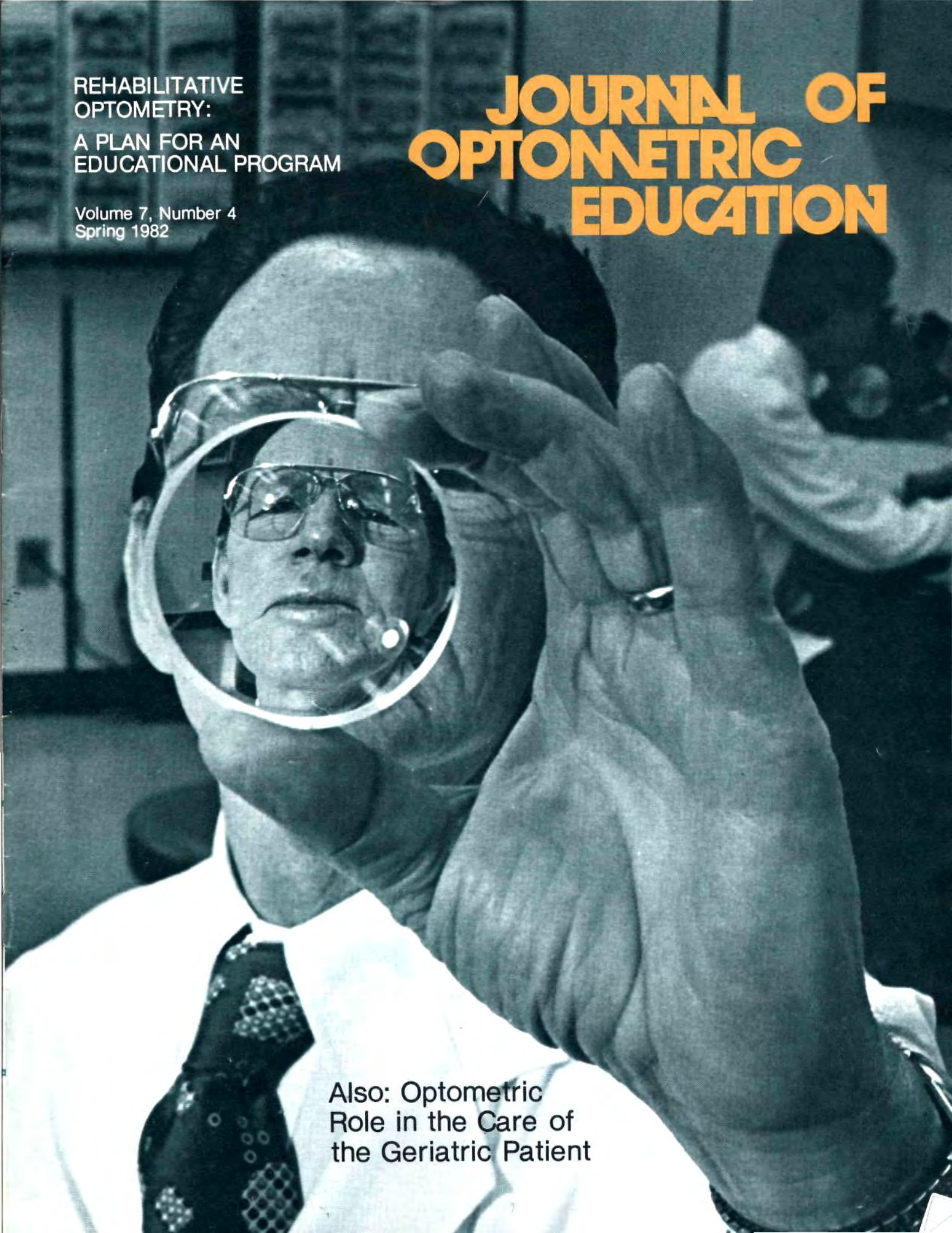
JOURNAL OF OPTOMETRIC EDUCATION

REHABILITATIVE OPTOMETRY:
A PLAN FOR AN EDUCATIONAL PROGRAM

Volume 7, Number 4
Spring 1982



Also: Optometric Role in the Care of the Geriatric Patient

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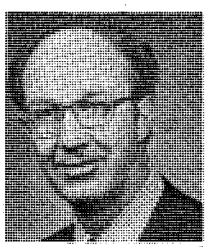

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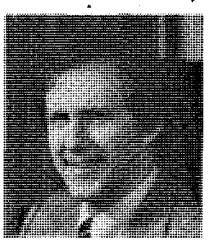

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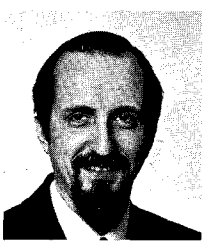

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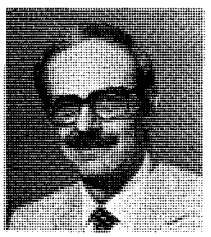

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Table of Contents
Spring, 1982
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Cost of Education—Whose Responsibility?

The year is 1960. Federal policy is developing which states that health is a right of all Americans, not just a privilege for those who can afford it. Federal programs to provide health care, preventive as well as curative, multiply at rates unheard of. Federal budget dollars are pumped into a rash of activities which not only increase costs but develop demand for services far beyond the projections of the most liberal forces in the Congress.

Suddenly the issue becomes whether the manpower will be available to provide all of these services. A new policy is formulated: health manpower is a national resource and therefore the responsibility of the federal government. New programs evolve rapidly to address health manpower supply issues. These include monies for establishing new facilities, incentives to increase class size and special scholarships as well as low cost loans. The philosophy evolves that all who want to pursue higher education should not be deterred either by inadequacy of the institutions or the inability to afford higher education.

The year is 1980. Literally hundreds of new schools of the various health professions have come into being and class sizes have mushroomed. Now, there is an awareness that perhaps the government programs have been too successful—the country may well have an excess of health professionals. Additionally, the drain of all of the federal health programs on the budget now reaches into the billions. The system is perceived to be out of control, particularly in a sluggish national economy. A policy change is needed. In the health field two principles emerge to guide decision making. One: public monies should not subsidize the education of those being trained to enter the highest paying professions in the land and two: they should no longer subsidize the maintaining of facilities which federal funds have built; these responsibilities should be assumed by the private sector.

Thus, we are today seeing the termination of institutional support as well as recommendations to terminate student support programs upon which both the schools and the students have come to rely. Health education students potentially are being affected by the loss of both health education loans and scholarships and those of the Department of Education. This change in federal policy has occurred suddenly and at a time when inflation is driving up the cost of education and, consequently, tuitions in the schools and colleges. Private sector monies for loans unsubsidized by federal programs are scarce, and interest rates result not only in increased cost while in school but a debt burden on the graduate which, if unchecked, could reach into six figures in coming years.

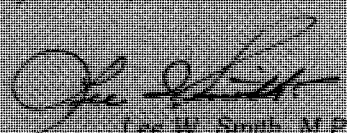
Should this policy position of the present Administration be implemented successfully, we can expect that only the rich and near rich will continue to have access to higher education, many health professions institutions will fail, and the cost of health care will soar merely to service the excessive indebtedness of graduates. Within the next decade, it is possible that a manpower shortage would be an accurate prediction.

Fortunately, the picture is not as bleak as the above prediction. Even those in the Congress who basically support the principles on which the administration's policy is based recognize that the sudden multiple impacts on institutions of higher learning and on students cannot be absorbed without serious and unacceptable results. This was borne out by the reaction of many elected representatives to the recent "Student Day" in Washington and to the appeals of many higher education organizations.

It may be a number of months before the final outcome of the debate is clear. One thing seems certain: compromise on this issue will be required. If the Congress ultimately agrees with the administration's position to withdraw from the now long-time support of higher education and health professions, it should consider how that can be accomplished in an orderly fashion. The education community, on the other hand, should undertake immediately to plan for the necessary adjustments such a change in policy will demand. Neither task lends itself to an immediate and obvious solution, and therefore, the urgency is to recognize that each group—the administration, the Congress, higher education, and the students and their families—must contribute to the ultimate solution.

As an association, ASCO will continue its efforts to retain Congressional support, work with other organizations with common interests, urge its member institutions to communicate with elected representatives the impact of these changes upon their institutions, and most importantly, cooperate with student groups in their efforts.

A future editorial beginning, "It is 1990 . . ." undoubtedly will recount a satisfactory and equitable solution to what may now seem an insurmountable problem.



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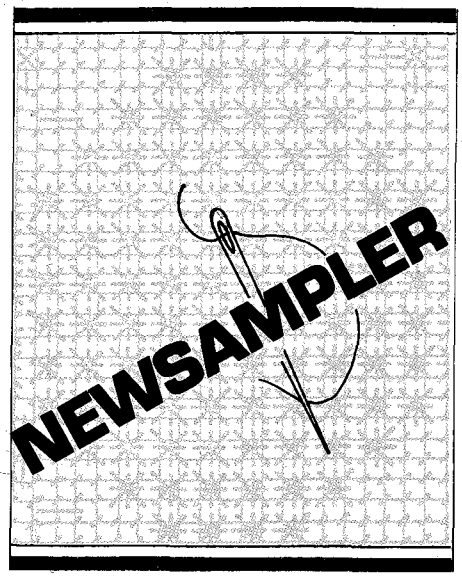


NBEO Adopts Mission Statement

The National Board of Examiners in Optometry (NBEO) adopted a mission statement at its January 15 Board of Directors meeting which reconfirms its purpose to provide examining services for the optometric profession and identifies further activities and services which will guide the tone and direction of the NBEO during its next stage of development.

The mission statement, resulting from a recommendation by an external review committee and refined by the NBEO Long-Range Planning Committee, reconfirms its original statement of purpose contained in its Articles of Incorporation:

> *The specific and primary purposes are to provide examining services for the profession of optometry and to undertake such related activities as may seem in the interest of improving test performance and standards.*

The statement also identifies two major activities which the NBEO performs: (1) "it constructs, produces and administers tests for the purpose of assessing knowledge . . . essential to the rendering of optometric care" and "competence in optometric clinical judgment;" and (2) "it maintains a continuous program of monitoring and improving examination reliability and validity."

In addition, the services which NBEO provides include entry level examinations, special examination services, and consultant and research services. These encompass tests for the assessment of continuing competence, certification of specialty competence, and registration of paraoptometric personnel; as well as consultation and research services in the areas of test construction and scoring, program development and evaluation, and educational and performance research.

ICO Faculty Accompany VOSH Trip

Illinois College of Optometry (ICO) faculty members Dr. Sunny Sanders and Dr. Peter Nelson and staff member Al Pouch accompanied an Indiana VOSH trip to Haiti in January and February. While there, they saw some of the causes of the nation's 2,000 inhabitants' Caribbean crossing to the Florida coast last year. Poverty plagues the people of Haiti, a country where disease, malnutrition and unsanitary living conditions are a way of life. "The people there were desperate," Pouch said. "I can understand now how they can hop on a boat and just take off."

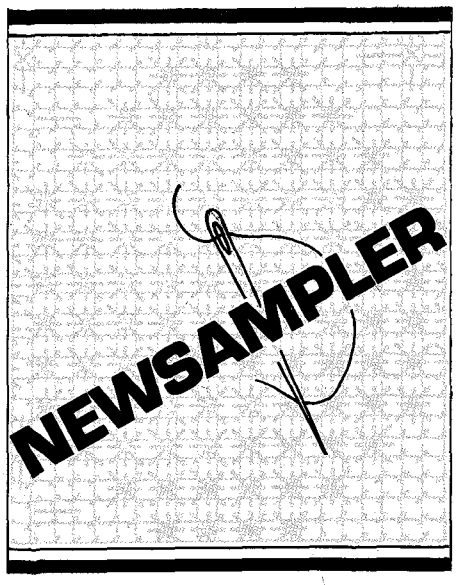
Dr. Walter Marshall, a member of the Illinois College of Optometry Board of Trustees, founded Indiana VOSH in 1974 and since then has led seven trips to Haiti. Of the 13 O.D.'s participating in this year's trip, 11 were ICO graduates. Audiovisual specialist Al Pouch accompanied them to photograph and videotape the events for ICO and VOSH use in educating groups about VOSH and optometry.

The trip from January 30 to February 6, visited two Haitian missions in Darbonne, 35 miles south of Port-au-Prince, and Piere Payan, 55 miles north of Port-au-Prince.

Many of the more than 850 people examined each day at Darbonne came from distances of more than 100 or 150 miles, and many had quite advanced cases of glaucoma, trauma, infections and suffered from severe pain. "It wasn't a task of let's give them glasses," Dr. Sanders said. "It was more like let's get them treatment because they had

(continued on page 6)

Many Haitians examined by ICO faculty on a VOSH trip in February walked for more than 100 miles and waited for days to see American doctors.



