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

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Address of the Editor:

John E. Gurley, D.D.S. 350 Post Street, San Francisco, 8, Calif.

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American College of Dentists

Objects: 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."—Constitution, Article I.

Announcements

Next Meeting, Board of Regents: St. Louis, Sept. 5, 1952

Next Convocation: St. Louis, September 7, 1952

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

JOURNAL American College of Dentists



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JOURNAL American College of Dentists

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One who appears before an audience (class) without preparation should disappear without delay.

JOHN ANDREW HOLMES.

EDITORIALS

A PROFESSION

Periodically we need to have brought to our attention the idea of a profession including of course the principle or the principles involved. There is a little book entitled The Seven Laws of Teaching, the last of the seven being, 'Review, Review, Review'. So it may be considered in this case as attention is again called to the principles of professionalism.

The merchant of what-so-ever kind; the business man; and men of commerce all have something to sell—something over which to barter. They have material things having a definite cost and on which it is necessary to make a profit that expenses including salaries may be met. They have something which may be of value to two or more individuals. Of course, need and desire are both wrapped up in the one word, value.

The professional man, physician, dentist, clergyman or again of what-so-ever kind, may be the possessor of something of value to two or more individuals also, but of a different type. That which the professional man possesses may not be handled as is that of the business man—it is something only that may be done for another and is done with the expectation that it will last and perhaps prevent something else. Or stated another way, that which the professional man does, is done with the ultimate idea of running himself out of business.

As professional men it is ours to bear in mind constantly this principle and do or suggest whatever may stop that particular kind of need. Business principles appear to involve the idea of 'coming again', and so they urge greater sales each year and not always with due regard to the effect upon the user. It behooves us to deal carefully with people and thereby do not betray confidence nor our own principle. The moral responsibility on the professional man today is very great.

THE DENTAL LIBRARY

The American College of Dentists has as one of its objectives, whether stated or not, the promotion of every phase of work or

activity which contributes to the development of the profession as a whole. Through the years the College has backed very many different enterprises, none the least of which has been dental research.

There is one, however, to which proper attention has possibly not been paid, namely the Libraries and the Librarians of our schools. We have promoted research, teaching, hospital service, the professional side of dentistry, in fact, every phase of dental practice, and although the charge that libraries have been overlooked might not be easily substantiated, yet the fact remains that very little atten-

tion has been paid to them.

It must not be forgotten that every phase of professional life or professional practice is dependent upon literature and that easily available. Therefore it has become necessary, among other things, for the schools to develop their libraries and as the attention shown them has increased, it has become necessary that librarians raise their own standards of excellence. This has been promoted very largely by the American Association of Dental Schools which institution gave encouragement at least, to each different school, its library, and librarian in their own development.

During later years, as the quality, the need, the usefulness and the availability of the library of the American Dental Association has expanded, not to overlook the indexing of our literature, another

source of helpfulness has been found.

Succinctly stated, the Committee on Library and Indexing Services of the American Dental Association, known later as the Advisory Committee on Indexing and Library Service, has had a very close association not only with that one library but with all the libraries to the extent that it might be said that under the leadership of this committee, the libraries and the librarians of the various schools have been brought to that point where they can think together and work together and thus exercise among themselves a high degree of co-operative usefulness.

Under the leadership of this committee, two conferences of librarians have been held in the offices of the American Dental Association. The first one was held some two years ago and the proceedings have been published in the Journal of Dental Education. The second was held in June 1951, the proceedings of which are being published

^{1 14, 5} and 15-49; 1949 (Nov.).

currently in this issue of the Journal of the American College of Dentists. This will afford the Fellows of the College an opportunity of seeing what our librarians are doing and to estimate the progress which has been made which, though not wholly to the credit of the College, yet it is a part of all that the College has promoted through its years of activity. Our libraries having come to this high point of excellence and our librarians having attained the degree of educational accomplishment which they have, must be encouraged in every possible way. In this then the College has an opportunity of recognizing this advance sharing in a degree the accomplishments that have been made, and giving further encouragement to them in their task.

HONOR TO WHOM HONOR IS DUE

There is one among us who is not a dentist and yet from the educational standpoint, to all intents and purposes, he is. Reference is made to William J. Gies, Ph.D., whose work within the field of dental education is now so well known and who has been honored in many ways by the profession as a partial manifestation at least for what he has accomplished. It is probably true that he can never be paid for what he has done.

However it has remained for his boyhood community to be apprised of his accomplishments and to have the vision to realize the honor which he may have brought to that community. True to that vision, his "home town community" turned "all out" to pay respects to him. A day, October 18, 1951, was set apart by the town of Manheim, Pennsylvania to be known as "Dr. Gies Day", when the former Manheim boy of nearly 80 years ago came home to receive acclaim from the people of Manheim and just awards from the state Chamber of Commerce as Pennsylvania Ambassador. . . ."

On this day Dr. Gies was carried through the town in an open car receiving the "Key to the Borough of Manheim" and the title "Pennsylvania Ambassador." Altogether it was a great day in Manheim in which every citizen turned out, both citizens and clubs participating in this show of honor. It was a great day for Dr. Gies, such a day seldom occurring in the lives of man. To be brought back to your old home town and paid the magnificent respect which was shown to him is one which happens to but few. That Dr. Gies merited the honor shown him is vouchsafed by every dentist.

GRADUATE FELLOWSHIPS FOR DENTAL TEACHERS

The Chairman of the above named committee, Dr. Harry Lyons, Dean, College of Dentistry, Medical College of Virginia, announces completion of items pertaining to eligibility of professors for fellowships. The full report will be published later in the Journal but in the meantime interested individuals may apply to the Chairman for immediate information.

BOARD OF REGENTS, CHICAGO, FEB. 4-6, 1951

The meeting of the Regents held at this time last winter has been reported periodically through the year, the principal item being the appointment of committees which have appeared regularly in the pages of the Journal. Other items included were the completion of the Board of Editors, mid-year reports of committees and matters pertaining to the work of the College in general.

CARE: DO YOU?

A campaign is just now being inaugurated to raise a fund of \$60,000.00, for the purchase of iron lungs and respirators for Asia. Requests come from WHO and are approved by the U. S. State Department's Advisory Committee on Voluntary Foreign Aid.

These are sorely needed and will serve as another arm of benevolence to a stricken world by one part of that world which dares to ask them to think as we do, namely in terms of peace. Checks may be sent to the Iron Lung Bank, Care, 20 Broad St., New York, 5, or your local Care office.

What if Four Hundred Readers sent in \$5.00 each, either to Secretary Brandhorst or to the Editor! The answer is that we could purchase one respirator and have it sent immediately to a place in Asia where most needed. This might be a fine, healthful undertaking on the part of the College! What do you say?

PRESIDENTIAL ADDRESS

WILLARD C. FLEMING, D.D.S., San Francisco

A. INAUGURAL

B. PHILOSOPHY OF DENTAL EDUCATION

A. INAUGURAL

The American College of Dentists, like most organizations, developed a very high set of standards and ideals in its early years and then began to develop ways and means to attain these standards. We have had our periods of turbulent politics, and there have been times when we did not appear to possess the professional maturity that is characteristic of our membership today. However, with all of this, the standards and ideals of the organization have always been excellent, and during the last twenty years we have seen an expansion of our original objectives and an increased stature among our members.

Leadership in the dental profession has characterized our actions, and expediency has rarely taken precedence over the principles of right action. In addition to leadership, the College serves the profession at times as a catalyzer to speed up certain actions and progressive development, and again as a governor to control too hasty action. One of its most important functions is to initiate and contribute thoughtful studies of various problems through the action of its nationally constituted committees. The past record of the committees on journalism, prosthetic service, and economics are examples of this function. There is no doubt but that our committees will continue to function with profit to the people of our country and to the health professions.

These points are mentioned not for the purpose of self-congratulation but to emphasize the place our College holds in the profession. It is well to bear this in mind because at the present time there are many problems facing our profession and our country which cannot be solved by expedient action but must be solved by thoughtful study and action by groups such as ours.

As you know, the political structure of our College consists of twenty-eight local sections covering practically all of the country.

¹ Delivered to the Convocation, Washington, D. C., October, 1951.

The members are dentists who have made distinct contributions to the profession in the fields of education, research, organizations, and literature. They are the "doers" in the profession, and therefore one would expect our local sections to be unusually active. Some of them are, but many of our sections continue to exert their influence only through the efforts of individual members, rather than through the concerted effort of the section.

This lack of group action is not the choice of the members, but often results from the difficulty of setting an objective that does not interfere with the objectives and functions of the many other local dental organizations, such as the local and state dental societies, the academies, the research and study groups. Most of our local members are active in these other organizations and quite properly are not inclined to duplicate or interfere in the activities of those groups. It is the purpose of this address to propose that these sections develop an area which is neglected at present by all of the health sciences. This goal will broaden the base of understanding within our profession of the past traditions and general trends in our American way of life and their application to the vital, changing socio-economic problems of today.

We have seen very bad public relations come to other groups and professions because of their lack of understanding of the fundamental trends in our way of life. They have tended to oppose new thoughts and ideas rather than guiding them along appropriate channels. Great political and social changes are taking place all over the world, and the speed of the reaction is assuming almost explosive proportions. History has shown time and again that rule by oligarchy, as we see it in Europe, and/or a change to an industrial economy, as is happening in the Orient, contain explosive elements affecting the existing social and political status quo. What happens in Iran or Korea affects this country, and what happens in the social and political economy of this country affects medicine and dentistry and to that extent the health program of the people.

Time was when two nations on the other side of the globe took up arms against each other it had little or no effect on us. Time was when a labor-management squabble in Detroit had only local significance. Time was when the health of the individual was a matter only between him and his physician or dentist. These conditions have changed and largely in our life time. What happens in Calcutta,

Cairo, or London affects every one of us in this country. Work stoppages are of national significance. The health of our people is no longer an individual problem, but is one of national interest and importance.

Many factors are involved in these changes and all of them lead to an increasing complexity in our way of life. As we change from the self sufficiency of an agrarian type of economy to the mutual dependency of an industrial economy we are more and more concerned with the welfare of those around us, both on a national and international basis. If the activities and decisions of our fellow men affect us, it is quite reasonable to suggest that what we do as individuals and as dental organizations will affect them.

Dentistry is no longer a simple matter of the relationship between patient and dentist. Our profession has grown to such a state that the oral health of the people of this country is of national importance. As a consequence we observe and are pleased by the spotlight of national attention. However, this also attracts the planners and the do-gooders who come forth with programs to make us over. It would appear highly desirable that if we are to deal intelligently with such people and to advance the profession to the ultimate good of dentistry and the country, we must have a better understanding of our social problems. I can think of no group or organization in dentistry that is in a better position than the American College of Dentists to assume the leadership in developing a program which will ultimately result in expanded professional horizons, and a greater understanding by the profession as a whole of the place which the health services must occupy in our political economy.

We think of dentistry as occupying a large and important part in the health profession. There is no doubt but that this is true. With this importance comes an increasing degree of responsibility which must be assumed by all dentists, but particularly by the leaders we elect to office. Whether we like it or not, the rise to a profession of national importance has forced upon us a high degree of leadership and the responsibility that goes with it. As dentists our community offers us the respect due educated and trained experts in an important field. Our opinions carry a weight with patients, friends, and neighbors which often we do not fully appreciate. To discharge this responsibility of leadership we must have a broader basis of information than can be picked up between the headlines and the sports

page of the daily paper. We must have a comprehensive understanding, not merely of our special field, but of the broad economic and political scene in this country and abroad, and it is to this end that the following program is pointed. It is suggested that the local sections consider the organization and development of classes of dentists to study subjects in the socio-economic-political fields which will lead to a better understanding of the fundamental trends in our American way of life.

These studies may be approached in several ways. The study group may embrace the entire section, or it may be started by a committee of the section. Another approach might be to interest the officers of the local and state associations in meeting together as a class. Once started, the medical groups could be invited to attend, as it is just as important for them to understand the basic trends as it is for us to have a comprehensive view of them. The future of both professions and the objectives of both professions are so interwoven that we must continue to develop programs that have the same basic objectives.

The study groups, once organized, should call upon people representing the many facets of our social and political economy. At first, some of the teachers from nearby universities could be engaged to direct the studies in political science, history, economics, foreign policy, taxation, labor-management problems, and so forth. At a later date representatives from various social and political fields could be invited to express their opinions and views on special subjects.

Two or three years ago one of our state associations instituted such a course of instruction for its officers and committee chairmen. The extension division of one of the nearby universities was requested to provide the teachers and the administrative guidance. The group of about twenty dentists met for a two hour session once a month. Teachers and others outstanding in their field met with this group. There were some lectures, but for the most part it was a lead discussion, based upon previously recommended reading assignments and previous discussions. These dentists spent time with an outstanding professor of political science, an expert on Anglo-Russian relations recently returned from the then current conferences in Berlin. One of the session leaders was a man recently returned from mediating a national strike. One was an authority on

taxation. Another was a student of Russian history and current Russian problems. All of these teachers and leaders were paid an honorarium, and the expense of the course was paid in part by the state association and in part by those participating in the course. It is not possible to measure the effect of this experience on the dental program of this state, but I am confident that it has had its effect and has aided the dentists to approach the complex social and economic problems of that state with a better understanding of the many facets that such problems present.

Our dental organizations have worked with and will continue to work with the many problems which result from the interrelation-ships of the health services and social and political activities. Their success or failure in meeting these problems has depended in large measure upon the informed breadth of leadership within our organizations. One of the greatest problems which has concerned all of us is the manner and expense of the distribution of health services to the people. We have said time and again that for the most part the distribution of these services should be directed by people who know these services: the physicians and dentists.

I recall a meeting some years ago when our State Legislature had before it three different bills advocating various types of compulsory health insurance. One bill was backed by the CIO, one by the state administration, and one by a large agricultural group. Fortunately, members of the dental and medical professions, belonging to a civic study group, had the opportunity to hear advocates of each plan present their views. As a result of this and other conferences, we could and did develop an understanding of the viewpoint of each group and were able to approach the entire situation as a problem to be solved, not as a battle to be won. I feel that the success of our local voluntary health plans is due largely to this approach. The answers to today's problems are not the black of state socialism and compulsory health insurance nor the white of "let them eat cake;" the answers lie in the shades of gray between these two extremes.

The dentist, confined by the four walls of his office and his horizon limited by the technical advances in his special field is at a disadvantage in providing the leadership to guide our profession through the complex maze of our social and political world today. We cannot look for this leadership among our dental educators whose acan

demic experience does not always reflect the real picture of dental practice. We should not look to the salaried secretariat of the American Dental Association whose function is execution of policy, rather than formulation. This leadership must come through our dental organizations, from local to national groups. If this leadership is to guide us successfully, it must be an informed leadership: a leadership based on a broad background of knowledge of the world about us and particularly the trends in our American way of life. One of the greatest contributions that the American College of Dentists can make is to organize, set in motion, and support a program of developing an informed leadership in our local, state, and national societies.

We have leaders today, and good ones, but we need more and we need to start them at the grass roots level, close to the practicing dentist who has the real picture of dental practice. In my opinion our local sections are ideally suited for the adoption of a program which will develop well informed leadership in our profession. Change is everywhere in the world, and if we do not have an intelligent understanding of these changes and the forces behind them, we will automatically resort to a defense of the "status quo" which will cancel all of the work and effort of those who have preceded us. In other words, the ability to survive depends upon the ability of the organism to adapt itself to a new environment. To make this adaptation we must have an intelligent understanding of the changes that are going on about us.

B. PHILOSOPHY OF DENTAL EDUCATION

All dental deans, faced with a recalcitrant faculty, an eager student body, a critical alumni, and a limited budget must develop a philosophical attitude as a means of survival. There are three classes of alumni that visit the dean's office to advise him regarding the dental curriculum and the general administration of the school. These interviews run something like this: The dean is seated at his desk when the door opens and in walks a recent graduate.

The conversation opens with: "Dr. Fleming, I have just been practicing a short time, and I think the school does not emphasize enough clinical practice or enough clinical experience. I feel that I am inadequately prepared to practice dentistry because I have had so little clinical experience." The dean agrees.

The next alumnus has been in practice for ten or fifteen years, and he says: "Bill, our school does a pretty good job, but we do not spend nearly enough time teaching the student the problems of practice management and the business side of dentistry. The student is woefully unprepared to handle this important phase of dental practice." The dean agrees. The third alumnus has practiced for 25 to 30 years, and he says: "Dean Fleming, our dental educational system has made great strides in my time, but we are failing in one very important aspect of our teaching. Nowhere in the modern curriculum do I see any time devoted to teaching the philosophy of dentistry and the philosophy of dental education. Time must be found for this important subject." The dean agrees.

An interest in the philosophy of dental education is really a sign of age, paralleling an interest in social security and old age insurance. This statement will be confirmed by any dental dean. Thus you will see that Doctors Sloman and Brandhorst, while possibly not qualifying for advanced age on a chronological basis, have certainly reached that stage of development in dentistry that places them in the "old-timer" group. In all seriousness, this interest of dentistry in its philosophy and in the philosophy of its educational program is not a sign of old age, but of maturity, or a coming-of-age.

What is the philosophy of dental education? What are the general principles, the elements, the causes and laws that explain dental education? I suppose the answers to these questions could be summed up in a paragraph, but the answers are not as important as the methods of reasoning or the thinking that led to the answers. After all, in this case the answer will be simply the opinion of one person, but the methods by which this person arrived at his anwsers may stimulate others of you to give thought to these questions.

As a start, let us review the historical development of dentistry, not date by date, but in the broadest possible fashion—a sort of "moon's eye view" of dentistry. History has a definite, practical value in that it provides material for a sort of curve of probability that can be projected into the future and thus give one some idea of future developments and trends. The very life of dental education is growth and change, and so from this point of view a knowledge of the history of our profession is of great importance. It is a far cry from the days of the barber-surgeon with his quackery and charlatanism to the modern dentist who understands and practices the

technics and methods of the control of dental disease, and who is literally standing on the threshold of its prevention.

Dentistry has been characterized by its willingness to accept new responsibilities, and dental education by its willingness to develop educational programs to meet these new responsibilities. Of this we can and should be very proud. Let us review dentistry's progress through the years and see the increasing burden of responsibilities that our profession has assumed. At the same time we can observe how dental educational programs have changed to meet these new objectives. The first responsibility that dentistry assumed was the relief of pain. Strangely enough, this was before there were dentists. Anyone with a good strong right arm, a deaf ear, and a pair of pliers could qualify. These qualifications served in the place of any educational requirements.

In the course of time it was found that teeth, and parts of teeth, destroyed and lost by disease, could be replaced and reconstructed. This called for some kind of educational preparation, and the need was met by the apprenticeship type of education used in the guilds and the crafts. In 1840 the first dental school was started and was rapidly followed by others. However, the methods of teaching were still largely of the vocational type.

About the turn of the century we found that there was a relationship between oral health and general health, and the profession of dentistry added the third responsibility: the prevention and elimination of oral infection. At this time the schools began to include courses in the medical sciences: Bacteriology; Pathology; Physiology; and so on. In other words, professional education advanced to the college level.

Then, in the early '20's it was found that it was possible to control dental disease if we carried out a program of frequent examination, early diagnosis, and early and adequate treatment. This period was characterized by the slogans: "A clean tooth does not decay;" and "See your dentist twice a year."

At this point it became apparent that the profession was coming of age and was well on its way to becoming an important part of our national health program. To meet this responsibility we needed dentists with broader educational backgrounds who could be expected to recognize the fundamental trends in our American way of life and to lead the profession intelligently into the future where new responsibilities were to be met. In addition, we recognized the need for dentists who are intellectually prepared to understand, appreciate, and contribute to the growth of our profession along the lines of ethics and conduct. The record of the professional advancement during the last three decades is proof of our efforts to meet this new responsibility.

It was during this period that the pre-professional college level courses were instituted in order to prepare the dental graduates to meet these new responsibilities. First one year and then two years was the minimum requirement. Parenthetically, it is interesting to note that over half of the students in dental school today have more than the minimum requirement of two years.

The fifth responsibility may be seen ahead of us in the immediate future and may be designated as the prevention of dental disease. There is no doubt but that the prevention of dental disease will come through the application of our basic sciences to clinical practices and not through improvement in technical procedures. You have probably noted that dental education is again making the changes necessary to prepare its graduates for this type of practice, and we are observing more and more emphasis on the basic sciences and their clinical application. Please note also that during all this period of added responsibilities the profession has not discarded a single one of its responsibilities. A dentist still relieves pain, restores teeth or parts of teeth, eliminates infection, and controls disease. Dental education still seeks to prepare its students to meet these responsibilities properly and spends a good deal of time teaching the students the necessary technical and clinical skills.

During all this period of growth and development, dentistry increased in stature and began to take its place as one of the important health professions. With this maturity came new responsibilities including that of leadership. The dentist is an acknowledged expert in his own field, but he is also being called upon, more and more, to take his place as a civic leader and to participate not only in community and state health programs but other civic projects as well. The pre-dental and dental curriculums are being adjusted to meet these new responsibilities. We find increasing emphasis laid on a broader preparation of the pre-dental student to prepare him for his role of an informed leader.

As we practise the control of dental disease, we find that we must

have an informed public who recognizes the importance of oral health and the need for early examination, diagnosis and treatment. The dental organizations and societies have established the Council on Dental Health to accomplish this purpose, and we find an increasing number of schools including courses in Public Health to prepare their graduates to meet this new responsibility. At the same time we observe an expansion of the dental hygiene program as a means not only of developing an increased number of auxiliary office personnel but more importantly as oral health educators in public education. We may consider ourselves fortunate that we have been able to develop our dental hygiene programs to a point where this responsibility for oral health education can be met by the dental hygienist working under our supervision.

As we grow older and more mature as a profession, as our scope of responsibility increases, and as we assume an increasing degree of leadership in our area of health sciences, we must look to the caliber of our membership. It is encouraging to note that the scholastic ability of our dental students has increased tremendously in recent years. The standards of admission today are high, so high in fact that I am confident that a noticeable percentage of us in this room would not be here if we had been required to meet the admission standards of the modern dental school.

This change has been brought about largely in the past six years and with it came new responsibilities. Already dental education is becoming more and more concerned about the fate of those who have been rejected. The frustrations and the upset careers of these splendid young men and women who are unable to obtain admission to the dental schools are truly as much our problem as the careers of those we admit. Should not our selection go further down into our educational system? Should not the medical and dental schools extend their admission programs into the pre-dental years and divert those unsuited for dentistry or medicine into other fields before their college career is fixed by the relatively narrow confines of the pre-professional curriculum?

As dentistry assumes a larger place in our national health picture, and as our responsibilities increase in number and in importance, the matter of ethics and our relations with our fellow men become of increasing importance. It was not so long ago that one of the major objectives of the dental school was to prepare its graduates to pass the State Board Examination. It is still an objective, but dental edu-

cation, conscious of the increased stature of the profession, must prepare for another change, if not in direction, at least in emphasis. Dental education realizes that in addition to preparing a graduate to conform to the rules, the etiquette, and the customs of a community, we must inspire hin to go beyond these. This additional demand on the professional person we call ethics, and it involves not only conformity to local customs but a way of life based upon the principles of right action. To put it another way, the mass of people are expected to conform to the customs or morals and manners of the day; the professional person is expected to be on the frontier of human conduct. The adoption of these higher standards by the profession challenges all lower standards, and we see increasing evidence on the part of some of the trades and industries to professionalize themselves. Right here we have a good example of how we as a professional group can, by our conduct and adherence to the principles of ethics, exert a degree of leadership in the community at large.

If the dental profession agrees that dentists must live by an increasingly higher standard of conduct, then dental education, according to its traditional policy of preparing its graduates to meet new responsibilities and objectives, must devise ways and means of admitting and educating those who are capable of real professional development. The background, environment, and cultural preparation of the dental student must come in for closer scrutiny and evaluation. If this is to be the case, should we not consider the kind of a home from which the student comes? Should we not consider ways and means of identifying applicants who possess in addition to intelligence, interest, diligence, and aptitude an above average degree of integrity, kindliness and interest in their fellow men. For example, I have grave doubts that a student has the capacity to develop these attributes if at every family gathering he hears the head of the house relate the day's successes of sharp practices and deals put over barely within the law. There is little doubt in my mind but that development in this direction will be demanded of the dental educators. Examine your program for this morning, and you will find that a good share of the papers are concerned with ethics, conduct, the dental oath, and the philosophy of education. The interests and activities of the American College of Dentists has many times foreshadowed things to come, and I can well believe that this is one of those occasions.

As I mentioned earlier, the value of history lies in the fact that

it provides material for a sort of curve of probability which can be projected into the future. As we enter the next period of dentistry's development, the period of prevention, what changes in dental education can we anticipate will be necessary to prepare our graduates to practise in this era? There seems to be little doubt but that we can anticipate an increased emphasis on the application of the sciences to clinical practice. Public Health will become of increasing importance, as will the selection of students capable of leadership and an increased capacity to develop into professional men and women.

History has shown that dental education has always added to its program to meet each new responsibility adopted by the profession, and we can expect it to do the same again. The first change may be an increase in the amount of time for dental education, either by a frank extension of the dental and pre-dental curriculums or by a combination of acceleration and interneship. We are seeing, and will continue to see, experiments in dental education with emphasis on certain subjects and de-emphasis on others. The development of auxiliary personnel will certainly be tried. The idea of dentistry as a specialty of medicine will be advanced as will other plans and schemes.

It is too early to predict just which plan or combination of plans will be adopted eventually, but we can predict that it will be a program which will permit dental education to prepare its graduates to meet old responsibilities as well as new ones. The growth of dentistry to professional status has been characterized by its willingness to seek new objectives and accept new responsibilities without sacrificing old ones. In every forward step dental education has undertaken to prepare its graduates to discharge these new responsibilities. At present we are practicing dentistry in what might be called a control era and are planning to enter the next phase of practice—the period of prevention. In addition to adding this new responsibility to the practice of dentistry, it is evident that with our growth and maturity we are accepting added responsibilities of leadership and an even higher concept of ethical conduct. This, in a nut shell, is the philosophy of dental education-to accept the changing objectives and increasing responsibilities of dentistry and to develop a basic educational program to fit its graduates to meet these changing conditions.

DENTISTRY AND THE FUNDAMENTAL SCIENCES¹

JOHN A. KOLMER, M.D.; Dr. P.H.; F.A.C.D., Philadelphia

I am not a dentist and I may hesitate to speak about the fundamental³ sciences in relation to dental education and the practice of dentistry. However, the principles involved are essentially the same as in medical education and the practice of medicine. That an adequate working knowledge of the fundamental sciences is or should be the basis of etiology, diagnosis, treatment and prognosis in clinical dentistry is so well established and generally agreed upon as scarcely to require mention at the present time. Likewise the fact that a comprehensive knowledge of these fundamental sciences is becoming increasingly important as dentistry continues to expand its fields of activities through a constantly increasing amount of meritorius laboratory and clinical research.

One result has been a growing conviction on the part of many dental practitioners and educators that the application of the fundamental sciences to clinical dentistry has become inadequate with the need for closer correlation in teaching and practice. If this is true the solution of the problem must begin in dental schools not only by providing for more correlated instruction in the third and fourth years but in the first and second years as well, as shortly to be discussed in more detail. With the seeds thereby deeply planted and nourished one may hope and expect that graduates of today and the future will have a higher and higher realization of the importance of the fundamental sciences in clinical dentistry and continue to be largely guided by developments in them in the daily practice of their profession.

TEACHERS OF THE FUNDAMENTAL SCIENCES

Certainly it is to be admitted that the fundamental sciences cannot contribute to the advancement and practice of clinical dentistry

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² Professor of Medicine, School of Medicine and School of Dentistry, and Director Institute of Public Health and Preventive Medicine, Temple University.

^a This term may be considered debatable as to whether the term expressing the meaning should be, "fundamental", "basis" or "Medical sciences". The term used by the author will be continued throughout this paper.

without an adequate knowledge and appreciation of its problems. Consequently, it appears advisable for teachers of the fundamental sciences in dental schools to possess or acquire as much knowledge of clinical dentistry as possible. This is not only true of teachers of dental histology and oral pathology but of teachers of anatomy. physiology, biochemistry, pharmacology and bacteriology as well. Indeed, I am convinced that the teaching of the principles of medicine in dental schools should be by those educated in both medicine and dentistry. At least I have found it necessary during the past seventeen years to acquire as much knowledge of the non mechanistic phases of dentistry as possible for the adequate teaching of internal medicine (the designation I prefer) at Temple University School of Dentistry. And in this connection my great regret is the fact that conditions have not permitted me to participate in or at least attend departmental conferences in pedodontia, orthodontics, periodontia, endodontia, oral surgery, etc., which are or should be held at periodic intervals for the presentation and discussion of clinical problems.

In the fundamental sciences, as in the clinical branches of dentistry, teachers should be selected as far as possible not only on the basis of their professional qualifications but also on their ability to teach and because they like to teach. To be a teacher is both an honor and a privilege carrying a heavy responsibility with the realization that the success or failure of students is at least partly a measure of the success or failure of teachers. I have long had the convicion that good teachers are born with the possession of natural ability but I now know that they can be qualified by training and experience. Certainly one reason for failure on the part of some teachers is the fact that fundamentally they do not like to teach or do not take enough time for the preparation of lectures, laboratory exercises, clinics, etc. A good teacher is one who revises his instruction at frequent intervals and one who is constantly seeking improved methods for the teaching of his subject. This is true not only of the fundamental sciences but of clinical dentistry as well. And indeed it is probably true in dentistry, as it is in medicine, that it is both rare and fortunate to find clinical teachers as familiar with the fundamental sciences as they are with the clinical aspects of their subjects. Furthermore, and not infrequently, teachers are selected on the basis of research ability alone instead of on the basis of teaching ability.

No one can deny that all teachers should devote some time to research and that the best teachers are those who combine teaching with at least some research activity.

TEACHING THE FUNDAMENTAL SCIENCES

Insofar as the teaching of the fundamental sciences is concerned, I believe they should be taught separately to dental and medical students. It is true that up to a certain point dental and medical students may be taught the same broads apects of a subject conjointly, but that the major portion of each course of instruction should be designed to meet the particular needs of the practicing

dentist or the practicing physician.

Anatomy and Histology. For example, the value of exact knowledge of the anatomy of the head and neck, taught in conjunction with the roentgenology of these areas from the standpoint of applied anatomy, is far more important to dental than to medical students in relation to local anesthesia, referred pain, oral surgery, orthodontics, the complex motions of the tempero-mandibular joints and their bearing upon hearing, etc. In this connection I believe that instruction in normal histology should be correlated with that of gross anatomy, instead of being taught separately, with special emphasis upon oral normal histology as the basis of oral pathologic histology. On the other hand, however, dental students do not require as much instruction on the anatomy of the extremities, thorax, abdomen and pelvis as medical students although sufficient instruction must be given as the basis for an understanding of diseases of these parts in possible relationship to dentistry.

Physiology. The same is true in relation to physiology where special attention should be devoted to the growing subject of oral physiology. Undoubtedly general physiology is one subject in which dental students are likely to experience puzzled bewilderment, with particular difficulty in correlation with the practice of dentistry, unless the teacher lays particular emphasis upon pathologic physiology. Since teaching clinical or internal medicine to dental students, I have also learned the importance of including adequate laboratory instruction on such simple procedures as methods for the the estimation of hemoglobin, the counting of erythrocytes and leukocytes, the determination of coagulation and bleeding times of the blood, etc. It is true that patients requiring such examinations

are easily and readily sent to laboratories for them but in the case of those practicing dentists electing to have a microscope and other equipment in their own offices, many such simple examinations can be made almost immediately in the case of patients presenting oral manifestations suggestive of agranulocytosis, leukemia, an anemia, a hemorrhagic diathesis, etc.

Biochemistry. Great judgment is also required in the teaching of biochemistry which should be taught more or less simultaneously with physiology. Here too, dental students are apt to wonder about the possible clinical value of an understanding of various complicated mechanisms and reactions. In my opinion most emphasis should be placed upon the physiological chemistry of the blood, excretions and secretions along with normal values in order that practicing dentists may properly interpret the results of chemical examinations in relation to etiology, diagnosis and treatment with special reference to systemic diseases in relation to dentistry. Emphasis should always be placed upon practical diagnostic procedures with adequate laboratory instruction on at least the simpler methods such as examinations of the urine for albumin, glucose, etc. which any dentist should be able to do or have done in his or her own laboratory.

Pathology. Needless to state a good working knowledge of gross and microscopic pathology is the foundation of dentistry as it is of medicine and surgery. Now-a-days every specialty in medicine has its own special pathology. Oral pathology is the special pathology of dentistry. It need not be split into various branches but taught as an inclusive subject meeting the needs of all dental specialties. Under these circumstances, however, the teacher must be fully informed about the needs of different specialties. Since increasing emphasis is being placed upon the importance of clinical correlation with pathology it is highly advisable for the teacher to employ the case history method which has amply proven its value in the teaching of pathology in medical schools. Special emphasis should be placed upon oral pathologic histology as an extremely important basis for diagnosis and intelligent therapy. This is not only of fundamental importance in relation to periodontia because the care of the supporting structures of the teeth is just as important a part of clinical dentistry as the restoration of teeth or parts of them, but in relation to the healing of extraction wounds, tissue reactions to dentures, the response of pulps to restorations, periodontal changes incident to

movements of the teeth, etc. Of course the dental student also requires adequate instruction on the clinical value of biopsy examinations; likewise some instruction in general pathology as the bais of an understanding of systemic diseases in relation to dentistry although this instruction need not be as thorough and comprehensive as medical students require.

Microbiology. Needless to state dental students require almost as much instruction in bacteriology and immunology as medical students although bacteriologic, serologic and immunologic diagnostic methods are not employed as frequently in clinical dentistry as in medicine and surgery. Particular emphasis should be placed upon advancing knowledge on infection in relation to the etiology of caries and pulpitis, the status of focal infections of dental origin in relation to the etiology of systemic diseases with special reference to subacute bacterial endocarditis and lung abscess, the bacteriology of gingivitis. gingivostomatitis, periodontitis, etc. Likewise upon other infections of the lips, oral cavity, head and neck like cavernous sinus thrombosis, paranasal accessory sinusitis, tonsillitis, diphtheria, Vincent's angina, erysipelas, Ludwig's angina, tuberculosis, leprosy and syphilis. It should also include some instruction on the etiology of those systemic infections like typhoid fever, brucellosis, tularemia, granuloma inguinale, epidemic influenza, etc., that may produce oral manifestations. Virology is of lesser importance but should include at least the herpetic viruses and that of lymphogranuloma venereum because of possible oral manifestations. The same is true of mycology although moniliasis, actinomycosis and histoplasmosis at least must be included. In my opinion, however, it is not necessary or advisable to burden the dental student with much instruction on parasitology since only Trichomonas buccalis and Endameba gingivalis are apt to be encountered in the oral cavity and even these are usually only saprophytic infestments of little or no etiologic importance. But the course of instruction should adequately cover the principles of chemotherapy including the sensitivity tests of antibiotic compounds as an aid in their selection for treatment purposes. Also the subject of allergy, including the technic of skin tests in relation to etiologic diagnosis with special reference to the patch test, in view of the frequency of natural or acquired allergic sensitization to dental materials, cosmetics, etc.

Here again the teacher of microbiology should be a dentist or one

willing to acquire sufficient knowledge of the particular phases and problems of clinical dentistry by conducting his department and instruction in the closest possible relationship with the various clinical departments. Special emphasis should be placed on methods for the collection of materials for bacteriologic examinations, including the many sources of error, along with adequate instruction on the interpretation of bacteriologic reports. Students should be particularly well instructed on the simpler bacteriologic methods. In my opinion every dentist should be prepared to make reliable examinations of simple smears for fusospirochetal infections, etc., in his or her own laboratory. Likewise cultures of pulp canals before they are finally filled. After all it is quite easy for the dentist to keep on hand a supply of tubes of an appropriate broth medium for inoculation, incubation and examination in his or her own laboratory. It is not absolutely necessary to identify microorganisms since the only matter at real issue is whether or not a pulp canal is sterile when cultures are made with proper precautions against contamination. But even more important is the matter of practical applications during the clinical years of dental instruction. Otherwise students cannot be blamed for wondering why they were given so much instruction only to find that their clinical teachers were not employing diagnostic bacteriologic methods as they were taught to expect and employ. Indeed junior and senior dental students should be given the opportunity and facilities for making at least some of these examinations themselves under expert guidance and instruction.

Pharmacology. Undoubtedly pharmacology, including materials used in dentistry, is one of the most important of the fundamental sciences because, if properly taught, it can or should be the basis for dental therapeutics. Here is a golden opportunity for teaching principles and the differentiation between rational and irrational compounds that should guide the practicing dentist throughout his or her whole professional career. The materials and remedies taught should be largely, if not entirely, those approved by the Council of Dental Therapeutics of the American Dental Association and listed in Acceptable Dental Remedies, the U. S. Pharmacopeia or the National Formulary. This teaching should be in the closest possible correlation and integration with the clinical applications taught during the junior and senior years. Otherwise only confusion and doubt ensue in the minds of students if and when they observe clinical

teachers using drugs in violation of council rules and regulations. The compounds taught in pharmacology and dental materials should be those practically employed or approved by clinical teachers. Apparent contradictions should be taught with due care; thus pharmacology may condemn the use of caustics like silver nitrate, zinc chloride, phenol and other obtundents of the dentin, etc., which have useful clinical applications and thereby confuse the student. There must be provided a sound background for the choice and clinical use of local and general anesthetics, local disinfectants, sedatives, etc., employed in dentistry. Students should also be taught that there is such a thing as dental pharmacy and that this subject is now being taught in pharmacy schools. Under the circumstances and since dentists are legalized to prescribe all the remedies used by physicians, students should be taught and drilled in the matter of writing prescriptions, including the legal requirements in the case of narcotics, barbiturates, etc., and preferably, using the metric system.

Textbooks. I believe that textbooks on these fundamental sciences should be especially written for dental students and dental practitioners. They should contain the same general principles as textbooks prepared for medical students and physicians but otherwise devoted largely to the particular needs of dentistry, with special attention given to the applied or clinical applications of the subject in relation to the etiology, diagnosis and treatment of dental conditions and diseases including those falling in the domain of oral surgery. If this is true, such textbooks should be written by teachers, or in collaboration with teachers, who have had the advantage of dental education or who have had the opportunity of otherwise acquiring an adequate knowledge of the practical or clinical aspects and application of the fundamental sciences thereto.

DENTAL CORRELATION CLINICS

As previously stated, no one disputes or denies the importance of the fundamental sciences in relation to the teaching and practice of clinical dentistry. The problem is how best to teach and utilize them to attain these ends. I presume it is true in dental as in medical education that clinical teachers should include more teaching of the fundamental sciences in their instruction than is commonly the case. Altogether too frequently students are puzzled and even discouraged to discover that much that they were taught in the first two years

is passed over or otherwise neglected in their clinical instruction on etiology, diagnosis and treatment. This can be a serious mistake urgently demanding correction. Otherwise a golden opportunity is lost for impressing upon them the fact that much of what they were taught in the fundamental sciences has a direct and very important practical bearing upon clinical dentistry. After all, example is one of the best methods of teaching and no one can impress students with the value of the fundamental sciences more than those clinical teachers who seek every opportunity for utilizing their practical or clinical applications in courses of instruction. Consequently I would urge that in all departmental conferences, operative dentistry, oral surgery, pedodontia, periodontia, endodontia, orthodontics, etc., for the presentation and discussion of particular cases or problems, the teacher or teachers of the fundamental science or sciences concerned should be required to attend and participate in discussions. I know how valuable such conferences are in the medical specialties, not only to clinical and science teachers, but to senior students as well, who might be encouraged or required to attend.

But my special object is to direct attention to the need for correlation clinics in the freshmen and sophomore years of dental schools. Twenty years ago I began holding weekly medical correlation clinics for sophomores in the hospital of Temple University School of Medicine. These were so successful and were appreciated by the students so much that Dean Parkinson soon requested me to also hold weekly clinics during the freshmen year. Cases are selected, presented and discussed as far as possible in relation to the courses of instruction in anatomy, physiology, biochemistry, bacteriology, pathology, etc., with the science teachers frequently in attendance for participation in the clinics. Nothing in my rather heavy teaching load is more inspiring and satisfactory than these weekly clinics. This is true not only because I love clinical teaching, but because of the great opportunity afforded for bringing freshmen and sophomore students in direct contact with the sick at the very beginning of their medical education in order to impress upon them the privilege of becoming physicians, and to realize that now is their real opportunity for learning thoroughly and well the fundamental sciences, so important in the practice of medicine and its specialties.

While such correlated teaching is both easy and valuable in the hospitals of medical schools, I realize that it may be more difficult

in dental schools. An amphitheatre equipped with a dental chair and accessories is almost a requisite because it is important for all students to be in as close contact as possible with both the teacher and the patient. And, in my opinion, there can be no clinic without the actual presence of a patient. It is true that students are unable to see intra-oral lesions but they can gain a great deal by having them described, supplemented, if necessary, by blackboard drawings. At least they can gradually learn how to take histories, hear questions asked and answered, observe methods of examination and, above all, observe those qualities of psychologic understanding, kindness, gentleness, thoroughness and other less tangible qualities on the part of a good teacher which are as essential in the successful practice of dentistry as they are in the practice of medicine.

Furthermore, there may be the additional difficulty of obtaining patients for such clinics since they must be selected from ambulatory individuals in various clinical departments. But I find in medicine that most adults appreciate being shown and discussed in clinics and it is likely that the budgets of most dental schools would be able to defray the transportaation expenses and even the brief loss of employment incident to securing selected patients for such clinical

instructions.

While the primary purpose of such clinics should be to teach students at the very outset of their dental education, the importance of the fundamental sciences from the standpoint of actual or potential relationships to clinical dentistry, it should not be their purpose to teach technical details or make them purely clinical demonstrations. This has been tried and found unsatisfactory during the first two years of dental education. Nor is it necessary to delay starting correlation clinics until students have had the fundamental instruction. At least I have seen no harm or disadvantage in medical correlation clinics antedating the latter for students can be depended upon to remember cases, and to grasp and understand the fundamentals taught later, especially if the science teacher or teachers participate in the clinic. For example, it so happened about four weeks ago that the very first hour of instruction for our freshmen class in the School of Medicine was my medical correlation clinic on a day at 8 A.M. It was difficult to select a case under these conditions, but knowing that the laity hear and read a good deal about heart disease, I had no hesitation in presenting a case of congestive heart failure since it

was very easy to explain the basic facts of its mechanics and pathologic physiology in simple and understandable terms. However, it is a little more difficult to offer suggestions in relation to dental correlation clinics, yet, one should have no hesitation in selecting cases presenting tooth ache due to caries or pulpitis; gingivitis and gingivostomatitis in relation to infection and other etiologic factors; swollen jaws due to acute periodontal infections; caries in relation to the composition of the teeth and saliva, and, infections; orthodontic cases presenting cleft palate, hare lip or other oral anomalies in relation to growth, development, anatomy and psychologic changes; tempero-mandibular ankylosis, subluxation, arthritis or other changes with or without the Costen syndrome; trifacial neuralgia and other dental neuralgias; Bell's palsy; purpuras and other hemorrhagic diseases in relation to the physiology of the blood: fracture of the jaws in relation to muscle pulls; cysts of the jaws; maxillary sinusitis; the establishment and maintenance of blood clots for the repair of bone loss in periodontal lesions; benign and malignant growths; leukoplakia; lichen planus; tuberculous and syphilitic lesions, etc.

"Good textbooks have undoubtedly saved many intelligent children (students) from the consequences of bad teaching."

Editorial,
PHI DELTA KAPPA
January 1952

LIBRARIES

Libraries: "A term applied alike to buildings designed to contain books and to the books deposited in these buildings." It is in the latter sense to which reference is here made.

