as a whole.

The following pertinent recommendations were recorded: (1) that there was need for a Committee on Specialties and General Practice that would devote itself to a study of problems of specialization in dentistry as they relate to the elevation of the profession and its services to the public, related ethical standards, etc., as an addition to
those aspects already defined by the Council on Dental Education, with an objective to formulate a series of baselines for guidance; (2) that a closer liaison be developed between the Board of Regents and the Sections; (3) that continued attention and planning be directed toward Operation Bookshelf to assure successful operation; (4) that activities and annual budgetary outlay be planned to provide an annual net balance to ultimately provide a reserve to carry on College activities for at least two years in an emergency. It was felt that present budgeting would make this possible in about five years.

Standing Committees. Actions supporting recommendations of several standing committees were recorded.

Bylaws: The Board of Regents instructed the Committee on Bylaws to prepare necessary resolutions to be presented at the Atlantic City meeting, October 13, 1963, amending Article II of the Constitution, and Section 4 of Article I of the Bylaws. (Details of the proposed changes have been mailed to the membership in a letter dated April 26, 1963.)

Journalism: The Board approved the recommendation of the Committee on Journalism to change the present awards for the annual Writing Award Competition from—first prize $500.00; second prize $100.00, to first prize $300.00, second prize $200.00 and third prize $100.00.

Social Characteristics: The Board approved the plan of the committee to hold a conference on "The Image of Dentistry as Seen by the Dentist and the Public" on Saturday afternoon, October 12, 1963 at Atlantic City.

Institute for Advanced Education in Dental Research: Detailed plans for the Institute to be held at Airlie, Virginia on August 12 to 24 and November 11 to 23, 1963, were presented. This is being developed by the Committee on Research of the College.

Dual appointments: The Board approved the suggestion that two persons be appointed to the several positions relating to ceremonial activities, using them alternately, thus always having experienced persons available. The positions referred to are Marshal, Mace and Torch Bearers, Organist and Orator.

All meetings of the College in Atlantic City will be held in the Chalfonte-Haddon Hall.

Headquarters for the 1964 meeting in San Francisco, Calif. will be the Fairmont Hotel.
Correspondence and Comment

A dental visit to Mexico. W. E. THURMAN, D.D.S., 516 West Twohig, San Angelo, Texas.—For many years I have hunted and fished in the interior of Mexico, and have become interested in the Republic and its people. Last year I accepted an invitation from the University of Nuevo Leon in Monterrey to present a clinic on dental procedures. A number of dentists from the United States have recognized the need for this "good neighbor" policy and have lectured and given clinics in Mexico; I mention only two other Texans, Sam Parks of Dallas and Sumter Arnim of the University of Texas Dental Department.

Monterrey is only a three hour drive from Laredo, Texas. This 105 year old University became the state University of Nuevo Leon in 1933; it is situated on the outer fringe of the city. I was told that the total enrollment was about 19,000. Building is continuing with most of the departments located in the Center. The Administration Building is 15 floors and constructed of steel, tile, and marble. It is truly a beautiful modern building, especially with the sun shining at different angles. American football is played the year around and an enormous stadium is under construction.

The dental department of the school was founded in 1939, and is located in downtown Monterrey. The junior and senior classes, at that time, were separated from the first two year students. I gave my clinic to the upperclassmen; there were about 60 students in each of these classes.

I am unable to recall the names of the many faculty members; they were all most friendly, courteous, and much interested in United States dental techniques. The dean of the dental department is Dr. Estella Barrera, an orthodontist and a charming lady. She spoke English, as did Dr. Manuel Campuzano and Dr. Luis Rodrigues; several of the faculty did not.

At the time of my visit (Spring of 1962) they had plans ready for a new dental building to be located near the Medical School and the University Hospital. This building will house the entire dental student body. There is an abundance of clinical material, and the new location will perhaps offer more.

Frank Morales, a student, met us (Mrs. Thurman accompanied me) in Laredo. He is a graduate of the University of Texas and spoke English fluently. He was a great help in getting us across the Border with all my equipment. Louis Alberto Romas, a graduate of Louisiana State University, was the other interpreter.

My clinic considered the use of hydrocolloid impression material in operative dentistry, with vacuum and hydroscopic investing methods as well as die and cast construction. It was a two hour presentation and was given to the seniors and juniors separately. Both of the students mentioned above were most helpful in assisting me to set up the clinic.

The faculty requested that I demonstrate a practical case for them—prepara-
tions and impression taking. I had not planned to do this and had brought no special equipment, but I couldn't refuse their request. I prepared cavities, including a 3/4 crown on an upper central incisor, and made the impressions and casts. This demonstration answered many questions that the slide-lecture did not stress.

