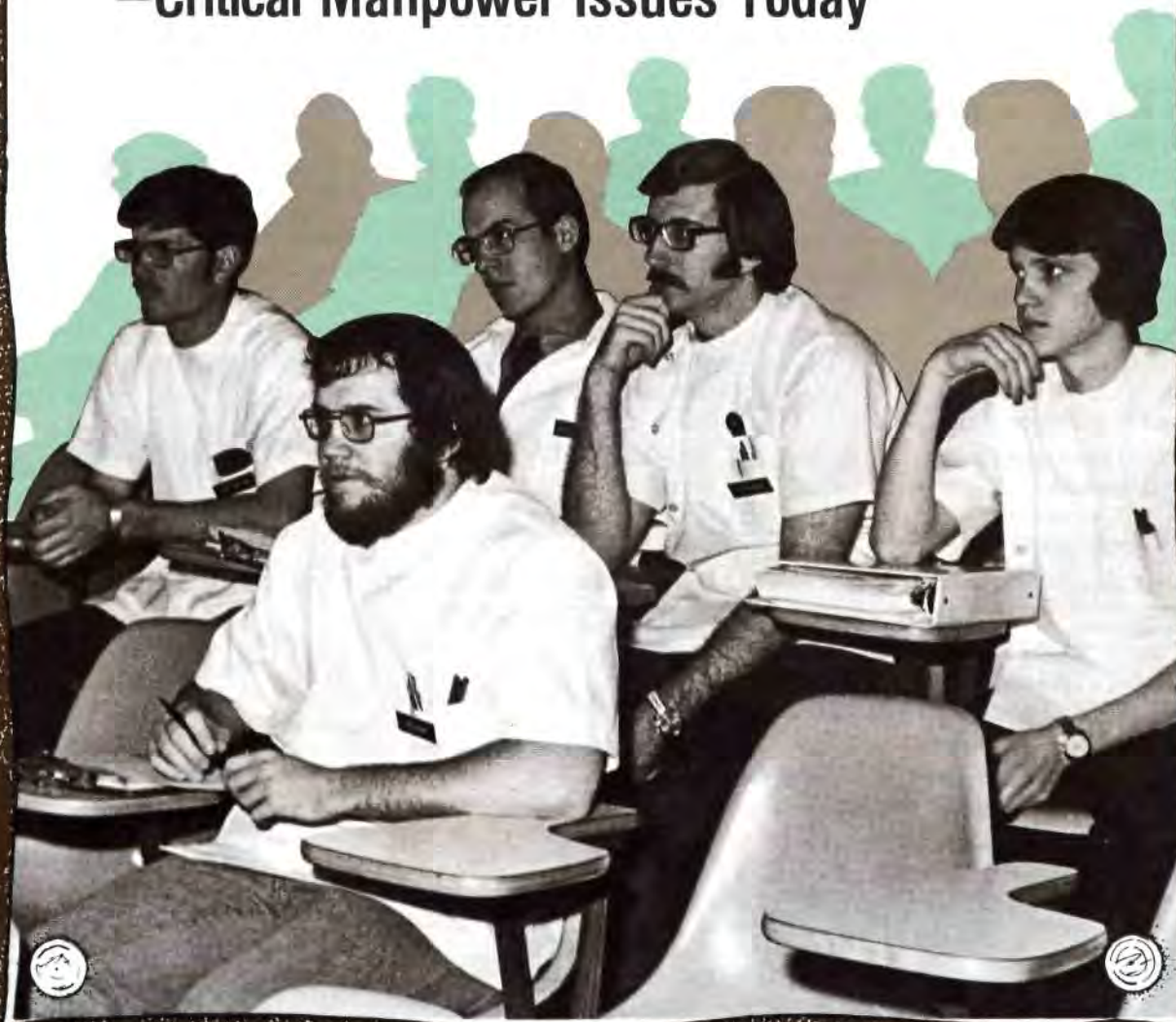


JOURNAL OF OPTOMETRIC EDUCATION

Volume 4, Number 4
Spring 1979

**Who will take
their place tomorrow?**

—Critical Manpower Issues Today



ASSOCIATION of SCHOOLS and COLLEGES of OPTOMETRY

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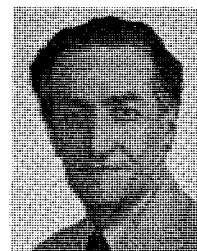
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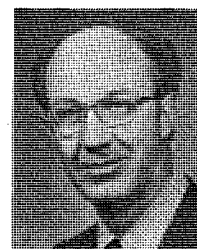
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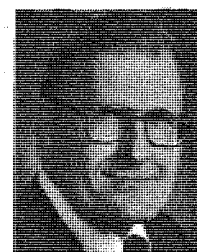
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LETTERS

I have just seen the new edition of the *Journal of Optometric Education*, and I am very pleased with the layout of my article. You did a first-rate job, and I appreciate it.
Again, congratulations on a job well done.

John G. Classe, J.D., O.D.
Attorney at Law, Birmingham, Alabama

I am sorry this letter is so long in coming to you. Financial Aid is a very time consuming activity, as you can no doubt imagine.

At any rate, I am writing to let you know just how much I appreciate the wonderful job you did on my article summarizing the data available in the *Exploratory Study of Women in Optometry*. The layout was simply beautiful. I really appreciate your thoughtful consideration of every aspect of my article. Your sense of dedication and your conscientiousness were very apparent.

Thank you for a job well done, not only on my article, but on all the issues of the *Journal of Optometric Education*.

Barbara Shoener
Financial Aid Officer, Southern California College of Optometry

Thanks for the copies of the *Journal*. I am pleased with the article and the positive comments I am receiving.

Sheldon L. Siegel, M.Ed., M.S.
Dean of Students / Director of Admissions, Illinois College of Optometry

Thank you very much for the last issue of the *Journal of Optometric Education*, Winter 1979.

We are particularly interested in the article written by Ms. Barbara Shoener called "Women and Perceived Barriers Relative to Optometry as a Profession." So, we ask your permission to translate it into French and publish it in our monthly magazine *L'Optometrie*. Please find enclosed a copy of the last issue. Of course we will mention the sources and send a copy of the translated article to the author.

We thank you very much in advance for your answer. Looking forward to hearing from you.

G.N. Roosen
Director, *L'Optometrie*, Bures, France

I just saw the Winter 1979 issue of the *Journal of Optometric Education*. I believe that you and the other people responsible for this journal and for the activities of the Association are to be highly congratulated. I noted with special interest your statement of priorities and purposes on pages 28 and 29. Again, I believe these are excellent in concept and in content.

I hope you will keep me up to date on ASCO's activities.

Raymond D. Cotton, J.D.
Washington, D.C.
(Former Executive Director, Association of Schools of Public Health)

At about the time this issue leaves the press the *Conference on Optometric Education in Europe* will have taken place in Milan, Italy. The dates are May 4 to 7 inclusive. Invited to participate are the academic heads of twenty-some ophthalmic optical schools of Europe, including East Germany and Hungary, as guests of the combined congress of FEDEROTTICA (Federation of Italian Optometrists and Opticians), the IOOL (International Optometric and Optical League), and MIDO, the annual international fair of the Italian ophthalmic optical industry.

This conference, though given relatively little publicity outside of Europe and the governing assembly of the IOOL, can well be the launching pad of an optometric trend that will be felt throughout the world. It is not without significance that the IOOL considers the ultimate goal of this meeting the founding of an Association of Optometric Educators in Europe.

We in the United States may be reminded that this conference may have some analogies to that of the *First Conference on Optometric Education* in St. Louis on January 11 to 14, 1922. That conference, which planted the seeds for almost every major optometric development in the American states during the subsequent few decades, was sponsored by the American Optometric Association to bring together representatives of the American optometry schools and colleges, the state boards of examiners, and the AOA Council on Optometric Education.

The composition, objectives, and potential long-range influence of the Milan conference suggest some striking similarities to the same features of the long past and almost forgotten St. Louis conference. But the attendant circumstances are certainly very different. For one thing, the St. Louis conference involved only one language while the Milan conference includes participants of at least 10 different native tongues. The cultural and political differences of the represented geographic areas of the former assembly emerged only in the occasional friendly conversational jibe, but in the latter meeting they are often serious barriers to cooperation demanding utmost patience and understanding.

Less obvious, but nonetheless deepseated, are the differences in ophthalmic/optometric structure in 1922 U.S.A. as compared to present-day Europe. The overwhelming majority of practices in the States in 1922 were small-town solo enterprises in predominantly rural countryside; the majority in today's Europe are well-established and complexly organized firms with several integrally involved and

vocationally qualified persons in each. The rank and file American optometrist in 1922 was an exempted entrepreneur under the grandfather clause of a recently enacted optometry law and typically without more than a few months training; in contrast our European counterparts are strictly licensed under long existing regulations of the craft ministries, among the oldest ministries of government. Most of our optometry schools in 1922 were privately operated under virtually unregulated charters and free of any responsible surveillance; the European schools are not private in any sense of the word, operating instead under direct government administration with prescribed curricula formulated in consultation with elected ophthalmic representatives. In 1922 we had not even entertained the concept of third party pay, but today's European practitioners, even the oldest living ones, cannot recall when prepaid vision care programs did not exist.

Major differences also exist in contemporary terms. Today's American student enrolls in optometry school only after a minimum of 14 years of formal academic work; the typical continental aspirant begins his/her training in optics at the end of the 9th or 10th grade of school, and this as an apprentice in a private establishment under government monitoring. In most West European countries the professional preparation consists of about two and a half or three academic years supplemented by apprenticeships averaging two years; in our country the preparation is uniformly four academic years with virtually no apprenticeship requirement.

In spite of such profound differences, and there are more, the completers of their education and ours provide much the same ophthalmic service to society, or so at least it seems to the consumer. What then, one may ask, are the fundamental academic issues, and what is the future of optometric education here and elsewhere?

We may at least hope that the Milan conference, like the St. Louis conference, will initiate an exchange of educational philosophy and a broader based analysis of what optometric education is all about than has been afforded by the provincialism prevailing heretofore in so many important areas of the world.



H. W. Hofstetter, O.D., Ph.D.
Rudy Professor of Optometry
Indiana University, School of Optometry

The Expanding Role of the Optometrist

Alden N. Haffner, O.D., Ph.D.

Summary of the Presentation at the Annual Meeting of the American Optometric Student Association

January 13, 1979, Columbus, Ohio

Key to any discussion about the future role of the optometrist must be the examination of the entire health care system as it is currently evolving and, as well, the optometric care system within which it is currently developing. As today's health care system is in transition, the following issues must be addressed: overall cost constraints; the "Proposition 13" atmosphere; President Carter's guidelines for the control of health care costs; hospital cost containment policies and federal oversight as it appears to be developing as a public policy issue; the "hold the line attitude" with regard to Medicare and Medicaid costs; the development of profile systems for practitioners as methods for the control of costs; and the overall growth and development of third party care, particularly by commercial insurance carriers as well as by the nonprofit Blue Cross and Blue Shield carriers.

As part of this aspect of the changes in health care financing, must also be examination of the general changes that are taking place in regard to procurement of services such as the use of centralized ophthalmic laboratories for the rendering of ophthalmic services.

1

Changes in Health Care Organizations and Delivery

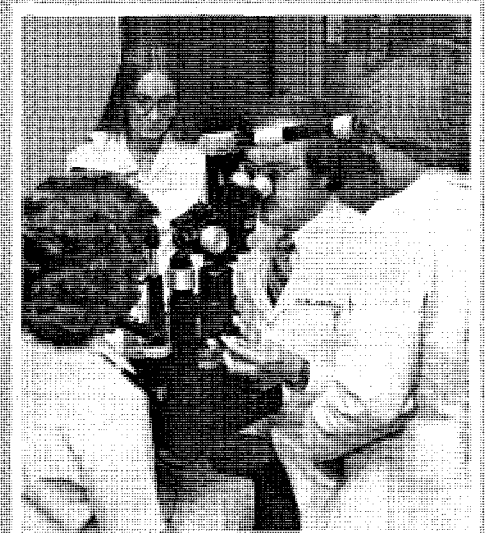
There are other changes in health care organization and delivery which likewise must be considered. Among these are: the general tendency toward more centralized and organized clinical care; more health care content planning; an increase in health care resource planning; and, surely, more health

manpower planning as well as facilities planning. Secretary Joseph A. Califano, Jr.'s statement before the Association of American Medical Colleges in New Orleans last October must also be taken into account. This statement declared a major manpower policy shift for the United States government. In effect, Secretary Califano indicated that the manpower shortage policy was at an end.

Additional changes in health care organization and delivery must surely address themselves to the development and growth of health maintenance or-

“

One of the most dramatic changes in optometry has been the emergence of the primary care optometrist.



”

Alden N. Haffner, O.D., Ph.D., is Associate Chancellor for Health Sciences at the State University of New York, Albany, New York.

ganizations (HMOs) as an alternative to traditional solo private practice. Moreover, the use of more assisting personnel at all levels, the development of the nurse practitioner and the development of clinical standards and review of performance standards, largely through the PSRO mechanism, are topics of critical moment.

2

Emerging Concepts in Health Care

Consideration of some of the emerging concepts in health care must also include the termination of manpower growth; cost constraints of the system; the concept of geographic "batching of fees;" application of the "certificate of need" concept to the registration of practice facilities and practice locations; the growth of institutional type facilities with fulltime clinicians at these facilities; and the legal recognition of the regulation and credentialing of assisting personnel.

Perhaps a major item for consideration as an emerging concept in health care is the gradual termination of the use of the traditional state board examination to be used as evidence of initial credentialing. Rather, the traditional state board examination may be used to examine continuing competence five or ten years after initial practice. Evidence of initial competence would be by the use of the earned degree.

Another important emerging concept in health care in the late 1970s is the indefinite deferral of national health entitlement and national health insurance as the result of the fiscal crisis of the country. There is a certainty that such a program of national scope would add many billions to the federal deficit.

Another increasingly emphasized concept in health care is the growth of the self-help, a self-reliance concept of wellness through increased emphasis on health education. There is also the greater reliance upon the public service mission of professional schools of the health sciences in health care delivery, particularly in resource shortage areas.

Of considerable interest in the financing of health education is the apparent greater reliance and dependence upon student borrowing to finance health professions education, coupled with the progressive withdrawal of federal supports for health professions education.

3

Changes in Optometry and in Optometric Care

It is only against this backdrop of the changes and evolution of the current health care system that we can consider changes in optometry and in optometric care. Among these are: the rise in the borrowing and debt limits for optometry students; the progressive rise in tuition in optometry colleges; the progressive rise in fulltime employment by optometric practitioners, particularly at institutional facilities as those grow and develop; and the decline in the number of solo practitioners and the concurrent rise in the number of group and association practices.

It is disturbing to note that there has also been a dramatic rise in the proliferation of commercial entities and "chains." This has had an enormous negative impact upon the professionalization movement in optometry.

There has also been a growth in the scope of optometric practice concurrent with the narrowing of the responsibility level in dispensing. Moreover, advertising has been confirmed as a concept in health care and in optometry, particularly as it applies to eyeglasses and contact lens dispensing.

One of the most dramatic changes in optometry and in optometric care has been the emergence of the primary care optometrist, and the emergence of the credentialed optometric specialist. There has been a significant rationalization of the need for optometric man-

power numbers and for ophthalmologic manpower numbers. Though he retains the responsibility for it, there is less dispensing by the optometrist. Clearly, the economic and manpower implications of this development are very important.