(continued from page 5)

physical diseases which had progressed so far. We were doing more to keep them alive here than advance them with glasses or anything." Dr. Sanders, a prosthetic specialist, fit about 35 people with prosthetic eyes but said many more needed prosthetic care.

At Piere Payan, where a medical clinic operates year round, the natives looked more healthy, more calm, and more patient than their counterparts at Darbonne, reported Dr. Sanders. The illiteracy rate, which runs about 70 percent, also seemed lower there.

"I'm glad I went," Dr. Sanders said. "But it's almost like putting a drop of water into the ocean. You wonder how much of a dent you make into the problem. My only consolation or justification is remembering the looks on their faces —that makes it all worthwhile."

Pacific Seals Time Capsules

Time capsules to be opened in 1990 and 2000 were sealed as one of the features of the sixth annual Vision Research Conference at the Pacific University College of Optometry April 24.

The capsules contained transcriptions of a panel discussion to predict what will be happening in optometry by 1990 and 2000. The idea was to help plan for the future in optometric education and in the varied optometric practices, explained Dr. Robert L. Yolton, director of research at Pacific College of Optometry and chairman of the conference.

The presentation featured Dr. Larry Clausen, assistant dean of the Pacific College of Optometry, who represented the educational perspective; Dr. Wesley Aplanalp, Portland, Ore., who represented commercial practice; Dr. Jack Hilborne, director of optometric care at Kaiser-Permanente, Beaverton, Ore., who represented institutional practice, and Dr. Gerald Easton, Coronada, Calif., American Optometric Association board member, who represented organized private practice.

The student optometric association of Pacific gave cash awards of $50 each for the best student paper presented in each of the four section presentations held during the first hours of the conference.

Save Your Vision Screening Held in Chicago

Illinois College of Optometry (ICO) interns screened more than 300 people at a joint Save Your Vision Week screening held with the Illinois Optometric Association (IOA) March 10 in Chicago's Union Station.

ICO supplies 51 interns from all four classes, equipment, and faculty supervisors while the IOA supplied informational pamphlets and publicity through its public relations firm. Chicago's independent television station, WGN, sent camera crews to cover the event.

The screening attracted a variety of people including Union Station employees, train conductors, area workers, and travelers caught between trains.

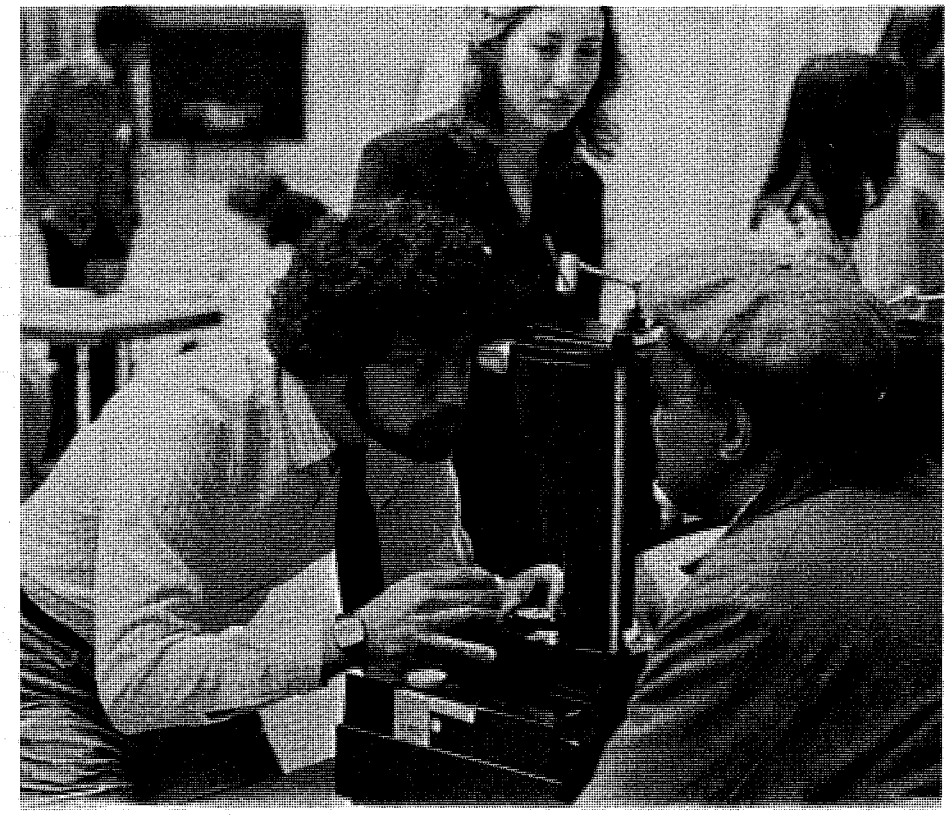


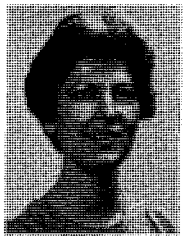
Photo by Dave Warsh

ICO students provide vision screening at Union Station in Chicago during Save Your Vision Week.

ASCO Rep Elected to NBEO Board

Dr. Earl P. Schmitt, Jr., of Hernando, Mississippi, has been appointed to the National Board of Examiners in Optometry Board of Directors. Dr. Schmitt, a professor at Southern College of Optometry, was nominated by the Association of Schools and Colleges of Optometry (ASCO) last fall and recently attended his first board meeting. Elected along with Dr. Schmitt was Dr. Paul N. Youngdale of Beaver Dam, Wisconsin, immediate past president of the International Association of Boards of Examiners in Optometry (IAB) and a nationally known practitioner.

Keeping Up with People...



Dr. Jurkus

Dr. Janice Jurkus recently was appointed chairman of the Division of Optometric Sciences at the Illinois College of Optometry, replacing Dr. Morris Berman who now serves as the assistant dean for education.

The Optometric Sciences Division encompasses a wide range of courses on optometric techniques, such as preclinic, contact lenses, functional vision, low vision, pediatrics, geriatrics, public health, and ophthalmic optics.

Dr. Jurkus graduated from ICO in 1974 and later received a master's of business administration from Loyola University in Chicago. She served as the contact lens specialty clinic director at ICO from 1975-1979. She now lectures extensively outside ICO.

Winners of the Southern California College of Optometry (SCCO) third annual SCCO Student Research Symposium have been announced. They are: **Loy D. Brown** and **Lawrence A. Morris,** first place, for a paper on "The Combined Effects of Parasympatholytic and Sympathomimetic Induced Mydriasis in the Aged Eye;" **Susan M. Nakasone** and **Franklin Y.P. Lau,** second place, for a study on "The Effect of Monocular Blur on Simple Reaction Time;" and **George M. Croft** and **Craig W. VanLeeuwan** for a paper about "The Effect of Contact Lens Edge Design on Three and Nine O'Clock Corneal Staining."

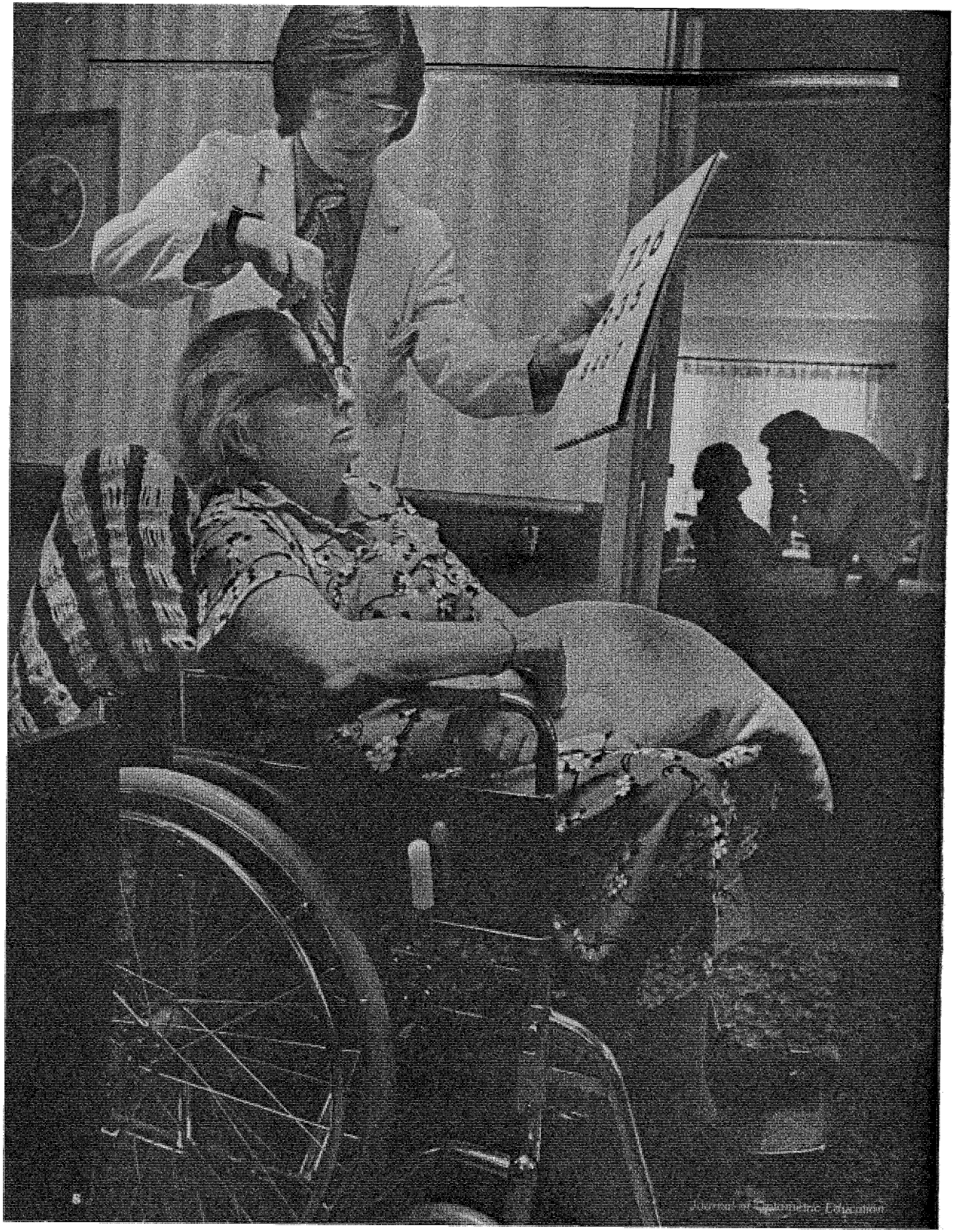
The Student Research Symposium is supported by a grant from the California Optical Laboratories Association and the SCCO Dr. John R. Dean Endowment for Optometric Research.

Dr. Robert L. Yolton, director of research at Pacific University College of Optometry has been awarded a grant by the U.S. Air Force in an attempt to make the VER (visual evoked response) as reliable for measuring vision functions as EKG (electrocardiogram) is for measuring the heart function.

VER is a sophisticated tool used to assess vision particularly for patients who are unable to respond normally during an eye examination or who have particularly difficult vision problems to diagnose.

The $10,000 grant is for one year and is from the Air Force Office of Scientific Research, Bolling Air Force Base, Washington, D.C. The title is "Evaluation of Factors Producing Visual Evoked Response Variability."

Shown at the recent Student Research Symposium of the Southern California College of Optometry are, left to right: Dr. Richard L. Hopping, SCCO President; George M. Croft, 4th year student, and Craig W. Van Leeuwen, 4th year, (3rd Place Winners); Lawrence A. Morris, 4th year, and Loy D. Brown, 4th year, (1st Place Winners); Franklin Y.P. Lau, 4th year, and Susan M. Nakasone, 4th year, (2nd Place Winners); and Dr. Douglas H. Poorman, SCCO Dean of Academic Affairs.



Geriatric Optometry—Today and Tomorrow

Satya B. Verma, O.D.

Oscar Wilde[1] commented on old age in two distinctly different ways. For the healthy, "the tragedy of old age is not that one is old, but that one is young." For the less fortunate, "my experience is that as soon as people are old enough to know better, they don't know anything at all."

Aging is a daily reality not only for each of us, but for the entire American population. The fastest growing family unit in this country is the geriatric family with its special needs. Within this century, the number of elderly has increased more than seven-fold. One in every nine Americans is 65 or older. The fact that this population continues to grow is one of the triumphs of modern medicine which Dr. Somers calls the "geriatric imperative."[2] By the year 2010, one-fifth of the people of this country will be 65 and older.[2]

Optometric Role in the Care of the Geriatric Patient

Hardy and Cull[3] note that "older people are not the lost generation but a generation whose day did not arrive. This segment of our population is angered, bewildered, concerned and groping for a meaningful place in society." A paper by Skuza[4] reported that "in many cases, geriatric patients labeled as senile, reclusive, bothersome, or irritable, actually have vision problems which affect their behavior. Once the problems are corrected with proper vision care, the patient's behavior often changes remarkably for the better."

