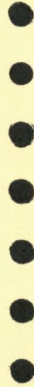


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The American College of Dentists was established to promote the ideals of the dental profession; to advance the standards of efficiency of dentistry; to stimulate graduate study and effort by dentists; to confer Fellowship in recognition of meritorious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

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Dentistry's Potential Contribution To Society*

WILLIAM R. PROFFIT

Class of 1959

School of Dentistry

University of North Carolina

"THE GOAL OF THE dental profession is to prevent oral disease and to promote oral health in the interest of the health and welfare of the public."¹ "The dentist has the responsibility of providing fully of his skills, knowledge, and experience to society in those fields in which his qualifications entitle him to speak with professional competence."² These statements, the one pertaining to the dental profession and the other to the individual dentist, outline the potential contribution of dentistry. For the purpose of this paper, dentistry's potential contribution to society may be defined quite simply: oral health care for all.

Historically, dentistry has progressed through several phases, during each of which the profession has had a different goal. At first the objective was the relief of pain, achieved by extracting the offending tooth. Development successively led to emphasis on restoration of teeth and parts of teeth, elimination of infection, and then control of dental disease. We are now entering a fifth period—prevention of dental disease, where greater emphasis will be put on a public health approach to dentistry.³

This progression of higher and higher goals for dentistry has been accompanied by increasing acceptance and utilization of dental services by the public. In the nineteenth century a dentist was something of a curiosity in most of the country; by 1929 20-25 per cent of the population were estimated to have visited a dental office during the past year;⁴ in 1957 the figure had climbed to 36 per cent.⁵ Seen in this perspective, the climb is encouraging. Yet when it is realized that not 36 per cent but virtually 100 per cent of the U. S. population suffer from some form of dental disease which requires professional care, the dimensions of today's problem are clear.⁶ In this country

* Judged the National Winner of the Writing Award Competition of the American College of Dentists, 1959.

42 per cent of the population have not seen a dentist for at least three years, 34.5 million people have never seen a dentist at all or so long ago they cannot remember when, and there are 21.6 millions edentulous.⁷ A majority of those who need professional dental care are not getting it.

Dentistry's present difficulty does not lie in need for improved materials, techniques, and procedures, though of course all these can and should be improved. If applied by the public, our present knowledge of how dental health can be improved could reduce dental ills by at least one-third.⁸ Present preventive and treatment measures could almost completely eliminate the loss of teeth through caries.⁹ What is needed most of all, then, is extension of the benefits of regular and adequate dental care to that majority of the population who presently regard dentistry with fear, suspicion and indifference. This paper will attempt to examine some of the reasons for the present situation and to suggest some measures needed if dentistry is to approach its potential contribution to society.

The major cause of the dental neglect just cited is public attitude toward dentistry. Forty-two per cent of the population have not visited a dentist for three or more years because they see no need to go; most of the 21.6 million persons are edentulous because they, or their parents, saw no need to take proper care of their teeth. A New York Study strikingly illustrates this point. As an experiment, free dental care with no strings attached was offered to high school students in an underprivileged area. A conveniently located clinic provided care during school hours, and school and health personnel made every effort to see that the students understood the opportunity and took advantage of it. Despite all this, one-third were never interested enough to visit the clinic.¹⁰

Few studies have been made of the attitudes of the public at large toward dentistry, a field which badly needs exploration. The American Dental Association has recently published the results of a pilot study based on long intensive interviews with 126 persons in a small midwestern community. Though this was not intended to be a statistically significant study, its conclusions are reported here as showing tendencies in public opinion.

In these interviews, it was brought out that though teeth are thought of as essential and dental care as important, they are thought of in a negative sense, in terms of pain, trouble, and care. There

seems to be little pleasure or gratification associated with them. The dentist is thought of as a last resort, as the one who fixes teeth that are painful, decayed, or need to be pulled, rather than as the one who can prevent dental disease. The lower socio-economic classes, especially, tend to think of the dentist only as the one who pulls an aching tooth.

The study showed a variance in practice and knowledge about dental care. Dental health education apparently has gotten across a superficial awareness of the importance of professional dental care—even those who saw a dentist only to have an aching tooth extracted usually completed the statement “the dentist . . . should be seen every six months.” But all too often this knowledge carried with it no motivation to act.¹¹

The cost of dental care is a factor in determining public attitude. A study in New York schools by dental hygienists showed the following ranking of reasons for failure to have a periodic dental examination: 1) lack of understanding of importance or complete indifference (60 per cent); 2) economics (35 per cent); 3) miscellaneous (5 per cent).¹² Many dentists feel that “economics” is a reason for neglect given by those who elect to spend for other things. Though this may be partially true, the problem exists.

Coupled with the indifferent attitude of large segments of the public is the short supply of dentists in this country. If through some miracle of education all those who now neglect dentistry suddenly demanded dental services, there would of course, be insufficient facilities and personnel to serve them. This is neither surprising nor alarming, since public attitudes do not change overnight. What is alarming is the fact that dentistry, far from improving its ability to give service, is actually falling behind. There are more dentists in relation to population now than there will be in 1965, fewer in proportion today than there were ten years ago. Whether there is now an unanswered demand for dental care is debatable. Quentin M. Smith states that, “The differences between states and regions in the number of dentists being supported by identical amounts of consumer income is so great that unquestionably many people who want dental care and can pay for it do not get it.”¹³ But from the fact that the average waiting period to obtain a dental appointment has remained constant while the average number of patients per dentist has increased, B. Duane Moen concludes that

dentists are presently able to meet the increased demand through increased productivity.¹⁴ There is every reason to expect the proportion of the population using professional dental service to continue to increase; if dentistry is to fulfill its potential contribution to society, this proportion must increase tremendously. Available dental manpower, and not public appreciation, may soon be the limiting factor in dentistry.

No easy solutions to the problems which face dentistry today are available. However, there are at least six areas in which dentistry must act if progress toward its potential contribution to society is to continue: 1) education of the public; 2) prepayment plans and public health programs for dental care; 3) dental education; 4) dental practice; 5) research; 6) preventive dentistry.

The greatest task facing dentistry in its effort toward reaching its potential contribution to society is in the field of education of the public. Until the general populace develops a different attitude toward dentistry and dentists, the dental profession will continue to occupy a fringe position as a health service. There have been few surveys to determine the attitudes which motivate less than half our population to obtain dental care and the rest to neglect it. Such studies are vitally needed—educational programs to favorably influence public attitudes must be based on these findings.¹⁵ One finding of the previously cited motivation study¹⁶ seems particularly worthy of emphasis: that mere knowledge of the need for periodic dental care is not enough. For that knowledge to be of any value, the individual must be motivated to act on it. Present dental care is lacking because the majority of the population are not willing to act on the basis of the knowledge they have.

The most effective dental health education is that which is done by the dental practitioner in his office. No treatment plan which omits patient education should be considered complete, for every dental patient is interested in his own teeth. The dentist who takes time to explain to his patient what he is doing, how he is going to do it, and why it is necessary can do more to awaken interest and appreciation of dentistry than any dental health education program ever could. No dentist should forget that "doctor" is derived from the verb "to teach."

Dental health education outside the practitioner's office is largely the responsibility of organized dentistry and of government. How-

ever, the individual dentist who is active in his community can do a great deal in this area through personal contacts and addresses to local groups.

The home atmosphere is the greatest determinant of values, and the home is perhaps the least accessible area to health education material. Yet most homes have television and radio now, nearly all receive newspapers and magazines, and in this way health information in considerable quantity does reach into the home. "The quietness that characterizes dental progress is in contrast to the regular flow of information concerning medical and surgical practice. . . . [In these fields] the need for funds for research and the care and correction of afflicted persons is giving the 'full treatment' in mass media and receives the personal cooperation and time of leaders in the business, political, and educational fields. But, except for the personal associations of less than half the citizens of this country who arrange for professional dental care, the needs, objectives, and potentials of dental practice remain pretty much a mystery."¹⁷ Different techniques from those used by other health professions might be required, but there is no reason for dentistry not to utilize the mass media as a means of education. The success, from a journalistic point of view at least, of a syndicated newspaper column on dentistry is impressive. How strange that its author's reward was expulsion from the local dental society on the grounds that the column was a weekly advertisement!¹⁸

It is often said that perhaps the best dentistry in this country is practiced in the Pacific Northwest. Is it coincidence that the public there is constantly reminded of dental health by advertising dentists? Admittedly the advertising which Seattle hears is in very poor taste; this is no reason for ethical dentists to think that all publicity which can help the dental profession better serve the public is to be condemned.

Dental societies and public health departments have traditionally relied on programs presented at schools to get across the message of dental health care. Though such programs have had a degree of success, it is more and more felt that health education should be an integral part of the school curriculum. It is in the lower grades that habits and attitudes are formed, and instruction in health by the teacher is an almost universal feature of elementary teaching. Yet adequate dental health information is conspicuous by its absence

from most health education courses for teachers. It is perfectly possible for a child to go through school without so much as learning the proper way to brush his teeth. After all, how can the teacher teach what she doesn't know herself? Dental societies interested in dental health education in the schools would do well to get the interest and cooperation of the teachers. A special program for teacher instruction might well be of more eventual benefit than a one-shot program aimed directly at the pupils.

As mentioned earlier, many efforts are being made to remove economic considerations when dental care is needed. It is interesting to quote from a 1955 address to the American College of Dentists by Congressman Short of Missouri: "I am of the opinion that the American people will demand a dental health program. Perhaps it will be paid for by the government in part, by industry in part, and in part by the patient himself. But it is inevitable that some type of program will be adopted. In my opinion it is wiser for you to not only accept the program, but to encourage and develop it yourselves. . . ."19

At the present time, dental care programs are still in limited and experimental form, though the insurance principle has been shown applicable to dental needs.^{20, 21} Dentistry would certainly be aided by a sound program to minimize economic reasons for dental neglect, whether such a program were privately managed or government controlled.

The need for greater numbers of dental graduates and for more dental schools has been pointed out by several recent surveys and has already been discussed.^{22, 23, 24} John Brauer correctly points out that there is no reason to assume that the present dentist-population ratio is the correct one; through better preventive measures and more effective use of dental manpower, higher ratios may be adequate.²⁵ However, it is interesting to note that in Norway, where dental care for all is more nearly a reality than in this country, an effort is being made to lower the dentist-population ratio to 1:1400 in order to extend complete care to all children under eighteen.²⁶ In planning for future dental manpower, the probability of an effective demand from an increasing proportion of the population should not be overlooked.

An expanding program of dental education must also consider the attraction of qualified persons into the profession. Certainly it would be an error to attempt to increase the number of dentists by

lowering the academic standards of dentistry. A dental education is more expensive than that for practically any other profession, so expensive that it is not within the means of the average family.²⁷ Dental education is now subsidized indirectly through deficit operation of dental schools, deficits which are covered by state appropriations or other sources of income. New Zealand has resorted to direct student subsidization on a large scale. Forty per cent of the dental students there receive free training, and enrollment has increased 40 per cent since the program was inaugurated.²⁸ Though American dental schools are full, scholarships and fellowships, now practically non-existent in dentistry, would help greatly in attracting qualified students to the profession.

The present dental curriculum, largely organized around a 1935 curriculum study, has been criticized as being inadequate to meet the needs of the future.²⁹ To quote Dean W. C. Fleming, "If dental education is going to assume its part in providing the necessary manpower requirements, it is going to have to do some self-analysis and initiate certain fundamental changes. . . . It may be that our greatest need in the future will be to break with the traditional dictums of today's leaders. . . ."³⁰ A shift of emphasis in dental education is the forerunner of a shift of emphasis in dental practice, and if dentistry is to fulfill its potential contribution to society, there must be a new emphasis on biologic principles in prevention and on dentistry's social responsibility. Significantly, several schools are now engaged in curriculum modification and experimentation.

Maximum service from trained dental personnel requires that the dentist perform only those tasks which require his professional skill and delegate the rest to assistants. Two dental assistants can allow the dentist to increase his weekly patient load by two-thirds; use of modern equipment and methods of practice management also lead to more efficient practice.³¹ Certainly dentistry has no manpower to waste through inefficient practice.

The need for dental research has been emphasized many times; there is no need here to attempt to show the contributions it can make. Research is the foundation of progress, and dental research is at last beginning to receive the support it needs. It is rather ironic that public acceptance of fluoridation of public water supplies, a great contribution of dental research, is no more complete than acceptance of other dental treatment.

Dental research will in the future undoubtedly lead to advances

in the prevention and treatment of dental disease. Preventive dentistry still depends on professional dental care, and it will almost certainly continue to do so. Prevention is the basic weapon in dentistry's fight to improve the oral health status of the nation; professional care at the time it is needed is the most important facet of preventive dentistry. In the Sandinavian countries, practically 100 per cent of the children attend school dental clinics. A comparison of thirteen year old children in Oslo, Norway, and Richmond, Indiana, showed a loss of 6 teeth per 100 children in Oslo, a loss of 100 teeth per 100 children in Richmond. Yet the caries rate in the two cities is practically identical. The difference is due to the fact that the Norwegian children had seventeen times as many fillings as did the Americans. Not only did proper care prevent dental mutilation, but also the Norwegian children seem to become dental health minded adults.³² If preventive dentistry of this type is not emphasized, there is little hope that dentistry can approach its potential contribution to society.

Dental health cannot be divorced from the total health status; any health evaluation which ignores the dental condition is dangerously incomplete. Dental diseases are the most frequently occurring diseases of man, and most are self-perpetuating rather than self-limiting.³³ The maintenance of an intact body surface is very important to general health; dental disease provides portals of entry to the body. It is not surprising that a study of Naval Aviation Cadets showed that the 15 per cent of a group of 1080 cadets who required the greatest amount of medical care during a year had a significantly higher rate of dental disease (as measured by DMF rate) than the rest of the group.³⁴ The health of its population is one of the greatest assets any nation can possess, and increasingly there is a tendency to regard health as a national asset to be carefully guarded. Militarily, economically, and socially, the benefits to the nation from oral health care for all would be enormous.

The amount of oral rehabilitation which was required during World War II served to emphasize the value of dental care for many who had never before considered it. At the beginning of World War II, when minimum dental standards for induction into the Armed Forces were established, so many men were rejected on dental grounds that even these standards had to be waived. The nation had no choice but to attempt oral rehabilitation of its fighting men, at great expense and effort in a time of extreme emergency. The situa-

tion has changed little since that time—many a recruit is still introduced to dentistry during his tour of duty, as what is left of his dentition is salvaged in order to protect his ability to fight.³⁵

The economic welfare of the nation depends on the health of the working population, and every year there is an important economic loss because of illness. In one large industry, the direct loss of employee time due to dental disease is only one and one-half per cent of the total;³⁶ the indirect contribution of neglected oral lesions may be considerably greater. Those industries which have adopted dental care programs have benefited in terms of increased production and better worker morale far beyond the cost of the dental care.³⁷ Similar benefits could be realized nationwide.

Another type of economic loss from dental neglect is that involved in attempting to salvage badly broken down teeth. Regular dental care and treatment of dental lesions in the incipient stage is much less costly.

The social value of adequate oral health care cannot be overlooked in any evaluation of the worth of such a program. Dento-facial abnormalities which are correctible by dentistry are every day reasons for social withdrawal and failure to get along in society. A Class II malocclusion, broken incisor, or missing tooth may have implications far beyond its strictly dental significance; the social well-being of the individual may well depend upon its correction. Care given the teeth has a direct correlation with social status.

Dentistry's potential contribution to society, oral health care for all will not be an easy goal to approach. Yet if dentistry is to retain and reinforce its position as a health service, the profession must strive to improve its service to the public. To paraphrase Robert E. Lee, "We cannot do more; we owe it to ourselves and to society to do no less."

SUMMARY AND CONCLUSIONS

Dentistry's potential contribution to society may be defined as oral health care for all. The fact that, while virtually all of the population have some form of dental disease, only 36 per cent now receive regular dental care, illustrates how far from that goal dentistry is at present.

There are two main reasons for the present situation: 1) public attitude, influenced both by ignorance of the value of dental care and by economic considerations; 2) the growing shortage of dentists,

which may already be depriving some of dental care who want it and can pay for it.

Action in at least six areas is needed to help dentistry more nearly realize its potential contribution: 1) emphasis on dental health education by the individual practitioner and by the profession as a whole; 2) development of dental care programs which will minimize economic considerations when dental care is needed; 3) changes in the pattern of dental education to give not only a greater number of graduates but also training with more emphasis on preventive dentistry and public health dentistry; 4) increase in efficiency of dental practice; 5) greater emphasis on basic research; 6) greater emphasis on preventive dentistry, utilizing research findings.

The benefits to society from achievement of oral health care for all would be enormous. Militarily, it would improve the nation's fighting readiness by removing the need for oral rehabilitation of recruits; economically, it would reduce the loss of productive effort caused by dental disease; socially, it would prevent the stigmatization which uncorrected dental conditions impose. The achievement of adequate oral health care for all will be difficult; the profession must strive to achieve it in order to retain and reinforce its position as a health profession.

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EDITOR'S NOTE: *In the following pages of this issue we bring you the material comprising the symposia presented at our Convocation held at Dallas, Texas, November 8, 1958. Each of these papers is outstanding, and you will find them interesting and easy reading.*

A.E.S.

The Efficient Use of Auxiliary Dental Services

The Purposes of Auxiliary Dental Services in Dental Practice

Paul L. Chevalier, D.D.S., Richmond, Va.

How Can the Efficient Use of the Auxiliary Services Aid in the Dental Manpower Hour Situation?

George E. Waterman, D.D.S., Washington, D. C.

The Need for Teaching the Dental Student How to Utilize Effectively the Services of a Dental Assistant

Kermit F. Knudtson, D.D.S., Chapel Hill, N. C.

Intra-Office Supervision and Extra-Office Direction of Auxiliary Services

Allison Gale James, D.D.S., Beverly Hills, Calif.

The High School Girl as a Part-Time Dental Assistant

Ralph H. Campbell, D.D.S., B.S., Detroit, Mich.

Moderator

PAUL L. CHEVALIER, D.D.S.

Richmond, Va.

The Purpose of Auxiliary Dental Services In Dental Practice

PAUL L. CHEVALIER, D.D.S.

Richmond, Va.

EDITOR'S NOTE: *Dr. Chevalier is a graduate of Indiana University School of Dentistry, 1922. Since graduation he has been associated with dental education, first on a full-time basis and presently part time. He is Professor of Restorative Dentistry at the Medical College of Virginia School of Dentistry. He is active on many committees at both state and local levels. He is a charter member of the American Academy of Crown and Bridge Prosthodontics.*

IT MAY APPEAR very obvious that the topic which has been assigned to me could be covered in very few words. It is analogous to a similar question which could be projected, e.g. "What is the purpose of medical auxiliary personnel in a physician's office?" After further thought on this subject I can see where there

may be, at least two entirely different interpretations as to the purpose of auxiliary personnel.

I am sure that most of us are familiar with the many studies which have been made relative to the financial advantage derived by the dentist who employs auxiliary personnel and operates a multiple chair office. The exact figures are not of importance, suffice to say, that it is very apparent that the dentist who has more than one operating room, and employs one or all of our auxiliary personnel, e.g., receptionist, secretary, dental assistant, technician, and/or a hygienist will have a far greater income than the individual who has a one chair office without auxiliary personnel. However, I personally would severely criticize the individual who employs auxiliary personnel *solely* as a means of increasing his income.

It appears to me that the primary justification for the employment of auxiliary professional personnel should be to *relieve* the more highly trained individual from performing those services for his patients which could be rendered as well by an individual with less comprehensive training. This would result in the more thoroughly trained individual rendering a maximum efficient and adequate service to his patient to the best of his ability.

There is one phase of the use of auxiliary personnel and multiple chair offices which should be considered. If for instance every

minute of the dentist's day is to be occupied by an accelerated program of utilizing all of his available time rendering professional services to his patients, this could be detrimental to his health and life expectancy, hence the purpose of the program would be defeated.

The title of this paper, if you will permit me to remind you is, "The Purpose of Auxiliary Dental Services in a Dental Practice." Possibly I should not inject a question of doubt about the dangers of delegating to various groups and individuals, duties and services which, until by recent legislation in many states, could be performed only by an individual with a degree of Doctor of Dental Surgery and licensed to practice in the state in which he resided.