The potential for expanding the role of the clinical optometrist in the use of drugs for diagnosis, as well as in a limited number of states for medical therapy short of surgery, continues to be a matter of close scrutiny. The economic, manpower and educational implications of this development, likewise, require continuing attention. The casting of the future of optometry and optometric care as a public health oriented profession in a family of health caring professions is the role of the leadership of the optometric community.

4

A Stronger and More Vital Profession—But a Different Profession

Of particular concern to the schools and colleges of optometry is the urgency for a renewed commitment to professionalism at the risk of slipping back to a former posture. The implications in terms of public attitudes, public perceptions and public support clearly are related to this question.

The changes in optometry and optometric care, related to the overall changes and evolution of health care in general, are creating a stronger and a more vital profession, but a different profession.

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JOE wishes to thank the following additional members of the Editorial Review Board who have agreed to serve as referees and as liaison representatives of their respective institutions for the next three years:

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Critical Optometric Manpower Issues

Henry B. Peters, O.D.

In the competition for attention and priority consideration the profession has totally ignored critical manpower issues. The recent Delphi study conducted by the American Optometric Association to set priorities for association action for 1979-80 showed that the profession placed optometric manpower issues at the bottom of the priority list. Rescued only by a thoughtful Board of Trustees, it is clear that the profession is uninformed regarding the serious nature of these issues. It is the purpose of this paper to inform the profession and alert

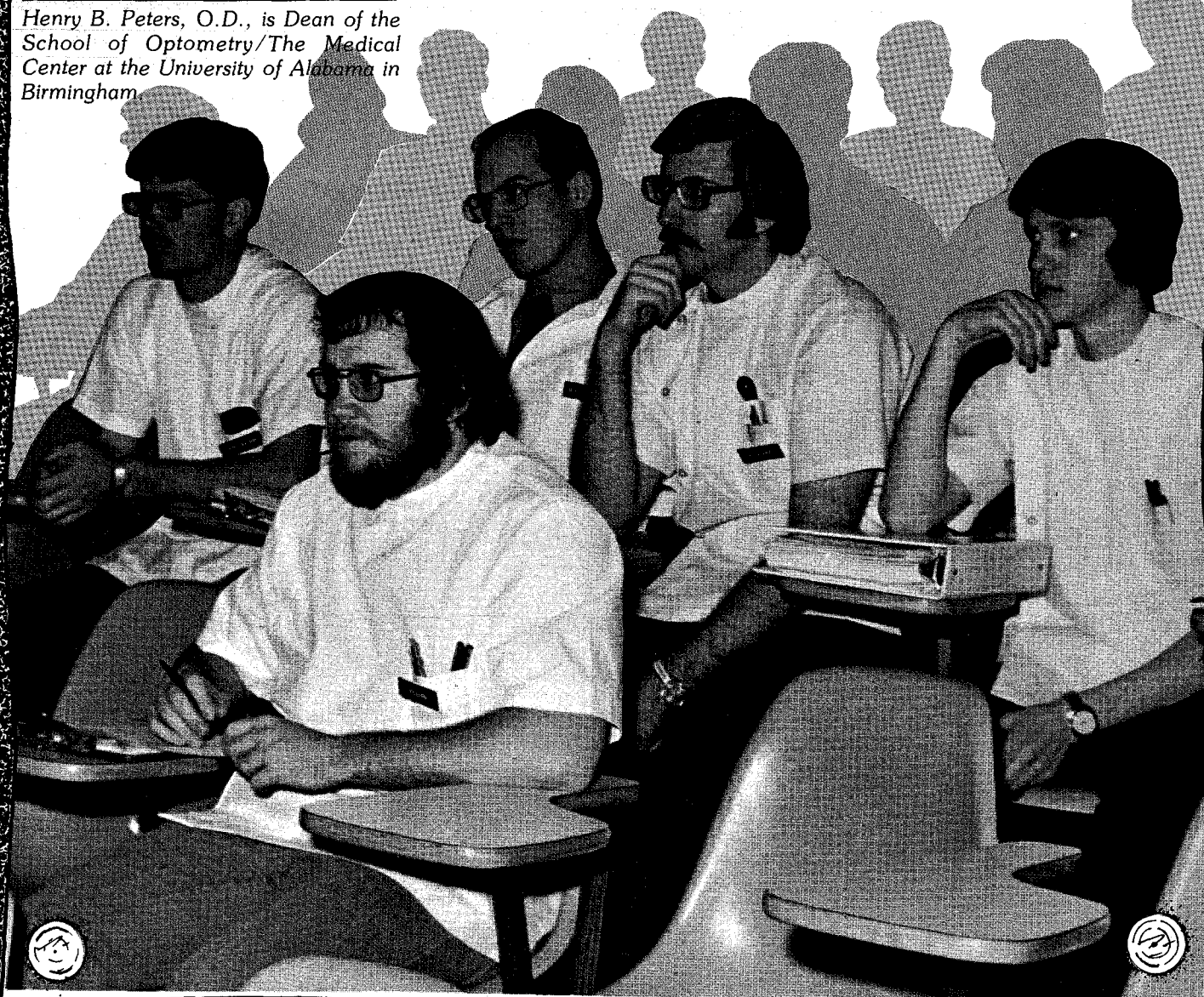
optometrists to the critical nature of the issues involved.

The very lifeblood of optometry is dependent upon an adequate number of new practitioners entering the profession—to at least replace those leaving practice from death, disability and retirement. Our existing schools, now filled to capacity, are barely able to meet this obligation, with precious little margin to supply the vision care needs of an increasing and aging population.

For the last three years there has been an alarming decrease in the number of

applicants to the schools. If the trend continues our schools will not be able to fill their classes. This could happen in the next few years—at just the time when the greatest number of optometrists will be leaving practice. This is a critical problem which the profession must address immediately or suffer irreparable loss. While there are other important issues relating to optometric manpower, the declining applicant pool is the most critical. This is one problem that the private practicing optometrist can do something about.

Henry B. Peters, O.D., is Dean of the School of Optometry/The Medical Center at the University of Alabama in Birmingham.



Student Recruitment

The students who will enter optometry school next year, in fact those who will enter school ten years from now, are already in school, in the educational pipeline. The number of such students has been declining for ten years and is not expected to increase again for another ten years. A report of the National Testing Service¹ says that in the next ten years the number of 18-to-20-year-olds in the population will drop by about 18 percent. So the total potential pool of students is declining. This has, and will continue, to affect the size of the applicant pool for all professions, not just optometry.

For the last three years there has been a continuing decline in the number of students taking the Optometry College Admission Test (OCAT) required of all applicants to schools of optometry. Figure 1 illustrates the relationship between new OCAT applicants² and optometry school admissions.³ If the present trend continues, clearly our schools will have difficulty filling their classes. This is true of other professions as well, so all professional schools will

be aggressively competing for students in the diminishing pool of college students.

It is imperative that optometrists and their representative organizations engage in an active student recruitment program now, before it is too late. We cannot wait for a repeat of 1964, when only 593 students were admitted to optometry schools, before starting this effort.

The unfilled need for optometric services is increasing. A recent marketing study by Frost and Sullivan⁴ indicates eye-care demand will increase by 300 percent in 1990. The need for optometric services increases with age, and the national prediction is that the percentage of the population over 65 years of age will increase from 10 percent, as it is today, to 18 percent by 1990.⁵

At the same time that optometric service needs are increasing, the production of optometric manpower is barely holding even—nationally at about nine optometrists per 100,000 population.⁶ Things will get worse before they get better. The age distribution of present practicing optometrists, particularly the post-World War II bulge now nearing

retirement, indicates there may be an actual decline in the number of optometrists over the next five to ten years. Figure 2 illustrates the problem of age distribution on the number of practicing optometrists. This problem has been predicted for more than a decade⁷ but remedial action has not been taken. Time is running out.

An important fact, reported by Levine,² is that 60 percent of all students taking the OCAT were interested in a career in optometry by an optometrist—a relative, friend, or their own optometrist. This offers an opportunity to do something about this critical situation. If each optometrist encouraged only one young person to apply for entrance to a school of optometry (or to take the OCAT) every four years, the problem would be solved. This is well within the capability of the profession and is each individual's responsibility.

Primary Eye/Vision Care

Optometric manpower issues are not separable from national issues of health manpower. Department of Health, Education and Welfare Secretary

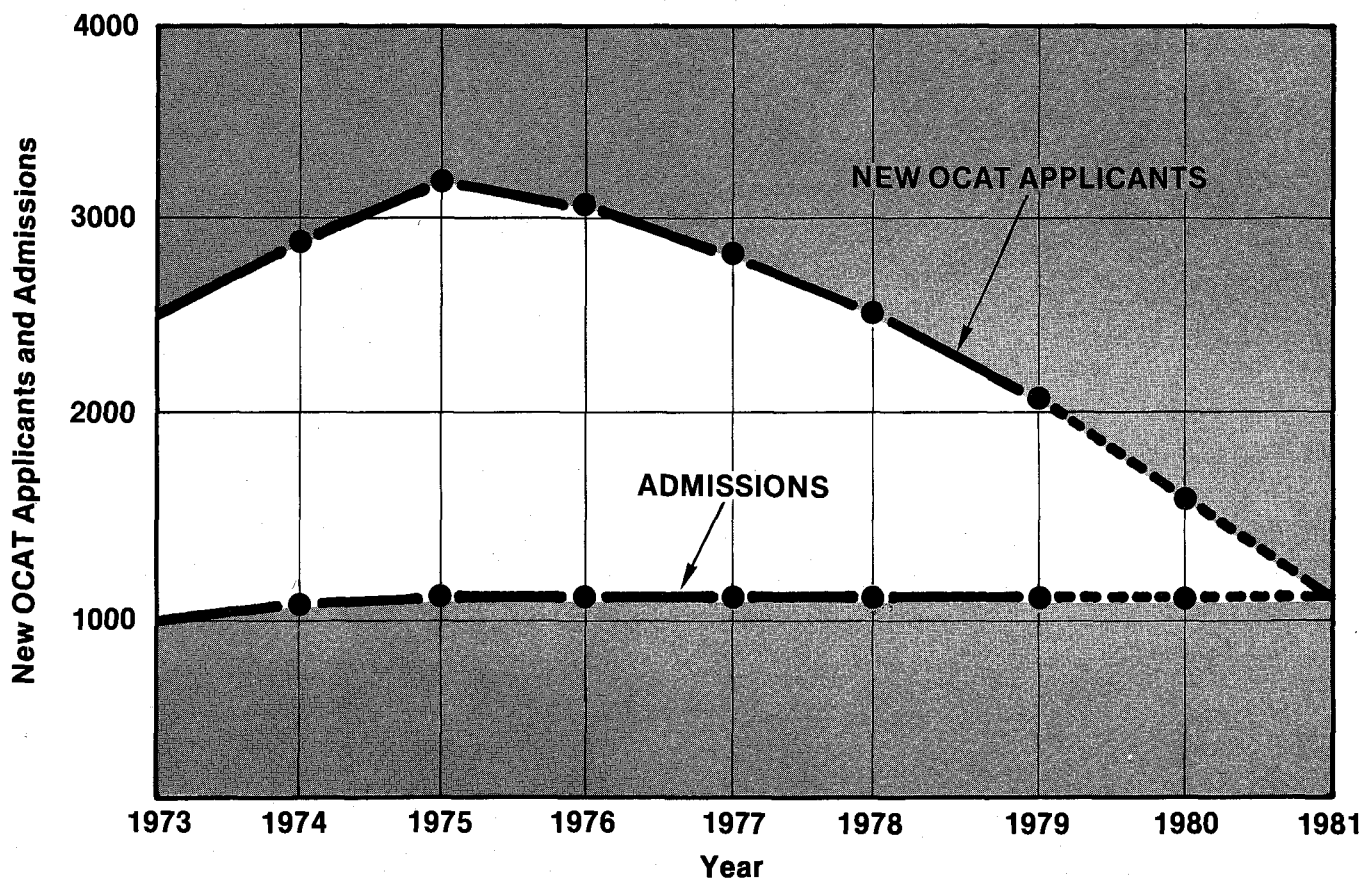


Figure 1.
NEW OCAT APPLICANTS AND ADMISSIONS
SCHOOLS OF OPTOMETRY 1973-1981

Joseph Califano⁵ defined these in a speech to the Association of American Medical Colleges (AAMC) in New Orleans October 24, 1978. He laid before the AAMC four "tenets of national policy in the health professions area."

First he said, "Overall, we face in the next decade an oversupply of doctors. Unless we change direction, we will seriously aggravate the oversupply by the end of this century."

At the present rate of production the number of physicians per 100,000 population will go from 143 in 1960 to 177 in 1975 and 242 by 1990, an increase of almost 70 percent. The physician graduates per year have increased from about 8,000 in 1963 to 15,000 in 1977, almost double. This surplus of physicians, estimated by Secretary Califano to be as much as 150,000 by 1990, has great significance for optometry, as well as other health care providers. If optometry's experience with the excess production of ophthalmologists in this nation over the last 10 years is any indicator, these excess physicians will be invading the professional responsibilities of all other health providers.

Concurrently, Reinecke et al.⁸ have developed a detailed study to justify the continuation of the present program which graduates 500 new ophthalmologists each year. Their prediction is that there will be 17,000 ophthalmologists practicing in the United States by the year 2000.

The second tenet, according to Secretary Califano, "is that we are producing too many medical specialists and subspecialists—such as surgeons. And there is a corresponding and disturbing decline in the production of primary care physicians."

This may seem like a problem of benefit to optometry since optometrists claim the role of primary vision care providers. But the other side of the coin is that ophthalmology is exerting considerable professional and political pressure to be declared a primary provider of health care, and *the* primary provider of eye/vision care. This is an issue of major importance to the profession of optometry.

If optometry is to establish itself as the primary provider of eye/vision care, then each optometrist must prepare

himself for this role. In-depth continuing education, mini-residencies and personal commitment to self-guided study are the only answers for the individual practitioner.

Secondly, office equipment must be upgraded to meet these new responsibilities. Tonometers, binocular indirect ophthalmoscopes, biomicroscope-slit lamps, adequate visual field plotting equipment and sphygmomanometers must be a part of the necessary equipment in each optometrist's office, along with the knowledge and skill to use it.

Finally, the political and professional climate to assist in the establishment of optometrists in community health centers, HMOs and ambulatory centers related to hospitals must be supported.

These are not easy commitments but ones to which every optometrist should give priority attention.