Thus, at a time in life when sensory modalities begin to deteriorate and fail, vision gains new importance to the life of the elderly individual. It is the ally of the older American, insuring communication with the outside world, and providing the means to maintain skills acquired throughout the individual's lifetime.

Recent U.S. Senate testimony revealed that at least 85% of all injuries sustained by persons 65 and older are caused by falls. Twenty-five percent (25%) of these are attributable directly to uncorrected visual problems. While 75% of this age group suffers from at least one chronic condition, 48% suffer from poor vision.[5] It also should be noted that 68% of those with one or more chronic conditions judged their own vision as poor. It is also a fact that the incidence and prevalence of ocular disease significantly increase with age.

Thus, the vision care needs of the elderly population are a significant component of the overall health and welfare of the elderly. Certainly, this is a vital area of need. When one considers these needs and contrasts them with the inadequate attention presently being devoted to this area in health professions education, it becomes quite apparent that changes in attitude and sensitivity are demanded. Health professions education institutions in general, and schools and colleges of optometry in particular, need to deliberately and comprehensively integrate gerontological principles and understanding into their professional curriculums.

In addition to the purely refractive problems of the elderly, the National Center for Health Statistics[6] also revealed that vision impairments are the third highest chronic condition reported in health interviews in persons 65 years and older. Only arthritis and hypertension have a greater prevalence than vision impairments.

The National Center for Health Statistics concluded that for those members of the public classified as retired, vision care examination visits decreased by 50% from pre-retirement levels. This decrease in vision care occurs at the age when a variety of causes of vision failure may be most probable and when inadequate vision may be most debilitating to the person as a whole. This lack of vision care is partly attributable to financial considerations. However, lack of interest, knowledge, understanding and sensitivity concerning the elderly person among the health professions in general seems to be a significant factor.

The Need for Geriatric Education

Health education in general lacks gerontological content. The students in the health care system receive little formal training and education in the care of the elderly. Some of the recommendations of a recent study by Rand Corporation[7] included increasing training programs for health professionals in geriatrics, expanding teaching of geriatrics in primary care training programs, developing visible geriatric units, etc.

Similarly in optometric education, although the number and frequency of people receiving and needing eye care increases with age, little time has been spent learning the normal biological, physiological, psychological, and social traits in aging.

Dr. Robert Butler,[8] director of the National Institute on Aging, in his testimony before the Senate Special Committee on Aging, October 13, 1976, said:

In order to effectively meet the needs of older people for high quality medical treatment, accurate diagnosis, sensitive care, and effective treat-

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ment, it is imperative that the special perspectice of the particular body of knowledge known as geriatric medicine be introduced into the curricula of all medical schools, into all intern and residency training and all continuing education programs. The real question is not whether geriatric medicine should be a specialty, certified or otherwise, that is essentially proprietary. Rather, the question is how can we expose every physician to procedures of primary care which are necessary to deal with the older patient?

Since optometry is a primary health care profession similar to its sister health professions of medicine, dentistry and podiatry, it is imperative that the optometric profession keep pace with other health professions in meeting these challenges in the health care field.

The current knowledge and understanding of the elderly in all health professions is negligible, and optometry is no exception. The little knowledge that does exist is mythful and far from reality. Old age generally is associated with sickness, blindness, nursing homes and institutionalization. If some of the facts recently made available are any indication, however, it becomes apparent how wrong this assumption is. As an example, only 4% to 5% of the total elderly population is chronically ill and lives in nursing homes or institutions. Similarly, a recent study[9] of 468 patients seen either at home or a nursing home revealed that a great majority of non-ambulatory people needing eye care also are elderly. As shown in Figure 1, only 31 of the patients examined were below 60 years of age, and 437 were above 60 years. Also the females outnumbered the males 4 to 1.

The findings in Figure 2 also are very revealing and contrary to the common belief that the majority of people lose considerable vision with age. The findings of the study clearly revealed that 57% of those seen had near normal functional corrected vision, and another 20% had good usable vision and could be helped with conventional spectacle correction. An additional 15% to 20% could be helped with some kind of low vision aid. The number of people who could not be helped was considerably small.

If these results are any indication of the trends of the visual status of all the elderly population, it safely can be said that the great majority of people in these age groups is not blind; rather they maintain good usable vision.

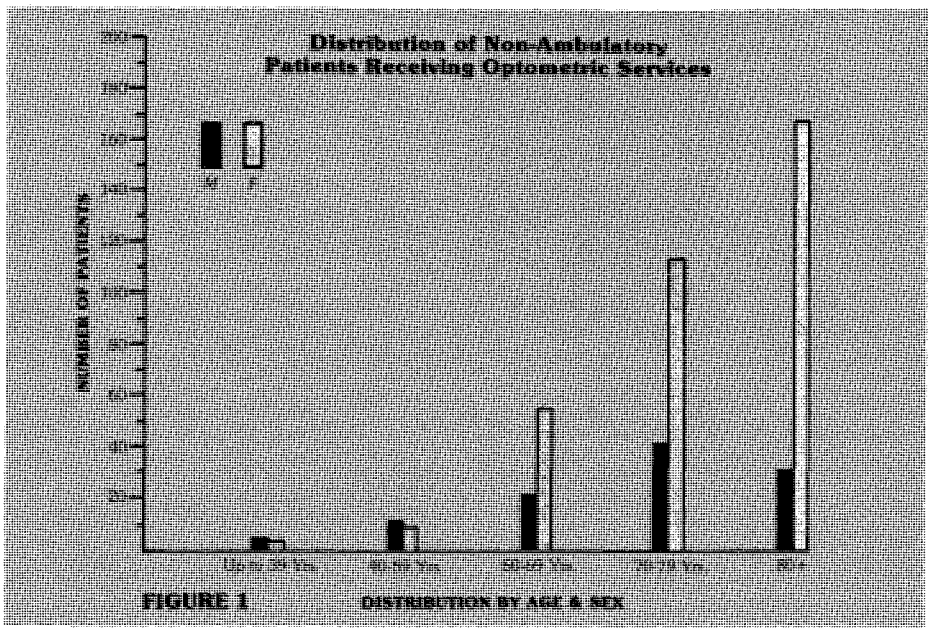

FIGURE 1 DISTRIBUTION BY AGE & SEX

It becomes quite apparent that eye care is an essential element of the total health care of the elderly, and as the providers of that eye care, optometrists must have a broader understanding of the normal behavioral, psychological, anatomical, physiological and physical changes that take place in the elderly. Even though optometry may claim to have been providing eye care to this population, it has been with insufficient knowledge of the traits described above.

Present Geriatric Curriculum in Optometric Institutions

To gain a better understanding of the courses in geriatrics currently being taught at the various schools and colleges of optometry, the following questionnaire was sent to all of the schools in the U.S. and Canada. Eleven of the schools responded, and results of that survey are summarized here.

1. Do you have a gerontology course being taught at your institution?
2. Do you have any other course with gerontological content?
3. Do you have any continuing education course in gerontology?
4. Do students receive clinical exposure to geriatric patients?
5. Does your institution plan to increase didactic or clinical activity in the coming year?
6. Is geriatric optometry a separate department or division in your school?
7. If no, what department does it come under?
8. Do you feel that the importance of this course is such that it should have its own independent department or section to receive proper credit in the curriculum?
9. In order to have a uniformity and general consensus as to what minimum topics should be covered in these courses, do you feel there should be continued dialogue between all involved, such as meeting as a group?
10. If the group is able to meet, what time do you feel would be most suitable?

Answers to questions 1 through 6 and question 10 as shown in Figure 3 clearly reflect the interest in geriatric teaching. How strongly that interest will be followed through is something that remains to be seen.

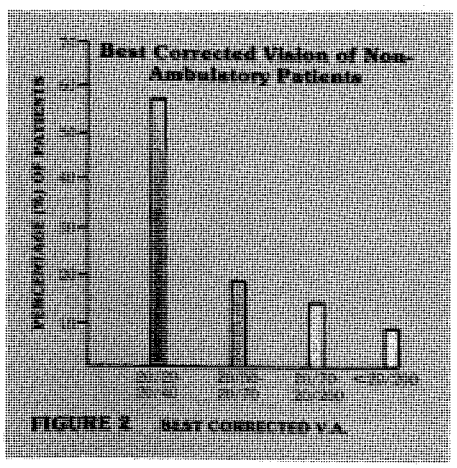

FIGURE 2 BEST CORRECTED V.A.

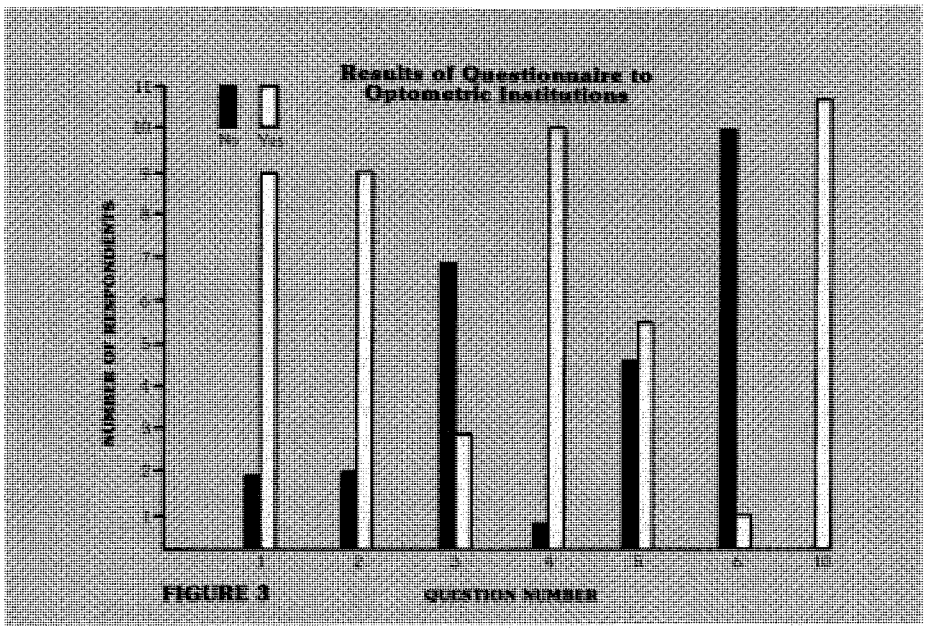

FIGURE 3

The answers to question 7, that is, what department does geriatric optometry come under if it is not an independent one, varied from one institution to another. Geriatric optometry came under low vision, rehabilitative optometry, community optometry, primary care optometry, external education, etc.

When asked about the need for an independent department or section in question 8, two of the respondents strongly agreed. Three merely agreed, five were neutral, and one strongly disagreed. it seems appropriate to mention that a great many medical schools and many other health education schools either already have visible geriatric units or are in the planning stages.

After examining the comments of the educators representing institutions, the following impressions were gleaned:

1. All of the respondents felt that courses with gerontological content are necessary for the students of optometry as well as practitioners.

2. Some of the schools already have some programs in the area of gerontology, and others plan to become involved in it.

3. Gerontological education was often considered the same as low vision. This is particularly disturbing since low vision education cannot be called geriatric education. Granted, many low vision patients are old, but that is still a minority among the elderly patients. There are a far greater number of elderly people who do not have low vision as discussed earlier. Therefore, it is important to understand their unmet visual and other health needs. The same message has to be conveyed to students and providers so that they are not disenchanted with the elderly as low vision problems.

Conclusions

After a careful look at the present status of geriatrics in optometric education, it seems that it lacks proper emphasis and identity. It may appear that a great deal of geriatrics is incorporated in optometric education, such as pathology, learning about cataracts and glaucoma, etc. On the other hand, that learning is taking place only in bits and pieces. The learning of geriatrics that should be stressed is the *process of normal aging*, which is imminent in all persons. Whether such things as cataracts, glaucoma, hypertension, diabetes, blindness, etc., are present or not is secondary. Since all optometric practitioners are involved in the care of the elderly, it is imperative that a maximum understanding of all the mechanisms and changes taking place within the aging person be acquired.

For the future, this author submits that geriatrics and the study of the aging population is picking up momentum in all the health care fields, and optometry cannot afford to remain aloof. Efforts must be made to equip future practitioners fully with adequate knowledge and understanding of the elderly population in order to provide care to them now and for the rest of their lives. Comprehensive health care and home health care for the elderly is the need of the hour. In primary care optometric practices, the frequency and number of office visits by the older patients far exceeds the younger generations.

Thus, activities must be increased in the areas of (1) education, in order to learn more about the elderly; and (2) legislation, to seek laws which cover optometric services for the elderly, such as Medicare, etc.