Libraries serve a two-fold purpose—historical and contemporary. And in each of these there may be a two-fold service detected—a collection of informational material used and developed through the years, chronological, biographical, and perchance, interpretative, which is also informational, while contemporary material is interpretative and of necessity both technical and scientific. In ordinary times libraries are almost if not wholly sacredly protected, for so much they contain can not be had again. Dental libraries are a part of this, and it is up to the dental profession and the dental schools to protect and further develop this side of professional learning. Read the following pages and contemplate the advance of the past quarter-century. These constitute the report of the Workshop previously referred to. (Ed.)

1 Websters Dictonary.

THE INDEXING OF DENTAL LITERATURE: HISTORY AND DEVELOPMENT

JOHN E. GURLEY, D.D.S., San Francisco1

The Idea of indexing the literature of dentistry made its first appearance in 1886, at which time the late Jonathan Taft published a book containing about 11,000 references.² Other lesser attempts were made and with smaller volumes, some in English, and also French and German. Then about 1908 the question was taken up by the American Institute of Dental Teachers and after bandying it about for a decade, Dr. Arthur D. Black was instructed in 1916 to use funds previously allocated to a proposed Index Bureau, in the development of a plan of procedure. Parenthetically, there is a little history of the Schools' Association which may not only, not be out

¹ Chairman, Advisory Committee, Library and Indexing Service, American Dental Association. Other members of this committee are: Drs. G. M. Anderson, E. E. Haverstick, M. B. Messore and T. D. Speidel.

² See Index, Dental Periodical Literature 1911-1915, p. X.

of place, but on the other hand may be interesting and valuable in this connection. In August 1893 there was organized in Chicago, the National School of Dental Technics consisting of the faculties of the various schools. Soon after their organization an invitation was extended to the National Association of Dental Faculties to unite with them. This latter organization had been in existence since 1884. This courtship carried on over a period of a few years and in December, 1898, the two did unite into another, known as the Institute of Dental Pedagogics. Following this, interest was manifested by the Dental Schools of Canada, and in 1912 the American Association of Dental Teachers was formed. This organization continued under that name until 1914, it was changed to American Institute of Dental Teachers. Finally in 1923, this body united with others to form the present American Association of Dental Schools.³

It was to the Institute of Dental Teachers that in 1918 Dr. Black made a report which was unanimously accepted in the following resolution:

"The general plan presented has the approval of this body, and the Executive Board is hereby directed to work out the details and to then present the problem to each individual school in the form of a definite agreement which the various schools may sign, this to be the basis for carrying on the work to completion."

The plan presented by Dr. Black may be said to have consisted of five parts, and minus details may be outlined as follows:

Index to Dental Literature

- A classified index, grouping related subjects. (This was and is known to us as a modified Dewey Decimal System. The entire Index up to the 1939–41 volume, all volumes copy-righted, was published in this system.)
- A Personal Index. (This was as is easily determined, an Author Index).
- 3. The Literature.
- 4. The Cost.
- 5. The Index. (Beginning with the year 1839, the accepted year of the first journal, volumes include years as follows:
- ³ A History: National School of Dental Technics, Institute of Dental Pedagogics and American Institute of Dental Teachers: Hoffman, Abram: (not published).

a.	1839–1875including	37	years
	1876–1890including		
c.	1891-1900including	10	years
d.	1901-1905including	5	years
e.	1906–1910including	5	years
f.	1911-1915including	5	years
	1916–1920including		

Three or four one year volumes were published during these years, as a matter of convenience for current readers. Dr. Black had estimated that a period of five years would be thus required to bring the work up-to-date and that an average of 120 pages per year would provide ample space. His estimate proved adequate on the average, until the present 1950 volume made its appearance, 180 pages were required. Following 1922, publication proceeded as follows:

h.	1921-1923 (391 pages)includ	ing 3 years
i.	1924-1926 (442 pages)includ	ing 3 years
j.	1927-1929 (411 pages)includ	ing 3 years
k.	1930-1932 (361 pages)includ	ing 3 years
1.	1933-1935 (301 pages)includ	ing 3 years
m.	1936-1938 (260 pages)includ	ling 3 years

At this point a change was made. The index was now changed from the classified type to the dictionary type, using subject headings. Much time was spent in developing these and of course, many changes will still be made. Subject Headings are not static—there will be many changes with each year's publication. More will be said about this presently. Therefore, beginning with the 1939–1941 volume, printing proceeded as follows:

n.	1939-41	(282 pages)including	3 years
0.	1942-44	(354 pages)including	3 years
p.	1945-47	(422 pages)including	3 years
q.	1948-49	(274 pages)including	2 years
r.	1950-	(180 pages)including	I years

Now, a checking of the sequence of events will indicate the real source of the present Index, which was taken over by the American Dental Association and has been published by that body since. Prior to there-to finances were secured from whatever source might at the moment be available, the present owner and publisher making some contribution never-the-less. During these years many different individuals have made some contribution either in labor or in money, as the following will show.

Ad	Iministrative Boards and Committees from the Administrative Board of the Dental Index	Committee on Dental Index
	Bureau	Committee on Bental Index
1921	H. E. Friesell, chairman R. W. Bunting, vice-chairman	A. D. Black Abram Hoffman
	A. D. Black, editor Abram Hoffman, sectreas. A. H. Hipple Edgar D. Coolidge	H. E. Friesell no chairman mentioned
1922	H. E. Friesell, chairman R. W. Bunting, vice-chairman A. D. Black, editor Abram Hoffman, sectreas. William Bebb, librarian A. E. Webster	Same as 1921
	Edgar D. Coolidge Herbert L. Wheeler	
1923	H. E. Friesell, <i>chairman</i> A. D. Black, editor Abram Hoffman, sectreas.	Same as 1922, no report of committee
	William Bebb, librarian	
1924	Same as 1923	Same as 1922
1925	Same as 1923	Same as 1922, A. D. Black named chairman
1926	Same as 1923	Same as 1925
1927	Same as 1923	H. E. Friesell Abram Hoffman J. F. Stephan H. B. Pinney A. D. Black, chairman
1928	Same as 1923	H. E. Friesell Abram Hoffman J. F. Stephan A. D. Black, chairman R. P. Thomas
1929	Same as 1923	Same as 1928
1930	Same as 1923	Same as 1928
1931	Same as 1923	Same as 1928
1932	Committee on Dental Index of the American Dental Association A. D. Black, chairman Abram Hoffman H. E. Friesell J. F. Stephan	Same as 1928
2222	R. P. Thomas	H. E. Friesell
1933	Same as 1932	Abram Hoffman J. F. Stephan W. C. Smolenske F. F. Whitcomb A. D. Black, chairman
1934	A. D. Black, chairman Abram Hoffman F. E. Friesell F. F. Whitcomb W. C. Smolenske	Same as 1933

1935	A. D. Black, chairman	A D Black chairman
- 233	Abram Hoffman	A. D. Black, chairman Abram Hoffman
	F F Whitcomb	F. F. Whitcomb
	F. F. Whitcomb W. C. Smolenske	W. C. Smolenske
1006	A. D. Black, Chairman	W. C. Smolenske
1936	AL D. Diack, Ghairman	A. D. Black, chairman
	Abram Hoffman	Abram Hoffman
	John E. Gurley	J. E. Gurley F. F. Whitcomb
	F. F.Whitcomb	F. F. Whitcomb
	W. C. Smolenske	W. C. Smolenske
1937	Same as 1936	Same as 1936
1938	Same as 1936	Same as 1936
1939	A. D. Black, chairman4	No report
	J. E. Gurley M. C. Hansen	25.000
	M. C. Hansen	
	W. C. Smolenske	
1940	See Committee on Dental Index opposite	M. C. Hansen
	and a series of the series of	W. C. Smolenske
		Fred Hoeffer
1941		Abram Hoffman
	Can appeal to salumn	John E. Gurley, Chairman
	See opposite column	M. C. Hansen
		W. C. Smolenske
		Fred Hoeffer
		Marcus L. Ward
	A company of the comp	John E. Gurley, chairman
1942	See opposite column	Committee on Library and Indexing
		Service
		J. E. Gurley, chairman E. E. Haverstick
		E. E. Haverstick
		H. Hillenbrand
		T. D. Speidel
		Librarians:
1943		Thomas D Flamina
		Thomas P. Fleming
		Alice McCann
	Commission on Tiberry and T. J. 1. C.	Hilda Rankin
	Committee on Library and Indexing Serv-	J. E. Gurley, chairman
	ice of the American Dental Association	E. E. Haverstick
	J. E. Gurley, chairman	T. D. Speidel
	J. E. Gurley, <i>chairman</i> Josephine P. Hunt, librarian and secre-	R. G. Kesel
	tary	Librarians:
	tary T. P. Fleming E. E. Haverstick	T. P. Fleming
	E. E. Haverstick	Alice McCann
	R. G. Kesel	Hilda Rankin
	Alice McCann	Dr. Kesel replaced Dr. Hillenbrand
	Hilda M. Rankin	and the second second
	T. D. Spediel	
	S	
1944	Same as 1943	Same as 1943
1945	See opposite column	Same as 1943, except Margaret G. Palmer replaces T. P. Fleming
		Palmer replaces T. P. Fleming
1946	J. E. Gurley, chairman J. P. Hunt, librarian and secretary	Same as 1945
	J. P. Hunt, librarian and secretary	The state of the s
	E. E. Haverstick	
	R. G. Kesel	
	Alice McCann	
	Hilda M. Rankin	
	R. D. Speidel	
	Margaret G. Palmer	
1047	Margaret G. Palmer	Same as to f
1947	Margaret G. Palmer Same as 1946	Same as 1946
1947 1948	Margaret G. Palmer	Same as 1946 Same as 1947, except that Dr. R. E. Sargent replaced R. G. Kesel

⁴ Deceased, Dec. 7, 1937.

1949 Advisory Committee to the Bureau of Library and Indexing Service
J. E. Gurley, chairman
E. E. Haverstick
Geo. M. Anderson
Michael B. Messore
T. D. Speidel
Donald A. Washburn, director of Bureau
(Dr. M. B. Messore replaced Dr. R. F.

Donald A. Washburn, director of Bureau (Dr. M. B. Messore replaced Dr. R. E. Sargent and Dr. G. M. Anderson was added.)

1950 Same as 1949

J. E. Gurley, chairman
Donald A. Washburn, Director of
Bureau
G. M. Anderson
E. E. Haverstick
Michael B. Messore
T. D. Speidel
(Due to changes in By-Laws, committee membership is confined to dentists

J. E. Gurley, chairman E. E. Haverstick G. M. Anderson T. D. Speidel D. A. Washburn, director M. B. Messore

1951 Same as 1949 (Due to change in By Laws, all Advisory Committees will be dropped.)

Doctor Black died in 1937 and the committee was organized on a different basis, under the direction of the American Dental Association, owner and publisher. Following a period of study and deliberation, it was deemed wise to add librarians to the committee which was then raised to seven, made up of four dentists and three librarians. This committee, with some changes, functioned until new By-Laws made provision for Advisory Committees, membership being confined to dental members only.

The object, or at least the basic pattern has been attained. We have splendid headquarters and a staff doing the job. It is now under the direction of the executive branch of the American Dental Association.

During these years the libraries of the schools have developed—you librarians attest to that. The literature both in books and periodicals has greatly improved and now we are well set to advance.

It seems but a short time since we had no libraries and as for librarians, they were not even thought of. But now in the second half of the 20th century, all that has been changed. Dentistry has come into its own and ranks with all colleges or departments of the University. You have had something to do with this. You will have more in the future. You are members of dental faculties—your function is in reality that of teaching. You must let probable readers know what you have and how they can get it and use it. You must know what is best, how to get it and how to handle it. A workshop such as this will tell you.

There is yet one phase of this work which requires better under-

standing and determination, if not extensive correction. Understanding and determination are perhaps good terms to use just now. Always there are before us the simple words "why" or "how". This is especially true as one thinks of the term nomenclature. The necessity of understanding the reason for names, how determined and the meaning each may carry. A clear understanding will help if not actually preclude personal whims and idiosyncracies. A name should be correct from the etymological standpoint, correct from the standpoint of the lexicographer and satisfying at least to the man with the whim. How can the term "primary" be acceptable in lieu of "deciduous"? And recently the dean of a dental college suggested the word "editorialize."

Probably careless usage of words and terms account for much of the difficulty and will be the hardest to correct. But isn't it our responsibility along with editors and authors to urge care and admonish caution?

The last quarter century has seen many changes—libraries have been developed; librarians have come into great usefulness; the library here at the A.D.A. headquarters has been transformed; the indexing service has been brought up to requirement; some of us have gone through all of this and are enjoying the result. It is yours to advance still further. One thing remains to be done, although that is started—nomenclature must be further developed. You will give some thought to that now along with other details of your work.

May we hope that this second workshop will see the inauguration, even the accomplishment of much that remains to be done.

CAN ONE LIST BE USED FOR BOTH INDEX AND CATALOG SUBJECT HEADINGS?

ADELE FISHER,1 Chicago

Can a list of subject headings similar to the *Index to Dental Literature Subject Headings*, published by the American Dental Association, be used for the dental school library? An examination of the character of the catalog and index will help us answer this question.

¹ Reference Librarian, Northwestern University Dental School.

By and large, the catalog is more extensive and covers a larger area of thought than the index which services a more intensive and specific subject area. Consider the purpose and design of a textbook and the purpose and design of a periodical article. A book on operative dentistry covers indications and contraindications for different types of restorations—gold, amalgam, silicate, acrylic resins—and the merits and inadequacies of each. Then, in similar manner, it goes on to cavity preparation, wax pattern technique, casting procedure, cementing, polishing and finishing. Because it is taken for granted that these subjects would make up the contents of such a text, the catalog could use a broad, general heading such as "Operative Dentistry." A periodical article would probably be limited to only one aspect or one part of the subject, and the index headings would have to be specific as "Inlays-Cementation," "Cavities-Preparation." Usually, a textbook covers the field in as adequate a manner as the author can present, and gives several techniques and methods. On the other hand, the journal article is usually an exposition or description of one man's trials, errors and results with an isolated problem of his special interest in the field of dentistry.

The catalog list has to contain headings for the basic and medical sciences as well as for all non-dental material that may be housed in the library. To cover this need, there must be headings for anatomy, physiology, bacteriology, chemistry and other allied subjects.

There are, however, certain circumstances which made a more analytical subject heading list necessary for the dental school library. When part of the contents of a textbook deviates from what is ordinarily expected, it is necessary to make an analytic entry for that chapter or section. Textbooks in dentistry are becoming more highly specialized. New popularity is being gained by books that deal with only one subject, such as recent publications on root canal therapy, mucostatics, precision attachment bridgework and the like. We also have books like Gordon's Dental Science and Dental Art and Lippincott's Handbook of Dental Practice edited by Grossman, which have several chapters handling various fields in dentistry written by experts in those fields. It is valuable to make analytics for the catalog to bring out not only the author entries, but also the analytical subdivisions in order to point up important and significant subject contributions that would be lost without detailed cataloging. Also, a substantial and essential part of our collections consists of theses, monographs, reprints and bulletins, which are concerned with very highly specialized material and particular research.

We catalog many masters theses which are based on research done on some particular problem in the field of dentistry. Usually work started by one man is continued by another and different aspects of the experiment are developed in that way. In each case a complete review of the literature is imperative, and in our library it is necessary that our catalog carry subject headings to answer these needs. Now the graduate school program is being expanded to accommodate the Ph.D. degree in dentistry. The Ph.D. theses again emphasizes the necessity for detailed subject headings. It is essential that the subject headings be slanted as directly as possible to the unique content of this type of material, so that research workers can readily find all publications on work done in new fields. This is the stuff journal articles are made of, and the index-subject heading list would certainly apply. The harmony and correlation that exists between these two vehicles for expediting the search for dental literature obviates the need for two subject heading lists.

We find that it is necessary to carefully explain to the students that if they wish general information for a short paper, they should use the catalog, and if they are desirous of more thorough information on a limited subject they should use the periodical index. However, students preparing assignments usually go to both the catalog and the index for their references. It is confusing and awkward for them to have to look under two different headings for the same subject.

The whole case for one standard list depends on the formation of regulations and policies in establishing and maintaining subject headings. Principles have to be thought through with a great deal of care and understanding, keeping in mind two problems—the nature and setup of the field of dentistry, and the use of the literature by the students and the profession. If guiding concepts are set up to anticipate and cover, as much as possible the current dental literature, a consistency and flexibility are brought into the scheme which makes the work of the library user and the librarian infinitely easier and more effective.

The answer to our question is—In the main, a composite list of regular catalog headings and periodical index subject headings can and should be used for the dental school library. The whole trend in librarianship today is the simplification of the use of the library. One authoratative subject heading list for dental literature and its allied subjects would be ideal. Let there be an all-inclusive list that would encompass the needs of the extensive work of broad scope as well as the exclusive needs of an intensive analysis. Each institution would use and modify the list according to its needs.

DEVELOPING A LIST OF SUBJECT HEADINGS FOR A DENTAL SCHOOL LIBRARY CATALOG

RITA D. FOWLER,1 Indianapolis

Before discussing my subject, "Development of a List of Subject Headings for a Dental School Library Catalog", perhaps it would be relevant to digress briefly and explain why it was necessary

to undertake this project for our library.

Our catalog was originally based on a very early list of subject headings. Probably they were adequate when the library was much smaller than now; however, judging from the headings pencilled into our copy of the list, the headings, especially the non-dental, must soon have needed expansion. For some of these additions I have found no explanation; others are obviously Library of Congress. At any rate, it became the practice to use Library of Congress headings from the cards for new subjects. Sometimes these subjects were used in addition to a similar heading already in use, and many odd combinations resulted. Under Operative Dentistry, for example, were books on oral surgery-because that was the heading suggested by Library of Congress—as well as books on operative dentistry as used at that time. See also and cross-references were practically nonexistent. The confusion was further increased by the fact that the library was adding Library of Congress headings but had no L. C. Subject Headings list to suggest reference or to note new headings and changes. Besides this, dental headings had been added when needed with an eye on the subjects used in the Index to Dental Periodical Literature.

This, I think, is not too exaggerated a picture. It is the kind of thing which can happen when a series of librarians add subject head-

¹ Librarian, Indiana University School of Dentistry.

ings without benefit of an over-all, adequate plan. These headings are helpful and are, so far as I know, the only such list in print;

but they have now become inadequate in certain respects.

I question the premise that "In a catalog of a dental library it is not necessary to preface every subject with the word "Dentistry" or "Dental", for it is to be expected that in a dental library the greater part of the books are on dentistry and allied subjects." Obviously all of the headings cannot be prefaced by "Dental" or "Dentistry", but I do not think it practical to use History, Biography, etc., in preference to Dentistry—History. Also Terminology unmodified, but meaning terminology of dentistry seems hardly adequate when your collection contains as many books on allied subjects as ours.

Second, although non-dental headings were included, these are only the beginning of possible headings needed as the collection expands. The "Surgeon-General's Index-Catalogue", the "Quarterly Cumulative Index Medicus", the index given in the pink pages of Black's "Index to Dental Periodical Literature" and the "Subject Headings used in the Dictionary Catalog of the Library of Congress" were consulted in preparing this list. But to which of these authorities, does one turn for the addition of non-dental headings?

And finally, what of the many developments in dentistry itself since 1932? Subjects must be added for the new consideration of psychology in its relationship to dentistry, the air-brasive technique, fluoridation of water supplies to prevent caries, acrylic resins, and all of the others. If *Periodontia* is used as a subject heading, should we not add *Endodontia*, and substitute *Pedodontia* for her *Children-Dental Care?*

It was anticipated that such changes and additions would be necessary and the cataloger was instructed in keeping a list of the headings used in her catalog. But it is the problem of selection and the process of addition as the need arises which can get out of hand and which necessitates the development of a new or revised list with stated plans for expansion.

To return to the revision of subject headings for our own catalog, it seemed feasible to start by standardizing the non-dental headings. Since Library of Congress headings are used on the Bloomington campus of Indiana University, where our students have their pre-

² Bowler, Inez. An elementary manual of dental library practice. p. 37.

dental work and first year of dental school, and since they are also used at the Medical Library, which our students use, it seemed most practical for us to adopt them. A copy of the latest edition of the Subject Headings Used in the Dictionary Catalogs of the Library of Congress was purchased, and the revision of subject headings for all non-dental material has been completed.

Then a study was started of our dental headings. For each dental subject heading in use in our catalog a 3 x 5 card was prepared. Two subject heading lists from other libraries, the subjects used in the *Index to Dental Periodical Literature*, Library of Congress headings, on earlier list were all studied carefully, and on each card a notation was made of the possible headings suggested by these lists. From the Library of Congress, similar headings shown under medicine but not under dentistry were listed. If this method served no other end, it resulted in a wealth of suggestions for see also and cross references—which, in my opinion, are equally as important as your final choice of subject headings.

From this study and a comparison of the various headings and their applicability to our catalog, the following broad decisions have volved for the formulation of our own list of headings:

- 1. Use of Library of Congress headings for all non-dental material.
- Prefer Library of Congress for dental subject headings where
 it is possible to adopt the L.C. heading or to use headings parallel to ones suggested for medicine and other subjects.

For example, these headings may well be adopted straight from Library of Congress: Acrylic resins; Breath, Offensive; Dentition; Jaws; Teeth (in religion, folk-lore, etc.) However, the following are parallel to those headings suggested by Library of Congress for subjects other than dentistry.

Dentistry as a profession—Library of Congress suggests under Professions, Music as a profession and similar headings.

Dentistry, Military and Dentistry, Naval—Similar headings appear under Medicine, Military and Medicine, Naval.

Dentistry-Practice parallels Medicine-Practice.

Dental care, Prepaid and Dentistry, State—These will require see also and cross references from Medical care, Prepaid and Medicine, State.

3. Use subject subdivisions suggested by Library of Congress under all headings, dental and non-dental, where they are needed. For example, Dentistry as well as any of its special branches can be subdivided by: —Biography; —Handbooks, Manuals, etc.; —History; —Societies; —Study and Teaching; and others.

4. Eliminate headings under Dental and Oral by inversion where it is possible to do so. For example: Instruments and apparatus, Dental; Internships, Dental; Materials, Dental; Metallurgy, Dental; Pathology, Oral; Surgery, Oral; etc. However, subjects like Dental care, Prepaid—which was mentioned above—remain under Dental. In addition, cross references will appear under Dental to inverted headings.

Use Dentistry as a heading only when referring to general works or when considering the subject in its entirety.

- 6. Use Teeth with subdivisions only for specific material referring to the teeth, as, for example: Teeth—Form; Teeth—Abnormities and deformities. Also use Teeth—Bicuspids; Teeth—Canines; etc. so that all will appear together as subdivisions under Teeth.
- Eliminate headings under Mouth by the use of Oral in inverted headings. (This raises the question of how carefully one should differentiate between Dental and Oral.)
- 8. Use headings ending in ia for the branches of dentistry in preference to those ending in ics or ology. (This choice was made because of usage common at our school. For the same reason Prosthetic Dentistry will be used instead of Prosthodontia.)
- 9. In general prefer rather broad subjects with cross references from very specific subjects. Subdivide the subject if there is sufficient material on the more specific to justify or if there is so much under the broad subject that a particular book would be lost. To illustrate: Cross references appear under Pulpectomy; Pulpotomy; and Root canal—Therapy to Endodontia. However the references from Articulators is to Instruments and apparatus, Dental—Articulators.

The list of dental headings, when completed, will be typed in the form used in the Library of Congress list of subject headings showing suggested "see also", "references from", and "cross references". These will be checked as used and as the references are made. The two lists, dental headings and Library of Congress, will bear cross

references to and from related headings so that they will be used together as a unit representing all of the headings in our catalog. The dental heading list will be prefaced by a statement of the overall plan and decisions such as those which have been set forth.

APPLICATION OF DENTAL CATALOG SUBJECT HEADINGS

JOSEPHINE P. HUNT,1 Chicago

The problems of subject headings for catalogs do not always involve such profundities as proper nomenclature and terminology. Many times even simple questions, such as whether or where the words "dental," "oral," or "dentistry" should be used, present difficulties. Perhaps a brief survey of some of these recurring questions might prove helpful and I would like to offer a few suggestions on how to modify some subject heading lists for your own needs. Let us review some of the points to be considered in applying subject headings to your card catalog:

1. Does the catalog represent principally a dental collection with the exception of a few general reference books?

2. Is the dental catalog part of a catalog containing cards for medical, law or other subjects?

3. Is the catalog primarily of a dictionary or a classified type?

4. Does the catalog include many analytics of books?

All of these things may have a bearing on the selection of suitable subject headings and on their arrangement.

In looking for information on the history of dentistry in an historical library, one would look instinctively under the subject "Dentistry" and not under the subject "History." In a general library such as the Chicago Public Library books on dental history are likewise classified under "Dentistry." In a purely dental library, however, references to dental history would almost surely be found under "History, dental" or "History—dentistry" though at least four other forms are permissible and might be used.

When the heading "Dentistry—History" is found in a general catalog or general subject heading list, this represents a subdivision of the heading "Dentistry." In a strictly dental list of subject head-

¹ Associate Librarian, -ADA.

ings a transposition is required and the word "history" would be placed first. In addition to this transposition of words, however, the heading also becomes a main heading and is no longer a subdivision; consequently the form "History, dental" would be preferable, in my estimation at least, to "History—Dentistry." If the necessary word changes are made and commas are used regularly for inversion of main headings and dashes are used only for subdivisions of headings much uncertainty and confusion may be avoided.

Similarly in a law library, the words "law" and "legislation" are omitted whenever possible. The items on laws pertaining to dentistry would be catalogued under "Dentistry" with such subdivisions as might be necessary. In a dental library, of course, the situation is reversed and the words "dentistry" and "dental" are used only when necessary. In a public health classification it is surprising how seldom

the words "public health" are to be found.

Let us study some of the catalog headings now in use from the standpoint of their application in the dental library. As many of you subscribe to the Library of Congress cards some of these headings will be cited as examples. On the Library of Congress cards Maximow's book entitled "A textbook of histology" is properly classified under the heading "Histology." Noyes' book entitled "Oral histology and embryology" however, has only the heading "Teeth". The heading "Teeth" is all right as a heading when properly applied but it is entirely inappropriate for this book in a dental library. A book of this nature should be given a heading such as "Histology, dental" or one of the other comparable variations of this heading and there should also be a heading to represent that part of the book on embryology.

Other examples of headings improperly assigned are those for Sicher's "Oral anatomy," for which the subject headings "Head," "Neck," and "Teeth" are suggested. In a dental library a heading such as "Anatomy, oral" is required. If general anatomy books were similarly classified the unsuitability of the headings suggested for Sicher's book would be still more apparent. So many anatomical parts would be listed that "Heinz 57 varieties" would be nothing in comparison.

On the Library of Congress cards the headings offered for books on dental roentgenology are variously "Radiography", "Teeth—Diseases—Diagnosis" and "X-rays in dentistry", none of which is completely satisfactory in a dental library. The headings suggested for

Tylman's "Theory and practice of crown and bridge prosthesis" are "Teeth, Artificial" or "Teeth, Prosthetic." To a group of dental librarians, I am sure no comment regarding the suitability or lack of suitability of these headings is required. As a further example of proper headings improperly applied I wish to mention three books on the subject of root canal treatment all of which were published recently. These are by Coolidge, Gottlieb, and Grossman. For these three similar books, the headings offered are "Dentistry, Operative," "Teeth—Diseases," and "Dentistry." Either the heading "Root canal treatment" or "Endodontia" would have been preferable for all three. However, I wish to emphasize again that it is not the subject headings themselves which are under critical review but merely their suitability when applied to a dental library catalog.

The index at the back of the Army Medical Library Classification (1951) contains a fair number of dental terms from which headings could be selected or developed that might be an improvement on those now placed on the Library of Congress cards. The present method of classifying books on dental anatomy, histology and embryology would have to be altered, however, before the available headings in the list could be utilized. (At present books on the anatomy of a particular section of the body are classified under the name of one or more anatomic parts. This gives no opportunity to use such a heading as "Anatomy, dental." If the name of an anatomic part must be given "Mouth" would be preferable to "Teeth" or "Head" which are now used as headings for books on dental anatomy.)

A quotation on the subject of Library of Congress subject headings from the book entitled "A handbook of medical library practice," is as follows:

"These headings should not be used as given, but should always be checked with the authority file so that they will conform to the headings found in the particular library at hand. They should also be considered in the light of the subject matter of the books, and the use which will be made of them... In a special library, it is desirable to speak in the specialist's own language, and to reflect in the catalog the terminology used in research, in publications, and in the classrooms of the institution as a whole."

² Doe, Janet (Ed.): Handbook of Medical Library Practice. Chicago, American Library Assn., 1943. p. 135.

Further on in the same book^a a similar thought is expressed, "Therefore the most suitable term would, in each case, prove the best term only for that particular library; one cannot state that it would prove best for all libraries."

It might be mentioned that the headings on the Library of Congress cards are not the only ones which are unsuitable or lack uniformity. The Cumulative Book Index, for May 1951 contains two recent books on dental roentgenology both of which were published in England. The book by Hepple is classified under "Dentistry" and the comparable book by Ingram is placed under "Radiology."

If analytics are used, these may be in the form of sub-divisions under broad headings, or they may be in the form of separate headings; thus an analytic for "cast gold inlays" could be a subdivision of "Operative dentistry" or a separate heading. If "cast gold inlays" is to have a separate heading, "gold foil," should be treated similarly unless there is a wide variation in the amount of published material on the two subjects. There are several acceptable forms for analytics but the main point is that only one style should be selected and that style should be used consistently. When analytics are used, the broad headings may also require modification. Of course, if analytics are used regularly, the number of headings will have to be greatly increased. In assigning headings, particularly when making analytics, the cataloger might well say to himself, "Will the reader be satisfied or disappointed with the material which is now being classified under this heading?"

The amount of material on a given subject should aid in determining whether a main heading or a subdivision is to be assigned. If the amount of material on a given subject is great enough to require subdivisions to be readily located, a main heading may be substituted and subdivisions provided. In other words, not only the scope of the subject matter but the amount of published material should be taken into consideration in selecting headings. Though following a pre-determined pattern or arrangement is important in selecting headings, ease in locating references is even more important than conformity to a form.

The most comprehensive printed list of dental catalog subject headings, with which I am familiar, is the one to be found in the book "An elementary manual of dental library practice" by Inez

³ Ibid p. 145.

Bowler⁴. Though this list is far from complete and contains many imperfections, it nevertheless represents the best and most comprehensive list which has been available to date. Perhaps after this meeting a more suitable list will become available.

General principles to be used in the application of subject headings might be summarized as follows:

- 1. Select one type or style of heading and use it as consistently as possible. Some variation is to be expected.
- Avoid duplication of headings with similar meanings, such as extraction and exodontia. Synonymous headings scatter related material.
- 3. Make all analytics in the same form.
- Transpose, add or omit such words as "dental, oral," and "dentistry" when necessary to make general headings suitable for a dental catalog.

SUMMARY

No general list of subject headings will be suitable for use in a dental library without modifications. If the general headings are well prepared, the modifications are usually quite simple. Many cases require only the omission of the word "dental," or "dentistry" from before a heading or the addition of the words "dental," "oral" or "dentistry" after a heading.

An editor in a publishing house tells a story of an author who wrote a book on physiology. The publishers of the book invited him to prepare his own index which he did. When the index to the book was received by the publisher, imagine his surprise when he found that practically everything in the book was indexed under "physiology." It is a good idea for the dental librarian to guard against the same sort of error in preparing a catalog.

Bowler, Inez: Elementary manual of dental library practice.

WEEDING

MINNIE ORFANOS, Chicago1

Why do we have to weed? The most common reasons fall into three groups: Condition of books, content of books, overstocking of

¹ Acting Librarian, Northwestern University Dental School.

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books and lack of space. The first group comprises weeding on account of the physical make up; books that are worn out and not worth rebinding. The second group comprises weeding because of contents. Additional discoveries in the various fields of scientific books grow dangerously out-of-date in ten years or less. There is no hard and fast rule about the term "out-of-date" and it would be better to clarify the meaning of the term. We could say: a book which no longer conforms to the prevailing ideas in dentistry. By the very nature of the subject, dental works get out-of-date quickly, few gain respectability with old age.

Slightly different, however, is the case of the work superseded by a newer and better edition, when, for example some new material has been added but the technique of presentation is improved in the new edition. More exhaustive description of the process, perhaps together with new illustrations, figures and visual material, gives the new edition a clear superiority as in the case of the operative dentistry text books. It is obvious that not every book announced as a new edition is a new edition. Very similar is the case of the book superseded by an entirely new book, offering the reader more or better material on the subject. There are cases where a book has permanent value by reason of its treatment and the authority of its author.

The librarian discarding must be able to differentiate between the useful and not so useful books. Books that attract national attention because they are authoritative works by outstanding men in their fields. Two such books are W. D. Miller's Micro-organisms of the Mouth and J. N. Farrar's Irregularities of the Teeth. A helpful guide to some books is Dr. Denton's article, "Book Literature", published in the Journal of the American Dental Association, June 1950. Works issued by dental commercial houses and by dental faculty which have short life and attain local attention.

The third group consists of our stocking of books and lack of space. In this case we should have to eliminate the dead wood and have a storage space for little used material and material kept for historical purposes.

A year ago in preparing to open the stacks to the Northwestern University Dental School borrowers it was necessary for the librarians to see that all the books were accurately shelved and useless books, pamphlets and reprints discarded. Because the dental school library is one of the most complete in the world it was decided to maintain one copy of every book published.

The books discarded were old editions of revised texts. We retained one copy for the sake of ourselves, the book reviewers and historians who are interested in comparing editions and progress, respectively. Other books discarded were all but two copies of a once popular book of which we had many copies. Here book selection is very important, the librarian should know the pulse of library and have foresight to order enough and yet not too many copies of a current popular dental book.

Pamphlets removed from the collection and discarded were obsolete state dental laws, duplicate of little used foreign material and reprints, treated as pamphlets, already contained in our bound dental periodicals.

After much consideration and thought we have decided to cut down on the number of copies of bound periodicals. For example five copies of the Journal of the American Dental Association; the American Journal of Orthodontics; and the Journal of Dental Research are being cut to three copies. Less important journals of which we have two bound copies are being cut to one bound copy and in many cases we are binding several years together. They are the Northwest Dentistry, Dental Student Magazine, Oral Hygiene and Oral Health, to mention just a few.

The actual process of withdrawing books is the simplest part of weeding, by the time you get to that point the agony of decision is over. The material discarded at N.U.D.S. was offered to other dental libraries and our own dental school borrowers.

Weeding is a mammoth undertaking, a complete project requiring much time and including responsibility, it is one of the jobs that we will do "someday", it is suggested, however, that it is done regularly and systematically. The sense of responsibility in weeding can not be over emphasized, the librarian must know what she is doing so that no valuable material is discarded. We used the advice of our faculty and Dr. Denton whose judgement we can trust. Such advice is two-fold in its value to the library, for it brings competent opinion to a problem which is sometimes beyond the librarian knowledge, and it tends to awaken a feeling of cooperation and friendliness.

DEPARTMENT BOOK COLLECTIONS

IDA MARIAN ROBINSON,1 Baltimore

Every librarian in the academic field becomes aware, at one time or another, of the library family's problem child—the department book collection. This is the orphan left on the doorstep, an orphan that often complicates its own situation by resisting adoption. It is the purpose of this brief discussion to suggest some methods which have been tried and to seek others which may be suggested in the attempt to establish this outsider, the department book collection, as a harmonious part of the library family.

A definition of terms may first be in order. By department book collection, we mean any group of books chosen by, purchased for, and maintained without formal supervision in a departmental division of a college (for example, in relation to dental schools, a group of books in the orthodontics department). Such book collections are tools of the department, needed constantly or frequently for reference, as essential to have readily at hand as other equipment used in teaching and research.

We may trace the orphan condition of the department book collection to the fact that, in many long-established academic institutions, it originated entirely apart from the general library system and spent its formative years without benefit of guidance or control from any organized parent-library. Departments simply bought books for their immediate need, used them intensively while the need lasted, then shelved them without record of their existence or mislaid them without indication of their ownership. If some of the more conscientious departments placed the book collection under superficial care of a secretary, her work schedule and attitudes probably determined, to a large extent, the ultimate fate of the books.

These methods still exist in the departments of some colleges. Other schools, eventually recognizing the wasteful duplication, restricted use, and extensive losses which may result from unrecorded book collections, have attempted in varying degrees to bring the orphan into the library circle. Such efforts frequently meet with resistance which is understandable, whether justified or not. Department heads who have had a free hand with their specialized book

¹ Librarian, University of Maryland, Baltimore College of Dental Surgery.

collections often have a tendency to think that all librarians are possessive of books and are just waiting to pounce; that any library control may mean, for the department, interference in book selection, delays in acquisition, unwelcome requests for use of department material, and other unaccustomed and unnecessary disciplines.

On the other side, it is possible that the librarian likewise has misgivings, fearing that departments will be antagonistic to any library supervision, or else make unreasonable demands about the speedy processing of department books in the library.

With this basic picture, we can enumerate some of the methods which have been tried and some of the attendant problems, in establishing a connection between the college library and department book collections.

- Method: Each department is requested or required to send to the library a record of all books purchased for its individual collection.
 - Questions: Will such a record be complete? What controls could assure its completeness?

 Will it be accurate? adaptable to the library catalogue?
- Method: Departments are required to send their department books to the library for recording, perhaps cataloguing and marking.
 - Questions: Will the department books be sent systematically? Will the library appreciate the department's need of books for a specific purpose, perhaps at a specific time? Will departments be justified in holding some books for urgent use first?
- Method: The purchasing department is instructed to have all department book orders shipped directly to the library for processing before delivery to departments.
 - Questions: Will this involve complications about order records? about billing? about three-way checking from department to purchasing office to library?
- 4. Method: Departments are required to send book orders for their department collections directly to the library. The library places the order in the usual way, receives and catalogues the books, marks them to indicate department location, delivers them to the department—in short, handles these books like all other library property, except for the final step of depositing them in departments.
 - Questions: Should the library budget or the department budget provide for these books?

 Will this control by the library cause undue delay in supplying the books for department needs? Will this method remove the need for indefinite loans of library material to departments? Will both library and departments be reasonable about the priority rights of department books versus books for the main library collection?

These are only some of the questions that may arise in trying to determine the best method of adoption or semi-adoption for the library orphan. Probably there is no complete answer possible and no complete agreement likely.

It has been indicated, however, by studies made in American

college and university libraries (summed up by Brodman in a survey² reported in 1951) that those schools and institutions which provide control strongly centralized in the library are the institutions which develop outstanding libraries. "It should be pointed out," says Brodman, "that dispersal of the resources of any institution can only be satisfactory if there is: 1) a knowledge of where the resources are stored, and 2) the ability to tap those resources when needed." This suggests, at least, that worthwhile results will follow the more complete adoption by the library of that sometime orphan, the department book collection.

² Brodman, Estelle. Survey of the National Institutes of Health Library . . . Washington, D. C., 1951. p. 20.

VERTICAL FILE MATERIAL

ADELE FISHER,1 Chicago

One of the ever-present problems confronting librarians is what to do with material that does not lend itself to cataloging and shelving in the usual manner. In our library at one time or another, we have asked ourselves, what shall we do with:

Reprints

Bibliographies

Pamphlets on popular dental education

Information on current issues in medicine and dentistry

Pharmaceutical house leaflets and brochures on new drugs

Dental school announcements

Programs of dental society meetings

Menus of dinner meetings and honorary banquets

Dental society membership rosters

Annual reports of dental examining boards and dental societies

Constitutions, bylaws, and regulations of dental associations

Dental supply house catalogs

Book sellers lists

Our vertical file for reprints is comprised of duplicate material. We keep here in alphabetical order according to author: 1) Reprints of articles from dental periodicals, 2) duplicates of cataloged reprints

¹ Reference Librarian, Northwestern University Dental School.

that do not appear in our periodical collection, 3) and duplicates of cataloged pamphlets. We draw on these duplicates when the library is put under pressure to supply several copies of one article for a particular assignment. No record is kept of these reprint holdings. Occasionally, we catalog particularly important dental periodical reprints that we feel warrant special attention and will get special use. These are put in pamphlet covers and placed in the stacks. Reprints on dental subjects that do not appear in our periodicals are cataloged and added to the collection.

We have recently decided to take bibliographies off the shelves and put them in a vertical file. Subject bibliographies are cataloged by subject and filed according to classification number, and author bibliographies are cataloged and filed alphabetically. We believe that putting them in one place, makes for greater accessibility and use.

The pamphlet material on popular dental education is used almost exclusively by the hygienists in their work with school children. No record is made for most of this material, and it is kept in a vertical file and discarded when it becomes old. If the material is unusually well presented, it is cataloged and added to the regular collection.

We constantly receive literature on current medical and dental legislation as well as on the controversial issues arising in these fields, such as socialized medicine and dentistry and proposed public health programs. The public health bills proposed in congress and material on public health programs actually in practice are cataloged. The rest of the material is put in the vertical file to be discarded as it becomes outdated.

Pharmaceutical house publications on new drugs are very valuable as they contain the first available information on administration and dosage. It is sometimes difficult to know how to handle these leaflets and brochures. If they are extensive enough to be of permanent value we may put several on the same subject in one pamphlet cover and catalog and shelf it with the rest of the pharmacological material.

We have discarded boxes of old book sellers lists and we now keep only the current issues.

Our collection of dental school announcements is a fairly extensive one and is valuable from a historical standpoint. They are arranged in magafiles in alphabetical order according to the name of the school. Catalog cards are typed giving the name of the school and the volumes and years we have. One box holds the current year announcements and at the end of the year these are filed in their regular places.

Programs of dental society meetings and all material that is concerned with dental associations are kept in magafiles and handled the same way as the dental school announcements.

HANDLING OF PAMPHLETS

RITA D. FOWLER, Indianapolis1

Our pamphlet file is a collection of ephemerial material which cannot be justified for inclusion in our book collection, but which should be part of the library. Any publication, even though a pamphlet in form, is cataloged and counted as a book if it appears to be of permanent value. If it does not meet this requirement, it is considered a pamphlet, subject to quick and easy disposal when its value and interest is past.

Our pamphlet file includes, among other things: pamphlets on dentistry intended for distribution to the public—such as those published by the A.D.A.; information by pharmaceutical houses on new drugs; booklets on the gold inlay by Ney and Co.; material on diet from the milk, sugar, and citrus fruit industries; plus odds and ends which come to us for temporary storage from the Dean.

Few reprints are included in the pamphlet file. A reprint collection of dental articles from non-dental journals has been started and is kept in a vertical file. Articles by our faculty are collected and bound. Otherwise, no effort is made to collect reprints from journals which we keep, except, of course, when extra copies are needed of a particular article for class assignment.

Because of the nature of the material included, our pamphlet collection is kept apart from our book collection. Pamphlets are filed alphabetically by author, if any, or title in open back cardboard pamphlet boxes. (I find that bulging pamphlet boxes are an ever present incentive for weeding.) Pamphlets are not accessioned, but a running count of those added and discarded each year is kept for our annual report.

¹ Librarian, Indiana University School of Dentistry.

For pamphlets, we type author and subject cards giving all pertinent information such as publisher and total pages, but in a form more simplified than that used for cataloging books. Also, blue catalog cards are used instead of white. At the present time, these cards are in a separate file; however, we are considering interfiling them in our card catalog in the near future. Since the cards are blue, they would stand out and all that would be necessary for identifying the material as pamphlet would be to type or stamp the notation "pamphlet file" on the card where the call number customarily appears. It would also be necessary to reassign subject headings using Library of Congress and the list of dental subject headings now being developed for our library.