I have been advised that in some other countries we have what is known as a "Public Denturist," e.g. an individual who after a very short course in denture construction may accept patients and construct dentures upon receiving permission from a licensed dentist. To me this is a very dangerous trend in regard to the recognition and use of auxiliary dental personnel without adequate and proper supervision by the dental profession. Likewise it is conceivable that in order to further meet the increasing demand for dental services, pressure may be brought to bear on our profession to train additional auxiliary personnel. For example, it would not be difficult nor would it require much time to teach individuals how to take impressions for partial dentures, full dentures, insert gold inlays, amalgam and silicate fillings, fixed bridges or any other phase of restorative dentistry. In fact, on several occasions I have heard dentists admit that their assistants or hygienists are performing some or all of these services in their offices, although they are aware of the illegality of this practice. Furthermore these dentists are members of the American Dental Association and many of them are members of the American College of Dentists.

The 1958 report of the Committee on Auxiliary Dental Services which was presented to the Board of Regents stated: "While it was felt that the training of auxiliary dental personnel was really outside the consideration of the committee, it was agreed that the committee did have an interest in whether or not the training of the personnel was such as to enable such personnel to serve the practitioner in the best possible way. The committee felt that the training of the dental assistant should not be a part of a dental school program, as such, but left to Vocational High Schools and Junior

Colleges with the profession, possibly through the Council on Dental Education, suggesting areas for study and inclusion in training."

As Chairman of the committee I signed this report. However, after further consideration it is my opinion that the training of all auxiliary dental personnel should be under the direct supervision of the dental profession and preferably conducted in a dental school. Although this type of training may be desirable, yet we must recognize the fact that it may not be possible because of the lack of finances and teaching personnel.

It is very important for the dentist to know how to utilize the services of his auxiliary personnel in the most efficient manner. What better way could this be accomplished than to have these individuals trained in the dental school and assist and render services to the dental student in his clinical years? Also this type of training would be very valuable to the auxiliary personnel. Unless the dental profession assumes the responsibility for the training, licensing and establishing regulations for their conduct and duties, how can we expect to control the extent of their services to the profession and the public?

In conclusion I would like to repeat that the main purpose of auxiliary personnel in a dental practice should be to enable the dentist to render the most efficient service to his patients of which he is capable in both quality and quantity.

How Can the Efficient Use of Auxiliary Services Aid in the Dental Manpower Hour Situation?

GEORGE E. WATERMAN, D.D.S.

EDITOR'S NOTE: *Dr. Waterman is a graduate of the University of Minnesota College of Dentistry, 1931. He is a Diplomat of the American Board of Pedodontics. He entered the U. S. Public Health Service in 1931 and is currently Chief of the Dental Service Branch, Division of Indian Health, in Washington. Since 1946 Dr. Waterman has been active in developing greater use of auxiliary dental personnel. He conducted the Dental Care Study Project at Richmond, Indiana recently and is well qualified to discuss the use of auxiliary personnel.*

THE DENTAL PROFESSION and those in the field of dental education are seriously concerned and rightfully so, with the dental manpower problem. It is an inescapable fact that the population is increasing at a greater rate than the rate at which new dental manpower is being created. True, the number of dental graduates has risen steadily in recent years. However, the number

is not adequate to do more than replace the dentists who die or retire.

It has been estimated¹ that there were 58 active dentists for every 100,000 population in 1930, compared with 46 per 100,000 population in 1955. According to the latest information available,² the national ratio of active dentists to total population is approximately 1:2,200. An optimum ratio of dentists to general population has not been determined. Such variables as the state of dental health of the population, socio-economic conditions, the degree of effective utilization of existing dental care resources by the profession, and the demand for dental treatment preclude an accurate determination.

Limited studies and surveys have indicated a wide variation in the number of individuals for whom a dentist can adequately provide treatment. The Richmond Study³ indicated one dentist working under near ideal conditions, with an adequate number of well-trained, fully utilized dental assistants, could provide complete corrective care, exclusive of orthodontic service, for approximately 550 new child patients (6-16 years) per year. According to the 1956 Survey report of the American Dental Association, the mean number

of patients treated or examined in 1955 was estimated to be 1,056 by the non-salaried dentist; the mean number of patient visits was estimated to be 2,977. Based on this figure, it is estimated that 73,000,000 persons or 45 per cent of the civilian population visited their dentist during 1955.⁴

Unfortunately, we are faced with the fact that dental defects are occurring much more rapidly than we as a profession can correct them. With population trends reflecting a marked annual increase, it appears doubtful that we can satisfy the demands for dental care services for this and future generations unless there is an immediate and marked improvement in the utilization of our existing and pending dental manpower resources. In other words, we must, if we are to discharge our obligation to society, provide more and better dental health services without an appreciable improvement of the current ratio of dentists to population.

If we accept this postulation, the most logical and least controversial means of providing increased dental care service is through wider and more effective use of trained dental auxiliary personnel. With few exceptions, every operation for which the dentist receives remuneration is one which he must perform with his two hands during the number of hours he is providing health services in his office. The quantity of dental health services provided per dentist is, therefore, largely dependent upon two factors: time available to the dentist, and his speed of operation. Anything that deters or restricts these factors reduces the quantity and quality of treatment provided. Conversely, any routine that will conserve the dentist's time and increase his efficiency will correspondingly augment the quantity and quality of his services and, equally important, conserve his energy.

This is where the well-trained, fully utilized chairside assistant plays such a vitally important role. It is paradoxical that we as members of a team providing health services make little serious attempt to conserve our physical and mental resources. All ethical tasks the dental assistant can be trained to perform that will expedite the treatment procedure and conserve time and energy of the dentist should be delegated by the dentist. Each of the functions performed by the chairside assistant may not represent a significant amount of time; however, when multiplied by the number of functions performed in a given period of time, the saving in time and energy to the dentist is significant.

In terms of productivity, operative dentistry is probably the most significantly affected by full-time chairside assistance, because of the multiplicity of tasks that can be delegated by the dentist. In the Richmond Study⁵ it was estimated that during routine operative procedures the difference in workload done by a dentist working with one assistant was slightly less than 50 per cent of the workload required of the dentist working alone. The workload was reduced to 27 per cent of that of the dentist working alone when two assistants were used, insuring uninterrupted chairside assistance for the dentist. While the productivity of oral surgery, orthodontic, prosthodontic, and periodontic treatment procedures may not be increased as markedly, the ease with which the treatment is accomplished no doubt will result in a significant conservation of the dentist's time and his mental and physical energy; quality of service will be enhanced; treatment will be more pleasant for the patient.

The 1953 Survey of Dental Practice by the Bureau of Economic Research and Statistics of the American Dental Association⁶ found that dentists with one auxiliary employee averaged 53.8 per cent more patients than dentists with no employees, 107.3 per cent more with two employees, and 219.3 per cent more with three employees. These increases were further substantiated in the 1956 Survey of Dental Practice⁷ by the Association, in which the greater income representing a greater quantity of dental services was quite evident with increased numbers of auxiliary personnel. The mean net income of independent dentists with one chair and no employees was found to be \$7,494; with one chair and one assistant it was \$11,444; and with two chairs and two assistants it was \$19,610. This report further stated the mean number of patients increased from 704 for dentists with no employees to 2,430 for dentists with 3.5 or more employees.

Coomer⁸ has stated that the dentist increases his weekly patient load approximately 36.8 per cent by employing one auxiliary, and 68.8 per cent with two employees. Thus, if a dentist working alone is able to render an adequate service for 10 patients a day, he will be able to serve 16 to 18 patients in the same time if he intelligently uses the services of two well-trained employees and if he has two, preferably three, operating rooms resigned and equipped for efficient operation.

The 1956 Survey showed that 22.9 per cent of the independent

dentists reporting had *no* employees. Sixty-nine per cent employed full-time assistants. It is encouraging to note a 13 per cent increase from 1952 to 1955 in the number of dentists employing some type of auxiliary personnel.⁹

Only 5.1 per cent of the dentists reporting in the 1956 Survey employed two assistants. Assuming only 5.1 per cent of the dentists employ more than one assistant, it is reasonable to conclude that only a comparable proportion of the dentists employing assistants utilize them to the full effectiveness. One assistant cannot effectively provide chairside assistance, if she is also expected to discharge the duties of secretary-receptionist and the routine tasks about the busy dental office. In order for the chairside assistant to work most effectively with the dentist, she must be at the patient's side continuously during the process of active treatment. All other concurrent functions and services incident to office routine should be performed by additional trained auxiliaries.

The availability of adequate numbers of well-trained dental assistants does not indicate, much less insure, successful utilization of auxiliary personnel. Time available for this presentation will not permit a detailed description of all the tasks that should be performed by dental assistants. There are certain general conditions considered essential to successful and complete utilization of such personnel.

The dentist must have a broad working concept of how to use his assistant to her fullest capacity. This he can achieve by analyzing each operation to determine what segments of the procedure should be delegated. His concept of how to use his assistant should not be a static one; through observation of the use of assistants and through his own experience, he has an excellent opportunity to improve continually his utilization of all types of auxiliary personnel.

The assistant must have a detailed knowledge of what her duties are and how to perform them rapidly and thoroughly; her performance of duties should be evaluated periodically by the dentist and discussed. She should be made to realize through the actions and advice of the dentist that she is an important part of a health team providing an essential service to humanity. The dentist and his assistant must strive constantly to achieve smooth running, highly coordinated teamwork. The assistant in effect should develop into an extra pair of hands for the dentist; he, in turn, should regard the

extra hands as indispensable to his work. Every conscious movement of efficiently utilized personnel should be a time-saver to the dentist. Much of the success of this teamwork will be dependent upon the dentist's work habits. Optimum results occur when his procedures are consistent, and the variations in sequence of instrumentation are kept to a minimum. Other important factors contributing to maximum utilization of auxiliary personnel are: a consistent supply of patients, treatment planning, and efficiently arranged office, modern, multiple chair equipment, and duplicate sets of frequently used instruments. There should be periodic meetings of the office staff to discuss problems and suggest methods of improvement. Salary scales must be equitable and adequate; periodic increments and regular vacation periods are important. Auxiliary personnel should be required to participate regularly in refresher training courses when available. The dentist should avail himself of every opportunity through training to improve his knowledge of the use of auxiliary personnel.

It is a well established fact that hygienists have increased the availability of dental care at the office of private practitioners. It has been estimated¹⁰ that a fully active hygienist should provide approximately 2,000 hours of service annually. If these hours are devoted to activities which would otherwise be carried on by the dentist, the contribution of the hygienist would obviously be the equivalent of 2,000 dentist hours to provide restorative procedures. Hygienists may increase markedly the availability of dental care in offices through the assistance they provide the dentist and through the additional man hours they can make available to him for the utilization of his professional skill. She also provides an essential service through the health education she directs toward the clientele.

In the 1956 Survey Reports⁹ of the American Dental Association, the number of dentists reporting full-time employment of hygienists was 8.6 per cent, a 2 per cent increase over the 1952 Survey. Unfortunately, the supply of hygienists is inadequate; for example, the anticipated need for hygienists in the New England Region alone exceeds the supply by an anticipated 1,115.¹¹ If hygienists are to make their full contribution to relieving the dental manpower problem, the supply must be greatly expanded. It is reasonable to expect the demand for dental hygienists will increase markedly with the increasing number of younger dentists who, having been given

the opportunity of working with auxiliary personnel during their undergraduate training, will have a greater appreciation of their importance. According to available information, 860 hygienists are being graduated annually by the nation's schools.¹¹

The efficient use of dental technicians and well-qualified laboratory services are important factors in our attempt to conserve dental manpower hours for the purpose of providing professional services. Only 3.6 per cent of the dentists surveyed in 1955 employed a full-time technician.⁹ It was estimated that 70.4 per cent of all dental laboratory work in 1955 was done by commercial laboratories. Obviously, had not a large proportion of this service been provided, considerably more time would have been required by the average dentist to perform the service in his own office. It was estimated, for all types of practice, that a mean of 4.1 hours per week of independent dentists' time was devoted to the laboratory, 35.3 hours per week to the chairside and 3.8 hours per week to the office.¹² It appears logical to conclude that practically all laboratory procedures, preliminary to fabrication of dental restorations, could be delegated to trained dental assistants. Pouring impressions, trimming casts, building bite rims, investing inlays are but a few of the tasks that can be performed expertly by well-trained auxiliaries, thus relieving the dentist of these time-consuming duties.

The procedure as heretofore described should be readily adaptable to the average dental practice. It is a method which requires a minimum of effort by the dentist and yet will provide maximum economic returns. It is a means for providing quickly and economically a considerable increase in dental care services to the population.

The complete utilization of adequate numbers of auxiliary dental personnel not only conserves time and energy of the dentist, but enhances considerably his professional dignity. We of the dental profession were trained to provide the best possible restorative, curative and preventive oral health services. It is incumbent upon us to exert all of our efforts to this end, unburdened by the innumerable activities incident to such service that can and should be delegated to auxiliary personnel.

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Teaching the Dental Student How to Utilize Effectively the Services of a Dental Assistant

KERMIT F. KNUDTZON, D.D.S.

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In 1953 he left private practice to join the faculty of the School of Dentistry, University of North Carolina at Chapel Hill, where he is Professor and Head of the Department of Practice Administration and Dental Science.

UNTIL THE PAST few years, dental students have never worked with chairside assistants during their school days except in isolated areas, such as oral surgery, pedodontics, or other specialty fields where a dental assistant was provided by that particular department to give token aid to the student.

Having been accustomed to working alone during his school years, the young graduate generally worked alone until his

practice grew to the point where he realized it was impossible to continue to admit the patient, answer the phone, make appointments, collect the fee, and perform a myriad of little annoying but essential tasks which were now interfering with his practice. At this point he decided to inquire about a girl who might be interested in becoming a receptionist or dental assistant. The assistant was chosen chiefly on personal characteristics and reported Monday morning for duty. She stepped into a busy office and usually received her training during and between patient treatments or at a broken appointment period. It was far from systematic and six months to a year was required before a girl became a helpful person in the office. True, she learned the reception room duties, sterilization of instruments, etc., in a lesser period of time, but the dentist generally continued to work alone in the operatory as before. He was hesitant in allowing her to pour up an impression, cast an inlay, or mix the cement for setting a bridge. It took too much time to teach her "these things," and he didn't quite trust his girl to do such more important tasks. In most cases the assistant never became an assistant, but remained chiefly a receptionist who greeted the patient and "cleaned-up" between appointments.

Training the new girl was foreign to the neophyte employer-dentist, and lack of "know how" resulted in very sketchy and inefficient training. Likewise, he did not realize how many tasks can and should be delegated to a capable dental assistant.

In the 1953 Survey of Dental Practice by the Bureau of Economic Research and Statistics,¹ the summary statement points out that "Dentists with one auxiliary employee averaged 53.8 per cent more patients than dentists with no employees; with two employees, the increase was 107.3 per cent, and with three employees, 219.3 per cent."

The 1956 Survey of Dental Practice² states: "Among dentists with one chair, the mean (net income) was about 50 per cent higher for dentists with one employee than for dentists with no employees. Among dentists with two chairs, the mean (net income) was from 37 per cent to 52 per cent higher for dentists with two employees than for dentists with one employee."

From these figures and other data contained in the two ADA Surveys, should immediately evolve certain conclusions: (1) I cannot afford to work without an assistant, (2) I must plan on adding a second operator to my office, and (3) I'm going to hire a second assistant, or receptionist-assistant just as soon as my practice warrants such a move.

Dr. John C. Brauer, Dean of the School of Dentistry, University of North Carolina and Consultant to the Office of Defense, Assistant Secretary of Defense (Health and Medical), in an article concerned with the "Dental Manpower in North Carolina"³ said: "The wasted manpower in dentistry is tremendous, perhaps as much as 35 to 50 per cent, when one evaluates the potentials of a dentist who is trained in the effective use of the assistants and when well-trained dental assistants are available."

Dr. Brauer, in a paper presented before the American Dental Assistants Association⁴ at their present meeting here in Dallas, states: "Accordingly, an important question arises, what percentage of the assistants presently employed are 40, 50, 75, or perhaps 90 per cent efficient in present-day accepted standards of dental assisting? Many hundreds of thousands of dollars are lost to the profession annually by the on-the-job method of training by dentists who have never been trained in how to use a dental assistant effectively."

Much has been written concerning the acute dental manpower

shortage and its partial solution through the use of auxiliary personnel.

The United States Public Health Service (Division of Dental Resources), The American Dental Association (Council on Dental Education, Bureau of Economic Research and Statistics), the American Dental Assistants Association, the Kellogg Foundation through a series of grants to regional Education Boards and Workshops, some dental educators, and private practitioners interested in the field of Dental Practice Administration have for years been shouting this philosophy from the roof-tops, however just within the past few years have concrete measures been taken to correct this grossly neglected area within our profession and teaching institutions.

The year 1956 is a year to be remembered in the history of dentistry. In that year the recommendation was made by the Council on Dental Education⁵ of the American Dental Association to the House of Delegates of that body that dental students be trained in the use of auxiliary personnel. In that same year, the basic plan for establishing a series of pilot-study research programs in dental schools to determine the best methods of training dental students in the use of chairside assistants was inaugurated.

A planning conference sponsored by the Division of Dental Resources, United States Public Health Service was held at Washington, D. C. in August 1956 at which representatives of eight schools participated. This committee studied the advisability and practicability of instituting an experimental program in one or more dental schools dealing with the problem of training dental students the effective use of chairside dental assisting as an available means of improving the utilization of dental manpower.

The following is a result of these deliberations: Three of the schools began operation of such programs during the fall and winter of 1956. At the present time, six schools have research studies in methodology of teaching dental students in the use of chairside assistants.

A conference of Deans and Supervisors of these six schools conducted by the United States Public Health Service, Division of Dental Resources last July in Washington, D. C. indicated that the six programs varied greatly, not so much in their philosophy as in their *modus operandi*. Some schools employ only certified dental assistants; others employ only untrained high school girls, still others

employed wives of dental students. The number of assistants in the six different projects varied from two to ten assistants. The assistants' pre-clinical training varied from one week to three months of lectures, demonstrations, and laboratory procedures. The indoctrination period likewise was different in each program. The on-the-job training of the student-dental assistant teams ran the gamut from one week in the senior year to a full academic year exclusively with the same dental student. At some schools the dental students were selected at random, others were selected on the basis of deficiency or superiority in their clinical activity. Some dental student-dental assistant teams were stationed in limited clinical areas only, while others rotated through all the clinical areas.

The School of Dentistry, University of North Carolina, now in the second year of its pilot study program, selects ten girls annually on the basis of high school grades, a series of college entrance examinations (didactic and manual dexterity tests) which are conducted by the University Testing Bureau, plus a favorable interview by a selection committee of the School of Dentistry. The course consists of a three-month intensive summer education (lectures and demonstrations) in 18 basic sciences and clinical dental subjects given by members of the University of North Carolina dental faculty for a total of 433 hours. Last summer a two-week, pre-clinical chairside assisting experience with senior dental students was also included in the curriculum. Comprehensive written, oral, and practical examinations consisting of 200 didactic and 350 practical questions for a total of 550 graded answers are given at the end of the training period. These examinations are repeated at three and six month intervals, during the academic year. Nine of the ten girls successfully completed the course and passed the comprehensive examinations. These girls returned in September for an additional nine-months on-the-job training. This year, five girls were assigned to work exclusively for five junior dental students, and will accompany the student to block assignments in oral surgery, pedodontics, and oral diagnosis, as well as assist him in the general clinic areas.

The assistant will prepare the patient, aid in taking and mounting x-ray films, and in charting of the case history. She will secure the supplies and materials needed for each operation and set up the bracket table, prepare the syringe for local anaesthesia, assist at all operative procedures, prepare and mix various impression and filling

materials. When a check-point is about to be desired, the dental student will ask his assistant to call the instructor, while he continues to complete the last few minutes of that particular operation.

She will further make future appointments, clean up the operating area, and secure the chair and unit. She will also fill out the patient's charts and record the daily work sheet.