Optometry has to be in the forefront not only in providing care to the elderly, but also in educating the other professions and agencies about the optometric practitioner's ability to contribute to the overall well-being of the geriatric society. In addition, optometry has to be included with other providers and given its share of the federal, state and local dollars spent on the health care needs of the elderly. □

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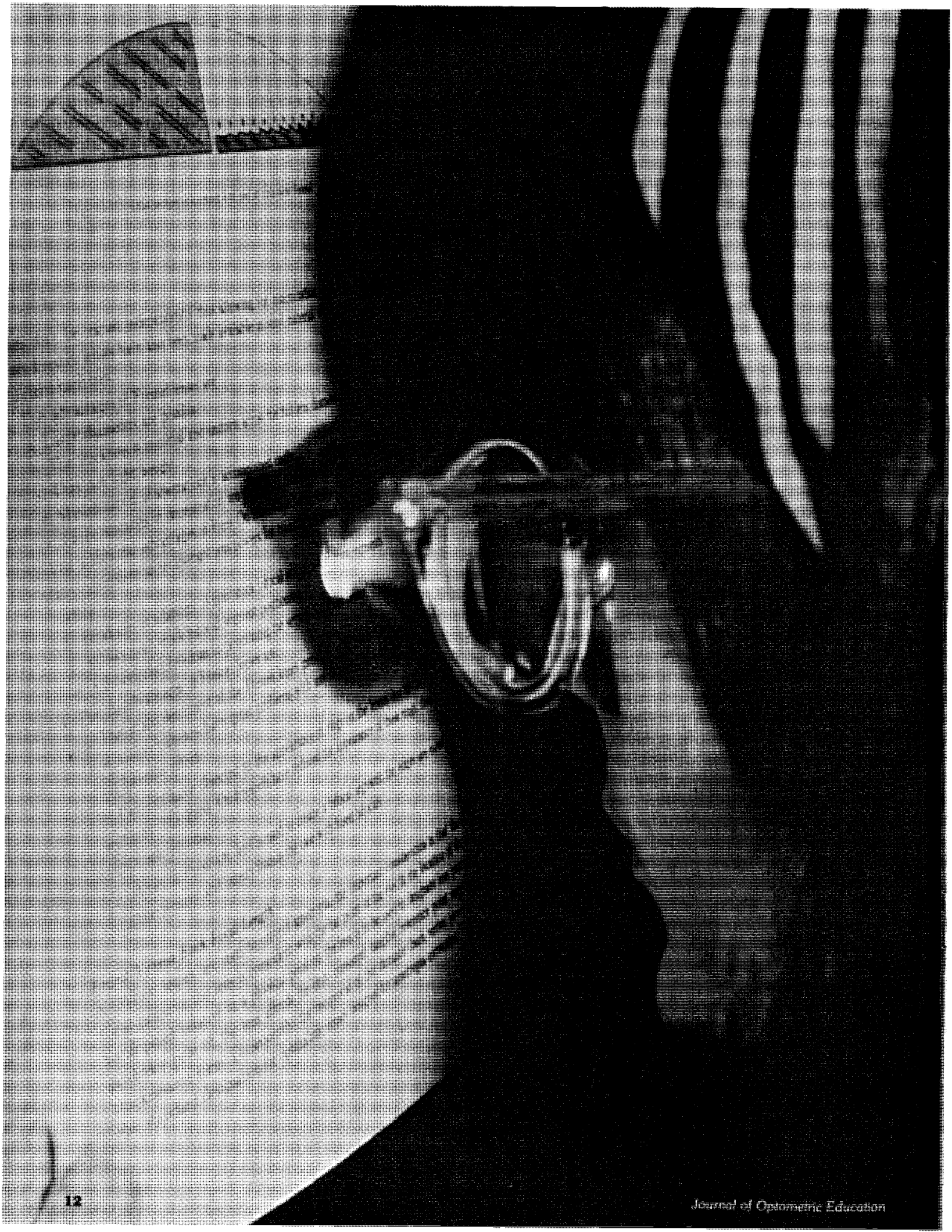

Plan for an Educational Program in Rehabilitative Optometry

INTRODUCTION

This report represents the basis of a recommended plan for an educational program in rehabilitative optometry developed by the Association of Schools and Colleges of Optometry and supported by a contract with the Health Resources Administration.*

A ten member advisory committee, established under the terms of the contract, provided professional advice and general guidance to the project. Various professional disciplines required in rehabilitative optometry and related patient services were represented in the membership of this committee which functioned to review, comment and make recommendations on plans and schedules and the various substantive materials developed during the course of the project. In addition, contract staff experts and specialized consultants were employed under the contract.

The chapters and appendices of the final report submitted to the Health Resources Administration presented the methodology used in the conduct of the contract and a complete inventory and analysis of a sampling of nine schools' existing programs in rehabilitative optometry. The educational plan, presented in a separate document under the contract,** set forth in detail information concerning the definition of the scope of practice of rehabilitative optometry used in connection with the project and the competency objectives to which the model educational program is directed.

THE NEED FOR A PROGRAM IN REHABILITATIVE OPTOMETRY

Current Needs and Resources

The need for a program in rehabilitative optometry is highlighted by estimates of the extent of low vision problems when viewed in relation to current resources available to provide adequate handling of the problem. Although there are no really reliable statistics as to the precise dimensions of the problem, conservative estimates place the numbers of people in the United States with impaired vision at at least two million. Other reports indicate this number may be as high as six million. The percentage of persons with visual impairment increases in the older age groups so that, as the average age of the population of the U.S. increases, so will the extent of the problem.

There are definite benefits to society to be realized through the provision of more adequate services to the visually impaired. These include improved social adjustment of the individuals so treated resulting in ability to lead more productive lives and to achieve a degree of self support, thus relieving society of a great deal of welfare services, institutionalization and specialized services and ultimately creating an impact on national productivity. In this time of serious concern for health care cost containment, timely identification and provision of effective rehabilitative vision service and devices significantly can contribute to this objective. The program and activities that might well constitute a program of training in rehabilitative optometry exist in all schools and colleges of optometry but to varying degrees and with a wide range of quantity as well as quality. The analysis of existing programs reported in the final report on the project confirms these circumstances. It would be desirable and beneficial to the consumer of optometric rehabilitative services, and to the provider as well, to have received a basic, standardized core of instruction regardless of the site of instruction. In order to provide this uniformity and efficiency of instruction, a more uniform approach to instructional methods and materials is indicated.

Instruction in optometric rehabilitation would be further enhanced with the inclusion of established non-optometric professionals working with the visually impaired. Professional workers with the blind are distributed throughout the country and often are in proximity to optometric educational institutions. The involvement of the non-optometric professional working with the blind in the educational process for the optometrist would enhance the concept and sensitivity of the optometrist relative to the wide range of problems encountered by the visually impaired person.

At present there are seven optometric residency programs in the United States with emphasis in rehabilitative optometry. The earliest program was established in 1975, and three were established as recently as 1979. To date, twelve residents have completed their residencies and seven are currently enrolled in such programs. It is reported that there are over 250 low vision clinics. At present, these are either unstaffed or served on a part-time basis.

The problem, however, is more com-

*Final Report on a Project for Development of an Educational program in Rehabilitative Optometry. Conducted by the Association of Schools and Colleges of Optometry pursuant to DHHS/HRA contract #232-79-0093. Washington, D.C.: U.S. Department of Health and Human Services, December, 1980. This project was funded at least in part with federal funds from the Department of Health and Human Services. The content of the report does not necessarily reflect the views or policies of the Department of Health and Human Services nor does the mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

**A Plan for an Educational Program in Rehabilitative Optometry. Conducted by the Association of Schools and Colleges of Optometry pursuant to DHHS/HRA contract #232-79-0093. Washington, D.C.: U.S. Department of Health and Human Services, December, 1980.

plicated than that posed by a substantial number of people in need of rehabilitative optometric services and a limited number of optometrists fully trained to provide such services. There is need for considerable patient education effort to inform those in need of rehabilitative services of what services are available and the benefits that the patient may expect to derive from them. Partly because of this, and partly because of the geographic dispersion of prospective patients and their limited financial resources, the economics of the situation make private practice in rehabilitative optometry unfeasible in many areas at this time. Thus, the viable opportunities for work in this field largely are found in institutional settings. This fact makes the prospect of work in rehabilitative optometry unattractive to many.

During the course of the project, considerable discussion occurred among the staff and members of the advisory committee for the project as to the educational needs to be met at the undergraduate level and at the graduate level (that is, pre-O.D. and post-O.D. levels, considered by many to be graduate and postgraduate levels). At the graduate level, the curriculum should prepare the student to be able to provide primary care. The practitioner should be conversant enough with conditions requiring rehabilitative optometric attention to recognize the need for and to know how to refer patients to an appropriate specialist. Equally important, the optometrist should know the functions and services of professionals in other disciplines and when and how to utilize them. At the postgraduate level, residents should undertake more intensive study of basic material, prepare an analytic paper in an aspect of low vision care, be provided with more intensive clinical experience, and be given first-hand experience working with various rehabilitative personnel.

COMPETENCY OBJECTIVE: #3

An understanding of the role of other sensory modalities for the efficient performance of visually impaired patients in their vocation, recreation, social interaction, or daily living.

Goals	Curricular Element(s) (Topical Outline)
I. Understanding the relative roles of senses other than vision in unimpaired living	Audition and vision Tactile sensation and vision Kinesthesis and vision Olfaction and vision Taste and vision
EDUCATIONAL OBJECTIVE: Explains the manner in which the kinesthetic, auditory, tactile, olfactory and taste senses interact with vision in daily living.	
II. Knowledge of the role of other senses for the visually impaired	Auditory loss: compensation Tactile loss: compensation Kinesthetic loss: compensation Olfactory loss: compensation Taste loss: compensation
EDUCATIONAL OBJECTIVE: Demonstrates an understanding of the need for additional compensation in the visually impaired individual who has suffered other sensory loss as well. Demonstrates the ability to detect these losses and compensatory behaviors through appropriate clinical observation and development of complete and relevant histories. Synthesizes these facts into an appropriate case disposition. Translates the plan into language that can be understood by the patient.	
III. Knowledge of sensory input into specific task performance	Mobility Communication Personal Management
EDUCATIONAL OBJECTIVE: Explains and describes sensory input into tasks of mobility, communication, personal management.	

Figure 1

Development of the Plan

The process followed in the development of the educational plan involved these basic steps:

1. Development of a statement of the scope of practice of rehabilitative optometry.
2. Development of a data collection format and instructions for use in inventorying existing programs and providing orientation and training for those who were to serve as data collectors.
3. Collection of the data, analysis of it and preparation of the inventory report.
4. Preparation of a statement of the competency objectives which the model educational plan was designed to achieve.
5. Development of the curriculum plan and the other elements of the educational plan.

The statements, definitions and data referred to in steps 1 through 4 above may be found in the final report on the project which the association submitted to the Health Resources Administration as a separate document under the contract.

The curriculum model developed in step 5 is in a format which sets forth competency objectives, goals, curricular elements (topical outlines) and educational objectives. An example of this format is shown in Figure 1. Definitions of these terms, for the purposes of the model are:

1. *Competency Objective*—a broad statement outlining a general area of expected performance.
2. *Goal*—general area of skills or knowledge outlining the boundary of the competency objective (from adaptation of Kemp's model in *Handbook for Teachers in Schools and Colleges of Optometry*[1]).
3. *Curricular Element(s) (Topical Outline)*—identification of those topics in which instruction is expected to be given and which describe the course content.

4. *Educational Objective*—". . . explicit formulations of the way in which students are expected to be changed . . ." through mastery of the curricular elements. The extent to which the students successfully meet these educational objectives is an indication of their ability to succeed in professional practice.[2]

The educational objectives form a concatenation, subsumed under the more general competency objective, and provide the basis for institutions to individually develop evaluative criteria and instruments. Such evaluations usually will be achieved through use of written or oral examination procedures or through demonstration of knowledge, skill or competence in a laboratory or clinical setting as appropriate for the particular curricular element.

In order to facilitate placing the plan for education in rehabilitative optometry in proper perspective, a statement of the scope of practice and competency objectives were developed.

COMPETENCY OBJECTIVES AND THEIR RELATIONSHIP TO THE PRACTICE OF REHABILITATIVE OPTOMETRY

Defined Area

Rehabilitative optometry, for the purpose of the project, was defined as that area of optometry which includes the knowledge, skill, and attitudes needed to provide appropriate and cost effective care for patients whose visual capabilities, after correction of their refractive error and the use of standard adds, are inadequate for the efficient performance of vision-related tasks in their vocation, avocation, social interaction, or daily living.