This arrangement would have advantages, the most obvious being that it would bring both pamphlet and book material to the attention of the reader in one operation. At present to cover a subject, the user must look in the periodical indexes and the card catalog, and then may possibly overlook material if he fails to investigate the two drawers labelled "Pamphlets". The chief disadvantage would be in applying suitable subject headings to some of the material. Probably less leeway would be permissible in assigning headings on very specific subjects if the cards were filed in the card catalog than when filed separately.

In conclusion, there is material of timely importance in pamphlets. The material should be made available to the reader as a source of information along with journal articles and books. This material should be kept in an orderly fashion so that it can be located easily. All operations incidental to achieving these ends should be simplified as much as possible with the idea that the material will remain in the collection only so long as it can justify its space on the shelf.

LIBRARY STATISTICS AND REPORT WRITING

HELEN HLAVAC, 1 New York

Statistics may be defined as the application of the science of the collection, classification and tabulation of facts and reports; report writing, as the accounting of previous occurrences. This information becomes important only after careful study and analysis is made of it.

¹ Librarian, New York University, College of Dentistry.

Librarians are mainly concerned with three categories of statistical and literary reports: those which are of use to themselves directly in carrying out their daily work; those which report activities and are passed along to supervisors, deans or others in authority;

and finally those which are directed to library users.

Statistics of use to the librarian include the daily record of circulation of periodicals and books arranged by broad subjects, as well as the use in the Library of the reserved book collection. Monthly and annual tabulation of these figures becomes useful when examined for purposes of book ordering and discarding and for comparative purposes in notifying departmental chairmen of library use in their respective fields. The relationship between circulation and book stock can be significant; there may be a direct proportion between them, which is worthy of analysis.

The second category of reports to those in authority should not be looked upon as a "necessary evil," but should be reexamined for application to current operation. Weekly reporting of illnesses is significant when cumulated over a period of months and finally effects efficiency of operation. Monthly reporting includes the total circulation of books and periodicals by faculty, students and outsiders, together with the use in the building of the "closed shelf," reserved book collection. This cumulated figure has been responsible to a large degree, for our increased appropriation for additional staff members (originally two, presently five). Monthly reporting of additions to the book stock are divided into purchases, gifts, exchanges, withdrawals and additions of lost and restored books and binding statistics. Cataloging figures are divided into cataloging with and without the use of Library of Congress catalog cards. These statistics have indicated the amount of work being accomplished and have aided us in obtaining extra personnel to carry it out. The monthly record of inter-library loan services to other libraries and requests for material from other libraries is significant in analyzing our needs and demands.

Semi-annually librarians of each of the University libraries submit to the Supervisor of Libraries a performance rating (popularly called service ratings) for all non-professional employees. This is a recent development and is still in an experimental stage, subject to change if experience warrants it. At the present time the employee does not see his rating sheet after completion, but he does see the

blank form and does know that he is being rated. He understands that periodic salary increases are based upon his rating.

Annually, reports to those in authority include cumulated statistics of all of the above mentioned monthly figures which are appended to the annual report. In writing the annual report we attempt to make it a staff project with everyone participating and submitting thoughts and suggestions. We treat it as a pleasurable reporting of achievements made during the year and even though we use this opportunity to state our needs, we do not stress this negative phase, but try to write positively and report progress. Recently the use of graphic charts, showing the growth of the book collection, were made and with this beginning we hope to include some visual material in each future report for added interest and attractiveness.

Annual reports of attendance at conventions is submitted in a similar style as the regular annual report. This is not compulsory, but it serves to keep those in authority informed about "extra-curricular" activities.

The third category of reporting is perhaps the most important, namely, reporting to library users. Daily contacts with our readers represents the best type of publicity. A staff, which is cognizant of its importance and the importance of giving good service to all, can render the finest type of publicity available. As librarians in charge, we must "set the stage" for this atmosphere by example, supervision, and occasional staff meetings with free discussion and comment. In addition, current periodicals which are received in the Library are examined and "You may be interested" notices are sent to departmental chairmen for posting. A typed list of new books is posted in the Library and keeps readers informed of recent acquisitions.

Publicity in each quarterly issue of the New York University Journal of Dentistry reports activities to non-library users and stimulates further use by others. Annually a report of progress during the year appears in the Journal and is directed primarily to the Alumni who have been loyal supporters of the Library.

Library orientation is scheduled for each Freshman class annually early in their year. This serves as an indoctrination period and helps to acquaint these newcomers with our facilities. The completion of a library work sheet necessitates the use of various basic tools, which are used during the four scholastic years and later in research and investigation. We have found that as a result of the lectures the

library becomes important from the beginning and is looked upon as a friendly, helpful and familiar place and is used. This is significant in light of the fact that freshman students spend most of their time in the medical building.

Miscellaneous reports include verbal and written reports to the advisory Library Committee, the chairman of which is the librarian and therefore all activity is left to her discretion. An Alumni Library Committee acts in a similar capacity and has given support beyond the call of duty. Conferences with the Dean are voluntary and scheduled as needed. These are usually important and always helpful and informative.

In closing let me add that statistics and reports are only what you make them, but since they are necessary why not make them impor-

tant.

NOMENCLATURE PROBLEMS IN THE SELECTION OF INDEX HEADINGS

GEORGE B. DENTON, Ph.D.1 Chicago

Perhaps I should preface my remarks by the admission that I am not a librarian and that I have never done any indexing or cataloging. I have, however, had many years of experience in using library catalogs, bibliographies and indexes. I have made almost continuous use of the Index to Dental Literature from the time when the first volume was published in 1921 to the present. Therefore, whatever bias, ignorance, or impracticality I may show with regard to the Index, you will understand, is that of a user and not a maker of indexes. For many years I used the Index when the entries were made under the classification devised by Dr. A. D. Black, and I found it fairly adequate and convenient until in later years when it became evident that the science and literature had outgrown some of the boundaries which Dr. Black's classification seemed to have put upon dentistry. Others did not find the classification system so satisfactory, especially the casual user who did not have time to become thoroughly acquainted with its system and its peculiarities. The dictionary arrangement now employed in the Index is generally

¹ Research Consultant, American Dental Association.

more convenient and certainly more flexible. However, a body of headings without any necessary logical restraint such as classification imposes may grow into a bewildering labyrinthine tangle unless guided by certain principles and occasionally reviewed and revised. Most of my comments will be devoted to the need for such guidance as it appears currently in the *Index*. In this discussion. I am ignoring certain important considerations such as budgetary appropriations for carrying out my suggestions and provision of adequate personnel and time to carry them out. Actually, I am not recommending anything; I am merely setting forth what appears to me desirable.

I. NOMENCLATURE AND INDEX HEADINGS

At first sight it might seem that if the problems of dental nomenclature were solved and we had available a complete and satisfactory terminology, then we should possess a ready-made satisfactory list of headings for indexing purposes. If this were true, all the needed headings would be furnished, already alphabetically arranged, in a dental dictionary. Obviously, this is not true.

Although a satisfactory solution of nomenclature problems would be of great help in the selection of certain headings, nevertheless technical terminology leaves much to be desired in the way of index headings. The dental vocabulary contains many words applicable to details of structure, symptomatology, procedure, and so forth, which are so minute as to preclude the likelihood that they should be the subjects of whole articles or should be required even for the most analytical indexing. Such terms, of course, would be eliminated from the dictionary list. Moreover, no matter how up-to-date our dictionary might be, it could furnish only established terms, while the articles indexed often call for terminology which is not standard and sometimes does not yet exist. Articles do not deal with isolated things but with relations among things, some of which can be designated only by descriptive phrases. These circumstances point to important requirements for index headings which cannot be supplied by the most comprehensive technical vocabulary alone. The literature that we are indexing is constantly calling for a new terminology in advance of our dictionary record of the terms.

I am going to attempt an analysis of the indexing problem from a fundamental and somewhat philosophical point of view.

In the indexing process, three personalities and their separate activities are involved. These are

- 1. The author and his article.
- 2. The seeker and his quest.
- 3. The indexer and his indexing.

II. THE AUTHOR AND HIS ARTICLE

The solid, substantial, and permanent part of the indexing problem is the printed article to be indexed. It is the only fact, the only actuality involved. It is an unchanging and unalterable thing, that can be examined, defined, described, analyzed, abstracted, evaluated, classified. And the result of treating it in any of these ways may always be compared with the original to justify or condemn the performance of these procedures. The author of the article needs to be considered only as a name. The article is self-sufficient and selfexplanatory. It must be the point of departure for the indexer. He can describe or classify it only from what may be learned from its title, its formal statement of conclusions, and an analysis of its content. The indexer owes to the author and to the world of knowledge that the article be truthfully and accurately recorded and that it be assigned the precise scientific niche which its content merits. Furthermore, the indexer must relate the fixed fact of the article to a somewhat, though not entirely, stable system of headings and to numerous extremely uncertain and variable wants of a prospective reader. In other words, he is disposing the item with two purposes in mind: 1) to give it its rightful place in the body of knowledge, and 2) make it as readily accessible as possible. With the former requisite we are most concerned at this moment.

The thought content of the article

Since the indexer must in considerable measure understand the article before he can index it, he must penetrate the language in which the author's ideas are expressed, and grasp the concepts of which the thought content is composed. It may be assumed that when an author writes an article, his finished contribution represents three levels of human experience. First of all, he had some contact with reality, such as an experience with disease, bodily structures,

materials, etc. From this experience he has evolved certain mental images or reflections which, at least to a considerable degree, correspond to reality. In order to fix these concepts in the mind, and to convey them to other minds, the author has chosen certain symbols, in the form of words and phrases, to represent these concepts. With the actual reality on which the author's experience is based the indexer is not concerned. Moreover, at the beginning of the task of indexing, the indexer is more concerned with the concepts of which the author's thought is composed than with the words in which the concepts are expressed.

The article as a logical pattern, aside from its existence as a pattern of words, is an organization of many concepts. Most of these concepts are derived from common everyday experience or from science, and are more or less standard. Whether simple or complex, they are easy to grasp because they are familiar. Sometimes, however, some of the concepts evolved by the author are vagaries resulting from imperfect thinking which do not accord with common human experience; and such concepts are not always easy to grasp and usually are negligible to the indexer. Not all non-standard concepts, however, are vagaries. It is the purpose of a good article to evolve new thought, and to do so requires the creation of new concepts or the elaboration of old concepts by relating them in new complexes. These new concepts are particularly significant and are usually relatively hard to grasp.

Let us make these abstract comments a little more concrete by considering the basic conceptual pattern of a specific article. I have chosen an article in the May issue of the Journal of the American Dental Association, one entitled "Evaluation of Caries-producing Potentialities of Various Foodstuffs." An examination of the title alone, which is fairly representative of the article, reveals several significant concepts, which expressed in words are caries, foodstuffs, potentiality, cause, and measurement. Restated in these terms, the title without changing the sense, might have been "Measurement of the Potentiality of Foodstuffs to Cause Caries." Although all of these five concepts are simple and standard concepts in the sense that we think in terms of them without difficulty, yet in this article they are not really retained in their distinct senses throughout the article, but are integrated into synthetic concepts of varying com-

plexity. The author is not really concerned with the isolated concept of caries but with a complex in which caries, cause, and potentiality are all involved at once—the caries-producing potentiality. This is not three concepts but one complex. To express this complex concept the term cariogenicity is not unknown in dental science. In short, the complex concept is already on its way to becoming standard and thus to serve as a manipulatable counter in our thinking. The author of the article has particularized cariogenicity by relating it to food. So, it is not impossible to conceive of an alimento-cariogenicity, a property of food causing caries. (And, by the way, I am coining these monstrous words, not because they should be used, but only because it is easier to realize that we have a unitary, though complex, concept when we have a single word with which to name it.)

We may go on and construct a still more complex concept, as the author virtually does though without the name, adding to the existing concept that of measure and producing the equivalent of alimentocariogenopotential, an index of the caries-producing capacity of foodstuff. This concept is also present, by implication, in more particular applications to certain foodstuffs, as for example, saccharocariogenopotential, the measure of caries-producing capacity of sugar.

I have contended that one of the obligations of good indexing is to enter the article under the one logically and scientifically most appropriate caption. There are three primary difficulties. 1) Some articles are not unified and therefore cannot be assigned to a single caption. This, however, is not true of the article used as an example above. 2) New and worthwhile articles usually introduce new essential concepts as may be seen in the example. To assign every such article to its most particular appropriate pigeon-hole would be to make a new category for each article. 3) The essential concepts of such articles are non-standard complexes which cannot be comprehended under simple standard headings.

Under these circumstances, the indexer must resort to one of three methods: 1) He may use a descriptive heading; that is, he may combine the various concepts into a single head such as Cariesproducing potentialities of foodstuffs. Such a heading is always objectionable because it cannot be conveniently placed in an alphabetical arrangement. 2) He may resort to a system of main and subordinate headings, such as

CARIES

Etiology

Foodstuffs

If adequate, this method usually requires too much subordination. 3) He may abandon the principle of single entry and distribute entries among headings for the various elements entering into the complex concept, as, in the example, assigning the entry to Caries and Foodstuffs. The other elemental concepts in the example—namely, cause, potentiality, and measurement—are too general to be of use as delimiting headings.

Obviously, from the point of view of specific indexing, this is inadequate. But at least until the specific concept comes into standard professional use, such indiscriminate pigeon-holing cannot be
helped. Many of the concepts commonly used in dentistry are as
complex as is this index of cariogenicity. Among such concepts are
articulation, dentition, extension for prevention, DMF, etc. Since
they have become familiar and standard, they may be employed as
simple headings without difficulty.

The language symbols employed in the article

Obviously, the article is not merely a structure in logic, an organization of concepts, a counterpart of thought. It is also a composition expressed in language, with sentences, phrases, and words.

Words are more or less imperfect symbols. To a certain extent they correspond to the concepts which they represent, and to a large extent they have peculiarities of their own.

Words, among themselves, have some of the same relations as do concepts among themselves. Words may overlap one another in meaning just as do the concepts which they stand for. For instance, the terms carbohydrate and foodstuff overlap, for some carbohydrates are not foods, and some foods are not carbohydrates. Words may also have the relations of an inclusive general term to an included specific term—the relation of part to whole—just as one concept may comprehend another. Carbohydrate is a general term that comprehends both starch and sugar.

In addition to these characteristics that words have in common with concepts, there are two respects in which words have additional complicating possibilities. Several words may exist with the same meaning; that is, they are synonymous. Examples are caries and and decay, food and diet, cause and produce, index and measure. This fact complicates indexing and raises the problem what word to make the entry heading, and what synonyms to give as cross references of the see type.

Moreover, a single word may represent more than one concept. For instance, the word caries unmodified means not only dental decay so-called, but also a cell-by-cell sort of destruction of bone. And as you all will recognize, I have used the word index in two senses already in this paper, once as a list of subjects, and once as a sign of a mathematical ratio. This double meaning of words offers a more serious problem to nomenclature and indexing than does the multiplicity of synonyms. At the present time the adjective periodontal has at least four different meanings in common use. In one usage the term retains its simple etymological meaning indicative of anything about the tooth. To the periodontist it may mean pertaining to the periodontium, that collective anatomical organ consisting of gingiva, peridental membrane, and alveolar bone, or it may mean pertaining to the practice of periodontics. Finally, it may refer to the periodontal ligament, or peridental membrane.

The language of the article is likely to bias the indexer. The indexer should think rather of the concepts than of the words in which the author has expressed them. It is not necessary to employ the author's terminology either as an occasional entry heading or as a cross reference heading unless it conforms to standard usage or unless the article is likely to be sought for under his term. Vagaries in the author's terminology may be either unintentional misuse of standard words or the coinage of unsatisfactory new words. For instance, an author who confuses Vincent's gingivitis with Vincent's angina may mislead an indexer. I also recall an article in which the author, in order to economize, substituted for a descriptive designation of several words the symbol zdeac, which is both unpronounceable as a word and without general acceptance. It is doubtful that any seeker would look for the concept intended under that heading.

In all instances, the entry heading should be an acceptable professional word when such a word exists. The fact that, in a given instance, an unacceptable word is better known than an acceptable one, and would be more likely first consulted by a seeker, should not influence the choice of the entry heading. We are no longer indexing articles on periodontitis under **Pyorrhea alveolaris** although the majority of even dentists might be more inclined to look for that heading. Cross references will lead the seeker to the chosen entry heading. This practice is in part an educational measure, and should result in time in the possibility of discarding the unacceptable cross reference heading when practitioners and users of the index have all come to use the more precise and scientific term. It would be useless to endeavor to revise the nomenclature of the profession if in so professional an enterprise as the *Index* no attempt were made to promote the preferred terminology.

III. THE SEEKER AND HIS QUEST

By the seeker I mean, of course, the person who is using the index, searching for literature on a certain subject. And by the quest I mean the information for which he is looking.

Both the seeker and his quest contrast sharply with the author and his article. From the indexer's point of view, the seeker instead of being a certain individual, is a hypothetical personality who has not even materialized, so to speak, at the time when the indexer attempts to provide for him by indexing articles. And the seeker is not one person; he is a myriad of persons who sooner or later will be seeking the same information. Nor is the quest certain or the same for all seekers even though the same article may be their common goal, for one may use it for one purpose and another for another purpose. Consequently, they will approach it from different angles and will be led to the specific head under which the article is indexed along different routes of cross reference.

The seeker may have varying degrees of knowledge as to what he is looking for. He may know the name of the author, or the fact that an article on a certain subject exists, but often enough he does not even know whether any material suited to his purpose is in the literature, and he may not be able to realize his subject in sufficiently clear concepts to make the search intelligently himself or state it clearly enough for a librarian to give him help. Usually, however, when the article is found, he recognizes that it was what he was looking for.

The many and extensive uncertainties involving the seeker and the quest pose difficult problems for the indexer.

From the point of view of the seeker, let us consider the indexing of another article from the Journal, American Dental Association for May of this year. The title is "Function, Prime Object of Restorative Dentistry; a Definite Procedure to Obtain It." The title, though somewhat disunified; gives a pretty good indication of the content. Now let us imagine a seeker, perhaps a dental student who has been assigned the subject, "The Objectives of Restorative Dentistry," or a dentist who has chosen it. The article in the May Journal, American Dental Association is surely one that either of these seekers might very well wish to consult on this subject. Let it be assumed that the seeker has no knowledge of the existence of this article, and therefore must rely entirely on the Index to locate it. How can this be done?

The key phrase would, of necessity, be "restorative dentistry". But neither Restorative dentistry nor Dentistry, restorative are headings in the Index. The seeker might then turn to either of the two restorative forms of dentistry, Operative dentistry or Prosthesis or to the general head Dentistry. Under these he would find no subheading indicative of aims, purposes, or objectives; and among the few articles listed under the general heads he would discover nothing akin to the subject sought. And the article in the May issue, which we know to be pertinent, he would not find under any of these heads in the Index. We do not index articles of this sort under these heads. The reason, of course, is that the term objective is too abstract, and the term restorative dentistry too ambiguous in its meaning to suggest itself either for a heading or for indexing.

It is probably impossible to imagine all the uses that a seeker might want to make of any article, and therefore the indexer will naturally overlook some of the less specific ones. And yet, it is not unreasonable for the seeker to expect that in the case in hand the **Index** should lead him to the article in question.

With the same article in view, let us assume a second user of the Index who has defined his subject sufficiently to express it in this statement, "Function is the prime object of restorative dentistry," but is ignorant of the existence of the article in question. What success would he have in locating this article? His thesis is identical with that of the article in the Journal, American Dental Association,

and he has the advantage of one more concept and word by means of which to run down pertinent articles in the Index.

Upon consulting the Index, the seeker will discover that the heading Function does not occur either as a main heading or as a subheading under any of the relevant branches of dentistry. Obviously, the seeker must examine the term function and give it more definite meaning in dentistry. There are several functions of the mouth and jaws, such as mastication, speech, and deglutition, but the most prominent is mastication. The seeker might try Masticatory function or Mastication. The general heading Mastication he would find in the Index but with no subheading. Under the general heading he would find some articles dealing with the function of mastication, but all of these would be descriptive of the process of mastication in health or disease; they would not deal with restoration of that function. If the seeker turned to the word restoration, he would find the cross reference, Restoration of oral function: See Mouth—(subhead) rehabilitation. This heading would seem to hold out some hope, and when consulted, it would be found to list some promising articles, in the indexes of the last five years, including one article on "Functional Analysis for Bite Rehabilitation." Finding some pertinent articles under this head and no see also cross reference, the seeker would probably look no further, assuming that the guidance of the Index had exhausted the subject for him. Would he be justified, and would he have located the article in the May Journal, American Dental Association. Let us turn to the Indexer's solution of this indexing problem.

Examining the article and observing the procedure which restoration of function involved, the indexer would recognize at once that the article is concerned with occlusion. The appropriate headings are Occlusion—centric; Mandibular movements; and Occlusion—restoration to normal. This is all logical enough, and the heading Occlusion—restoration to normal especially is not only appropriate but seems to take care of the restorative aspect of the article. Under this latter head in the various issues of the Index for the last five years, other closely related articles have been listed. Yet the seeker would in all probability have overlooked these articles as well as the one in the May Journal, American Dental Association because the heading Occlusion did not occur to him.

What is the trouble here? Is the seeker at fault in not looking under

Occlusion? Or is the indexer at fault in not entering the article under Mouth—rehabilitation? The basic difficulty here is that of necessity, there are two different psychologies at work. The indexer is thinking from a known article to an unknown use of it. And the seeker is thinking from a known use to an unknown article. The index headings must be so devised and cross referenced that one approach will invariably lead into the other, so that neither seeker nor indexer

can go astray or overlook any relevant category.

Specifically, it should not be possible to enter the article either under Occlusion—restoration to normal or under Mouth—rehabilitation indiscriminately. One of these heads it would seem is expendable and should be discarded. Perhaps both heads should be superseded as entry heads by the head (now a see cross reference only) Restoration of oral function. Moreover, it would seem desirable to have the concept of function directly accessible to the seeker, especially since the term function has come to be used extensively in recent years. This could be accomplished by adding to the standard list a heading for cross reference such as Function, oral.

IV. THE INDEXER AND HIS INDEXING

The indexer has two quite distinct functions. These are

 To assign the article to the most acceptable heading or headings under which it can be entered.

2. To provide such entry headings and cross reference headings as are desirable for indexing.

Let us consider each of these functions.

Assigning the article to the appropriate headings

It has already been pointed out in the discussion of the article to be indexed that the heading under which it should be entered is the available heading which is most acceptable from the standpoint of precision, scientific concept, and terminology. In other words, the ideal heading would correspond to the specific and accurate meaning of the author; it would represent a concept in accord with the present scientific outlook; and it would conform to the best usage and criteria of professional nomenclature. It would not necessarily be the heading most familiar or most convenient for the seeker. The special needs of the seeker must be provided for then in the cross reference headings when the entry heading does not entirely fulfill these needs.

Now, since cross references are from heading to heading and not from article to heading, it might appear that the indexer's duty ends with the assignment of the article to its proper entry heading and that the rest could be taken care of automatically by the standard cross references. However, a new article would very likely deal with a new relation or involve such a possibility. Listing an article under any head which is not absolutely specific for the subject of that article, of necessity calls into question the adequacy of the cross references of that heading. Unless the see also references cover all the important new implications of the article listed, the indexer must then and there supply the lacking cross references to the entry heading. In other words, whenever the indexer makes an entry, he must ask himself whether there are implications in the article which call for new cross references to the entry heading and also to any other headings in the index. Sometimes the indexer may have to decide between creating an additional new entry subheading for the article of a new cross reference.

To exemplify this attention to the adequacy of the cross references I am going to use an article entitled "Two Cases of Green Pigmentation of the Deciduous Teeth Associated with Hemolytic Diseases of the Newborn" in the Journal, American Dental Association for March of this year. This was entered in two places, under the heading Blood (subheading) diseases and under the heading Enamel (subheading) pigmentation. There are no cross references leading into either of these headings. Therefore, unless the seeker knows that the condition for which he is looking is associated with a blood disease, he will not discover the article from the angle of systemic disease. From the tooth side, it is quite likely that the seeker will think, first of all, of the condition of the affected tooth, and attempt to find the article through the stain, color, or pigmentation. This would be a fruitless task. Since the condition is not limited to one of the hard tissues of the teeth, he may not look for enamel, and if so he will miss the only route from the tooth side. Several cross references added to existing headings would help to insure the seeker's making a successful search. If the seeker suspected that a systemic condition was involved and turned to the heading Systemic conditions manifested in mouth, a cross reference, now lacking, from that heading to Blood diseases would help. If the seeker made the attempt from the tooth side, a cross reference from the heading Stains and plaques on

teeth to Enamel pigmentation or cross references directly from the headings Green stain, and Teeth (subheading) discolored would probably remove the difficulty. Also, it seems to me that a new heading Pigmentation of tooth tissue, either for entry or for cross reference to Enamel pigmentation would be justifiable.

The creation of indexing headings.

In the capacity of creator of indexing headings the indexer should maintain three files or listings. These should be

1. A list of standard or permanent headings.

2. A list of occasional headings.

3. An anticipatory list of headings for type situations.

The standard list of headings should be circulated to librarians and should appear as an appendix of the annual Index volume. It should contain all the headings which are of a more or less permanent nature, and which may be reasonably expected to be needed in any subsequent volume. A heading should be placed on the standard list only when there is reason to suppose that the subject it covers has an established interest for the profession. Every standard heading should appear in the Index at its proper alphabetical location, whether or not there are articles to be indexed under that head in the present volume. This is something that we do not do at the present time. In order to prevent the seeker's experiencing the disappointment of following through empty headings, lack of articles under the head or under any cross reference from the head might be indicated by a special symbol such as an asterisk. The advantage of publishing the standard heads where no article is indexed consists in the assurance that it gives the seeker that he has found the right head and that nothing on the subject has been published during the period covered. Otherwise, he may rightfully infer that there may be articles on the subject but that he has not located the right heading for them.

Occasional headings are those which are required for current indexing but which will probably not be needed again or will not certainly be so required. For instance, a new drug may be suggested in an article for a certain dental application, but with little or no assurance that such a drug will ever be routinely used for that purpose. This heading will be needed for current indexing; but not until sufficient interest is manifested by the literature, should this heading appear

in the standard list. Or, for example, an unusual, or even frea association of circumstances may appear in an isolated instance in the literature. Back in 1940, at the Centenary Celebration of dentistry, in Baltimore, an historical drama depicting the progress of dentistry was enacted, and publication of excerpts from that presentation called for the heading Drama (subheading) dental in the Index. This heading has been retained in our list of headings ever since though there has been no other dental drama published up to the present, and there is no great likelihood that dental literature will be flooded with dramas in the future. Such a heading should not be retained on the standard list. However, it is desirable that the indexer should preserve a file of such headings so that if a similar subject comes up in the future, it may be treated in the same way; or, if the subject achieves sufficiently significant status, it may become a standard heading in identical form. Even occasional headings should not be adopted without due consideration, but possibly they can be somewhat more casual than would be desirable if they were to be used as standard headings.

The third file of which I have spoken, the anticipitory list of headings for type situations, is designed to aid in present and future revision of the list of standard headings. Many concepts which appear in dental literature, or in any specialized literature, are of similar sorts, and fall naturally into groups, which, in turn, have similar sub-groups or similar type aspects. For instance, there are anatomical structures, substances, conditions, properties, procedures. Among the conditions of interest to the dental reader are, of course, those in the group, diseases. And these may fall into certain sub-groups or kinds of the disease. Also, diseases are all viewed in certain type ways, such as etiology, pathology, symptomatology and diagnosis, prognosis, and treatment. Even a yet unknown disease will upon discovery be studied in the same general way as those long recognized diseases, and some of the same headings will be useful as they have been in previously recognized pathoses. It is highly desirable that our headings be so organized as to treat similar concepts in similar ways; and this can be accomplished only by adopting certain principles of heading-making, which can be applied to the revision of headings as they are and to the creation of new headings as they are needed in the future.

An examination of our list of headings as they stand will reveal that uniform principles have not been carried out consistently in our headings; and that, because of the more or less occasional exigency which has led to their adoption, omissions, redundancies, and confusions exist. For example I am going to take the indexing of articles pertaining to caries and to periodontal disease. These are the two principal pathoses of interest to the dentist, and they both have been studied extensively and both have so considerable a body of literature on various phases of the diseases as to require some analysis in indexing. Let us compare the indexing of these two dental diseases with regard to certain type aspects. What provision and disposition have been made for such analysis?

Suppose we are interested in articles on the diagnosis of these diseases. The heading Periodontal disease has a subheading diagnosis under which all diagnostic articles on periodontitis and periodontosis are entered. In contrast, the heading Caries has no subheading diagnosis, and no other subheading where articles on diagnosis might be logically recorded. Occasionally, a diagnostic article has been entered under the general heading Caries; and this disposition might be defensible on the grounds that articles on diagnosis of caries are few compared to those on diagnosis of periodontal disease. However, if one consults the heading Roentgenology (subheading) in dental diagnosis, he will discover may articles on diagnosis of caries by roentgenography and a few that combine roentgenography with clinical diagnosis of caries. Under the heading Caries there is not even a cross reference to this subheading covering roentgenographic caries diagnosis. There is also in the Index a main heading Diagnosis (subheading) dental, but under this subhead articles on diagnosis of caries are not listed. Some of the articles on diagnosis of caries have crept in under the heading of Caries (subheading) etiology and control, and appear nowhere else. Obviously, diagnosis has no direct relation to either etiology or control. The reason for this scattering of caries diagnosis is that no subheading or cross reference has been provided in the standard list of headings for this important phase of every disease.

Again, under Periodontal disease we have the subheading etiology and relation to systemic conditions. This subheading looks to me like a hesitant admission of systemic causes for periodontal disease. But the simple subheading etiology would be more clear-cut and less equivocal. Relation to systemic conditions is equivocal since it might cover the supposed effects of periodontal disease through the mechanism of focal infection just as well as the systemic causes of that oral disease.

As a somewhat corresponding subheading under caries, we find etiology and control. These two phases of caries are not inseparably associated in fact, and can be easily discriminated. But, if these phases of caries are generally discussed together, the combination heading may be justified. However, a glance at the literature will show that many (perhaps most) of the articles are predominantly either etiology or control. With some repetition of entry, these distinct phases could be given separate subheadings.

Please let it be understood that I am not advocating that headings for every disease included in the Index should be subdivided into etiology, pathology, diagnosis, prognosis, treatment, and prevention, or indeed, that every heading should necessarily be divided at all. I am only urging that in systematic and foresighted planning, these uniform aspects should be contemplated and arranged for in the anticipatory file of which I have spoken. The desirability of subdividing a subject heading depends partly on the number of articles written on the general subject and partly on the extent of specialization and degree of analysis characterizing the articles. If our indexing system is planned adequately, similar types of problems will be solved similarly, and almost every exigency of indexing will be accommodated and adjusted when it arises.

V. The Librarian

In limiting the personalities involved in indexing to the author of the article, the seeker, and the indexer, I have omitted one important agent, the librarian. As the indexer is an intermediary between the author and the seeker, so the librarian is an intermediary between the index and the seeker. Often the librarian's familiarity with the Index and his (or her) knowledge of the literature will compensate for shortcomings in the headings of the Index. By this I do not mean that the librarian should do the seeker's work for him. I have always contended that it was rather the duty of the librarian, and especially the school librarian, to teach the student and the dentist how to find things for himself through intelligent use of the Index.

ADDENDUM

On the morning of June 26 twelve members of the conference met to consider revisions of the Black Dental Classification. Two revisions were taken up, one suggested by Miss Adele Fisher, Northwestern University Dental School and one by Miss Helen Hlavac, New York University School of Dentistry.

Suggestions and discussion continued until 12:00 when the meeting had to be adjourned. Miss Hlavac's revision had been studied up to D₄ at that time. Those attending this meeting were to work through the classification and send their suggestions in to Miss Hlavac.

There is only one way to be an ethical individual, that is to choose your cause and then to serve it.

Josiah Royce

A BRIEF HISTORICAL REVIEW OF OMICRON KAPPA UPSILON

DONOVAN W. BROWN,1 D.D.S., M.S. Chicago

Omicron Kappa Upsilon had its inception in 1914 at Northwestern University Dental School. A committee from the class of 1914 submitted a petition to the faculty of the School, stating that they were "desirous of organizing and founding a national honorary fraternity similar to other fraternities now in existence in the leading universities of the United States, but for dental students exclusively; admission and membership to which shall be based entirely upon scholarship and character as manifested by election of the faculty," etc.

The petition was presented to the faculty of Northwestern University Dental School on June 26, 1913, by A. E. Hurt, E. Soucek and R. H. Jirka, who were carrying out the desire of the class.

Dr. G. V. Black, Dean of the School, received the suggestion favorably and appointed Drs. H. A. Potts, A. D. Black and C. R. E. Koch as a committee to counsel the students. A letter was prepared by the student committee and sent to the Deans of fifty-one dental schools in the United States and Canada. In reply, the Deans manifested great interest in the proposed organization.

During the period of correspondence, the local committee formulated necessary plans. A decision had to be made regarding a name for the new organization; an insignia had to be designed, approved

and adopted.

Mr. John C. Burg, Northwestern University, Liberal Arts, 1909, was requested to select a name and design a key. This request was conveyed in a telephone conversation with Dr. Arthur D. Black who asked Mr. Burg to 'think up' Greek letters for the new honor society in the Dental School, and to design a key as a badge.

Mr. Burg secured from Dr. C. R. E. Koch a statement of the ideals of the dental profession. The ideal of the Doctor of Dental Surgery, as expressed by Dr. Koch, is the conservation of teeth and

health.

The name of the Society was built upon three words—conservation, teeth and health. John A. Scott, professor of Greek in North-

¹ President, OKT.

² Deceased.

western University, was asked for the Greek terms expressing the three words. Dr. Scott replied as follows: Soteria is the Greek for

conservation; Odous for teeth; and Hygeia for health.

Using this information, Mr. Burg selected the initial letters of the last two Greek words, that is, Omicron and Upsilon, chiefly because they were appropriate but also because they were euphonious. OMICRON KAPPA UPSILON was suggested as the name for the Society, Kappa being the initial letter for the Greek word for "and" (kai). Upsilon is the Greek letter which under certain conditions indicates the sound of the English letter "h".

Honor societies in other departments of education used the 'Key'. Mr. Burg, therefore, submitted a design that was in keeping with

precedent.

In the Northwestern University Dental School minutes of the faculty meeting of April 8, 1915, we find—"In behalf of the Committee on Honor Society, Dr. Eisenstaedt reported by presenting a copy of the gold insignia for the approval of the faculty. The design and insignia were approved."

A standard for membership was established, and we quote from

the preamble of the first Constitution, the following:

To encourage and develop a spirit of emulation among students in dentistry, and to recognize in an appropriate manner those who shall distinguish themselves by a high grade of scholarship.

The date on the certificate of incorporation by the State of Illinois is March 15, 1916. The certificate was signed by Thomas L. Gilmer, Arthur D. Black, Herbert A. Potts, Fred W. Gethro, and Charles R. E. Koch. Dr. Gethro is the only surviving member of this group.

By March, 1916, several schools had shown special interest in the new organization. A meeting of representatives from ten dental schools was held in Minneapolis, in June, 1916, at the time of the meeting of the Institute of Dental Teachers. Interest ran high, as is shown by the fact that the University of Pennsylvania dropped its proposed local honor fraternity in favor of Omicron Kappa Upsilon.

Temporary officers, chosen in 1915, were as follows:

Thomas L. Gilmer, President Arthur D. Black, Vice-President C. R. E. Koch, Secretary-Treasurer

These officers were re-elected at the 1916 meeting.

World War I, with its accompanying distractions, resulted in a lapse of interest, although most chapters functioned by conferring membership upon honor students.

In 1921, during the meeting of the Teachers Association at Indianapolis, representatives of existing chapters were called together by Arthur D. Black, who acted as temporary chairman. The minutes of the meeting show a revival of interest in the organization. The annual meetings of the Supreme Chapter, since 1921, have been held with general regularity, and the transactions properly recorded.

The first Constitution and By-laws were adopted in 1921. The Society functioned under this Constitution until the Chicago meeting of March 25, 1926, when the officers were directed to prepare certain revisions in the Constitution. A committee report was made at the Chicago meeting of March 25, 1929, and the report was adopted.

A third revision of the Constitution was presented and adopted at the Baltimore meeting of March 16, 1937. A fourth revision was adopted at the French Lick meeting of March 28, 1950.

With the passing of thirty-seven years, the Society has grown from concept to actuality. Steady development and expansion have been in evidence. The Society, in its Supreme Chapter organization, is made up of forty-one component chapters.

In 1927, Alpha Chapter, at Northwestern University Dental School, made membership retroactive for all classes prior to the Class of 1914. Elections were made according to the standard of membership established by the Constitution. Since that time, other chapters have adopted the retroactive policy.

The Society, in 1951, has over eight thousand members. It seems logical to believe that the present and future welfare of the Society will be insured by following the policies which motivated the founders.

We should not forget that the primary purpose of this Society, as stated in the Constitution, is to promote scholarship and honor character among students of dentistry. Given a firm foundation and a record of significant achievement, we can look forward with confidence, so long as we may cling to the ideals and aspirations of those who founded the Society.

On behalf of the officers of the Supreme Chapter, and every member of Omicron Kappa Upsilon, I wish to thank the Editor and the Journal of the American College of Dentists for the privilege of presenting this review of some of the historical phases of the founding and growth of Omicron Kappa Upsilon.

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- 3. Omicron Kappa Upsilon Pamphlet, copyright 1941 Chicago, Illinois.

"One thing a textbook is for—to supply indirect experience in large and well-organized amounts.

KNOW YOUR FEDERAL BUREAU OF STANDARDS

T. T. RIDER,1 B.S., D.D.S., MISSOULA

This American Dental Association member arrived in Washington, D. C. several days in advance of the October session. Therefore in order "to make hay while the sun shone" he spent several profitable hours in the Dental Division of the National Bureau of Standards learning what was going on for our benefit.

The purchase and use of materials employed in operative and restorative dentistry are major considerations in the dental health of the Nation. In 1948, 864 million dollars was spent for dentistry in this country, and of this sum 100 million was spent for materials. It is estimated that 60–80% of all dental service received by the public is of a reparative or restorative nature involving the use of some type of organic, ceramic or metallic substance. Good dentistry, therefore, is largely dependent on the quality of these products and the skill with which they are used by the dental profession.

In my visit to the Bureau I gathered my impressions from seeing the work being done and discussing it with the staff. Their aim, first, to obtain fundamental information on dental materials which will enable the dental profession to use the products to the best advantage in their practice; second, to improve existing materials; third, provide the profession with a list of acceptable products; and fourth, to develop new materials.

How does the Bureau go about accomplishing the above purposes? The research program includes investigations of the fundamental chemical, physical and engineering properties of dental products; the development of special equipment and methods for evaluating these properties and the clinical application of these findings.

The first step in carrying out the above aims is the purchasing of dental products in the open market in various parts of the country, these materials are then mailed to the Bureau for checking. The chemical, physical, engineering and clinical behavior of the product is determined, so that a measuring stick of a particular item can be established and thus, a standard set up.

When the dental research program was established at the Bureau, it was decided to concentrate on the investigation of materials most

¹ Contributing Editor.

commonly used in the replacement or repair of teeth or tooth structures lost through dental disease. By limiting the program in this manner, the greatest immediate service has been rendered to the public and the dental profession. These investigations have covered such diversified materials as amalgams, silicate cements, zinc phosphate cements, waxes, precious metal alloys, base metal alloys, hydrocolloids, gypsum products, synthetic resins, rubber and a number of other products employed in the processing of dental restorations.

The A.D.A. has adopted a program of securing a list of certified products to be supplied to us as a buyer's guide when we purchase supplies. We should always refer to this list when making purchases from dealers, for then we know that we are getting the best to be had and our money's worth. The approved articles will do what they are supposed to do, if we follow the directions of the manufacturer. It does not cost the manufacturer any money to see that his products meet the requirements of the A.D.A.

This work has been in progress since 1919. It has brought about a very definite improvement in dental products. At that time thirty percent of the products in the amalgam field failed to meet specifications, while to date 95% of all amalgams meet A.D.A. requirements, a very definite improvement. Similar examples obtain concerning synthetic cements, crown and bridge cement, gold solders, etc. At one time a gold alloy was on the market containing only 0.7 gold, the remainder being brass. This writer thinking that price determined quality purchased an alloy at \$6.00 per ounce only to find that the Bureau had placed it on the non-acceptable list.

This research group of the A.D.A. in the Bureau are our watch dogs to guard the worthwhileness of the products on which we depend for doing good dentistry. This checking of materials is not only done at the time of certification, but is continued at intervals to make certain that the manufactured article is being kept up to standard. An even more important service is the supplying of detailed directions as to the use of the products to the dental profession, the dental schools and the armed services. This is a large part of the program. The Bureau has a group of nine dentists, who in cooperation with chemists and physicists, work out chain reactions for using dental materials.

If you have the opportunity, see some of the motion pictures illustrating the work of your research group; you will then realize the value of this type of work. These pictures are made available to any dentist, dental society, or dental school with the purpose of giving basic information in regard to the work that is being done. Films now available show amalgam technics, uses of synthetic cements, denture resins and gold casting. The films are available for purchase or as loans at no cost other than transportation charges to the groups mentioned above within the confines of the U. S. Just write to the National Bureau of Standards, Washington 25, D. C., giving the date of the meeting. Your letter should reach the Bureau six or eight weeks in advance of the meeting.

Recently the Bureau has undertaken a new project, namely the study of the structure of human enamel and dentin. They are trying to determine the hardness, the crystalline structure, the thermal and electrical conductivity, organic structure and other fundamental properties of tooth structures in order to help solve the cause of caries.

Another program in which the Bureau is involved may not appeal to the civilian dentist, yet the data obtained will be available to all members of the profession, namely a research program for the various federal agencies, the Army, Navy, Air-Force and the Veterans' Administration, problems specific to these agencies.

As an example of the wide variety of service which this group renders and is undertaking for dentists, I have taken the liberty to copy a list of the current projects, part of which I saw at the Bureau. The A.D.A. largely supports this project, so it is up to us to make use of it and get our money's worth. This group, working quietly in Washington, D. C., without any fanfare, deserves more recognition than it now receives. So from hereon, make it a practice to obtain authoritative information on all supplies and drugs we purchase.

CURRENT PROJECTS

- 1. Self Curing Resins
 - 1. Temperature rise
 - 2. Curing Shrinkage
 - 3. Water absorption and expansion
 - 4. Porosity
 - 5. Color stability
 - 6. Completeness of polymerization
 - 7. Flow
 - 8. Hardness
 - 9. Thermal expansion

- 2. Plastic Teeth
 - 1. Crazing
 - 2. Bonding to denture base
 - 3. Hardness
 - 4. Flow
 - 5. Water absorption
 - 6. Abrasion resistance
- 3. Denture Base Resins
 - A. Low Temperature Curing Type
 - 1. Completeness of Cure

- 2. Color stability
- 3. Transverse strength
- 4. Flow
- B. High Temperature Curing Type
 - 1. Kinetics of Polymerization
 - 2. Effects of mold liners
 - 3. Molding techniques
 - 4. Repairability
- 4. Investment Materials
 - 1. Hygroscopic expansion
 - 2. Thermal expansion
 - 3. Fins on castings
- 5. Amalgams
 - 1. Microstructure
 - 2. Mercury-alloy ratio
 - 3. Mechanical condensers
- 6. Denture Reliners
 - 1. Effect on denture
 - 2. Permanence
 - 3. Use by layman
 - 4. Mechanical properties
- Dental Cutting Instruments (Carbide, Diamond and Steel)
 - 1. Temperature rise during cutting
 - 2. Cutting characteristics
- 8. Hand Pieces
 - 1. Wear at high speed
 - 2. Lubricants for
- 9. Structure of Enamel and Dentin
 - 1. Inorganic crystalline structure
 - 2. Fluorescence

- 3. Hardness
- 4. Electrical properties
- 10. Impression Materials (Alginate Type)
 - 1. Accuracy of reproduction
 - 2. Mechanical properties
 - 3. Deterioration
- 11. Motion Pictures
 - 1. Gold Castings
- Special Investigations for Federal Dental Services (Army, Air Force and Veteran Administrations)
- 13. Clinical Research
 - Evaluation of clinical behavior of resin filling material, low temperature curing denture base resins, amalgams, plastic teeth and x-ray techniques
- Specifications for and Certification of Dental Materials
 - Revisions of specifications for denture base resins
 - Development of specifications for alginate type impression material
 - 3. Certification of new products and routine testing of certified amalgams, silicate cements, zinc phosphate cements, inlay waxes, inlay casting dental gold alloy, inlay casting investments, mercury, denture base resins, impression compounds, wrought gold wires, hydrocolloidal impression materials (agar type).