Maldistribution

The third tenet of Secretary Califano is "the doctors we do have are seriously

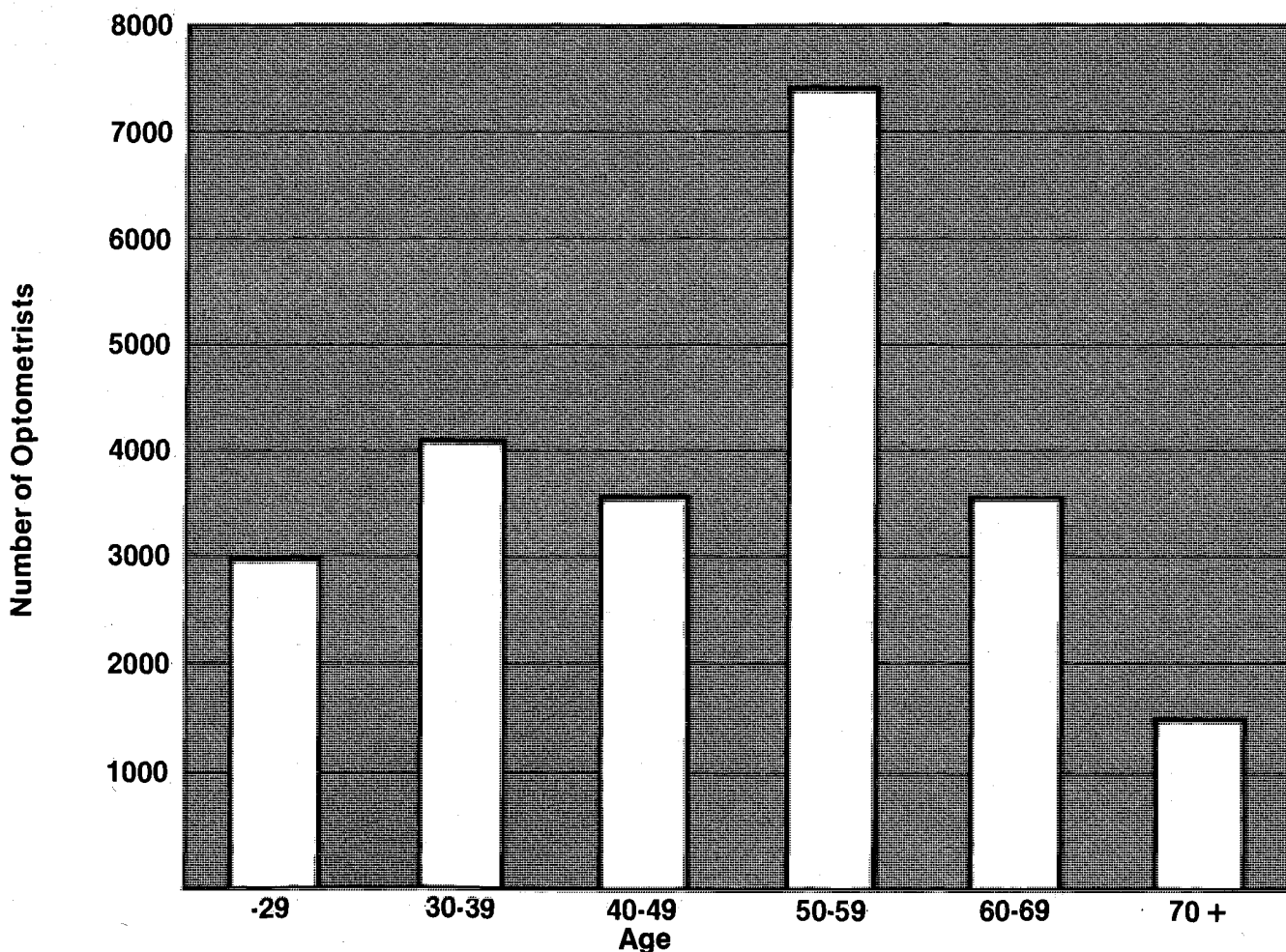


Figure 2.
AGE OF PRESENT OPTOMETRISTS — 1977

maldistributed in geographic terms."

The maps of optometric distribution may not indicate that this is a problem of optometry. Relatively speaking, optometry is the second most widely, evenly distributed profession (after pharmacy). But there still exists considerable maldistribution in optometry, and this issue must be addressed.

An Alabama optometrist will almost invariably agree that there is a shortage of optometrists in the state. Alabama is, after all, the 49th of the 50 states in the ratio of optometrists to population. But if asked where this shortage exists, he will always say "somewhere else," never in his own community.

At the University of Alabama in Birmingham, a community analysis of all the market areas of the state is being assembled to show where people go for goods and services. There is a remarkable amount of information available in state planning offices, chambers of commerce, banks, highway authorities, departments of education and many more. Community profiles are being developed that include numbers of kinds of health professionals, population trends, new industry, economic status, recreational facilities, churches, schools, etc. The graduates of our institution are being encouraged to use this material in selecting a practice location. This approach might be considered by others as a solution to maldistribution.

There is also a major program for providing health care to underserved areas through the U.S. Public Health Service, particularly under Public Law (P.L.) 95-626.

To participate, optometrists must help establish health shortage areas. Few state associations have made any attempt to develop designated health manpower shortage areas for optometrists in their state at the present time. This is a job for Health Systems Agencies (HSAs), and optometrists must provide input into this process.

The Public Health Service has developed an important system for development of health centers in underserved areas.⁹ These are Community Health Centers, Rural Health Initiatives, Migrant Health Centers, Ambulatory Centers, and Maternal and Child Health Centers. There are literally hundreds of these clinics in the nation. As far as can presently be determined, not one of these clinics has a regular staff optometrist.

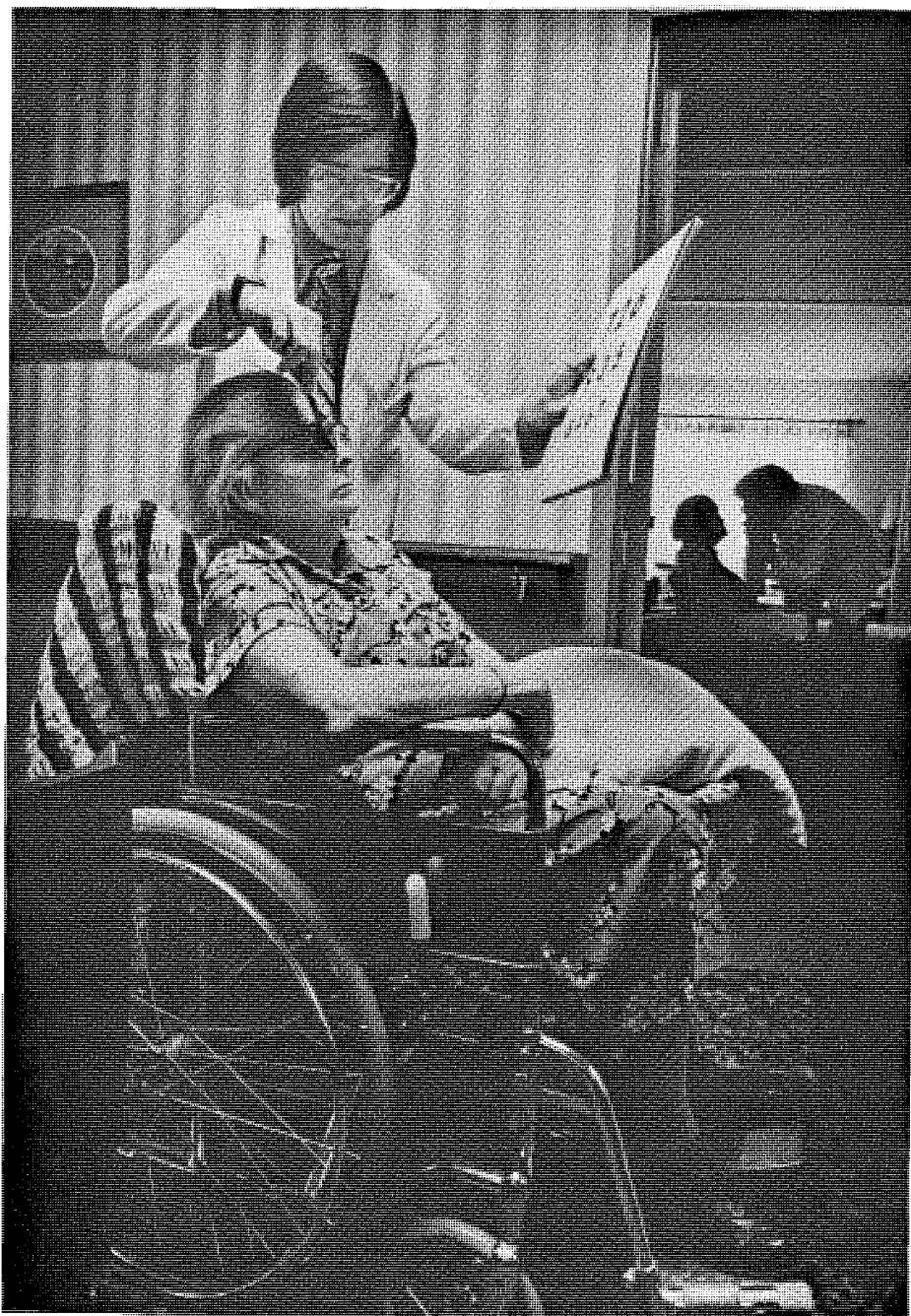
Under P.L. 95-626, each region is assigned PHS positions for the development of these clinical programs. They may be filled by National Health Service Corps, Public Health Service Commissioned Corps, or contract personnel. Of the positions available, 81% must be physicians and 9% dentists, but 10% can be other health personnel, including veterinarians, health educators, physicians extenders and optometrists.

Optometry must make the effort to secure professional positions in these programs. There are needs for optometric services among the populations served by these clinics.

Demographic, Social and Economic Changes

Califano's fourth tenet is that health professional schools "must take a more active role in making physicians responsive to demographic, social and economic changes which have deep implications for health care."

The implications of this statement are beyond the scope of this paper, but clearly the increasing number of older people, the needs of the institutionalized in prisons and mental hospitals, the problems of the disabled, the concerns for affirmative action, and more are



Clearly the increasing number of older people and more are problems that should concern the profession as well as the educational institutions.

problems that should concern the profession as well as the educational institutions.

Individual concern as responsible professionals should be directed to these issues.

There is yet another problem and opportunity that exists here. A community health center would be a most appropriate place to develop the specialized secondary and tertiary services that some of our present day graduates can provide: electrodiagnostic services (ERG, VER, etc.), specialized neurological studies through pupillography and ocular motility techniques, aniseikonia diagnosis and treatment and others. The equipment is sufficiently expensive and the incidence of appropriate patients is sufficiently low that private practitioners rarely offer such services. But the services are most important to the patients with problems amenable to these techniques.

The schools and colleges have such services, but where else can they be obtained? The establishment of such referral centers in each state, as a starter, in community health centers can readily be envisioned.

At the same time, many students finance their education with federal loans. By the time they graduate they are deeply in debt. They can get a substantial amount of this indebtedness forgiven by practicing in a health shortage area. That is where the community health center is most likely to be located. Perhaps such a program also could become a residency training site for advanced clinical training of optometrists.

Accountability

Now, finally, there is a group of issues that needs to be addressed that are indicative of major programs being developed in Secretary Califano's office. They can be contained in one word—accountability.

In this context, accountability includes the concepts of quality assurance, productivity, effectivity (cost effectiveness), and appropriateness. The profession of optometry has paid little attention to these issues.

The Professional Service Review Organizations (PSROs), established across the land, have focused their initial attention on services within acute care hospitals. Their second priority is long-term health care facilities and their third priority is ambulatory care. Make no mistake, these programs will one day impact on individual practitioners and will

include optometric services. Optometry has done precious little to develop either the professional standards that will be required or the social-political relationships with the existing PSROs to effectively participate in the process.

A new initiative at the national level is a program to study the productivity of health providers and the settings in which they function. To suggest that health professions increase their productivity, patients served, without adequate measures of the quality of care is to foster "mills." Optometry has known of this type of operation, the so-called commercial chain, for a long time. The recent FTC rulings on adver-

*Proof of accountability
must be developed—cost-
effectiveness, quality
assurance and productivity.*

tising have encouraged an explosion of this type of optometric practice. As professionals concerned with quality vision care this should be cause for great concern, even alarm. But the profession has not developed the quality standards that are the only possible way to combat this development or discourage the FTC from further actions of the same kind. The general assumption is that commercial chains supply inferior service, but where are the standards by which to measure this? Where are the studies that prove it? Optometry has been so involved in the fight over turf with ophthalmology that it has largely ignored the expansion of the conglomerates into

the field of vision care.

Proof of accountability must be developed—cost-effectiveness, the application of standards of quality assurance, the appropriateness of treatment regimens and productivity of optometric practices.

Clearly, there is a trend toward group practice in optometry. This is viewed as a more productive and cost-effective delivery mode than solo practice. Who has published the proof?

One proven way to increase the productivity, the quality of care and the cost-effectiveness of optometric services is to employ a trained optometric technician.¹⁰ Published studies indicate that such a technician can increase the productivity of a practice by at least 25 percent and increase the quality of the service at the same time. The technician can measure visual fields the busy practitioner may neglect; and perform tonometry, color vision testing and many other services that extend and enhance the services of the optometrist.

Alabama has had such a program since 1971. It is small, graduating about ten per year from the two-year program. The optometrists were slow in taking advantage of this opportunity but now literally stand in line to recruit graduates to their practice. Every student has a job before he or she graduates. The optometrists have found these trained technicians to be far superior to the on-the-job trained assistants they formerly employed.

An optometric technician is useful for one's own personal development, as well as the effective delivery of quality vision services to patients.

These optometric manpower issues are critical to professional survival. They are obviously of interest to the public as expressed in social policy. Both individual optometrists and their organizations should give these matters priority attention.

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Full Cost Tuition and the Academic Common Market

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This paper is part of a project that has been funded at least in part with Federal funds from the Department of Health, Education, and Welfare under contract number HRA-232-78-0125. The content of this publication does not necessarily reflect the views or policies of the Department of Health, Education, and Welfare, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

Premises of this Paper

A major theme in the history of American education has been an often-heated discussion of methods and alternatives for the financing of the system, complicated by the structural and fiscal differences between private and public education. The questions most often asked are:

1. Who pays?
2. Who benefits?
3. Who should pay?
4. How much, both in dollars and as a percentage of total cost?

American public education is based on the concept of universal free primary and secondary education. Only at the post-secondary level is it common for tuition to be charged for public education. Thereafter, as the student moves on to graduate or professional education, the tuition usually increases. Tuition is, of course, commonplace in private education, and is usually higher than in public schools. The tuition is dramatically higher in private single-purpose professional schools.

Charging of tuition in post-secondary public education may be justified on the basis of the costs incurred for equipment, facilities, and the much higher

number of faculty relative to students, as compared to primary and secondary education. Also, by far the greatest benefit of higher education accrues to the individual. Thus, fairness suggests that a greater and greater portion of the cost be borne by the student as he or she progresses further into his or her post-secondary education.

This relationship of individual benefit to responsibility for cost of education may be ameliorated to a degree in terms of the particular professional skills being acquired. Maintenance of a relatively high number of persons with desired professional skills can be a social goal justifying the payment of a larger share of the costs of appropriate professional education by the public at large. Thus because of public subsidization of medical education, it may be no more costly to the student than graduate study in engineering.

In time, of course, providers of such post-secondary educational services may come to rely on continuing subsidization of their "product." However,

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society changes its collective "mind" with regard to its "needs" for certain types of graduates as readily as individual students change their minds regarding their fields of interest and career goals.

It is important that some arrangement for stable and rational administration of higher education financing be utilized, particularly with regard to graduate professional education. For purposes of this paper, we will limit our focus to the health care education field.

At Southern College of Optometry, we believe we are using a system which is equitable—or at the very least, understandable—to all parties. We use the concept of "Full Cost Tuition," which will be the focus of the balance of this paper.

The "Full Cost Tuition" Concept

At Southern College of Optometry, our experience suggests that there is one financing system which is capable of being administered impartially and with equity for all participants (administrators, students, faculty, and other "payers") in the educational process. This we have defined as "Full Cost Tuition," which approach is used for all students. *Full Cost Tuition* is defined as "a concept which holds the consumer of the educational process (student) solely responsible for its cost."

In essence SCO says to each of its

applicants that, "If you want an optimum education of high quality* as delivered by Southern College of Optometry, you must pay a specific tuition in full, less any government or other subsidization (whatever may be available)." Expressed most simply, the student's tuition responsibility would be determined by taking the expense as reflected in a yearly budget and dividing it by the number of students. This is a way of determining the actual per-student cost of the operation of the college; it automatically assigns "overhead" to tuition. Our concept holds the student solely responsible for his cost, and he is so advised before he enrolls.