She will not only assist the student at the chairside but in the laboratory as well. She has been trained to run up dies and models, trim and mount casts, make rough wax carvings of inlays and crowns, execute castings, and do preliminary finishing.

The five junior dental students who have permanently assigned assistants were selected at random by the Department of Biostatistics, School of Public Health, University of North Carolina. These five students plus the nine dental assistant trainees returned to the School of Dentistry for an intensive three-day orientation period just prior to the Fall registration. They received eight periods of indoctrination in how to work as a "dental team" in the following areas, operative dentistry, periodontics, surgery, pedodontics, prosthodontics, endodontics, roentgenology, and crown and bridge prosthodontics. Each of these eight departments prepared a check list of chairside and laboratory duties for the dental assistant to perform when working with the dental student, plus a list of duties *not* to be relegated by the dental student to his assistant. (In a private office, the assistant would be given even more duties and responsibilities, however in a dental school, the student must learn and do certain phases in operative and laboratory procedures which after graduation, he may if he chooses delegate to a capable assistant.)

Films were shown the dental student-dental assistant teams. One film⁶ is relatively new and is an excellent color, sound film depicting a day in the life of a busy practitioner with two operatories and two well trained dental assistants. The other is the story of the *Richmond, Indiana Study*⁷ sponsored by the city, the State Health Department, and the Public Health Service's Division of Dental Public Health. We plan to reshow these films several times during the academic year to the dental student-dental assistant teams, believing that they will have newer and greater values as their clinical experience progresses.

At the conclusion of the previously referred to meeting of Deans and Supervisors of the various dental assistant projects held last July

in Washington, the following categories and questions were compiled. The provocative thinking and possible solutions by the six schools represented in the teaching of dental student-dental assistant teams:

DENTAL STUDENTS

1. At what point in his undergraduate training would the dental student be introduced to the use of the dental assistant?
 - a. Teaching methods to be employed.
 - b. Curriculum changes required.
2. What is the optimum training period required to teach dental students to work with assistants?
3. What effects does the training in utilization of dental assistants have upon the student while he is still in dental school? After he enters practice?
 - a. His appreciation of the value of dental assistants.
 - b. The level and scope of his achievements as a student.
 - c. The efficiency and quality of his work.
 - d. His use of dental assistants after graduation and the effectiveness with which he uses them.

DENTAL ASSISTANTS

1. How should dental assistant trainees be selected and to what level should they be trained?
 - a. Selection of trainees.
 1. For dental school use.
 2. For private practice.
 - b. Length of training.
 - c. Scope of activities (Are there new and better ways to use assistants?)
 - d. Teaching methods.
 - e. Types of institutions in which assistants should be trained.

POSTGRADUATE TRAINING

1. Can this program be expanded to include Refresher and postgraduate courses for dentists and their assistants?
 - a. Optimum length of courses.
 - b. Course content.
 - c. Advisability of integrating course with training in practice administration or other courses, such as pedodontics.

Another illustration in the progressive thinking concerned with the training of dental assistants is contained in the Workshop Papers⁸ of a group of 70 educators and leaders in practice administration and various peripheral dental ancillary groups. This workshop on the Education and Classification of Dental Assistants, sponsored by the Council on Dental Education, American Dental Association was held in Chicago, Illinois, Oct. 2-4, 1957.

At the conclusion of the three-day conference, the participants made certain recommendations to the Council on Dental Education of the American Dental Association. The council will in all probability make recommendations regarding the minimum skills and knowledge which a dental assistant should have to the House of Delegates of the American Dental Association, following further evaluation and study.

The following quotation by Goethe which is printed routinely on the back cover page of the *Journal of Dentistry for Children* states "Little can be accomplished for grown-up people; the intelligent man begins with the child."

This quotation could be paraphrased to read "Little can be accomplished for training the established dental practitioner to utilize effectively the services of an assistant; such training must begin with the student in dental school."

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Intra-Office Supervision and Extra-Office Direction of Auxiliary Services

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THIS CONCERNS only the dental laboratory technician and the commercial dental laboratory, since only these function both within and without a dental office. The dental laboratory craft and its relation to the dental profession has been the subject of extensive study for at

least twenty years. It has likewise been a source of apprehension to the dental profession in a number of areas. This has been occasioned by the activities of recalcitrant and illegal practitioners of dentistry among dental laboratory technicians. Why such a situation has slowly developed since the turn of the century requires some analysis. In the early 1900's dentists were accustomed to carry out their own laboratory procedures and were capable in them. Those dental practitioners who excelled and rapidly increased their practices found it expedient to train assistants in their own offices to take over some of the mechanical details involved in restorative procedures. Those dentists fully met their professional obligations. How a skilled craft of competent and useful workmen evolved from this point is obvious. Because of the variations in individual dental practices the development of the commercial dental laboratory, serving more than one dentist, is likewise easily seen. It was to be expected that among these capable craftsmen there would be a number whose interests would lead them on to professional status through attendance and graduation from accredited schools of dentistry. Numbers of our most illustrious members came to the profession in this way, and from them have come some of the major contributions in the field of restorative dentistry.

To see how this happy relationship degenerated to the mixed and frequently chaotic present state is not so obvious. Basically of course,

it is because too many dentists failed to fulfill completely and ideally their professional responsibility. Unless it be greed or economic pressures, why this relinquishment of professional responsibility occurred is somewhat obscure. One factor perhaps is the tendency on the part of many of the older and capable dental laboratory technicians to patronize, and on some occasions browbeat, young, inexperienced dental graduates in matters concerning dental laboratory procedure. We all must have seen some of this, and also must have noticed that when the dentist, be he young or old, had full knowledge and skill in the procedures under discussion, such tactics were immediately terminated. Such a dentist may find it necessary to discharge incompetent technicians or an incompetent dental laboratory, and under no circumstances should he tolerate laboratory dictation or failure to follow instructions.

This brings us to what may be the crux of the situation. We find graduates of recent years coming into practice with a bare, minimal understanding of laboratory procedure and with virtually no practical experience in it. Possibly it requires a certain aptitude or temperament for a dentist to acquire this knowledge. Perhaps it is beyond the possibilities to train students adequately in these procedures today. The reduction of the dental curriculum by as much as one thousand hours from the 1926 level may account for this. It may well be that only through postgraduate activities, such as study clubs, refresher courses, etc., can this training be achieved. But that it must be achieved is certain, if the dental profession is to retain proper control and direction of dental laboratory technology. If this be so—and the speaker is well aware that fully 80 per cent of his knowledge of laboratory procedure was obtained in postgraduate activity—then the effort within the dental schools would perhaps more properly be directed toward convincing the students of the necessity for furthering their knowledge in dental laboratory technology following graduation.

Ideally, every dentist doing any appreciable amount of restorative dentistry requiring laboratory procedures should have a dental laboratory technician in his own office. But this arrangement will only be comfortable, convenient, and economically sound if he himself has full knowledge of the technics involved. Suppose the same expert advertising propaganda were applied to this problem as has been applied to influencing young graduates to undertake multiple chair

offices, with multiple engine arms, etc., in each room, and even to include multiple x-ray equipment. The cost of one fully equipped extra operating room instead invested in the services of a dental laboratory technician, beyond question would result in an increase of dental practice. The carefree willingness to assume heavy, long-term interest bearing notes for elaborate extra equipment appears inconsistent with the timidity displayed in the unwillingness to assume a salary obligation which, if necessary, can be terminated on relatively short notice with no penalty.

Direction of the dental laboratory craft when utilized through commercial dental laboratories, rests on exactly the same principles as does supervision of the craft within the private dental office. It is, however, complicated by the need for adequate communication. In constantly increasing numbers, state dental practice acts are requiring written authorization to accompany each dental prosthetic case sent to a commercial laboratory for processing. This is a highly desirable and necessary development, but in some areas it is erroneously referred to as a prescription. A prescription implies full directions for the completion of an order. It is the writer's belief that except for some isolated, very simple requirement it would be impossible and impractical to write a work authorization giving full details which could not be misunderstood by a dental laboratory technician unfamiliar with the dentist's wishes and customary requirements. Some personal contact is essential. After familiarity of craftsman and dentist is established much may be accomplished by designs on study casts or even working casts, but even with these, personal consultation is necessary in the majority of instances. This, of course, presents a difficult problem for dentists in isolated areas to solve. But it is not insolvable.

No dentist can be so busy that he has no time to write a work authorization, any more than a physician can be so busy that he has no time to write a needed prescription for a patient. If he believes he has insufficient time, it is either a subterfuge to avoid an unpleasant task, or he is woefully disorganized. In either event, he fails to fulfill his professional responsibility, and violates both ethical and legal requirements. Wherever we find dentists fulfilling their professional obligations, we find profession-dental laboratory craft problems non-existent.

In closing, just a word about accreditation of dental laboratory

programs. There has been a tendency on the part of a large proportion of the dental profession to look upon accreditation as a police action. This is completely erroneous. It is a joint program developed to improve the standards of dental service rendered by dental laboratory technicians. In other words, it is inseparable from an educational program. No matter how small the starting nucleus of dental laboratories is in such a program with a dental society, if it is developed as a mutual project and the policing of each party left to the respective societies, it will be a growing and spreading program. Unfortunately, it must be admitted that education in laboratory procedures is just as necessary these days for the dental profession as for the dental laboratory craft. But honest endeavor will bring success.

The High School Girl as a Part-Time Dental Assistant

RALPH H. CAMPBELL, D.D.S.

EDITOR'S NOTE: *Ralph Campbell received his D.D.S. degree from the University of Michigan in 1929. He is widely known as a lecturer in the fields of practice administration and the use of auxiliary personnel. He is the originator of the Detroit District Dental Society Dental Payment Plan, which is used in various other parts of the country.*

INTRODUCTION

THE STATEMENT that "no dentist can hope to approach his maximum professional or economic potential without the aid of one or more well-trained dental assistants" is readily supported by a mass of factual information. It is unfortunate, therefore, that

many dentists find the problem of interviewing, employing and training of auxiliary personnel a perplexing one, and even more perplexing when consideration is given to employing a second assistant. Many groups, among them the American Dental Association, the Michigan Workshop in Practice Administration, the American Academy of Dental Practice Administration and the United States Public Health Service, have shown through their activities that they recognize that the problem of Auxiliary Personnel will continue to challenge the dental profession, if it is to fulfill its obligation of serving the dental needs of the American people.

PURPOSE

Although the Practice Administration Section of the Detroit Clinic Club has been studying the Interviewing, Employing and Training of Auxiliary Personnel for the last four years, this paper is intended to cover briefly only one aspect of this study, the employment of a high school girl as a part-time dental assistant.

WHEN TO ADD PERSONNEL

The decision of when to add other personnel should be based on the special problems in each office. Failure to realize that the potential of the office can be increased, professionally and economically causes many dentists to wait too long before taking positive action. This delay is detrimental to both the professional and the economic aspects of their practice.

There are several reasons for delay:

First: The dentist does not truly appreciate the value of well trained auxiliary personnel.

Second: The dentist hesitates to increase his overhead expense.

Third: The dentist does not know the source to use in seeking additional personnel, how to interview people, how to compensate them, how to train them, or how to delegate duties after he has employed them.

Fourth: The dentist cannot decide whether to hire another full-time assistant, a hygienist, or a part-time assistant.

Although it is neither the purpose nor the intent of this paper to try to overcome all of these objections, the following may help the dentist to arrive at a better decision.

Surveys reported by Henry Klein,¹ B. Duane Moen² and the American Dental Association³ have proven that the wise use of additional personnel enables the dentist to care for an increased number of patients with a marked increase in the dentist's personal income. At the Workshop in Practice Administration at the University of Michigan in 1953, the following question was submitted to Committee IV on Auxiliary Personnel:

"At what point of progress with a practice is a second member of auxiliary personnel justified? Should this second member be an assistant? A hygienist? A part-time high school assistant?"

The question was answered as follows:

"When the professional demands of the dentist increase to the point that the assistant's delegated duties are so numerous, that even with conscientious application of her efforts, the assistant cannot perform them, a second auxiliary is indicated in order to serve the increased number of patients competently. It is recommended that she be an assistant on either a full or part-time basis, depending on the type of assisting the individual dentist requires.

"A dental hygienist is indicated as soon as the increased number of patients necessitates that the dentist's productive time be directed to those services which he alone is required by licensure and education to perform."

The members of the Practice Administration Section of the Detroit Clinic Club believe that a practical solution to the problem of many dentists who desire more than one assistant and yet cannot justify the additional expense of two full-time girls, lies in the employment of a high school girl as a part-time dental assistant. In this manner, the small additional increase in expense will be more than off-set by the professional and economic advantages gained.

LEGAL RESPONSIBILITY

Since the hiring of minors is a matter governed by Federal, State and Local laws and regulations, it is important that a dentist check

his legal responsibilities before actually hiring such a girl. These regulations are usually available through the local school boards, or through the State Department of Labor in the state in which the dentist practices. These regulations, which are intended to protect minors, are seldom complicated and should in no way deter the dentist from hiring such a girl. The working conditions which prevail in most dental offices are considered ideal by most State Departments of Labor. For this reason the dentist may anticipate courteous attention to his request for information.

CONSENT OF PARENTS

Before making a final decision to hire a high school girl, it is a wise precaution for the dentist to interview one of the parents. At this time the girl's duties, hours of work and salary can be discussed with the parent or the guardian. This precaution will help eliminate resignations because of parental misunderstanding. There is the added advantage of allowing the parent to see the office in which their daughter will be working. Many parents are rightfully concerned with the question of whether their daughter should be permitted to work, and if so, under what conditions. Many would consider a dental office an ideal place in which to work, for a girl of this age. The interview with the parent is also an ideal opportunity to explain that, in addition to the salary, the girl will receive a valuable training which will prove worthwhile in later life. Many capable girls from families of higher economic brackets who would not be permitted to work in many types of employment, would be encouraged to take such a job because the parents appreciate the value of the education and training which their daughter would receive in a dental office.

Parental understanding of the requirements of the job may often prove to be more important than that of the girl.

SOURCE OF GIRLS

There is a large pool of girls, eager and willing to learn, among the members of the junior and senior classes of the public and parochial high schools in the community in which any dentist practices. Although seniors will be more mature, the dentist must weigh this factor of greater maturity against the asset that once trained, a junior will be in his employment longer. In many instances the

dentist might find it advantageous to employ two girls. In this event he would employ a junior each year and delegate to the senior the responsibility of training the junior. This plan would relieve either the dentist or his full-time assistant of this responsibility.

SELECTION OF GIRL

Before making a selection of a girl, it is a wise precaution for the dentist to first speak to the principal or to the counselors of the high school. At this time, the requirements of the job should be explained, and in general, the number of hours, duties, and the educational value of the job emphasized. The advisors often will be in a position to help the dentist make a better choice than he possibly could do by himself.

It is wise precaution to select the applicants from the upper third of their class. There are several reasons for such a selection:

First: Such a girl has proven her ability to maintain her scholastic standing, and is therefore, more likely to maintain this standing under the increased pressure and responsibility of working.

Second: A girl chosen from this group is usually capable of learning more quickly, thereby reducing her training period.

Third: If she becomes interested in dental hygiene as a result of her contact with dentistry, her academic grades are more likely to be of such quality that she can qualify for entrance into one of the schools of dental hygiene. The selection of a girl who has had training in bookkeeping and typing will also prove to be helpful. Likewise, girls who have additional school, church or community interests usually are the more capable girls.

APTITUDE TESTS

From a practical viewpoint the only recommended aptitude tests would be those used to determine the manual dexterity of the applicant.

HOURS OF WORK

The number of hours and the arrangement of hours may be regulated by the state laws. Once this information is available, then the dentist can decide on the number and arrangement of hours which will be most suitable. Flexibility in both the number and the arrangement of hours will vary, depending on the scholastic ability, the economic need and the outside interests of the girl, and the dentist's requirements.

SALARY

It is recommended that the girl be hired on an hourly basis. The minimum salary may in some instances be governed by the state's laws, although most states do not establish this provision for dental offices. A practical range might vary from sixty cents to one dollar an hour. It is recommended that a girl be started at a minimum hourly rate and have this hourly rate increased as she proves her ability to perform her tasks. It should be remembered that a small increase in salary at frequent intervals is more appreciated than larger amounts at longer intervals.

UNIFORMS AND APPEARANCE

When a high school girl has been employed, she should be expected to dress in conformance with the other personnel of the office. Future problems relating to appearance can readily be handled by insistence on this from the beginning.

DELEGATION OF DUTIES

There are many time-consuming routine duties in a dental office which these girls can be taught to perform. In many instances they will soon perform the routine tasks more quickly than an experienced girl, who may be concentrating on what she considers to be more important tasks. Therefore, if a dentist is to derive the maximum benefit from hiring such a girl he should, in cooperation with his assistant, make out a list of routine tasks, and then from this list choose two or three which he wishes the part-time assistant taught first. If the full-time assistant understands the true purpose of the high school girl in the office, she will more than welcome the task of training her. The knowledge on the part of the instructor that as the new girl learns these routine tasks she will be relieved of them, will provide an excellent incentive for her teaching. It is a wise precaution to make certain that the new assistant masters at least one of the originally assigned tasks before she is taught another. Proceeding in this manner she will learn to handle each task more quickly and will not be so likely to be overwhelmed by the multitude of things to learn. It is surprising to many dentists to find out how many routine things such a girl can learn to do within the short space of a week. After a month of good training she will serve as a right arm

to the assistant and the assistant in turn will be more helpful to the dentist.

Among the routine duties which should be placed high on the teaching list are the important ones which come under the general heading of housekeeping. This heading would include such things as cleaning and sterilizing of instruments, keeping the operating room, laboratory, dark room and reception room in good order. A suggested procedure is for the assistant to demonstrate how the task is performed at least twice, then have the new employee perform the task with the assistant supervising at least two times. Finally the high school girl will try the task alone, followed by a careful check by the assistant when she thinks the task is completed. At this time any details missed can be brought to the girl's attention. This period of close supervision should continue until she is able to complete the task to the satisfaction of those responsible for her training. Once she has mastered a duty she should be immediately assigned an additional duty.

BENEFIT OF PROGRAM

The advantages of hiring part-time high school girls can be divided as follows:

TO THE PROFESSION—

1. Such a program would in time help to provide a pool of partially trained dental assistants. Many of them would be interested in studying in dental assisting on a full-time basis after graduation from high school.
2. Some of the girls would decide on dental hygiene as a career after gaining a knowledge of that profession. The quality of hygienists with this previous experience in a dental office would be influenced favorably.
3. Because of their interest and enthusiasm, they would become ideal boosters for dentistry in general, and for their dentist in particular.

TO THE GIRL

In addition to the economic benefits obtained, the educational training, discipline and the prestige and dignity of such a job would influence her later life markedly.

TO THE DENTIST

It is impossible in this short paper to present in detail all the professional and economic advantages resulting from the continuing practice of utilizing one or more high school girls as part-time dental assistants. Among the advantages, however, are the following:

1. There is always an available source of girls in the community in which the dentist practices. Since there are not many jobs open for girls at this age, which

provide the dignity and prestige that a dental office can offer, the dentist has the opportunity of choosing from the "cream of the crop."

2. High school girls are at a highly impressionable age, therefore, many of the girls will become so enthused about dentistry that they will decide to continue in dentistry before they ever come in contact with other occupations. Over a period of time this will greatly influence the caliber of girls going into dental assisting, dental hygiene, or in fewer instances into dentistry itself. Many dentists who complain of their inability to get hygienists in their community, should keep in mind that many girls with a previous background in dentistry in a community, would be more likely to return to that office or community after graduating from a school of dental hygiene.

3. The efficiency of the full-time assistant will be increased by relieving her of many time consuming routine duties. The dentist's and his assistant's efforts therefore, can be concentrated on caring for more patients with resulting economic benefits to the dentist.

4. High school girls once trained, will be extremely valuable in the event of illness of the full-time assistant.

5. During vacation, high school girls can work full time, or they can work full time when the regular assistant is on her vacation.

REMARKS

The Practice Administration Section of the Detroit Clinic Club recommends the employment of high school girls as part-time dental assistants as a practical means of partially solving the problem of obtaining and maintaining auxiliary personnel.

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Some Socio-Economic Problems Related To Dental Services

Introduction

Richard C. Leonard, D.D.S., Baltimore, Md.