Competency Objectives

The rehabilitative optometry program is a patient-centered care approach. The education and training of optometrists to provide this patient-centered rehabilitative care requires the knowledge, skills and attitudes acquired in the general optometric curriculum, but with additional and special emphasis on the following objectives:

1. Knowledge of the epidemiology of low vision.
2. Knowledge and understanding of the role of hereditary, congenital, and acquired ocular and systemic anomalies in low vision.
3. An understanding of the roles of vision impairment and the age of onset on the efficient performance of vision-related tasks.
4. An understanding of the role of other sensory modalities for the efficient performance of visually impaired patients in their vocation, avocation, social interaction, or daily living.
5. An understanding of the social, emotional, physical, intellectual and psychological problems in the management of visually impaired patients.
6. An understanding of the concepts of rehabilitative methodology.
7. Knowledge and skills needed in the design, procurement, evaluation, application, and modification of devices and aids to provide optimum vision performance of visually impaired patients and those with special visual requirements.
8. Knowledge of the role of environment and its modification in providing optimum visual performance for visually impaired patients.
9. Knowledge and diagnostic abilities necessary to detect and diagnose those ocular, neurological, and other anomalies causing vision impairments and to provide for their appropriate management.
10. Knowledge and skills needed in the examination and evaluation of the visual status and vision performance abilities of visually impaired patients.
11. Knowledge necessary for the selection of appropriate therapy, patient education, and for the continuing care of visually impaired patients.
12. Knowledge and skills needed for the development of appropriate interpersonal relationships in the care of visually impaired patients.
13. Appreciation of the need for education of the public regarding vision and vision impairments.
14. Understanding and appreciation of the roles and services of other professions working with the visually impaired and their health care contributions in a cooperative multidisciplinary care program.
15. Understanding and appreciation of the vocational, legal, social, financial, and other benefits available from community, state, regional, and federal resources for handicapped patients, and the ability to assist patients to obtain the appropriate benefits.
16. Understanding the practice advolved in the delivery of health care to visually impaired patients.

The Practice of Rehabilitative Optometry

Optometrists currently are involved in rehabilitative optometry in a variety of ways with roles and responsibilities that vary with the situation. A realistic set of competency objectives therefore should recognize the strengths and weaknesses of present situations. The objectives should be aimed at achieving an ideal but should be sufficiently flexible so as to permit patients to be well served in a variety of settings and situations. Educationally, this means that in addition to demanding mastery of the currently necessary skills, the successful curriculum provides the opportunity and challenge to develop a sound theoretical basis for future learning. It is both efficient and effective to prepare a student to be a competent learner if his or her role is not to be static but rather is expected to continually evolve as a result of new knowledge and new applications of existing methods.

Above all, the patients who seek out the rehabilitative optometrist belong to a group characterized by a high degree of individual differences. Each patient requires of his or her doctor the ability to approach the patient's goals and form a set of objectives for vision care that is truly unique for the patient. Most vision care patients have organically healthy visual systems. The rehabilitative patient, however, frequently presents a more complex circumstance. The rehabilitative optometrist must therefore be able to differentiate between those conditions that are best remediable by optometric or by other means. Where the usual patient receives complete care from the optometrist or optometrically trained assistant, the best rehabilitative care may involve the services of other disciplines. The usual patient can have his skills measured against a norm and then have the abnormal visual skills corrected to normal, thereby preparing the individual to meet the visual requirements of employment, recreation, or daily living. The rehabilitative patient usually requires counseling and assistance to seek activities within the visual abilities or approaches to tasks that permit adaptation of reduced visual skills to successfully, safely, and profitably achieve life's goals.

Traditionally, rehabilitative optometrists have worked as most other opto-

metrists: in a solo practice setting. Indeed they have been responsible for much of the state of the art, handing down much knowledge in the field informally, or if formally, without theoretical support, except in the areas of optical design and physiological optics. Recent years have seen optometric rehabilitative care move into institutions, both those for blind rehabilitation (where many patients were found not to be totally blind but only partially so) and those providing rehabilitation of persons with other types of handicaps. Some of the results of this integration of optometry with other rehabilitative disciplines have been demands for description of this trend in the professional optometric literature and a greater interest by students and practitioners in specialization in rehabilitative optometry. It also has brought about development of interdisciplinary education and patient care programs and growth of institutional visual rehabilitative care. In addition, it has resulted in a definition of the personality traits, knowledge, and special skills in communication and human relations required of the practitioner for successful rehabilitative optometric treatment.

For the future, the curriculum objective should provide opportunity for flexibility in the rehabilitative optometric curriculum that will allow rigorous training in rehabilitative optometry with a view to preparation for several modes of practice. While the multiple practice model may be the ideal urban setting for rehabilitative optometry, many optometrists will continue to work in rural settings, isolated from other resources, and must be able to provide an appropriate level of care in that setting. In view of the aging population and the rising incidence of visual impairment, hospital or institutional practice requires competence in appraisal of visual handicaps.

Optometry has concerned itself with rehabilitation in the sense that most vision impairment can be remediated but not cured. Virtually 100 percent of the population over age 45, for example, has significantly impaired accommodation. Optometrists have for years been compensating for this while fitting patients to efficiently and effectively perform near point tasks. More recently, optometry has evolved methods and approaches to abnormal visual development to aid children in visual tasks related to learning. It is only natural to extend into the formal area of rehabilitation of the more unusual and disabling impairments, the treatment skills, and the specialized approaches which best combine to utilize a variety of competencies to foster effective and efficient patient care in any setting.

PLAN FOR IMPLEMENTATION OF THE PROGRAM

Achievement of the competency objectives set forth in the program can best be obtained if the school concerned lays out and follows a carefully conceived plan for implementation. This section sets forth the major elements of such a plan. In those elements in which it is appropriate an assumption has been made that the plan is based on a student group of twenty-four divided into two sections of twelve each for laboratory and clinical work. Should the actual situation involve a different number of students, adjustments will be necessary.

Organization and Administrative Considerations

It is essential that academic and administrative officers determine the need and demand for rehabilitative services in the geographic areas served by institutional service arms (clinics, teachers or others) and by graduates. Finding a significant need in the community or region to be served justifies expending the necessary resources to establish the program in a professional school supported by public and/or private funds where the main goal is the training and education of individuals to serve the visual needs of the public. This step also will indicate the availability of patients for the teaching clinics.

The dean or chief administrative officer should assign responsibility for the program and authority to act in the institution's behalf to a single individual or team to:

a. Be an advocate for the program in institutional councils.

b. Determine an organizational focus for rehabilitative optometry as appropriate in the institution.

c. Establish relationships with educational, clinical, rehabilitation, and other resources outside of the school or college of optometry.

d. Recruit faculty across departmental and disciplinary lines.

e. Develop institutional objectives in cooperation with faculty.

f. Develop outcome measures in cooperation with faculty, based upon educational objectives.

g. Establish an evaluation mechanism and timetable.

Required Educational Resources

A careful analysis of the curricular elements of the educational plan by the project staff and consultants resulted in the conclusion that the educational time required in the model would be 30 lecture hours, 20 laboratory and 120 clinic hours per student. These determinations were used for the cost estimate presented in the final document. It should be recognized, however, that various institutions may find ways of implementing the program using another configuration.

Presidents, deans or other appropriate chief administrative officers should activate procedures to gain faculty support for the adoption of the goals of the rehabilitative optometry curriculum and administrative support from university officers. Previously collected data on need will be valuable to this end and should be made available both up and down lines of organization. The individual referred to in the previous section should serve as the chair of a steering committee which should be appointed with responsibility to define the additional resources the institution must make available to implement the curriculum (these will differ somewhat from school to school). These resources will include at least:

a. Faculty time

b. Laboratory space and equipment

c. Ancillary personnel and other professionals

d. Support and administrative staff

e. Travel and continuing education for faculty

f. Numbers and types of patients

g. Institutional research facilities and personnel

h. Clinical facilities—space and equipment.

The formula for calculating faculty time and typical lists of needed equipment for examining rooms and for low vision diagnostic work appear in Figure 2.

Ancillary personnel and other professionals might include social workers, rehabilitation counselors, psychologists, occupational therapists and others as noted under Competency Objective #14 in the final document.

Under clinical facilities, it will be important to evaluate the characteristics of

the institution's clinic patients and of patients who might be likely to visit under a new program. Because many campuses have rather homogeneous populations it may prove necessary to establish outreach programs or to move into and staff, with appropriately qualified faculty, satellite clinics and/or develop relationships with hospitals (Veterans Administration, Public Health Service and other public, voluntary and private) or other resources having access to patients and an interest in serving the service and teaching needs of the optometric institution.

Having assessed the educational resources of the institution and compared them with the needs as established, a decision should be made at this point to commit the necessary existing and additional resources to the program as adopted. A decision may be made to adopt and implement the program (curriculum) in one of two ways to match the institution's resources to its goals as follows:

a. Adopt the full curriculum—didactic, laboratory, and clinical for all students.

b. Adopt the didactic and laboratory portions only, leaving the structured clinical training to a limited number of students who demonstrate the necessary qualifications and for whom clinical training facilities and other resources are adequate, affordable, or available.

In part the decision as to which of these approaches is utilized will be controlled by the availability of an adequate population group for clinical instruction and the recognition of the need for each student to select elective programs in accordance with his or her primary interests.

The Postgraduate Level (Residencies)

Available data[3] indicates that a significant portion of those in need of rehabilitative optometric services are not presently served. The increase in the aging population projects an increasing number of persons with treatable visual impairment. Most significant in consideration of postgraduate or residency training are the advances made and being made and the higher degree of technology emerging in the treatment of visually impaired patients. These circumstances support the conclusion that rehabilitative optometry is and will continue to be a specialized area and that postgraduate education for some number of specialists is indicated.

As noted earlier, the residency program developed around the curriculum model contained in this document should stress more intensive study of the basic material and concentrated exposure to a variety of clinical experiences with visually impaired persons.

All residencies should be established in accordance with the guidelines developed by the Association of Schools and Colleges of Optometry[4] and should be reviewed and accredited by the Council on Optometric Education.

Each institution should establish special admission requirements for its residency program in accordance with those established by the Council on Optometric Education.[5] It is recommended that such requirements include:

a. Graduation with an O.D. degree from an accredited institution.

b. An academic attainment level.

c. Completion of all aspects of the graduate program or that they be completed as part of the didactic portion of the residency.

d. Recommendation from both the dean and chairman or director of low vision service of the applicant's graduate institution including professional, noncognitive and academic evaluation.

In view of the limited number of

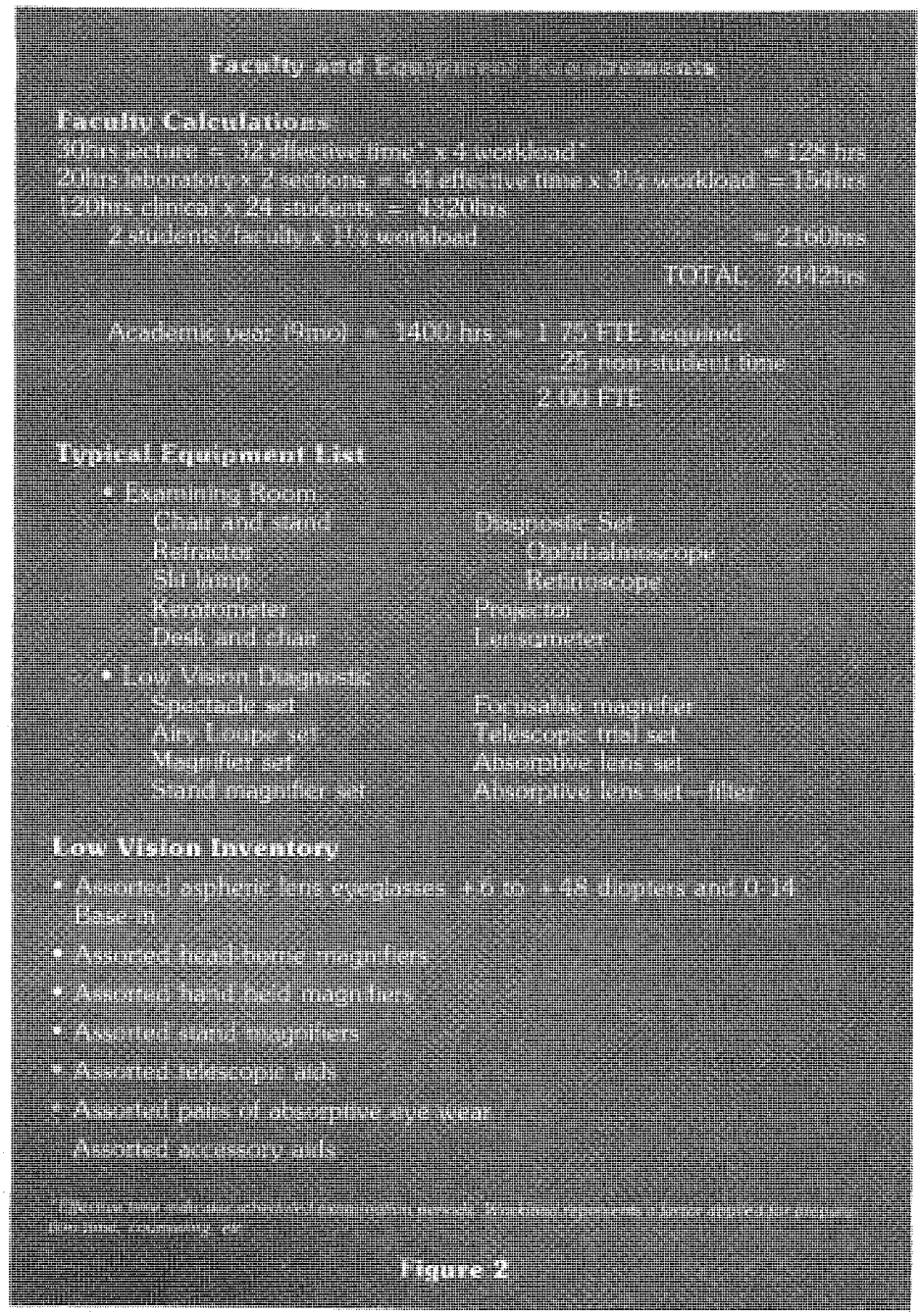

Figure 2

specialty training opportunities available at the present time and for the immediate future, national competition should be provided in the selection process. It is recommended that an annual announcement in the optometric press be established to notify possible candidates of the availability of such residency training.