If the tuition were actually calculated in this manner, we would have a normative definition of full cost tuition. However, to actually charge the tuition to the student in this manner would overcharge the student. It would ignore social benefit and more important (from the student's point of view) the portion of tuition which society elects to pay in order to ensure availability of needed health professionals. Thus, *charges* (as opposed to costs) are spread over a variety of sources: the student, society at large, endowment, and so forth. The Southern College of Optometry utilizes the full cost tuition concept by holding

*Measured in terms of behavioral objectives and performance.

the student solely responsible for the total tuition cost while offering society an opportunity to contribute its share. The Federal Government, and the government of the state in which the applicant resides and others may contribute some share of the student's tuition which they determine appropriate from "society's" point of view. Such sums contributed by society at large are credited to the student's account. Also credited to the student's account are a share of all other incomes to the institution from endowments, investments, and auxiliary enterprises. In this latter case, contributions from school non-tuition revenues are distributed to each student's tuition so as to be equitable to all students.

The "Academic Common Market"

Non-student contributions or payments against full tuition cost have many forms. These include grants, gifts, and contracts. At Southern College of Optometry, contracts are our most common form of non-student payment of tuition. The concept upon which our use of contract payment is based has been named by us "the academic common market." It is defined as the academic marketplace in which educational services are delivered to selected students from various states which are in need of a certain type of health manpower. This concept is premised on the

TABLE 1.
Elements of Tuition Cost Over Five-Year Period at Southern College of Optometry

Fiscal Year	QH/Year	Rate/QH	Educational Cost/Student	Non-Regional Tuition (Full Cost)	*Regional Tuition	Credit
1974-75	61	86.00	4,023	5,246	3,246	+ 1,223
1975-76	61	96	5,256	5,856	3,856	+ 600
1976-77	61	100	6,479	6,100	2,850	- 379
1977-78	60	100	7,490	6,000	2,750	- 1,490
1978-80	60	110	7,998	6,600	2,850	- 1,398

DEFINITIONS:

Fiscal Year— Budget year July 1-June 30.

QH/Year— Quarter hours in curriculum that year.

Rate/QH— Tuition charge per quarter hour.

Educational Cost/Student— Cost of education excluding transfer to Audio Vision, maintenance, etc.

Non Regional Tuition— The full cost tuition for which each and every student is responsible.

Regional Tuition— An example of tuition paid by S.R.E.B. contract students. Contracts began at \$2,000, moved to \$3,250 and are now \$3,750.

Credit— The difference between educational cost per student and full cost tuition (non regional). This credit is awarded every student on an individual basis and represents a proportional amount of all sources of income to the school, such as capitation, endowments, etc.

*Regional Tuition as stated above is an example of charges to students who are S.R.E.B. contract students. However, each student is responsible for the full cost tuition, and any funds which come to the institution on behalf of a student are credited to the full cost tuition. Other examples are HR-2 students who would have -0- in the regional tuition column as the Federal Government pays the full cost. The same would be true for Vocational Rehabilitation students.

Contract sums vary, such as, Oklahoma provides \$3,000 of the full cost tuition so that their students would pay \$3,600 in the 1978-79 year.

The college does not accept two contracts for the same student. S.R.E.B. contract students who secure an HR-2 contract are given a choice as to which one they want credited. The other sum is credited to the contractor or the funds are returned to sender. To do it any other way would cause a double charge for the full cost tuition; it would cause the student to make a profit from tuition contract aid.

idea that some states may lack both sufficient numbers of certain health professionals (e.g., podiatrists or optometrists) and the capital resources in existence to produce them. Under such circumstances, a given state may opt to obtain such health professionals from the "common market" rather than by mobilizing resources within the state itself.

An example of this type of choice is the Federal Government's "Uniformed Services University of the Health Sciences." The Armed Forces, premised on shortages of key military health care specialties, has decided to mobilize Federal resources to meet this need. In effect, the Armed Services are partially withdrawing from the "common market" of existing medical schools. The military has now opted to contribute 100 percent of the tuition of some military medical and health specialists. However, this is a limited example, as the military will still rely heavily on existing medical schools for much of the needed manpower. Also, even this limited withdrawal from the common market has been fraught with controversy.

The Federal Presence in the Health Common Market

All of you are familiar with the various educational regions which have been lately defined in this country. Each region constitutes a common market for at least one curriculum which is not available in each of the states in the particular region. The Federal Government, however, has defined a nationwide "common market" for both optometric and podiatric medicine. Contractual arrangements have been made with each of these professional schools; each of us has contracted with the Federal Government largely on its terms. The contracts with the Federal Government are varied and different. Southern College of Optometry's contract with the Federal Government declares that we will admit a given number of students. This forces an increase in both our total and per-student cost. This, in turn, is theoretically offset by the old basic improvement (capitation) grant money. In fact, though, this is not the case, as the capitation award has been consistently reduced. We, and most of our peers, are now in the position of having grant-related cost increases in concert with notably reduced Federal funding contributions. Of course, this is corrected in a full-cost tuition concept, at least from an administrator's point of view, but certainly to the student's detri-

Year	CPI 1957-59 Base	SCO CPI
1957-59	1.000	---
1960-61	1.031	---
61-62	1.041	---
62-63	1.054	---
63-64	1.067	---
64-65	1.081	---
1965-66	1.099	1.102
66-67	1.131	1.141
67-68	1.163**	1.165
68-69	1.211	1.225
69-70	1.277	1.275
1970-71	1.352	1.37
71-72	1.411	1.42
72-73	1.457	1.48
73-74	1.543	1.54
74-75	1.725	1.74
1975-76	1.888	1.90
76-77	1.990	2.00
77-78	2.124	2.10
78-79	2.288	2.25
79-80	2.49	2.49

*In 1958 the tuition was \$750 for three quarters. Using this year as an index of \$1.00 = 1.00, the 1979 tuition (Regional) should have been ($750 \times 2.28 = \$1,710$) to remain equal. In fact, it was \$2,850. When reduced to the 1958 index, the comparative cost would be (1,250-750) or a \$500 increase in 21 years.

**The CPI in current use by the Department of Labor has 1967 as base year. Therefore, to convert to 1967 base, divide 1957 by 1.163.

ment. And this is occurring at the same time that professionals are finding their practice ever more regulated.

Other contracts which optometric and podiatric institutions have with the federal society are those covered under H.R. -II. This legislation calls for the payment of contracted sums to the student, who would in turn pay the cost of his education to the college through direct tuition charges. It should be noted that there is no per-student contract dollar limit in the legislation. The result could be that one student might pay \$10,000 a year for his optometric education, while another student might pay only \$1,000. In each instance, the Federal Government pays the bill. There is an obvious inequity here, in that neither quality nor cost are attempted to be bal-

anced by the contribution of society (i.e., the Federal contract payment). If a school were to undertake the responsibility for achieving such equity by contributing funds to balance both educational services and per-student charges, one would have to question whether the administration of that school were acting prudently.

At Southern College of Optometry, we charge the Federal Government the full cost, or some portion of the full cost responsibility which is assigned to all students based on the full-cost tuition concept. The Federal Government indirectly pays us \$7,200 per student for educational services. Most colleges of optometry receive far less, because most colleges charge less (since they do not compute "full cost tuitions").

Approaches to State "Common Markets"

Since it is possible to contract with the Federal Government to provide a common market for the health professions student as a national resource, it then would seem reasonable to be able to contract with a regional or state entity in like manner. Indeed, it should be possible to contract with any group which needs health manpower, particularly that developed by the optometric and podiatric curriculum. This led Southern College of Optometry to the use of existing regional mechanisms, foundations, and state departments of higher education to contract with individual states for manpower development on the basis of the needs of the particular state. At Southern College of Optometry this is generally referred to as the state contract program. The operations of the program are described below.

After several years of experience with this contract mechanism, Southern College of Optometry's preference is to operate through a regional compact. In such cases, there is an intermediary between the school and the state particularly when the state fails to honor its contract. Regional mechanisms provide

a vehicle which can actively seek out states which are interested in supporting the development of your educational "product." Regional compacts provide a much stronger and more reliable base of tuition support than single states. In most instances, state governments tend

Regional compacts provide a much stronger and more reliable base of tuition support than single states.

not to match increasing costs of services. Regional compacts, on the other hand, maintain a standard percentage contribution to the cost and encourage increased appropriations by states to cover such increases.

State contracts, *per se*, call for two things. First, states are allowed to re-

serve a specified number of entry places, or "slots," within a school. Second, they define the cost contribution per student. It should be noted, though, that students remain responsible for all unpaid tuition costs. No students are named. Indeed, many students will, from time to time, fill an existing "slot" reserved via a contract. Of course, states have other objectives in the management of such contracts. The state desires to insure that its residents who fill contract "slots" are treated equally with all other students in a given school. It wants the school to make an explicit demonstration of the support provided to the student. This is usually done by differential (lower) tuition rates for in-state students or providing a specific credit entry on tuition bills. At base, of course, this type of requirement is a "PR" action by the state. The intent is to stimulate loyalty and encourage the student to return to the state and deliver health care within its bounds upon completion of his education. Since Southern College of Optometry operates on a full-cost tuition concept, all of the funds received from states are credited to the student's account, not just the funds provided by a specific contract.

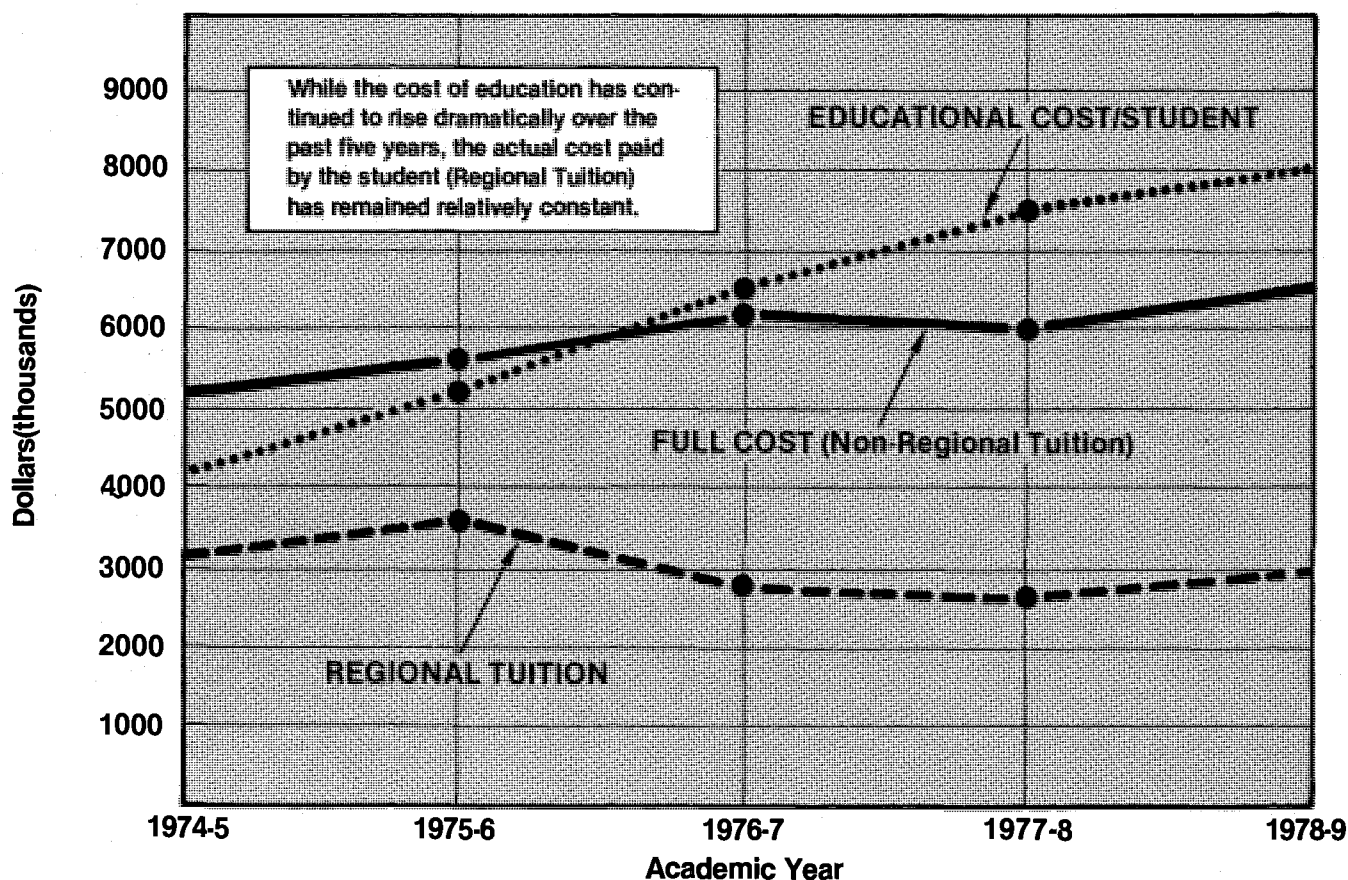


Figure 1.
RELATIONSHIP BETWEEN EDUCATIONAL COST, FULL COST TUITION
AND AMOUNT PAID BY STUDENT (REGIONAL TUITION).

Common Elements of a State or Regional Contract

The key provisions of a workable contract are outlined as follows:

1. Institution—The services or conditions to which the school agrees are:

- To reserve a specific number of places and admit only those students which the state has certified as residents
- To list those students who fill contract "slots" and properly bill the Regional Compact or State
- To inform the State of drop-outs and report the progress of each student
- To substitute other students of equal ability not to exceed 4 years of duration from entrance to completion for any one "slot;" i.e., to maintain an annual number of "filled slots"
- To continue students if the State contract is terminated, so long as the student meets the policies of the school
- To charge the contract states' students the same amount as the school's home state students*
- To refund or credit the State for students dropping out in the first 6 months

2. The State Agency—In return for the school's services, the State agrees:

- To pay a specific sum (currently \$3,750/year at Southern College of Optometry) for each "slot" reserved for State students on or before January 1st of each year for the ongoing academic year
- To set a contract effective date and hence, renewal date, on an annual or biannual basis
- To provide a Cancellation Clause containing a statement of automatic continuation or amendment subject to 1 or 2 years notice of cancellation to the school (i.e., unless positively cancelled by the State the contract is automatically extended)

Conclusions

The full cost tuition concept definitely adds stability to the finance of higher education. However, the administration of the school using this concept must develop stringent fiscal policies and controls. Some of the needed features include: a fixed salary schedule which has a computed index (based on C.P.I.) to ensure that the faculty and employees of the institution will not lose real

*This is automatic under the full cost tuition concept.

HOW DOES FULL-COST TUITION OPERATE:

The Annual Budget is based on a five-year projection, with the expense side being drafted first.

Student charges are demonstrated by example.

The gross expense side of the Budget is demonstrated by example, and the full-cost tuition arrived at.