Payment Plans for Dental Services

Henry D. Cossitt, D.D.S., Toledo, Ohio

Health Service Planning at the National Level

J. Claude Earnest, D.D.S., Monroe, La.

The ILWU-PMA Activities

Wm. B. Ryder, Jr., D.D.S., San Francisco, Calif.

Our Dental Manpower Problem

Obed H. Moen, D.D.S., Watertown, Wis.

Realism in Maintaining Present Dentist-Population Ratio in the Next 17 Years

B. Duane Moen, B.A., M.S., Chicago, Ill.

Moderator

WM. B. RYDER, D.D.S.

San Francisco, Calif.

Introduction

RICHARD C. LEONARD, D.D.S.

EDITOR'S NOTE: *Richard Leonard received his D.D.S. degree from the Indiana University School of Dentistry and that of M.S.P.H. from the University of Michigan School of Public Health.*

After several years of private practice in Indiana and directing a children's dental health program in Fargo, North Dakota, he was appointed Chief, Division of Dental Health, Maryland State Department of Health, a position he now holds. He has served on the staff of the Baltimore College of Dental Surgery as Instructor in Preventive and Public Health Dentistry.

He is a charter member and first president of the American Association of Public Health Dentists and is editor of their bulletin. He is a founder Diplomate of the American Board of Dental Public Health.

AS A BRIEF, informal preamble to a brief, if somewhat more formal, presentation, I would like to explain the circumstances under which my paper has been prepared. As indicated by the title of my assignment, my task is that of generalizing upon the data to be given by my fellow panelists, all members of the College Committee on Socio-Economics. Minus details—it is my responsibility to outline what they will tell you.

To attend this convocation, my wife and I left Baltimore by car on October 8 and headed for Dallas via San Francisco, Los Angeles and other points of interest in the West and Southwest. May I philosophize momentarily and say that the long trip has served as a splendid background for the preparation of my formal remarks? The miles covered in reaching Dallas could not but amplify the variables that influence socioeconomic problems. The heavily industrialized East, the rural Midwest, the teeming Pacific Coast and the wide open spaces of the Southwest may have like social and economic problems. But they also have problems that are regional in character. Moreover, regional variables influence the approach of solutions of common problems.

The experiences of the past four weeks have served well in making me more aware not only of what a big, wonderful nation we live in, but how that very vastness complicates the consideration and solving of the socio-economic problems of our profession. The papers to follow, without possibly intending to do so, will, I am sure, support this concept of the social and economic factors influencing the present and the future of the dental profession.

The application of the term "socio-economics" to the field of

dental health involves a great deal more than the mere consideration of the financial ability of one or another segment of society to purchase dental service. Indeed the topics considered by the Socio-Economics Committee during the past few years have been of such wide spread variety that recurrently the question has been raised as to whether or not our considerations are trespassing upon the domains of every other College committee. Seldom has it been found possible to refer some topic in entirety to another committee simply because no socio-economic aspect could be noted in it.

For example, the need for more dental schools, the recruitment of high grade dental students, the staffing of dental school faculties—all, obviously, are “social” matters. All, too, have equally obvious “economic” aspects.

No more substantiating example of the scope of the considerations of the Socio-Economic Committee needs be cited than that of the agenda of this session. So far as the titles of the five scheduled presentations are concerned, only one, by terminology, makes specific reference to the monetary aspects of the problem discussed. That the others will present the financial or economic aspects of their subjects is probable. But the far reaching scope of socio-economics as a field of study is clearly delineated by the use in the titling of the four following papers of such terms as “Health Service Planning,” “Dental Manpower” and “Dentist-Population Ratio.”

Recalling topics discussed in committee meetings and by correspondence confirms the opinion that the agenda of this meeting might, quite appropriately, have been devoted to presentations on such topics as “Fluoridation,” “Geriodontics,” “Insurance Plans” or a score of others. That the agenda covers subjects that are considered the *most* important is not sole basis for their selection. They are among many important topics that need study. They are presently pertinent. They are not completely unrelated one to the other. They will, most certainly, provoke thoughtful consideration on the part of the audience. It is hoped they will also provoke questions on your part.

In order of their presentations the program will include the following:

I. Dr. Cossitt will discuss “Payment Plans for Dental Services,” outlining for your consideration the two major prepayment methods with generalized data relative to the four types of sponsorships, namely: (a) Community, (b) Unions, (c) Employer-Employee, and (d) Fraternal. Time limitations have not

permitted him to go into much detail on this type of payment for dental services. He has seen fit—and in my opinion, properly so—to devote most of his time to a discussion of post-payment plans. As he points out, the vast majority of our population are not members of any of the four above named groups for whom prepayment plans have or may be developed. For this majority of the population post-payment plans are the most feasible.

His warning regarding the necessity of dentist control of *all* plans deserves the consideration of everyone.

II. Nothing better substantiates my statement relative to the variety of topics considered by your Committee on Socio-Economics than does Dr. Earnest's paper on "Health Service Planning at the National Level." His "list of a few of the important" health bills acted upon by Congress during its last session (26 of them) indicates numerically the scope of socio-economic considerations our profession faces. The *variety* of topics listed serves further to depict the myriad of problems the dental profession must keep under their consideration.

Dr. Earnest discusses in detail only a few of the topics listed as having had Congressional action. These details most certainly justify his concluding opinion that "a changing social order now confronts" our profession, and that it is "our obligation to furnish the leadership" necessitated by that changing social order.

III. The portent of labor union activities in the field of dental health services as indicated by developments on the West Coast makes Dr. Ryder a most excellent contributor to the Socio-Economic Committee's considerations and to today's panel discussion. He *knows* the origin, the development, the first results and the present status of the ILWU-PMA dental care program. Today he can merely summarize on a few facets of a program in the initiation of which he has played so large a part and which may well serve as a pattern for consideration by many other dental groups. Serious study of the September, 1958, JOURNAL OF THE AMERICAN COLLEGE OF DENTISTS containing a more detailed statement by Dr. Ryder and the two other related reports is urged.

IV. To substantiate still further the variety of topics given consideration by your Committee we present papers on the problem of dental manpower. Actually this is not much of a "jump." If more dental service by whatever financial method is a socio-economic problem so, too, is the provision of personnel to render the service.

Dr. Obed Moen will present data on dentist-population ratios, population changes, the effectiveness of the use of auxiliary dental personnel and the influence of preventive dental health measures such as water fluoridation and limitation of carbohydrate consumption. He also touches upon the matter of dental student recruitment, thus bridging the way to the final paper of this session.

V. I am happy that the title of Mr. Duane Moen's paper includes the word "Realism." He is, as I'm sure you all know, a statistician. To the non-statistical mind, including my own, statisticians usually are fabulous and their statistics fantastic! Such opinions do not apply today. Mr. Moen's figures are so arithmetical as to be comprehensible even to the statistically uninformed.

In spite of his realism some of Mr. Moen's statistics will, to use a word of his own, be "astounding." As they relate to socio-economics (and they certainly do) they put a definite exclamation point on our efforts to depict some of the interests of the Committee on Socio-Economics.

Payment Plans for Dental Services

HENRY D. COSSITT, D.D.S.

EDITOR'S NOTE: *Dr. Cossitt is an orthodontist. His D.D.S. degree was earned at the University of Pittsburgh. His orthodontic training was under Dr. Martin Dewey. He has served as President of the Toledo Dental Society and the Great Lakes Society of Orthodontists. He is a member of the Royal Society of Health, has been active in community health problems, and has also served in the field of dental journalism.*

IT IS AN HONOR and a privilege to present to you this portion of the Socio-Economic Committee report, on Payment Plans for Dental Services. Like all phases of any subject today, there is a tremendous source of material that is presentable.

In this report I have condensed the material which is voluminous and growing. In touching on the salient points of this amoeba-like present day economic factor of payment plans confronting our profession, I found much written and statistical material. These plans are a part of the ever spreading welfare state concept which everyone of us in our profession and in our nation is daily aware of having thrust at us. Whether this concept may be right or wrong still remains to be proven; let us hope that it will not be proven at a colossal loss of what is right to our nation. The desire for security is casting a deepening shadow over the spirit of striving to attain one's goal in life, with no adventure being intertwined with it.

I understand that at the beginning of 1958 there were less than 350,000 people covered under a dental plan that provided any degree of restorative service. There is a general feeling that the urge and desire for protection against major illness expenses has outweighed that of dental illness. The latter has been left to tag along.

Giving a quick glance at the dental manpower situation as of now and projected into the future, I say that in view of the public's desire for protection against major illnesses our profession has been blessed. It appears that we had best gird ourselves in readiness with more suitable plans available and possibly an increase in the benefit coverage to meet the developing desire on the part of the public which has a growing interest in dental health.

Delving into the subject of Payment Plans for Dental Services, I was astounded to find that the oldest plan instituted dental care benefits in 1912. It is in the employer-employee sponsorship category.

In a study made by the United States Department of Public Health Service, published in April, 1958, they confined themselves to the field of "Prepaid Dental Care Plans." Their "definition of Prepaid Dental Care Plans, are plans that range from the provision of complete dental care to those that support only diagnostic and consultative services; those that provide only major dental surgery in hospitals; those that cover only extraction or treatments required in connection with a medical condition; and those providing a reduced fee-for-service schedule."

There are two major classifications in this study:

1. Regular prepaid dental benefits. These are considered "Comprehensive" in their coverage but most are a far cry in the scope of services covered.
2. Limited prepaid dental benefits, which do not provide any restorative services, or a limited indemnity for such services, or provide them as reduced fee benefits for which the subscriber must pay an established charge.

The plans are then arranged in four subdivisions under the two classifications above. The first subdivision is community-wide, in which category there are listed three organizations, two of which are sponsored by dentists.

The second subdivision is union sponsorship, which has many organizations. The third subdivision is employer-employee sponsorship with an amazing number in its group and in which group the oldest prepaid plan is found. The fourth subdivision is fraternal organization sponsorship, making up a small percentage of the sponsors.

The International Longshoremen's and Warehousemen's Union and the Pacific Maritime Association is probably the largest group with approximately 11,000 children enrollees who are eligible.

The benefits and the exclusions are listed under each individual sponsoring organization. As you might well guess they range from the taking of an x-ray to the construction of dentures with all the in-between stages.

The sponsors of prepaid plans are comparable to a situation in which the father of a large family is tyrannical in telling his adult children they can or cannot work and how much of their income they must in turn give to him. In turn, he will look after their general welfare, arrange for medical care—at a rate—and for their dental

care—at a rate. The father has little interest in the well-being of the particular child. His interest is in being head of the family.

The dental profession is recognized by commercial insurance coverage for dental procedures of a surgical nature. Blue Shield in the various states is gradually recognizing the dental profession. There is no question that Blue Cross is beginning to recognize the stature of dentistry by permitting dental patients to enter hospitals for needed surgery. In some states dentists have the privilege of admitting their patients to hospitals.

There remains the post-payment plans for our consideration at this time. Truly they are a form of budget payment plan for the individual securing dental care. They are the most pragmatic of any of the payment plans conceived.

The necessity for a payment plan available to those of the public who were not members of unions or organizations setting up large reserves and welfare funds, was essential if the public was to benefit in a greater interest in dental health.

It was deemed advisable that the benefits of financial assistance be made attractive and convenient to more of the population of our nation. As a result of such basic thought in 1941, the Detroit District Dental Society established the Detroit Dental Society Payment Plan. The Medical Bureau of Pittsburgh established the Budget for Health Plan in the same year.

Since the inception of these two budget plans, there have been many budget plans for dental care by state and local dental societies throughout the country. The basis of the plans is the same but many details of operation and structure vary according to the community in which they are established.

Many members of our profession favor the post-payment plans as established today in that they feel these plans are on a higher ethical plane. Under such plans any dentist who wishes, may make such a plan available to his patients. The most outstanding feature is the freedom of stating a just fee according to the degree of service needed by the individual patient and the privilege of the patient to accept, reject or discuss the fee in the light of their ability to pay. These plans are established by dental societies, who in turn continue to control the structure and operation of the plan for the benefit of the public.

The prime motive of leaders of mass organizations is to assist their members in securing a higher standard of living, enjoying

greater benefits of health along with basking in more free hours of leisure. If these are obtained through means that may be unfair, then it is up to the non-organization individual and the professional individual to strive in guarding against this hydra of colossalism.

Time payment for homes, automobiles, furniture, kitchen ranges, dishwashers, washers, dryers, refrigerators, radios, televisions and vacation trips is considered fitting and proper. Why then should our profession's post-payment plan not be acceptable to all upstanding, forthright people?

The post-payment plans recognize the human liberties of the public and the profession, which is most essential to the advancement of man as an individual and not to be a mere number or thing as some would like.

With this type of plan, human relations come forward into a common meeting ground where the patient and the dentist respect each other. Each depends on the integrity of the other, with the dentist conscious of his responsibility as a professional person and dedicated to rendering service to his fellow man.

The benefit under this type of plan is absolutely comprehensive, to the limit of the dental service needed by the individual at the time. There may arise a limit to which the financing bank or the individual desiring the financing, may care to accept such a responsibility of payment.

Any of you who may be interested in organizing a post-payment plan for the individual securing dental care, or to increase the availability of better dental health to the public in your community will find an excellent presentation of it in the *Journal of the American Dental Association* for September, October, November and December of 1957.

The American College of Dentists recently conducted a survey through the medium of a questionnaire on payment plan organizations. Of the 49 states sent questionnaires 48 reported, with a summary of prepaid plans being reported in three areas (California, New York and Texas). In my reading of material to prepare this report, I found prepaid plans existing in many more states than those that registered as having such plans. The post-payment plans are available in most of the areas of the United States, many are functioning and many are in the process of organization.

There is a growing trend toward a desire for insurance to cover dental care and insurance companies are interested in such coverage.

In widespread need, the initial benefit rendered and the continued maintenance of dental care are the problematic factors involved. In 1956, C. A. Kulp, Ph.D., Dean of the Wharton School of Finance and Commerce of the University of Pennsylvania said, "You never have statistics ready-made when you set out to create an insurance plan." Continuing, "statistics just don't exist for insurance purposes. You have to insure first and then get statistics." It was interpreted that he was of the opinion that "dental health care meets the requirements for an insurable risk relatively well."

It was with regret during my reading of source material that in none of it was there mention made of one of our greatest payment plans. The one in which we recognized the dignity of man when he is or has become a ward of society. We must not overlook this group of people who are unfortunate enough to not be included among any of the groups that I have spoken of earlier.

The individual professional man must carry his fair share, with a feeling of gratitude, when he is requested to contribute to Community Funds and taxes of which a portion are for health services.

In the interest of better dental health for the public at large, much responsibility rests on the shoulders of our profession in guarding against the deterioration of the high standards of dentistry today. This is one of the pitfalls confronting the public and ourselves when payment plans are devised by groups controlling much money, large organizations and the like, who will set up controls in the form of fee schedules and benefits.

What starts out with all good intentions to aid those who are considered as oppressed becomes top-heavy and the professional man begins to be imposed upon to the degree that he can no longer maintain the high standard we have in this country.

It behooves us as members of a health profession to give some time and thought to the dynamic trend of our times and the future, that we may keep abreast if not a step ahead. In this fashion, we can aid in the formulation and setting into operation of those plans having to do with dental health, which is our daily concern.

May I interject a thought that bears much consideration. We as professional individuals are respected and looked up to by the public at large. Ours is a heavy responsibility, for we must advise the very best procedure to follow for the individual from the oral health standpoint, with remuneration receivable being of least consideration.

So it is up to you and me, every one of us, to take a firm stand in declaring our post-payment plans as being positively superior to any other payment plan and fight for the post-payment plan straight down the line.

The establishing of post-payment plans throughout the United States should be spearheaded by the American Dental Association. It then follows that every State Society and every Component Society of each state should have an active committee that will see to the establishing of a usable working post-payment plan in every city or community in the component's area.

In so doing, we will be assisting the public to receive the full benefit of dental health service and at the same time maintain their own liberty and respect.

Such action on the part of our profession will halt or at least stem what may be a growing tide. The sponsors of prepaid plans appear before our profession and tell us what they want, and unfortunately, many of the suggested plans are being accepted. It is inconceivable that we, an outstanding health profession of great stature, should bow to accepting the basis of "going along."

This is where we need to get out and do some mighty energetic planning and positive effort in order to maintain for our profession a position of leadership in the eyes of the public.

In conclusion I ask you: why were these plans devised and put into operation? Was it to insidiously further the concept of the welfare state within our country, just another step toward Socialism? Was it so that groups and organizations with tremendous reserves could get a control foothold in other fields? Was it to see that the public would become more conscious of dental health benefits? Or was it done to provide the individual with a health benefit, that his life would be more pleasant so that he would live a fuller, more useful, productive life?

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Health Service Planning at the National Level

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IN THE LAST QUARTER of a century, we have all seen the State and Federal Government acquire an increasing role in all facets of our everyday life. Agriculture, industry, local political subdivisions, all look to the Federal Government for increasing help, financial as well as advisory and administrative. The Health Serv-

ices have not escaped these changes. At the last session of Congress approximately 500 bills were introduced which pertained to the Health Services. In a great majority of these bills, dentistry is involved; if not directly, indirectly. I will list a few of the more important ones that Congress acted on in the last session:

Public Works Loan	Rehabilitation
Civilian Pay (VA Doctors)	Jenkins-Keogh Taxes
Military Pay	Hill-Burton Extension
Public Health School Grants	Hill-Burton Loans
HEW Appropriations	Federal Aviation Agency
Union Health Plans	Civil Defense Aid
Social Security	Defense Reorganization
Medical School Aid	Medicare Appropriations
Research Facilities	Nursing Home Loans
Chemical Additives	Presumption of Service Connection
Va. Hospitalization	Aging Conference
Medical Care for Aged	Grants and Scholarships for Nursing
National Compulsory Health Insurance	Health Insurance Pooling

We will cover a few of the items listed above: The Social Security Administration changes in Public Assistance Programs. On October 1 the United States made available to the states the increases voted by Congress in public assistance funds. (Old age assistance, aid to the blind, aid to the permanently and totally disabled, have one formula; and the aid to dependent children has another formula.)

Under the new increased formula the average will simplify the administration and help meet unusual needs.

Changes in the method of receiving and spending medical care funds: In the old formula, the U. S. offered states on a matching basis, \$3.00 per month for adults and \$1.50 per month for children for vendor payments paid directly to M.D.'s, Hospitals, Dentists, etc.

Under the new system, the concept of a separate accounting of medical care funds is eliminated. The monthly funds will be for medical care and all other expenses, such as housing and food, and the States may use any part of these funds to pay hospital and doctor bills. Furthermore, the States may pay the money directly to the vendors of medical care; they may pay it to the recipients with the understanding it is intended for the vendors; or they may pool the funds for broad, state-wide programs of medical care.

Another item of the Department of Health, Education and Welfare expected to be presented next year are parts of the Bayne-Jones report which proposes a wide scale expansion in medical education and research efforts. The report proposed immediate building of 14 to 20 medical schools to supply researchers as well as enough physicians to maintain the present physician-population ratio.

Medical care for the aged—Congressman Forand's bill would enact a system of federally sponsored health care for recipients of Old-Age and Survivors Insurance under the Social Security Act. The present bill which was not enacted at the last session of Congress, but will be with us again next year, will provide hospitalization, nursing, home and surgical care, including oral surgery to those eligible to OASI benefits. While the bill failed to clear the House Ways and Means Committee, the Committee did order the Department of the H.E.W. to make a thorough study of the problems of financing medical care of the aged, with emphasis on use of Social Security. One thought being increasing OASI taxes and using the money to purchase health insurance on retirement.

Another item of far reaching results is the continuing effort for a prepaid medical care and hospital insurance for some 5 million federal employees and their dependents. On a contributory basis, the estimated cost to the U. S. would be \$100 million a year.

Probably the program with the greatest impact at the present time, which will be considered by the House of Delegates of the A.D.A. is the Dental Care Program for the dependents of the Federal Dental Armed Services.