A man has made at least a start on discovering the meaning of human life when he plants shade trees under which he knows full well he will never sit.

Elton Trueblood

BOOK ANNOUNCEMENTS

ACCEPTED DENTAL REMEDIES: This is the 17th edition of this book so well known to every dentist. With the passing of the years and the development of new materials, the paging has reached the high point of 211 pages including an index and all in double column. There is a special chapter devoted to a discussion of the Antibiotics, which group of drugs are of so great value in the practice of dentistry. It also contains a chapter on the disinfection of dental instruments with particular reference to cold disinfection. It has been thoroughly revised and contains a list of Therapeutic products marketed in the United States and acceptable to the Council. Published by American Dental Association. Price \$1.50.

Pharmacology and Pharmacotherapeutics for Dentists (Fourth edition): This is a revised edition of a book previously published by William H. O. McGehee formerly Professor, Dental Pharmacology and Therapeutics and Dean of the Dental Department, Medical College of Virginia and laterly Professor, Operative Dentistry, New York University College of Dentistry. It has been revised in this fourth edition under his own name and that of Melvin W. Green, B.S., Ph.D., Associate Professor of Pharmaceutical Chemistry, University of Wisconsin.

The authors claim to have assumed a conservative position regarding possible Pharmacologic action and Therapeutic effect of certain remedies even to the omission of others deemed by them unworthy of consideration at the present time. It will therefore present to readers carefully considered advisability as to the use of certain drugs,

thus precluding to hasty application of unknown value.

It is a book of 550 pages including an index and appendix. It is well printed on good paper and with fourteen illustrations. Published by the Blackiston Co., Philadelphia. Price \$7.50.

The Other Child: This is the title of a book devoted to a consideration of the brain-injured child. It is a small book of 108 pages including an index but they are the heaviest pages one has read. There are three authors to the book: A. A. Strauss, Laura Lehtinen and Richard S. Lewis. Surely this is one of the most important subjects confronting the healing profession today and here is a little book by three people which has required "many years to write". It is one which you can read and put into practice and will help immeasureably in dealing even with the normal child. Publishers: Grune & Stratton, New York. Price \$2.50.

AMERICAN COLLEGE OF DENTISTS

Register of Membership As of December 31, 1951

1. HONORARY FELLOWS1

Ash, James Earle, '47, Army Institute of Pathology, Washington 25, D. C.

Blair, Vilray P., '38, Metropolitan Bldg., St. Louis 3, Mo.

Blauch, Lloyd E., '39, U. S. Office of Education, Washington 25, D. C.

Briggs, Lyman J., '40, Nat. Bureau of Standards, Washington 25, D. C.

Horner, Harlan H., '42, 171 South Main Ave., Albany, N. Y.

Kolmer, John A., '51, Temple University, School of Medicine, Philadelphia, Pa.

Kraus, Edward H., '32, University of Michigan, Ann Arbor, Mich. Leake, Chauncy D., '36, University of Texas, College of Medicine, Galveston, Tex.

Leary, Timothy, '31, 44 Burroughs St., Jamaica Plain 30, Mass. Luckhardt, Arno B., '33, 5216 Greenwood Ave., Chicago 15, Ill. McQuarrie, Irvine, '38, University of Minnesota, Minneapolis, Minn. Murphy, Francis Daniel, '39, Milwaukee County Hospital, Milwau-

kee, Wis.

Parran, Thomas, '40, Dean, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pa.

Riggs, Charles E., '31, 3105 36th St., Washington 16, D. C. Schwitalla, Fr. A.M., '38, St. Louis University, St. Louis 4, Mo.

Sinai, Nathan, '34, University of Michigan, Ann Arbor, Mich.

Souder, Wilmer, '30, National Bureau of Standards, Washington 25, D. C.

Thompson, Lewis R., '32, U. S. Public Health Service, Washington 14, D. C.

Waller, Clifford E., '33, 1707 W. Highland Drive, Woodside, Md.
Total 19

2. ACTIVE FELLOWS

Abbey, Leon L., '44, 619 Union St., Schenectady 5, N. Y. Abbott, Rush P., '34, West Point, Miss. Abbott, Thomas Richard, '38, 1321 S. 28th St., Milwaukee 4, Wis. Abel, John R., '50, 406 N. Bedford Drive, Beverly Hills, Calif.

¹ Numerals following names indicate year of admission to Fellowship

^{*} A founder

^{**} A founder and organizer

Abelson, Josephine May, '51, 136 E. 36th St., New York, N. Y. Adair, Wilbur G., '50, 3823 Glenway Ave., Cincinnati, Ohio Adams, Carl W., '44, 636 North Road, San Bernardino, Calif. Adams, Frank Lionel, '49, 627 First Trust Bldg., Pasadena, Calif. Adams, John Davis, '51, 4559 Scott Ave., St. Louis, Mo. Adams, J. William, '50, 707 Bankers Trust Bldg., Indianapolis, Ind. Adams, Kinley K., '49, Salem, Oregon Adams, Philip Edwin, '37, 106 Marlborough St., Boston, 16, Mass. Addie, Charles B., Sr., '37, 1300 N. 29th St., Philadelphia 21, Pa. Aiguier, James E., '37, 1116 Medical Arts Bldg., Philadelphia 2, Pa. Aisenberg, Myron S., '33, 618 W. Lombard St., Baltimore 1, Md. Albaugh, Harold E., '43, 521 Lamont Ave., San Antonio, Tex. (Armyregular, retired)

Albert, Archie A., '43, 84 Broad St., Pawtucket, R. I.
Albert, Earl Harry, '49, 821 Chestnut St., Lebanon, Pa.
Alden, Harold W., '35, 160 Main St., Northampton, Mass.
Aldrich, Frederick Raymond, '48, 327 E. State St., Columbus, Ohio Alexander, Howard, '33, 1305 E. 63rd St., Chicago 37, Ill.
Alexander, M. M., '50, 1726 Eye St. N. W., Washington, D.C.
Alford, Frank O., '39, 1109 Liberty Life Bldg., Charlotte, N. C.
Allen, Clifford E., '44, Naval War College, Newport, R. I. (Navyregular)

Allen, Hunter S., '46, 911 Comer Bldg., Birmingham, Ala. Allen, Newton Ervin, '44, 213 Hooper Drive, Selma, Ala. Altfillisch, Henry J., '29, 722 Roshek Bldg., Dubuque, Ia. Amies, Arthur, '38, % Australian College of Dentistry, 193 Spring St., Melbourne, Australia

Amundson, Frederick A., '47, 1200 Medical Arts Bldg., Duluth, Minn. Anderson, Alvin B., '40, Hamilton Bank Bldg., Knoxville 2, Tenn. Anderson, George M., '31, 831 Park Ave., Baltimore 1, Md.

Anderson, Glenn C., '49, Avoca, Iowa

Anderson, Henry A., '42, 3504 Fifth Ave., Pittsburgh, Pa.

Anderson, Leslie Lloyd, '51, 908 S. Harrison St., Clearwater, Fla.

Anderson, Oswell A., '43, 1329 Medical and Dental Bldg., Seattle 1, Wash.

Anderson, Percy G., '47, 601 Medical Arts Bldg., Toronto, Can. Andrews, LaVerne H., '50, 1600 Niles Ave., St. Joseph, Mich. Applegate, Oliver C., '38, 2015 Woodside Rd., Ann Arbor, Mich. Applegate, Stephen G., '39, 630 E. Jefferson Ave., Detroit 26, Mich. Appleman, Robert M., '51, 950 E. 59th St., Chicago, Ill. Archer, W. Harry, Jr., '38, 3500 Fifth Ave., Pittsburgh, Pa. Armbrecht, Edward C., '38, Fidelity Bldg., Wheeling, W. Va.

Arnold, Earle S., '42, 37 Linnard Road, West Hartford, 7, Conn.

Arnold, Edmond B., '38, 3306 Fannin St., Houston 4, Tex.

Arnold, Eugene K., '47, 258 Plaza Bank Bldg., Kansas City, Mo.

Arnold, Francis A., Jr., '44, U.S.P.H. Service, National Institute of Health, Bethesda, Md. (U.S.P.H.S.)

Arnold, Joseph P., '37, 3618 Mt. Vernon St., Houston, Tex.

Arnot, Leland D., '48, 1008 Sharp Bldg., Lincoln, Neb.

Arnott, Alwyn J., '32, % Dental Hospital, Chalmers St., Sydney, Australia

Asch, Andrew J., '39, 8 West 40th St., New York 18, N. Y.

Asgis, Alfred J., '50, 7 East 42nd St., New York, N. Y.

Ashbrook, John Stewart, '28, 310 Medical Arts Bldg., Pittsburgh 13, Pa.

Ashby, John L., '40, Box 728, Mount Airy, N. C.

Ashton, John T., '38, 108 N. Patrick St., Alexandria, Va.

Ast, David B., '51, 198 Holmes Dale, Albany, N. Y.

Atkins, A. Paul, '40, 3519 6th Ave., Des Moines, 13, Ia.

Atkins, William Blaine, '48, Millsboro, Delaware

Atkinson, Spencer Roane, '37, 407 Professional Bldg., Pasadena 1, Calif.

Atwood, Theodore W., '48, Duke Hospital, Durham, N. C.

Aubertine, Don Jose F., '50, 1260 Flood Bldg., San Francisco, Calif.

Austin, Louie T., '38, Mayo Clinic, Rochester, Minn.

Bach, Ernest N., '37, 305 Professional Bldg., Toledo 2, Ohio

Bacon, Edgar Samuel, '48, 595 Madison Ave., New York, N. Y.

Bailey, Adams, '39, 1 East 57th St., New York 22, N. Y.

Bailey, Byron Wright, '51, Main St., Bradford, Vt.

Bailey, Elpha E., '36, 1124 Republic Bldg., Denver 2, Colo.

Bailey, Joseph W., '46, 712 Medical-Professional Bldg., Corpus Christi, Tex.

Bajuk, John Henry, '51, 1551 Webster St., Alameda, Calif.

Baker, Charles Reeder, '28, 636 Church St., Evanson, Ill.

Baker, Chester A., '32, 1726 Eye St. N.W., Washington 6, D. C.

Baker, Frederick Cooper, '39, 508 Calumet Bldg., Hammond, Ind.

Baklor, Max Kentz, '42, 815 Medical Arts Bldg., Baltimore 1, Md.

Ball, Edward L., '31, 814 Doctors Bldg., Cincinnati 2, Ohio

Ball, John Gordon, '47, 212 Armstrong Bldg., El Dorado, Ark.

Banks, Ernest Lee, '40, 805 Candler Bldg., Atlanta, Ga.

Banks, William Herman, '51, Box 307, Montezuma, Ga.

Bannister, Guy P., '42, 1036 Rose Bldg., Cleveland 15, Ohio

Barker, Paul A., '43, 390 University Blvd., Denver, Colo.

Barlow, T. Marvin, '43, 510 Bellingham Natl. Bank Bldg., Bellingham, Wash.

Barnard, Frank P., '35, 507 Main St., Worcester, Mass.

Barnes, Forrest A., '39, Mare Island Naval Shipyards, Code 750, Vallejo, Calif. (Navy-reserve)

Barnwell, Charles M., '38, Medical Arts Bldg., Atlanta 3, Ga.

Barrett, Charles E. F., Jr., '51, 10 N. Main St., West Hartford, Conn.

Barron, Seth Lee, '50, 2618 Oak Lawn, Dallas, Tex.

Barry, Aloysius L., '38, 144 Harrison St., E. Orange, N. J.

Bartels, John C., '48, 721 Selling Bldg., Portland, Ore.

Bartlett, Avery Allen, '38, 525 David Whitney Bldg., Detroit 26, Mich. Bassett, Charles Turk, '38, R.F.D. No. 1, Box 152, Auburndale, Fla.

Bassett, Russell Warren, '49, 416 N. Bedford Drive, Beverly Hills, Calif.

Bassman, Abraham H., '42, 411 E. Mason Ave., Milwaukee 2, Wis. Bastian, Carlisle C., '50, 22 Central Park, South, New York, N. Y.

Baumann, Charles J., Sr., '36, 768 Dental Service Detachment, APO 743, % P.M., New York (Army-reserve)

Baumgartner, John Francis, '48, 213 N. Main St., West Bend, Wis.

Beachum, Horace Ryan, '42, 1209 Medical Arts Bldg., Dallas 1, Tex. Becks, Hermann, '35, 2240 Channing Way, Berkeley, Calif.

Bedell, Walter Reynolds, '49, 49 Market St., Poughkeepsie, N. Y.

Beier, David W., '46, Education Bldg., Albany, N. Y.

Bell, Arthur I., '47, 406 Medical Arts Bldg., Baltimore, Md.

Bell, Dickson G., '38, 450 Sutter St., San Francisco 8, Calif.

Bell, Frank J., '39, Billings, Mont.

Bell, Welden Emery, '49, 920 Medical Arts Bldg., Dallas, Tex.

Bell, Willard S., '50, 118 Rockaway Blvd., Azone Park, N. Y.

Bellinger, Don H., '51, Henry Ford Hospital, Detroit, Mich.

Benbrook, Charles M., '27, 707 Theatre Auditorium Bldg., Los Angeles, Calif.

Bennett, Glenn, '42, 262 W. Grand Ave., Wisconsin Rapids, Wis.

Bennett, Paul Hamilton, '38, 1541 N. Tucson Blvd., Tucson, Ariz. Berger, Adolph, '29, 654 Madison Ave., New York 21, N. Y.

Bergstrom Hyrum '33, 220 Seventh Ave., Salt Lake City 3, U.

Bergstrom, Hyrum, '33, 229 Seventh Ave., Salt Lake City 3, Utah Berkey, Hugh Thomas, '38, 408 Wayne Pharmacal Bldg., Ft. Wayne, 2, Ind.

Bernier, Joseph LeRoy, '48, Army Institute of Pathology, Washington, D. C. (Army-regular)

Berthel, Russell W., '38, 501 Portland Ave., St. Paul, Minn.

Bertram, Irvin Roy, '38, 966 Metropolitan Bldg., Denver 2, Colo.

Berwick, Edward C., '45, 521 Scarbrough Bldg., Austin, Tex.

Best, J. V. Hall, '38, 135 Macquarie St., Sydney, Australia

Bettman, M. M., '36, 528 Medical Arts Bldg., Portland 5, Ore.

Birthright, Woodston T., '51, 1835 Eye St., N.W., Washington, D. C. Bishop, Lyall O., '42, U. S. Navy, U. S. Naval Hospital, Oakland, Calif. (Navy-reserve)

Black, Frederick W., '48, 835 Doctors Bldg., Cincinnati, Ohio Blackburn, Estes McMath, '49, 949 North State St., Jackson, Miss. Blackerby, Philip E., Jr., '45, W. K. Kellogg Foundation, Battle Creek, Mich.

Blackwell, Robert E., '29, 55 East Washington St., Chicago I, Ill. Blair, Thomas L., '50, 736 Nissen Bldg., Winston-Salem, N. C. Blake, Reuben Lloyd, '36, 240 Stockton St., San Francisco, Calif. Blakeman, Robert I., '27, 103 E. 47th St., Indianapolis, Ind. Blakemore, J. Frank, '41, 613 1st Natl. Bank Bldg., Ft. Smith, Ark. Bland, Thomas J., '44, 606 Medical Arts Bldg., Baltimore 1, Md. Blanquie, Raoul Henry, '36, 924 Warfield Ave., Oakland, Calif. Blass, J. Lewis, '48, 4 East 41st St., New York, N. Y. Blevins, Denzell C., '42, 1801 Eye St., N.W., Washington 6, D. C. Blight, Herbert E., '49, 568 Fisher Bldg., Detroit, Mich. Bliss, Cecil H., '46, 812 Frances Bldg., Sioux City, Ia. Blum, Theodor, '23, 101 E. 79th St., New York 21, N. Y. Blumenthal, Emmanuel E., '49, I Hanson Place, Brooklyn, N. Y. Blutau, Theodore C., '40, 89 East Ave., Rochester 4, N. Y. Bock, Charles Adam, '41, 823 Park Ave., Baltimore, Md. Bodecker, Charles Francis, '26, Journeysend, Center, Moriches, N. Y. Bodine, Theodore Alan, '49, 904 Akron Savings & Loan Bldg., Akron, Ohio

Bodmer, Eugene, '48, 55 East Washington St., Chicago, Ill. Boero, Edward P., '46, 490 Post St., San Francisco, Calif. Boland, Clay A., '51, 905 Birchwood Rd., Falls Church, Va. (Navy-

reserve)
Boland, Paul J., '51, 105 El Prado Drive West, San Antonio, Tex.
Bolks, Harry Garrett, '41, 923 Badgerow Bldg., Sioux City, Ia.
Bomberger, Paul E., '44, 116 E. Chestnut St., Lancaster, Pa.

Bommer, Arno M., '50, 349 Broadway, Revere, Mass.

Booth, Cecil O., '29, 405 Flannery Bldg., Pittsburgh 13, Pa.

Booth, John J., '33, Marion, Iowa

Booth, William W., '45, 7112 Jenkins Arcade Bldg., Pittsburgh, Pa.

Boots, John L., '28, 759 Herkimer St., Pasadena 4, Calif.

Bordner, Stanton N., '51, 5123 Linnean Ave., N.W., Washington, D. C. (Veteran's Adm.)

Bossert, Walter A., '40, 1346 Taylor Ave., Bronx 60, N. Y. Boswell, John C., '50, 508 Lamar Life Bldg., Jackson, Miss.

Both, Hans Spalding, '48, 217 Orchard St., White Plains, N. Y. Botts, Robert C., '50, 807 Medical Arts Bldg., Ft. Worth, Tex. Boucher, Carl O., '43, 317 Beggs Bldg., Columbus 15, Ohio Boulger, Earl P., '50, 27 South Pulaski Rd., Chicago, Ill. Bowman, Ralph J., '46, 121 E. 60th St., New York, N. Y. Bowyer, Frank P., Jr., '49, 608 Medical Arts Bldg., Knoxville, Tenn. Box, Harold Keith, '38, 86 Bloor St., West, Toronto, Canada Boyd, Bert, '30, 610 S. Broadway, Los Angeles 3, Calif. Boyd, Drexel Allen, '45, 1223 E. 61st St., Indianapolis, Ind. Boyd, Russell C., '50, 512 West Virginia Bldg., Huntington, W. Va. Boyden, Carl H., '42, Mitchell, South Dakota Boydston, Walter J., '37, 204 Masonic Temple, Fairmont, W. Va. Boyko, G. Victor, '40, 64 Hamilton St., Paterson 1, N. J. Brach, Louis, '34, 112 Monticello Ave., Jersey City 4, N. J. Bradford, Harry, '37, Medical Arts Bldg., Birmingham, 5, Ala. Bradley, Howard W., '50, 911 Savannah Bldg., Pittsburgh, Pa. Bradley, Sydney W., '50, 142 Laurier St., Ottawa, Canada Brady, Ewing P., '33, 7259 Northmoor Drive, St. Louis 5, Mo. Branch, Ernest A., '38, State Board of Health, Raleigh, 5, N. C. Brand, Thurlow Weed, '29, School of Dentistry, University of Pittsburgh, Pa.

Brandhorst, Otto W., '34, 4952 Maryland Ave., St. Louis 8, Mo. Brandon, Gerald Ivanhoe, '38, 3203 Garrison Blvd., Baltimore 16, Md. Brandon, Samuel A., '50, 620 Medical Dental Bldg., Portland, Ore. Brann, Clinton T., '40, 4305 W. 61st St., Cleveland, Ohio (Veteran's Administration)

Brashear, Alton Dean, '41, Medical College of Virginia, College of Dentistry, Richmond, Va.

Brauer, John C., '38, University of North Carolina, School of Dentistry, Chapel Hill, N. C.

Braum, Blanchard Kenneth, '49, 3738 Chicago Ave., Minneapolis, Minn. Braun, Louis, '50, 1601 David Whitney Bldg., Detroit, Mich.

Bray, Joseph A., '42, 15 Grennan Rd., West Hartford, Conn.

Bremner, M. D. K., '33, 15 N. Jefferson St., Chicago, Ill.

Brennan, Naysh C., '44, Shenandoah, Pa.

Brevig, Harold R. H., '33, 27 E. Monroe St., Chicago 3, Ill.

Bricker, Frederick A., '33, 3780 Wilshire Blvd., Los Angeles 5, Calif.

Bridgford, Richard D., '50, Box 592, Colorado City, Tex. Broadbent, B. Holly, '33, 1400 Keith Bldg., Cleveland, Ohio

Broadhurst, George B., '38, 420 University Club Bldg., St. Louis 3, Mo.

Brock, David W., '38, 6026 Enright Ave., St. Louis 12, Mo.

Brock, Sam H., '38, 1318 Medical Arts Bldg., Dallas 1, Tex.

Brockington, Marion L., '33, Cherokee Road, Florence, S. C.

Broesamle, Kenneth M., '51, Dental Dept. Naval Receiving Station, Norfolk, Va. (Navy-regular)

Bronner, Finn J., '37, 209 East 23rd St., New York 10, N. Y.

Brooks, Clarence G., '39, 302 State St., New London, Conn. Brooks, Everett Carl, '47, 4500 Olive St., St. Louis, Mo.

Brophy, Frederick H., '47, 200 W. 59th St., New York, N. Y.

Broussard, A. Claude, '38, 1116 Maison Blanche, New Orleans 16, La.

Brown, Chas. Frederick, '38, 301 Medical Dental Bldg., Denver 2, Colo.

Brown, Coleman T., '48, 601 Citizens Bldg., Tampa, Fla.

Brown, Eugene L., '51, 7051 W. Magnolia, Fort Worth, Tex.

Brown, George Cowles, '35, 332 Main St., Worcester, Mass.

Brown, Harry Knowlton, '49, 72 Metcalf St., Ottawa, Canada.

Brown, Homer C., '23, 1816 Franklin Ave., Columbus 9, Ohio

Brown, James A., '38, 4500 Olive St., St. Louis, Mo.

Brown, James W., '47, 1726 Eye St., N.W., Washington, D. C.

Brown, J. Draper, Jr., '39, Madison at 10th St., Wilmington 16, Del. Brown, Lee, Jr., '50, 820 Medical Professional Bldg., Corpus Christi, Tex.

Brown, Little Berry, '38, Atlanta-Southern Dental College, Atlanta, Ga. Brown, Vivian Z., '51, Hdq., 6th Army, Presidio of San Francisco, Calif. (Army-regular)

Browne, Wilbur F., '40, 2 Lincoln St., Brunswick, Maine

Browning, Chas. Clive, '50; Omar, West Virginia

Browning, Douglas A., '50, Medical Arts Bldg., Baltimore, Md.

Brownlie, Ira C., '30, 536 Metropolitan Bldg., Denver, Colo.

Brownson, Henry Newman, '51, 7046 Hollywood Blvd., Hollywood, Calif.

Bruening, Edward H., '22, Box 720, Route 6, Tucson, Ariz.

Brun, B. Lucian, '29, 827 Park Ave., Baltimore 1, Md.

Bryan, Alvin Wesley, '28, Box 727, Iowa City, Ia.

Bryans, Walter J., '38, 76 Park St., Lee, Mass.

Bryant, Samuel H., '50, 522 Old Orchard Rd., Baltimore, Md.

Buckley, George A., '49, 58 Rutland Ave., Brooklyn, N. Y.

Buechele, Keith L., '43, 229 University Club Bldg., St. Louis 3, Mo.

Buhler, John Embich, '47, Emory University, School of Dentistry, Atlanta, Ga.

Bulbulian, Arthur H., '44, Mayo Clinic, Rochester, Minn. Bullard, Orlan K., '46, 2665 Fourth Ave., San Diego, Calif.

Bull, Terry P., '44, 2365 North Point, San Francisco, Calif. (Armyregular, retired)

Bumgardner, Amos Sumner, '51, 1516 Elizabeth Ave., Charlotte, N. C. Bumgardner, E. Gaither, '49, 1517 Hampton St., Columbia, S. C.

Bumstead, Carl A., '51, 924 Stuart Bldg., Lincoln, Neb.

Bunch, George A., '51, Sou. Carolina State Board of Health, Columbia, S. C.

Bunker, Herbert L., '42, 7012 N. Washington St., Junction City, Kans. Bunting, Russell W., '22, University of Michigan, Ann Arbor, Mich.

Burford, Wilson N., '50, 520 Guitar Bldg., Columbia, Mo.

Burkart, Howard Houston, '41, 236 Miracle Bldg., Coral Gables 34, Fla. Burke, John Francis, '41, 921 Bergen Ave., Jersey City 6, N. J.

Burke, John Patrick, '48, 510 Colorado Bldg., Washington, D. C.

Burke, William Edw., '42, 220 Marlborough St., Boston 16, Mass.

Burket, George E., '30, Kingman, Kans.

Burkhart, Richard H., '40, Bishops Head, Maryland

Burmeister, C. H., '33, 2711 Union Central Bldg., Cincinnati 2, Ohio

Burns, William McGill, '48, 80 Hanson Place, Brooklyn, N. Y.

Burr, LeRoy E., '42, 27 Ludlow St., Yonkers 5, N. Y.

Burrill, Dan Youngs, '46, 129 E. Broadway, Louisville, Ky.

Bustetter, Joseph Robert, '48, 609 Fincastle Bldg., Louisville, Ky.

Butler, Charles Early, '48, 1226 Medical Arts Bldg., San Antonio, Tex.

Butler, Edward T., '50, 468 Delaware Ave., Buffalo, N. Y.

Byrnes, Ralph R., '22, 1928 Richardson Pl., Tampa, Fla.

Cadarette, Leo Anthony, '38, 759 David Whitney Bldg., Detroit 27, Mich.

Cahn, Lester R., '44, 888 Park Ave., New York 21, N. Y.

Callahan, Vincent D., '47, 80 Hanson Place, Brooklyn, N. Y.

Callaway, George S., '38, 654 Madison Ave., New York 21, N. Y.

Calmes, Francis Marion, '40, 1108 E. 10th St., Kansas City 6, Mo.

Camalier, C. Willard, '29, 1726 Eye St., N.W., Washington 6, D. C.

Cameron, Dan U., '26, 1210 Astor St., Chicago 10, Ill.

Cameron, James R., '35, 19th and Spruce St., Philadelphia 3, Pa.

Campbell, Newton M., '44, 504 Broadway, Gary, Ind.

Canavan, William H., '38', 47 Bay State Road, Boston 15, Mass.

Canby, Henry F., '51, U.S.P.H.S. 4th and D. St., Washington, D. C. (U.S.P.H.S.)

Cane, John J., '50, 225 Prospect St., Hillcrest, Phillipsburg, N. J.

Canning, Frank J., '50, 23 Cottage St., Pawtucket, R. I.

Cannon, Charles Francis, '49, 146 Westminster St., Providence, R. I.

Cannon, Charles R., '40, 142 E. Market St., Georgetown, Del. Cannon, Harve Elliott, '44, 606 S. Hill St., Los Angeles 14, Calif.

Caraballo, Christobal, '31, 713 Stovall Bldg., Tampa 2, Fla.

Carl, Cecil Earl, '40, 503 First National Bank Bldg., Waterloo, Ia. Carlson, LeRoy, '39, 600 LaSalle Bldg., Minneapolis, Minn.

Carmichael, Dale V., '46, 1194 Hodiamont Ave., St. Louis, Mo.

Carnes, Harold Arthur, '40, 29 Bay State Road, Boston 15, Mass. Carpenter, Edw. Eugene, '50, 307 National Reserve Bldg., Topeka, Kans.

Carr, James B., '31, 907 Hume Mansur Bldg., Indianapolis 4, Ind. Carr, Malcolm W., '34, 52 East 61st St., New York 21, N. Y. Carroll, Bryant Shadrick, '45, 706 Professional Bldg., Jacksonville, Fla. Carson, James Wilson, '51, 1332 Wilshire Blvd., Los Angeles, Calif.

Carson, K. Paul, '38, 503 Physicians and Surgeons Bldg., Minneapolis 2,

Minn.

Cart, Jacob F., '39, 509 Jefferson Bldg., Peoria, Ill.

Cartee, Horace L., '37, 810 Huntington Bldg., Miami, Fla.

Casey, Leo James, '47, 603 Bay St., Chippewa Falls, Wis. Cassel, Carl V. E., '50, 242 Lowry Medical Arts Bldg., St. Paul, Minn.

Chamberlain, Clarke E., '50, 115 North St., Peoria, Ill.

Champagne, Joseph L., '48, 3714 West McNicholas Rd., Detroit, Mich. Chandler, Alfred White, '38, Bu. Med. and Surgery, (Dental Inspection) Navy Dept., Washington 25, D. C. (Navy-regular)

Chandler, Chas. F., '23, P. O. Box 99, 919 1st Nat. Bank Bldg., Mont-

gomery, Ala.

Chapin, Walter Coolidge, '38, 524 North Ave., New Rochelle, N. Y. Charbonnel, Ernest A., '27, 334 Westminster St., Providence 3, R. I.

Charlton, Percie C., '28, "Rushall" Almy St., Pymble, Australia

Charron, Ernest, '45, 2900 Blvd., Mont-Royal, Montreal, Canada Chartrand, Browning O., '49, Agnews State Hospital, Agnew, Calif.

Chase, Oscar Jerome, Jr., '38, 140 E. 54th St., New York 22, N. Y.

Chase, William, '49, 1726 Eye St. N.W., Washington, D. C.

Cheney, Howard A., '50, 377 S. Broadway, Yonkers, N. Y.

Cheo, Eric Shao-Wu, '46, Address unknown (China)

Chesser, Page P. A., '46, 14 North Walnut St., Phillipi, W. Va. (Armyregular, retired)

Chevalier, Paul L., '39, 11 E. Franklin St., Richmond, Va.

Cheyne, Virgil D., '45, 1238 Medical and Dental Bldg., Seattle, Wash.

Child, Fred Rutledge, '46, 219 Lynch Bldg., Blytheville, Ark.

Childers, Leon M., '41, Chief Dental Service, Coral Gables, Fla. (Veteran's Administration)

Childs, Herbert G., Jr., '42, 427 W. Fifth St., Los Angeles 13, Calif. Childs, Wyatt, Bentley, '39, Bankers Insurance Bldg., Macon, Ga.

Christensen, Martin L., '33, 99 West New York Ave., Oshkosh, Wis.

Christensen, Ralph O., '50, 829 LaSalle Bldg., Minneapolis, Minn.

Christiansen, George W., '48, 413 David Whitney Bldg., Detroit, Mich.

Citron, Louis, '45, 9 Chester Ave., White Plains, N. Y.

Clark, Clifford Freemont, '47, Menomonie, Wis.

Clark, Daniel Raymond, '51, 747 Medical Arts Bldg., Minneapolis, Minn.

Clark, Henry B., '38, 1132 Lowry Medical Arts Bldg., St. Paul, Minn. Clark, Henry B., Jr., '48, School of Dentistry, Univ. of Minnesota, Minneapolis, Minn.

Clark, Ralph Lucius, '50, 20 Park Ave., Mt. Vernon, N. Y. Clark, Walter Edgar, '51, 507 Flatiron Bldg., Asheville, N. C.

Clarke, John J., '35, Artesia, New Mexico

Clarke, John Joseph, Jr., '51, 117 S. Roselawn Ave., Artesia, New Mexico Clarridge, Duane H., '42, 6 Concord St., Nashua, N. H.

Claytor, Spry Owen, '50, Bu.Med. and Surg. Navy Dept., Washington, D. C. (Navy-regular)

Clemson, W. Buckey, '42, 516 Medical Arts Bldg., Baltimore, Md.

Clendenen, Irving B., '30, 124 S. Marion St., Oak Park, Ill.

Clendenin, George B., '51, 4406 East-West Highway, Bethesda, Md.

Cleveland, Charles Pearson, '51, 410 St. James Bldg., Jacksonville, Fla.

Cleveland, Joseph Lee, '40, 675 Delaware Ave., Buffalo 2, N. Y. Cline, Harold MacKechnic, '43, 1428 Medical Dental Bldg., Vancouver, B. C.

Clotworthy, William B., '40, Medical Arts Bldg., Knoxville 1, Tenn. Clough, Oliver Wendell, '47, Medical College of Virginia, School of Dentistry, Richmond, Va.

Coale, Woodrow, '50, 405 California Bldg., Stockton, Calif.

Cobb, Frederick Emory, '38, 3933 Bryant Ave., South, Minneapolis, Minn.

Coberth, M. Edward, '51, 715 Medical Arts Bldg., Baltimore, Md.

Cogan, Alfred V., '40, 891 East Fourth St., South Boston, Mass.

Cogley, Elmer Anthony, '47, 1625- 1st Ave., North, Great Falls, Mont. Cogswell, Wilton W., '30, 612 Exchange Natl. Bank Bldg., Colorado Springs, Colo.

Colby, Henry E., '51, 1850 Medical Arts Bldg., Minneapolis, Minn. Colby, Robert A., '51, U. S. Naval Dental School, Bethesda, Md. (Navyregular)

Cole, C. Walter, '49, 31st and MacDonald St., Richmond, Calif. Coleman, Bertram F., '36, 1302 W. Cliff Ave., R. 4, Box 885-Y, Santa Cruz, Calif.

Coleman, William Edgar, '39, 830 Candler Bldg., Atlanta, Ga. Colgan, James Francis, '48, 838 Newport Ave., Pawtucket, R. I. Colgan, John Gilbert, '38, Penney Bldg., McCook, Neb.

Collins, Cecil Hickman, '51, 122 E. 16th St., Los Angeles, Calif.

Colquitt, Walter Thomas, '51, 2015 Line Ave., Shreveport, La.

Colver, Hugh B., '38, 314 Eastman Bldg., Boise, Idaho Colvin, E. Milburn, '51, 1726 21st St. N.W., Washington, D. C. Combs, Warren S. P., '30, Middletown, Del. Cone, George, '49, Osceola, Ark. Conklin, Frank G., '29, 1525 Harwood Ave., Orlando, Fla. Conley, Clinton E., '37, 307 Wight St., St. John's, Mich. Conley, Francis Joseph, '44, 1052 W. 6th St., Los Angeles, Calif. Conley, Philip James, '40, 1226 Main St., West Warwick, R. I. Conly, Atlee B., '42, 623 Medical Arts Bldg., Dallas I, Tex. Conn, Robert Wm., '48, 36 Amherstdale Rd., Snyder, N. Y. Connell, Ewing B., '49, 1005 Medical Arts Bldg., Chattanooga, Tenn. Connelly, Cecil Clayton, '45, 4660 Maryland Ave., St. Louis 8, Mo. Conner, Mervyn Ignatius, '39, 311 Dillingham Bldg., Honolulu, T. H. Conrad, Fred O., '49, Midyette Moore Bldg., Tallahassee, Fla. Conran, Wilson R., '40, 750 Main St., Hartford, Conn. Cool, David Parker, '45, 80 Hanson Place, Brooklyn 17, N. Y. Coolidge, Edgar David, '26, 636 Church St., Evanston, Ill. Coomer, Orville B., '49, 1006 Heyburn Bldg., Louisville, Ky. Cooper, David, '44, Fort Stanton, New Mexico (U.S.P.H.S.) Cooper, Herbert C., '28, Univ. of Tennessee, College of Dentistry,

Memphis, Tenn. Cooper, Herbert Kurtz., '37, 26 N. Lime St., Lancaster, Pa. Corby, Arthur Edw., '50, 44 Wall St., New York, N. Y. Corcoran, John Hayes, '41, Scranton Life Bldg., Scranton, Pa. Coriell, Louis D., '22, 111 W. Monument St., Baltimore 1, Md. Cormier, A. J., '50, 120 Queen St., Moncton, N. B. Corriveau, Joseph Arthur, '46, 1694 Main St., Springfield, Mass. Cory, Edwin Francis, '38, 62 Trumbull St., New Haven, Conn. Cosgrove, Williams L., '48, 25 Hancock St., Lexington, Mass. Cottrell, Harvey V., '32, 79 E. State St., Columbus, Ohio Cottrell, Ivan Rogers, '40, 1004 Granite Bldg., Rochester 4, N. Y. Coulter, Melville R., '38, 517 Bryon St., Mankato, Minn. Courtade, Gerard Louis, '50, I East 57th St., New York, N. Y. Crabb, Lloyd A., '41, 1213 Medical Arts Bldg., Dallas 1, Tex. Craig, Charles W., '48, University of California, College of Dentistry, San Francisco, Calif.

Cramer, Morris, '48, 2352 Eutaw Place, Baltimore, Md.

Crawford, J. W., '27, 773 N. Prospect Ave., Milwaukee, Wis.

Crawford, Wm. H., '38, University of Minnesota, School of Dentistry, Minneapolis, Minn.

Cronin, Harold J., '42, 739 Liberty St., Springfield, Mass. Cross, Sydney, '49, 3780 Wilshire Blvd., Los Angeles, Calif.

Crozat, George B., '51, 1214 Maison Blanche, New Orleans, La. Crum, Walter A., '47, 310 Medical Arts Bldg., Richmond, Ind. Crumpton, Robert I., '46, Peoples East End Bldg., Pittsburgh, Pa. Cruse, Milton, '51, 1977 W. 111th St., Chicago, Ill. Crysler, Earle Martin, '50, 185 Stone St., Watertown, N. Y. Culler, Oscar E., '48, 1306 Fidelity Bldg., Baltimore, Md. Cunningham, J. Stier, '50, 3718 Travis St., Houston, Tex. Cunningham, Perley M., '50, 511 Hynds Bldg., Cheyenne, Wyo. Curd, John Price, Jr., '48, 3618 Lexington Road, Louisville, Ky. Current, Alfred Cornelius, '46, Commercial Bldg., Gastonia, N. C. Curry, William W., '50, Holden, W. Va. Cusick, William Chester, '48, 2300 Durant Ave., Berkeley, Calif. Daley, Francis H., '38, 15 Bay State Road, Boston 15, Mass. Dalitsch, Walter Wm., '44, 325 Sylvan Road, Lake Bluff, Ill. Damon, George M., '34, 730 La Salle Bldg., Minneapolis, Minn. Daniel, Leland Thomas, '51, American Bldg., Orlando, Fla. Daniels, Wells A., '38, 293 Bridge St., Springfield 3, Mass. Davenport, Sebert E., Jr., '33, 34 East 51st St., New York 22, N. Y. Davidson, Lynval Earl, '39, 1107 Professional Bldg., Kansas City 6, Mo Davies, Clinton Lindale, '51, 390 Main St., Worcester, Mass. Davis, Albert David, '30, 384 Post St., San Francisco, Calif. Davis, Charles J., '40, 1332 Medical Arts Bldg., Omaha 2, Neb. Davis, Robert Holbert, '48, 510 Goff Bldg., Clarksburg, W. Va. Davis, Robert S., '44, 631 Ocean Blvd., Coronado, Calif. (Navy-regular, retired) Davis, Wilbur McLaurin, '41, 401 Exchange Bldg., Orlando, Fla. Davis, William R., '31, 2070 Cartier St., Flint, Mich. Dean, H. Trendley, '39, National Institute of Health, Bethesda 14, Md. (U.S.P.H.S.) Dean, Oscar T., '36, 818 Cobb Bldg., Seattle 1, Wash. Dear, David Philip, '48, 5 Place St., Francis, Lausanne, Switzerland Deems, Paul Adam, '41, 835 Park Ave., Baltimore 1, Md. Delaney, Henry R., '39, District Dental Officer, Hdg., 3rd Naval District, 90 Church St., New York, N. Y. (Navy-regular) Delton, Rudolph W., '45, 1527 East Lake St., Minneapolis, Minn. Dempsey, Peter A., '42, 56 Melville Ave., Dorchester 24, Mass. Denny, Robert Frank, '45, 1020 Hume Mansur Bldg., Indianapolis, Ind. Derbyshire, Raymond A., '48, Box 387, Skowhegan, Maine Desmond, John Walter, '35, 9 Pleasant St., Ayer, Mass. Devitt, Oliver H., '40, 523 Republic Bldg., Denver 2, Colo. Devlin, Gerard A., '40, 49 Bleeker St., Newark 2, N. J.

DeVries, Bernard G., '26, 705 Medical Arts Bldg., Minneapolis 2, Minn.

DeYarman, Lester, '47, 734 Higley Bldg., Cedar Rapids, Ia. Dick, George W., '27, Sumter, S. C.

Dickerson, Leon E., '50, Peoples Bank Bldg., White Plains, N. Y.

Dickson, Emet Pearson, '50, First Natl. Bank Bldg., Paris, Tex. Dickson, Wm. A., '38, 1535 Medical Arts Bldg., Minneapolis, Minn.

Diedrich, Arthur Victor, '46, 14015 Gratiot St., Detroit, Mich.

Diehl, Crown O., '47, 208 Professional Arts Bldg., Hagerstown, Md.

Dierdorff, H. Beecher, '50, Valley Forge Army Hospital, Phoenixville, Pa., (Army-regular)

Diessner, William Daniel, '51, Waconia, Minn.

Dietrich, Carl P., '49, 904 Akron Savings & Loan Bldg., Akron, Ohio

Dillon, C. F. Stenson, '37, 1020 Taft Bldg., Hollywood 28, Calif.

Dillon, Edward Leo, '38, 825 Professional Bldg., Kansas City 6, Mo.

Dingman, Reed Othelbert, '42, School of Dentistry, University of Michigan, Ann Arbor, Mich.

Dinham, George A., '46, 1100 Medical Arts Bldg., Duluth, Minn.

Dinham, William Richard, '51, 901 Selling Bldg., Portland, Ore.

Dippel, Albert R., '39, Baraboo, Wis.

Dirksen, Lynn C., '49, Army Medical Center, Washington, D. C. (Armyregular)

Dittmer, Cedric Kenneth, '48, 55 E. Washington St., Chicago, Ill.

Dobbs, Edward Clarence, '40, 42 S. Greene St., Baltimore 1, Md.

Dodd, Lloyd H., '50, 860 Citizens Bldg., Decatur, Ill.

Dohan, John S., '35, 1411 Stanley St., Montreal, Canada

Dohrman, Stanley T., '42, 414 Ford Bldg., Great Falls, Mont.

Dolce, John Jos., '50, 2922 Grand Concourse, New York, N. Y.

Donovan, John M., '38, 112 Bond St., Neenah, Wis.

Doran, Edward J., '50, Brisbane Bldg., Buffalo, N. Y.

Dorr, Robert E., '43, 144 Harrison St., E. Orange, N. J.

Dorsey, Brice M., '40, Hockley-on-the-Hill, Annapolis, Md. Douglas, Arthur F., '43, Florida State Hospital, Chattahoochee, Fla.

Douglass, Elijah D., '39, 1308 Market St., Parkersburg, W. Va.