Advantages:

- (a) Program can be maintained or advanced on a known income base
- (b) Cost can be projected over five years and matched to income
- (c) Inflation of cost of living is automatically placed in the income and expense prior to budget operation
- (d) Advanced warning is provided for financial distress and a correction made prior to its occurrence
- (e) Provides a real and comprehensive way of explaining income to probable donors
- (f) Stimulates aid of parents to join in seeking donors
- (g) Provides a central checkpoint for expanding or reducing the programs

Disadvantages:

- (a) In the beginning, it makes fund raising through accepted channels more difficult
- (b) Tends to move toward apparent higher costs for students (discourages financially disadvantaged applicants)
- (c) Difficult to manage in the early stages of initiation and be fair with donors and students—must be phased in
- (d) Faculty has objections in the early stages when they become aware of the cost of adding courses or subtracting courses from the curriculum

Examples of institutions using this financial method are the Dental School, University of Colorado, and Georgetown Medical School.

There are many road signs as to full-cost tuition becoming the method of finance for higher education in the future, such as: regional health care concept in the Health Professions Educational Assistance Act of 1976, contracts in the Southern Regional Educational Board, willingness of government agencies to participate, development of new schools—it is the only practical way.

wages over the term of the contract periods; the capacity to project expenses over a reasonable future period so that income to the institution may be adjusted systematically to inflation or deflation; and a strong commitment to hold the institution's budget in balance.

With reasonable long-term knowledge of income flow, the institution may plan for quality improvement and feel comfortable that the improvement not only can be instituted, but maintained. In other words, this approach allows for an organized growth of the institution and continuing improvement of the quality of the product.

Southern College of Optometry's experience has been that the student pays less money under the full cost tuition concept. Further, the student is more satisfied. He knows precisely what his responsibilities are, as well as who is contributing to his welfare. He derives a better sense of national, regional or state purposes and priorities regarding his chosen profession.

As with any concept and administrative process, there are pros and cons.

The negative aspects of the full cost tuition program are:

- It will always push the tuition rate of the institution to an apparently higher level than other institutions' tuition rates,** and may discourage applicants if the applicant pool begins to drop
- It can breed overexpansion and create capital expenditures in excess of future applicant pools' needs and society's willingness to assume the financial obligations

For every service there is a cost. Many educational administrators "overlook" certain costs of service since they are attuned to a "free educational society." The full cost tuition concept, however, is a business principle that can be effectively applied to education as to any other business. Indeed, the survival of high quality professional degree education may well require it.

**In fact, true full cost probably varies only slightly from school to school; what does vary is stated charges, which amounts to cost less all offsets available to a particular school.

Pharmacology Curriculum Model

A Report of the ASCO Council on Academic Affairs

The role of the optometrist as a health care practitioner and a primary vision care provider has encouraged a movement in optometry to modify state optometry laws so that pharmaceutical agents can be utilized in the practice of optometry. This has also focused attention on the scope of the pharmacology programs in the schools and colleges of optometry. Sensing this attention, the Council on Academic Affairs of the Association of Schools and Colleges of Optometry (ASCO) selected a committee and prepared the following curriculum model to be utilized by the various schools and colleges in assessing the scope of their individual programs in pharmacology.

We want to thank the members of the committee who devoted considerable time and effort to this project: Dr. David Amos, private practice, Kansas City, Missouri; Dr. Freddy Chang, faculty member, School of Optometry, Indiana University; Dr. Siret Jannus, faculty member, Southern California College of Optometry; Dr. Jerry Rapp, faculty member, State University of New York, State College of Optometry; Dr. Tom Stelmack, faculty member, Illinois College of Optometry; and Dr. Jess Boyd Eskridge, faculty member, University of Alabama in Birmingham, School of Optometry.

GENERAL PHARMACOLOGY

I. Introduction to Basic Principles of Drug Action

A. Definitions

1. General Concepts

- Definition of a drug
- Absorption and elimination
- First order kinetics
- Biological half-life
- Volume of distribution
- Dosing concepts

B. Sources of Drugs

- Naturally occurring
- Synthetic
- Semi-synthetic

C. Drug Classification

- Site of action
- Functional group
- Nomenclature

D. Dosage forms

- Oral
- Parenteral
- Suppositories
- Sustained release

E. Pharmacodynamics—pharmacokinetics

1. Routes of administration

- Enteral
- Parenteral
- Rectal

2. Absorption

- Passive versus active transport
- Acid—base characteristics
- Lipid solubility
- Molecular size and charge characteristics

3. Distribution

- Lipid solubility
- Free versus bound
- Blood-brain barrier
- Protein binding (plasma, tissue)

4. Metabolism

- Oxidation—reduction
- Hydrolysis
- Acetylation
- Conjugation
- Other

5. Excretion

- Renal
- Lungs
- Skin

F. Pharmacogenetics

- Idiosyncratic effects
- Inborn errors of metabolism

G. Mechanisms of drug action

1. Kinetics of drug action

- Michaelis—Menten
- Biological half-life
- Dose—response curve
- Volume of distribution
- Maintenance of dose, dosing interval, loading dose

2. Receptors and acceptors

- Primary versus secondary

3. Agonist and antagonist

4. Drug tolerance

- Tachyphylaxis
- Physiological
- Psychological

5. Drug—Receptor Interactions

- Synergism
- Additivity
- Potentiation
- Inhibition

H. Evaluation of Drug Action

1. Animal Studies

- ED₅₀
- LD₅₀
- Therapeutic index
- Drug efficacy
- Drug potency

2. Clinical Investigations

- Host factors
- Placebo effect

3. Legal Regulations

- Laws and rules
- Agencies (federal and state)

4. Drug Standards

- Bioassays

I. Prescription Writing

- Composition of the prescription
- Laws governing drug dispensing

J. Ethical Factors of Drug Use

K. Psychological Factors of Drug Use

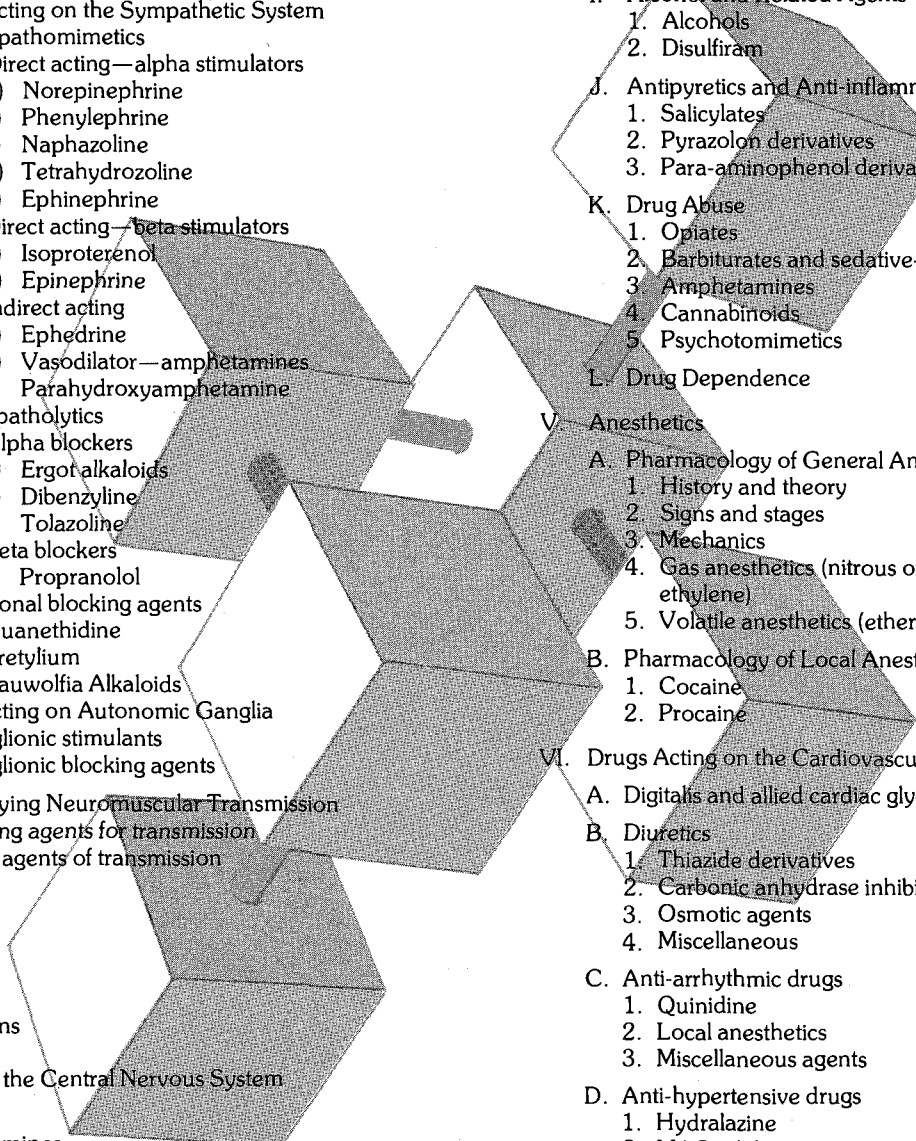
II. Drugs Acting on the Peripheral Nervous System

A. Neurochemical mediators

B. Autonomic drugs

1. Drugs acting on the parasympathetic system

- Parasympathomimetics
 - Acetylcholine
 - Methacholine
 - Carbachol
 - Pilocarpine

- 
- 2) Indirect acting
 - a) Physostigmine
 - b) Neostigmine
 - c) Edrophonium
 - d) Echothiophate
 - e) Diisofluorophosphate
 - b. Parasympatholytic
 - 1) Anti-Muscarinic
 - a) Atropine
 - b) Scopolamine
 - c) Homatropine
 - d) Cyclopentolate
 - e) Tropicamide
 - 2) Nicotinic
 - a) D-tubocurarine
 - b) Succinylcholine
 - 2. Drugs Acting on the Sympathetic System
 - a. Sympathomimetics
 - 1) Direct acting—alpha stimulators
 - a) Norepinephrine
 - b) Phenylephrine
 - c) Naphazoline
 - d) Tetrahydrozoline
 - e) Ephinephrine
 - 2) Direct acting—beta stimulators
 - a) Isoproterenol
 - b) Epinephrine
 - 3) Indirect acting
 - a) Ephedrine
 - b) Vasodilator—amphetamines
 - c) Parahydroxyamphetamine
 - b. Sympatholytics
 - 1) Alpha blockers
 - a) Ergot alkaloids
 - b) Dibenzylamine
 - c) Tolazoline
 - 2) Beta blockers
 - a) Propranolol
 - c. Neuronal blocking agents
 - 1) Guanethidine
 - 2) Bretylium
 - 3) Rauwolfia Alkaloids
 - 3. Drugs Acting on Autonomic Ganglia
 - a. Ganglionic stimulants
 - b. Ganglionic blocking agents
 - C. Drugs Modifying Neuromuscular Transmission
 - 1. Stimulating agents for transmission
 - 2. Blocking agents of transmission
 - III. Autacoids
 - A. Histamines
 - B. Kinins
 - C. Prostaglandins
 - IV. Drugs Acting on the Central Nervous System
 - A. Stimulants
 - 1. Amphetamines
 - 2. Non-amphetamines
 - B. Anti-depressants
 - 1. MAO inhibitors
 - 2. Tricyclic antidepressants
 - 3. Sympathomimetic agents
 - C. Anti-convulsants
 - 1. Barbiturates
 - 2. Phenytoins
 - 3. Miscellaneous
 - D. Anti-Parkinsonism
 - 1. Levodopa
 - 2. Anti-cholinergic
 - E. Anti-spasmodic agents
 - 1. Anti-cholinergics
 - 2. Gastric antacids
 - F. Sedatives and hypnotics
 - 1. Barbiturates
 - 2. Non-barbiturates
 - G. Psychotherapeutic agents
 - 1. Phenothiazine derivatives
 - 2. Thioxanthene derivatives
 - 3. Benzodiazepine drugs
 - 4. Miscellaneous agents
 - H. Analgesics
 - 1. Narcotics
 - 2. Non-narcotic
 - I. Alcohol and Related Agents
 - 1. Alcohols
 - 2. Disulfiram
 - J. Antipyretics and Anti-inflammatory (non-steroid)
 - 1. Salicylates
 - 2. Pyrazolon derivatives
 - 3. Para-aminophenol derivatives
 - K. Drug Abuse
 - 1. Opiates
 - 2. Barbiturates and sedative-hypnotics
 - 3. Amphetamines
 - 4. Cannabinoids
 - 5. Psychotomimetics
 - L. Drug Dependence
 - V. Anesthetics
 - A. Pharmacology of General Anesthesia
 - 1. History and theory
 - 2. Signs and stages
 - 3. Mechanics
 - 4. Gas anesthetics (nitrous oxide, cyclopropane, ethylene)
 - 5. Volatile anesthetics (ether, halothane, chloroform)
 - B. Pharmacology of Local Anesthesia
 - 1. Cocaine
 - 2. Procaine
 - VI. Drugs Acting on the Cardiovascular System
 - A. Digitalis and allied cardiac glycosides
 - B. Diuretics
 - 1. Thiazide derivatives
 - 2. Carbonic anhydrase inhibitors
 - 3. Osmotic agents
 - 4. Miscellaneous
 - C. Anti-arrhythmic drugs
 - 1. Quinidine
 - 2. Local anesthetics
 - 3. Miscellaneous agents
 - D. Anti-hypertensive drugs
 - 1. Hydralazine
 - 2. MAO inhibitors
 - 3. Diuretic agents
 - E. Anti-coagulants
 - 1. Heparin
 - 2. Oral anti-coagulants
 - 3. Miscellaneous agents
 - F. Vasodilators
 - 1. Nitrates and nitrites
 - 2. Theophylline compounds
 - G. Anti-atherosclerotic agents
 - 1. Hyperlipidemic drugs
 - 2. Female sex hormones
 - 3. Nicotinic acid

VII. Hormones and Drugs Modifying Endocrine Activity

- A. Pituitary Hormones and their actions
 - 1. Anterior pituitary hormones
 - 2. Posterior pituitary hormones
- B. Thyroid hormones and anti-thyroid agents
 - 1. Thyroid hormone
 - 2. Anti-thyroid drugs
- C. Insulin and other hypoglycemic agents
 - 1. Insulin
 - 2. Biguanides
 - 3. Sulfonylureas
- D. Adreno-cortical hormones
 - 1. Glucocorticoids
 - 2. Mineralocorticoids
 - 3. Androgenic steroids
- E. Gonadal hormones—oral contraceptives
 - 1. Estrogens
 - 2. Androgens
 - 3. Progesterone
- F. Parathyroid hormones
- G. Agents Affecting Immune Systems
 - 1. Corticosteroids
 - 2. Cytotoxic agents

VIII. Drugs Affecting Metabolic Activity

- A. Antianemic drugs
 - 1. Iron
 - 2. Copper
 - 3. Cobalt
 - 4. Pyridoxine
 - 5. Vitamin B12
 - 6. Folic acid
- B. Uricosuric drugs
 - 1. Colchicine
 - 2. Allopurinol
- C. Vitamins, Minerals and Other Nutrients
 - 1. Fat-Soluble Vitamins
 - 2. Water-Soluble vitamins
- D. Metals
 - 1. Heavy metals
 - 2. Heavy-metal antagonists

IX. Chemotherapeutic Agents

- A. Introduction
 - 1. History of chemotherapy
 - 2. Mechanisms of action of chemotherapeutic agents
- B. Antibiotics
 - 1. Synergism and antagonism
 - 2. Classification
 - 3. Methods of selection for clinical use
- C. Sulfonamides
 - 1. Chemistry
 - 2. Classification
 - 3. Toxicity and hypersensitivity
- D. Antiviral agents
 - 1. Idoxuridine
 - 2. Amantadine
 - 3. Miscellaneous agents
- E. Anti-fungal agents
 - 1. Nystatin
 - 2. Amphotericin B
 - 3. Griseofulvin
 - 4. Miscellaneous agents