A recommendation to establish a dental care program for the three million dependents of military personnel was submitted to the Defense Department in a report prepared by the Dental Advisory Committee to the office for Dependents Medical Care (Medicare). Under the present medicare program, dental care for dependents is limited to emergency treatment at military installations, as an adjunct to medical or surgical care or in geographically remote areas. Major General Paul I. Robinson (now retired) headed the 18-member Dental Advisory Committee which was composed of three A.D.A. representatives; Dr. John Looby, member of Council on Hospital Dental Service; Dr. C. E. Rutledge, Chairman of the Judicial Council; and Dr. Rudolph H. Friedrich, Secretary of the Council on Dental Health. The Committee also included representatives of the Military Services, the Public Health Service, the Insurance Industry and the Blue Shield. The report was submitted to Dr. Frank B. Berry, Assistant Secretary of Defense for Health and Medical Affairs.

The Committee, which sent questionnaires to 8,000 servicemen in the 15-month study, said that "comprehensive dental care is an integral part of basic health care and essential to health maintenance." It reported that dependents' dental care is an important factor in the decision of servicemen on re-enlistment. The program would include all dental care, exclusive of routine orthodontics. The recommendations included treatment of dependents by dental officers, within the limit of facilities, and inauguration of an extensive program of dependents' care by civilian dentists. The dental care provided dependents in dental facilities of the uniformed services should in no way interfere with the primary mission of those facilities, the report said. Complete dental care, including orthodontics, would be made available in cases of cleft palate and other severe mouth and jaw abnormalities. "High priority to the care of children in order to develop the maximum preventive effect of early and regular dental care" was also advocated.

With respect to financing, it was recommended that the dependants would bear part of the cost, the degree of participation to be determined by Congress. "The method for determining the participation of the Government and dependents in the cost of dental care should give consideration to the optimum use of individual responsibility (deductible factors) and co-participation (co-insurance factors) in order that the dependents' participation

in the cost of the program can be clearly fixed," the report said.

It recommended that the program should use such established agencies as dental service corporations, insurance companies, medical society sponsored plans such as Blue Shield, and dental societies for the administration of claims and payment for dental care. As "most reasonable and feasible" it suggested a \$15 deductible method for dependents other than children and co-insurance of 15 per cent of partial and full denture costs and 35 per cent of inlay, crown and bridge costs. Full fee schedules or tables of allowances would be developed with the advice and assistance of the state dental society in each area in order to assure (1) high standards of treatment in providing benefits under the program, and (2) adjustments at periodic intervals in accordance with the changes in the economic level.

We are now looking at a great period of experiment in the provisions of health care. It is no good to say it can't be done. It is less good to sit still and wait until the plans go through. It is still less good to say this is "socialization," and therefore is not the concern of the dental profession. Some of these things may be partially or wholly true. The fact remains that a changing social order now confronts the profession with more insistent requests for expanding its health services. No profession conscious of its obligation to society can ignore or frustrate such requests coming from larger and larger groups of its population. It is our obligation to furnish the leadership and help in the planning in the better standard of dental health for the great numbers that desire this service.

The ILWU-PMA Activities

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He is a past-president of the California State Dental Association and was chairman of the Dental Service Committee which developed the basic plan for dental care under the Welfare Fund of the ILWU-PMA.

FOUR YEARS AGO, the International Longshoremen's and Warehousemen's Union by collective bargaining with the Pacific Maritime Association secured agreement to expend surplus monies in their joint welfare fund to provide dental care for dependent children of union members. The trustees of the fund were authorized to establish programs in all ports on the Pacific Coast. This bargaining agreement was made without prior discussion with any dental organization.

Headquarters of the Welfare Fund was in San Francisco and the trustees decided that first discussions and planning would be done with the California State Dental Association. The trustees expected to put the plan in operation within three months.

The California State Dental Association established a Committee on Dental Care and authorized it to assist the trustees in planning the program. Almost daily meetings were necessary to explore and resolve the many problems facing the profession in this situation. Legal methods of payment for dental services, problems of care for minority groups, proper forms and records to protect both the Welfare Fund and the dentists were of equal importance to the basic problem of what type of care and how much was to be provided.

The trustees agreed that the highest standard of care was essential and felt that the profession should receive payment equal to the average in the area for such service. It is a matter of record that agreement was reached with the various state dental organizations and their agencies and that the program has been in operation for more than four years.

Several years ago the Regents of the College agreed to support

studies of the dentists working under this program and also of the families receiving care. As a result of this stimulus, studies were done in the Oregon area and in the San Francisco area. These have recently been published in the Journal of the College. The results of these studies are of great value to the profession because they give quite a complete picture of the attitudes of the profession and the public to the largest and most effective program of dental care so far established by a Welfare Fund. It is not intended at this time to discuss these reports in detail, but merely to point out a few important aspects as they relate to the whole problem of the Socio-Economics of dental care.

In considering all group purchase programs a major factor is the method of securing the money to be utilized. Modern social trends and union labor practice favors the use of fringe benefits as a device to establish funds of this type. The difference between "take home pay" and the total wage of an employee is a variable thing. While most union members realize that they are getting fringe benefits, the total story of their use is frequently not understood. Particularly the fact that the individual loses control of this portion of his wage is not clearly defined. As a result welfare programs are established, and for the member to receive full value from his labor he must use the service provided by the fund. In the ILWU-PMA program provisions were sufficiently broad to permit the members to select the type of care they desired. In this particular, the program differs from most others. A choice was given to use a closed panel or to use the open panel of dental service corporations which usually included most of the dentists in the area.

The report on the San Francisco area indicates that minority groups, and those with lower incomes and perhaps lesser education are inclined to favor closed panels. Previous experience with closed panel medical facilities also seem to be a factor in this matter. This is of importance in considering group purchase programs of other groups. In large metropolitan areas where minority groups and low income groups may be involved in such programs, it is likely that closed panel dental facilities will be favorably received. On the other hand in groups of medium and higher income without problems of minority consideration it is probable that closed panels will not be acceptable and that care on the open panel of a dental service corporation will be demanded. The profession must be aware of this

in all discussions of group purchase. It is most important that the individual's inherent right to decide who shall care for his body be preserved no matter how the payment for this service is made.

Another aspect of these reports is the high ratio of satisfaction both of the consumer and the profession. It must be well understood, however, that this program is new, well organized and operated with excellent cooperation with the professional agencies. It must also be realized that this is probably the only one that most of the profession studied are now actually using. The great success of this program and its acceptance by the profession must surely indicate that other groups, particularly those which are socially orientated, will try to duplicate it. If this becomes a major field for expansion of fringe benefits in labor management agreements, a large portion of the population could be receiving dental care under a similar method. The effects of such a transition in dental care could be catastrophic to the profession and the public. So many problems face dentistry at this time as indicated by other members of this panel that the necessity to provide complete dental care to such a large group would lead to a breakdown of the present conception of dental practice. In many ways this approaching problem resembles the situation which faced dentistry in Great Britain when the Beveridge program was instituted. It seems of great importance that continuing study and planning in this field be a major activity of the College and of the entire profession.

Our Dental Manpower Problem

OBED H. MOEN, D.D.S.

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THERE ARE MANY socio economic problems facing the profession today and there will be many more similar problems in the future, but one problem which will attract increasing interest during the years to come is that of dental manpower. Right now survey indications are that we will, especially in years to come,

have a shortage of dentists to meet dental demands. However, a study of dental manpower is justified because of what may happen in relation to the profession if such studies are not made and if the profession waits to meet future demands until such demands cannot be answered.

Since I was requested to prepare this paper, I have asked several individual dentists as to whether or not, in their opinion, we now have a sufficiently large number of dentists to take care of demands for dental services. Many answered in the affirmative feeling that we do have right now enough dentists to meet present demands. This feeling also predominates in at least one state where a survey has been made.¹ It has also been shown in some surveys that an average condition throughout the United States will not apply similarly to each state. There is enough variation to make this impossible.² However, the fact that the problem does exist is evidenced by many surveys and reports.³ A study also reveals quickly that dentistry is not alone in this problem of manpower. Even public magazines and journals carry articles pertaining to manpower shortage in the professions.^{4, 5}

The fact that the problem exists quite generally is evidenced by the many studies being made of the problem. Its recognition in Hawaii is manifest by a program established for the ringing of the doorbells of 3,000 households in Oahu in October to determine the type of medical, dental and hospital care utilized.⁶ Interviewers are

trained by a U. S. Census Bureau field worker. Involved in the survey are U. S. Public Health Service, the Territorial Department of Health, the Oahu Health Council and interested local agencies.

The manpower shortage is not only evident in the United States. It is also a problem in European countries. I am sure I need not recount details of the various phases through which dentistry in England has passed, where the demand for dental services was almost overnight changed and re-changed by man-made laws and which likewise almost as quickly determined what services the profession would be privileged to give. The General Dental Council in England has now been empowered by Parliament to give increased attention to auxiliary dental workers. The Regulations actually provide for the establishment of only one such class of auxiliary worker, namely, the Dental Hygienist.⁷

While in Brussels, Belgium, attending the meeting of the Federation Dentaire Internationale in September, I was particularly interested in the Report of the Special Committee on European collaboration, which, among other things, studied the role of the auxiliary and ancillary dental workers from the standpoint of dental manpower. In personal conversation, it was evident that the thinking was that where there were not enough dentists to care for dental demands, the care would be supplied by less qualified groups, and where there were enough dentists, the invasion by such groups was much less evident.

The Public Dental Health Services Commission of the Federation Dentaire Internationale also had a two-day meeting with some very fine reports pertaining to "What problems arise in those countries where the number of practicing dentists is not sufficient in order to ensure the dental health care of the population." An exceptionally complete report on "Dentistry's Manpower Problem in the U. S. A." was presented by one of the U. S. A. delegates⁸ at the Commission's meeting.

With all these various recognitions of this manpower problem and without going into statistics so completely prepared by the Bureau of Economic Research and Statistics³ of the American Dental Association, I believe we are justified in giving consideration to some of the factors that may influence the end results of our problem.

As the old law of supply and demand was a commercial basis and as the law of action and reaction is basic for some phases of eco-

nomics, so the need and comparative demand for dental services must be considered in solving our dental manpower problem. In the thirties there was plenty of need for dental services, but the demand for such service made use of only a fraction of the average dentist's time. Certainly, we cannot predicate the average need of dental manpower from such a baseline. Consequently, our position in the economic cycle must be considered as an uncontrolled variable.

Another phase that is also a variable but which is controllable to a larger degree is education of the public on the health values of dental services. The extent of public appreciation of dentistry is a large factor in determining demand for such services. That is why in our own States, we find one dentist needed for 1,166 persons in one state but only one for 4,891 in another state.⁹ It is also evident that education of the public is progressing. In 1949, the average number of patients of dentists was 933 and in 1955 it was 1,056. This is equivalent to 40 per cent of the population seeing their dentist in 1949 increased to 45 per cent in 1955.¹⁰

In the United States we have a daily average increase in population of 7,400 persons or about $2\frac{1}{2}$ million per year.² In fact, during the year ending mid 1957, the population increased 3,055,000.¹⁰ Also, with the marked increase in longevity established during the last 20 years, we now have 8.5 per cent of the population over 65 years of age.¹¹ Both of these developments are influencing factors in the dental manpower problem and the demand for dental services.

Now what are some of the methods by which dental demand may be answered? Certainly an increased number of dental students resulting in more dentists is our first thought. This is being done to the best of ability by educators in training students and university officers in endeavoring to build more schools. During the period of 1947-1957, dental schools by remodeling and new construction, increased their enrollment capacity by 1,707 dental students and 647 dental hygiene students and 1,019 graduate and postgraduate students. Further increases are now being developed.⁸ We as dentists must also help by interesting young men to study dentistry. Science fairs, etc. can help us greatly. Another factor is that as of September 30, 1958, membership in the A.D.A. was 91,166, which is 2,141 more than a year ago at the same time.¹²

Another very effective program is also being developed by the American Dental Assistants Association in their Certification pro-

gram. This program requires much study and practical work on the part of the assistant and the American Dental Assistants Association recognizes such effort by certification. The examinations are very complete and certified assistants value very highly their distinction.

The services rendered by the dental assistant as a chairside assistant can also be increased to relieve a dentist of such work as laboratory techniques and taking radiographs. She may be so trained by you or she may enroll in a course for assistants where basic information is obtained.

The increased use of auxiliary help is the most potent effort dentists can make in meeting demands for dental services. At present we have over 55,000 dental assistants, over 20,000 dental technicians and about 4,500 dental hygienists actually practicing. Comparing these figures as of 1952 and 1955, there was an increase of 28 per cent in the auxiliary personnel in that three-year period.¹⁰ It is evident therefore that progress is being made in the use of auxiliary personnel.

Also, statistics³ show a remarkable increase in services rendered by the dentist where one, two, three or even four auxiliary personnel is employed.³

We must include one more positive factor that can assist greatly in reducing dental needs. That is the field of research. Results, for instance in reduction of caries by fluoridated water, may someday become available to a still larger proportion of our people, or some other development may become a valuable adjunct to fluoridation. We have in the United States, as of June 30, 1958,⁸ 1,651 communities with fluoridated water serving 33½ million people. That dental research is recognized by the Federal Government is evident by the report from the Committee on Appropriations which included the following statement: "The Dental Bill includes \$6,543,000, an increase of \$250,000 over the amount requested and \$113,000 over the amount appropriated for 1958. After the magnificent and classic research on protection of teeth against decay by fluorides in water, the dental research program is moving into new areas."¹³

Another method of reducing dental demand is effective in Europe. Two Scandinavian countries, Norway and Sweden, have laws recently passed prohibiting the sale of sweets in schools or adjacent properties. Denmark is now trying to obtain a similar law. These sweets do not include carbonated beverages. The laws are a result of

research during World War II, when it was observed that dental caries was lessened to a marked degree during the war when no candies and sweets were available in Norway and it again became prevalent when sweets were available after the war.¹⁴ It will be interesting to watch results of this legislation.

Dental manpower will not be solved by any overnight effort. Auxiliary personnel seems now to be the factor of choice. Dental schools are now teaching dental students how to work with auxiliary personnel so that as a dentist in practice he will obtain the maximum assistance from such personnel.¹⁵ Of course, the recruitment of high calibre students to enter dental schools is a basic requirement for favorable results.

The problem is general. "In all countries, the population is growing faster than the number of dentists."¹⁶ Let this be an incentive to us to build for stronger dental associations and stronger individual dentists so that at no time may we ever be forced to lower the high quality of dentistry in the States, nor permit any action to diminish the prestige of present-day dentistry or dentists. This can be our greatest contact with the public. Under any controllable situation, the public will not forsake the type of dentistry thus exemplified, to assume a quality of inferior status. Let us bear that in mind.

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Realism in Maintaining the Present Population-Dentist Ratio in the Next 17 Years

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AT THE PRESENT time the United States has 91,000 professionally active dentists, serving a population of 174,000,000. There is one dentist for each 1,900 persons.

In the armed forces, however, there is one dentist for each 500 persons. For civilians there is only one active dentist for each

2,000 persons. And if only dentists in private practice are counted, the ratio is one dentist for each 2,100 civilians.

The question to be discussed here today is "how can the over-all ratio of one dentist to approximately 1,900 people can be maintained through 1975?" Whether that ratio will be a proper one in the future is another question. It may be argued that advances in preventive dentistry, improvements in equipment and techniques and increases in office productivity will all combine to lower the number of dentists needed per unit of population. On the other hand it is known that public appreciation and demand for dental care are increasing, along with increases in education and purchasing power, and that programs for the group purchase of dental care loom as a potential stimulant to demand for dental care. The influence of all these factors on the number of dentists needed cannot be measured at present. Clearly there are influences on both sides which may well prove to be counter-balancing. Therefore, it appears reasonable to study the requirements for maintaining the population-dentist ratio at its present level.

The basis for estimating dentist requirements in future years is, of course, the estimated future population. Since 1945, the population of the United States has increased, on the average, 1.74 per cent per year. If this rate of increase is maintained, the population will

reach 300 million in 1990 and 360 million, over twice the present population, by the year 2000.

These astonishing figures illustrate the law of population growth, which is very important in predicting or planning for the future of dentistry or any other segment of the economy. Population growth works much like compound interest. It tends to be maintained at a nearly constant rate, which means that the yearly amount of increase becomes greater as the years go by. Population growth currently is about 3,000,000 per year whereas in the first year of this century it was only half as much.

Official population projections for the United States are calculated by the Bureau of the Census. These projections take into consideration the age composition of the population and estimated net migration, with various assumptions being made regarding the future birth rate.

In 1955 the Census Bureau issued four official population projections for future years up to 1975. The highest projection was based on the assumption that the 1954-55 birth rate would continue to 1975. The lowest projection was based on the assumption that the 1950-53 level would decline from 1953 to about the pre-war level by 1975. In all of these projections, no improvement in mortality rates was assumed for years after 1960.

About three years have gone by since these official projections were issued. Population growth during that period has actually exceeded the highest projection. It is worthwhile to note that none of the four projections assumed an increase in birth rate, and that past population predictions have generally been too low. At this time it appears that only the two highest projections are reasonably possible.

These two projections indicate a 1975 population of 228.5 million or 221.5 million. In order to have a ratio of one dentist for each 1,900 in 1975, between 117,000 and 120,000 active dentists will be required, compared to 91,000 today.

In recent years increases in number of dentists have not kept pace with population growth. The number of dental graduates in 1958 was about 3,100. The number of dentists lost through death and retirement was about 2,100, providing a net gain of 1,000 dentists. However, the Census Bureau reports that the population increased about 2,900,000 during the year ending at mid-1958. In other words, one dentist was added for each 2,900 persons added to the popula-

tion. To have maintained the level of one dentist for 1,900 persons would have required a graduating class of 3,600 rather than 3,100.

The size of graduating classes during the next four years is already determined by current enrollments, and it is apparent that the number of graduates will not be sufficient to maintain the present population-dentist ratio. It has been determined mathematically that if the population increases according to the highest projection, an increase of 125 graduates each year will be required in order to have a ratio of 1,900 persons per dentist in 1975. If the second highest projection prevails, an annual increase of 94 graduates will be required. In other words, about two new schools will have to be established each year, or the equivalent in expansion of existing schools.

It appears very unlikely that increases in graduating classes will occur in the magnitude required to maintain the present population-dentist ratio. It is almost certain that the supply of dentists in relation to the population will continue to decline. At the same time, it seems certain that per capita demand for dental care will continue to increase. How, then, will the dental profession meet the added burden?

In the recent past, dentists have been able to increase their productivity from year to year. Surveys conducted by the Bureau of Economic Research and Statistics have shown that the average annual number of patients treated by dentists has increased from 933 in 1949 to 1,012 in 1952 and to 1,056 in 1955. During this period there has been a sharp increase in the number of auxiliary personnel employed, which undoubtedly was a large factor in enabling the dentist to increase his productivity.

Surveys conducted by the Bureau have shown that dentists are "keeping ahead" of dental demand. In the surveys conducted in 1953 and 1956, dentists were asked to record the average length of wait for the initial appointment of a series of appointments. During the three-year period, there was a reduction in average waiting time from 13.6 days to 12.8 days.

It appears that the productivity of the dental office is flexible. As the demands upon the individual dentist increase, he responds by hiring auxiliary personnel and by increasing office efficiency in other ways. This has been the pattern in the past and it will undoubtedly continue.

Dental Education

The Objectives of Dental Education

Francis J. Conley, Los Angeles, Calif.

Problems Associated With the Production of Dental Manpower

Shailer Peterson, Ph.D., Chicago, Ill.

Influence on Current Dental Education of Increased Speeds in Dental Practice

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Objectives of Dental Education in Light of Present Day Needs and Trends

FRANCIS J. CONLEY, D.D.S.

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THE COLLEGE HAS always had an intense working interest in dental education. It has been a source of gratification to me to have had the opportunity of serving as a member of this Committee on Education and also to be able to participate in the panel discussion. In the few comments I have in regard to this program,

I shall try only to air out, or place on the table, certain factors as I have observed them and as I have watched them drift or change, during the years of my experience as a general practitioner and as a member of the faculty of a school of dentistry. The papers to follow will furnish the "high octane" by dealing more specifically with problems of notable significance in dental education in view of present day needs and trends.

