

I. PRESIDENT'S ADDRESS³

A DENTAL RESEARCH PROGRAM

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Several years ago, the Chairman of the Chemistry Division of the National Research Council discussed with the writer certain principles which should, in his judgment, govern a research program. In doing so, he referred to a grant of \$500,000 which had been allotted to various research groups in the petroleum industry, over a period of five years. Grants had been made in varying amounts to a large number of workers, with the result that much scattering research had been promoted, and, as the end of the five years drew near, it was realized that very little had been learned that could be practically applied. He expressed the opinion that it would have been better to request each research group to endeavor to solve the problem of removing sulphur from gasoline, because he felt that to be the most important practical question in the petroleum field of research, and real progress would probably have been made toward its solution. In other words, he emphasized the importance of concentration of research effort.

Two years ago a request was made on behalf of the Research Commission of the American Dental Association that a Dental Research Advisory Committee be appointed by the Executive Board of the Medical Division of the National Research Council. The Committee consisted of Prof. L. B. Mendel, of Yale; Col. Charles F. Craig, of the Army Medical School; Dr. E. R. LeCount, of Rush Medical College; Dr. Vilray P. Blair, of Washington University; and the writer, who was a member by virtue of the fact that he represented the American Dental Association in the National Research Council.

A year ago, the applications to the Research Commission of the American Dental Association, for grants, were referred to this Committee. Each application consisted of (1) a review of the literature on the problem, (2) its present status, (3) the proposed research, (4) the facilities at hand and the anticipated cost, (5) available consul-

³ Read at the opening of the second session, preceding the annual business meeting. See page 385.

tants and advisors, and (6) information regarding each person to be a part of the research group. After a careful study of all this material, and a thorough discussion that occupied the greater part of a day, the Committee made the following report, which is considered of sufficient importance to be presented in full (excepting the list of grants that were approved):

“The Committee on Dental Research met on Wednesday, April 24, and reviewed a number of applications for grants referred to it by the Research Committee of the American Dental Association. Also, at the request of representatives of the American Dental Association, the general plans upon which grants have been made were discussed and certain recommendations were made relative to the direction of its research program.

“The Committee desires to express its appreciation of the attitude of the membership of the American Dental Association in supporting research, also of the efforts of the Research Committee in its encouragement of investigations by individual workers, as well as by those connected with the Dental Departments of a number of universities.

“It is clearly recognized that there are many problems within the dental field that are of importance to health, and that the time is opportune for a more extended program, which should receive the financial support of persons of means and the hearty coöperation of the medical profession.

“The following recommendations are made to the Research Committee of the American Dental Association:

“1. That a survey should be made of the problems suggested for study and that stress should be placed upon those of greatest importance, rather than to scatter grants among a large number.

“2. That more satisfactory results are likely to be obtained if grants are voted to men of known ability, rather than to projects.

“3. That it is fundamental to the successful study of many problems in this field that more extensive use be made of animals for experimental work.

“4. That careful inquiry be made to find those animals best suited to the work to be undertaken. This appears to be an exceptionally difficult problem in the study of dental caries.”

More recently, the writer, as a member of the National Research Council, was requested to act as chairman of a committee to prepare a program which would portray the scientific achievements in dentistry during the past one hundred years, for the Century of Progress Exposition to be held in Chicago in 1933. This has necessitated a review of dentistry's research from the organization of the profession to date.

It is intended to make the contributions of science the central feature of the Chicago Fair. The plan involves demonstrations that will be of interest to the general public along two related lines: contributions of pure science, and applications of scientific discoveries. It was therefore necessary, in laying out a program for dentistry, to analyse as far as possible the progress of dentistry in connection with discoveries in related fields. This has been divided into three main sections: (1) the relation to biology and the medical sciences; (2) the relation to physics, chemistry, and metallurgy; (3) the relation to anthropology, paleontology, comparative anatomy, and comparative pathology.

These contacts have led the writer to propose that it might be worth while for this organization to make a survey of the dental field, and develop a program which would serve as a guide for men of inquiring mind who are inclined to devote part or all of their time to research. It is suggested that much more of real value might result, if there were reasonable direction of the trend of investigations. This suggestion is made with full recognition of the fact that research can not be charted in advance. However, for the most part an investigator undertakes to find the answer to a question, and there should be an understanding that the answer, if found, would be worth having. It is granted that one may undertake a blind study and more or less by accident make a wonderful discovery. Research work is expensive and there should be some understanding of the possibilities of a problem.