Goals of the Curriculum

A strong, positive aspect of this project of curriculum development is the broad participation by those agents ultimately responsible for the plan's implementation—the schools and colleges of optometry. This already has resulted in the development and/or reinforcement of positive attitudes in the members of the project committee. It is expected that, within available resources of their constituent institutions, this will result in individual plans to strengthen existing programs.

Essentially, goals in two directions should be pursued concurrently: (1) the curriculum should be implemented in order to provide an adequate number of appropriately educated and trained optometrists; and (2) the target patient population should be encouraged and aided in seeking out the services of rehabilitative optometry.

The first step toward the first goal should be a careful comparison between the elements of existing programs and the curriculum proposed in this plan. (An inventory and analysis of the existing programs in nine of the schools and colleges of optometry appears as part of the final report on this project submitted to the Health Resources Administration.)

Other actions which will contribute toward the achievement of this goal are:

a. Publicity in the optometric literature, including but not limited to the *Journal of Optometric Education*, the *Journal of the American Optometric Association*, and the *American Journal of Optometry and Physiological Optics*. In addition, summary notices of the results should be placed in the journals of clinical vision care and rehabilitation.

b. Provision or encouragement of programs for the development of teaching materials (learning resource centers) for rehabilitative optometry where the curriculum is adopted.

c. Provision or encouragement of programs for teacher training in rehabilitative optometry.

d. Publicizing the curriculum and supporting programs to: (1) optometric teachers at the schools and colleges of optometry directly; and (2) the ASCO board of directors at one of their regular meetings.

e. Enlisting the aid of the ASCO Council on Academic Affairs through its chairman. This would be another avenue of implementation through council representatives at the schools and colleges of optometry.

f. Distributing full copies of the proposed program to teachers of rehabilitative optometry nationwide.

The second goal, which would insure that there are patients to be cared for by graduates of this program, could be pursued through:

a. Education of teachers and counselors in the primary and secondary schools to the importance of early visual rehabilitation in such programs of care.

b. Programs aimed at government and private agencies to inform them of the role of the rehabilitative optometrist in the care of the visually impaired and blind.

c. Public education programs stressing the role of rehabilitative optometry in the care of the visually impaired.

d. Advocacy of recognition of visual impairment (within the definition of this report) as a major health problem for adequate payment for services by rehabilitative optometrists under appropriate federal and other third party programs.

If an optometric college or school is to be successful in achieving the goals of the rehabilitative optometry curriculum as devised here, a number of steps should be taken to assure success. It is to be understood, of course, that details of this implementation plan will vary with the differences in precise organizational structure of the various schools and colleges of optometry.

The plan provided will, if adopted, assure that the graduate doctor of optometry will be prepared to identify and service the needs of the visually impaired patients in his or her general practice either by treatment or referral. At the same time, the plan provides for the further development of the graduate OD to specialize in the field of rehabilitative optometry to ensure in-depth services to those in this population group.

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Some Answers To Questions About Mandatory Continuing Education

Jo McIntosh, M.Ed.

The rationale for imposing continuing education requirements upon a profession is to ensure that professionals keep abreast of latest developments. Optometry, through its national professional organization, the American Optometric Association, has accepted the responsibility "to continually update and upgrade optometric professional knowledge and awareness so that the vision and well-being of the citizens of the United States may thus be maintained and protected."[1]

A battle has raged over how well mandatory continuing education requirements have met that goal ever since the state of Iowa first imposed mandatory credit requirements for relicensure in 1938. There were 24 states requiring postgraduate course work for relicensing in 1972 when the American Optometric Association held a major conference on continuing education at Williamsburg, Virginia.[2] Less than a decade later, that number had risen to 46 states.[3] In 1981 only four states plus the District of Columbia did not have mandatory continuing education requirements.[4] The trend toward mandatory continuing education shows that both the states and the profession consider such requirements useful and consistent with professional and service goals. Nevertheless, serious questions have been raised with respect to mandatory continuing education.

1 Is the cost of mandatory continuing education unreasonable?

One of the feebiest arguments against mandatory continuing education is that it is expensive and that high costs for fees are passed on to the consumer. In fact, optometric continuing education costs are nominal. The current tuition charges for continuing education presented at the colleges of optometry are $10 to $12 per credit hour; courses in instrumentation are about $20 per credit hour.

The average mandatory state credit hour requirement for relicensing is only about 10 hours per year.[5] Moreover, government tax policy allows registration and related costs to be a tax deductible expense. Thus, probable net cost is considerably lower. In short, the cost for minimum requirements for continuing education is about $120 to $150 a year—not a significant sum to an optometric practice.

2 Does mandatory continuing education take time away from practice?

Optometric seminars are almost without exception held on Sundays and Wednesdays (the traditional "day off" for health professionals), with less than one percent being scheduled on Saturdays or Mondays. As a result, lost office time is not a factor in raising costs to the practitioner or the consumer.

3 Is learning effectiveness decreased by mandatory continuing education requirements?

There is a caricature drawn of the health professional as a recalcitrant student attending continuing education programs only because of relicensing requirements. Such forced attendance, it is stated, is antithetical to a proper learning environment. In contrast to this portrait, observers such as those in the Office of Continuing Education at the New England College of Optometry have long maintained that optometrists participate in continuing education for a variety of reasons of which mandatory requirements is only one.

Their observations are borne out by two studies analyzing the reasons physicians participate in continuing education.[6] The author of these studies found that physicians attended continuing medical education "to fulfill the obligation of being a professional, which includes a commitment to the continual improvement of craftsmanship; to keep abreast of new developments which may be related to their practice; to validate or modify prior learning or behavior; to attain an identified learning or behavior objective; to have a change of pace from practice routine and to have social contact with other physicians." It seems fair to assume similarities in reasons for attendance throughout the health professions, including optometry.

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4 Do we need more qualitative evaluation?

There has been very little analysis of whether continuing education is effective in upgrading practitioner skills over time. Most continuing education providers have had to concentrate their limited financial resources in the development and presentation of seminar programs—evaluation has been a secondary priority. It is interesting to note, however, that when medical continuing education programs are developed on sound educational principles—including didactic instruction, participative methods with hands-on experience, small group discussion and self study materials—it does seem to affect physician performance.

For example, in a study in which sixty physicians participated in a workshop on tonometry, there was a significant increase in the use of the tonometer in examinations, the number of instruments purchased and a high level of response to follow-up questionnaires.[4] This study, perhaps the only attempt to quantify previous medical continuing education studies, analyzed eight studies that included systematic efforts to evaluate program effectiveness and learner achievement. The results showed significant improvement in skills and patient care.

5 Is mandatory continuing education pertinent?

Part of the reasons to maintain mandatory continuing education requirements for relicensing through the state boards of registration is to regulate consumer interest through the supervision of the state and to set some minimum standards through which continued competency can be determined. Mandatory continuing education is an accepted method of achieving that objective. However, since an average of only ten hours per year of mandatory credit is probably not an appropriate minimum, state boards across the country are adjusting the total hours required into more meaningful groupings such as raising the number of hours required but spreading the requirements over a number of years. Moreover, some state associations demand many more hours than the minimum for state society membership.

Mandatory education is one response to the demand for accountability. Although the power of consumerism may have slowed its thrust for a while as the nation adjusts to an administration less interested in promoting the consumer-health professional partnership, it does not seem that demands for accountability will completely disappear. It seems more likely that the same push-pull effect will continue and that any state that opts to remove mandatory requirements will have to confront the consumer interest question again and again—what is the state doing to supervise continued competency in the health professionals ministering to its citizens? It seems unlikely that many states will or should want to give up the mandatory continuing education requirement as a method of expressing concerns for the public.

6 Does mandatory continuing education aid in preventing obsolescence?

One of the most frequently discussed concerns for professional proficiency is the continual creation of new knowledge, the development of new techniques and the invention of new technology. An optometrist who graduated during the 40s, 50s and 60s must be brought up-to-date on new findings in primary medicine relating to optometric techniques, diabetes and its various ocular effects, the effects of contact lenses on numerous eye conditions, the importance of blood pressure and tonometric readings, and the use of instrumentation such as the biomicroscope and the binocular ophthalmoscope. Continuing education is a primary method of helping professionals update their skills.

Summary

Continuing optometric education is not without problems. Sometimes individual courses fall the mark. Certainly greater emphases on evaluating the impact of continuing education would result in more attention to clinical relevancy. However, over the long run a continued lively discussion over the pros and cons of continuing education at the annual optometric conventions, within the leadership of the state societies and on the state boards, has resulted in a curriculum that is a mix of educational procedures.[5]

Consumer demands for accountability, plus the problems of obsolescence of previous practices and techniques impose on all professions the responsibility of continuing education. Mandatory requirements bearing the state aegis have caused continuing education to be taken more seriously and have institutionalized optometric continuing education, allowing a steady development of in-depth, varied and regularly scheduled programs. □

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On the Use of Combined Response Options in Multiple-Choice Items

Leon J. Gross, Ph.D.

Multiple-choice examinations which include a substantial number of items with combination responses (CRs) make their reliability, validity, and thus utility rather dubious. A CR item requires that the examinee select the correct combination of correct responses, such as "all of the above," "a and b above," and "none of the above." Item writers appear to regard CR options as a valid testing procedure that contributes substantially toward distinguishing between high and low achievers. In contrast, examinees appear to be somewhat intimidated by this item type, since they are not often awarded partial credit for partially correct responses. Contrary to the perceptions of both examinees and examiners, CR items may actually be easier for the test-wise (TW) examinee than comparable simple multiple-choice items lacking CRs. A critique of a variety of CR option formats that are used in testing illustrate why it might be best to not use CR options at all.

The most basic CR option format consists of three singular options, followed by "all of the above" (AOTA) and "none of the above" (NOTA). An example of this format is seen in Example 1. From the item writer's perspective, examinees should select the correct response (AOTA) *only* because they recognize that *each* of the singular options is correct. However, this amount of knowledge is not necessary to correctly answer the question because of the format. The TW examinee need only see that *any* two singular options are correct in order to select AOTA. Since it has been shown that TW is not related to general intellectual ability or achievement level,[1] it is likely that many of the examinees who manipulate the CR format as described above would not otherwise have been able to respond correctly.

In order to inhibit this TW effect, the AOTA option should not be used without subset CRs such as "a and b above." However, in resolving the AOTA problem, these subset CRs create other testing problems, as Example 2 illustrates. In this item, there are four singular options and five CRs. This item format contains two flaws. First, the singular responses are not equally distributed among the combinations. Specifically, "a" appears in four of the five CRs, which is more than any of the other singular options. Knowing that option a is incorrect is more valuable than knowing about the incorrectness of the other singular options, since rejecting option a simultaneously results in rejecting options e, f, g, and h. Rejection of the other singular responses is not as effective a strategy. This unequal distribution therefore unduly rewards knowledge of one incorrect response more than knowledge of another distractor, simply as a function of the frequency of the option.

The second flaw in this item is that in generating five CRs, the item writer produced a total of nine options, which is simply too many for a classical multiple-choice item because, in proportion to the taxonomy[2] and sophistication of this item, too much time is required to select an answer. This excessive time would be better directed at administering a greater number of items, which would likely, in turn, increase the test's reliability and validity.