For consideration of subject matter dealing with trends, it is well to establish a criterion for comparison of values; the current period of endeavor, let us say, compared with a previous era of accomplishment. For the purpose of this paper, attention will be directed primarily to the immediate post-World War II period.

No one can deny the stimulus of programs that have promoted the desirability of good dental health that had such a profound influence on the demand for dental services and that have resulted in a growing recognition of the importance of dentistry. Unquestionably, one significant impetus to the present day acceptance of the philosophy of maintaining a healthy mouth was provided by the several thousand dentists in uniform who were able to reach a large segment of the population who had not previously been aware of the value of a healthy mouth. It has been obvious that the hundreds of thousands

of young people in military service who received dental attention, and thereby a form of dental health education during the war years, became disciples for the maintenance of their own mouths and for the oral well-being of their children in the years to come. Those years are now here. We are treating a new generation.

Along with programs of dental health education sponsored by our profession, the schools of dentistry are enlarging the scope of instructional activities in the field of public health dentistry and are teaching students to accept community responsibilities of fostering and participating in programs of dental health education. These programs are bearing fruit. Between 1935 and 1952 expenditures for dental care increased from \$302,000,000 to \$1,028,000,000.¹

Often we do not know whether supply follows demand, or vice-versa, but dental school curricula, sooner or later, include advancements contributed by the profession. Then through the media of undergraduate and postgraduate teaching, current information is returned to the profession. Educational programs of the schools of dentistry are trying to keep up with the needs as well as the advancements in research and treatment. Schools are eager to accept the best ideas and to supplement them through the efforts of teachers and the people in research. The current emphasis on research, both basic and clinical, is making it easier for teachers to adapt themselves to changes in various phases of dental service. The combined efforts of school and profession, well integrated between basic and applied clinical research, are helping to formulate trends in the practice of dentistry. Fundamental principles do not change but certainly the methods and approach to treatment have moved ahead with rapid strides. Objectives of dental teaching must keep pace wherever and whenever personnel and facilities permit.

Another measurable trend applies to the increasing number of more highly qualified freshman students who seem to be more acutely attuned to the demands of a future professional career. Methods of selection of students have been improved. With students of high caliber, efforts of teachers fall on more receptive ground. In the light of this trend attention is being directed to the need for continuously re-examining our methods of teaching. It is quite possible that the efforts of committees now evaluating the situation may come up with recommendations for rather startling changes in the curriculum. We are trying to make it possible for the superior stu-

dent to accomplish to the utmost of his ability. On the other hand, it is always a question whether more time should be provided for the less accomplished. The public we serve has a right to expect that the services of our graduates will be of the highest caliber. From the standpoint of prevention there is no substitute for good, competent dental service. The place for acquiring competence is in the undergraduate curriculum; we cannot indefinitely postpone the acquisition of these skills.

This period of renaissance, these past fifteen or twenty years, has witnessed attempts by teaching institutions to improve facilities as well as methods. No one questions that proper tools are aids to a better end result. For example, on the Pacific Coast alone, there are six schools of dentistry and a new one in contemplation; only one is using clinical facilities in existence prior to World War II. The complement to better facilities geared to a higher level of accomplishment is competent teaching personnel and the trend is definitely toward a higher percentage of full-time faculty members. There is still much to be accomplished in the way of making dental teaching as a life career more attractive, not alone from the standpoint of spiritual satisfaction, but also from the material. This objective certainly is not a new one but it must be solved. It is high time that dental teaching discards its "poor but proud" attitude and breaks forth with a sound, common-sense approach to this most vital problem.

Many years ago the American Dental Association established an objective of more and better dentistry for more people and many agencies are at work planning for the future. We can envision rather significant changes in the appearance and organization of the dental office as well as in methods of treatment. Of particular note has been the almost spectacular development of the use of increased operating speeds. This has acted as a catalyst for what may be termed a marked evolution in the methods of dental practice: longer and more productive appointments; better office organization; more effective utilization of auxiliary personnel; improved financial arrangements that enable more people to have more dentistry. Schools have accepted the responsibilities of applied research in this field in order that newer methods may be safely and properly employed. With greater attention being given to the comfort and ease of both patient and dentist, the longevity of the dentist will be extended.

By reason of the constantly growing effectiveness of efforts of dental health education, the need for more efficient utilization of auxiliary personnel in the dental office is a primary challenge. If we are to treat more people effectively, then we should expand the facilities for the teaching and training of dental assistants and dental hygienists. In 1929 only 41.3 per cent of dentists employed dental assistants. By 1950, this figure had reached 64 per cent and unquestionably the number of offices with one or more dental assistants is on the increase.²

There has been a marked change in our thinking relative to the pulpless tooth. We have become awakened to new possibilities in the treatment of the periodontally involved dentition. Students are taught that the utilization of proper methods to preserve teeth results in fewer extractions and fewer replacements. In these two phases of dentistry, periodontics and endodontics, there lies a great future for the preservation of the natural dentition.

Another trend in dental education that is becoming recognizable is the emphasis on programs that integrate all ingredients of teaching; that will graduate the young dentist who is better equipped to develop a rational treatment plan, and to properly execute it; one who will continue to build his professional career upon the right types of experiences of his own making and those of his better informed colleagues. This will be done if teachers and their students, the dentists of tomorrow, are to be free from the isolationism of the "four narrow walls" which has been a characteristic of the profession in the past. Well organized programs of postgraduate and graduate instruction are now or will be available to all who seek them. The past decade has witnessed a most favorable expansion of school efforts toward meeting the needs and helping to direct the trend of continuation study.

Since 1910, a half century ago, there has been an awakened interest in what has been called the biological aspects of dentistry and dental education has been giving more and more attention to curriculum requirements to better prepare the student in the basic sciences. But we should not conclude that the complete problem begins and ends with the recognition that health and disease within the mouth are related to the problems of general health or the lack thereof. We are beginning to recognize that our objectives in teaching must go further than this. A mouth to be completely healthy by our new con-

cept must also function in a complete manner—not 50 per cent or 75 per cent of capacity. True, an individual with an edentulous mouth can eat and survive and the crippled can walk, but we as dentists and teachers must establish as our major objective the integration of all factors that will help us to do a better job of restoring, maintaining and preserving the natural dentition. No longer is it a matter of just relieving pain and eliminating disease. Objectives of teaching must go further than that—for today's needs and trends are pointing to a new criterion based upon the proper functioning of the mouth. Anything less is not a healthy mouth by this definition. This should be the ultimate goal of a program of true preventive nature.

There has been a gradual divergence from former programs of teaching separate individual units of instruction in the different phases of dentistry, the "block-assignment" methods. The present objective is to teach the student to accept the responsibility of treating the mouth as a whole—to treat each defect in a way that each single restoration will fit into the treatment plan as an integrated unit of the "organ of mastication" for the complete restoration of function. In this way, students assume the responsibility of treating all the needs of a patient and thereby they develop maturity. They learn that they are treating the patient, not just a single tooth or a single deficiency. This emphasis on the treatment of the patient and the mouth as a whole is a major objective of dental education in the light of present day needs and trends.

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Problems Associated With the Production Of Dental Manpower

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EDITOR'S NOTE: Dr. Peterson is Secretary of the Council on Dental Education of the A.D.A. He received his Ph.D. from the University of Minnesota and has been a member of the faculties of the Universities of Oregon, Minnesota and Chicago. He is an Honorary Fellow of our College and holds similar memberships in many dental groups. His observations are acute and based upon a broad understanding of the problems of our profession.

I HAVE BEEN asked to present in about ten minutes some of the considerations related to the problem of dental manpower. Obviously, one cannot give adequate consideration to this whole problem in a short time, but it is possible to point out some of the factors that should be given attention when groups do have time to devote to the problem.

Many of us have been impressed with the fact that we have witnessed phenomenal growth in the number of dental graduates since 1949 following World War II when the graduates numbered 1,574, compared with the 3,050 graduated in 1958, almost doubling the 1949 figures. This, of course, is not really a fair comparison, for 1949 was an atypical year and the numbers of graduates just prior to World War II with 39 schools was about 1,700 to 1,800. This still shows, however, that we have made fair headway with about a 75 per cent increase. Furthermore, schools have increased from the 39 to a total of 47, counting the four new schools which are not yet producing graduating classes.

I haven't the time at this moment to go into all of the details of the figures and computations, but we estimate that by 1975, our dental schools will have produced enough dentists so that we shall have 104,467 in active practice. However, these will serve about 228,463,000 people, giving us a dentist to population ratio of one to 2,187. This is not as favorable as the national ratio of about one to 1886 that we have had. We would need in 1975, only 17 years from now, another 16,669 dentists in order to maintain the 1:1886 ratio. This in turn would mean that our output of graduates for the next 17 years—starting immediately—would have to be increased

by one-third. This is, of course, impossible and hence we must be concerned over our future manpower situation even though many are not particularly concerned about shortages at this time.

There are some phases of our manpower and student situation that are becoming problems. Just following World War II, we had almost 11,000 applicants for dental schools. This again was an atypically high figure for it represented many G.I.'s who in turn represented a backlog of desires to enter the profession. By 1951, we had a total of about 7,200 applying for 3,260 positions in 42 dental schools. This number has fluctuated since that time, but in general it has remained relatively constant and we had last year a total of 7,200 applying for 3,600 positions in 47 dental schools. Last year we experienced a 4 per cent decrease in the number of applicants participating in the dental aptitude testing program, but it is too early to say whether this decrease is a reflection of a temporary economic situation or whether it is the beginning of a downward trend. Even if we have approximately the same number of dental school applicants, we have some cause for concern because the reservoir from which these students come is increasing rapidly. In 1951, our 7,200 applicants represented about 1.3 per cent of the students entering colleges and universities two years previously, and the total of 7,200 who are applying now represent only about 1.0 per cent of the 1956 entering college students. This means, of course, that we are interesting only three-fourths as many of the college students in dentistry as we were able to attract seven years ago. If this trend continues, we have real cause to be concerned, for all of us want the dental schools to be able to choose their students from a good-sized reservoir of applicants; and furthermore, we want these new students to be as highly qualified as those which we were accepting last year and ten years ago. While we need to be concerned over this trend, we are cognizant of the fact that the other professions are being confronted with the same problems. Many students who normally would have been interested in dentistry, medicine or law are being attracted toward other fields that are being widely publicized, such as electronics, aerodynamics and nuclear physics.

Recruitment—and particularly early recruitment—seems to be an important factor in this problem of selecting highly qualified students. Considerable thought is now being given to plans for telling students more about dentistry while they are still in high school; and

perhaps aptitude tests could be given to them at that level with good predictive results. Activity in the field of recruitment is, of course, a project to which the American College of Dentists would make a worthwhile contribution. Also, every state and local dental society should be conscious of the problem and should give it study. Dental school faculties are taking active parts in such projects and it is hoped that the societies themselves will place this project high on their priority lists.

One may wonder if the schools will be able to absorb more students even if projects are undertaken to supply a greater number of qualified applicants. Various departments in our universities today are already looking toward the future and wondering how they are going to care for the increased number of applicants. Many remember the days when schools answered the challenge of the federal services by going on to an accelerated program. This was a type of "crash program" and didn't please everyone, largely because there were not enough teachers to carry the teaching load. This would still be a problem, but again if the schools anticipate seventeen years in advance that the situation will be critical, one can depend upon the fact that the schools will find some way of meeting this need and this challenge. Already we have heard deans and faculty members discussing ways by which this might be accomplished.

However, even if our figures and our estimates of future needs are in error, they cannot be so much in error that we will not have a great need for added personnel. Thus far, all estimates of population growth have turned out to be underestimates, so we can be fairly sure that the needs we have talked about will actually occur.

As I indicated earlier, however, even if we had no more potential need than we have today, it is still important for us to consider the problem of recruitment, for we cannot maintain the high quality of selection if the percentage of college students attracted is reduced further. Already a few schools have reduced slightly the size of the entering class because they report that they cannot find the high quality of students that they have been teaching during the past few years. Of course, there are other schools that are still able to keep both quality and quantity high, but even they report that during the last few years a greater proportion of the applicants would not be successful in dentistry.

Many would probably like to have some comment made about the

new methods of practice and the high speed equipment that is coming into prominence. All of this will undoubtedly make it somewhat easier for the dentist to provide the quantity of service that he provides now, but I doubt if the dentist of the future will double his production by working the same number of hours with equipment and organization that would allow him to double his speed. I rather think that the dentist of the future will utilize all of these developments to the joint advantage of the patient and himself, but the big advantage will be that while the amount of service can be increased slightly, the dentist himself will have more time for further study, and for meeting the responsibilities that he has as a citizen in his community. Dentists, as professional men, are needed in their communities for more than just dental care, and these new methods will permit them to render these additional services that are almost being crowded out of the time schedule of the busy practitioner of today.

One other thing that must be said in any paper on manpower today is the fact that the dental profession will need to take an increased interest in the wise and efficient utilization of the properly educated auxiliary personnel. This is another phase of recruitment programs; programs of recruitment that enlist as dental assistants, dental hygienists and dental laboratory technicians, those who want to become real members of the dental health team and who will make a life-long career of this important work. These problems of recruiting personnel for the dental team are important for all men in dentistry to consider, whether they be examiners, school men or practitioners. The future of the dental profession depends largely upon how these problems are solved and the philosophies upon which their solutions are based.

The Influence of Increased Speeds and Modern Office Procedure on the Undergraduate Curriculum and Dental Educational Trends

REX INGRAHAM, D.D.S.

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BEFORE DISCUSSING TRENDS in dental education and current changes in the undergraduate curriculum it appears desirable to re-examine for the moment, the basic philosophy of the profession in light of the existing manpower problem in dentistry.

Reports^{1, 2}, have stressed the fact that the population increase of some two and one-half million per year within the United States is mounting at a much faster rate than is additional new dental manpower.

If it is the considered opinion that the profession provide dental manpower in relation to the rapidly increasing demand for dental service, then present and future planning of the dental curriculum will have a far reaching effect upon the future status of dentistry as a profession.

A report by the American Dental Association³ indicates that an estimate of two new dental schools (or the equivalent expansion of existing schools) would be needed each year from 1957 to 1971, in order to maintain a satisfactory ratio of active dentists to population. Since no such expansion of facilities appears to be economically feasible in the immediate future, the solution to the manpower needs must be found in other ways. Among suggested answers to this vital question are the following:

1. A more realistic distribution of existing dental manpower, in view of the variations in need for dental care throughout the country.

2. The effective utilization of control measures for the prevention of dental disorders, thus reducing the total dental health needs of the public.
3. Increased productivity of the individual dentists by utilization of a more efficient operating environment, with particular reference to the arrangement of physical facilities and equipment within the immediate operating area.
4. Increased productivity through a more general application of the so-called "Mechanized Approach" to dental procedure, with reference to Increased Speeds, Washed Field Technics, and further Work Simplification Methods.
5. An increased utilization of the dentist's special skills and knowledge through a more efficient use of auxiliary personnel, with attention directed toward adequate training of sufficient numbers of assistants.

Major responsibility for solving the many complex problems and questions revolving around the manpower shortage, by no means rests with the dental schools alone. However, it most certainly offers both an immediate and long-range challenge to dental education.

The teaching of the basic skills necessary for performing the technical phases of dentistry, and imparting a fundamental knowledge of the various subjects of dental science, has monopolized most of the available time within the undergraduate curriculum. However, in view of the current advancements in dental science and the more advanced present day approach to office organization and procedure, this concept must be considered to be highly inadequate.

There should be a continual shift of emphasis and reevaluation of the undergraduate course of study, to keep pace with current changes in dental procedure and dental thinking, and to keep attuned to the socio-economic trends of the country. This is imperative if the schools are to fulfill a basic obligation to society and the student, who represents the future manpower of the profession. The objective should be to indoctrinate the undergraduate with an adequate philosophy and concept of the requirement for a present day dental practice, in view of the present and future dental health needs of the public.

The task of preparing young men to enter the highly competitive field of practice today, is more of a challenge to the teacher and the institution than ever before. The new graduate must compete with senior colleagues, possessing far more experience in the highly "mechanized" approach to dental procedures, and far more capable of comprehending the present social and economic trends as they relate to the conduct of a present day dental practice.

Dental education at the undergraduate level has barely begun to

take steps toward increasing the student's capacity to produce a present day dental service.

It can be pointed out here, that qualified observers have found very little limitation to the capacity of the student to acquire additional knowledge when properly presented; or, to adapt to new and revolutionary procedures when these are adequately demonstrated and taught. Any limitations lie, rather, in the degree of preparedness of our teaching staffs and in the latitude of foresight and imagination of our administrative leaders.

The introduction of increased speeds at the undergraduate level was looked upon at first with considerable apprehension. However, as in the instance of the practicing profession, the increased efficiency resulting from higher speeds and improved instrumentation, has established an entirely new concept for increased productivity. Even so, it must be recognized that increased speed is only a single step toward increasing the efficiency of the undergraduate student. He must also be trained in other mechanical approaches to dental procedure, such as, indirect impression technics, washed field technics, and further work simplification methods. Furthermore, the effectiveness of such a program is largely dependent upon an adequate training of the student to use a dental assistant in an efficient manner.

In a report on the profession's manpower problem, Brauer states:³ "Dental schools obviously cannot assume the major responsibility for the education and the training of the greater number of assistants needed. However, the dental schools are obligated to find ways and means of adequately training the dental student to effectively use a well trained dental assistant."

During the past two years steps have been taken to project the undergraduate student well beyond his basic course of instruction. A pilot study was authorized by Dean R. W. McNulty, of the University of Southern California, School of Dentistry, in June 1957. The Senior student body has participated in this project on an assignment basis.

Following a series of orientation lectures and seminars, the students observe an experienced operator with a well trained assistant, receive a patient into the office, make an examination, outline a treatment plan, and present the treatment plan to the patient. On a subsequent appointment the student observes the doctor-assistant team prepare multiple preparations, take impressions for dies and

master models, and temporize the operated teeth, or place other types of restorations. When cast restorations are indicated in the treatment plan, a third appointment is utilized to demonstrate office procedures for finishing and cementation.

These patient operations are carried out with modern armamentarium and employ work simplification methods. The effective use of a well trained dental assistant is emphasized and demonstrated.

In turn, the students now duplicate these operations on selected patients. Following the examination and the outlining of the treatment plan, they make case presentations to their patients, using fees based on an arbitrary hourly figure. During the next two carefully outlined appointments they work in pairs, with one acting as the assistant. Operating speeds of 35,000 to 50,000 RPM are employed routinely by the undergraduate students in the clinic. However, no particular problems have been encountered in the special course when the transition is made to speeds in the region of 100,000 RPM and above.

The students operate from a prepared tray "set-up" employing washed field technics with increased speeds, vacuum elimination, and indirect hydrocolloid procedures. When properly oriented, the undergraduate readily adjusts to this work simplification program. Working in this more favorable environment has made it possible for the average student to prepare multiple preparations, and in many instances, a quadrant of teeth within the allotted time. Obviously, the assistant plays an important role in the efficient execution of this program.

Throughout the program, quality of dental service and adherence to fundamental principles is emphasized. It has been a reassuring observation that while a 50 per cent increase in productivity has been attained by the students under these more favorable working conditions, the quality of work accomplished by individual students has shown general improvement.

This pilot study will be expanded in the future, to include the utilization of well trained assistants to work with the students during all patient operations. Also, further variations will be employed in planning the physical environment of the operating area and in selecting the types of equipment used.

It is the considered opinion of the investigating staff that with the anticipated improvements, student productivity can easily be doubled.

With the potential for increased student accomplishment, it is a logical conclusion that the schools must find ways and means of providing the physical environment and special equipment necessary for introducing work simplification methods into the undergraduate course of study. As previously stated in a quote by Brauer:¹ "It is also an obligation of the schools to find ways of training the dental students how to effectively use a well-trained assistant."

Acceptance of these concepts, along with more efficient utilization of well trained laboratory personnel in certain phases of fixed and removable prosthesis, would be highly effective in meeting the challenge which the manpower shortage has placed upon dental education and the profession.

It is essential that any modification or change in the basic concepts of our undergraduate teaching program must be substantiated by sufficient factual information. Applied clinical studies are as necessary to the intelligent planning of the present and future dental curriculum as is basic research to the advancement of pure science. Ways and means must be found for implementing clinical studies of the operating environment and work habits of the student in the dental clinic. It is hoped that this type of research activity within the dental schools will receive a more realistic financial support in the future from both local and national sources for grants-in-aid.