Douglass, Geo. Crawford, '39, 80 Hanson Place, Brooklyn 17, N. Y.

Douglass, John Willoughby, Jr., '51, Sou. Car. Nat. Bank Bldg., Greenville, S. C.

Downs, Bertram H., '38, 629 N. Nevada Ave., Colorado Springs, Colo.

Downs, Robert A., '46, 1235 So. Downing St., Denver, Colo.

Drake, Marion L., '51, 1320 Keith Bldg., Cleveland, Ohio

Drake, Robert G., '39, 909 First Natl. Bank Bldg., Omaha, Neb.

Dresen, Oswald M., '34, 735 N. Water St., Milwaukee 2, Wis.

Dressel, Robert Phillips, '38, 2165 Adelbert Rd., Cleveland, Ohio

Droegkamp, Gilbert Henry, '39, Bankers Bldg., Milwaukee 2, Wis.

Duckworth, Thomas G., '38, 915 Medical Arts Bldg., San Antonio 5, Tex.

Duncan, George W., '47, 301 Professional Bldg., Richmond, Va.

Dunlap, Walter M., '48, 144 Harrison St., East Orange, N. J.

Dunn, A. Laurence, '46, 1836 State St., Santa Barbara, Calif.

Dunn, Lawrence Joseph, '40, 80 Hanson Place, Brooklyn 17, N. Y.

Dunn, P. M., '51, 1246 Med. Arts Bldg., Minneapolis, Minn.

Dunning, James Morse, '40, 25 Shattuck St., Boston, Mass.

Dunning, William Bailey, '28, 87 Spring Lane, Englewood, N. J.

Durham, Kenneth R., '48, Box 326, Tahoka, Tex.

Durst, D. Leslie, '39, 802 Medico-Dental Bldg., Sacramento 14, Calif.

Eader, Thos. Stephen, '38, 40 N. Market St., Frederick, Md.

Easlick, Kenneth A., '39, University of Michigan, Ann Arbor, Mich.

Easton, Arthur Witham, '48, 37 Highland Ave., Norway, Maine

Easton, George S., '44, 1006 Highland Dr., Iowa City, Ia.

Eaton, Earl Mason, '49, 1011 American Bldg., Cedar Rapids, Ia.

Eaton, Leonard James, '48, 115 Park Ave., Mt. Vernon, N. Y.

Ebert, Elmer M., '50, 10058 Ewing Ave., Chicago, Ill.

Edlund, E. Walter, '32, 715 Lake St., Oak Park, Ill.

Edwards, Linus M., Sr., '48, 111 Corcoran St., Durham, N. C.

Edwards, Ralph W., '34, 300 West 47th St., Kansas City 2, Mo.

Edwards, Zeno Lester, '47, Box 157, Washington, N. C.

Eggers, Herbert L., '39, 701 Citizens Bank Bldg., Sioux Falls, S. Dak.

Eggnatz, Meyer, '42, 420 Lincoln Rd., Miami, Fla.

Elam, Arthur Matthew, '48, 309 Citizens Bldg., Lexington, Ky.

Elam, Roy O., '50, 2102 West End Ave., Nashville, Tenn.

Ellington, Elzea Oran, '40, 202 Petroleum Bldg., Big Springs, Tex.

Elliott, Frederick C., '43, 1018 Blodgett St., Houston 4, Tex.

Elliott, Mark David, '38, 25 Bay State Rd., Boston, Mass.

Elliott, William H., '27, 707 50th St., Court, West Bradenton, Fla. Route 1

Ellis, Roy Gilmore, '46, 230 College St., Toronto, Canada

Ellis, Walter H., '42, 333 Linwood Ave., Buffalo, 9, N. Y.

Ellsperman, Geo. A., '39, 620 Herald Bldg., Wellingham 14, Wash.

Eman, Vernor H., '50, 622 Medical Arts Bldg., Grand Rapids, Mich.

Emig, George E., '50, 5301 Potomac Ave., N. W., Washington, D. C.

Emmons, Harold Leonard, '51, Saco, Maine

Engel, Arthur C., '37, 605 Deerhurst Drive, St. Louis 18, Mo.

English, James Andrew, '48, 5525 Southwick St., Bethesda, Md. (Navyregular)

Ennis, LeRoy M., '48, 4001 Spruce St., Philadelphia, Pa.

Epes, Beverly M., '43, A.P.O., 403, % P.M., New York, N. Y. (Armyregular)

Epperly, James M., '43, Fitzsimmons Army Hospital, Denver, Colo. (Army-regular)

Epstein, Irwin A., '38, 543 Lowry Medical Arts Bldg., St. Paul 2, Minn.

Epstein, Sidney, '50, 516 Sutter St., San Francisco, Calif.

Erikson, B. Edwin, '37, 3726 Connecticut St., Washington 8, D. C.

Ernst, Herbert H., '40, 730 Fifth Ave., New York 19, N. Y.

Ernst, Henry W., '38, 1102 Lowry Bldg., St. Paul 2, Minn.

Ernst, Max E., '32, 1250 Lowry Bldg., St. Paul 2, Minn. Eselman, J. Clifton, '42, 3453 Parkview Ave., Pittsburgh, Pa.

Essig, J. Irwin, '50, 509 Heyburn Bldg., Louisville, Ky.

Essig, Norman Sturgis, '38, Calder Bldg., Michaels, Md. Esterberg, Herbert Ludwig, '40, 430 Centre St., Newton 58, Mass.

Estes, George Downes, '40, 1546 Medical Arts Bldg., Minneapolis 2,

Everhard, Will Duguid, '37, 305 Galder Bldg., Harrisburg, Pa.

Everly, E. Lloyd, '48, 617 Fairfield Ave., Bellevue, Ky.

Ewing, Wm. T., '49, 910 Akron Savings & Loan Bldg., Akron, Ohio

Fabrizio, Francis J., '51, 1834 K. St. N.W., Washington, D. C.

Faggart, Harold L., '50, 2120 Pine St., Philadelphia, Pa.

Falls, John B., '45, 703 Medical Arts Bldg., Houston, Tex.

Falls, W. Marion, '51, 1801 Eye St., N.W., Washington, D. C.

Farber, Charles Max, '48, Dental Division SGO, Dept. of Army, Washington, D. C. (Army-regular)

Fasken, Lorne John Dale, '49, 2216 Angus St., Regina, Saskatchewan Fauber, John Edw., '45, 244 Southhampton Drive, Silver Springs, Md. (Veteran's Administration)

Faulkner, Alden W., '31, 524 Quinpool Road, Halifax, Canada

Fearn, Harvey, '48, 302 Commercial Bank Bldg., Bozeman, Mont.

Fee, Graham B., '39, 4019 N. Oakland Ave., Milwaukee 11, Wis.

Feeney, Frederick Joseph, '45, 444 Essex St., Lawrence, Mass.

Feinman, Jacob, '48, 25 Forest Ave., Staten Island, N. Y.

Feldman, Roscoe Donald, '40, McFarland Medical Bldg., Ames, Ia.

Fenner, Clarence L., '47, 504 Mullin Bldg., Cedar Rapids, Ia.

Fenton, Harold R., '38, Box 274, Austin, Minn.

Fenton, Ralph A., '29, Box 587, Iowa City, Ia.

Ferguson, James H., Jr., 33, Medical Arts Bldg., Baltimore 1, Md.

Ferguson, R. Andrew, '40, 2536 Kings Highway, Louisville 5, Ky.

Ferrier, Walden I., '33, P. O. Box 685, Seattle, Wash.

Fiero, Charles Nelson, '44, 1005 Commerce Bldg., Erie, Pa.

Finke, Almore H., '48, 925 N. 8th St., Sheboygan, Wis.

Fisher, Alton Kindt, '42, College of Dentistry, University of Iowa, Iowa City, Ia.

Fisher, Harry M., '38, Metropolitan Bldg., St. Louis 3, Mo.

Fisk, G. Vernon, '43, 818 Medical Arts Bldg., Toronto, Canada

Fitzgerald, Gordon Meade, '49, University of California, College of Dentistry, San Francisco, Calif.

Fitzgerald, Paul, Sr., '50, State Bank and Trust Bldg., Greenville, N. C.

FitzGerald, Don J., '47, Mason City, Ia.

FitzGerald, Leslie M., '33, 718 Roshek Bldg., Dubuque, Ia.

Fitzgibbon, David J., '49, 601 19th St. N.W., Washington, D. C.

FitzHugh, John Cook G., '32, Greenock Road, McKeesport, Pa.

Fixott, Henry Cline, '27, 814 Medical Dental Bldg., Portland 5, Ore.

Fixott, Henry Cline, Jr., '48, 814 Medical Dental Bldg., Portland 5, Ore. Fladeland, Robert H., '38, Claremont, Calif. (Navy-regular, retired)

Flancher, Edwin A., '39, 231 W. Wisconsin Ave., Milwaukee 3, Wis.

Fleming, J. Martin, '29, 1218 Glenwood Ave., Raleigh, N. C.

Fleming, Willard C., '36, University of California, College of Dentistry, San Francisco, Calif.

Flesher, Wm. E., '38, Medical Arts Bldg., Oklahoma City, Okla.

Flickinger, Harold M., '50, Siloam Springs, Ark.

Flynn, John Tynan, '42, Harwood Bldg., Scarsdale, N. Y.

Foerster, Frank H., '38, 3129 S. Grand Ave., St. Louis 18, Mo.

Foley, John Joseph, '42, 106 N. 10th St., Fort Dodge, Ia.

Folley, John Frederick, Jr., '51, 31 Oxford Rd., New Hartford, N. Y.

Fontaine, Sadi B., '36, 1904 Franklin St., Oakland 12, Calif.

Foote, L. LaVerne, '50, 1711 Medical Dental Bldg., Seattle, Wash.

Forbes, John Wallace, '46, 1420 Medical Arts Bldg., Philadelphia, Pa.

Ford, Earl Henry, '38, Address unknown (Iowa)

Ford, James W., '38, 55 E. Washington St., Chicago 2, Ill.

Forrest, Stephen Paul, '50, Baylor University, School of Dentistry, Dallas, Tex.

Forsyth, Bruce Dawson, '49, Assistant Surgeon General, Washington, D. C. (U.S.P.H.S.)

Fortier, Norman H., '48, 255 Main St., Pawtucket, R. I.

Foss, Willard Harold, '41, 42 Main St., Leominster, Mass.

Foster, Caryll S., '38, 803 Dows Bldg., Cedar Rapids, Ia.

Foster, Herbert Robson, '49, 1904 Franklin St., Oakland, Calif.

Foster, Wm. Talbot, '38, 1107 Medical Arts Bldg., San Antonio 5, Tex. Fountain, Lee Stanley, '38, 1127 Nix Professional Bldg., San Antonio,

Tex.

Fox, Carleton, '48, 557 David Whitney Bldg., Detroit, Mich.

Fox, Thomas P., '48, 1930 Chestnut St., Philadelphia, Pa. Frank, Victor Harry, '48, 1800 Pine St., Philadelphia, Pa.

Franklin, Jacob Baer, '50, 208 E. Wisconsin Ave., Milwaukee, Wis.

Franklin, William W., '51, Dental Clinic, Amarillo Air Force Base, Amarillo, Tex. (Army-regular)

Fraser, Emery James, '48, 823 Medical and Dental Bldg., Seattle, Wash.

Fraser, M. S., '34, Lahaina, Hawaii

Frates, Frank Edw., Jr., '50, 6417 Fairfax Road, Chevy Chase, Md. (Navy-regular)

Frech, Carl A., '50, 504 Broadway, Gary, Ind.

Frechette, Arthur R., '50, U. S. Naval Dental School, National Naval Center, Bethesda, Md. (Navy-regular)

Frederich, Val H., '37, 101 Summitt, Webster Groves, Mo.

Freeman, Charles W., '29, 311 E. Chicago Ave., Chicago 11, Ill.

Freitag, Otto Frederick, '40, 555 Stratford Ave., St. Louis 5, Mo.

French, Felix Andrew, '32, 111 Metcalf St., Ottawa, Canada

Frew, Athol Lee, '28, 4105 Live Oak St., Dallas 4, Tex.

Friesell, Frederick Chas., '23, University of Pittsburgh, School of Dentistry, Pittsburgh, Pa.

Frisbie, Harry E., '36, 450 Sutter St., San Francisco 8, Calif.

Frisch, John G., '48, 110 E. Main St., Madison, Wis.

Frost, Ralph Wilson, '45, 512 Bryant Bldg., Kansas City, Mo.

Gale, E. Harold, '49, 142 Washington Ave., Albany, N. Y.

Gallagher, Chas. J., '50, 210 Main St., Hackensack, N. J.

Gallagher, Daniel Earl, '41, 1309 Market St., Parkersburg, W. Va.

Gallie, Donald Muirhead, Jr., '41, 25 E. Washington St., Chicago 2, Ill.

Gamard, Edward Alphonse, '38, 1131 Maison Blanche, New Orleans, La.

Gardner, Wm. M., '50, 940 Hanna Bldg., Cleveland, Ohio

Garrett, Steve A., '50, Medical Arts Bldg., Atlanta, Ga.

Garrett, William A., '37, 833 Candler Bldg., Atlanta, Ga. Garrison, Ferd Erwin, '51, 3023 East Rosedale St., Ft. Worth, Tex.

Garrison, Monte Ralph, '40, 327 Hamilton Bldg., Wichita Falls, Tex.

Gates, Lester Minton, '45, 116 W. 47th St., Kansas City 2, Mo.

Gauchet, Leon Joseph, '45, 333 Linwood Ave., Buffalo, N. Y.

Gauthier, Gustave, '48, Faculty of Dental Surgery, University of Montreal, Montreal, Canada

Gaver, Grayson, W., '38, 618 W. Lombard St., Baltimore 1, Md.

Gaynor, Clement John, '45, Winston Churchill Apartments, St. Louis, Mo. (Army-regular, retired)

Geller, John W., '48, 704 Bankers Trust Bldg., Indianapolis, Ind.

Genre, Francois J., '38, 302 Medical Arts Bldg., New Orleans 15, La.

Geoffrion, Paul, '48, Medical Arts Bldg., Montreal, Canada

George, Chalmer Lee, '48, 702 Medical Dental Bldg., Portland, Ore. Gerard, Reed H., '50, Box 2297, Carmel, Calif. Gethro, Fred William, '40, 30 N. Michigan Ave., Chicago, Ill. Gibb, Hugh, Jr., '47, 58 Trumbull St., New Haven, Conn. Gibbons, John J., '40, 375 Commonwealth Ave., Boston, Mass. Gibbs, Millard D., '38, 201 Woodbine St., Hot Springs, Ark. Giblin, Thomas Jas., '42, 476 Commonwealth Ave., Boston 15, Mass. Giblin, William A., '48, 85 Park St., Montclair, N. J. Gibson, Kenneth R., Sr., '38, 660 Frederick St., Detroit 2, Mich. Gibson, Ralph Richard, '51, 1132 Republic Bldg., Denver, Colo. Gies, William J., '23, 632 West 168th St., New York 32, N. Y. Giesecke, Max, '30, 1206 Republic Bldg., Denver 2, Colo. Gilbert, Howard I., '49, 1126 Medical and Dental Bldg., Seattle, Wash. Gilbert, Lloyd Irwin, '39, 401 Black Bldg., Fargo, N. Dak. Gilchrist, Earl Spencer, '40, 3440 N. Meridian St., Indianapolis, Ind. Gilchrist, Harry A., '38, 11139 88th Ave., Edmonton, Canada Gill, J. Raymond, '33, 450 Sutter St., San Francisco 8, Calif. Gillean, Edgar Turner, Jr., '40, 1219 Medical Arts Bldg., Dallas, Tex. Gillespie, Rupert H., '42, 609 Citizens Bldg., W. Palm Beach, Fla. Gillis, Robert R., '22, 134 Rimbach St., Hammond, Ind. Gilmer, William Samuel, '48, 33 3rd St., Pulaski, Va. Ginn, James Theda, '49, 847 Monroe Ave., Memphis, Tenn. Giordano, James Victor, '48, 425 Union Ave., Patterson, N. J. Girardot, Raymond L., '37, 28 West Adams St., Detroit, Mich. Glascock, Campbell Hopson, '47, 1878 15th Ave., San Francisco, Calif. (Army-regular, retired) Glaser, Clifford G., '48, 1255 Delaware Ave., Buffalo, N. Y.

Glaser, Clifford G., '48, 1255 Delaware Ave., Buffalo, N. Y. Glenn, William Lloyd, Sr., '47, 2601 Broadway, Galveston, Tex. Glennie, Blair Alexander, '48, 130 S. Scott St., Tucson, Ariz. Glezen, Roy James, '40, 2241 Wisconsin Ave., N.W., Washington 7, D. C. Glickman, Irving, '50, 483 Beacon St., Boston, Mass. Goad, Grosvenor McKinley, '47, Hillsville, Va. Goggin, W. Ormond, '51, 805 Maison Blanche, New Orleans, La. Golden, Roy F., '50, 6th and Main St., Arkadelphia, Ark. Golton, Harold, '38, 2408 Eutaw Place, Baltimore 27, Md. Gomes, George A., '50, 80 Hanson Place, Brooklyn, N. Y. Goodsell, J. Orton, '35, 501 Second Natl. Bank Bldg., Saginaw, Mich. Goodwin, Wm. McCullough, '51, Pagebrook Road, Silver Springs, Md.

(Veteran's Administration)
Gore, Samuel Davis, '48, 1237 Maison Blanche, New Orleans, La.
Gossett, John E., '50, 236 Plaza Bank Bldg., Kansas City, Mo.
Gougler, Roscoe A., '46, 6765 Penn Ave., Pittsburgh, Pa.

Granger, Ernest R., '39, 149 Prospect Ave., Mt. Vernon, N. Y.

Grant, D. Roy, '49, 1425 Mendel St., San Francisco 24, Calif.

Grant, Edmund A., '47, Dept. of Public Health, City Hall, Toronto, Canada

Grant, Frederick E., '38, 603 High St., Dedham 15, Mass.

Grant, Giles C., '37, 655 Congress St., Portland 3, Maine

Grant, W. Henry, '32, 406 Marlborough St., Boston 15, Mass.

Gray, Chas. Files, '42, Medico-Dental Bldg., Sacramento 14, Calif.

Gray, Dell S., '43, 219 Ricardo Road, Mill Valley, Calif. (Army-regular, retired)

Gray, Marion H., '38, 507 Boyle Bldg., Little Rock, Ark.

Green, Robert O., '38, 1048 Lowry Medical Arts Bldg., St. Paul, Minn.

Green, Roy A., '36, 412 Medico-Dental Bldg., Sacramento, Calif.

Greene, John H., '50, University of Detroit, School of Dentistry, 630 E. Jefferson Ave., Detroit 26, Mich.

Gregory, G. Thaddeus, '41, 505 Hume Mansur Bldg., Indianapolis, Ind.

Gregory, William Alfred, '40, 1907 Carson St., Pittsburgh 3, Pa.

Grevatt, Edw. M., '50, 181 Park St., Montclair, N. J.

Griffin, William H., '37, 520 Beacon St., Boston 15, Mass.

Griffith, Chas. A., '38, 503 Medical Arts Bldg., Minneapolis 2, Minn.

Grimm, David H., '49, University of California, College of Dentistry, San Francisco, Calif.

Grinnell, Willis H., '51, 18 Bank Row, Pittsfield, Mass.

Groh, Russell W., '40, 1165 Colvin Ave., Kenmore, N. Y.

Gross, Louis, '48, 8 Bank Row, Pittsfield, Mass.

Grover, George H., '38, 450 Sutter St., San Francisco, Calif.

Gruebbel, Allen O., '42, 9510 Harding Ave., Evanston, Ill.

Grunewald, Alvin Herbert, '48, 5607 Northfield Road, Bethesda, Md. (Navy-regular)

Gugino, Anthony Samuel, '49, 333 Linwood Ave., Buffalo, N. Y.

Gulick, Fred E., '30, 925 Medical Dental Bldg., Portland, Ore.

Gullett, Donald W., '43, 94 Coldstream Ave., Toronto, Canada

Gurley, John E., '22, Medical Center, College of Dentistry, 3rd and Parnassus Ave., San Francisco 22, Calif.

Gurley, Webb B., '42, 4559 Scott Ave., St. Louis, Mo.

Gyllenberg, William H., '49, Longview, Washington

Gyllenborg, Lloyd Conway, '41, 4039 Xerxes Ave., So., Minneapolis 10, Minn.

Hackett, Francis M., '49, 267 Academy Ave., Providence, R. I.

Hagan, Clarence W., '38, 7528 Graymore Rd., Pittsburgh, Pa.

Hagemann, Harry F., '37, Missouri Theatre Bldg., St. Louis 3, Mo.

Hahn, George W., '43, 2300 Durant Ave., Berkeley 4, Calif.

Hahn, Henry F., '38, 1350 N. 45th St., Milwaukee, Wis.
Hahn, William E., '43, 47 Holmehurst Ave., Catonsville, Md.
Hair, Pinckney Belton, '39, 701 Andrews Bldg., Spartanburg, S. C.
Hale, Gaither Fred, '37, 406 Professional Bldg., Raleigh, N. C.
Hall, Ambert B., '38, 681 E. Wheelock Bldg., St. Paul 6, Minn.
Hall, Charles Baynes, '49, 1835 Eye St. N.W., Washington, D. C.
Hall, C. Taylor, '38, 1601 David Whitney Bldg., Detroit 26, Mich.
Hambly, Harry B., Jr., '39, 2215 Chestnut St., San Francisco 23, Calif.
Hamilton, Paul Howard, '51, 1200 N. State St., Los Angeles, Calif.
Hamilton, Wm. Scott, '47, University of Alberta, Edmonton, Alberta,
Canada

Hampp, Edw. Gottlieb, '49, 9612 Cedar Lane, Bethesda, Md. Hampson, Robert Edwards, '42, 805 General Insurance Bldg., Seattle, Wash.

Hancock, Harry R., '43, 1836 State St., Santa Barbara, Calif. Hard, Dorothy G., '50, University of Michigan, School of Dentistry, Ann Arbor, Mich.

Hanna, Hilery E., '45, El Dorado, Ark.

Hardgrove, Timothy A., '24, 710 Commercial Bank Bldg., Fond du Lac, Wis.

Harding, J. C. Almy, '49, 311 Nutmeg Ave., San Diego, Calif. Harding, Robert LeGrande, '50, 1402 Jefferson Michigan Park Hill, Hyattsville, Md. (Army-reserve)

Hardy, George E., Jr., '42, 207 Medical Arts Bldg., Baltimore 1, Md. Harker, Lee A., '39, 1225 Medical Arts Bldg., Minneapolis, Minn.

Harkins, Cloyd S., '35, 222 Curtain St., Osceola Mills, Pa.

Harkins, John F., '51, Penn Theatre Bldg., Wesleyville, Pa. Harkrader, Roy C., '35, 1010 Union Central Bldg., Cincinnati 2, Ohio

Harper, Charles F., '32, 146 Belmont Ave., Jersey City 4, N. J.

Harper, Neal Anthony, '44, Office of Surgeon General, Dept. of the Army, Washington, D. C. (Army-regular)

Harpole, Homer J., '38, 1120 Doctors Bldg., Atlanta, Ga.

Harrigan, Wm. F., '50, Medical Bldg., 165 N. Village Ave., Rockville, N. Y.

Harrington, Albert A., '37, 43 Bleeker St., Newark, N. J.

Harris, Eldon E., '51, 413 W. 15th St., Austin, Tex.

Harris, Harold L., '37, 2075 Locust St., Denver, Colo.

Harris, Samuel David, '38, 2312 Eaton Tower, Detroit 26, Mich.

Harrison, Guy R., '33, Professional Bldg., Richmond 19, Va.

Harrison, Walter C., '48, 870 Market St., San Francisco, Calif.

Harrison, William Pate, '38, 6253 Hollywood Blvd., Hollywood, Calif.

Hartley, LeRoy P., '39, Post Dental Surgery Dental Clinic, Fort Ord, Calif. (Army-regular)

Hartman, James A., '51, 1809 Union Central Bldg., Cincinnati, Ohio

Haskell, Alaric W., '39, Town Bldg., Brunswick, Maine

Hatcher, William Henry, '48, Veterans Adm., Center, Bay Pines, Fla. (Veteran's Administration)

Hava, Walter C., '41, 1320 Aline St., New Orleans 15, La.

Haverstick, Edward Everett, '38, 346 N. Boyle Ave., St. Louis 8, Mo.

Hawley, Joseph M., '50, 1355 13th Ave., Columbus, Ga.

Hayes, George Byron, '27, Box 423, La Jolla, Calif.

Hayes, Harold H., '38, 2376 E. 71st St., Chicago 49, Ill.

Hayes, Louis Vincent, '38, 2701 Grand Concourse, New York, N. Y.

Hayes, R. Duane, '48, Pocahontas, Va.

Haynes, Edgar Tunis, '39, 407 Hume Mansur Bldg., Indianapolis, Ind. Hays, Stuart E., '38, 929 Medical Arts Bldg., San Antonio 5, Tex.

Healey, Harry Joseph, '48, 1121 W. Michigan Ave., Indianapolis, Ind.

Healey, William J., '50, 1106 Maison Blanche, New Orleans, La.

Hebble, Clyde H., '38, 327 E. State St., Columbus 15, Ohio

Heffernan, Andrew J., '50, 38 N. Franklin St. Wilkes-Barre, Pa.

Heintz, Karl P., '38, 121 Bedford St., Cumberland, Md.

Heinze, Robert L., '43, I Hanson Place, Brooklyn 17, N. Y.

Helstern, Nolon, '49, P. O. Box 56, Fayetteville, Ark.

Hemingway, John Dexter, '39, 1232 Bremer Ave., Waverly, Ia.

Hemley, Samuel, '40, 745 Fifth Ave., New York 22, N. Y.

Hemphill, W. Frank, '40, 603 N. 62nd St., Omaha 3, Neb.

Hemsworth, Leroy Clifton, '38, 733 Blacks Bldg., Waterloo, Ia.

Henderson, Andrew H., '38, 1300 Main St., Greenville, Miss.

Henderson, Archibald B., '46, 23 Kraft Ave., Bronxville, N. Y.

Henegan, James Francis, '42, 223 East 61st St., New York 21, N. Y.

Henkin, Mort, '42, 520 Pierce St., Sioux City, Ia.

Henry, Raymond R., '38, 805 Medical Arts Bldg., Minneapolis 2, Minn.

Herbine, Frederick Wayne, '49, 230 N. 5th St., Reading, Pa.

Herz, Francis J., '46, 450 Sutter St., San Francisco, Calif.

Hess, Lawrence Eugene, '49, 1243 W. Allegheny Ave., Philadelphia, Pa.

Hewett, Ashley M., '33, 55 E. Washington St., Chicago 2, Ill.

Hickey, Maurice John, '51, 630 West 168th St., New York, N. Y.

Hicks, Charles Joseph, Sr., '40, 417 W. Louisiana, McKinney, Tex.

Hicks, C. J., Jr., '48, Pope Bldg., McKinney, Tex.

Hicks, Henry, '50, 5 Glen Court, Greenwich, Conn.

Hicks, Hugh Thomas, '41, 506 Medical Arts Bldg., Baltimore 1, Md.

Higgins, Howard B., '38, 927 Montgomery Bldg., Spartanburg, S. C.

Higley, Lester Bodine, '38, 705 So. Summitt St., Iowa City, Ia. Hildebrand, John G., '28, 207 Black Hawk Bldg., Waterloo, Ia. Hilgemann, Victor H., '38, 2902 Fairfield Ave., Ft. Wayne 6, Ind. Hill, Paul K., '49, 595 E. Colorado Blvd., Pasadena, Calif. Hill, Thomas J., '33, Western Reserve University, Cleveland 6, Ohio Hillias, George Watts, '28, 1213 Rialto Bldg., Kansas City, Mo. Hillyer, Norman L., '39, I East 57th St., New York 22, N. Y. Hilty, Oswin K., '49, 301 Central Bldg., Fort Wayne, Ind. Hinds, M. Francis, '39, 352 Union St., New Bedford, Mass. Hine, Maynard K., '46, 1121 W. Michigan Ave., Indianapolis, Ind. Hiniker, Jerome Joseph, '51, 1705 Hillwood Ave., Falls Church, Va. (Veteran's Administration)

Hinkson, Thomas Edwin, '51, 1403 N. Brown St., Wilmington, Del. Hixson, James Monroe, '49, 1200 Equitable Bldg., 6253 Hollywood Blvd., Los Angeles, Calif.

Hocking, William E., '23, Devil's Lake, N. Dak.

Hodgkin, William N., '31, Warrenton, Va.

Hodgson, Lorin B., '39, Breckenridge, Minn.

Hoeffel, Paul Heath, '33, 25 E. Washington St., Chicago 2, Ill.

Hoffer, Carl Walsh, '26, 715 Bennie Dillon Bldg., Memphis, Tenn. Hoffman, Henry F., '34, 932 Metropolitan Bldg., Denver 2, Colo.

Hoffman, Henry F., '34, 932 Metropolitan Bldg., Denver 2, Cold Hoffman, Olin E., '40, 812-A Nettleton Apts., Seattle, Wash.

Hoffman, Paul, '50, 1835 Eye St. N.W., Washington, D. C.

Hogeboom, Floyde Eddy, '36, 3780 Wilshire Blvd., Los Angeles 5, Calif.

Holbrook, Edwin Almus, '40, 80 Hanson Place, Brooklyn 17, N. Y.

Holder, B. Carl, '40, 1002 Meyersville St., Cuero, Tex.

Holland, Francis A., '45, 311 Cranston St., Providence 7, R. I.

Hollenbach, Albert Morgan, '48, U. S. Army Hospital, Dental Clinic, Ft. Jackson, S. C. (Army-regular)

Hollenback, George M., '30, 15372 Dickens St., Sherman Oaks, Calif. Hollers, James Porter, '49, 1414 Alamo Mutual Bldg., San Antonio, Tex.

Holt, James Warren, '42, 154 Bank St., Fall River, Mass.

Hookway, Harold H., '42, 10 High St., Boston 10, Mass. Hooper, Robert Henry, '50, 521 Medical Arts Bldg., Houston, Tex.

Hoopes, Frank M., '50, 600 W. 10th St., Wilmington, Del.

Hopkins, James Stephenson, '29, Bel Air, Md.

Hopkinson, Roy S., '28, 4177 N. Oakland Ave., Milwaukee, Wis.

Hopper, Craft Ackerman, '48, 534 Broadway, Patterson, N. J.

Hopping, John Greer, '38, 901 Massey Bldg., Birmingham, Ala.

Hoskin, Sidney B., '43, 627 Medical Dental Bldg., Portland, Ore.

Houghton, Frank J., '41, 1517 Nashville, New Orleans, La.

*House, Milus M., '21, 1601 Scenic Drive, Whittier, Calif.

Hower, Frank Beard, '29, 814 Heyburn Bldg., Louisville 2, Ky. Howes, Ashley E., '46, 650 Main St., New Rochelle, N. Y. Hoyt, Earl Banks, '50, 630 Fifth Ave., New York, N. Y. Hubbuch, Edward H., '27, 830 Starks Bldg., Louisville 2, Ky. Hudson, Clarence J., '50, 116 Garfield Place, Cincinnati, Ohio Huegel, Raymond W., '33, 703 Tenney Bldg., Madison, Wis. Huff, Malvern Dumah, '25, 1204 Medical Arts Bldg., Atlanta 3, Ga. Hughes, Frank C., '37, 1121 W. Michigan Ave., Indianapolis, Ind. Hughes, George A., '38, 1904 Franklin Ave., Oakland 12, Calif. Hughes, John Mortimer, '48, 715 Medical Arts Bldg., Richmond, Va. Hume, Elmer Clarence, '24, 746 Francis Bldg., Louisville 2, Ky. Humiston, Albert N., '47, 409 Higley Bldg., Cedar Rapids, Ia. Humphreys, Karl James, '38, 401 Security Bldg., Pasadena 1, Calif. Hunt, Lester Callaway, '50, Cheyenne, Wyo. (U. S. Senate, Washington, D. C.)

Hunt, Loren Thos., '38, 1123 Sharp Bldg., Lincoln 8, Neb.

Hunt, Vernon L., '34, Hunt Bldg., Arcata, Calif.

Hunt, William R., '49, Clarksville, Ark.

Hunter, Grover C., '39, LaGrange, Ga.

Hunter, Grover C., Jr., '51, 46 East Brookhaven Drive, N.E., Atlanta, Ga.

Hurley, Willard Howard, '49, 922 Selling Bldg., Portland, Ore.

Hurst, William W., '48,4906-47th St., N.W., Washington D. C. (Veteran's Administration)

Hutt, Spence Atwell, Jr., '51, 1906 Wyndale, Houston, Tex.

Hyde, Walter, '37, 434 LaSalle Bldg., Minneapolis 2, Minn.

Ide, Burt Beldon, '29, 611 Medical Arts Bldg., Baltimore 1, Md.

Ingersoll, William B., '50, 1220 16th St., N.W., Washington, D. C.

Ingraham, Rex, '51, 311 East Mountain St., Glendale, Calif.

Inman, Conrad L., '39, Medical Arts Bldg., Baltimore 1, Md.

Inskipp, E. Frank, '38, College of Physicians and Surgeons, A School of Dentistry, San Francisco, Calif.

Irby, J. Poindexter, Jr., '50, Blackstone, Va.

Ireland, Ralph Leonard, '46, University of Nebraska, College of Dentistry, Lincoln, Neb.

Irish, Russell E., '35, 5039 Jenkins Arcade, Pittsburgh, Pa.

Irons, Arthur L., '51, Walter Reed Army Hospital, Washington, D. C. (Army-regular)

Irons, Robert Paul, '50, Bu.Medicine and Surgery, Navy Dept., Wash ington, D. C. (Navy-regular)

Irving, Albert John, '35, I East 57th St., New York 32, N. Y.

Isaacson, Samuel A., '44, 501 Madison Ave., New York 22, N. Y.

Ivory, James Thomas, '40, 612 Security Mutual Bldg., Binghamton 63, N. Y.

Jack, Clyde A., '43, 235 Main St., Ridgway, Pa.

Jackson, Charles R., '25, 5335 N. Delaware St., Indianapolis 4, Ind.

Jackson, Wilbert, '38, Clinton, N. C.

Jacob, Laverne H., '51, 634 Jefferson Bldg., Peoria, Ill.

Jacobs, Max H., '47, 311 Commonwealth Ave., Boston, Mass.

Jacobson, Oscar, '50, 35 West 81st St., New York, N. Y.

James, Allison Gale, '48, 409 North Camden Drive, Beverly Hills, Calif.

Jamieson, Oliver M., '42, 808 Exchange Bldg., Memphis 3, Tenn.

Jarrell, Marion Fahy, '39, Commercial Bldg., Alexandria, La.

Jarvis, Holly C., '38, 716 Mercentile Library Bldg., Cincinnati 2, Ohio

Jasper, Elmer A., '48, 3556 Caroline St., St. Louis, Mo.

Jasper, Lester, H., '48, Metropolitan Bldg., St. Louis, Mo.

Jay, Philip, '38, 715 Forest Ave., Ann Arbor, Mich.

Jaynes, Herbert D., '41, 58 Sixth St., N.E., Atlanta, Ga.

Jefferis, Chas. R., '39, 409 Medical Arts Bldg., Wilmington 9, Del.

Jeffery, Alexander W. C., '43, 518 Medical & Dental Bldg., Seattle 1, Wash

Jeffreys, Frank Ernest, '51, Administrative Command, U. S. Naval Training Station, Newport, R. I. (Navy-regular)

Jenkins, Carey H., '43, 607 Hazel Ave., Hood River, Ore.

Jennings, Geo. A. C., '50, 413 Medical Arts Bldg., Richmond, Va.

Jernall, Roy M., '44, 1549 Medical Arts Bldg., Minneapolis 2, Minn.

Jernigan, Geo. C., Sr., '50, Rector, Ark.

Jersin, Geo. Burchard, '38, 317 Medical Arts Bldg., Baltimore 1, Md.

Jeserich, Paul H., '37, University of Michigan, Ann Arbor, Mich.

Johanson, Benjamin F., '48, 1006 Security Bank Bldg., BattleCreek, Mich.

John, James E., '35, 804 Medical Arts Bldg., Roanoke 11, Va. Johns, Glover, '42, 3212 Beverly Road, Austin, Tex. (Army-regular,

retired)
Johnson, Chester W., '39, 450 Sutter St., San Francisco 8, Calif.

Johnson, Earl E., '38, 700 Service Bldg., Rutland, Vt.

Johnson, Emmett Russell, '50, 906 Texas Bank Bldg., Dallas, Tex.

Johnson, Ernest L., '40, 450 Sutter St., San Francisco 8, Calif.

*Johnson, Ervin A., '21, Box 1156, Vero Beach, Fla.

Johnson, E. H., '38, Pine Bluff, Ark.

Johnson, Joseph E., '31, 752 Starks Bldg., Louisville 2, Ky.

Johnson, Kenneth L., '46, 302 Masonic Temple Bldg., Raleigh, N. C.

Johnson, Melvin E., '38, 324 W. Main St., Waukesha, Wis.

Johnson, Raymond E., '36, 824 Lowry Medical Arts Bldg., St. Paul 2, Minn.

Johnson, R.F.D., '46, 820 LaSalle Bldg., Minneapolis, Minn. Johnson, Vincent Merrill, '51, 924 Chandler Bldg., Atlanta, Ga.

Johnson, William J., '41, 1017 Professional Bldg., Phoenix, Ariz. Johnston, Harry Buchanan, '38, 1133 Candler Bldg., Atlanta, Ga.

Johnston, John Francis, '38, 473 E. Pleasant Run Parkway, North Drive, Indianapolis, Ind.

Johnston, Howard Milne, '49, 2300 Durant Ave., Berkeley, Calif. Johnston, Lloyd W., '43, 1108 Republic Bldg., Denver 2, Colo.

Jones, Alvah Lucas, '42, 604 First Natl. Bank Bldg., Paris 1, Tex.

Jones, Arthur H., '43, 1018 Paul Brown Bldg., St. Louis 1, Mo. Jones, Bush, '33, 6234 Prospect Ave., Dallas 2, Tex.

Jones, Earl Gardner, '50, 185 E. State St., Columbus, Ohio

Jones, E. Horace, '51, Provident Bank Bldg., Cincinnati, Ohio

Jones, Ernest Morgan, '40, University of Washington, School of Dentistry, Seattle, Wash.

Jones, Leland D., '50, 906 Bank of America, San Diego, Calif.

Jones, Paul Erastus, '38, Main St., Farmville, N. C.

Jones, Rolland R., '42, 408 First Trust Bldg., Pasadena 1, Calif.

Jordan, John Dawson, '38, 510 Boyle Bldg., Little Rock, Ark.

Jordan, Luzerne Dawson, '38, 1801 Eye St., N.W., Washington 6, D. C.

Jorgensen, Niels B., '50, 3875 Wilshire Bldg., Los Angeles, Calif.

Joule, William R., '50, 549 High St., Newark, N. J.

Juett, Brooks, '37, 1112 First Natl. Bank Bldg., Lexington, Ky.

Justis, E. Jeff, '48, 1504 Exchange Bldg., Memphis, Tenn. Jutton, Daniel, '48, 723 State Tower Bldg., Syracuse, N. Y.

Kaletsky, Theodore, '45, 9033 153rd St., Jamaica, L.I., N. Y.

Kalk, Lester Edward, '48, 5500 S. Halsted St., Chicago, Ill.

Kany, Alfred William, '40, 580 Fifth Ave., New York 22, N. Y.

Kaplan, Harry, '38, 404 Farragut Medical Bldg., Washington, D. C.

Karcher, Paul Hoffman, '46, 1159 Hancock St., Quincy, Mass. Karn, George Conrad, '40, 3101 Belair Rd., Baltimore 1, Md.

Kasper, Stephen Thomas, '51, U. S. Naval Dental Clinic, Naval Gun Factory, Washington, D. C. (Navy-regular)

Kazanjian, Varaztad, '29, 475 Commonwealth Ave., Boston 15, Mass.

Keane, Willard T., '46, 654 Madison Ave., New York, N. Y.

Kefferstan, John Jay, '50, 106 E. Haverhill St., Lawrence, Mass.

Keller, Richard B., '49, 620 Medical Dental Bldg., Portland, Ore.

Keller, William C., '38, 20 Station Plaza, Great Neck, L.I., N. Y.

Kellner, Arthur W., '47, Hollywood, Fla.

Kelly, Arthur G., '40, 810 Metropolitan Bldg., Denver 2, Colo.

Kelly, Eugene J., '50, 455 W. State St., Trenton, N. J.

Kelly, William Norman, '40, 806 Blackman St., Clinton, Ind.

Kemper, John W., '39, University of Michigan, School of Dentistry, Ann Arbor, Mich.

Kendall, Charles H., '48, 2866 N. Oakland Ave., Milwaukee, Wis.

Kennebeck, George R., '50, (Major General), 9315 Harvey Road, Silver Springs, Md. (Army-regular)

Kennedy, Claude M., '39, 602 Empire Bldg., Des Moines, Ia.

Kennedy, Edward, '23, 9 East 46th St., New York 17, N. Y.

Kennedy, Ross R., '41, 305 West Franklin St., Elkhart 4, Ind.

Kennedy, Thomas Hughes, '42, 35 Highland Park Shopping Village Dallas, Tex.

Kennedy, William E., '27, 3920 Winthrop, Indianapolis 4, Ind.

Kercheval, Leonard I., '43, 1625 Main St., Houston 2, Tex.

Kerr, Donald A., '50, University of Michigan, School of Dentistry, Ann Arbor, Mich.

Kesel, Robert George, '48, 808 S. Wood St., Chicago, Ill.

Keys, Donald Alfred, '48, College of Dentistry, University of Nebraska, Lincoln, Neb.

Keys, Edgar Hayden, '32, 809 University Club Bldg., St. Louis 3, Mo. Khambatta, Sorab M., '26, Albert Bldg., Hornby Road, Bombay, India

Kibler, Edwin R., '28, 927 Pacific Mutual Bldg., Los Angeles 5, Calif.

Kimball, Horton Duncan, '51, 873 Lakewood Bldv., Detroit, Mich. Kingery, Richard H., '38, University of Michigan, School of Dentistry Ann Arbor, Mich.

Kingsbury, Bernerd C., '36, 490 Post St., San Francisco 2, Calif.

Kirtland, Howard B., '34, 1114 Marsh St., San Luis Obispo, Calif.

Kitchin, Paul C., '37, Ohio State University, College of Dentistry, Columbus, Ohio

Klaffenbach, Arthur Otto, '36, 226 River St., Iowa City, Ia.

Knapp, George G., '29, 727 West 7th St., Los Angeles, Calif.

Knauff, Robert S., '47, 302 State St., New London, Conn.

Kniesner, Albert H., '50, 728 Osborn Bldg., Cleveland, Ohio

Knighton, Holmes T., '45, Medical College of Virginia, School of Dentistry, Richmond, Va.

Knowles, Leroy E., '49, 306 N. Vermont Ave., Los Angeles, Calif.

Knudson, John F., '43, 1532 Walnut St., Berkeley, Calif.

Knutzen, Philip L., '39, Roundtop, Tex.

Koch, Clarence W., '36, 817 Donaghey Bldg., Little Rock, Ark.

Koepf, Sheldon W., '51, 1814 Kensington Ave., Buffalo, N. Y.

Kohn, Alfred L., '32, 8 West 40th St., New York 18, N. Y. Kohn, Sidney I., '50, 921 Bergen Ave., Jersey City, N. J.

Kornfeld, Max, '38, Missouri Theatre Bldg., St. Louis 3, Mo.