Example 1

Which of the following disorders may result from a vitamin deficiency?

a. Scurvy
b. Rickets
c. Pellagra
*d. All of the above
e. None of the above

Example 2

Which of the following disorders may result from a vitamin deficiency?

a. Hepatitis
b. Rickets
c. Eczema
d. Scurvy
e. All of the above
f. a and b above
g. a and c above
h. a and d above
*i. b and d above

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Both the option distribution and excess time flaws of the item shown in Example 2 can be resolved by utilizing a standardized or consistent CR format that controls for these factors. The item in Example 3 illustrates the standardized CR format that is used on the credentialing examinations of the National Board of Medical Examiners and the American Society of Clinical Pathologists Board of Registry. In this format, the examinee is presented with four singular options followed by five combinations of these options from which the correct combination must be selected. Since the arrangement of the CRs is fixed, examinee time does not have to be spent in scanning an item just to be aware of what unique option combinations are present. In addition to this efficiency in response time, each of the singular options is equally weighted in the CR options; specifically, each singular option appears in three of the CRs. However, this item type is nevertheless flawed for two reasons: (1) knowledge of the correctness/incorrectness of one singular option necessarily affects more than one CR; and (2) examinees of similar achievement levels may utilize strategies of differential effectiveness in responding that may produce dissimilar scores.

To illustrate the latter problem, consider that an examinee who knows only that "Scurvy" is correct can eliminate combinations a and b, since they do not include option 4. While being able to "kill two birds with one stone" is not a sound testing technique, another examinee who is test-wise may invoke a shrewder strategy to "kill three birds." Rather than scrutinizing the singular options for those that are correct, this examinee looks for options that are incorrect. For example, the examinee who only knows that "Rickets" is incorrect can eliminate combinations a, c, and e, since they include option 2. This examinee knows very little about the concept being tested (vitamin deficiency diseases) yet is able to eliminate all but two options. This undesirable effect places a substantial limitation on the use of CR options. Recent studies have shown the resultant deleterious effects of these test-taking strategies on the ability of an examination to distinguish between high and low-achieving students.[3,4] A preferable testing approach would be to assess knowledge of one characteristic (e.g., in this item, one deficiency disease) in a standard multiple-choice format.

Example 3

Which of the following disorders may result from a vitamin deficiency?

1. Hepatitis
2. Rickets
3. Eczema
4. Scurvy

Select:

a. if only 1, 2, and 3 are correct
b. if only 1 and 3 are correct
*c. if only 2 and 4 are correct
d. if only 4 is correct
e. if all are correct

In contrast to the AOTA option and its component subsets, a different problem is presented by the NOTA option. To illustrate the problem, consider the item presented in Example 4. NOTA is keyed because the correct response, "vitreous humor," is not offered as an option. This allows an examinee with little subject matter knowledge to correctly select NOTA based on misinformation. For example, if "retina" is incorrectly perceived to be correct, the examinee will select NOTA and be credited with a correct response. The threat that this possibility poses to test validity is substantial.

One alternative to the CR option approach is to utilize a multiple true-false item format in which examinees respond to each option individually. However, there are three issues to consider before utilizing this format. First, should each option be worth one point or 1/n points, where n is the number of options with the item? If one point is given for each option, there will be an overweighting of these responses in comparison with the one best-response multiple-choice item. In contrast, awarding 1/n points for correct responses creates an underweighting situation. The second problem relates to the difficult task of categorizing responses as true and false, since few phenomena exist or occur in such absolute terms that allow no exception. Finally, the nature of the health care professions is such that clinical encounters as well as clinically-oriented test items often do not have a mixture of right and wrong responses but, rather, one preferred or best response. The multiple true-false item would not be effective in this type of situation.

In short, the use of CR options in multiple choice testing appears to be inherently flawed. The logic that has been presented in this article formed the basis for the decision of the National Board of Examiners in Optometry to eliminate CR options from its examinations, effective April, 1981. Academic faculty and other test constructors should similarly abandon use of the CR approach. □

Example 4

The transparent jellylike substance that fills the eyeball is the:

a. iris
b. pupil
c. optic nerve
d. cornea
*e. none of the above

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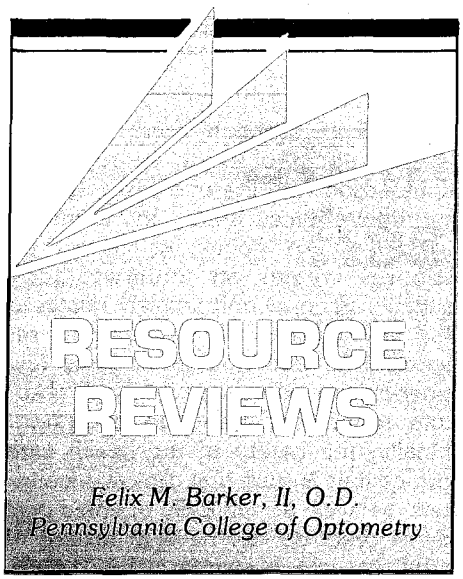

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Diabetic Retinopathy Clinical Evaluation and Management by Francis A. L'Esperance, Jr. and William A. James, Jr. C.V. Mosby Company, St. Louis, 1981, 294 pp., illus., $44.50.

Due to rapid advances in the field of diabetic retinopathy, much of the present literature and most current texts are woefully out of date. *Diabetic Retinopathy* reverses this trend by summarizing for the eye care community the latest information concerning assessment and treatment of this devastating retinal condition.

The text is divided into two approximately equal-length parts, the first of which begins with a thorough discussion of man's knowledge about diabetes mellitus and diabetic retinopathy. The authors cover well the epidemiology, pathology and pathogenesis of the diabetic retinal condition and conclude part one with a very enlightening chapter on past and current systems used to classify background and proliferative diabetic retinopathy.

The second half of the text covers present and future medical and surgical therapy for the general diabetic condition, diabetic maculopathy, photocoagulation and vitrectomy. The chapters on vitreo-retinal therapy are well written and highlight the National Diabetic Retinopathy Study (DRS) and Diabetic Retinopathy Vitrectomy Study (DRVS) which have been in progress for the past four years to assess the significance of treatment of retinopathic conditions in diabetes by photocoagulation and vitrectomy.

Organized in the format of a brief review text, *Diabetic Retinopathy* is easy to read, informative, and up-to-date. It is a must for those who are not current in the vitreo-retinal literature and wish to bring their practice knowledge up-to-date in a short period of time.

Ocular Therapeutics and Pharmacology, 6th ed., by Philip P. Ellis. The C.V. Mosby Company, St. Louis, 1981, 320 pp. $29.95.

Now in its sixth edition, *Ocular Therapeutics and Pharmacology* is a familiar and well-worn reference in the offices of most eye care providers and educators.

The present writing of this text preserves the basic concise clinical reference format which has made it so useful to clinicians for almost twenty years. All sections are updated with the latest new drugs as well as newly reported side effects and new dosage and delivery information. In addition, a completely new chapter has been added by James Koetting, O.D., Ph.D., on contact lens solutions. One drawback, for which the authors apologize, is the lack of topical references at the end of each chapter. This should be corrected in the future and does cause the reader with academic interest to have to search through the overall bibliography for original sources in which they may be interested. This problem, however, does not detract from the clinical usefulness of this reference text.

Ocular Therapeutics and Pharmacology is a standard which should be available as a reference for almost anyone in clinical practice or clinical education.

Ocular Immunology by Gilbert Smolin and G. Richard O'Connor. Lea & Febiger, Philadelphia, 1981, 322 pp., illus., $27.50.

Perhaps one of the most frustrating aspects of clinical optometric practice is dealing with patients who present with ocular allergy. The text, *Ocular Immunology,* addresses the subject in a very comprehensive, yet easy to read manner.

The authors treat the subject of ocular immunology, first, with a basic discussion of the immune response and hypersensitivity reactions. They then proceed to a thorough discussion of immunologic blood and skin testing procedures. Specific disorders of immunology affecting the eye are then detailed in chapters about atopic reactions, ocular allergies, systemic-ocular allergies, corneal graft rejection, and uveal-retinal responses to inflammatory disease.

An advantage of the text as a clinical reference source is that it is written in the case report format with each disease entity being presented systematically in succinct, sequential paragraphs labeled history, clinical course, differential diagnosis, histopathology, pathogenesis and treatment. There is good correlation throughout these clinical discussions with the basic principles discussed in the opening chapters.

Ocular Immunology presents a much needed contribution to clinical ocular science. It is recommended for use in clinical care and clinical education.

Diabetic Renal-Retinal Syndrome edited by Eli A. Friedman, M.D., and Francis A. L'Esperance, Jr., M.D. Grune and Stratton, Inc., New York, 1980, 451 pp., with illustrations, $39.50.

This text presents 36 independent chapters concerned with various aspects of the disease, diabetes mellitus, and its effects on renal or retinal tissue in patients who are affected. The book is a compendium of lectures which were developed into chapters by the editors after a 1979 conference on the subject held in Brooklyn by Columbia University and State University of New York.

Diabetic Renal-Retinal Syndrome is important in that it brings together discussions of ocular and systemic effects which are coincident in their occurrence in the disease, diabetes mellitus, but which are frequently treated separately by independent practitioners without cross-discipline awareness. For the average reader the "Conference Proceedings" format gives each chapter a strong focal thrust which may make reading the entire text difficult and unnecessary. There are specific chapters in which the members of the eye care community are likely to be mainly interested. These chapters deal with demographics, epidemiology, pathogenesis, diabetic retinopathy, fluorescein angiography, photocoagulation, and control of neovascularization. Interesting updates on systemic diabetes and its treatment are also provided in chapters covering pathology of the diabetic kidney, hemodialysis and diabetes, and pancreatic transplantation.

This text is interesting and informative reading and is recommended because of its cross-disciplinary approach and thorough discussion in each of the areas under consideration. One possible drawback to the text is that it has taken two years to bring the conference presentations to publication in this textbook from causing some chapters to be slightly out of date even in this newly published text.

SURVEY RESULTS

JOURNAL OF OPTOMETRIC EDUCATION

READER SURVEY

Dear Readers,

The editors of the JOURNAL OF OPTOMETRIC EDUCATION (JOE) are pleased to report the following results of our Reader Survey conducted in April, 1981. Since neither the JOURNAL's content nor its distribution has changed significantly since that time, we feel the results — which represent 75 responses or 5% of the total readership — are as apropos now as ever. Certain changes in distribution and further editorial improvement are planned as a result of the survey, and the editors would like to thank all those who participated in answering the questionnaire. It is our sincere hope that, with the aid and input of our readers' comments, we can provide the best possible quality educational journal for the profession.

It is expected that potential advertisers will take note of our outstanding ratings and quality readership and make plans to include JOE in their future advertising programs. JOE is an important vehicle and resource of information to the educational community. It should not be overlooked, particularly in view of the primary audience it serves: the schools and colleges of optometry and their faculty and students.

James F. Amos, O.D.
Chairman, Editorial Council

Harriet E. Long
Managing Editor

RESULTS

Journal of Optometric Education

READER SURVEY

I. WHAT READERS THINK ABOUT THE *JOURNAL OF OPTOMETRIC EDUCATION*

1. In general, how would you rate the overall quality of the *Journal of Optometric Education?*

Excellent	17%	Below average	4%
Very good	47%	Unsatisfactory	1%
Average	31%		

2. Which features do you read?

Feature	Always or Frequently Read
Articles	82%
Editorial	69%
Newsampler	64%
Abstracts	54%
Resource Reviews	46%
ASCO Activities & Board Briefs	45%
Letters	45%
Interviews	42%
Classified	26%

3. Which features are most useful or interesting to you?

Feature	Ranked Feature in Top Three
Articles	90%
Abstracts	40%
Editorial	37%
Interviews	33%
Newsampler	32%
Resource Reviews	19%
ASCO Activities & Board Briefs	19%
Letters	15%
Classified	3%

4. Which features, if any, would you eliminate?

   Seven respondents (10%) suggested that Interviews and Classified be eliminated.

5. What *new* features would you add?

   Student news, foreign news, specialty sections; also, more clinical features, research reports, institutional comparisons, financial tips, teaching aids and controversial examination.

6. In general, how would you rate the quality of writing in the *Journal of Optometric Education?*

Excellent	11%	Below Average	1%
Very good	59%	Unsatisfactory	0
Average	29%		

7. In general, how would you rate the quality of the photographs and illustrations used to support the text?

Excellent	27%	Below Average	1%
Very good	51%	Unsatisfactory	0
Average	20%		

8. What topics would you like to see covered in future issues of the *Journal of Optometric Education?*

   Practice delivery models, clinical teaching methods and evaluation, teaching innovations and techniques, interprofessional relations, curriculum review and examination, faculty needs and responsibilities, NBEO review and evaluation, issues impacting upon optometric education and the profession, new areas in optometric practice and education, public and preventive health issues, historic and future view of the profession.