The unit that was available was of German make, and much of the other equipment was Japanese. I felt somewhat like a relief pitcher they had sent into a baseball game with the bases filled, no one out, and with three 300 hitters coming up! My senior student interpreters came to the rescue and assisted me greatly. I had hydrocolloid water-cooled trays and some other minor instruments with me, but their hydrocolloid conditioner was either wired differently or was for a left hander—I had difficulty. Needless to say I improvised a great deal. However, both students and faculty exhibited the greatest interest.

About half of the students, 47 per cent, are women. Those I talked to indicated that this was due to the socialization program; most of them were planning to work in government clinics since both the state and federal governments support Care Hospitals.

Also, I was invited to speak at an evening meeting of the Monterrey Dental Society. Dr. Efrain Covozos Flores was the president. There are several hundred dentists in Monterrey, and about 40 were present; perhaps a third of these were women. Also active in the society was Dr. Halya N. Rodriguez Arizpe, who had had graduate training at the University of Michigan, spoke good English, and was quite helpful; he is the only pedodontic practitioner in Monterrey. Again, my student interpreters—Morales and Romas—were present to give me assistance.

There are four other dental schools in Mexico: at Mexico City, Guadalajara, Puebla, and San Luis Potosi.

Mexico is a wonderful country and the people are most gracious. The dentists are in need of clinic demonstrations, particularly of a practical nature. If any Fellows of the American College of Dentists plan a trip to the Republic, I suggest you arrange to visit the schools. From Texas, the five schools are only minutes by air and a few hours by automobile. I feel certain the schools would welcome you, and likely urge you to tell them of United States dentistry and clinical procedures. There is no better way to further international and particularly Pan American friendship.

Professional pride. DAVID TABAK, D.D.S., 335 South Second Street, Brooklyn 11, N. Y.—In everyday dental practice one's professional pride is constantly challenged—by the patient and by the dentist's own image of his chosen profession. It has to be so. There are wide discrepancies between idealistic aim and workaday performance. When, regardless of the service you have rendered a patient, you have a hidden sense that perfection has eluded you and you find yourself secretly unhappy, that is when professional pride—that reservoir of strength—rises to sustain a faltering ego.

When you have accomplished something which is either in itself artistic, or is helpful to another, a deeply nourishing feeling wells up from your inner resources which you call pride—justifiable pride. This answers a hunger to rise above the pettiness of routine; you realize and experience a superior yet basic linkage with something ineffably harmonious with the Universal.

As a member of a health profession you belong to a court of last resort—a court where the judges are not elevated to the bench by political maneuvering.
nor even by popular vote. You are there in response to an inner humanistic call, buttressed by an unwearying application and single-minded devotion to the study of life's secrets. Thus you come to preside over a court where the "cases" before you are not the routine adjudications of violated rights or the abatement of frictions and dissensions that crowd the courts of law; before your bar of justice appear cases which deal with life's rawness, with all its mystic and its manifold tangents. All this places you in a unique position: you are honored with the rather frightening privilege of adjudicating the problems of health and the enjoyment of life. These are activities that go well beyond the mundane and of a nature that bring you just a bit closer to God.

How strong are your social commitments and your social awarenesses? To what extent do you feel responsible for your "brother" and are glad that you can contribute your mite in functioning as his "keeper"?

Professional pride should be separated sharply from that freakish social phenomenon—snobbism. Snobbism is conspicuous enjoyment of unearned wealth cynically lifted from other people's possessions. A snob parades in borrowed attire, sails under a false passport, hides behind a facade that belies his true character. A snob demands credit for qualities and gifts that are foreign to him. Because he wears a false face and walks on feet of clay, he is constantly in need of shoring up his ego or risk collapse into inferiority. In brief, a snob is a fraud.

Professional pride has to be guarded against still another subtly denigrating pitfall: smugness. Smugness is life in reverse. Instead of plunging joyously and eagerly into the unexplored and intriguing world of knowledge and experience, a smug person feels he has had enough of this "larnin'" nonsense. He pulls up stakes and retires from the world of new ideas so he may enjoy his little bag of educational toys with which he is completely satisfied. Smugness is an arresting, self-defeating stance; it is a blind alley. Smugness is twin brother to mediocrity and holds back advancement. A smug professional is dead to the world, and though he does not realize it, dead to himself.

Dentistry in its manifold forms is a profession of great art. Its possibilities and potentialities for the enrichment of life spread and unfold as far as imaginative eyes can see. To those professionals of limited vision, dentistry is reduced to a series of automatic chores not unlike those of a small storekeeper—a fortuitous activity yielding some sort of a living with but little more. Here it is that professional pride becomes decisive.