Kothe, Herman H., '51, Walter Reed Hospital, Washington, D. C. (Army-regular)

Kraus, E. Edw., '38, 425 E. Wisconsin Ave., Milwaukee, Wis.

Kraus, Leland Leo, '48, 411 E. Mason St., Milwaukee, Wis.

Krause, Richard, '48, Box 179, Bismarck, N. Dak.

Kremer, Leo W., '38, 55 E. Washington St., Chicago 2, Ill.

Krogh, Harold Walter, '38, 1835 Eye St., N.W., Washington 6, D. C.

Kronmann, Edw. Chas., '50, 136 Park Ave., Freeport, N. Y. (Navy-regular)

Kroschel, William P., '44, U. S. Public Health Service, 50 Seventh St., N.E., Atlanta, Ga. (U.S.P.H.S.)

Kubacki, W. Howard, '49, 808 S. Wood St., Chicago, Ill.

Kulstad, Hugo M., '51, 750 Market St., San Francisco, Calif.

Kunkel, Paul Worth, '48, 915 Selling Bldg., Portland, Ore.

Kuratli, John, '48, 717 Medical Arts Bldg., Portland, Ore.

Kurth, Leroy E., '38, 25 East Washington St., Chicago, Ill.

Kyes, Frank M., '50, 4318 Kentbury Drive, Bethesda, Md. (Navyregular)

LaBorne, Charles A., '48, 80 Hanson Place, Brooklyn, N. Y.

Lacy, William H., '50, 1209 Medical Arts Bldg., Dallas, Tex.

Lageson, Bert Lyle, '51, 219 Fluhrer Bldg., Medford, Ore.

Landa, Joseph S., '49, 136 E. 54th St., New York, N. Y.

Lankford, Arthur, '51, 608 Medical Arts Bldg., Baltimore, Md.

Larkin, John David, '49, 3217 Montrose Blvd., Houston, Tex.

Larkin, Richard J., '43, 1245 Hancock St., Quincy 69, Mass.

Larned, Claude S., '44, 806 Central Natl. Tower, Battle Creek, Mich.

Larson, G. Edward, '39, Box 147, St. Peter, Minn.

LaRue, F. Wade, '31, 904 Medical Arts Bldg., Indianapolis 4, Ind.

Lasby, Wm. F., '28, 425 Walnut St., S.E., Minneapolis, Minn.; 1303 W. Washington St., Santa Ana, Calif.

Lattig, Edward J., '48, 450 Sutter St., San Francisco, Calif.

Law, Frank E., '50, 120 Boylston St., Boston, Mass. (U.S.P.H.S.)

Leabo, Walter, '38, 706 Medical Arts Bldg., Shreveport, La.

Leavell, Fred W., '40, 326 Burr Bldg., New Castle, Ind.

Lee, Henry C., '29, Lyons Bend Road, R. 4, Knoxville, Tenn.

Leggett, John W., '36, 490 Post St., San Francisco 2, Calif.

Leggett, Robert M., '38, 490 Post St., San Francisco 2, Calif. Leggett, Thomas Ford, '39, 1024 Euclid Ave., Laurel, Miss.

Lehman, Cyril V., '39, 302 Second Ave., S.E., Cedar Rapids, Ia. Leigh, Rufus Wood, '34, 1468 Logan Ave., Salt Lake City, Utah (Armyregular, retired)

Lentz, Maxwell J., '42, 655 Main St., Passaic, N. J.

Leonard, Neil Jones, '49, 1108 Exchange Bldg., Memphis, Tenn.

Leonard, Richard R. C., '38, 2411 N. Charles St., Baltimore 18, Md.

Lepeska, Francis W., '42, Bu. Medicine, Navy Dept., Bldg., 2, Room 215, Washington, D. C. (Navy-regular)

LeRoy, Raymond P., '49, 406 Morgan Bldg., Portland, Ore.

LeSage, George A., '50, 1320 Tower Ave., Superior, Wis.

Leslie, William Walter, '39, 4812 Van Ness Blvd., Fresno 4, Calif.

Lesney, Theodore A., '50, U. S. Naval Medical Unit, Tripler Army Hospital, APO 438, San Francisco, Calif. (Navy-regular)

Levesque, Raymond E., '50, 66 Parker St., Gardner, Mass.

Levin, Harry, '46, 3429 Park Heights Ave., Baltimore, Md.

Levin, Matthew D., '48, 200 Fifth Ave., New York, N. Y.

Levy, Walter Ralph, '40, 506 First Natl. Bank Bldg., Jackson, Tenn.

Lewis, Douglas, '50, Box 272, McGehee, Ark.

Lewis, Frank Lucas, '38, 37 Greenridge Ave., White Plains, N. Y.

Lewis, Paul Donovan, '49, 643 Stimson Bldg., Seattle, Wash.

Lewis, Samuel J., '37, 704 American Natl. Bank Bldg., Kalamazoo, Mich.

Lieban, E. Alan, '49, 30 West 59th St., New York, N. Y.

Lifschutz, Alex. N., '51, 616 E. 19th St., Brooklyn, N. Y.

Lindley, Cecil Franklin, '51, 729 Medical-Dental Bldg., Seattle, Wash.

Lindsay, Ashley Woodward, '28, 121 Rose Park Drive, Toronto 12, Canada

Linehan, Lloyd Edward, '46, 209 Post St., San Francisco, Calif.

Link, Waldemar A., '49, 4051 W. North Ave., Chicago, Ill.

Linn, Jesse A., '50, 5410 Wilshire Bldg., Los Angeles, Calif.

Listiak, Daniel A., '46, 2201 27th Ave., So. Minneapolis, Minn.

Lipp, Chas. Shiller, '49, University of California, College of Dentistry, San Francisco, Calif.

Locke, Franklin H., '30, 1624 Franklin St., Oakland 12, Calif.

Lockwood, Daniel S., '43, 825 N. Cedar St., Colorado Springs, Colo. (Army-regular, retired)

Longley, Chester H., '42, 741 Broadway, E., Little Falls, Minn.

Loper, William R., '40, 911 Hawley Bldg., Wheeling, W. Va.

Lord, DeForest Dodge, '38, Coronado Bldg., Santa Fe, New Mexico

Lotz, Walter E., '32, 217 Edmore Rd., W., Palm Beach, Fla.

Loughry, James A., '37, 1024 Rose Bldg., Cleveland 15, Ohio

Love, Walter Duncan, '48, Dental Division, Office of the Surgeon General, Washington, D. C. (Army-regular)

Lovestedt, Stanley A., '48, Mayo Clinic, Rochester, Minn.

Lovett, Ethelbert, '38, 515 Medical Arts Bldg., Baltimore, Md.

Lowery, Percy C., '28, 8545 Gratiot St., Detroit 13, Mich.

Lowery, R. Percival, '50, Glendonwynn Road, Toronto, Canada

Lowry, Earl D., '50, 79 East State St., Columbus, Ohio

Lowy, Richard A., '43, 302 Main St., Chatham, N. J.

Lucas, Carl D., '23, 119 1 North Clark Drive, Los Angeles, Calif.

Ludwick, Ralph Waldo, '39, 1014 Federal Security Bldg., Lincoln 8, Neb.

Ludwick, William Ernest, '51, 1st MAW Hqsq., % FPO San Francisco, Calif.

Lufkin, Arthur Ward, '40, 6253 Hollywood Blvd., Hollywood 28, Calif. Lum, Frederick Harvey, Jr., '36, 108 Fairmont Ave., Chatham, N. J.

Lundberg, Geo. W., '43, 702 Lowry Medical Arts Bldg., St. Paul 2, Minn.

Lundquist, Gottfred R., '29, 55 E. Washington St., Chicago 2, Ill.

Lunsford, Edwin Clements, '45, 2742 Biscayne Blvd., Miami, Fla.

Lush, Robert A., '43, 1001 Bank of America Bldg., San Diego 1, Calif. Lussier, Earl Fabian, '51, 36 S. El Camino Real, San Mateo, Calif.

Lux, Konrad, '38, Medical Arts Bldg., Waco, Tex.

Lyle, A. Gordon, '43, R. 1, Box 276-B, Indiana Ave., Newport, R. I. (Navy-regular, retired)

Lynch, Daniel Francis, '37, 1678 Primrose Road, N.W., Washington, D. C.

Lynn, Cleo B., '40, 1404 Meridan Lane, Austin, Tex.

Lynn, Roland, '42, 905 Medical Arts Bldg., Dallas 1, Tex.

Lyon, Douglas M., '51, 3556 Caroline St., St. Louis, Mo.

Lyons, Harry, '34, Medical College of Virginia, School of Dentistry, Richmond, Va.

Lytle, Floyd E., '49, 3409 Clifton Ave., Cincinnati, Ohio

MacBoyle, Robert E., '27, 2460 North Clark St., Chicago 14, Ill.

Macfarlane, William I., '33, Tomahawk, Wis.

Mack, Cornelius H., '34, 2505 16th St., N. St. Petersburg, Fla. (Navyregular, retired)

MacGibbon, Everett E., '44, 703 Medical Arts Bldg., Minneapolis,

MacKay, George W., '38, Millinocket, Maine

MacKinnon, Peter R., '44, 101 Beach St., Wollaston 70, Mass.

MacKnight, Thomas S., '47, 119 Church St., Newport, R. I.

MacLean, Hector R., '49, 318 Birks Bldg., Edmonton, Alta., Canada

MacMillan, Hugh W., '27, 715 Carew Tower, Cincinnati 2, Ohio MacMillan, Roger Neil, '51, 450 Sutter St., San Francisco, Calif. Madden, Clare Kenneth, '51, 22 Lafayette Place, Greenwich, Conn. Maddox, Ray A., Sr., '47, 304 Alexander Bldg., Abilene, Tex. Main Lee Roy, '37, 3556 Caroline St., St. Louis 4, Mo. Mallett, Stephen P., '39, 358 Commonwealth Ave., Boston, Mass. Margolis, Herbert I., '51, 136 Harrison Ave., Boston, Mass. Marjerison, Howard M., '42, Forsyth Dental Infirmary, Boston, Mass. Markley, Miles R., '43, 632 Republic Bldg., Denver 2, Colo. Marks, Rodney Hugh, '40, Address Unknown (Illinois) Marré, John M., '42, Missouri Theatre Bldg., St. Louis 3, Mo. Marshall, Jay P., '44, Marshall Bldg., Maplewood 17, Mo. Marshall, Leon Wesley, '38, 490 Post St., San Francisco 2, Calif. Marshall, Thomas R., '50, 62 Richmond St., Toronto, Can. Martin, Aubrey Lee, '29, 1704 Medical Dental Bldg., Seattle, Wash. Martin, Bernard A., '47, 1018 Hume Mansur Bldg., Indianapolis, Ind. Martin, Joseph W., '50, 399 Seneca Parkway, Rochester, N. Y. Martin, Ruth E., '50, 4559 Scott Ave., St. Louis, Mo. Mason, Arnold D. A., '31, 7 Schofield Ave., Toronto, Canada Mason, William J. B., '42, 501 Peoples Bldg., and Loan Bldg., Saginaw, Mich.

Masters, Carrington J., '42, 430 St. James Bldg., Jacksonville 2, Fla. Matteson, Clarence E., '43, Medical Square, 2404 Elm St., Tucson,

Ariz. Matthews, George Wheeler, '41, 1922 Tenth Ave., Birmingham, Ala.

Maxfield, Carl W., '35, 31 Central St., Bangor, Maine Maxfield, Fred Evans, '29, 31 Central St., Bangor, Maine

Maxwell, Merritte M., '43, U. S. Naval Dental Clinic, U. S. Naval Academy, Annapolis, Md. (Navy-regular)

Maycock, James Herbert, '37, 332 Main St., Worcester, Mass.

Mayer, Edward L., '38, 3606 Gravois Ave., St. Louis 16, Mo.

Mayhall, Charles P., '44, Harlan, Ky.

McBeath, Ewing Cleveland, '39, 630 West 168th St., New York 32, N. Y

McBride, Thomas F., '38, 4808 Fifth Ave., Pittsburgh 13, Pa.

McBride, Walter C., '33, 660 Fisher Bldg., Detroit, Mich.

McCaleb, Thomas Maxey, '46, 1670 Madison Ave., Memphis, Tenn.

McCall, John Oppie, '26, 133 East 58th St., New York 22, N. Y.

McCall, Wesley Bernard, '38, Scott and White Hospital, Temple 5, Tex.

McCarl, James Walter, '48, Medical Center, Greenbelt, Md.

McCarthy, Frank M., '43, First Natl. Bank Bldg., Olean, N. Y.

McCarthy, Harry Bryan, '38, 618 W. Lombard St., Baltimore 1, Md.

McCartney, James Robt., '49, Box 4203, Shreveport, La.

McCarty, Gird Astor, '50, 401 Standard Life Bldg., Jackson, Miss. McCarty, Wm. D., '38, 1208 Nix Professional Bldg., San Antonio 5, Tex.

McCasland, Roy F., '49, Box 486, Tulia, Tex.

McCauley, Dallas Ramsey, '51, 410 South Beverly Dr., Beverly Hills, Calif.

McClelland, William D., '48, 405 Park Bldg., Pittsburgh, Pa.

McClung, John A., '32, 401 Pepper Bldg., Winston-Salem, N. C.

McCole, Patrick A., '32, 3935 Legation St., N.W., Washington 15, D. C. McCormack, Ormonde Jerome, '50, 400 Keith Theatre Bldg., Syracuse,

N.Y.

McCoy, James D., '22, 405 N. Bedford Drive, Beverly Hills, Calif. McCrea, Marion W., '45, University of Maryland, School of Dentistry, Baltimore, Md.

McCready, William A., '31, 1115 Highland Bldg., Pittsburgh 6, Pa. McDowell, Rex McKinley, '43, 2049-A, S.E., Madison, Portland, Ore. (Army-regular, retired)

McElrath, Hugh M., '31, Murray, Ky.

McGee, George Franklin, '46, 450 Sutter St., San Francisco, Calif.

McGehee, Wm. H. O., '33, 16th and R. St., Washington 9, D. C.

McInnis, Harry B., '50, U. S. Depot of Supplies, Barstow, Calif. (Navyregular)

McIntosh, William G., '50, 170 St. George St., Toronto, Canada

McKee, William A., '48, Benton, Ill.

McIntyre, John Robert, '48, % U. S. Naval Advance Base, Bremerhaven, Germany, % FPO, New York (Navy-regular)

McKivergan, Charles F., '49, 102 Water St., Providence, R. I.

McLaughlin, Wm. John, '38, 601 Medical Bldg., Bridgeport 3, Conn.

McLean, Gordon, '31, % The Canadian Dental Association, 211 Huron St., Toronto, Canada (marked "Please forward")

McLeod, Walter G., '43, 400 Blount Bldg., Pensacola, Fla.

McMurray, Carl Ernest, '51, 1411 58th St., Philadelphia, Pa.

McMurray, Crawford Andes, '49, Alexander Bldg., Ennis, Tex.

McNeil, William Clarence, '45, Silsbee, Tex.

McNerney, James M., '42, 8126 Jenkins Arcade Bldg., Pittsburgh 22, Pa.

McNulty, Robert W., '41, 1508 Capistrano Ave., Glendale, Calif.

McNulty, Wilbur Palmer, '48, 3501 S. Harrison St., Fort Wayne, Ind.

McParland, John F., '45, 517 Medical Arts Bldg., Pittsburgh, Pa.

McRimmon, David C., '38, 807 Medical Arts Bldg., Fort Worth 2, Tex.

Meachum, Forrest W., '33, 911 Hamilton Natl. Bank Bldg., Chattanooga, Tenn.

Mead, Sterling V., '43, 1149 16th St., N.W., Washington 6, D. C.

Mehringer, Edward J., '51, 260 Smallwood Drive, Buffalo, N. Y. Meisburger, L. Halliday, '40, 172 Summer St., Buffalo 2, N. Y. Meisel, Emanuel George, '29, 121 University Place, Pittsburgh 13, Pa. Meisser, John Geo., '38, 1540 Hanna Bldg., Cleveland, Ohio Mentzer, Wm. Edward, '37, 1108 Medical Arts Bldg., Duluth 2, Minn. Merchant, Henry A., '38, 1228 Medical Arts Bldg., Omaha 2, Neb. Merkeley, Howard J., '49, 613 Medical Arts Bldg., Winnipeg, Canada Merritt, Arthur H., '23, 580 Fifth Ave., New York 19, N. Y. Mershon, John Valentine, '40, 1520 Spruce St., Philadelphia 2, Pa. Mesjian, Harry A., '50, 3922 Chestnut St., Philadelphia, Pa. Messner, Jack Mennefee, '51, Army Air Force, 1100th Dental Flight, Bolling Air Force Base, Washington, D. C. (Army-regular) Messore, Michael B., '49, 807 Union Trust Bldg., Providence, R. I. Metcalf, John Carroll, '49, 1340 Granada Ave., San Marino, Calif. Metz, Harry Cameron, '29, 1201 Highland Bldg., Pittsburgh 6, Pa. Metz, Karl Hugo, '40, 0-138403 Camp Breckenridge, Ky. (Army-reserve) Metzger, Frederick J., '50, 306 Brisbane Bldg., Buffalo, N. Y. Meyer, Francis P., '50, 2 Hall St., St. Petersburg, Fla. Meyers, Charles Edward, '51, Naval Dental School, Bethesda, Md. (Navy-regular) Michaels, Manly, '50, 915 19th St., Washington, D. C. *Midgley, Albert L., '21, 1108 Union Trust Bldg., Providence 3, R. I. Mihnos, Frank, '48, 920 Selling Bldg., Portland, Ore. Milas, Vincent B., '48, 2559 W. 63rd St., Chicago, Ill. Miller, Donald Henry, '47, 109 Walnut St., Elmira, N. Y. Miller, E. Carl, '46, 13859 Euclid Ave., East Cleveland, Ohio Miller, Ellis Henry, '46, Reading Hospital, Reading, Pa. Miller, James S., '44, U. S. Public Health Service, 8608 Irvington Ave., Bethesda, Md. (U.S.P.H.S.)

Miller, Paul Anderson, '51, Walter Reed Hospital, Washington, D. C. (Army-regular)

Miller, Samuel Charles, '38, 57 West 57th St., New York 18, N. Y. Milliette, Gerald Thos., '38, 735 N. Water St., Milwaukee 2, Wis.

Millhon, Jerry A., '45, 411 East Capitol, Springfield, Ill.

Millikin, John D., '22, 490 Post St., San Francisco 2, Calif.

Mills, Edward Cook, '31, 220 S. Cassady Ave., Columbus, Ohio

Mills, Robert H., '40, 4000 Cathedral St., N.W., Washington, D. C. (Army-regular, retired)

Mills, Sam Elrod, '46, 1620 Medical Arts Bldg., Houston, Tex.

Mimmack, Edward F., '40, 266 Bryant St., Buffalo 9, N. Y.

Miner, Leroy M. S., '29, 363 Marlboro St., Boston 15, Mass.

Minges, Clyde Estes, '47, Peoples Bank Bldg., Rocky Mount, N. C. Mitchell, Edward L., '37, 701 Hume Mansur Bldg., Indianapolis 4, Ind. Mitchell, Gerald Alexander, '38, 912 Candler Bldg., Atlanta 3, Ga.

Mitchell, Louis Donald, Jr., '49, U. S. Naval Dental School, Bethesda,

Md. (Navy-regular)

Mitchell, Ronald A., '50, 1300 8th Ave., Wichita Falls, Tex. Mitchell, Roy Douglas, '42, 731 Candler Bldg., Atlanta 3, Ga.

Moen, Obed H., '40, Masonic Temple, Watertown, Wis.

Molt, Frederick F., '32, 728 Medical and Dental Bldg., Seattle 1, Wash.

Monheim, Leonard M., '51, Presbyterian Hospital, Pittsburgh, Pa.

Monroe, Chas. Alexander, '38, Box 226, Boulder, Colo.

Montgomery, W. Ray, '45, 675 Delaware Ave., Buffalo, N. Y.

Moore, Fred Percival, '32, 900 Bank of Commerce Bldg., Hamilton, Canada

Moore, Geo. Raymond, '39, University of Michigan, Ann Arbor, Mich. Moore, Norman August, '38, 5507 Charlotte St., Kansas City 4, Mo.

Moore, Robert H., '50, U. S. Marine Hospital, Stapleton, N. Y. (U.S. P.H.S.)

Moore, Russell Lee, '48, 212 First Citizens Nat. Bank Bldg., Dyersburg, Tenn.

Moose, Sanford M., '35, 450 Sutter St., San Francisco 2, Calif.

Moran, Michael J., '34, Deming, New Mexico

Morgan, George E., '33, 2018 E. North Ave., Milwaukee, Wis.

Morin, Edward C., '50, 156 Broadway, Pawtucket, R. I.

Mork, Waldo H., '26, 501 Madison Ave., New York 22, N. Y.

Morrey, Lon W., '33, 222 E. Superior St., Chicago, Ill.

Morris, Emory W., '38, Kellogg Foundation, Battle Creek, Mich.

Morris, Glenn Seay, '42, 2711 Crocker St., Houston, Tex.

Morris, James Harold, '47, Hudson River State Hospital, Poughkeepsie, N. Y.

Mortonson, James C., '27, 735 N. Water St., Milwaukee 2, Wis.

Mortonson, Morton H., '27, 735 North Water St., Milwaukee 2, Wis.

Moulton, George H., '51, 1703 Cody Drive, Silver Springs, Md. (Armyregular)

Mowry, Daniel Prescott, '45, Faculty of Dentistry, McGill University, Montreal, Canada

Moxham, Harry C., '36, "Wyoming", Macquarie St., Sydney, Australia Mueller, Emil, '29, 25 E. Washington St., Chicago 1, Ill.

Muir, Norborne F., '38, 713 Shenandoah Life Bldg., Roanoke 11, Va.

Mullaney, Michael Lawrence, '26, 1201 Union Trust Bldg., Providence, R. I.

Muller, Cecil George, '48, 1516 Medical Arts Bldg., Omaha, Neb. Mullett, Harrison J., '36, West China Union University, Chengtu, Szechwan, China

Murphy, Edward G., '42, 9 Rockefeller Plaza, New York 20, N. Y. Murphey, Phelps John, '51, Fairmont at Welborn, Dallas, Tex.

Murphey, Willis Hull, '48, 1216 Medical Arts Bldg., Fort Worth, Tex.

Murto, Charles B., '50, 1223 Noyes Drive, Silver Springs, Md.

Musselman, Paul K., '48, 143 W. Main St., Newark, Delaware

Muzzey, Ivor P., '38, 521 Main St., Athol, Mass.

Myers, Lester E., '38, 1229 Medical Arts Bldg., Omaha 2, Neb.

Myers, Raymond E., '38, 129 E. Broadway, Louisville, Ky.

Nachazel, Delbert P., '40, 425 E. Wisconsin Ave., Milwaukee 3, Wis.

Nail, William R., '48, 1104 Medical Arts Bldg., Dallas, Tex. Neblett, W. Stuart, '48, 3705 Main St., Riverside, Calif.

Nelson, Charles, '37, Hodgson Block, Fergus Falls, Minn.

Nelson, Clarence A., '34, Amery, Wisconsin

Nelson, Earl Allen, '42, 711 Medical Arts Bldg., Minneapolis 2, Minn.

Nelson, Harry W., '29, 1747 Medical Arts Bldg., Minneapolis 2, Minn. Nesbitt, Kenneth Irwin, '36, 450 Sutter St., San Francisco 2, Calif.

Nestler, Edw. J., '29, 230 Park Ave., New York, N. Y.

Neuber, Augustave, '47, 619 Union St., Schenectady, N. Y.

Nevitt, George Allen, '44, Federal Security Agency, Region VII, Fidelity Bldg., 911 Walnut St., Kansas City, Mo. (U.S.P.H.S.)

Newman, Eugene W., '48, 16 Wallace St., Red Bank, N. J.

Newton, Walter Thos., '38, 2008 Esperson Bldg., Houston 2, Tex.

Nicaud, Wallace M., '43, 805 Maison Blanche, New Orleans 12, La.

Niiranen, John Victor, '51, 4607 West Virginia Ave., Bethesda, Md. (Navy-regular)

Norman, Robert C., '46, 100 S. 4th St., Guthrie Center, Ia.

North, Eugene J., '50, 143 Bryant St., Buffalo, N. Y.

Northrop, Philip Munro, '51, 705 N. University Ave., Ann Arbor, Mich.

Noyes, Frederick B., '21, 621 Park Place, Park Ridge, Ill.

Noyes, Harold J., '38, University of Oregon, School of Dentistry, Portland, Ore.

Nuckolls, James, '40, University of California, College of Dentistry, Medical Center, San Francisco, Calif.

Nuttall, Ernest B., '46, 5811 Clearspring Road, Baltimore, Md.

Nygard, Arthur Louis, '35, 1232 Medical Arts Bldg., Dallas 1, Tex.

O'Brien, Lane Woodrow, '48, 5236-A Gravois Ave., St. Louis, Mo.

O'Brien, Paul Francis, '38, Missouri Theatre Bldg., St. Louis 3, Mo.

O'Farrell, James Daughtry, '40, 1025 Medical Arts Bldg., Houston 2, Tex. O'Grady, George L., '46, 97th General Hospital, A.P.O.P.M. New York, N. Y. (Army-regular)

O'Halloran, Frank H., '43, 410 Hulman Bldg., Evansville 18, Ind.

O'Hearn, Leo James, '40, 184 North St., Pittsfield 10, Mass.

O'Leary, Joseph T., '40, Girard, Pa.

O'Neill, Daniel F., '50, 456 W. Water St., Elmira, N. Y.

Oartel, John Sheldon, '35, Army Medical Service Graduate School, Dental Division, Washington, D. C. (Army-regular)

Oatman, Clyde D., Jr., '50, Station Hospital, Camp Rucker, Ala. (Armyregular)

Obrey, Lawrence Jarvis, '45, 93 Wilshire Park, Needham, Mass.

Obst, Joseph J., '51, 8 Seventh Ave., Brooklyn, N. Y.

Oesterling, Benj. W., '50, U. S. Naval Hospital, Corona, Calif. (Navy-regular)

Ogden, John J., '32, 1005 Sterick Bldg., Memphis 3, Tenn.

Oggesen, Walter L., '40, St. Paul and 23rd St., Baltimore 18, Md.

Ogle, Willard, '38, 6858 Lorna Lane, Dallas, Tex.

Olafsson, Olaf J., '29, 55 E. Washington St., Chicago 2, Ill.

Olds, Fred B., '43, 727 W. 7th St., Los Angeles 14, Calif.

Olive, Robert M., '38, Box 1223, Fayetteville, N. C.

Oliver, Oren Austin, '27, 1915 Broadway, Nashville, Tenn.

Oman, Carl R., '48, 630 W. 168th St., New York, N. Y.

Oppice, Harold W., '49, 1002 Wilson Ave., Chicago, Ill.

Ortion, Edward Joseph, '44, 1 East 57th St., New York 22, N. Y.

Ortolani, Francis C., '50, 171 Tremont St., Boston, Mass.

Osborn, Harry E., '50, 604 Farragut Medical Bldg., Washington, D. C

Osmun, Willis R., '50, 580 Newark Ave., Elizabeth, N. J.

Ostrander, Floyd Darl, '50, University of Michigan, School of Dentistry, Ann Arbor, Mich.

Ostrem, Carl Theodore, '38, 1107 Equitable Bldg., Des Moines 9, Ia.

Oulliber, V. John, '51, 3798 25th St., San Francisco, Calif.

Outlaw, Joseph W., Sr., '40, 2444 Broadway, Beaumont, Tex.

Owings, James Rembert, '51, 7 Medical Court, Greenville, S. C.

Padelford, Donald C., '47, 906 Medical Arts Bldg., Rochester, N. Y.

Paffenbarger, George C., '35, Dausonville, P.O., Boyds, Md.

Page, Norman Edgar, '50, 503 S. Conkling Drive, Baltimore, Md.

Pallardy, Sumner, '47, 250 Barclay Road, Upper Darby, Pa.

Pallen, Robert Lester, '38, 5870 Cartier St., Vancouver, B. C.

Palmer, Bissell B., '28, 2 East 54th St., New York, N.Y

Pammenter, Elmer J., '48, 92 Pine Grove Ave., Rochester, N. Y.

Pankey, Lindsey Dewey, '36, 138 Alhambra Circle, Coral Gables, Fla.

Pankow, Charles A., '40, 902 Main St., Buffalo 2, N. Y.

Pankow, Charles W., '51, 902 Main St., Buffalo, N. Y.

Paquin, Ozias, Jr., '44, U. S. Coast Guard Academy, New London, Conn. (U.S.P.H.S.)

Parkinson, David Talbot, '36, 729 Beacon Bldg., Wichita, Kans.

Parke, Gerald Linscott, '51, Dental Div. Bu. Med. & Surgery Dept., Navy, Washington, D. C. (Navy-regular)

Parks, Claude M., '50, 803 Wachovia Bank Bldg., Winston-Salem, N. C.

Parks, Samuel Ragland, '39, 1505 Medical Arts Bldg., Dallas 1, Tex.

Partridge, Benjamin Sherwin, '28, 1305 East 63rd St., Chicago 37, Ill. Pattishall, Harold B., '42, 225 West Ashley St., Jacksonville, Fla.

Patton, Chas. H., '50, 235 S. 15th St., Philadelphia, Pa.

Patton, Ernest W., '34, 1807 Comer Bldg., Birmingham 3, Ala.

Patton, Everett Kenny, '48, Fleet Marine Force, Atlantic South Annex, Naval Base, Norfolk, Va. (Navy-regular)

Pattridge, Mark O., '38, 1648 Medical Arts Bldg., Minneapolis 2, Minn.

Payne, S. Howard, '49, 25 Goodrich St., Buffalo, N. Y.

Pearce, James Henry, '48, 55 E. Washington St., Chicago, Ill.

Pearce, Matthew C., '50, 15 Washington St., Newark N. J.

Peate, Leslie Wilson, '49, Medical Arts Bldg., Klamath Falls, Ore.

Peavy, Daniel C., '44, 746 Milam Bldg., San Antonio 5, Tex.

Peck, Merritt Edw., '42, Jeffersonville, Ind.

Pell, Glenn Jasper, '31, 505 Hume Mansur Bldg., Indianapolis 4, Ind. Pelton, Walter J., '43, Chief, Division of Dental Resources, Room 3062,

Federal Security Bldg., So., Washington, D. C. (U.S.P.H.S.)

Pendleton, Elbert Crosby, '41, 5550 Kenmore Ave., Chicago, Ill.

Penn, Ernest B., '42, 901 Huntington Bldg., Miami 32, Fla.

Peplow, Edward Hadduck, '48, 40 W. State St., Trenton, N. J.

Perdue, George Garnet, '51, 763 Fisher Bldg., Detroit, Mich.

Perkins, Harry Winfield, '39, 29 Commonwealth Ave., Boston 16, Mass.

Perry, Chester, '47, 16350 E. Warren Ave., Detroit, Mich.

Peterka, Charles, '45, 805 Medical Arts Bldg., Minneapolis, Minn.

Peters, Maurice E., '37, 20 Charlesgate West, Boston 15, Mass.

Peterson, Clarence E., '40, 9 Elm St., Rockville, Conn.

Peterson, L. W., '50, 4559 Scott Ave., St. Louis, Mo.

Peterson, Lowell N., '49, 450 Sutter St., San Francisco, Calif.

Petray, Henry C., '38, 809 Medical Bldg., Oakland 12, Calif.

Pfeiffer, Frederick F., '40, 654 Madison Ave., New York 21, N. Y.

Pharr, John R., '48, Professional Bldg., Charlotte, N. C. Phillips, George A., '48, 31 Central St., Bangor, Maine

Phillips, John H., '24, 2117 Blair Blvd., Nashville 5, Tenn.

Phillips, Percy T., '39, 18 East 48th St., New York 17, N. Y.

Phillips, Stanley J., '51, 12½ Simcoe St., Oshawa, Ont., Canada

Pierson, Fritz A., '38, 1112 Federal Securities Bldg., Lincoln 8, Neb. Pike, Jay N., '46, 811 Medical Arts Bldg., Minneapolis, Minn. Pike, Joe M., '43, 811 Medical Arts Bldg., Minneapolis, Minn. Pilkington, Ernest Leon, '39, 1729 David Whitney Bldg., Detroit 26, Mich.

Pincock, Douglas F., '47, 311 First Security Bldg., Odgen, Utah Platt, Geston M., '40, 2405 San Jacinto St., Houston, Tex. Plummer, Ralph E., '49, 1425 Medical Dental Bldg., Seattle, Wash. Poe, Earl J., '38, 818 Olive St., St. Louis 1, Mo. Poindexter, Charles C., '41, Jefferson Life Bldg., Greenboro, N. C. Poindexter, J. Bernard, '38, Professional Bldg., Huntington 1, W. Va. Pond, William R., '32, Merchants Row, Rutland, Vermont Porter, Chastain G., '37, 255 Plaza Bldg., Kansas City, Mo. Porter, Lowrie J., '37, 41 East 57th St., New York 22, N. Y. Postle, Wendell Dean, '40, College of Dentistry, Ohio State University, Columbus 10, Ohio

Powers, George L., '25, 6906 Lakewood Blvd., Dallas, Tex. Pratt, Frank Hawley, '51, 7710 Crest Drive, Seattle, Wash. Pratt, Frederick W., '50, 9 Rockefeller Plaza, New York, N. Y. Preis, Kyrle Wm., '42, 700 Cathedral St., Baltimore 1, Md. Prejean, Bernard Marcel, '51, U.S.P.H.S. Hospital, Carlville, La. (U.S. P.H.S.)

Preston, John L., '42, P.O. Box 300, Wichita Falls, Tex. Prezzano, Wilbur J., '49, Medical Centre, White Plains, N. Y. Price, Robert Emmett, '39, 54 Winslow Road, Newark, Del. Price, Thomas A., '51, 808 Congress Bldg., Miami, Fla. Prichard, John F., '44, 4121 Camp Bowie Blvd., Fort Worth, Tex. Pridgen, Dallas Leroy, '38, 115 Bow St., Fayetteville, N. C. Prime, Frank V., '39, 1495 South Liberty St., Salem, Ore. Prince, M. Webster, '33, 7634 Dexter Blvd., Detroit 6, Mich. Prindle, V. Arthur, '51, 760 Market St., San Francisco, Calif. Pritchard, George P., '39, 312 Dillingham Bldg., Honolulu, T.H. Pritchard, Griffith G., '48, 130 Woodward Ave., Buffalo, N. Y. Proctor, Hobart Hazlett, '48, 412 Metropolitan Bldg., Denver, Colo. Pruden, Kenneth C., '34, 44 Church St., Paterson I, N. J. Pryor, Walter J., '38, 1020 Rose Bldg., Cleveland 15, Ohio Psayla, Joseph Emile, '37, 1108 Maison Blanche, New Orleans 16, La. Purcell, James Leo, '44, District Dental Office, Navy #128, % Fleet P.O., San Francisco, Calif. (Navy-regular) Purcell, Thomas E., '33, 907 Waldheim Bldg., Kansas City, Mo. Pyott, James Edward, '41, 206 Medical Arts Bldg., Baltimore 1, Md. Queern, John B., Sr., '50, 1130 State St., Schenectady, N. Y.

Raasch, Frank O., '44, 2116 Ave. D., Kearney, Neb.

Racey, Arthur Gerald, '50, 1414 Drummond St., Montreal, Canada

Rader, George C., '49, U. S. S. Philippine Sea (cv-47) % F.P.O., San Francisco, Calif. (Navy-regular)

Radusch, Dorothea Franke, '50, 832 LaSalle Bldg., Minneapolis, Minn.

Randall, W. Marcus, '29, 1035 Secons St., Louisville 3, Ky.

Randolph, Milton F., '39, 1414 Medical and Dental Bldg., Seattle, Wash.

Ranfranz, Oscar E., '41, 1518 Medical Arts Bldg., Houston 2, Tex.

Rath, Walter A., '51, 1835 Eye St., N.W., Washington, D.C.

Ratté, Gustave, '50, 140 St. John St., Quebec, Canada

Rault, Clemens V., '34, Georgetown University, School of Dentistry, Washington, D. C.

Ray, Harold G., '49, Univ. of California, College of Dentistry, San Francisco, Calif.

Redeman, Ernest H., '42, 1723 Main St., Marinette, Wis.

Redpath, George Wm., '45, 318 Medical Dental Bldg., Portland, Ore.

Reese, Sylvanus F., '50, Weymouth and Atlantic Ave., Ventnor, N.J.

Regan, Thomas P., '43, Helena, Mont.

Reichmann, Francis J., '38, 514 Medical Arts Bldg., Oklahoma City 2, Okla.

Reid, Harvey W., '47, 195 Yorge St., Toronto, Canada Reid, Howard Hill, '45, 18 South Main St., Barre, Vt.

Renfrow, Louis H., '42, 1712 G. St., N.W., Washington, D. C. (Armyreserve)

Reock, Ernest Clifton, '39, 367 Washington St., Belleville 9, N. J.

Rial, Bruce Poole, '32, 4612 Bayard St., Pittsburgh 13, Pa.

Richards, Albert James, '40, 735 David Whitney Bldg., Detroit 26, Mich.

Richison, Frank A., '42, Dental Clinic, Marine Air Station, Cherry Point, N. C. (Navy-regular)

Richmond, Fred A., '31, 861 Brotherhood Bldg., Kansas City 10, Kans. Rider, Thomas T., '38, 9 Higgins Block, Missoula, Mont.

Riebe, Herman Paul, '45, Dental Detachment, U. S. MCRD, Parris Island, S. C. (Navy-regular)

Riesner, Joseph L., '50, 745 Fifth Ave., New York, N. Y.

Riesner, Sidney E., '39, 136 East 36th St., New York 16, N. Y.

Rinehart, Roy James, '25, 1108 E. 10th St., Kansas City 6, Mo.

Risser, Stella, '51, 721 Medical Arts Bldg., Houston, Tex.

Ritchey, Beryl, '48, 629 N. Nevada Ave., Colorado Springs, Colo.

Ritsert, Ernest F., '47, Oxford Rd. and Penn St., Philadelphia, Pa.

Robb, Malcolm, '38, 5167 Rosa, St. Louis, Mo.

Roberts, Arthur L., '50, Aurora Nat. Bank Bldg., Aurora, Ill. Roberts, C. W., '30, 7 Upper Harley St., Regents Park, London, England Roberts, Jay George, '45, 471 Linwood Ave., Buffalo 9, N. Y. Roberts, Myron A., '46, 471 Linwood Ave., Buffalo 9, N. Y. Roberts, Zenas T., '40, 1955 Forrest Parkway, Denver 7, Colo. Robertson, Garrett P., '40, 1703 Nix Bldg., San Antonio 5, Tex. Robinson, J. Ben. '23, 618 W. Lombard St., Baltimore 1, Md. Robinson, Saul C., '49, 1203 Selling Bldg., Portland, Ore. Rochon, René', '47, 630 E. Jefferson Ave., Detroit, Mich. Rodgers, Frank C., '38, 903 Missouri Theatre Bldg., St. Louis 3, Mo. Rogers, Alfred Paul, '42, 60 Charlesgate West, Boston 15, Mass. Rogers, Andrew Wier, '49, Box 631, Corsicana, Tex. Rogers, Fred H., '38, 67 Leonard St., Boston, Mass. Rogers, Roy L., '38, 909 Medical and Professional Bldg., Amarillo, Tex. Rohde, Arthur C., '26, 324 E. Wisconsin Ave., Milwaukee 2, Wis. Rollins, Fred Goldsmith, '32, 93 Central St., Wollaston, Mass. (Veteran's Administration)

Romnes, Arne Foster, '47, 55 E. Washington St., Chicago, Ill. Rose, Armand M., '50, 197 Lorraine Ave., Upper Montclair, N. J. Rosenbaum, William, '50, 111 E. 56th St., New York, N. Y. Rosenthal, S. Leonard, '49, Medical Arts Bldg., Philadelphia, Pa. Ross, John W., '50, 1520 Spruce St., Philadelphia, Pa. Rossman, John Harold, '48, 333 Medical Arts Bldg., Portland, Ore. Rothner, Jacoby T., '50, 1418 Medical Arts Bldg., Philadelphia, Pa. Rounds, Jack S., '43, 603 Wilshire Professional Bldg., Los Angeles, Calif. Rowlett, Alfred Ernest, '48, 238 London Road, Leicester, England Rudolph, Charles E., '31, 909 Pillsbury Bldg., Minneapolis 2, Minn. Rule, Robert W., Jr., '41, 450 Sutter St., San Francisco 2, Calif. Rusca, Felix St. Elmo, '34, 3943 Chestnut St., Philadelphia 4, Pa. Rushing, Shade P., '37, 212 Armstrong Bldg., El Dorado, Ark. Russell, Carl Purvis, '50, 17 State Circle, Annapolis, Md. Rutledge, Clarence E., '43, 2500 Bissell Ave., Richmond, Calif. Ryan, Daniel W., '46, Ninth Naval District, Great Lakes, Ill. (Navyregular)

Ryder, William B., '45, 2000 Van Ness Ave., San Francisco, Calif. Sager, Aubrey Palmer, '51, 1212 Medical Arts Bldg., Philadelphia, Pa. Sager, Louis E., '39, 818 South St., Roslindale 31, Mass. Salisbury, Paul Crandle, '48, 55 E. Washington St., Chicago, Ill. Salman, Irving, '47, 250 West 57th St., New York, N. Y. Salzmann, Jacob Amos, '51, 654 Madison Ave., New York, N. Y. Samuel, James H., '40, 116–19th Ave., North, Lake Worth, Fla. Sand, Russell Agern, '40, 807 N. Broadway, Fargo, N. Dak.

Sanders, Cleon Walton, '50, 203 1st Citizens Bldg., Benson, N. C. Sandman, George H., '47, U.S.S. Orion, % Fleet P.O., New York, N. Y. (Navy-regular)

Sanner, Charles G., '43, 1188 Wood St., Dubuque, Ia. Sargeant, Walter S., '40, 648 Nicholas Bldg., Toledo 4, Ohio Sauer, Raymond J., '38, 30 N. Michigan Ave., Chicago 2, Ill.

Sault, Jack H., '50, U. S. Naval Hospital, Philadelphia, Pa. (Navy-regular)

Saunders, Alonzo E., '49, 809 Security Bldg., Long Beach, Calif.

Sausser, Emerson R., '37, 269 S. 19th St., Philadelphia, Pa.

Sawyer, Carl Woodward, '40, 1108 E. 10th St., Kansas City 6, Mo.

Sayre, Loren Dana, '34, 30 N. Michigan Ave., Chicago 2, Ill. Schaefer, Frederick W., '40, 721 Barker Bldg., Omaha 2, Neb.

Schantz, Curtiss W., '46, Fleet Force Dental Officer, Pacific Fleet, Box 26, % Fleet Postoffice, San Francisco, Calif. (Navy-regular)

Schelpert, John W., Jr., '39, 125 Prospect Ave., Mt. Vernon, N. Y.

Schenk, Worthington G., '48, 40 Gates Circle, Buffalo, N. Y.

Scheu, Carl H., '49, 14805 Detroit Ave., Lakewood, Ohio

Scheumann, William F., '43, 33 Lincoln Ave., Buzzards Bay, Mass. (Army-regular)

Schlack, Carl August, '49, Naval Medical Research Institute, Bethesda, Md. (Army-regular)

Schlosser, Rudolph O., '32, 55 E. Washington St., Chicago 11, Ill.

Schmid, Sylvester A., '48, 709 Provident Bank Bldg., Cincinnati, Ohio Schmidt, Frederick E., '48, 144 S. Harrison St., E. Orange, N. J.

Schneer, Jacob Bernard, '39, 1035 Dickens Ave., Far Rockaway, N. Y.