F. Anti-parasitic agents

- 1. Ectoparasites
- 2. Endoparasites
- 3. Antimalarial

G. Drugs used in treatment of tuberculosis and leprosy

- 1. Streptomycin
- 2. Isoniazid
- 3. Para-aminosalicylic acid
- 4. Dapsone
- 5. Ethambutol

H. Drugs used in the treatment of neoplasia

- 1. Alkylating agents
- 2. Anti-metabolites
- 3. Hormonal agents
- 4. Radioactive isotopes

I. Antiseptics and disinfectants

- 1. Benzalkonium chloride
- 2. Thimerosal
- 3. Phenylmercuric nitrate

X. Over the Counter Medications

- A. Types of drugs found in OTC preparations
- B. Concentrations used
- C. Potential hazards

XI. Toxicology

A. Adverse drug reaction

- 1. Classification
- 2. Frequency of occurrence
- 3. Drug factors
- 4. Patient factors
 - a) Age
 - b) Weight
 - c) Race
 - d) Pathological factors
 - e) Other
- 5. Drug contraindication in pregnancy and lactation

B. Environmental Factors

- 1. Poisons
- 2. Carcinogens
- 3. Pollutants

XII. Principles of Immunopharmacology

A. Immunosuppressive agents

B. Cellular aspects of the immune response

C. Effector mechanisms and mediators in immune injury

D. Immunosuppressive and anti-inflammatory drug action

OCULAR PHARMACOLOGY

I. Properties of Ophthalmic Preparations

A. Physical properties of ophthalmic solutions

- 1. Tonicity
- 2. PH
- 3. Stability
- 4. Sterility
- 5. Viscosity
- 6. Surface activity

B. Physical properties of ophthalmic ointments

- 1. Tonicity
- 2. PH
- 3. Stability
- 4. Sterility
- 5. Viscosity
- 6. Surface activity

- C. Other dosage forms
 1. Suspension
 2. Time release systems
 - D. Packaging
 1. Single dose
 2. Multiple dose
- II. Routes of Drug Administration
- A. Topical
 - B. Subconjunctival injections
 - C. Retrobulbar injections
 - D. Intracameral and intravitreal injections
 - E. Iontophoresis
 - F. Other
- III. Ocular Drug Pharmacodynamics and Pharmacokinetics
- A. Absorption and penetration
 - B. Distribution
 - C. Metabolism
 - D. Routes of removal
- IV. Techniques and Procedures in Clinical Administration
- A. Pre-instillation
 1. Case history
 2. Ocular tissue integrity
 3. Angle evaluation
 4. Tonometry
 - B. Installation Techniques
 1. Solution
 2. Ointments
 3. Miscellaneous
 - C. Injections
 - D. Ophthalmic Prescription Nomenclature
- V. Drugs Affecting the Autonomic Nervous System of the Eye (Mechanisms of Action, Indications, Precautions, Contraindications, Dosage, Adverse Reaction, and Side Effects)
- A. Sympathomimetics (Mydriatics)
 1. Direct acting
 - a. Norepinephrine
 - b. Epinephrine
 - c. Phenylephrine
 - d. Isoproterenol
 2. Indirect acting
 - a. Cocaine
 - b. Hydroxyamphetamine
 - c. Ephedrine
 - B. Sympatholytics
 1. Alpha blockers
 2. Beta blockers
 - C. Neuronal blockers
 - D. Parasympathomimetics (Miotics)
 1. Direct acting
 - a. Acetylcholine
 - b. Methacholine
 - c. Pilocarpine
 - d. Carbachol
 2. Indirect acting (Anticholinesterases)
 - a. Reversible (short acting)
 - 1) Physostigmine
 - 2) Edrophonium
 - 3) Neostigmine
 - b. Irreversible (long acting)
 - 1) Demecarium
 - 2) Echothiophate
 - 3) Isoflurophosphate
- E. Parasympatholytics (Cycloplegics—Mydriatics)
 1. Atropine
 2. Scopolamine
 3. Homatropine
 4. Cyclopentolate
 5. Tropicamide
 6. Oxypentonium
- VI. Pharmacological Diagnosis and Treatment of Neuro Muscular Disorders
- VII. Local and Topical Anesthetics (Mechanisms of Action, Indications, Precautions, Contraindications, Dosage, Adverse Reactions, and Side Effects)
- A. Cocaine
 - B. Procaine
 - C. Lidocaine
 - D. Tetracaine
 - E. Proparacaine
 - F. Benoxinate
 - G. Piperocaine
 - H. Butyn Sulfate (Butacaine)
- VIII. Miscellaneous Ophthalmic Preparations
- A. Hyper-Osmotic Agents
 - B. Antihistamines
 - C. Ocular lubricants
 - D. Decongestants
 - E. Dyes
 - F. Irrigating Solutions
 - G. Vitamins
 - H. Ophthalmic Preparations in Contact Lens Wearing
 - I. Preservatives
 - J. Antiseptics
- IX. Corticosteroids and Other Anti-Inflammatory Agents (Mechanisms of Action, Indications, Precautions, Contraindications, Dosage, Adverse Reactions, Side Effects)
- X. Ocular Chemotherapeutic Agents (Spectrum, Mechanisms of Action, Indications, Precautions, Contraindications, Dosage, Adverse Reactions, and Side Effects)
- A. Antibiotics
 - B. Sulfonamides
 - C. Antiviral
 - D. Anti-fungal
 - E. Antiparasitic
 - F. Germicidal
- XI. Therapeutic Management of Ocular Disorders (Mechanisms of Action, Indications, Precautions, Contraindications, Dosage, Adverse Reactions, and Side Effects)
- A. Diseases of the eyelids
 - B. Diseases of the lacrimal apparatus
 - C. Diseases of the conjunctiva
 - D. Diseases of the cornea
 - E. Diseases of the sclera
 - F. Glaucoma

- G. Uveitis
- H. Diseases of the retina
- I. Optic neuritis
- J. Diseases of the Visual Pathway
- K. Diseases of the Orbit
- L. Miscellaneous Ophthalmic Diseases

XII. Ocular Side Effects of Systemically Administered Medications and Drug Interactions

- A. Autonomic
- B. Cardiovascular
 - 1. Digitalis and allied cardiac glycosides
 - 2. Diuretics
 - 3. Anti-arrhythmic drugs
 - 4. Anti-hypertensive drugs
 - 5. Anti-coagulants
 - 6. Vasodilators
 - 7. Anti-atherosclerotic agents
- C. Central Nervous System
 - 1. Stimulants
 - 2. Anti-depressants
 - 3. Anti-convulsions
 - 4. Anti-Parkinsonism
 - 5. Anti-spasmodic agents
 - 6. Sedatives and hypnotics
 - 7. Psychotherapeutic agents
 - 8. Analgesics (narcotic and non-narcotic)
 - 9. Alcohol and Nicotine
 - 10. Antipyretics and anti-inflammatory (non-steroid)
 - 11. Drug Abuse
 - a. Cocaine
 - b. Morphine
 - c. Marijuana
 - d. Barbiturates
 - e. LSD
- D. Hormones
 - 1. Corticosteroids
 - 2. Oral contraceptives
- E. Vitamins
- F. Chemotherapeutic agents
- G. Anti-tubercular
- H. Anti-histamines
- I. Metabolic agents
- J. Heavy metals

XIII. Management of Complications of Ocular Drug Use

- A. Cardiovascular
- B. Respiratory
- C. Central Nervous System
 - 1. Syncope
 - 2. Psychosis
- D. Anaphylaxis
- E. Acute Glaucoma
- F. Drug Hypersensitivity
- G. Drug Toxicity

LABORATORY EXPERIENCE WITH DRUGS

- I. Routes of Administration
 - A. Solutions/Ointments
 - B. Injections (Video tape or models)

II. Effects of Autonomic Drugs

- A. Animal Preparation
 - 1. Isolated Smooth Muscle preparation
 - 2. Cardiovascular drugs
- B. Humans
 - 1. Mydriatics
 - 2. Cycloplegics
 - 3. Miotics

III. Local and General Anesthesia

- A. Plans of general anesthesia in humans (videotape / movie)
- B. Topical Anesthesia on Humans with Anaesthesiometry
- C. Local Anesthesia (videotape or model)

IV. Dyes and Other Miscellaneous Agents

- A. Fluorescein angiography (videotape)
- B. Tear Break Up Time With and Without Ocular Lubricant
- C. Ocular Decongestants

CLINICAL EXPERIENCE WITH OPHTHALMIC DRUGS

It is recommended that this should include sufficient experience in the actual use of pharmaceutical agents so that students upon completion of their training feel comfortable and confident in their use.

Topical Anesthetics, Mydriatics and Cycloplegics should be used on patients by optometry students in their entire clinical training as often as possible. These drugs should be used under staff supervision.

RECOMMENDED TEXTS FOR PHARMACOLOGY COURSES

- I. General Pharmacology
 - A. Goodman, L. S. and A. Gilman: Pharmacological basis of therapeutics, 5th edition, McMillan (1975)
 - B. Gith, A. Medical Pharmacology, 9th edition, Mosby (1976)
 - C. DiPalma, J. R. : Basic Pharmacology in Medicine, McGraw-Hill (1976)
 - D. Meyers, F. H. , E. Jawetz and A. Goldstein: Review of Medical Pharmacology, 4th edition, Lange (1974)
 - E. Bevan, F. : Essentials in Pharmacology, Harper & Row (1975)
 - F. Physicians Desk Reference, Medical Economics, Oradell, N. J. (1976)
- II. Ocular Pharmacology
 - A. O'Connor Davies, P. H. : The Actions and Uses of Ophthalmic Drugs, Barrie and Jenkins (1972)
 - B. Ellis, P. P. : Handbook of Ocular Therapeutics and Pharmacology, 5th edition, Mosby (1977)
 - C. Havener, W. : Ocular Pharmacology, 3rd edition, Mosby (1974)
 - D. Grant, W. M. : Toxicology of the Eye, 2nd edition, Thomas (1974)
 - E. Fraunfelder, F. T. : Drug Induced Ocular Side Effects and Drug Interaction, Lea & Febiger (1977)
 - F. Dunlap, E. A. : Gordon's Medical Management of Ocular Disease, 2nd edition, Harper & Row (1976)
 - G. Vale, J. and Cox, B. : Drugs and the Eye, 1st edition, Butterworths (1978)

ABSTRACTSABSTRACTSABSTRACTSABSTR

An Admissions Interview to Measure Good Dentist Attributes. Fuller et al. J. Am. Dent. Assoc. 98(4): 546-552, April 1979

The goal of this study was a noble one—an attempt to correlate measurable attributes of dental students with those of “good” dentists. However, the study failed to achieve this objective.

This study seems to have bogged itself down with statistical manipulations that would prove the validity of the instrument of the evaluation, the SRI dentist perceiver. Indeed, one gets the impression that the authors were already committed to the instrument they set out to evaluate. The value of a predictive instrument for success in clinical practice would be greatest if it indicated prior to the time of admission what the future prospects were. The procedure described in the article depends upon evaluations done by faculty and students well into the program, far too late to be of any value to professional schools and colleges who would like to select “good” practitioners prior to admissions decisions in order to maximize the use of rare and costly places in professional school classes.

This article leads the reader to conclude that those fourth year dental students, probably not different from fourth year optometry students, who seem to be the best clinicians based on the judgments of their peers and their faculty are most likely to be the best practitioners after graduation. That is not a terribly revealing conclusion.

Reviewed by Robert Rosenberg, O.D.

BOOKREVIEWSBOOKREVIEWSBOOKREVIEW

Aging and Mental Health, by Robert N. Butler and Myma I. Lewis, 2nd ed., St. Louis, Missouri, C.V. Mosby Co., 1977, 365 pages

The typical approach to aging in texts is a description of the degenerative processes involved and their observed manifestations, leading to classification but rarely to therapy whose goals are other than a benign period before death. In optometric and ophthalmological texts, the discussion is often limited to terminal presbyopia. Only rarely is there an attempt to apply functional principles to the care of the aging patient.

The only part of clinical practice that seems to deal constructively with medically or surgically intractable visual degenerations or diseases is that which cares for the partially sighted patient. Perhaps the most significant difference between the low vision practitioner and others is this clinician's positive and ever optimistic approach to patient care although he often deals with referrals of last resort and a day in such a clinic can indeed be discouraging. The low vision clinician often finds, however, that a positive attitude that focuses on abilities rather than on handicaps permits and encourages significant improvement in function for the patient. This may be the reason that a successful low vision clinician finds his consulting room occupied by the aging patient as well as by the visually disabled patient of any age. It is the doctor's attitude as much as the technical skills that contribute to the patient's success.

Our experience with third year optometry students at the State University of New York has shown that the type of care rendered is a function of attitude toward the patient as much as of technical skills. Attitudes toward the aging, as much or more than attitudes toward other identifiable groups of patients, seem to be molded by personal feelings more than by rational approaches or objective experiences. A student practitioner who had a good relationship with grandparents, for example, and who is part of a family where the elders grew old while remaining vigorous, independent, and alert is apt to approach the aging patient in a way that reflects this experience in one of two ways: (1) all aged patients may be approached positively, or (2) those who do not display the familiar positive characteristics may be treated very negatively. Good patient care, then, demands a formal review of attitudes and some sensitivity development.

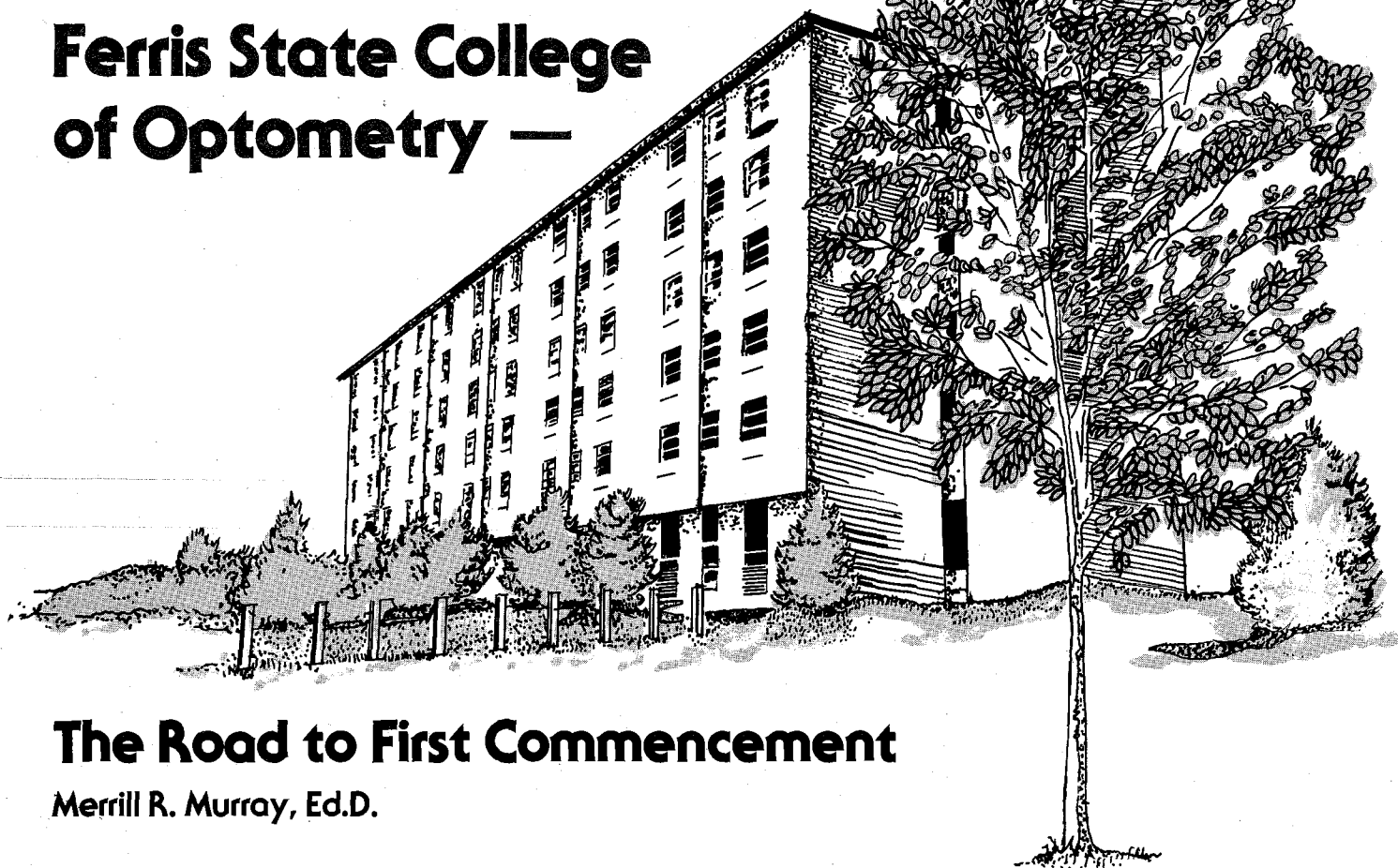
Butler and Lewis express this positive attitude toward the aging patient in their text as well as in their title, *Aging and Mental Health—Positive Psychosocial Approaches*. It is a book obviously written for clinicians. There is much hard data, but it is presented and applied as part of a positive therapeutic approach to aging, not as a sterile tabulation of isolated facts. It is not a psychiatric text, but should have wide application with all health practitioners who care for the elderly in private or institutional settings.