Individuals might be mentioned who have labored for years in an effort to contribute something to the advancement of knowledge, but who have failed because of lack of guidance, or of a sufficiently close objective, or both. The writer has in mind a research worker who attracted much attention by his rather startling results over a period of years, during which time he was a member of a group who had the guidance of several older men of broad experience. This man then moved to another city, where he was given ample funds and permitted to carry on as he liked. At this time one of the elders remarked that he feared that this man would not accomplish as much in his new environment, as there was no one to keep him "on the track." Subsequent events have proven that to be the case.

Would it not be worth while at this time to list the important un-

knowns in the dental field, such as dental caries, erosion, the dystrophies of the hard tissues of the teeth, infections of the investing tissues, and other diseases of the soft tissues of the mouth, and to review the related fields of scientific study, to determine as far as possible what approach to each problem might be made in the several fields? For example, in the study of *dental caries*, we might list certain work that has been or should be done in the histology and histopathology of tooth structures; in *oral anatomy*, tooth forms; in *bacteriology*, the bacterial flora of the mouth and their products; in *biochemistry*, the saliva and the action of various salivary elements on the teeth; in *physiology*, comparative studies of the saliva of persons immune or susceptible to decay; in *nutrition*, the relation of diet to the structure of the teeth and to the composition of the saliva; in *secretions*, the ductless glands, and their relation to the teeth and saliva; in *occlusion*, the forms of the teeth and of all elements of the masticatory mechanism in relation to the occurrence and surface-spreading of decay; etc.; etc. A similar statement might be made for each major dental problem. For some, the relation of the mouth condition to the general health would develop an interesting group of systemic problems, such as the causes of salivary calculus, which are doubtless closely related to, if not identical with, the etiology of gall stones, renal calculi, and other similar concretions.

Two types of charts might be made, one having the major problem in a centrally located circle, with statements of studies in related fields as radiants. This group of charts would constitute the major-problem series. The other type of chart would place a field of study in the center, as biochemistry, and the radiants would consist of all studies in biochemistry that might fall within the dental field, thus illustrating the opportunities for dental research by the chemist. A similar chart might be made for physiology, for bacteriology, etc., etc. Such charts would enable the investigator to form a better conception of the place which his problem occupied in the general scheme, and its relation to other studies. They would also suggest the importance of coordinated research in several fields, directed toward the solution of a single problem.

One of the major research-problems in dentistry today is that of securing funds for this work. During recent years the amount of

money that has been given to medical education and research in Canada and the United States has averaged more than \$50,000,000 per year. Figures recently collected by Dr. Gies show that a number of dental colleges have received endowments in considerable amounts, from which, however, only one has an income of more than \$50,000 per year. Doubtless a portion of this is for research, yet the total is so small as to be of little consequence in comparison with the need. Many wealthy persons are desirous of contributing large amounts to any cause that is really worth while, and it seems to be only a question of organizing our opportunities in such a way that their importance will be appreciated.

It appears to be of first importance that our field should be so analyzed and organized that there would be less scattering of effort, less repetition of good work already performed, greater coördination, and a general guidance that would incline a larger number to concentrate on a few problems. The development of a program of research not only would give each interested person a better understanding of the important relationships of every major problem, but also would place in our hands the data necessary to convince wealthy people that satisfactory returns would accrue from money invested in our work.

II. PAPER TRANSFERRED TO A COÖRDINATED SESSION OF THE
AMERICAN ASSOCIATION OF DENTAL SCHOOLS: MORNING,
MARCH 24; ABSTRACT 1

1. RESEARCH IN THE USE OF A RATING SCALE AS A MEANS OF EVALUATING THE PERSONALITIES OF SENIOR DENTAL STUDENTS⁴

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Measurement of the physical world has been reduced to an exact science. It is reasonable to expect that similar progress will be made in the measurement of human traits that comprise personality. A *trait* is a mode of reaction that tends to differentiate one individual from another. *Individuality* is the sum of the measurable differences that makes a man what he is, and also shows why he differs from other men. *Personality* is an individual as perceived by others.

⁴ Published in full in this issue: *Journal of Dental Research*, 1930, x, p. 271.