Schneider, E. J. H., '44, 519 Prospect St., Maplewood, N. J.

Schneider, Francis Mathias, '51, 240 Bradley St., New Haven, Conn.

Schoeny, Leo John, '46, 729 Maison Blanche, New Orleans, La.

Schopper, Arthur F., '47, 914 Professional Bldg., Kansas City, Mo.

Schork, Charles J., '51, U. S. Naval Tr. Station, Bainbridge, Md. (Navy-regular)

Schott, Carlos H., '31, 1004 Neave Bldg., Cincinnati 2, Ohio

Schultz, Louis Charter, '40, University of Michigan, Ann Arbor, Mich.

Schultz, Wiley F., '51, 624 Hanna Bldg., Cleveland, Ohio

Schulze, Herbert E., '50, 1st National Bank Bldg., Navasto, Tex.

Schuyler, Clyde H., '32, 400 Madison Ave., New York 17, N. Y.

Schwartz, Philip L., '39, 49 Bayard St., New Brunswick, N. J.

Schweitzer, Jerome M., '51, 730 Fifth Ave., New York, N. Y.

Scott, George B. 122 1214 Missouri Theatre Bldg. St. Louis 2 Mo.

Scott, George B., '43, 1214 Missouri Theatre Bldg., St. Louis 3, Mo. Scott, Jay D., '38, 315 Alemada Road, Kansas City 2, Mo.

Scott, Saxon Bird, '29, 291 Geary St., San Francisco 2, Calif. Scroggie, Robert A., '44, U.S.P.H.S. Hospital, Lexington, Ky. (U.S. P.H.S.)

Scrivener, Charles A., '49, 344 Fourteenth St., San Francisco, Calif. Scruggs, Anderson McLaren, '35, 11, The Prado, N.E., Apt. 1, Atlanta, Ga.

Searl, Clarence A., '43, Owatonna, Minn.

Sebald, H. Adler, '47, 404 Castell Bldg., Middletown, Ohio

Sebelius, Carl L., '49, Tennessee Dept. of Health, Nashville, Tenn.

Selberg, Alver, '35, 344 Fourteenth St., San Francisco 3, Calif.

Selden, Joseph L., '29, 118 S. Perterson Ave., Louisville 6, Ky.

Seldin, Harry M., '49, 57 West 57th St., New York, N. Y.

Selleck, George A., '35, 450 Sutter St., San Francisco 8, Calif.

Seyler, Alfred Edward, '44, 14615 E. Jefferson Ave., Detroit 26, Mich. Shackelford, John H., '39, 1601 David Whitney Bldg., Detroit 26, Mich.

Shaffer, Oliver J., '45, 1101 First Natl. Bank Bldg., El Paso, Tex.

Shannon, Walton, '50, 409 Lamar Life Bldg., Jackson, Miss.

Shapiro, Benjamin, '39, 849 Eastern Parkway, Brooklyn 13, N. Y.

Shapiro, Jacob, '39, 766 Eastern Parkway, Brooklyn 13, N. Y.

Shapiro, Raymond N., '50, 142 Joralemon St., Brooklyn, N. Y.

Shapiro, Simon, '38, 142 Joralemon St., Brooklyn, N. Y.

Sharp, J. Guilford, '49, 604 Medical Arts Bldg., Knoxville, Tenn.

Shaw, Wm. S., '39, 304 First Natl. Bank Bldg., Fargo, N. Dak.

Sheffield, Neal, '41, 304 Dixie Bldg., Greensboro, N. C.

Shehan, Daniel Edward, '41, 619 Medical Arts Bldg., Baltimore 1, Md. Shellman, Joseph F., '38, Creighton University, Dental Dept., Omaha, Neb.

Shepard, Earl E., '46, 4500 Olive St., Lister Bldg., St. Louis, Mo.

Sheppard, Clyde C., '50, 2628 Telegraph Ave., Berkeley, Calif.

Sherwood, Paul P., '49, 2165 Adelbert Rd., Cleveland, Ohio

Shonfield, Leo, '44, 631 Jenkins Arcade, Pittsburgh 22, Pa.

Shooshan, E. David, '50, 70 N. El Molino Ave., Pasadena, Calif.

Shurr, Raymond Carter, '39, 428 Commercial Natl. Bldg., Muskogee, Okla.

Siegal, Louis R., '50, 750 Main St., Hartford, Conn.

Silberhorn, Otto W., '51, 311 E. Chicago Ave., Chicago, Ill.

Simkins, William Morris, '28, 207 Bal Cross Drive, Miami Beach, Fla.

Simmons, Richard F., '37, 705 Medical Arts Bldg., Norfolk 10, Va.

Simon, William John, '48, University of Minnesota, School of Dentistry, Minneapolis, Minn.

Simpson, Richard Lee, '48, Medical College of Virginia, School of Dentistry, Richmond, Va.

Singleton, Charles R., '45, 535 Medical Arts Bldg., Charleston, W. Va.

Sippel, Harold Edward, '51, 32 Linwood Ave., Buffalo, N. Y.

Sissman, Isaac, '51, 4041 Jenkins Arcade, Pittsburgh, Pa.

Skelton, Oscar G., '43, 1312 Medical Arts Bldg., Dallas 1, Tex. (Armyregular, retired)

Skiff, Mark S., Jr., '49, 702 Medical and Dental Bldg., Portland, Ore.

Skinner, Clawson N., '49, 603 Bank of America, Whittier, Calif.

Skupa, Arthur James, '49, 5853 W. North Ave., Chicago, Ill.

Slaughter, Nathaniel G., '31, Athens, Ga.

Sloan, Alvan Charles, '46, 1514 Medical Arts Bldg., Dallas, Tex.

Sloan, John Ivan, '50, 1032 Rose Bldg., Cleveland, Ohio

Sloman, Ernest G., '38, 344 Fourteenth St., San Francisco 3, Calif.

Small, Donald Meeds, '37, Kennebunk, Maine

Small, Herbert Bates, '38, 82 Church St., Burlington, Vermont

Smedley, Wm. P., '38, 1206 Republic Bldg., Denver 2, Colo.

Smiley, Roy Danks, '48, 1098 W. Michigan Ave., Indianapolis, Ind.

Smith, Alfred E., '51, 1936 S. Carrollton Ave., New Orleans, La.

Smith, Boyd Lee, '49, % Dr. J. W. Parks, Jr., 111 E. Broad St., Newnan, Ga. (Army-regular, retired)

Smith, C. Carroll, '38, 906 N. Sheridan Rd., Peoria 5, Ill.

Smith, Charles M., '39, 727 Jefferson Bldg., Peoria 2, Ill.

Smith, Donald Emerson, '49, 6777 Hollywood Blvd., Hollywood, Calif.

Smith, Earle S., '30, University of Iowa, College of Dentistry, Iowa City, Ia.

Smith, Edward Henry, '29, 216 West Cook Ave., Libertyville, Ill.

Smith, F. Noel, '38, 617 Medical Arts Bldg., Baltimore 1, Md.

Smith, George Albert, '44, 1835 Eye St., N.W., Washington 6, D. C.

Smith, Harry L., '33, Charlottesville, Va.

Smith, J. Melville, III, '50, 1224 Maison Blanche, New Orleans, La.

Smith, Llewellyn J., '50, Peoples Bank Bldg., Biloxi, Miss.

Smith, Lou T., '42, American Trust Bldg., San Jose 21, Calif.

Smith, Paul Rexford, '50, 145 Lisbon St., Lewiston, Maine

Smith, Prescott E., '36, 922 Canal Bank Bldg., New Orleans 12, La.

Smith, Ray Victor, '38, 504 Oakland Ave., Iowa City, Ia.

Smith, Rowe, '51, 405 E. Fifth St., Texarkana, Ark.

Smith, Thomas L. (Major General), '46, 4826 33rd Road, North Arlington 7, Va. (Army-regular)

Smith, Wiley W., '40, 401 Professional Bldg., Baltimore, Md.

Smith, Wm. Sylvester, '44, 450 Sutter St., San Francisco 8, Calif.

Snapp, Ralph B., '40, Berryville, Va.

Snider, Raymond Douglas, '51, 1323 Medical Arts Bldg., Houston, Tex.

Snyder, Charles V., '50, 219 E. Orange St., Lancaster, Pa.

Snyder, Dick Pearl, '38, 137 E. State St., Columbus 15, Ohio Snyder, Louis Frederick, '42, 13th Naval Dist., Hdq., Seattle, Wash.

(Navy-regular)

Snyder, Oscar P., '44, Army Medical Center, Washington, D. C. (Armyregular)

Soderstrom, Ernest F., '45, 409 Beaty Bldg., Modesto, Calif.

Solomon, Harold Arthur, '48, 663 North Oak St., Buffalo, N. Y.

Sommer, Ralph F., '50, University of Michigan, School of Dentistry, Ann Arbor, Mich.

Sommers, E. J., '48, 1115 Equitable Bldg., Des Moines, Ia.

Sommers, Hilmar F., '38, Hamilton Bank Bldg., 5439 Harford Rd., Baltimore, Md.

Sommers, Roy Sherman, '38, 1115 Equitable Bldg., Des Moines 9, Ia.

Sorensen, Hans W., '36, 450 Sutter St., San Francisco 8, Calif.

Sorrin, Sidney, '48, 745 Fifth Ave., New York, N. Y.

Spalding, Edward B., '26, 555 W. Maple Ave., Birmingham, Mich.

Spalding, Grace Rogers, '50, 555 W. Maple Ave., Birmingham, Mich.

Spangenberg, Harry D., Jr., '50, 9 Buttle Ave., Columbus, Ohio.

Spaulding, Ralph L., '50, 236 Broadway, Monticello, N. Y.

Speas, Clarence Jesse, '45, 2122 West End Ave., Nashville 5, Tenn.

Speer, Wayne H., '49, 3104 Gulf Bldg., Houston, Tex.

Speidel, Thomas D., '47, University of Minnesota School of Dentistry, Minneapolis, Minn.

Spence, John Monroe, '51, 1033 Augusta St., Oak Park, Ill.

Spencer, Earl W., '42, 620 Thatcher Bldg., Pueblo, Colo.

Spicer, Albert H., Jr., '35, Westerly, R. I.

Spinney, David F., '38, 1330 Beacon St., Boston 46, Mass.

Spotts, William B., '38, 522 University Club Bldg., St. Louis 3, Mo.

Spratley, Donald A., '45, Medical Building, Mt. Vernon, Wash.

Sprau, Robert L., '27, 970 Baxter Ave., Louisville 4, Ky.

Springsted, James H., '38, 230 Stilz Ave., Louisville, Ky.

Sprinkel, A. Hume, '39, Staunton, Va.

Sproule, Walter K., '43, 1626 Medical Dental Bldg., Vancouver B. C.

Squires, Franklin A., '38, Medical Center, White Plains, N. Y.

Squires, William A., '38, 115 Broadway, New York 6, N. Y.

Stafne, Edward C., '38, Mayo Clinic, Rochester, Minn.

Stahl, Joseph J., '48, 68 Washington St., Garden City, N. Y.

Stanmeyer, William Robt., '51, Dental Dept. U. S. Naval Training Station, Great Lakes, Ill. (Navy-regular)

Staples, George A., '33, 6 Concord St., Nashua, New Hampshire

Stark, Carl John, '49, 1238 Keith Bldg., Cleveland, Ohio

Starr, Frank C., '40, 150 E. Broad St., Columbus 15, Ohio

Starshak, Thomas C., '50, 753 E. 79th St., Chicago, Ill. Steadman, Sherwood R., '44, 1201 Lowry Medical Arts Bldg., St. Paul, Minn.

Steber, Oliver F., '45, 2838 S. Grand Ave., St. Louis, Mo. Steen, John, '50, 601 Bank of America, San Diego, Calif. Steffel, Victor L., '46, 19 West 5th Ave., Columbus, Ohio

Steinmeyer, Herbert P., '49, 3244 E. Douglas, Wichita, Kans.

Steinmiller, George C., '48, Box 2423, Reno, Nevada Stern, Leo, '32, 745 Fifth Ave., New York 22, N. Y.

Stetzer, John J., Jr., '46, 269 South 19th St., Philadelphia, Pa.

Stevens, Walter Wallace, '47, 54 Noxon St., Poughkeepsie, N. Y.

Stewart, Clad C., '44, 709 Power and Light Bldg., St. Petersburg, Fla. Stibbs, Gerald Denike, '48, University of Washington, School of Den-

tistry, Seattle, Wash.

Stickney, Truman L., '37, Wallace Block, Crookston, Minn. Stillson, Wm. Chas., '35, 10208 Euclid Ave., Cleveland 6, Ohio Stillwell, Edw. C., '38, Glen Ridge Arcade, Glen Ridge, N. J.

Stinson, Allison MacCabe, '50, Stewartstown, Pa.

Stoler, Wayne Karlson, '51, 165 W. Lincolnway, Valparaiso, Ind.

Stolworthy, Ralph, '48, 516 Howard Bldg., Providence, R. I.

Stone, John S., '51, Box 285, Clarksburg, W. Va.

Stransky, Irving Milton, '47, 30 N. Michigan Ave., Chicago, Ill.

Stratton, George Allen, '27, Oshkosh, Wis.

Street, William Henry, '48, Medical Arts Bldg., Richmond, Va.

Streett, H. Hayward, '32, 829 Park Ave., Baltimore 1, Md.

Stricker, Carl Henry, '38, 841 Doctors Bldg., Cincinnati 2, Ohio

Strife, Cyril F., '50, 745 Fifth Ave., New York, N. Y.

Strosnider, Charles W., '37, 21 East State St., Columbus 15, Ohio

Strusser, Harry, '50, 175 Fifth Ave., New York, N. Y.

Sturdevant, Roger E., '41, University of North Carolina, School of Dentistry, Chapel Hill, N. C.

Sturm, C. Ray, '38, 7 Park Drive, Fairmont, W. Va.

Suggett, E. D., '48, Jefferson City, Mo.

Sullivan, Allyn F., '49, 171 Westminster St., Providence, R. I.

Sullivan, Joseph David, '38, 919 Toledo Medical Bldg., Toledo 2, Ohio

Sullivan, Robert Fulton, '39, 118 Jones St., Savannah, Ga.

Summers, Howard E., '35, 1015 First Natl. Bank Bldg., Huntington 1, W. Va.

Sundby, Elmer Julius, '38, 825 Medical Arts Bldg., Duluth 2, Minn.

Swanson, Clarence H., '42, Columbus, Mont.

Swanson, Edgar Walford, '40, 25 E. Washington St., Chicago 2, Ill. Swanson, Henry A., '35, 1726 Eye St., N.W., Washington 6, D. C.

Swanson, William F., '32, 5326 Pocusset St., Pittsburgh 17, Pa. Sweeney, John A., '48, 710 Rose Bldg., Cleveland, Ohio Sweet, Charles A., '32, 344 Fourteenth St., San Francisco, Calif. Swett, Alton H., '45, 723 Congress St., Portland, Maine Swepston, Otis L., '51, 1504 Medical Arts Bldg., Dallas, Tex. Swift, Thomas C., '39, 132 Rich Ave., Mt. Vernon, N. Y. Swinehart, Earl W., '28, 717 Medical Arts Bldg., Baltimore 1, Md. Swinehart, D. Robert, '50, 717 Medical Arts Bldg., Baltimore 1, Md. Taber, Loren B., '44, 2212 Lake St., San Francisco, Calif. Taggart, Chas. Ives, '38, 139 Bank St., Burlington, Vt. Talbot, William O., '28, 1508 Commercial Standard Bldg., Fort Worth, Tex.

Tanchester, David, '46, 180 W. 58th St., New York, N. Y. Tannebring, Wm. Chas., '38, 163 Cabot St., Beverly, Mass.

Tartre, Joseph Armand, '40, Dist. Dental Officer, Hdq., 11th Naval Dist., San Diego, Calif. (Navy-regular)

Taylor, Cecil McDow, '41, 1018 Esperson Bldg., Houston 2, Tex.

Taylor, Edward, '41, % State Health Department, Austin, Tex.

Taylor, Elbert Woodson, '38, Harlingen, Tex.

Taylor, Ralph Wm., '43, U. S. Naval Hospital, San Diego, Calif. (Navy regular)

Taylor, Richard P., '37, 414 St. James Bldg., Jacksonville 2, Fla.

Taylor, Walter Elliott, '39, 630 Fifth Ave., New York, N. Y.

Teall, Gordon L., '49, Box 71, Hiawatha, Kans. Teich, Isidore, '51, 535 Fifth Ave., New York, N. Y.

Templeton, James W., '38, 4952 Maryland Ave., St. Louis 8, Mo.

Templeton, Loyd Clayton, '47, 84 Cherry Road, Memphis, Tenn.

Templeton, William J., '50, 709 Medical Arts Bldg., Memphis, Tenn.

Terrell, Wilfrid H., '38, 627 First Trust Bldg., Pasadena I, Calif.

Terry, Harold Knight, '51, 2742 Biscayne Bldg., Miami, Fla.

Terwilliger, Glendon H., '45, 3408 Webster, Oakland, Calif.

Terwilliger, Kenneth F., '46, 450 Sutter St., San Francisco, Calif.

Teuscher, George William, '40, 55 E. Washington St., Chicago 2, Ill. Thatcher, George A., '34, 12 Oakdale St., Brockton 46, Mass.

Thee, Earl John, '49, 3780 Wilshire Blvd., Los Angeles, Calif.

Thielen, Benj. Franklin, '38, Room 8, Sanitarium Clinic, Paris, Tex.

Thiers, Frederick C., '45, 817 Lowry Medical Arts Bldg., St. Paul, Minn.

Thoen, Erling, '29, 1026 Kirkwood Ave., Iowa City, Ia.

Thom, Lewis W., '38, 1546 Medical Arts Bldg., Minneapolis 2, Minn.

Thomas, Bernerd O. A., '48, University of Washington, School of Dentistry, Seattle, Wash.

Thomas, Earle H., '28, 55 E. Washington St., Chicago 2, Ill.

Thomas, Elmer A., '32, Box 603, Hastings, Neb.

Thomas, Kenneth Wilson, '51, 1107 Medical Arts Bldg., San Antonio, Tex.

Thomas, Robert Palmore, '27, 720 Francis Bldg., Louisville 2, Ky.

Thomas, Thomas Heathcote, '39, 1747 Medical Arts Bldg., Minneapolis 2, Minn.

Thompson, Edward C., '47, Carle Clinic, Urbana, Ill.

Thompson, Edward Lauck, Sr., '38, 326½ S. Beach St., Daytona Beach, Fla.

Thompson, Emory C., '38, 1835 Eye St., N.W., Washington, D. C.

Thompson, John Robert, '48, 55 E. Washington St., Chicago, Ill.

Thompson, Walter S., '36, 727 W. Seventh St., Los Angeles 14, Calif.

Thomson, Harry S., '39, 18 Summerhill Gardens, Toronto, Canada

Thorn, Doran S., '40, P.O. Box 671, Bradenton, Fla.

Thornton, Irl Jay, '41, 4407 Oak Lawn, Dallas, Tex.

Thornton, M. H., '39, 180 N. Snelling Ave., St. Paul 4, Minn.

Throndson, Albert H., '48, 209 Post St., San Francisco, Calif.

Tiblier, Sidney Louis, '40, 1141 Canal Bank Bldg., New Orleans 12, La.

Tidwell, R. Bruce, '49, 936 Metropolitan Bldg., Denver, Colo.

Tilden, Thomas E., '47, 552 Medico Dental Bldg., Sacramento, Calif.

Timmons, Gerald D., '36, Temple University, School of Dentistry, Philadelphia, Pa.

Tipton, J. Roscoe, '43, 624 Medical Arts Bldg., Dallas 1, Tex.

Tison, Gordon Beldon, '37, 505 W. University Ave., Gainesville, Fla.

Tocchini, John J., '51, 455 Palm Ave., So., San Francisco, Calif.

Todd, Russell I., '40, Western Union Bldg., Richmond, Ky.

Tolan, Joseph James, '39, 208 E. Wisconsin Ave., Milwaukee 2, Wis.

Toole, Chas. L., Jr., '50, Veterans Hospital, Thomasville, Ga. (Veterans Administration)

Toye, Alfred E., '50, Murphy Army Hospital, Waltham, Mass. (Armyregular)

Trail, William E., '43, Professional Bldg., Frederick, Md.

Travis, John J., '37, 715 Forest Ave., Ann Arbor, Mich.

Traynor, Phillip A., '38, 807 Washington St., Wilmington 43, Del.

Trier, Jerome H., '38, 105 East 85th St., New York, N. Y.

True, Harry A., '30, 344 Fourteenth St., San Francisco 3, Calif.

Trueblood, Roger Ketcham, '50, 25 N. 2nd St., Glendale, Ariz.

Truitt, John Wellington, '51, 341½ E. California Ave., Gainesville, Tex.

Tuck, Robert Franklin, '51, 4010 W. Madison Ave., Chicago, Ill.

Tucker, J. Ross, '41, 813 Candler Bldg., Atlanta 3, Ga.

Tuckfield, William J., '24, Australian College of Dentistry, 193 Spring St., Melbourne, Australia

Tuma, Clarence Frank, '51, 1320 Miles Ave., Cleveland, Ohio

Turner, Lewis Chambers, '38, 845 Milam Bldg., San Antonio 5, Tex. Turnquist, Herbert Ellis, '40, 305 Donaldson Bldg., Minneapolis, Minn. Tweed, Chas. Henry, Jr., '38, 2620 East Broadway, Tucson, Ariz.

Tyler, John Edward, '38, 311 Main St., Worcester, Mass.

Tylicki, B. M., '46, 547 E. Broadway, Long Beach, Calif.

Tylman, Stanley D., '29, 55 E. Washington St., Chicago, Ill. Uebele, Harvey M., '34, 208 E. Wisconsin Ave., Milwaukee 2, Wis.

Ulen, Francis Graeme, '42, U. S. Navy, U. S. Naval Dental Clinic, Washington, D. C. (Navy-regular)

Underwood, Harry Mason, '40, 1003 Medical Arts Bldg., Knoxville 1, Tenn.

Updegrave, William James, '48, 417 W. School House Lane, Philadelphia, Pa.

Van Horn, Chris. S., '32, 424 Iron St., Bloomsburg, Pa.

Van Kirk, Lawrence Edw., '29, University of Pittsburgh, School of Dentistry, Pittsburgh, Pa.

Van Natta, Howard, '40, Medical Arts Bldg., Baltimore 1, Md.

Vail, Walter D., '43, 773 20th Ave., San Francisco, Calif. (Army-regular, retired)

Varnado, Major Brooks, '40, 1239 Maison Blanche, New Orleans 16, La. Vaughan, Clarence B., '37, 363 Marlborough St., Boston 15, Mass.

Vaughn, James J., '34, 1921 Division St., Nashville, Tenn.

Veatch, Henry Clay, '45, 870 Market St., San Francisco, Calif.

Vedder, Francis B., '33, 2033 Norway Road, Ann Arbor, Mich.

Vinsant, Robert Sherman, '31, 1726 Madison Ave., Memphis 4, Tenn.

Vogan, John Wilbur, '41, Alvin, Tex. Voiers, Allen L., '42, Jeffersonville, Ind.

*Volland, Roscoe H., '21, First Natl. Bank Bldg., Iowa City, Ia.

Waddell, J. Clark, '34, 413 Murphy Bldg., E. St. Louis, Ill.

Wade, Juanita, '51, 1304 Medical Arts Bldg., Dallas, Tex.

Wade, Walter Frank, '51, 258 West 10th St., Erie, Pa.

Wagner, Ralph O., '39, 431 30th St., Oakland 9, Calif. Waggener, Donald Todd, '51, Univ. of Neb. College of Dentistry,

Waggener, Donald Todd, '51, Univ. of Neb. College of Dentistry, Lincoln, Neb.

Wahl, Leonard P., '38, 518 First American State Bank Bldg., Wausau, Wis.

Wainwright, William Ward, '40, 808 S. Wood St., Chicago, Ill.

Waite, Sheridan C., '50, 103 Linwood Ave., Buffalo, N. Y.

Wakefield, Bernard G., '40, 333 Linwood Ave., Buffalo 9, N. Y.

Wald, S. S., '38, 745 Fifth Ave., New York, N. Y.

Waldron, Carl William, '28, 950 Medical Arts Bldg., Minneapolis 2, Minn.

Waldron, Ralph, '23, 549 High St., Newark 2, N. J.

Walker, John Lawrence, '48, 640 Barbee Way, South Louisville, Ky.

Walker, J. Lewis, Jr., '51, 403 Medical Arts Bldg., Norfolk, Va.

Walker, Marion Bagley, '46, 618 Medical Arts Bldg., Norfolk, Va.

Walker, Tyler James, '51, 400 Throckmorton Ave., Mill Valley, Calif. (Army-regular)

Walls, James Milton, '34, 1470 Lowry Medical Arts Bldg., St. Paul 2, Minn.

Walls, Milton G., '39, 1470 Lowry Medical Arts Bldg., St. Paul 2, Minn. Walsh, Arthur L., '38, 1122 Drummond Medical Bldg., Montreal, Canada

Walsh, Joseph Richard, '38, 326 Glenn Ave., Short Hills, N. J.

Walsh, Leoarnd Theodore, '39, 442 Thatcher Bldg., Pueblo, Colo.

Walter, Raymond C., '47, 6867 N. 19th St., Philadelphia, Pa.

Walters, Arthur L., '44, 604 Medical and Dental Bldg., Tulsa 3, Okla.

Waltmon, William Knight, '40, Marshall Bldg., Hearne, Tex.

Walton, Charles R. B., '42, 114 Arlington Apartments, Pittsburgh 6, Pa.

Walz, William F., '23, 1114 First Natl. Bank Bldg., Lexington, Ky. Warburton, W. Les., '40, Medical Arts Bldg., Salt Lake City, Utah

Ward, Marcus L., '23, 1308 Cambridge Road, Ann Arbor, Mich.

Warden, Arthur G., '50, 16 Lackawanna Plaza, Orange, N. J.

Wash, Atwood M., '38, Medical Arts Bldg., Richmond 19, Va.

Watkins, Joseph Conrad, '25, 603 Wachovia Bank Bldg., Winston-Salem, N. C.

Waugh, Leuman M., '23, 931 Fifth Ave., New York 21, N. Y.

Wayman, Leon H., '50, 169 Main St., Oneonta, N. Y.

Weaver, Samuel Marshall, '38, 403 Republic Bldg., Cleveland, Ohio

Webb, W. Lester, '43, 201 Lake Park Blvd., Fairmont, Minn.

Webb, William R., '50, 3441 79th St., Jackson Heights, N. Y.

Weber, Faustin Neff, '48, 811 Medical Arts Bldg., Memphis, Tenn.

Weber, Paul M., '50, 1 Engle St., Englewood, N. J.

Weber, Richard Thorp, '51, 1014 Capital Nat. Bank Bldg., Austin, Tex.

Webster, Raymond L., '47, 133 Waterman St., Providence, R. I.

Weinz, Edward C., '51, 713 Wilson Bldg., Syracuse, N. Y.

Weiss, Louis Robert, '49, 1846 Medical Arts Bldg., Minneapolis, Minn.

Wekenman, Charles William, '40, 642 N. 10th St., E. St. Louis, Ill.

Welch, Harold W., '40, 25 E. Washington St., Chicago 2, Ill.

Welker, John J., '38, 1144 Edison Bldg., Toledo 4, Ohio

Weller, Roland Edward, '39, 29 Commonwealth Ave., Boston, Mass.

Wells, Amos S., '37, 700 Physicians and Surgeons Bldg., Minneapolis 2, Minn.

Wells, Benjamin S., '44, 510 Medical Arts Bldg., Baltimore 1, Md.

Wells, C. Raymond, '45, One DeKalb Ave., Brooklyn, N. Y.

Wennerberg, Gunnar N., '39, Box 252, Glencoe, Ill. (Navy-regular, retired)

Werner, Jack, '35, 344 Fourteenth St., San Francisco, Calif. Wertheimer, Fred, '48, Michigan Department of Health, Lansing, Mich. West, Frederick T., '29, 760 North St., San Francisco, Calif. West, John Bernard, '38, 306 W. Church St., Elmira, N. Y. West, Sylvan Edmond, '37, 450 Sutter St., San Francisco 8, Calif. Westcott, Eugene Reed, '48, 1500 Pacific Ave., Atlantic City, N. J. Westfall, Beverly Kemper, '40, 1006 Hume Mansur Bldg., Indianapolis 4, Ind.

Westhoff, Henry F., '47, Missouri Theatre Bldg., St. Louis 3, Mo. Weyer, Eldie S., '45, 305 Hart-Albin Bldg., Billings, Mont. Wheeler, Russell C., '38, Missouri Theatre Bldg., St. Louis 3, Mo. Wherry, Orange T., '49, 1201 Standard Insurance Bldg., Portland, Ore. Wherry, Styles W., '33, 2575 Swanner Place, Ogden, Utah Whinery, Frank B., '40, Iowa State Bank and Trust Bldg., Iowa City, Ia. White, Edward R., '44, 921 Bergen Ave., Jersey City, N. J. White, F. Denton, '30, 4908 Sunnyside Rd., Minneapolis, Minn. White, Oliver Wilson, '35, 231 David Whitney Bldg., Detroit 26, Mich. White, Paul Gardiner, '30, 2601 Parkway, Philadelphia, Pa. (Navyregular, retired)

White, W. Wayne, '38, 6333 Brookside Plaza, Kansas City 5, Mo. Whiteman, Joseph D., '32, Mercer, Pa.

Whiteman, Wilbert J., '38, 295 Hunter Blvd., Birmingham, Mich.

Whitman, Alton B., '41, 108 E. Central Ave., Orlando, Fla.

Whitson, Glenn Haverly, '42, 80 Hanson Place, Brooklyn 17, N. Y.

Whittaker, H. F., '28, Tegler Bldg., Edmonton, Canada

Wier, Richard Royal, '51, 1110 N. Jackson St., Wilmington, Del. Wiethoff, Charles Albert, '37, 909 Medical Arts Bldg., Minneapolis 2, Minn.

William, Maurice, '34, 200 West 57th St., New York 19, N. Y. Williams, Albert P., '36, Starks Bldg., Louisville 2, Ky.

Williams, Austin Thomas, '40, 70 Washington St., Salem, Mass.

Williams, Connie N., '50, 1308 Exchange Bldg., Memphis, Tenn.

Williams, Frank A., '49, 506 Security Bldg., Pasadena, Calif.

Williams, Joseph H., '37, Beaumont Medical Bldg., St. Louis, Mo.

Williams, Philip Earle, '47, 1319 Medical Arts Bldg., Dallas, Tex.

Williams, Sidney T., '48, 4559 Scott Ave., St. Louis, Mo.

Willits, Harry K., '50, 750 N. 10th St., Reading, Pa.

Williss, Henry M., '44, 719 Roshek Bldg., Dubuque, Ia.

Willman, Warren Page, '48, 1757 Harrison St., Chicago, Ill.

Wilson, Dwight R., '48, 59 E. 54th St., New York, N. Y.

Wilson, John Lacy, '35, 940 N. Campbell Ave., Indianapolis 1, Ind.

Wilson, Orlie D., '45, 400 Masonic Bldg., Owensboro, Ky.

Wilson, Walter A., '39, 28 Duncan Ave., Jersey City, N. J.

Wimberly, Alonzo J., '48, 811 E. Broadway, Sweetwater, Tex. Winchester, George F., '45, 29 Commonwelath Ave., Boston, Mass. Winkelspecht, Harold J., '50, Cooper and Warren Sts., Beverly, N. J. Winthrop, J. Paul, '38, 604 Medical Arts Bldg., Wilmington, Del. Wirth, F. Harold, '51, 829 Maison Blanche, New Orleans, La.

Wisan, Jacob M., '42, 2100 Connecticut Ave., N.W., Washington, D. C. (Veteran's Administration)

Wise, Albert Irwin, '32, Wm. Penn Hotel, Box 1978, Pittsburgh, Pa.

Wittich, Harold C., '41, 1663 Eleanor St., St. Paul 5, Minn.

Wood, Harry T., '38, 1261 David Whitney Bldg., Detroit 26, Mich. Wood, Karl Hayden, '50, 1835 Eye St., N.W., Washington, D. C.

Wood, William A., '38, 1004 Merchants Natl. Bank Bldg., Mobile 11, Ala.

*Woodbury, Charles E., '21, 225 N. Granada Ave., Alhambra, Calif.

Woods, Fred Sumner, '38, 704 Congress St., Portland 4, Maine Woodworth, J. Galvin, '33, 40 North St., Buffalo 2, N. Y.

Worman, Harold G., '47, 5505 Sherwood Road, Little Rock, Ark. (Veteran's Administration)

Wright, Clarence John, '38, 701 American State Savings Bank Bldg., Lansing 68, Mich.

Wright, Edgar Allan, '41, Salem, Mass.

Wright, Roy Berton, '49, 1904 Franklin St., Oakland, Calif.

Wright, W. R., '23, Jackson, Miss.

Wylie, Wendell Leroy, '51, Univ. of Calif., College of Dentistry, San Francisco, Calif.

Wylie, William Leroy, '48, 2165 Adelbert Road, Cleveland, Ohio Wyman, Eugene Barry, '39, 51 Brattle St., Cambridge 38, Mass.

Wynn, Percy A., '51, 803 Medical Bldg., Houston, Tex.

York, Fred Miller, '51, 640 Beach Drive, St. Petersburg, Fla.

Yost, Howard, '39, 803 West Division St., Grand Island, Neb. Young, Alfred Clyde, '29, 121 University Place, Pittsburgh 13, Pa.

Younger, Harold B., '50, 806 Medical Arts Bldg., Dallas, Tex.

Zappe, Herbert Arthur, '49, Mineral Wells, Tex.

Zech, Lando W., '50, 503 Medical Dental Bldg., Seattle, Wash.

Zeisz, Robert C., '36, 490 Post St., San Francisco, Calif.

Ziegler, Joseph Eugene, '45, 3875 Wilshire Blvd., Los Angeles 5, Calif. Ziegler, Samuel, '38, 405 Lowry Medical Arts Bldg., St. Paul 2, Minn.

Zimmer, Earl Henry, '43, 415 Exchange Natl. Bank Bldg., Colorado Springs, Colo.

Zimmerman, Neal L., '36, 620 Medical Dental Bldg., Portland, Ore.

Zugsmith, Robert, '23, 5842 Ferree St., Pittsburgh, Pa.

Total 1795

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Arkansas: Ball (J.), Blakemore, Child, Cone, Flickinger, Gibbs, Golden, Gray (M.), Hanna, Helstern, Hunt (W. R.), Jernigan, Johnson (E. H.), Jordan (J.), Koch, Lewis (D.), Rushing, Smith (R.)—18.

California: Abel, Adams (C.), Adams (F.), Atkinson, Aubertine, Bajuk, Bassett (R.), Becks, Bell (D.), Benbrook, Blake, Blanquie, Boero, Boots, Boyd (B.), Bricker, Brownson, Bullard, Cannon (H.), Carson, Chartrand, Childs (H), Coale, Cole, Coleman (B.), Collins, Conley (F.), Craig, Cross, Cusick, Davis (A.), Dillon (C.), Dunn (A.), Durst, Epstein (S.), Fitzgerald (G.), Fleming (W.), Fontaine, Foster (H.), Frisbie, Gerard, Gill, Grant (D.), Gray (C.), Green (Roy A.), Grimm, Grover, Gurley (J.), Hahn (G.), Hambly, Hamilton (P.), Hancock, Harding (J.), Harrison (W. C.), Harrison (W. P.), Hayes (G.), Herz, Hill (P.), Hixson, Hogeboom, Hollenback, House, Hughes (G.), Humphreys, Hunt (V.), Ingraham, Inskipp, James, Johnson (C.), Johnson (E. L.), Johnston (H.), Jones (L.), Jones (R.), Jorgensen, Kibler, Kingsbury, Kirtland, Knapp, Knowles, Knudson, Kulstad, Lattig, Leggett (J.), Leggett (R.), Leslie, Linehan, Linn, Lipp, Locke, Lucas, Lufkin, Lush, Lussier, MacMillan (R.), Marshall (L.), Mc, Cauley, McCoy, McGee, McNulty (R.), Metcalf, Millikin, Moose, Neblett, Nesbitt, Nuckolls, Olds, Oulliber, Peterson (L.N.), Petray, Prindle, Ray, Rounds, Rule, Rutledge, Ryder, Saunders, Scott (S.), Scrivener, Selberg, Selleck, Sheppard, Shooshan, Skinner, Sloman, Smith (D.), Smith (L. T.), Smith (W. S.), Soderstrom, Sorenson, Steen, Sweet, Taber, Terrell, Terwilliger (G.), Terwilliger (K.), Thee, Thompson (W.), Throndson, Tilden, Tocchini, True, Tylicki, Veatch, Wagner, Werner, West (F.), West (S.), Williams (F.), Woodbury, Wright (R.), Wylie (W. L.), Zeisz, Ziegler (J.)-153.

Colorado: Bailey (E.), Barker, Bertram Brown (C. F.), Brownlie, Cogswell, Devitt, Downs (B.), Downs (R.), Gibson (R.), Giesecke, Harris (H.), Hoffman (H.), Johnston (L.), Kelly (A.), Markley, Monroe, Proctor, Ritchey, Roberts (Z.), Smedley, Spencer, Tidwell, Walsh (L.), Zimmer—25.

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Brown (J. W.), Burke (J. P.), Camalier, Chase (W.), Colvin, Emig, Erikson, Fabrizio, Falls (W.), Fitzgibbon, Glezen, Hall (C. B.), Hoffman (P.), Ingersoll, Jordan (L.), Kaplan, Krogh, Lynch, McCole, McGehee, Mead, Michaels, Osborn, Rath, Rault, Smith (G. A.), Swanson (H.), Thompson (E. C.), Wood (K.)—33.

Florida: Anderson (L.), Bassett (C.), Brown (C. T.), Burkart, Byrnes, Caraballo, Carroll, Cartee, Cleveland (C.), Conklin, Conrad, Daniel, Davis (W. McL.), Douglas, Eggnatz, Elliott (W.) Gillespie, Johnson (E. A.), Kellner, Lotz, Lunsford, McLeod, Masters, Meyer, Pankey, Pattishall, Penn, Price (T.), Samuel, Simkins, Stewart, Taylor (R. P.), Terry, Tison,

Thompson (E, L.), Thorn, Whitman, York-38.

Georgia: Banks (E.), Banks (W.), Barnwell, Brown (L. B.), Buhler, Childs (W.), Coleman (W.), Garrett (S.), Garrett (W.), Harpole, Hawley, Huff, Hunter (G.C. Sr.), Hunter (G. C. Jr.), Jaynes, Johnson (V.), Johnston (H. B.), Mitchell (G.), Mitchell (R. D.), Scruggs, Slaughter, Sullivan (R.), Tucker—23.

Idaho: Colver-1.

Illinois: Alexander (H.), Appleman, Baker (C. R.), Blackwell, Bodmer, Boulger, Bremner, Brevig, Cameron (D.), Cart, Chamberlain, Clendenen, Collidge, Cruse, Dalitsch, Dittmer, Dodd, Ebert, Edlund, Ford (J.), Freeman, Gallie, Gethro, Gruebbel, Hayes (H. H.), Hewett, Hoeffel, Jacob, Kalk, Kesel, Kremer, Kubacki, Kurth, Link, Lundquist, MacBoyle, McKee, Marks, Milas, Millhon, Morrey, Mueller, Noyes (F.), Olafsson, Oppice, Partridge, Pearce, Pendleton, Roberts (A.), Romnes, Salisbury, Sauer, Sayre, Schlosser, Silberhorn, Skupa, Smith (C.C.), Smith (C. M.), Smith (E. H.), Spence, Starshak, Stransky, Swanson (E.), Teuscher, Thomas (E. H.), Thompson (Edw. C.), Thompson, (J.), Tuck, Tylman Waddell, Wainwright, Wekeman, Welch, Willman—74.

Indiana: Adams (J. W.), Baker (F.), Berkey, Blakeman, Boyd (D.), Campbell, Carr (J.), Crum, Denny, Frech, Geller, Gilchrist (E.), Gillis, Gregory (G.), Haynes (E.), Healey (H.), Hilgemann, Hilty, Hine, Hughes (F.), Jackson (C.), Johnston (J.), Kelly (W.), Kennedy (R.), Kennedy (W.), Leavell, LaRue, McNulty (W.), Martin (B.), Mitchell (E.), O'Hallo-

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Iowa: Altfillisch, Anderson (G. C.), Atkins (A.), Bliss, Bolks, Booth (J.), Bryan, Carl, DeYarman, Easton (G.), Eaton (E.), Feldman, Fenner, Fenton (R.), Fisher (A.), FitzGerald (D.), FitzGerald (L.), Foley, Ford (E.), Foster (C.), Hemingway, Hemsworth, Henkin, Higley, Hildebrand, Humiston, Kennedy (C.), Klaffenbach, Lehman, Norman, Ostrem, Sanner, Smith (E. S.), Smith (R. V.), Sommers (E.), Sommers (R. S.), Thoen, Volland, Whinery, Willits (H. M.)—40.

Kansas: Bunker, Burket, Carpenter, Parkinson, Richmond, Steinmeyer, Teall-7.

Kentucky: Burrill, Bustetter, Coomer, Curd, Elam (A.), Essig (J.), Everly, Ferguson (R.), Hower, Hubbuch, Hume, Johnson (J. E.), Juett, McElrath, Mayhall, Myers (R.), Randall, Selden, Sprau, Springsted, Thomas (R.), Todd, Walker (Jno. L.), Walz, Williams (A. P.), Wilson (O.)—26.

Louisiana: Broussard, Colquitt, Crozat, Gamard, Genre, Goggin, Gore, Hava, Healey (W.), Houghton, Jarrell, Leabo, McCartney, Nicaud, Psayla, Schoeny, Smith (A. E.), Smith (J. M.), Smith (P. E.), Tibler, Varnado, Wirth—22.

Maine: Browne, Derbyshire, Easton (A.), Emmons, Grant (G.), Haskell, MacKay, Maxfield (C.), Maxfield (F.), Phillips (G.), Small (D.), Smith (P. R.), Swett, Woods—14.

Maryland: Aisenberg, Anderson (G.), Baklor, Bell (A.), Bland, Bock, Brandon (G.), Browning (D.), Brun, Bryant, Burkhart, Clemson, Clendenin, Coberth, Coriell, Cramer, Culler, Deems, Diehl, Dobbs, Dorsey, Eader, Essig (N.), Ferguson (J.), Gaver, Golton, Hahn (W.), Hardy Heintz, Hicks (H. T.), Hopkins, Ide, Inman, Jersin, Karn, Lankford, Leonard (R.), Levin (H.), Lovett, McCarl, McCarthy (H.), McCrea, Murto, Nuttall, Oggesen, Paffenbarger, Page, Preis, Pyott, Robinson (J.), Russell, Shehan, Smith (F.), Smith (W. W.), Sommers (H.), Streett, Swinehart (E.), Swinehart (D.), Trail, Van Natta, Wells (B.)—61.

Massachusetts: Adams (P.), Alden, Barnard, Bommer, Brown (G.), Bryans, Burke (W.), Canavan, Carnes, Cogan, Corriveau, Cosgrove, Cronin, Daley, Daniels, Davies, Dempsey, Desmond, Dunning (J.), Elliott (M.), Esterberg, Feeney, Foss, Gibbons, Giblin (T.), Glickman, Grant, (F.), Grant (W.), Griffin, Grinnell, Gross, Hinds, Holt, Hookway, Jacobs, Karcher, Kazanjian, Kefferstan, Larkin (R.), Levesque, MacKinnon, Mallett, Margolis, Marjerison, Maycock, Miner (L.), Muzzey, O'Hearn, Obrey, Ortolani, Perkins, Peters, Rogers (A.), Rogers (F.), Sager (L.), Spinney, Tannebring, Thatcher, Tyler, Vaughan, Weller, Williams (A. T.), Winchester, Wright (E.), Wyman—65.