Although it deals only briefly with vision, per se, it is strong in dealing with aging, and with the aged, it is most important to deal with the patient, not just the visual problem.

Aging and Mental Health should be read by all optometrists and students.

Reviewed by Robert Rosenberg, O.D.

PROFILE: Ferris State College of Optometry —



The Road to First Commencement

Merrill R. Murray, Ed.D.

When 20 young men and women, clad in the traditional caps and gowns of commencement, walked across the stage at formal exercises at Ferris State College May 19, it not only marked the graduation of the first class of students from the College of Optometry. It also was the culmination of a dream of many Michigan optometrists to have a college in their own state devoted to their profession.

The College of Optometry has an enrollment of 99 professional degree students and is one of seven schools and colleges that comprise Ferris State College (FSC). The campus of FSC approximates an area of one square mile in size. The total enrollment of the College exceeds 10,000 students. It is situated in the somewhat rural/resort community of Big Rapids, Michigan, about 200 miles northwest of Detroit.

Merrill R. Murray, Ed.D., is Associate Dean of the College of Optometry at Ferris State College, Big Rapids, Michigan.

Establishing a new College of Optometry at Ferris State College was not an easy task. The many problems associated with the founding and development of the Doctor of Optometry degree program at Ferris posed obstacles formidable but not unconquerable. Under the leadership of Dean Jack Bennett, O.D., along with an exceptional faculty, that originally was three in number—Robert Carter, O.D., Michael Keating, Ph.D., and Vince King, O.D., Ph.D.—the College of Optometry was established and guided through formative years.

Purpose

The College of Optometry at Ferris State College was established in accordance with Act 227 of the Michigan Public Acts of 1974. Its charge or purposes as stated are:

- To meet the optometric manpower needs of the State of Michigan
- To provide continuing and post-graduate education for practicing optometrists
- To serve as a repository of visual science information and to serve as a

center for visual science research and the development of optometric skills

Development

Long before the 1966 adoption of a formal proposal by the Michigan Optometric Association, optometrists in Michigan had supported the establishment of a college of optometry in the state to help meet the documented need for additional optometric manpower. However, early in the development of the College of Optometry there were some questions raised about the location of the school in a rural setting without the health-medical facilities of the larger urban communities.

Ferris State College's involvement dates back to the early 1970s when one of the nation's leading optometric educators was retained to do a feasibility study. His investigation of the ability of Ferris to develop and sustain a quality program of optometric education resulted in a positive report.

In September, 1974, Ferris President Robert L. Ewigleben created three strategic groups—a Dean's Search and

Screening Committee, an Internal Task Force with specific areas of assigned responsibility, and an External Optometric Advisory Committee composed of optometric leaders throughout Michigan. Veteran Ferris staff member George Holcomb, Ph.D., was appointed Associate Dean to coordinate planning and to direct the Internal Task Force. Other administrators and faculty were appointed to specific areas of responsibility on the task force and search-and-screening committee.

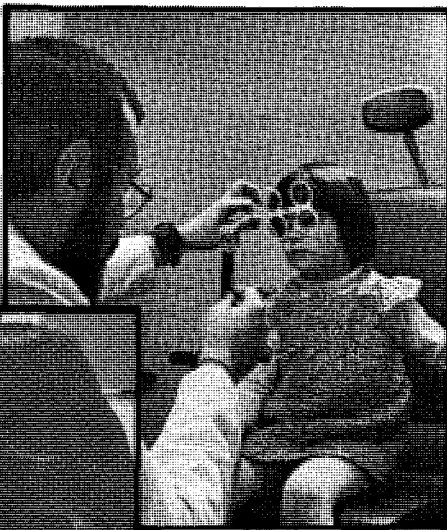
In September, 1975, the Board of Directors of the Michigan Optometric Association unanimously passed a resolution placing the Board "on record as being in total support of Ferris State College continuing its optometry program within the physical, mental, and financial means of the Association." The leadership and the membership of the Michigan Optometric Association have continued to support the optometry program with time, effort, and financial assistance.

The Michigan Board of Examiners in Optometry also endorsed Ferris State College as the location for the College

of Optometry and at its January, 1977, meeting, the Board granted provisional accreditation status to the College of Optometry. *The North Central Association (NCA) Report of a Visit to Ferris State College* submitted following the NCA 1976 site visit provided further positive support for the location and structuring of the College of Optometry.

The foregoing historical developments and endorsements culminated in the last of three successive accreditation site visits from representatives of the Council on Optometric Education (COE) of the American Optometric Association in February, 1979. The College of Optometry at Ferris State College was accredited by the COE in April 1979.

Pediatric services are an integral part of the total clinical experience.

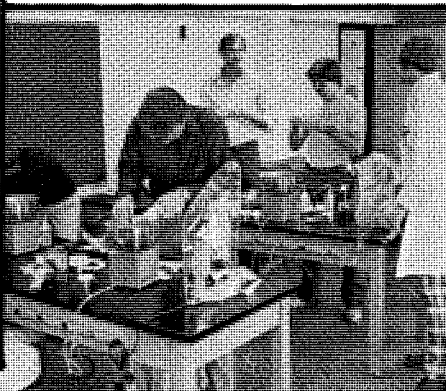


Facilities

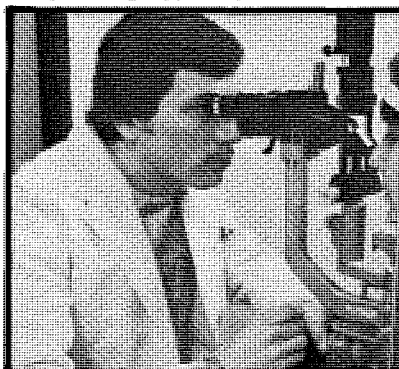
The FSC College of Optometry is housed in a ten-year-old dormitory that has been extensively remodeled into a modern instructional facility. The carpeted six-story structure houses classrooms, laboratories, faculty and administrative offices, staff, faculty and student lounges, professional library, and the on-campus clinic facilities. It is conveniently located near the School of Pharmacy building and the newly constructed Allied Health building.

The Ferris State College campus consists of 75 architecturally homogeneous structures and covers 650 acres of land. These structures include the necessary classroom, administrative, cultural and recreational, library, learning resources, and support facilities for the college's 10,000 students. Internal components include residence and dining hall facilities for 5,780 students and more than 400 married student apartments.

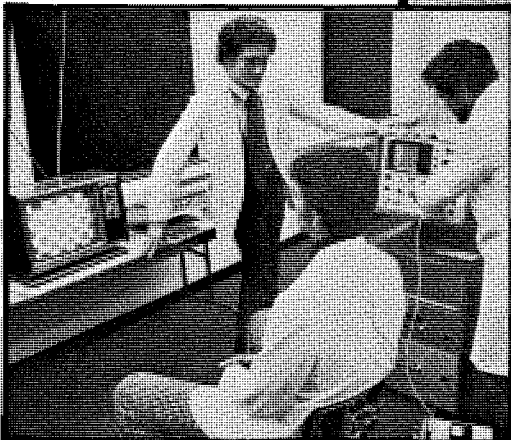
Small class sizes allow for individualized instruction.



Each module is completely equipped to provide a complete range of primary care services.



A complete range of electrodiagnostic services is available at the on-campus clinic.



Optometric education is now available to many more Michigan students.



Faculty

The faculty of the College of Optometry now numbers 14 with an additional 23 part-time faculty and clinic associates. As a developing institution, the College of Optometry at Ferris has sought and attracted high quality, well-experienced faculty and professional staff whose backgrounds include teaching experiences at a number of the institutions preceding Ferris in offering the O.D. degree. The faculty recruiting program will be continued as the College of Optometry moves forward toward its planned total enrollment of 160 students in 1982.

While at this point in the development of the FSC optometry program a considerable amount of faculty effort is directed toward the building of a fully integrated program of instruction, individual faculty carry on research projects, serve as consultants to various private and public agencies, and frequently publish articles and reports in professional journals and other publications.

Curriculum

The College's curriculum is designed to effectively prepare optometry students to take their place as a primary entry point into the health care system and as providers of the total scope of vision care services. This curriculum, along with prerequisite learnings, provides for a broad foundation of basic scientific knowledge, an understanding of human health and disease processes, thorough knowledge and experience in diagnosing and treating problems, a knowledge of research techniques and an appreciation for the value of legiti-

mate research, a dedication to the necessity of continuing education, and a compassion for the health problems of humanity and a command of how the optometrist's unique skills and knowledge can be applied to solving these problems.

The curriculum provides an effective balance of courses and materials presented in a logical sequence as influenced by the experiences and models of other optometry schools. Additionally, this curriculum takes full advantage of the unique educational environment of Ferris State College. A faculty committee periodically reviews the curriculum and suggests modification and revision as needed.

For purposes of curriculum development, the program has been divided into four broad areas that were titled Basic Sciences, Pre-Clinical Optometry Sciences, Clinical Science, and Community Health Service. Of these study areas, the Clinical Science area has presented special challenges.

In relation to the clinical science component of the curriculum it was recognized that the population base in the Big Rapids-Ferris State College area would not be adequate in either size or diversity to supply the total clinical experience needs of the optometry students. The solution was to go to the population areas needed, and this was the basis of the clinical planning.

Ferris State College, responding to the needs of the Schools of Pharmacy and Allied Health, had developed an impressive array of off-campus clinical, preceptorship, clerkship, and other arrangements with various health facilities around the state. Building on these established relationships, the College of

Optometry was able to establish and develop off-campus clinics in the densely populated areas.

The clinical experience is as follows: (1) students engage in programs and clinical observation in the on-campus clinic and the Big Rapids area during the latter part of their first year and all of their second year; (2) third-year clinical experience is centered in the on-campus clinic and primarily provides care for the Big Rapids area-Ferris State College population; and (3) the fourth year is a required full calendar year with each student spending two four-month periods in the off-campus clinical facilities and one period in advanced clinical activities on campus.

Clinic Program

The stated purpose of the clinical program at Ferris is to develop, through extensive practice, those skills which a student must acquire to examine, diagnose, and treat patients with vision problems. It is further the purpose of the clinical program to train and develop the student optometrist into a socially concerned primary health care practitioner through the deliberate integration of knowledge acquired from basic science and clinical optometry courses with experience in the conduct of community health programs.

Of the 30,000 gross square feet in the College of Optometry building, 7,800 square feet are devoted to the on-campus optometry clinic. It is within this well-equipped, clean, pleasant, and patient-oriented environment that comprehensive optometric services are provided. Moreover, an additional 1,000 square feet function as a pre-clinical laboratory for first and second-year optometry students, and another 2,500 square feet are devoted to preclinical training of optometric technician students.

The 7,800 square feet of on-campus clinical space serve jointly as general diagnostic and treatment facilities for the entire third-professional-year class and for one-third of the fourth-professional-year students.

A physical and administrative format in the clinic design structured along "modular" lines affords the student an opportunity to function in a setting much like that of a group practice. Each of the three clinic modules contains a business/reception area, two preliminary test rooms, four diagnostic rooms, two consultation/progress evaluation/dispensing rooms, one frame selection room, one dispensing laboratory, and



Teaching laboratories are roomy and completely equipped.

one verification/contact lens modification room. In addition, the three modules as a whole are supported by a central business office, an electrodiagnostic facility, and a visual function laboratory. This modular design provides a patient-oriented approach to clinical education.

In addition to the on-campus clinic facilities, affiliation agreements have been developed for off-campus clinic facilities at the Optometric Institute and Clinic of Detroit, State Prison of Southern Michigan, Michigan Reformatory and Riverside Correctional Facility, the Michigan Training Unity, and the Michigan Veterans' Facility at Grand Rapids.

Each off-campus clinic facility provides the Clinical Program a special educational goal. Low vision rehabilitation is the major emphasis at the Optometric Institute and Clinic of Detroit. Primary care is emphasized in a multidisciplinary setting at the State Prison of Southern Michigan. In addition, the large prison industries program provides an opportunity to develop skills in the area of environmental vision.

Similarly, primary care is emphasized in a multidisciplinary setting at both the Michigan Reformatory and the Riverside Correctional Facility. The Michigan Training Unity affords the student the opportunity to observe vocational education for male residents, ages 16 to 21. Geriatric care is provided at the Michigan Veterans' Facility.

Research

Research is important at the FSC College of Optometry. Recognizing the importance of research to the profession of optometry, the building designers included individual research laboratories in the College of Optometry facility.

Even though the entire faculty had to be occupied with the establishment of the instructional program, several started research projects. One is entitled "Investigative Studies into Retinitis Pigmentosa" which is a basic research study of the physiological and biochemical aspects of retinitis pigmentosa. Another project is entitled "In vivo Examination and Photography of the Corneal Endothelium," which will allow the exploration of new methods of examining the cornea under high magnification.

Several studies in contact lens research include the development of hydrophilic lens verification procedures and quality control procedures. Also in the contact lens area, a study is in progress on the effectiveness of hydrophilic

lens surfactant cleaners in preventing lens coatings. Another study on the corneal thickness changes with different contact lenses has commenced.

Still other faculty members are involved in such studies as the relationship between small uncorrected refractive errors and visual performance, a Fourier transform computer program to be applied to optical systems, a study analyzing the early reflex behavior in infants as it relates to visual development, fixation disparity and accommodation and eye movements as related to night myopia.

Numerous facilities that support research have been or are being developed within the College of Optometry. The electrophysiology laboratory with the associated equipment offers many

research opportunities as does the biodiagnostic laboratory. Specialized clinical equipment such as the electronic digital pachometer, photo-biomicroscope, anterior segment photography equipment, binocular vision diagnostic equipment, visual function laboratory instrumentation, and other instruments are available that greatly aid high quality clinical research. Additionally, the college computer center is equipped with an IBM 360-145 computer that is available for faculty research.