Professional pride is found in fields other than the professions. For no matter how humble a man's work may be, if it meets up with his secret dreams and longings and brings a modicum of reality to his life, there ensues that soul-satisfying feeling which earns and justifies pride in accomplishment.

A man with pride in his work will instinctively recoil from shoddiness. He will defend his professional accomplishments against traducers, and steadily and loyally will carry on to new horizons. He will do this without heroics or self-consciousness as a part of his daily routine. To such a man, "work" has long since ceased to be a chore: it has become creative living.

Modern man is a restless man. Dormant for countless ages, his faculties stir with ever greater impetus and vigor. Literally and figuratively he rides the winds. A sense of the infinite but accentuates man's finiteness. The vastness of space and the mysteries of creation curb his arrogance; they humble him and leave him deeply restless. This built-in restlessness differentiates man from beast; it is the fountainhead of his spirituality.

Professional pride, and pride in profession, sustain him.
Changes in Constitution and Bylaws

AMERICAN COLLEGE OF DENTISTS

The Secretary, in accordance with the requirements of the Bylaws, advised the membership on April 26, 1963, that the Board of Regents will ask the consideration of certain changes in the Constitution and Bylaws at the Sunday morning meeting of the College, October 13, 1963, at Atlantic City. The proposed changes follow.

The Board of Regents will recommend that Article II, Section I of the Constitution of the American College of Dentists, which now reads:

**ARTICLE II PURPOSES AND OBJECTIVES**

Section I. The purposes and objectives of the College are as follows:

a. To promote the ideals of the dental profession.
b. To advance the standards and efficiency of dentistry.
c. To encourage graduate studies and continuing educational effort by dentists.
d. To encourage, stimulate and promote research.
e. To improve public understanding and appreciation of oral health service.
f. To encourage the development and use of measures for the control and prevention of oral disorders.
g. To cooperate with other groups for the advancement of professional relationships in the interest of the public.
h. To recognize meritorious achievement, especially in dental science, art, education, literature, and human relations by conferring Fellowship in the College on those persons properly selected to receive such honor.

be changed to read:

**PREAMBLE**

The American College of Dentists, in order to promote the highest ideals of the dental profession, advance the standards and efficiency of dentistry, develop good human relations and understanding with the public, and extend the benefits of dental health services to the greatest number, declares and adopts the following principles and ideals as ways and means for the attainment of these goals:

a. To encourage qualified persons to consider a career in dentistry so that
the public may be assured of the availability of dental health services now
and in the future;
b. To urge broad preparation for such a career at all educational levels;
c. To encourage graduate studies and continuing educational efforts by
dentists;
d. To encourage, stimulate, and promote, dental research;
e. To urge the development and use of measures for the control and pre-
vention of oral disorders;
f. To improve the public understanding and appreciation of oral health
service and its importance to the optimum health of the patient through
sound public dental health education;
g. To encourage the free exchange of ideas and experiences in the in-
terest of better service to the patient;
h. To cooperate with other groups for the advancement of interprofession-
al relationships in the interests of the public;
i. To urge upon the professional man the recognition of his responsibil-
ities in the community as a citizen as well as a contributor in the field of
health service; and
j. To encourage individuals to further these objectives, and to recognize
meritorious achievements and potentials for contributions to dental science,
art, education, literature, human relations, and all the other areas that con-
tribute to the welfare and the promotion of these objectives: by conferring
Fellowship in the College on such persons properly selected to receive such
honor.

The Board of Regents will also recommend that Section IV of Ar-
ticle I of the Bylaws be amended to change the first sentence of said
Section to read:

“A nomination must be presented, on a fully executed copy of the official
nomination form, to the Secretary of the College, before March 1st.” . . .
For a number of years the Secretary has attempted to obtain books written by Fellows of the American College of Dentists for a permanent collection. A special bookcase, prominently placed, in the Conference Room of the Central Office displays the publications.

From time to time in the Journal and in releases from the Secretary, Fellows are reminded of this project and are urged to send to the Central Office a copy of the books they have written. This is such a notice.

Author, may we have a copy of your book to add to the growing Central Office collection of “Books by Fellows?” The gesture will be appreciated.

“. . . the true University of these days is a Collection of Books.”—Carlyle

“. . . there is no Past so long as Books shall live.”—Bulwer-Lytton

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**CALENDAR OF MEETINGS**

**CONVOCATIONS**

October 13, 1963, Atlantic City
November 8, 1964, San Francisco
November 7, 1965, Las Vegas
1966, Dallas
1967, Washington, D. C.
1968, Chicago