Michigan: Andrews, Applegate (O.), Applegate (S.), Bartlett, Bellinger, Blackerby, Blight, Braun, Bunting, Cadarette, Champagne, Christiansen (G.), Conley (C.), Davis (W. R.), Diedrich, Dingman, Easlick, Eman, Fox (C.), Gibson (K.), Girardot, Goodsell, Greene, Hall (C. T.), Hard, Harris (S.), Jay, Jeserich, Johanson, Kemper, Kerr, Kimball, Kingery, Larned, Lewis (S.), Lowery (P.), McBride (W.), Mason (W.), Moore (G.), Morris (E.), Northrop, Ostrander, Perdue, Perry, Pilkington, Prince, Richards, Rochon, Schultz (L.), Seyler, Shackelford, Sommers (R.), Spalding (E.), Spalding (G.), Travis, Vedder, Ward, Wertheimer, White (O.), Whiteman (W. J.), Wood (H.), Wright (C.)—62

Minnesota: Amundson, Austin, Berthel, Braum, Bulbulian, Carlson, Carson, Cassel, Christensen (R.), Clark (D.), Clark (H. B. Sr.), Clark

(H. B. Jr.), Cobb, Colby (H.), Coulter, Crawford (W.), Damon, Delton, DeVries, Dickson (W.), Diessner, Dinham (G.), Dunn (P.), Epstein (I.), Ernst, (H. W.), Ernst (M.), Estes, Fenton (H.), Green (Robt. O.), Griffith, Gyllenborg, Hall (A.), Harker, Henry, Hodgson, Hyde, Jernall, Johnson (R. E.), Johnson (R. F. D.), Larson, Lasby, Listiak, Longley, Lovestedt, Lundberg, MacGibbon, Mentzer, Nelson (Chas.), Nelson (E.), Nelson (H.), Pattridge, Peterka, Pike (Jay), Pike (Joe), Radusch, Rudolph, Searl, Simon, Speidel, Stafne, Steadman, Stickney, Sundby, Thiers, Thom, Thomas (T.), Thornton (M.), Turnquist, Waldron (C.), Walls (J.), Walls (M.), Webb (W.), Weiss, Wells (A.), White (F.), Wiethoff, Wittich, Ziegler (S.)—78

Mississippi: Abbott (R.), Blackburn, Boswell, Henderson (A. H.), Leggett (T. F.), McCarty (G.), Shannon, Smith (L. L.), Wright (W. R.)—9.

Missouri: Adams (J. D.), Arnold (E. K.), Brady, Brandhorst, Broadhurst, Brock (D.), Brooks (E.), Brown (J. A.), Buechele, Burford, Calmes, Carmichael, Connelly, Davidson, Dillon (E.), Edwards (R.), Engel, Fisher (H.), Foerster, Frederich, Freitag, Frost, Gates, Gossett, Gurley (W.), Hagemann, Haverstick, Hillias, Jasper (E.), Jasper (L.), Jones (A. H.), Keys (E.), Kornfeld, Lyon, Main, Marre, Marshall (J.), Martin, (Ruth), Mayer, Moore (N.), O'Brien (L.), O'Brien (P.), Peterson (L. W.), Poe, Porter (C.), Purcell (T.), Rinehart, Robb, Rodgers, Sawyer, Schopper, Scott (G.), Scott (J.), Shepard, Spotts, Steber, Suggett, Templeton (J.). Westhoff, Wheeler, White (W. W.), Williams (J. H.), Williams (S.)—63.

Montana: Bell (F.), Cogley, Dohrman, Fearn, Regan, Rider, Swanson (C.), Weyer-8.

Nebraska: Arnot, Bumstead, Colgan (J. G.), Davis (C.), Drake (R.), Hemphill, Hunt (L.), Ireland, Keys (D.), Ludwick (R.), Merchant, Muller, Myers (L.), Pierson, Raasch, Schaefer, Shellman, Thomas (E.), Waggener, Yost—20.

Nevada: Steinmiller-1.

New Hampshire: Clarridge, Staples-2.

New Jersey: Barry, Boyko, Brach, Burke (J. F.), Cane, Devlin, Dorr, Dunlap, Dunning (W.), Gallagher (C.), Giblin (W.), Giordano, Grevatt, Harper (C.), Harrington, Hopper, Joule, Kelly (E.), Kohn (S.), Lentz, Lowy, Lum, Newman, Osmun, Pearce (M.), Peplow, Pruden, Reese, Reock, Rose, Schneider (E.), Schmidt, Schwartz, Stillwell, Waldron (R.), Walsh (J.), Warden, Weber (P.), Westcott, White (E.), Wilson (W.), Winkelspecht—42

New Mexico: Clarke (J. J. Sr.), Clarke (J. J. Jr.), Lord, Moran-4.

New York: Abbey, Abelson, Asch, Asgis, Ast, Bacon, Bailey (A.), Bastian, Bedell, Beier, Bell (W. S.), Bergen, Blass, Blum, Blumenthal, Blutau, Bodecker, Bossert, Both, Bowman, Bronner, Brophy, Buckley, Burns, Burr, Butler (E.), Cahn, Callahan, Callaway, Carr (M.), Chapin, Chase

(O.), Cheney, Citron, Clark (R.), Cleveland (J.), Conn, Cool, Corby, Cottrell (I.), Courtade, Crysler, Davenport, Dickerson, Dolce, Doran, Douglass (G.), Dunn (L.), Eaton (L.), Ellis (W.), Ernst (H. H.), Feinman, Flynn, Folley, Gale, Gauchet, Gies, Glaser, Gomes, Granger, Groh, Gugino, Harrigan, Hayes (L.), Heinze, Hemley, Henderson (A. B.), Henegan, Hickey, Hillyer, Holbrook, Howes, Hoyt, Irving, Isaacson, Ivory, Jacobson, Jutton, Kaletsky, Kany, Keane, Keller (W.), Kennedy (E.), Koepf, Kohn (A.), LaBorne, Landa, Levin (M.), Lewis (F.), Lieban, Lifschutz, McBeath, McCall (J.), McCarthy (F.), McCormack, Martin (J.), Mehringer, Meisburger, Merritt, Metzger, Miller (D.), Miller (S.), Mimmack, Montgomery, Mork, Morris (J.), Murphy, Nestler, Neuber, North, O'Neill, Obst, Oman, Ortion, Padelford, Palmer, Pammenter, Pankow (C. A.), Pankow (C. W.), Payne, Pfeiffer, Phillips (P.), Porter (L.), Pratt (F. W.), Prezzano, Pritchard (G. G.), Queern, Riesner (J.), Riesner (S.), Roberts (I.), Roberts (M.), Rosenbaum, Salman, Salzmann, Schelpert, Schenk, Schneer, Schuyler, Schweitzer, Scola, Seldin, Shapiro (B.), Shapiro (J.), Shapiro (R.), Shapiro (S.), Sippel, Solomon, Sorrin, Spaulding, Squires (F.), Squires (W.), Stahl, Stern, Stevens, Strife, Strusser, Swift, Tanchester, Taylor (W.), Teich, Trier, Waite, Wakefield, Wald, Waugh, Wayman, Webb (W. R.), Weinz, Wells (C.), West (J.), Whitson, William, Wilson, (D.), Woodworth-174.

North Carolina: Alford, Ashby, Atwood, Blair (T.), Branch, Brauer, Bumgardner (A.), Clark (W.), Current, Edwards (L.), Edwards (Z.), Fitzgerald (P.), Fleming (J.), Hale, Jackson (W.), Johnson (K.), Jones (P.), McClung, Minges, Olive, Parks (C.), Pharr, Poindexter (C. C.), Pridgen, Sanders, Sheffield, Sturdevant, Watkins—28.

North Dakota: Gilbert (L.), Hocking, Krause, Sand, Shaw-5.

Ohio: Adair, Aldrich, Bach, Ball (E.), Bannister, Black, Bodine, Boucher, Broadbent, Brown (H. C.), Burmeister, Cottrell (H.), Dietrich, Drake, (M.), Dressel, Ewing, Gardner, Harkrader, Hartman, Hebble, Hill (T.), Hudson, Jarvis, Jones (E. G.), Jones (E. H.), Kitchin, Kniesner, Loughry, Lowry, Lytle, MacMillan (H.), Meisser, Miller (E. C.), Mills (E.), Postle, Pryor, Sargeant, Scheu, Schmid, Schott, Schultz (W.), Sebald, Sherwood, Sloan (J.), Snyder (D.), Spangenberg, Stark, Starr, Steffel, Stillson, Stricker, Strosnider, Sullivan (J.), Sweeney (J. A.), Tuma, Weaver, Welker, Wylie (Wm. L.)—58

Oklahoma: Flesher, Reichmann, Shurr, Walters-4.

Oregon: Adams (K.), Bartels, Bettman, Brandon (S.), Dinham (W.), Fixott (H. C. Sr.), Fixott (H. C. Jr.), George, Gulick, Hoskin, Hurley, Jenkins, Keller (R.), Kunkel, Kuratli, Lageson, LeRoy, Mihnos, Noyes (H.), Peate, Prime, Redpath, Robinson (S.), Rossman, Skiff, Wherry (O.), Zimmerman—27.

Pennsylvania: Addie, Aiguier, Albert (E.), Anderson (H.), Archer, Ash-

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Webster-19.

South Carolina: Brockington, Bumgardner (E.), Bunch, Dick, Douglass (J.), Hair, Higgins, Owings—8.

South Dakota: Boyden, Eggers-2

Tennessee: Anderson (A.), Bowyer, Clotworthy, Connell, Cooper (H. C.), Elam (R.), Ginn, Hoffer, Jamieson, Justis, Lee, Leonard (N.), Levy, Mc-Caleb, Meachum, Moore (R. L.), Ogden, Oliver, Phillips (J.), Sebelius, Sharp, Speas, Templeton (L.), Templeton, (W.), Underwood, Vaughn,

Vinsant, Weber (F.), Williams (C.)-29.

Texas: Arnold (E. B.), Arnold (J.), Bailey (J.), Barron, Beachum, Bell (W. E.), Berwick, Boland (P.), Botts, Bridgford, Brock (S.), Brown (E.), Brown (Lee), Butler (C.), Conly, Crabb, Cunningham (J.), Dickson (E.), Duckworth, Durham, Ellington, Elliott (F.), Falls (J.), Forrest, Foster (W.), Fountain, Frew, Garrison (F.), Garrison (M.), Gillean, Glenn, Harris (E.), Hays, Hicks (Chas. J. Sr.), Hicks (C. J. Jr.), Holder, Hollers, Hooper, Hutt, Johnson (E. R.), Jones (A. L.), Jones (B.), Kennedy (T.), Kercheval, Knutzen, Lacy, Larkin (J.), Lux, Lynn (C.), Lynn (R.), McCall (W.), McCarty (W.), McCasland, McMurray (C. A.), McNeil, McRimmon, Maddox, Mills (S.), Mitchell (R. A.), Morris (G.), Murphey (P.), Murphey (W.), Nail, Newton, Nygard, O'Farrell, Ogle, Outlaw, Parks (S.), Peavy, Platt, Powers, Preston, Prichard, Ranfranz, Risser, Robertson, Rogers (A. W.), Rogers (R.), Schulze, Shaffer, Sloan (A.), Snider, Speer, Swepston, Talbot, Taylor (C.), Taylor (Edw.), Taylor (E. W.), Thielen, Thomas (K.), Thornton (I.), Tipton, Truitt, Turner, Vogan, Wade (J.), Waltmon, Weber (R.), Williams (P.), Wimberly, Wynn, Younger, Zappe—104.

Utah: Bergstrom, Pincock, Warburton, Wherry (S.)-4-

Vermont: Bailey (B.), Johnson (E. E.), Pond, Reid (H. H.), Small (H.), Taggart-6.

Virginia: Ashton, Brashear, Chevalier, Clough, Duncan, Gilmer, Goad, Harrison (G.), Hayes (R), Hodgkin, Hughes (J.), Irby, Jennings (G.), John, Knighton, Lyons, Muir, Simmons, Simpson, Smith (H.), Snapp, Sprinkel, Street, Walker (J. Lewis), Walker (M.), Wash—26.

Washington: Anderson (O.), Barlow, Cheyne, Dean (O.), Ellsperman, Ferrier, Foote, Fraser (E.), Gilbert (H.), Gyllenberg, Hampson, Hoffman (O.), Jeffery, Jones (E. M.), Lewis (P.), Lindley, Martin (A.), Molt, Plummer, Pratt (F. H.), Randolph, Spratley, Stibbs, Thomas (B.), Zech—25.

West Virginia: Armbrecht, Boyd (R.), Boydston, Browning (C.), Curry, Davis (R. H.), Douglass (E.), Gallagher (D.), Loper, Poindexter (J.),

Singleton, Stone, Sturm, Summers-14.

Wisconsin: Abbott (T. R.), Bassman, Baumgartner, Bennett (G.), Casey, Christensen (M.), Clark (C.), Crawford (J.), Dippel, Donovan, Dresen, Droegkamp, Fee, Finke, Flancher, Franklin (J.), Frisch, Hahn (H.), Hardgrove, Hopkinson, Huegel, Johnson (M.), Kendall, Kraus (E. E.), Kraus (L.), LeSage, Macfarlane, Milliette, Moen, Morgan, Mortonson (J.), Mortonson, (M.), Nachazel, Nelson (C. A.), Redeman, Rohde, Stratton, Tolan, Uebele, Wahl—40.

Wyoming: Cunningham (P.), Hunt (L. C.)-2.

Territories: Conner, Fraser (M.), Pritchard (G. P.)-3

Army: Albaugh, Baumann, Bernier, Brown (V.), Bull, Chesser, Dierdorff, Dirksen, Epes, Epperly, Farber, Franklin (W.), Gaynor, Glascock, Gray (D.), Harding (R.), Harper (N.), Hartley, Irons (A.), Hollenbach, Johns, Kothe, Leigh, Lockwood, Love, McDowell, Metz (K.), Miller (P.), Mills (R.), Moulton, O'Grady, Oartel, Oatman, Renfrow, Scheumann, Schlack, Skelton, Smith (B.), Smith (T.), Snyder (O.), Toole, Vail, Walker (T.)—43.

Army-Air Force: Kennebeck, Messner-2

Navy: Allen (C.), Barnes, Bishop, Boland (C.), Broesamle, Chandler (A. W.), Claytor, Colby (R. A.), Davis (R. S.), Delaney, English, Fladeland, Frates, Frechette, Grunewald, Irons (R.), Jeffreys, Kasper, Kronmann, Kyes, Lepeska, Lesney, Ludwick (W.), Lyle, McInnis, McIntyre, Mack, Maxwell, Meyers, Mitchell (L.), Niiranen, Oesterling, Parke, Patton (E. K.), Purcell (J.), Rader, Richison, Riebe, Ryan (D.), Sandman, Sault, Schantz, Schork, Snyder (L.), Stanmeyer, Tartre, Taylor (R. W.), Ulen, Wennerberg, White (P.)—50.

United States Public Health Service: Arnold (F.), Canby, Cooper (D.), Dean (H. T.), Forsyth, Hampp, Kroschel, Law, Miller (J.), Moore (R. H.),

Nevitt, Paquin, Pelton, Prejean, Scroggie-15.

Veteran's Administration: Bordner, Brann, Childers, Fauber, Goodwin, Hatcher, Hiniker, Hurst, Rollins, Toole, Wisan, Worman—12.

B. Countries other than the United States

Australia: Amies, Arnott, Best, Charlton, Moxham, Tuckfield-6. Canada: Anderson (P.), Box, Bradley (S.), Brown (H. K.), Charron, Cline, Cormier, Dohan, Ellis (R.), Fasken, Faulkner, Fisk, French, Gauthier, Geoffrion, Gilchrist (H.), Grant (E.), Gullett, Hamilton (W.), Lindsay, Lowery (R.), MacLean, McIntosh, McLean, Marshall (T.), Mason (A.), Merkeley, Moore (F.), Mowry, Pallen, Phillips (S.), Racey, Ratte, Reid (H. W.), Sproule, Thomson, Walsh (A.), Whittaker-38.

China: Cheo, Mullett-2. England: Roberts, Rowlett-2.

India: Khambatta-1. Switzerland: Dear-1.

Charles L. Alexander, '28

4. DECEASED FELLOWS

Charlotte, N. C.

Kansas City, Mo.

New York, N. Y.

Sydney, Australia

Brunswick, Ga.

Davenport, Ia.

Charles C. Allen, '22 Charles F. Ash, '22 Percy Ash, '38 D. D. Atkinson, '22 Chas. R. Baker, '22 John H. Baldwin, '23 N. Talley Ballou, '37 Norman Hempstead Baker, '48 *Henry L. Banzhaf, '21 Arthur D'Alanson Barber, '33 Ogden, Utah Henry U. Barber, Jr. '42 Lafavette L. Barber, '23 Alexander E. Bard, '32 Albert M. Barker, '33 Leland Barrett, '29 Thomas J. Barrett, '21 Walter F. Barry, '35 Leo N. Baughman, '41 Harry Bear, '29 Arthur R. Beckman, '40 Clarence R. Benney, '39 William J. H. Benson, '29 John J. Berry, '42 Louis P. Berthel, '23 Theodore B. Beust, '28 *John F. Biddle, '21

Louisville, Ky. Richmond, Va. Charleston, W. Va. Milwaukee, Wis. New York, N. Y. Toledo, Ohio Tucson, Ariz. San Jose, Calif. New York, N. Y. Worcester, Mass. Newark, N. J. Los Angeles, Calif. Richmond, Va. Dallas, Tex. Army—regular Milwaukee, Wis. Deadwood, S. Dak. Columbus, Ohio Louisville, Ky.

Pittsburgh, Pa.

July 22, 1947 October 29, 1951 March 5, 1951 December 27, 1944 August 16, 1948 November 23, 1929 August 19, 1941 December 22, 1938 March 7, 1945 December 20, 1930 July 5, 1942 February 21, 1944 July 30, 1950 November 28, 1948 November 30, 1946 October 5, 1948 March 31, 1949 January 17, 1936 November 24, 1937 January 19, 1926

October 13, 1933

January 25, 1938 July 21, 1944

January 14, 1924 March 7, 1940

January 20, 1929

July 16, 1930

Samuel Birenbach, '40 **Arthur D. Black, '21 J. Cannon Black, '29 Roy E. Black, '32 Edwin C. Blaisdell, '34 James A. Blue, '26 R. Boyd Bogle, '23 Frank B. Bostwick, '26 Geo. A. Bowers, '32 Shirley M. Bowles, '28 Charles A. Brackett, '22 Frank T. Breene, '26 Peter John Brekhus, '34 E. Fred Briggs, '39 William Bogan Brooks, '41 Norman Broomell, '34 Truman Brophy, '21 J. H. Brown, '38 Robert K. Brown, '32 Wm. Wiley Brown, '38 Henry Herbert Bryans, '45 Elwyn R. Bryant, '37 *John P. Buckley, '21 David Clare Budge, '29 George K. Burgess, '30 *Harvey J. Burkhart, '21 John H. Cadmus, '29 H. Wood Campbell, '25 Eben J. Carey, '39 Thos. E. Carmody, '30 John Kenneth Carver, '50 Calvin S. Case, '23 Theodore D. Casto, '33 James E. Chace, '34 W. T. Chambers, '22 David Theodore Chase, '37 Henry Duley Chipps, '35 John F. Christiansen, '33 W. R. Clack, '23 James Francis Clark, '34 Stanley W. Clark, '33 Harold H. Cleaveland, '39 Wm. Neal Cogan, '28

New York, N. Y. Chicago, Ill. Chicago, Ill. Huntington, Pa. Portsmouth, N. H. Mobile, Ala. Nashville, Tenn. Arlington, Va. Nashua, N. H. Newport, R. I. Iowa City, Iowa Minneapolis, Minn. Bangor, Maine Chattanooga, Tenn. Philadelphia, Pa. Chicago, Ill. Newton, Miss. Ann Arbor, Mich. Joplin, Mo. Birmingham, Ala. New Haven, Conn. N. Hollywood, Calif. May 14, 1942 Logan, Utah Washington, D. C. Rochester, N. Y. Chicago, Ill. Suffolk, Va. Milwaukee, Wis. Denver, Colo. Montreal, Can. Chicago, Ill. Philadelphia, Pa. Oscala, Fla. Denver, Colo. Portland, Ore. Corinth, Miss. Los Angeles, Calif. Pawtucket, R. I. Chicago, Ill. Clear Lake, Iowa Springfield, Mass. Washington, D. C.

November 25, 1950 December 7, 1937 January 28, 1947 March 7, 1942 November 19, 1945 June 8, 1949 May 25, 1941 March 4, 1949 December 18, 1935 Laguna Beach, Calif. September 23, 1945 March 20, 1927 October 15, 1931 June 29, 1951 March 31, 1944 December 28, 1951 March 23, 1941 February 3, 1928 March 4, 1947 March 28, 1944 April 23, 1945 October, 30, 1947 October 2, 1942 June 22, 1947 July 2, 1932 September 22, 1946 October 31, 1934 March 31, 1931 June 5, 1947 August 30, 1946 January 30, 1951 April 16, 1923 May 17, 1949 April 30, 1940 March 29, 1949 October 23, 1936 July 21, 1950 January 15, 1952 March 7, 1940 April 1, 1944 August 1, 1932 February 2, 1949 October 4, 1943

Charles D. Cole, '35 Charles B. Coleman, '38 Martin L. Collins, '38 Frederick Joseph Conboy, '42 Toronto, Can. ** John V. Conzett, '21 August R. Cooke, '23 Clarence S. Copeland, '33 Willis A. Coston, '22 Arthur J. Cottrell, '33 Robert C. Craven, '43 Albert W. Crosby, '36 Hugh S. Cummings, '32 Frederick C. Curtis, '43 Frank H. Cushman, '32 Levitt E. Custer, '22 William D. Cutter, '37 David S. K. Dai, '43 W. L. Darnall, '33 S. E. Davenport, Sr., '32 W. S. Davenport, Sr., '26 DeForest Davis, '39 Horace M. Davis, '24 Lyndall L. Davis, '27 Robert L. Davis, '38 Thos. J. Davis, '38 Roscoe A. Day, '36 Frank H. Dean, '24 James W. Deaton, '38 W. H. DeFord, '32 Frank A. Delabarre, '28 William P. Delafield, '43 Henry A. Delaney, '48 Charles Wm. Digges, '45 G. Walter Dittmar, '22 Arthur Pue Dixon, '38 Wilson Case Dort, '37 Charles L. Drain, '34 Forrest G. Eddy, '22 *Julio Endelman, '21 Lewis W. Ender, '35 Chas. J. R. Engstrom, '30 Alfred Enloe, '38

Washington, D. C. Poplar Bluff, Mo. New York, N. Y. Dubuque, Ia. Syracuse, N. Y. Rochester, N. H. Kansas City, Mo. Knoxville, Tenn. Army-regular New Haven, Conn. Washington, D. C. San Jose, Calif. Boston, Mass. Dayton, Ohio Chicago, Ill. Chengtu, China Washington, D. C. New York, N. Y. Paris, France Cleveland, Ohio Baltimore, Md. Chicago, Ill. Woonsocket, R. I. St. Louis, Mo. San Francisco, Calif. June 28, 1939 Worcester, Mass. Texarkana, Ark. Des Moines, Ia. Boston, Mass. Dallas, Tex. Allaston, Mass. Columbia, Mo. Chicago, Ill. Cumberland, Md. Boston, Mass. Iowa City, Ia. Buttonwoods, R. I. Los Angeles, Calif. LaCrosse, Wis. Los Angeles, Calif. Atlanta, Ga.

August 31, 1940 January 31, 1949 December 26, 1949 March 29, 1949 November 19, 1944 April 17, 1945 July 9, 1948 March 30, 1936 October 31, 1945 February 10, 1949 November 11, 1938 December 20, 1948 March 17, 1943 February 28, 1946 January 3, 1924 January 22, 1942 December 14, 1946 April 29, 1941 June 7, 1934 February 26, 1938 August 8, 1940 February 8, 1935 February 25, 1937 March 22, 1941 March 13, 1943 September 10, 1934 July 14, 1942 March 22, 1932 April 15, 1938 May 16, 1951 February 4, 1949 November 6, 1948 May 18, 1949 August 5, 1947 August 20, 1951 June 5, 1937 May 17, 1939 November 10, 1948 December 19, 1946 March 5, 1947 February 12, 1941 Simon Eschelman, '23 George Evans, '27 Walter Earle Fancher, '39 Edwin L. Farrington, '29 Luther A. Faught, '28 Archibald Graham Fee, '26 W. L. Fickes, '23 Josia G. Fife, '33 Delbert D. Fisher, '49 Hugo G. Fisher, '28 E. J. Fitzgerald, '38

John J. FitzGibbon, '28 Carl O. Flagstad, '32 Clinton T. Fleetwood, '43 Lynn A. Fonner, '38 Lewis E. Ford, '22 Sheppard W. Foster, '21 Milburn Matthew Fowler, '46 Chevy Chase, Md. **H. Edmund Friesell, '21 Jos. H. Fullenwider, '29 Donald M. Gallie, Sr., '24 C. Fred GaNun, '40 Gordon M. GaNun, '38 Oren Henry Gaver, '31 Royal B. Giffen, '27 *William A. Giffin, '21 Steele F. Gilmore, '32 William E. Goepper, '25 Nye White Goodman, '31 Hart J. Goslee, '23 Frank A. Gough, '26 Horace P. Gould, '23 James Allen Graham, '28 Louis Graham, '22 Wm. Conrad Graham, '30 Karl Frederick Grempler, '42 *Clarence J. Grieves, '21 Thos. L. Grisamore, '23 W. M. Griswold, '33 Carl J. Grove, '34

Frederick T. Guild, '37

Buffalo, N. Y. New York, N. Y. Yonkers, N. Y. Lowell, Mass. Philadelphia, Pa. Superior, Wis. Serona, Pa. Orange, Tex. Portland, Ore. Chicago, Ill. Boothbay Harbor, Me. Holyoke, Mass. Minneapolis, Minn. Seattle, Wash. Ft. Wayne, Ind. Los Angeles, Calif. St. Petersburg, Fla. Pittsburgh, Pa. Louisville, Ky. Wilmette, Ill. New York, N. Y. New York, N. Y. Baltimore, Md. Sacramento, Calif. Detroit, Mich. Princeton, Ind. Louisville, Ky. Los Angeles, Calif. Chicago, Ill. Brooklyn, N. Y. Brooklyn, N. Y. San Francisco, Calif. August 16, 1948 Columbus, Ohio Baltimore, Md. Baltimore, Md. Chicago, Ill. London, England St. Paul, Minn. Providence, R. I.

September 26, 1932 January 12, 1942 June 26, 1940 April 1, 1941 November 23, 1933 October 27, 1950 March 30, 1951 June 27, 1940 February 14, 1950 September 18, 1943 December 19, 1944

June 4, 1948 June 16, 1949 May 1, 1944 December 7, 1944 June 13, 1947 August 16, 1947 Oct. 27, 1947 October 27, 1946 November 12, 1940 October 8, 1946 November 30, 1944 December 31, 1949 March 28, 1940 September 3, 1943 July 3, 1929 July 15, 1932 March 24, 1949 June 26, 1945 May 31, 1930 August 15, 1938 April 4, 1928 San Francisco, Calif. February 19, 1932 February 15, 1945 February 25, 1951 November 4, 1927 October 16, 1939 July 13, 1935 July 5, 1942 May 1, 1941

Alfred M. Haas, '36 Frederic T. Haberle, '38 Amos I. Hadley, '31 John M. Hale, '24 Charles W. Hall, '23 James Oscar Hall, '33 Albert Hallenberg, '34 Frank A. Hamilton, '26 James Leo Hanley, '48 Paul J. Hanzlik, '33 *Thomas B. Hartzell, '21 Madeson C. Harris, '36 John F. Hasbrouck, '24 H. Clay Hassell, '23 Ingolf B. Hauge, '44 Wm. Haussmann, '32 Charles A. Hawley, '27 George F. Haynes, '39 Timothy Oliver Heatwole, '40 Baltimore, Md. Milo Hellman, '29

Frederick R. Henshaw, '22 Frank W. Hergert, '29 John D. Hertz, '40 Frank O. Hetrick, '22 Finis Marlin Hight, '31 DeLos L. Hill, '23 Guy H. Hillman, '50 Ellison Hillyer, '23 Frederick W. Hinds, '32 *Thomas P. Hinman, '21 A. Hugh Hipple, '21 N. S. Hoff, '22 Thos. A. Hogan, '30 J. A. C. Hogan, '23 Edgar Allen Honey, Sr., '38 Pope B. Holliday, '40 Walt E. Hoppe, '46 William Hopkinson, '24 David A. House, '24 Edward J. Howard, '32 Percy R. Howe, '21

Philadelphia, Pa. Chicago, Ill. Boston, Mass. Mt. Vernon, Ind. Milwaukee, Wis. Waco, Tex. Fargo, N. Dak. Indianapolis, Ind. East Orange, N. J. San Francisco, Calif. February 1, 1951 Minneapolis, Minn. Eugene, Ore. Pasadena, Calif. Tuscaloosa, Ala. Army-regular West Bend, Wis. Washington, D. C. Laurel, Miss. Far Rockaway, N. Y.

Indianapolis, Ind. Seattle, Wash. Stamford, Conn. Ottumwa, Kansas Houston, Tex. Atlanta, Ga. Plainfield, N. J. Brooklyn, N. Y. Dallas, Tex. Atlanta, Ga. Omaha, Neb. Ann Arbor, Mich. Pittsburgh, Pa. Richmond, Va. Kalamazoo, Mich. Athens, Ga. Portland, Ore. Milwaukee, Wis. Indianapolis, Ind.

Boston, Mass.

December 20, 1947 November 9, 1943 December 16, 1943 March 2, 1946 June 10, 1936 March 9, 1951 November 17, 1940 September 3, 1937 April 16, 1951 August 26, 1951 November 12, 1947 October 13, 1945 August 14, 1950 June 20, 1949 October 8, 1943 July 22, 1929 December 6, 1948 April 28, 1949 May 11, 1947

May 27, 1938 August 31, 1937 November 26, 1943 May 17, 1934 August 6, 1939 May 7, 1931 July 13, 1951 May 3, 1943 June 4, 1943 March 19, 1931 July 29, 1933 December 1, 1926 July 17, 1930 February 28, 1928 April 13, 1947 November 1, 1950 April 28, 1951 July 23, 1941 January 8, 1933 San Francisco, Calif. November 16, 1931 February 28, 1950

Eugene Bond Howle, '30 Claude Newton Hughes, '38 Dudley C. Hughes, '38 Alfred O. Hunt, '27 Forrest Wm. Huntington, '48 Everett M. Hurd, '29 R. G. Hutchinson, Jr., '24 W. E. Hutchison, '38 *Victor H. Jackson, '21 Albert Wade Jarman, '31 Louis E. Jelinek, '29 Edward J. Jennings, '42 *Chas. N. Johnson, '21 H. Herbert Johnson, '23 John Norborn Johnson, '30 Leland Ray Johnson, '36 Ralph Bullock Jones, '38 Jorgen Peter Justin, '38 H. Leonidas Keith, '37 Henry Allen Kelley, '29 *C. Edmund Kells, '21 Oather A. Kelly, '37 Harry E. Kelsey, '22 James Keltie, '31 Frederick C. Kemple, '38 Albert H. Ketcham, '30 Herbert E. King, '26 Jacob Henry Kolter, '39 Charles S. Kramer, '30 Leon R. Kramer, '48 Otto G. Krause, '27 Glenn D. Lacey, '38 Charles Lane, '26 Arthur C. LaTouche, '23 Harry E. Latcham, '33 Charles R. Lawrence, '33 Harry Comegys Lawton, '38 Alfred P. Lee, '23 Albert Leland LeGro, '26

Henry O. Lineberger, '31 Edward G. Link, '22

Raleigh, N. C. Atlanta, Ga. New York, N. Y. Omaha, Neb. Kansas City, Mo. Portland, Ore. Essex Falls, N. J. Little Rock, Ark. New York, N. Y. Philadelphia, Pa. Cicero, Ill. Trenton, N. J. Chicago, Ill. Crescent, Ga. Goldsboro, N. C. Chicago, Ill. Willimantic, Conn. Milwaukee, Wis. Wilmington, N. C. Portland, Maine New Orleans, La. St. Louis, Mo. Baltimore, Md. Boston, Mass. New York, N. Y. Denver, Colo. Omaha, Neb. Wausau, Wis. Colorado Spgs., Colo. July 30, 1941 Topeka, Kans. Milwaukee, Wis. Dallas, Tex. Detroit, Mich Los Angeles, Calif. Baltimore, Md. Enid, Okla. St. Paul, Minn. Philadelphia, Pa. Grosse Point Farm, Mich. Raleigh, N. C.

Rochester, N. Y.

June 23, 1942 March 8, 1938 May 4, 1942 January 12, 1934 February 28, 1949 February 17, 1950 September 23, 1945 September 11, 1942 January 26, 1929 May 20, 1933 July 16, 1950 December 12, 1951 July 17, 1938 May 23, 1937 December 2, 1946 May 29, 1948 May 9, 1941 November 19, 1948 July 29, 1938 February 21, 1945 May 7, 1928 September 11, 1942 March 1, 1946 December 11, 1950 May 21, 1938 December 6, 1935 May 11, 1950 January 10, 1950 May 21, 1950 January 31, 1940 November 10, 1948 April 28, 1938 May 10, 1938 August 20, 1941 August 6, 1940 January 29, 1946 April 8, 1940 November 1, 1947

December, 7 1951

July 12, 1933

Robert R. Linville, '41 Arthur P. Little, '39 Wm. H. G. Logan, '21 Jack LeRoy Loop, '40 Benjamin F. Luckey, '23 S. Blair Luckie, '34 William E. Lundy, '38 John J. Lusardi, '44 Myron E. Lusk, '46 Ambrose H. Lynch, '32 Chalmers J. Lyons, '22 Chas. J. Marcinkiewicz, '38 J. A. Marshall, '22 Richard Holmes Mason, '31 Joseph P. Massicotte, '25 John F. Mauer, '36 Herman A. Maves, '28 Charles J. McCarthy, '36 Harris W. McClain, '29 Wm. H. McCracken, '38 Arthur R. McDowell, '27 Harry M. McFarland, '38 William A. MacFarlane, '39 Paul Joseph McKenna, '38 Patrick, Vincent McParland, '29 Philip Thomas, Meaney, '43 George H. Means, '25 Horace G. Meek, '45 Louis Meisburger, '22 George H. Mengel, '32 Alvin Fox Merriman, Jr., 35 Clinton T. Messner, '29 Compton B. Millarr, '46 Donald Howard Miller, '51 Herbert C. Miller, '23 Howard C. Miller, '29 Jesse Miller, '38 Robert T. Miller, '45 Sydney Robotham Miller,

Mt. Olivet, Ky. Richmond, Va. Chicago, Ill. Alhambra, Calif. Paterson, N. J. Chester, Pa. Memphis, Tenn. Jersey City, N. J. Minneapolis, Minn. Providence, R. I. Ann Arbor, Mich. Detroit, Mich. San Francisco, Calif. May 7, 1941 Macon, Ga. Providence, R. I. El Monte, Calif. Minneapolis, Minn. San Francisco, Calif. January 23, 1940 Chicago, Ill. Detroit, Mich. San Francisco, Calif. May 14, 1938 Kansas City, Mo. Waukesha, Wis. Springfield, Mass. Pittsburgh, Pa.

August 10, 1945 February 1, 1950 April 6, 1943 October 21, 1951 April 29, 1930 December 21, 1944 May 7, 1948 May 7, 1948 November 25, 1951 October 9, 1950 May 18, 1935 April 23, 1940 March 29, 1946 December 27, 1945 April 12, 1946 March 19, 1932 July 16, 1934 September 12, 1939 June 28, 1949 April 2, 1948 August 31, 1948 August 2, 1949 September 2, 1949

Portland, Ore. Louisville, Ky. Oakland, Calif. Buffalo, N. Y. El Paso, Tex. Santa Rosa Calif. November 9, 1942 November 19, 1946 August 10, 1927 February 14, 1932 January 27, 1952

Washington, D. C. San Francisco, Calif. August 12, 1948 San Leandro, Calif. Newport, Ore. Chicago, Ill. Marysville, Mo. Muncie, Ind. Baltimore, Md.

May 28, 1936 November 16, 1951 December 20, 1947 May 18, 1950 April 5, 1950 November 8, 1948 May 25, 1949

Charles Willett Mills, '31 Clayton L. Miner, '33 George E. Mitchell, '23 J. Russell Mitchell, '28 J. N. C. Moffat, '31 George S. Monson, '22 Claude A. Moore, '38 W. D. M. Moore, '27 Harry Greenwood Morton, 24 Frederick T. Murlless, Jr., 36 John Maxwell Murphy, '32 Robert H. Murphy, '38 Harold J. Nelson, '43 Adelbert John Noetzel, '35 Llewellyn G. Noel, '23 J. Emmett Northcutt, '38 William Frederick Northrup, '41 Edmund Noyes, '23 Elmer Chas. O'Connell, '45 Alphonse Patrick O'Hare, '37 John Thos. O'Rourke, '28 Robert Todd Oliver, '26 Forrest H. Orton, '24 Elbert B. Owen, '34 Leland Ray Packwood, '38 Addison K. Parks, '38 Luther M. Parsons, '38 Alexander H. Paterson, '25 John D. Paterson, '27 J. G. Pattison, '39 John L. Peters, '23 William Pilcher, '38 Harry B. Pinney, '33 Henry H. Piper, '32

Frank L. Platte, '26 Harry R. Potter, '41 William H. Potter, '26 William B. Power, '29

Chillicothe, Ohio St. Cloud, Minn. Haverhill, Mass. Atlanta, Ga. Memphis, Tenn. St. Paul, Minn. Lexington, Miss. Chicago, Ill. Elm Grove, Wis.

Hartford, Conn.

Temple, Tex. Macon, Ga. Fergus Falls, Minn. Milwaukee, Wis. Nashville, Tenn. Kansas City, Mo. Detroit, Mich.

Chicago, Ill. Navy—regular St. Louis, Mo. Boston, Mass. Washington, D. C. San Francisco, Calif. March 1, 1933 St. Louis, Mo. Fresno, Calif. Memphis, Tenn. Baltimore, Md. Baltimore, Md. Kansas City, Mo. Rochester, Minn. New York, N. Y. Petersburg, Va. Chicago, Ill. West Medford, Mass. Berkeley, Calif.

Los Angeles, Calif.

Boston, Mass.

Seattle, Wash.

March 23, 1948 January 17, 1952 August 23, 1934 July 1, 1950 August 14, 1933 May 27, 1933 October 11, 1941 July 19, 1937 May 23, 1950

March 11, 1948

June 7, 1943 April 25, 1949 May 29, 1946 December 1, 1945 January 20, 1927 January 5, 1943 December 28, 1951

March 28, 1927 November 3, 1948 September 19, 1949 June 3, 1948 July 11, 1937 June 6, 1950 April 11, 1942 January 5, 1943 February 23, 1949 February 4, 1941 January 12, 1930 December 28, 1942 May 18, 1945 January 18, 1948 October 18, 1951 April 9, 1942

June 27, 1927 February 13, 1950 July 27, 1928 March 29, 1940

Weston A. Price, '22 James M. Prime, '22 Merle M. Printz, '25 James H. Prothero, '23 Herbert A. Pullen, '32 Andrew A. Rafferty, '42 G. A. Rawlings, '25 Harry J. Ray, '34 Frank B. Rhobotham, '29 Charles E. Rice, '28 William Rice, '27 Walter H. Richardson, '23 U. G. Rickert, '23 John M. Ridley, '38 W. M. Robey, '38 Wilfred H. Robinson, '30 Fernando E. Rodriquez, '33 Ernest Albert Rogers, '34 Albert R. Ross, '23 Frank G. Rohde, '40 Louis Rossman, '38 Arthur T. Rowe, '34 Joseph Samuels, '32 Benedict F. Sapienza, '37 Walter H. Scherer, '34 Adolph Robt. Schmid, '38 John V. Scholten, '32 Wallace Seccombe, '21 Harry M. Semans, '22 Jas. H. Shaw, '40 Will Gross Sheffer, '36 L. Langdon Sheffield, '40 Clyde C. Sherwood, '31 Harry B. Shuman, '39 Samuel L. Silverman, '22 Richard Lee Simpson, '29 William K. Slater, '38 A. Malcolm Smith, '37 Arthur G. Smith, '26 Edbert A. Smith, '38 Harold S. Smith, '24

Redlands, Calif. Omaha, Neb. Chicago, Ill. Chicago, Ill. Buffalo, N. Y. Worcester, Mass. Bismarck, N. D. Aiken, S. C. Chicago, Ill. Los Angeles, Calif. Boston, Mass. Worcester, Mass. Ann Arbor, Mich. El Paso, Tex. Charlotte, N. C. Oakland, Calif. Washington, D. C. Carr, Colo. Lafayette, Ind. Columbus, Neb. Baltimore, Md. New York, N. Y. Providence, R. I. Birmingham, Ala. Houston, Tex. Worthington, Minn. Cedar Rapids, Iowa Toronto, Canada Columbus, Ohio St. Petersburg, Fla. San Jose, Calif. Toledo, Ohio Toledo, Ohio Boston, Mass. Atlanta, Ga. Richmond, Va. Knoxville, Tenn. Tampa, Fla. Tryon, N. C. Montclair, N. J. Chicago, Ill.

January 23, 1948 May 29, 1948 February 10, 1934 April 8, 1929 February 17, 1935 November 2, 1950 April 16, 1933 June 27, 1936 May 30, 1934 February 5, 1935 November 23, 1932 May 9, 1940 October 21, 1938 November 7, 1947 July 10, 1938 September 12, 1948 October 21, 1932 June 4, 1947 May 13, 1938 December 14, 1948 April 2, 1940 December 12, 1935 February 12, 1939 March 31, 1951 May 12, 1951 January 22, 1947 March 8, 1938 January 16, 1936 July 29, 1948 October 21, 1942 February 15, 1950 June 4, 1947 July 5, 1942 November 1, 1946 October 7, 1934 July 1, 1947 January 24, 1949 November 10, 1950 July 24, 1936 December 8, 1947 October 16, 1949

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July 15, 1943 December 28, 1950 October 27, 1924 April 2, 1950 November 10, 1948 August 9, 1934 December 15, 1945 December 16, 1951 March 26, 1938 October 23, 1931 April 20, 1930 June 24, 1951 March 22, 1939 January 9, 1939 May 2, 1935 February 11, 1931 July 29, 1941 February 11, 1937 August 12, 1944 September 2, 1950 September 9, 1927 April 1, 1944 October 15, 1948 June 14, 1925 July 13, 1951 March 28, 1936 July 6, 1937 December 13, 1950 March 1, 1936 July 25, 1943 March 16, 1945 November 6, 1936 December 30, 1948 May 25, 1951 June 1, 1931 December 14, 1948 November 18, 1949 February 26, 1933

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December 26, 1944 September 16, 1941 December 23, 1950 January 18, 1952 February 22, 1932 April 12, 1922 November 11, 1947 July 9, 1941 March 28, 1940 July 30, 1951 July 6, 1948 September 29, 1945 March 29, 1940 November 27, 1946 November 8, 1926 December 31, 1951 March 14, 1944 May 3, 1941 March 12, 1938

January 16, 1946

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April 9, 1951

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