Innovations in programming and curriculum necessitated by the location of the College and the circumstances of its development are being used as the foundation of a program of excellence in optometric education for Michigan and the nation.

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Journal Preferences Among Our Beginning Students

H.W. Hofstetter, O..D., Ph.D.

In each year that I have taught the one semester credit hour course in "optometric orientation" at Indiana University I have required that each student submit weekly a brief written review or abstract of a published article related to optometry, optics, vision, or the eye. The only restriction of choice of article has been that each article be from a periodical of different title and published within 12 months prior to the date of reading.

Because the purpose of this assignment was primarily to provide exposure to the wide range of serial publications of optometric significance, no academic incentives were initiated to steer the students to any type or quality of magazine. The class was assured that full credit for each review would be virtually automatic if the reference details (names, titles, volume and issue numbers, dates, and pagination) were correct and if the review comments gave evidence that the student had indeed seen the article. In line with the latter assurance I did not grade on the basis of the literary quality of the review, the evidence of understanding the article, or the kind of article selected, except that it had to relate in some obvious way to optometry, optics, vision, or the eye. Perhaps somewhat idiosyncratically I did hold out for the correct spelling of words frequent to the optometric vocabulary. Occasional articles were selected even from local newspapers and familiar household magazines as well as from the more professionally related serial publications.

In every year except 1977 and 1978 the classes consisted only of first year optometry students. In 1977 the class of 118 students included 47 first and second year students in an adjunct program to train technical and office assistants for employment in optometric practices. In 1978 the class included 41 of the latter category. The course was always taught in the fall semester, and therefore, virtually all of the enrollees were students who had not yet completed any of the required courses in the optometry curriculum, though they were simultaneously studying such basic optometric curricular material as geometric optics, anatomy, and physiology.

Since 1967 the optometry library has been very conveniently located in the same building as are the classroom and laboratory facilities and has provided a wide assortment of current serial publications on open shelves. Even before 1967 a substantial assortment of optometrically related periodicals was made conveniently available at the headquarters of the school. In other words each student could easily make his selection from a many times more extensive array than he needed for meeting the course requirements.

Table 1 is a list of periodicals from which the students selected articles to read in 1978 . . . arranged in order of the percentage of students using each. Omitted from the list are 33 periodicals such as newspapers and other general interest publications not identified with science, health, technology, a profession, a vocation, or a discipline, in which a total of 96 articles, approximately 6%, were reviewed.

It may be derived from this tabulation that approximately 54% of the reviewed articles were from optometry-based periodicals. Another 11% were from ophthalmology-based journals, and about 10% were from journals serving opticianry and optical science and technology. The remaining 25% suggest no significant clustering in any single category.

The tabulation of the remarkably similar results obtained in a class of 118 students in the preceding year were published in *Interoptics*, No. 22, April, 1978. The data from previous years during the last two decades are also at hand but not fully comparable because of differences in class composition, gross variations of class size, changes in admission standards, and differences in accessibility to some of the serial publications.

However, the major nationally-distributed optometric periodicals have been immediately, conveniently, and equally accessible to the students in every year. Two of these were started quite recently and therefore are not represented throughout the 21-year interval, but the other five were well established decades before 1958 and have continued to be issued regularly ever since. Three of these five underwent minor title variations, and one changed from a weekly to a much larger monthly, but with essentially unchanged missions.

The year-by-year percentage of students who read articles in each of the seven aforementioned optometric

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TABLE 1.
Frequency Rank of Periodicals Reviewed

	Percent		Percent
Chilton's Review of Optometry	77	New Jersey Journal of Optometry	3
Journal of the American Optometric Association	75	Color	3
Optometric Management	72	Journal of Learning Disabilities	2
American Journal of Optometry and Physiological Optics	55	Light & Lighting & Environmental Design	2
Optometric Monthly	48	Science	2
Australian Journal of Optometry	46	Scientific American	2
Dispensing Optician (London)	41	Optics & Laser Technology	2
Journal of Optometric Education	35	Optics News	2
The Optician (London)	33	Insights	2
Ophthalmic Optician (London)	32	Psychology Today	2
Journal of Optometric Vision Development	30	Pennsylvania Optometrist	2
Journal of Visual Impairment and Blindness	29	Optical Engineering	2
Canadian Journal of Optometry	27	Journal of the Optical Society of America	2
Annals of Ophthalmology	26	Impact (American Optometric Association)	2
American Journal of Public Health	25	Public Health Reports	2
Archives of Ophthalmology	24	Ophthalmologica	2
Optometrists' Exchange	24	Journal of the Illinois Optometric Association	2
Journal of Optometry (New Zealand)	22	California Optometrist	2
Optometric World	22	Optist (Omega Epsilon Phi)	2
American Optometric Association News	22	Radharc (Ireland)	1
Optometric Observer and Contact Lens News	22	Survey of Ophthalmology	1
Twenty-Twenty	19	International Journal of Neuroscience	1
Journal of Pediatric Ophthalmology	18	Laser Focus	1
Manufacturing Optics International	18	New England Journal of Optometry	1
Optical Management	17	Applied Optics	1
American Journal of Ophthalmology	16	Brain: Journal of Neurology	1
Prevent Blindness News	16	Journal of the Wisconsin Optometric Association	1
Optical World	15	Oregon Optometrist	1
Optometry Today (India)	14	Vision Research	1
Contacto	13	Optics Letters	1
Optical Spectra	13	Advances in Ophthalmology	1
Optical Index	13	Journal of Experimental Psychology:	
Metabolic Ophthalmology	13	Human Learning & Memory	1
Sight-Saving Review	11	Sensory World	1
Investigative Ophthalmology and Visual Science	10	Eyedeology: Wisconsin Optometric Association Newsletter	1
Southern Journal of Optometry	9	American Optometric Association Register for Technicians Quarterly	1
British Journal of Ophthalmology	8	Perception & Psychophysics	1
Philippine Journal of Ophthalmology	8	Medical Ophthalmology	1
Perception	7	Transactions of the American Ophthalmological Society	1
Interoptics	7	Physics Today	1
American Optometric Student Association Review	6	Lighting Design & Application	1
Hoosier-Star-Light	6	Popular Science	1
Optics News	6	Developmental Psychology	1
Ophthalmology	6	American Orthoptic Journal	1
South African Optometrist	6	Journal of General Physiology	1
Science News	6	Contact Lens Forum	1
Australian Journal of Ophthalmology	6	The Braille Forum	1
Experimental Eye Research	5	Color Research & Application	1
British Orthoptic Journal	5	International Contact Lens Clinic	1
Acta Ophthalmologica	5	Iowa Optometrist	1
Ophthalmic Research	5	Scottish Ophthalmic Practitioner	1
Jena Review	4	Texas Optometry	1
Science Digest	4	Journal of Neurophysiology	1
New England Journal of Medicine	4	Medical Economics	1
Consumer Reports	4	Family Health	1
New Scientist (London)	4		
British Journal of Physiological Optics	3		
Japanese Journal of Ophthalmology	3		

TABLE 2.

Year-by-year percentage of students reading articles in each of seven nationally prevalent optometric journals, with frequency-of-use rank shown in parentheses. Quality ratings of the articles reviewed in 1978 are shown in the bottom row. N = number of students in the class.

	N	Amer. J. Optom. & Physiol. Optics	Chilton's Rev. of Optom.	J. of Amer. Optom. Assoc.	J. of Optom. Educ.	Optom. Manage- ment	Optom. Monthly	Optom. World
1958	22	34 (13)	75 (1)	72 (2)			53 (5)	69 (3)
1960	20	35 (10)	80 (1.5)	25 (12)			60 (6)	80 (1.5)
1961	23	57 (5)	74 (1)	30 (14)			39 (10)	52 (6)
1962	33	21 (24)	84 (1)	67 (3)			66 (5)	67 (3)
1963	32	34 (14)	75 (1)	72 (2)			53 (5)	69 (3)
1964	30	23 (20)	87 (1)	63 (5)			83 (2)	77 (3)
1965	42	21 (22)	64 (5)	67 (3)		76 (1)	57 (8)	71 (2)
1966	49	18 (24)	76 (3)	78 (2)		88 (1)	51 (6.5)	69 (4)
1969	30	57 (4)	53 (7)	97 (1)		73 (3)	83 (2)	37 (13)
1971	64	52 (6)	58 (3.5)	84 (1)		58 (3.5)	72 (2)	30 (15)
1972	63	40 (6)	78 (1)	52 (5)		63 (4)	70 (2)	35 (14)
1977	118	46 (6)	100 (1)	74 (2.5)	1 (99)	74 (2.5)	69 (4)	13 (23)
1978	108	55 (4)	77 (1)	75 (2)	35 (8)	72 (3)	48 (5)	22 (20)
(quality rating)								
1978		1.49	1.45	1.54	1.47	1.38	1.25	1.38

journals is shown in Table 2. The same table also shows in parentheses the frequency-of-use rank of each of these journals among all serial publications reviewed. The *American Journal of Optometry and Physiological Optics* (title varied) showed a substantial and sustained increase of use in the '70s, whereas the *Journal of the American Optometric Association* did similarly in the early '60s. The *Optometric World*, on the other hand showed a steady decline of utilization over the 15 year period 1964-1978. The other two full-term publications, the *Optometric Monthly* (titled varied) and *Chilton's Review of Optometry* (title varied) showed substantial variations in usage but somewhat less identifiable overall trends. These asynchronous shifts of popularity may well be due to periodic changes of attractiveness of the individual serial publications rather than to changes of academic character of the students.

Additionally, an attempt was made in the 1978 sample to get a rating of students' evaluations of the quality of the articles they read. On the revision and abstract forms supplied to the students was the question, "In terms of the apparent purposes of the periodical in which this article appeared, do you think the article meets appropriate standards of publication quality? __yes, __probably, __no opinion, __doubtfully, __no." Giving each checked answer a rating of 1, 2, 3, 4, or 5 in the same yes-to-no sequence, I then calculated the mean rating for the articles read in each journal. The ratings for the seven major optometric journals are shown in the bottom row of Table 2. Because the rating distributions were very skewed, conventional statistical indices could not be computed legitimately. However, it seems very doubtful that the difference is significant. The average of these seven means is 1.42, approximately half way between "yes" and "probably."

Similarly the means of the quality ratings of articles in the seven most frequently utilized ophthalmological journals were calculated and averaged, giving a value of 1.45, obviously not significantly different from the combined rating of the seven optometric journals.

The mean of the quality ratings of all 30 periodicals, excluding the seven above-tabulated major optometric journals, in each of which articles were reviewed by at least 10 students was 1.48 with a standard deviation of 0.226 and a standard error of 0.041. It is apparent that either the quality ratings that the beginning optometry students assigned to articles in major optometry journals did not provide a sensitive measure or that a significant qualitative difference does not exist.

Summary

It would appear that students entering the study of optometry choose to read about optometry, optics, vision, or the eye from publications which are not optometry-based about as often as from publications originating from within optometrically identified sources. Approximately half of the articles chosen from non-optometric publications are from popular publications not identified with science, health, technology, a profession, a vocation, or a discipline. More than half of the reading preferences in optometry-based sources are in privately published serials rather than in professionally sponsored publications. The ratings of articles in terms of meeting appropriate standards of publication quality showed no significant differences between the seven major nationally distributed optometry journals nor between these journals as a group and a comparable sample of ophthalmological journals or all of the other journals from each of which articles were reviewed by at least 10 students.

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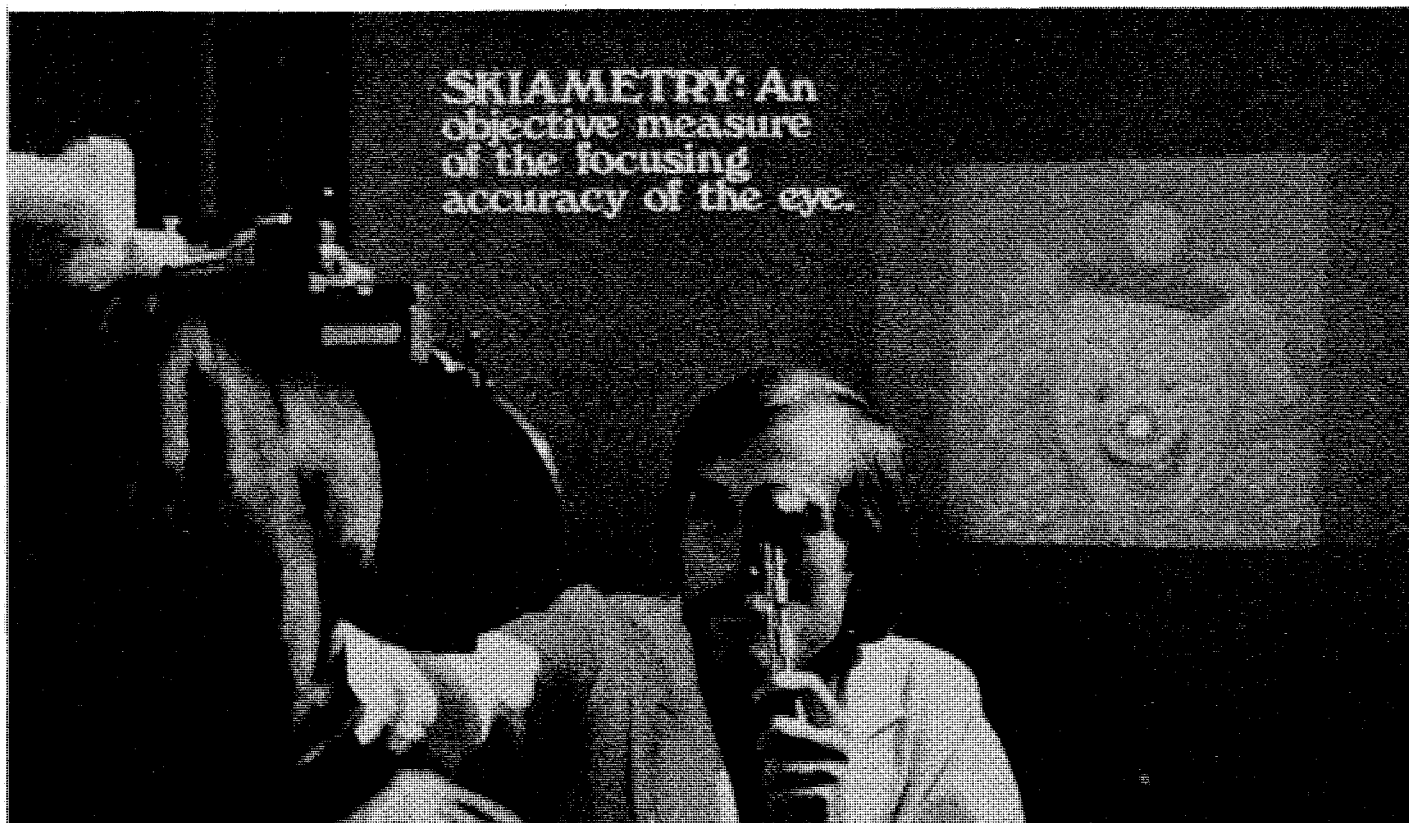
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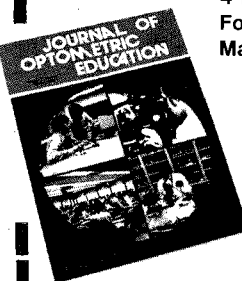
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