A new area of research activity has been instigated at the University of Southern California, School of Dentistry, under the title: "HUMAN FACTORS IN DENTISTRY." To quote from a preliminary report by Golden, one of the principle investigators on the project: "The dental environment and human beings involved in that environment form the subject of this study. The operator, the patient, and the auxiliary personnel are being considered upon both a physiologic and physical basis. It is hoped that this analysis will aid in a better understanding of the work habits of the operator and auxiliary personnel relative to their working environment, as well as provide detailed information about the patient's environment and comfort."

SUMMARY AND CONCLUSION

1. If it is the considered opinion that the profession provide dental manpower in relation to the rapidly increasing demand for dental service, then present and future planning of the dental curriculum will have a far reaching effect upon the future status of dentistry as a profession in society.

2. The undergraduate adapts readily to a modern work simplification program.

3. By placing a student in a more favorable working environment, his capacity to produce a health service, by conservative estimate, can be doubled.

4. An energetic research program of an applied clinical nature within the schools is essential to the intelligent planning of the dental curriculum.

5. Incorporating the concepts of work simplification methods and efficient utilization of well trained personnel into undergraduate course of study, would be highly effective in meeting the challenge which manpower shortage has placed upon the dental education and profession.

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American Council on Education

Survey of Dentistry

BYRON S. HOLLINSHEAD, LL.D.

EDITOR'S NOTE: *Dr. Hollinshead is the Director of the Survey of Dentistry. He was formerly President of Coe College at Cedar Rapids, Iowa, and only recently returned from Paris, France, where he served for five years as a Director of UNESCO. He has contributed widely to educational literature, is the author of several books and has served in many capacities in the field of education.*

RECENTLY I WAS on a panel to discuss American education. My task was to say within five minutes what constituted the major difference between American and European education. My reply was that if I had to focus so sharply I would say that the most significant difference between

American and European education is that American schools and colleges are more closely related to their times. They are more susceptible to the forces of change, and indeed they help to bring changes about. In contrast, education in Europe does not change as rapidly as the society which it reflects, and, by and large, their education is not engaged in trying to foster changes.

If more time had been available, I would have added that the second most significant difference was that the changes in American education are usually brought about by voluntary means—that is, by voluntary accrediting agencies, by study groups appointed by non-governmental organizations, by committees on faculties of institutions, or by lay groups working with professionals to influence institutional behavior.

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, non-

governmental bodies to suggest the ways and means by which such improvements can be made.

Carrying out such an aim, a group of influential dentists solicited the funds necessary to make a study of dentistry and asked the American Council on Education to take the responsibility for its organization. The Council appointed a representative commission of dentists and laymen to oversee the work and we were, so to speak, in business.

However, we did not start from scratch. Before receiving any funds, and, indeed, as a part of the request to foundations, a group of dentists had already devised a general plan for the study which included sectional committees in the fields of dental education, dental research, dental practice, and dental health.

With this background, the Commission met in March, 1958, to devise a general plan. There were three main points to be considered. One, there was a need for a thorough-going study for the information of the profession itself, and for those professions closely allied with dentistry. Two, there was a need for a popularized version of the main study for the man in the street to read. Three, there were many special studies which needed to be made of problems or issues now facing the profession.

The main volume must, obviously, cover the divisions already set up—education, research, practice, and health. Further, it needs to deal with the perennial problems of dentistry by showing how and when and why these problems arose.

In the light of these considerations, it seemed logical to plan a main book with six chief chapters: The Problems of Dentistry, Dental Education, Dental Research, Dental Health, Dental Practice, and Socio-Economic studies.

In the field of special problems, we have decided that we should make some special investigations of the following topics:

1. The role of women in dentistry.
2. The role of auxiliary personnel—hygienists, dental assistants, laboratory technicians.
3. Student recruitment for dental schools.
4. Dental care of low-income groups.
5. Dental care of the aged and indigent.
6. Training dental students for work abroad and training foreign students here.
7. Licensing—national dental examinations—state reciprocity—international exchanges.

8. Dental clinics in hospitals—internships for dental school graduates.
9. Organized dental care programs.
10. Dental programs under governmental agencies.
11. Finding and training faculty members for dental schools.

This all sounds very dry and sober, and indeed it is, but it has its exciting aspects. No one of us, of course, can entirely disentangle himself from the stranglehold of his environment—the stranglehold of customs, ideas, habits, and ways of doing things. Yet, this is what a survey must do, to a degree, if it is to have value. We must, somehow, act as if we were men from Mars investigating this strange profession which scrapes, fills, grinds, and replaces the grinders which allow us to masticate. As men from Mars we want to know how these useful people are trained. By what laws and customs do they practice? How are people to know where to find a good one? Should a dentist commit the modified mayhem which creates pain while relieving it within the four walls of his own office or out where a group can see him, or both ways?

It is such questions as these which we must ponder. Hopefully, we should be able to make recommendations which will advance us a little from where we are. Such an enterprise is a common responsibility in which we must all participate. We shall be grateful for any assistance you can give us, and if you have suggestions to make we shall always be glad to receive them.

Teaching and Research

WILLIAM G. McINTOSH, D.D.S.

EDITOR'S NOTE: *Dr. McIntosh is a graduate of the Faculty of Dentistry of the University of Toronto, Canada. After several years in general practice and active duty with Royal Canadian Dental Corps, he limited his practice to periodontics. He is Associate Professor at the University of Toronto, Faculty of Dentistry, and consultant in periodontics at Sunnybrook Military Hospital. He is a member of the Board of Governors of the Canadian Dental Association and Chairman of the Committee on Research of the American College of Dentists.*

THE RESEARCH COMMITTEE of the American College of Dentists has been invited to participate on this panel. I wish to point out that although it is my honor to represent the Research Committee, I can not hold that committee responsible for the views and opinions herein expressed.

The American College, recognizing the need for up-to-date instruction in dentistry and the

value of continued research, has long been interested in the relationship of dental education to dental research. By encouraging the activities of both departments through the work of the various committees the College has striven and continues to strive toward its main objective—better dental health for all people.

In the short space allotted to the topic "Teaching and Research," only a few comments and observations can be made. To conserve time some pertinent questions about this topic are proposed and brief answers are suggested.

1. *Do teaching methods and research activities in our dental schools warrant continued study?*

Those who have had an opportunity of visiting a number of dental schools and observing the teaching methods used in each, will no doubt be impressed with the fact that there are wide differences in the approach to the various subjects on the dental curricula as well as in the methods by which they are taught. For example, in one case clinical experience or orientation may come early—even before the academic lectures—and in the next, this approach is considered to be heresy and the full academic lecture series precedes any laboratory or clinical examples of the subject matter discussed in the lectures.

The fundamental principles of teaching and the techniques which are used are therefore obviously in need of extensive study. At a time

when it seems necessary to give the student more and more knowledge in less and less teacher-student hours, it is highly desirable to have the teaching system as efficient as possible.

Research in dental and allied subjects is increasing in quantity year by year. Most authorities on the subject seem to think that the quantity as well as the quality is still far short of what it ought to be. It was pointed out in the 1956 annual report of the Research Committee of the American College of Dentists and again at the IADR-AADS' Joint Symposium on dental research and education that funds are no longer the main stumbling block to dental research. The supply of interested and trained personnel is the main problem. It therefore appears necessary that administrative groups continue to make a study of ways and means of interesting young people in dental research and enticing them to take the necessary training that will fit them to be competent research workers.

A nationwide organization of research projects designed to save unnecessary duplication, the proper choice of research projects and the application of new knowledge are other examples of phases of research that are in need of constant study.

2. Is a teacher a better teacher if he also does research?

The influence a teacher has on his students is usually considered to go far beyond the actual limits of prepared lecture material. A teacher therefore who can refer with enthusiasm to some of his own research work and who reflects the inquisitive attitude of a true research worker will undoubtedly impress the eager student more than the instructor who is limited by his own lack of interest. If as teachers we accept the challenge of stimulating more young men into careers of teaching and/or research, this influence in the lecture room can be most important in providing that incentive.

It is only fair to add that in my opinion a teacher can be an excellent teacher, especially at the undergraduate level, without being actively engaged in research. However, he must have research attitude with regard to both his own teaching methods and his subject, if he is to meet his full responsibility to the students.

3. Should a research man be forced to teach?

The best research men are not always the best teachers. In fact the true scientist often has great difficulty in leaving out the detail that

is usually over the heads of his students—particularly undergraduates. To be a good teacher the scientist has to be a good editor. Experience has shown that the disciplines required for original research do not always go hand in hand with the disciplines necessary for good editing or good teaching. It would seem therefore that making a hard and fast rule that would oblige all research workers to teach, could result in loss of productive research hours in favor of less productive teaching hours.

Many dental institutions have found it necessary from a financial standpoint, to have research men assume some of the teaching load. Ideally this appears to be the best arrangement. However, with more monies available for research and more personnel interested and trained in research, it may not continue to be the most practical situation.

4. Should a teaching institution have an atmosphere of research?

Dr. Willard Fleming¹ has written that research is one of the most important activities which identify a profession. "Above all else," he writes, "there must be an atmosphere of research in the institution."

An active research program in a teaching institution is a means of integrating the basic and clinical sciences. It helps to give the institution character, about which, students, staff and public will be justly proud. Close association with a well organized research department should also help to motivate young men to choose careers in dental teaching and research.

These are important phases in the future development of our profession. A dental school of today is therefore not living up to its true responsibility to profession or public unless it does present an atmosphere of research.

5. Can a teaching institution have too many research activities?

It seems important that one does not lose sight of the main function of a dental school—that of training young men and women to be good dentists. Being a good dentist of course, implies the ability to render good service to patients, to have an inquisitive or research attitude about his practice, to continue his studies in order that he keep up with new knowledge and procedures, as well as fulfilling his obligations to family, community and himself.

With this objective in mind and considering both practical and economical viewpoints, it would be possible for a teaching institution to be overweighted in research activities. Ideally the research efforts should be related to the size of the faculty. Since it is desirable that most research workers have teaching responsibilities to either undergraduate or graduate programs, they should not, with few exceptions, be engaged at a faster rate than they can be accepted within the teaching staff.

In a study of immediate needs for research in dental institutions in the United States, prepared in 1956 by the Council on Dental Education and the Council on Dental Research of the American Dental Association, it is stated that "facilities and personnel available at dental institutions are far from saturated with respect to dental research capacity." Accordingly there seems little likelihood that the research activities will interfere with the teaching efficiency for some time to come. Indeed from the standpoint of the research worker, according to Dr. J. B. Macdonald, teaching experience is beneficial and helps to prevent narrowness. The converse is equally true and teaching benefits immeasurably from active research. Research brings to teaching new ideas and a sense of inquiry rather than mere pedantry.

6. Is there a difference between undergraduate and graduate levels so far as the teaching-research relationship is concerned?

The techniques involved in this relationship have to be different at the two levels of education. At the undergraduate level, the application of the products of research and the development of a research attitude in the minds of the students, seem to be the main objectives. At the graduate level, research procedures and creative thinking are the important features. Consequently, an individual may be an excellent graduate instructor and much less successful as an undergraduate teacher. The opposite of course may also be true.

A committee from the University of Toronto School of Graduate Studies has reported that it is impossible to separate teaching from research, particularly at the graduate level. Further, that it is possible to pursue research vigorously in the absence of graduate students but not to train graduate students in the absence of active research. It is almost as true to say that this also applies to undergraduate education.

7. *Do both clinical and basic research have a place in a teaching institution?*

The clinical investigator has a very important responsibility in a teaching institution. He must not only be up on basic knowledge but he must be able to put this knowledge to clinical practice where it may be tested. He is the middle man between the basic research worker and the clinical teacher. Ideally the clinical investigator is also the clinical teacher. Dr. Willard Fleming¹ when discussing the activities of the clinical research investigator stated "Not only is this fellow an essential part of our educational program, but we cannot advance without him."

Basic research, meaning research in the basic sciences, has at least two important reasons by which to justify its existence in a teaching institution. One is to provide a basis for growth of professional knowledge. A second is to serve as a stimulus and background for (a) research minded individuals who may seek out dental research and teaching as their career, and (b) for dental practitioners who are interested in continuing their studies after graduation. Dentists with such a background are the ones most likely to have their philosophy of practice develop around a research attitude. This can only result in a more scientific dental practice and better dental service to the public.

It appears then to be a very difficult task to divorce the work of the clinical investigator from that of the basic research man. One complements the other. The stature of the institution which encourages both fields of endeavor will undoubtedly grow.

8. *Should special steps be taken to encourage young individuals to make careers of teaching and research?*

Surveys have indicated that dental faculties throughout this country are not saturated with respect to their research capacity. In most instances this deficiency is the result of lack of properly trained personnel, rather than insufficient funds.

The ultimate in the case management of any dental disease is prevention. Prevention of course can only come as the result of a better understanding of the biologic processes involved in health and disease. President Conant³ of Harvard is quoted as saying "The prevention of dental disease must be a major national objective."

The accomplishment of fundamental research, and the teaching

and application of research principles in our dental institutions depends upon well qualified personnel. The number of individuals so qualified at the present time is small. It is, therefore, the duty of every one of us to seek out, motivate, encourage, help and direct students who show interest or capacity for a career of teaching and/or research.

9. Should the public be kept informed of the problems associated with teaching and research?

It has been very satisfying over the past few years to see the scholarships, bursaries, fellowships and other funds in aid of students who wish to qualify themselves for teaching and research positions, increase in amount. While monies available for these purposes have increased, they have not kept pace with grants available for actual research projects. It has been stated previously that the immediate need is not money for research, but for trained personnel.

This situation can only be improved by keeping the public and administrative groups fully informed of the actual problems confronting our profession. Just as dentistry improves as a result of a better understanding of biologic principles, so the relationship and cooperation between public and profession will improve as the public is made to understand and appreciate some of our basic problems, especially the urgent need for well trained personnel.

10. Conclusion

Statistical evidence indicates that to date very little can be claimed in the field of true preventive dentistry. Also conclusive studies which relate the significance of dental disease to general health are lacking. Dentistry sorely needs to make advances in both of these important fields if it is to grow as a health profession. Such advances can only be made through the efforts of individuals working alone or in groups, who are willing to accept the challenge of the unknown, to maintain an inquisitive attitude, and to slowly add to our knowledge by laborious but rewarding research.

Educators in dentistry are today, perhaps more than ever before asking themselves whether the old techniques and teaching methods are still appropriate. Furthermore, is the subject matter presented in our dental curricula in the best interest of the public and the profession?

Such problems relating to both dental education and to fundamental research need careful investigation. The relationship between the two is inseparable and this area of relationship should be extended. The future of dentistry is closely related to our research efforts and to the degree to which the principle of experimentation is included in dental education.

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CALENDAR OF MEETINGS

CONVOCATIONS

September 13, 1959, New York, N. Y.

October 16, 1960, Los Angeles, Calif.

Research Opportunities in Dental Practice

SEYMOUR J. KRESHOVER, D.D.S.

EDITOR'S NOTE: *Dr. Kreshover received a D.D.S. degree from the University of Pennsylvania, an M.D. degree from New York University and his Ph.D. degree from Yale University. He is Associate Director of the National Institute of Dental Research at Bethesda and formerly served as Professor of Oral Pathology and Director of Dental Research and Graduate Study at the Medical College of Virginia. He is a member of the Committee on Research of our College and the Committee on Dentistry of the National Research Council.*

IN THE SIMPLEST terms of definition and viewed in a broad sense, the primary responsibility of the man or woman in general or specialized dental practice, is to serve the immediate, day-to-day, oral health needs of the Nation. However, this important role of diagnostician and therapist, in order to be completely rewarding for both doctor and patient, must be coupled, at least

to some degree, with research. Very probably, the increasing awareness by schools of the essential part that research must play in professional education has contributed significantly in recent years to an improved product of dental graduate; i.e., one equipped with the truly essential tools of research—a sense of skepticism, a spirit of inquiry, and a dedicated responsibility to seek for new knowledge.

Research opportunities in dental practice must necessarily be predicated on an assumption that we understand the meaning of research. Appleton has said that “dental research, as well as other areas of medical research, probably begins with such questions as how to treat and how to prevent departures from normal in certain structures or functions.”* Thus, three essential questions are involved: First, what is normal? Second, what are the departures from normal? And, third, what can be done to prevent and correct these departures from normal? Although this concept encompasses both structural components and related physiologic processes, it should be emphasized that dental research has an even broader scope. For example, there is epidemiological and sociological research, as well as research in history and research in practice administration. Viewed

* J. L. T. Appleton: The Field of Dental Research. *Annals of Dentistry*, 11:17-18, March 1952.

in this light research becomes a pursuit of new ideas and new concepts together with advances that can be made for their better understanding and communication to others.

While continuing to recognize the essential component of patient care in the pursuit of a professional career, we should not lose sight of the fact that just as education becomes infertile in the absence of a research environment, so does dental practice. What then can the average practitioner realize in the way of research opportunities? Being charged with responsibility for the nation's oral health, he cannot escape an obligation to contribute to research, in at least some measure, either by active participation in original types of investigation; by part-time membership on a research team; or by just keeping abreast of major contributions to the scientific dental literature and understanding their meaning and significance. Unfortunately, far too little attention has been given to the important contribution that can be made to research by the mere intelligent interpretation and evaluation of scientific reports. It should, of course, be borne in mind that as the volume of publication expands to keep pace with increasing knowledge, there develops an obvious inability of one person to grasp it all. And so there continually arises a need for newer fields of specialized interest and a parallel need for each practitioner to establish and maintain lines of communication with his professional colleagues. This perhaps can be accomplished best by attendance at scientific meetings, participation in seminars and informal reading groups, and matriculation in postgraduate refresher courses.

Clinical research, perhaps even more so than the laboratory variety, demonstrates that problems are solved in one's head and not on a laboratory table. Nevertheless, the traditional distorted picture of a scientist stooped over his maze of complex equipment and tabulating a score sheet of formulae, continues to be a symbol of all scientific research. This, undoubtedly, has had an unfavorable influence on the advancement of clinical research in that many practitioners feel an insecurity about venturing into a field about which they presume to know so little. It bears emphasis, however, that although so-called basic research requires long years of training, its important objective of developing skills in the use of research tools—both physical and mental—is also common to clinical fields. Presumably, the application of knowledge through a developed sense of

observation, interpretation, and judgment is equally obtainable in courses of clinical study. Obviously, therefore, the average dental practitioner has just as much chance of being qualified to pursue research in his clinical field, as does the bench scientist in his basic field. Viewed in this light, it would seem that fear of being incompetent to engage in research is possibly a less hindering factor than are the demands that research would make on a practitioner's time. However, it would seem that whereas the newcomer to dental practice must devote long hours to the improvement of his technical skills, the veteran, with added years of clinical experience, can more easily and effectively discharge a patient responsibility and thereby permit more attention to a research interest.

In further consideration of more specific research opportunities in dental practice, a profitable example of experience may be cited from the program of the United States Public Health Service since the duties of the average dental officer in federal employ closely parallel those of the man in private dental practice. Recognizing the importance of emphasizing clinical research, a procedure was instituted during the past year whereby dental officers in installations throughout the country could be provided with consultation by experienced investigators. Through a series of visits, the going research programs in various dental clinics were discussed, and wherever assistance was required to further the productivity of a study, it was given. In those clinical facilities where there was no research activity, an attempt was made to stimulate interest by a series of follow-up visits. While too early to show possible benefits from this program of guidance and encouragement, the following random excerpts from the reports of project site visits are pertinent:

Commented one officer, "The clinical dentist is hesitant to propose study projects for fear his ideas may look ridiculous—he prefers to stay on the more familiar ground of treating patients." Commented a second officer after visiting another installation: "I have attempted to suggest a variety of research projects using essentially simple techniques, requiring little extra equipment, and consisting of work that relates closely to the daily clinical duties. A single project, or any combination of suggested studies (and these included an office efficiency study and a study of stress as related to mucosal changes) would constitute a valuable contribution. With careful planning it will be seen that such projects will move of their own speed and,

with some training, office assistants can maintain most of the records." A third officer commented as follows after visiting an outpatient clinic in New England: "The gradual stimulation of an attitude of inquiry and the development of a clinical research program can prove to be very rewarding to the men in the field; it will be advantageous to the Dental Corps and its operation, and it will be beneficial to the profession at large. This program will grow to the degree that it is mutually advantageous." It is encouraging to note, even at this early date, that studies of good quality are now under way in several clinics that previously had never engaged in research; and that other installations are requesting continued consultative visits as they plan projects for the early future.

Among the needs of clinical dentistry today are more case reporting for the literature; more information on high speed instrumentation and the comparative cutting efficiency of points of different size and composition; and evaluation of newer drugs such as sedatives, antihistaminics, and local anesthetic agents as they are made available for use. Thus, an almost endless number of projects are suitable for study in the dental office. Without question, these could and should be initiated by the private dental practitioner. Guidance through contact with colleagues experienced in clinical research; willing attendance at scientific sessions of component dental societies; and acceptance of a duty to contribute in some measure to the advancement of knowledge, are avenues of approach available to all. We need only be reminded that by seeking new light one finds new light, and in finding it ever seeks for more.

Financial Aid: Need and Availability

DOYLE J. SMITH, D.D.S.

EDITOR'S NOTE: *Dr. Smith is a graduate of Washington University School of Dentistry, 1936. He is in the practice of orthodontics and is a lecturer on Dental Public Health at the University of Tennessee School of Dentistry. Dr. Smith is Chairman of the Committee on Financial Aid to Dental Education of the American College of Dentists.*

THE MORE ONE studies the problems of financing dental education in the United States as it ought to be financed, the more apparent it becomes that a multitude of imponderables makes exact judgment impossible, though at the same time it becomes apparent that though

the need is great, the opportunities are also enormous.

The number of variables in all statistical studies thus far is a little dismaying. At best we may hope to see the light as travelers through a jungle might see it—fitfully and diffused into an unreal average. For example, in attempting to estimate the cost of dental education to the student, your committee has found that tuition costs for residents in 17 state schools during 1955 range from a low of \$800 to a high of \$2,480. For purposes of discussion we must work with an average figure of \$1,652 tuition costs for 1955. In 1954 a similarly computed average was \$1,591. Dr. Harry B. McCarthy, writing in the fall of 1957, computes the average cost of tuition as being \$2,522 in the state dental schools.¹ Just as the jungle light has a function for travelers, these averages have a function for us. We may safely conclude that costs are rising very rapidly—from \$1,591 in 1954 to perhaps \$2,522 in 1957.

This indubitable rise is, of course, an essential part of the total problem. Rising costs to the dental student represent to some degree rising costs to the school. However, since the cost of tuition amounts to only one third of the total cost of educating a dental student,² the schools become increasingly less solvent as enrollment grows under this condition of generally increasing costs. Considering only this one factor, then, it is easy to see that not only dental students but also dental schools are in trouble and will be in more trouble.

It has been argued that since a student invests approximately \$26,000 in his four years of training (all conceivable expenses in-

cluded) and since his earning potential over a thirty-year period is approximately \$600,000, he could reasonably be expected to pay a greater share of tuition costs than one third he now pays.³

This conclusion is, on the surface, reasonable. However, at least two unfortunate facts appear to undermine its practicability. One is the decline in the ratio of dentists to population. The number of dentists in active practice rose from 1930 to 1955 by 5,000. But the ratio declined from 1:1728 in 1930 to 1:2168 in 1955. The fact that dental enrollments increased more than 50 per cent from 1944 to 1950 did not prevent this decline. The present ratio of 1:1886—less than in 1930 but more than in 1955—indicates that the downward trend has been checked, but the continued increase in dental enrollments is not adequate to reverse this trend.⁴ Another report estimates that in 1930 the ratio was 38:100,000, but in 1957 only 46:100,000.⁵ The Bureau of Economic Research and Statistics judges that by 1960 we will be short of maintaining the present 1:1886 ratio by from 600 to 2,100 dentists.⁶

The second awkward fact militating against the possibility of any great increase in the percentage of tuition costs paid by the student is that dental students graduate in debt to the extent of an estimated \$4,230 at the end of their four years.⁷ Even though the graduate may look forward to financial rewards in one of our most remunerative professions, this initial debt is bound to be discouraging. The difficulty is compounded, of course, by the fact that we need not just dental students, but students of a certain calibre. As you well know, many of those who would be a credit to the profession may be less well able to finance themselves than the average currently going into debt for their training. Part of our need here may well be an expanded scholarship program.

All of these data, I believe, provide good illustration of one aspect of the "need" that is part of my subject today. Another aspect of this need involves, of course, the schools themselves. Here also we must deal with generalities and averages. But again the conclusions seem inevitable. According to a 1957 report of the House Interstate and Foreign Commerce Committee, the nation's dental schools need \$77,000,000 for improvement of teaching facilities alone. An estimate published one month earlier in the JADA states that the forty-five dental schools need nearly \$85,000,000 for construction and remodeling of educational and research facilities.⁸ Assuming that about

\$8,000,000 might appropriately be spent on research facilities, these estimates jibe very well. The American Dental Association has recently made two recommendations in this area: 1) a \$95,000,000 five-year program to aid the forty-seven existing dental schools, and 2) construction of eight new schools during the next five-ten years at a cost of \$30,000,000.⁹ The need of the schools goes beyond these which I have mentioned—teaching and research facilities. A glance at some of the principal factors making for added expenditure will suggest the further scope of the problem:

1. A rapid rate of population increase projected to a total of 228,500,000 by 1975 requiring a large future increase in the number of students and dentists.
2. An increasingly high standard of living and of education which will entail more dentists and increasing utilization of dental specialties.
3. Expansion of teaching and research facilities.
4. Modernization of present facilities and equipment.
5. Increased salaries for teaching and research faculties.
6. Increased administrative cost.
7. Increased demand for graduate and postgraduate programs.

Traditionally the schools have derived their income from tuition, clinic fees, tax funds from the state and/or support from the parent university. As we have already seen, tuition paid by students amounts to approximately one third of the cost to the school. There is some divergence of opinion as to the value of fees from clinics. According to the report on Cost of Dental Education for 1949-50, made by the Council on Dental Education and the U. S. Public Health Service, clinic income is of considerable importance, approximating 25 per cent of the total basic operating expense. However, in the JADA for March, 1957, this source of income is dismissed with the statement that it produces only "limited funds."¹⁰

At any rate, it seems unlikely that any great additional funds can be secured through increased fees from students and clinic patients. Inevitably, most support must come from state and federal sources.

Government subsidies are available under the Hill-Burton Act on the matching basis of \$2 for \$1, and under the Hill-Bridges Act on a one-to-one basis during a three-year period to the maximum of \$30,000,000. It is reasonable to expect that such appropriations, though insufficient in themselves to solve the total financial problem, will be continued in at least the same proportion to need as at present. Other available federal aids include FHA aid in acquisition

of land for building purposes, and federal loans for dormitory construction.

Two national institutes are also current sources of financial aid. The National Institute of Dental Research provides grants for the training of dental teachers. The National Institute of Health Senior Fellowship Program provides funds for adding teachers and research workers in biological sciences to faculties of medical, dental, and public health schools.¹¹

Another potential—though as far as dentistry is concerned almost uncultivated—source of revenue is the private foundation or trust. Of 4,162 foundations existing in 1955 only six so much as mentioned dentistry.¹² The Report on Cost of Dental Education for 1949-50 shows that gifts and grants for dental education amounted to \$66,454 for public schools and \$215,467 for private schools—a total of \$281,921. In the words of the report:

"Gifts and grants, endowment income, miscellaneous transfers and income from regional organizations were of nominal importance as sources of income in schools of dentistry, together comprising only five per cent of total basic operating expense. This situation is in sharp contrast to that found among medical schools. For example, 40 per cent of the income of private medical schools came from endowments and gifts and grants combined, whereas only five per cent of private dental schools' income came from these sources."

Financial support for postgraduate and graduate dental education is largely unexplored. However, resident training in medical specialties has been expanded with government funds under joint medical school-veterans hospital programs. Why not dental residency programs?¹³

Total endowment funds from philanthropic institutions given for the advancement of dentistry amount to \$8.6 millions. Similar endowments for medicine amount to \$210 millions. Obviously we have failed to cultivate an area of availability that has produced for medicine an abundant harvest. To do so properly, we need to develop much more effective public relations, including a blueprint for the future capable of convincing potential supporters both of the need which their help will satisfy and the values which it will create. I might remind you in passing of suggestions made in the 1958 Report of the Committee on Financial Aid to Dental Education concerning methods of supporting the Fund for Dental Education. The problems of creating awareness and of interesting donors are very similar in both cases.

Another relatively uncultivated field is that of alumni support. It has been said that a program of increased alumni support ought to produce more than a million dollars a year.¹⁴ Development of such a program also calls for good public relations and careful planning.

Whatever methods we adopt—and they must be many and varied—in the attempt to meet a very obvious need, they all require, in my opinion, careful organization, good public relations, and above all the devoted interest of every individual member of the profession everywhere. For a cause such as ours, funds are available from many sources. The task is to cultivate the zeal and foresight which will channel them in the right direction.

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The American Association for the Advancement of Science

Proceedings of Section Nd—Dentistry at the One Hundred Twenty-Fifth Meeting of the Association*

Reported by
REIDAR F. SOGNNÆES

SATURDAY MORNING, December 27, the Section on Dentistry co-sponsored a Symposium on "Pre-Medical and Pre-Dental Education" arranged under the auspices of Alpha Epsilon Delta at the George Washington University School of Medicine. Dr. Clemens V. Rault, Dean, Georgetown University School of Dentistry, presented a talk on "The education of the dental student" as part of a symposium during which the new plans for medical education at John Hopkins School of Medicine were discussed by that school's Associate Dean, Dr. Samuel P. Asper, Jr. Criteria for admission to dental school, a panel discussion moderated by Dr. Lester C. Shell, pre-medical and pre-dental advisor at Central College, were explored from the point of view of a dental school dean (Dr. R. A. Dixon, Howard University), a dental school admission officer (Dr. E. G. VandenBosche, University of Maryland), and a senior dental student (Mr. Eugene Colao, Georgetown University).

Monday, December 29, 1958, in the Blue Room of the Shoreham Hotel, the Section on Dentistry conducted a three-session Symposium on "CALCIFICATION IN BIOLOGICAL SYSTEMS." At the request of Dr. Russell W. Bunting, outgoing Secretary of Section Nd, and Dr. George C. Paffenbarger, 1958 Vice President and Chairman, this Symposium was arranged by Dr. Reidar F. Sognnaes, with the co-sponsorship of Section N (Medicine) and Section F (Zoology), as well as by the International Association for Dental Research, North American Division, the American Dental Association and the American College of Dentists. Dr. A. F. Forziati, Bureau of Standards, was Chairman of the Local Arrangements Committee.

This Symposium for the first time permitted scientists from many

* Held in Washington, D. C., December 26-31, 1958.

fields to take a total, coordinated look at the manner in which Nature deposits inorganic minerals in biological tissues in normal and pathological conditions, exploring the ultimate building blocks of living Nature's hardest structures—from lobster claws to human teeth.

During the morning session, moderated by Dr. Roy O. Greep of the Harvard School of Dental Medicine, the process of calcification was reviewed as it occurs in the exoskeleton of echinoderms (Dr. Bevelander, NYU); in the shells of oysters (Dr. Wilbur, Duke); in the crayfish gastroliths (Dr. Travis, Harvard); rodent otoliths (Dr. Belanger, Ottawa); in normal and abnormal cartilage (Dr. Follis, AFIP); and in the leg tendon of the turkey (Drs. Likins, Nylen, Piez, Scott, Mosley, NIH and Johnson, AFIP).

During the afternoon session (moderated by Dr. Sognnaes), the discussion focused on higher animals and man, including the enzyme reactions in osteogenesis and odontogenesis (Dr. Burstone, NIDR); the ultrastructure of enamel (Drs. Frank and Sognnaes, Harvard); calcifiability of dentin (Drs. Solomons, Irving and Neuman, Rochester); ultrastructure of bone (Dr. Robinson, Johns Hopkins); abnormal tissue calcification (Drs. Eisenstein, Trueheart and Hass, Illinois); and salivary calculus deposition around the teeth (Dr. Leung, Pittsburgh).

The evening session, moderated by Dr. Franklin C. McLean of the University of Chicago, dealt with experimental induction of osteogenesis (Dr. Moss, Columbia); behavior of bone in tissue culture (Dr. Goldhaber, Harvard); chemical structure of the organic phase (Drs. Piez, NIDR and Gross, Harvard); the crystallographic nature of the inorganic phase (Dr. Posner, NBS); and finally, the molecular relationship between the organic and inorganic ingredients in mineralization (Dr. Glimcher, MIT).

The full titles of the presentations, speakers and affiliations have appeared in the printed program. It is hopefully anticipated that the complete transactions of this Symposium will be published in monograph form.

Throughout this three-session Symposium, there was a capacity attendance of approximately 200, about one third of whom also attended the group luncheon and dinner organized by the excellent local arrangement committee.

At the concluding evening session, Dr. Sognnaes thanked all who

had made this Symposium a success, and took the opportunity to express the gratitude and admiration for the wise, enthusiastic and progressive leadership of Dr. R. W. Bunting during his eight years of service as Secretary of Section Nd. Dr. Bunting expressed his pleasure in having served the AAAS and his high hopes for the future as organized dentistry in the United States stands on the threshold of its centennial celebration.

It was announced that the following officers have been elected to represent Section Nd: *Chairman and Vice President*: Dr. Maynard Hine (1959), School of Dentistry, University of Indiana, Indianapolis, Indiana; *Program Chairman*: Dr. Frank J. Orland (1959), Zoller Memorial Dental Clinic, Chicago, Illinois; *Committeeman-at-large*: Dr. Gerald J. Cox (1959), University of Pittsburgh, School of Dentistry, Pittsburgh, Pennsylvania; *Secretary*: Dr. Reidar F. Sognaes (1959/62), Harvard School of Dental Medicine, Boston, Massachusetts.

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Book Reviews

Clinical Dental Hygiene, edited by Shailer Peterson, B.A., M.A., Ph.D. Index, Glossary. St. Louis, C. V. Mosby Co., 1959. 323 p. Price \$6.75.

The writings and teachings of eighteen persons have been integrated and edited by Shailer Peterson to produce this book. It is intended as a basic text for the dental hygiene curriculum.

The introductory chapter provides the reader with an historical, statistical, and enlightening approach to dental hygiene and describes the role of the dental hygienist in a dental office.

One bright spot of the text is found in the chapter on radiography, which is excellent. It includes the history, theory, and technic of radiography and this material is well presented. The chapters on toothbrushing and case histories are done very well.

Because dental hygiene embraces phases of dentistry, dental assisting, office administration, patient handling, and other related things, the editor has included all of these facets under one cover in an attempt to provide the dental hygiene profession with their own text. Many of these aspects of dental hygiene are a course in themselves and hence an entire text could be devoted to any one of them. Consequently, in the space afforded the editor of necessity had to limit this text to the salient points.

Dr. Peterson has compiled a comprehensive tome on dental hygiene, the reading of which to its greatest advantage will necessitate supplemental reading in most of the areas covered.

PIERCE A. McLEAN

The Influence of War and Postwar Conditions on the Teeth of Norwegian Children.

This is the title of a research project conducted in Norway by the author, Guttorm Toverod and published in book form. The book consists of 235 pages including 59 tables. It is a comprehensive report requiring intensive study by readers. It is in reality a cause and result study, comparing tooth conditions among children at the end of World War II with the same or similar effects following World War I.

The author has not only presented a very clear picture of the dental caries situation, but he has devoted much space and time to a consideration of the eruption of the permanent teeth. In this latter case he reports delay in eruption, citing three reasons therefor:

1. Reduced rate of root resorption.
2. Less caries destruction of the teeth.
3. Extended conservative treatment of the teeth.

One can read between these three lines and realize what can or may be done in the matter of caries reduction—call it control, if you like. During war time there was some restriction on food, therefore, a stricter selection of good food with a reduction of the non-essentials. But in addition the care of children has been so greatly increased over the years that it is easily to be seen that there is a possibility of no little reduction of dental caries. That is the job of the next one-half or full century.

The report is published by and is available through The Millbank Memorial Fund, paper back.

JOHN E. GURLEY

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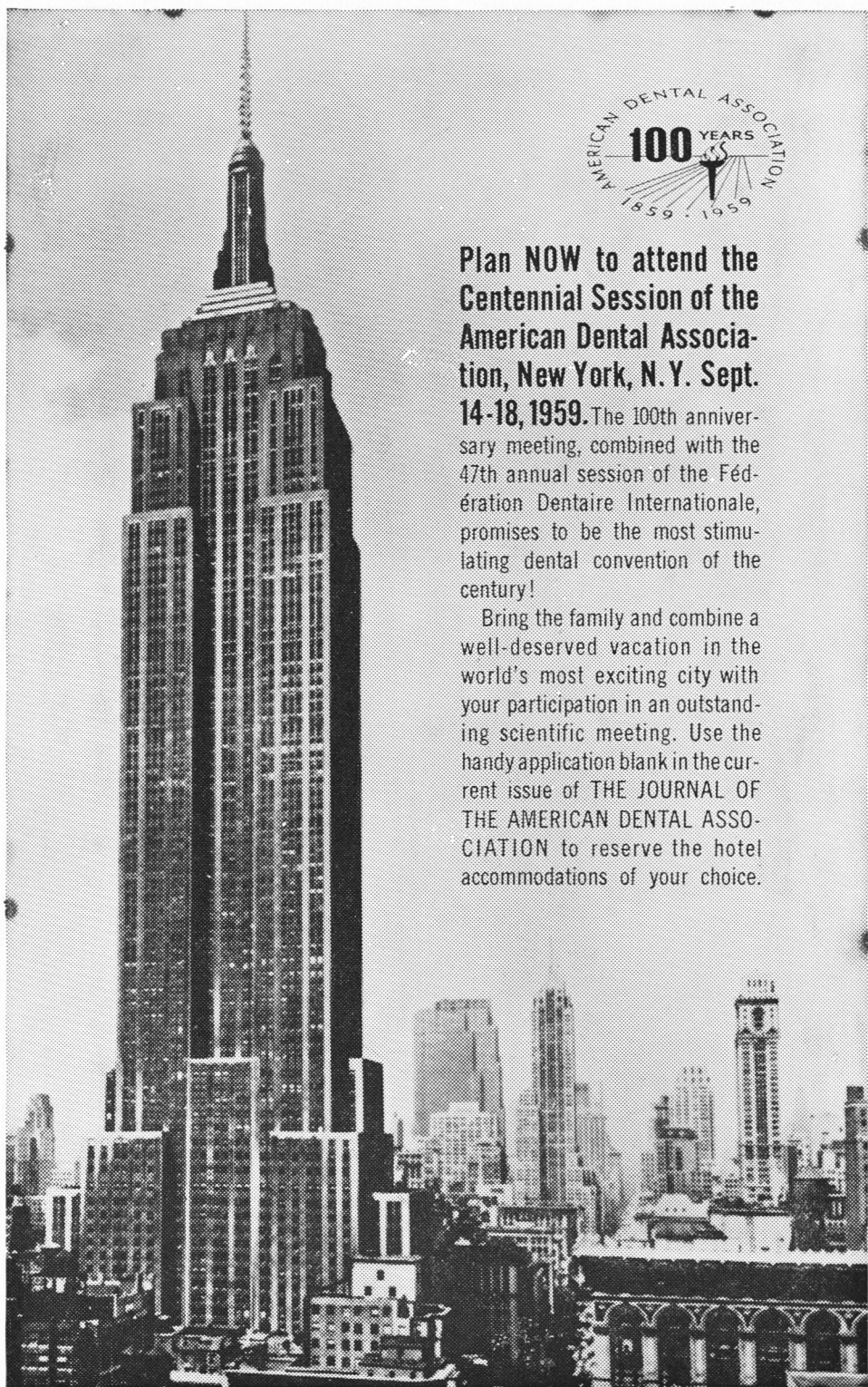
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