9. What persons or occupational types would you like us to interview for future issues?

   Optometric educators, congressional members, key government and health officials, optometric researchers, successful practitioners, unusual practitioners, unique degree holders, clinical educators, institutional administrators, regulatory officials, other professionals, optometry's "greats."

10. Which publications are the most important for you to read?

Publications	Ranked Publication in Top Five
J of American Optometric Assoc	77%
American J of Optometry and Physiological Optics	62%
J of Optometric Education	56%
Other*	53%
Time/Newsweek	51%
Chilton's Review of Optometry	47%
Optometric Monthly	45%
The Wall Street Journal	27%
The New York Times	18%
The Washington Post	7%

*chiefly ophthalmological and scientific publications

11. How many times/quarter do you pick up and read the *Journal of Optometric Education?*

    Each issue is read an average of 2.5 times per quarter.

12. How much time do you spend reading the *Journal of Optometric Education* each time you pick it up?

    Average reader time is 26 minutes.

13. How many persons other than yourself read *your* copy of the *Journal of Optometric Education?*

    Pass-along readership averages 2.5 persons per copy.

14. How frequently should the *Journal of Optometric Education* be published?

Quarterly	74%	Other	1%
Bimonthly	17%		
Monthly	8%		

II. WHO READS THE *JOURNAL OF OPTOMETRIC EDUCATION*

A. PERSONAL DATA

1. Age

   85% are between 30 and 59 years old.

2. Sex

Male	88%	Female	12%

3. If student:

   75% are 3rd year students;
   25% are 1st year students.

B. EMPLOYMENT DATA

1. Type of position held:

Administrative officer, trustee, department chairman	12%
Clinic director	8%
Professor, associate or assistant professor, instructor	51%
Fellow/resident, student	9%
Private practitioner	15%
Military, VA, PHS	3%
Other: state exec., licensing exec., other professionals	3%

2. Type of institution:

University/college	45%
Private	25%
Military, VA, PHS	4%
Private practice	15%
Other	12%

3. As part of job, responsible for:

   67% have responsibility for the following purchases:

Textbook selection	52%
Clinical equipment/materials purchases	68%
Library purchases	34%
Purchases of research equipment	48%
Contracting for institutional services	30%
Other	8%

4. As part of job, control annual budget of:

   61% control an average annual budget of $400,000; 74% of these were in the range of $17,500 to $1,000,000 annually.

C. FINANCIAL DATA

1. Annual Income

   Mean annual income is $36,541, with 67% earning more than $30,000 a year.

2. Financial Holdings

93% have financial holdings, including:

Bank savings	86%
Stocks and bonds	56%
Mutual funds	41%
Savings and loan account	60%
Credit union account	39%
Real estate and other	23%

3. Credit Cards

An average of 3 credit cards per reader.

4. Automobiles

An average of 2 automobiles per reader, with 87% having a medium or full-size auto.

D. ACTIVITIES

1. Travel (business and pleasure)

51% take out-of-town trips 3-10 times a year, 15% more than 20 times a year.

75% travel by plane and car.

2. Leisure Activities

Reading	84%
Listening to music	68%
Attending cultural events	46%
Photography	39%
Sports	28%

3. Hours/Week Spent:

93% spend an average of hours/week:

Reading	14.4
Listening to stereo	5.5
Participating in athletics	3.6
Watching television	7.2

III. COMMENTS

Other comments regarding format, content, distribution, etc., if any:

"I would like to see articles by outstanding teachers outlining their best lectures or courses with selected readings on the topic."

"How about some discussion of 'faculty issues and problems,' such as salary, rank, research requirements, teaching experiences—also, why OD's go into teaching, the demand for optometric educators, etc.? In addition, JOE should take an indepth look at residency/fellowship programs and what happens after a person completes a program."

"It would be advantageous to get more of these into the hands of students. After all, it is their education."

"The articles are not very substantive, although they are often directed toward important topics. Greater breadth is needed and more emphasis on educational research."

"JOE is an outstanding journal with regard to content, format and breadth of coverage. The editorial staff appears to be doing an outstanding job!"

"Interviews with influential students on issues of importance to students should be included; also, address the topic of optometric literature and how it can be improved."

"Papers are often blown way out of proportion to relevant content. I would urge shorter, more tightly written communications on all aspects of education."

"Best topography of any journal I read with the possible exception of the DuPont (Teflon) Journal."

"Articles on significant research that will ultimately benefit the patient (i.e., general public) should be included; for example, electrodiagnostics such as VER's, ultra sound, etc."

"I would like to see more articles that would in some way help me as a private practitioner cope with day to day decisions and practice changes; I find that most articles are irrelevant to me as an independent practitioner."

"I should like the JOURNAL to have a much wider reading in Great Britain as it is the only journal concentrating on educational aspects of optometry."

"There is a significant need for more/better educational research articles similar to those in the Journal of Medical Education."

"Develop it more into a journal format rather than a magazine."

"The JOURNAL could become an excellent asset for OD's in optometric education. It is developing well. Keep up the good work."

Optometrists Invited to Apply for NEI Small Grants

Those in the optometric field who are just entering some area of vision research and have an idea for a small-scale, innovative project that might lead to more extensive studies in the future may want to consider applying for a new kind of research grant now being offered by the National Eye Institute (NEI). Special awards paying $15,000 or less and lasting for only one year are being made available under NEI's new small grants program for pilot projects in vision research.

The small grants program is intended to encourage innovation in vision research by making it easier for new investigators, and those with highly original ideas, to obtain federal support. Optometrists and optometric investigators are invited to join other visual science professionals in competing for these NEI awards.

The NEI is a component of the federal government's National Institutes of Health (NIH) located in Bethesda, Maryland. NEI's mission is to reduce the nationwide toll of blindness and visual disability by fostering the development of new knowledge about the normal function of the eye and visual system, the pathology of visual disorders, and methods of preventing, diagnosing, and treating these disorders. With a budget of $127 million for fiscal year 1982, NEI supports most of the vision research conducted in the United States.

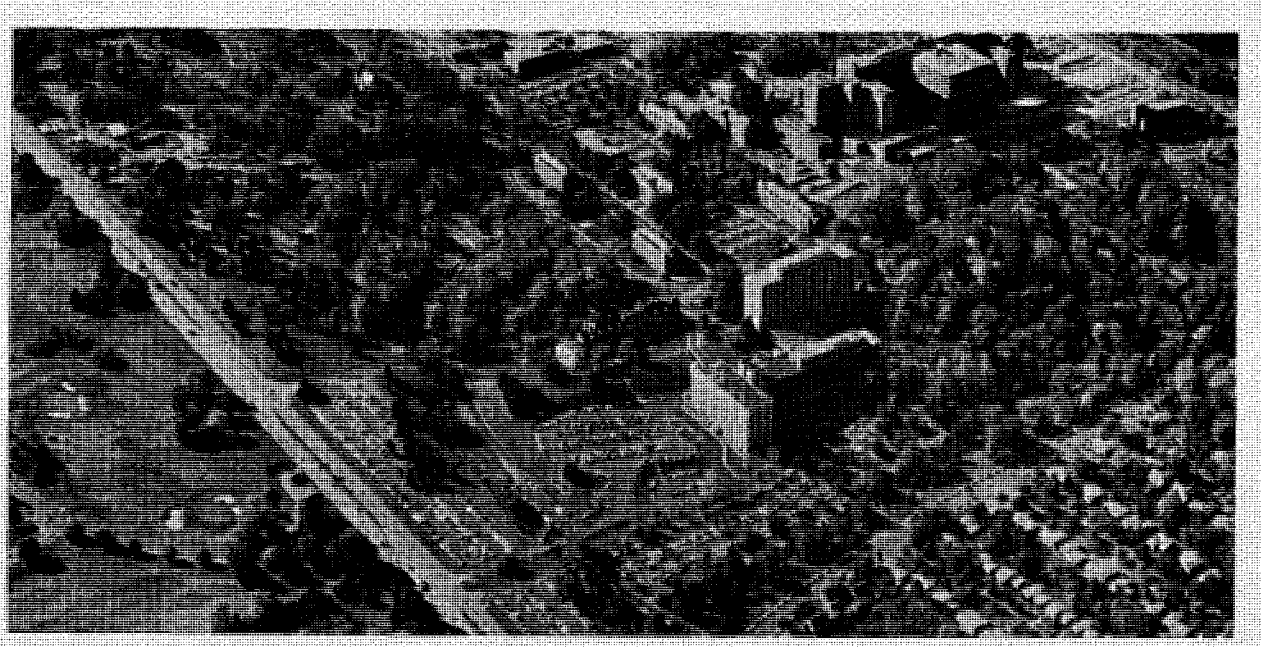
A total of about fifty small grants are expected to be awarded in 1982. Certain individuals will be given perference. They are:

- eye care professionals with limited research experience;
- basic scientists who only recently were trained, or are relatively inexperienced in research;
- investigators whose research career has been interrupted and is to be resumed;
- investigators who are changing their field of research; and
- investigators who are working at minority institutions or in a largely nonresearch environment.

Experienced investigators who want to begin small-scale projects not related to their ongoing research also will be considered for support but will be in a less favorable position to receive funds.

Each small grant research proposal should be designed to yield new knowledge in one of NEI's major program areas. These areas form the basic framework of the Institute's extramural research effort. They are:

- Retinal and Choroidal Diseases
- Corneal Diseases (including refractive problems)
- Cataract
- Glaucoma
- Strabismus, Amblyopia, and Visual Processing



National Eye Institute, National Institutes of Health in Bethesda, Maryland

• Low Vision and Rehabilitation of the Visually Impaired

These NEI program areas encompass laboratory as well as clinical research and include studies of the normal tissues and functions of the visual system along with research on visual disorders.

Research that would be of particular interest to the NEI is identified in the National Advisory Eye Council report, *Vision Research—A National Plan: 1983-1987*, which now has been drafted and will be published later this year. This plan outlines needs and opportunities in each major area of vision research. By referring to the plan, an investigator can obtain ideas for possible research projects and also can see what types of investigations are considered highly relevant to the NEI's mission.

In addition to program relevance, key factors that will be taken into consideration when a small grant proposal is reviewed are:

• the significance and scientific merit of the proposed project;

• the methodology and experimental materials that the investigator proposes to use;

• the investigator's background and training;

• the adequacy of the facilities available to or requested by the investigator; and

• the explanation of how the money that the investigator requests will be used in the course of the project.

Any investigator who intends to submit a small grant proposal can obtain the required proposal form (Form PHS 398) from his or her institution's business office, or from the Division of Research Grants, National Institutes of Health, Bethesda, Maryland 20205. Before filling out the form, the investigator should contact one of the NEI staff members listed below for a packet of special instructions. These guidelines must be followed to make sure that the proposal qualifies for review under the small grants program.

Small grant proposals will be considered for funding in an accelerated review process that was developed especially for this program. This process will be far more rapid than that used for research project grant applications, which sometimes requires a year or more to complete. As the timetable shown indicates, there will be three complete review cycles for small grant proposals each year.

For detailed instructions on how to apply for a small grant, contact:

Ronald G. Geller, Ph.D.
Associate Director for Extramural & Collaborative Programs
National Eye Institute
Building 31, Room 6A04
National Institutes of Health
Bethesda, Maryland 20205
(301) 496-4903

or

Catherine Henley, Ph.D.
Review and Special Projects Officer
Extramural & Collaborative Programs
National Eye Institute
Building 31, Room 6A06
National Institutes of Health
Bethesda, Maryland 20205
(301) 496-5561

These and other NEI staff members will be glad to supply information on the Institute's programs and research priorities.

Timetable for National Eye Institute (NEI) Small Grants Program

Deadline for Applications	Review by NEI Committee	Review by National Advisory Eye Council	Earliest Date for Funding
October 1	November	January-February	February
February 1	March	May-June	June
June 1	July	September	September

Notice to Contributing Authors:

The Journal of Optometric Education (JOE) publishes scholarly papers, descriptive and timely reports, continuing information and findings in the field of optometric and professional health education, as well as news of the member institutions of the Association of Schools and Colleges of Optometry (ASCO). Manuscripts are accepted for review with the understanding that they are to be published exclusively in JOE, unless other arrangements have been made in advance.

Preparation of manuscripts:

Submit original manuscripts and two copies to:

Journal of Optometric Education
600 Maryland Ave., S.W., Suite 410
Washington, D.C. 20024

Manuscripts should be typed double-spaced on 8½" x 11" paper, with one-inch margins on all edges. No length requirements exist, with the content of each paper determining length. It is noted, however, that the average length for most full-fledged professional papers runs 3000 words, or approximately fifteen double-spaced typewritten pages.

References and Illustrations:

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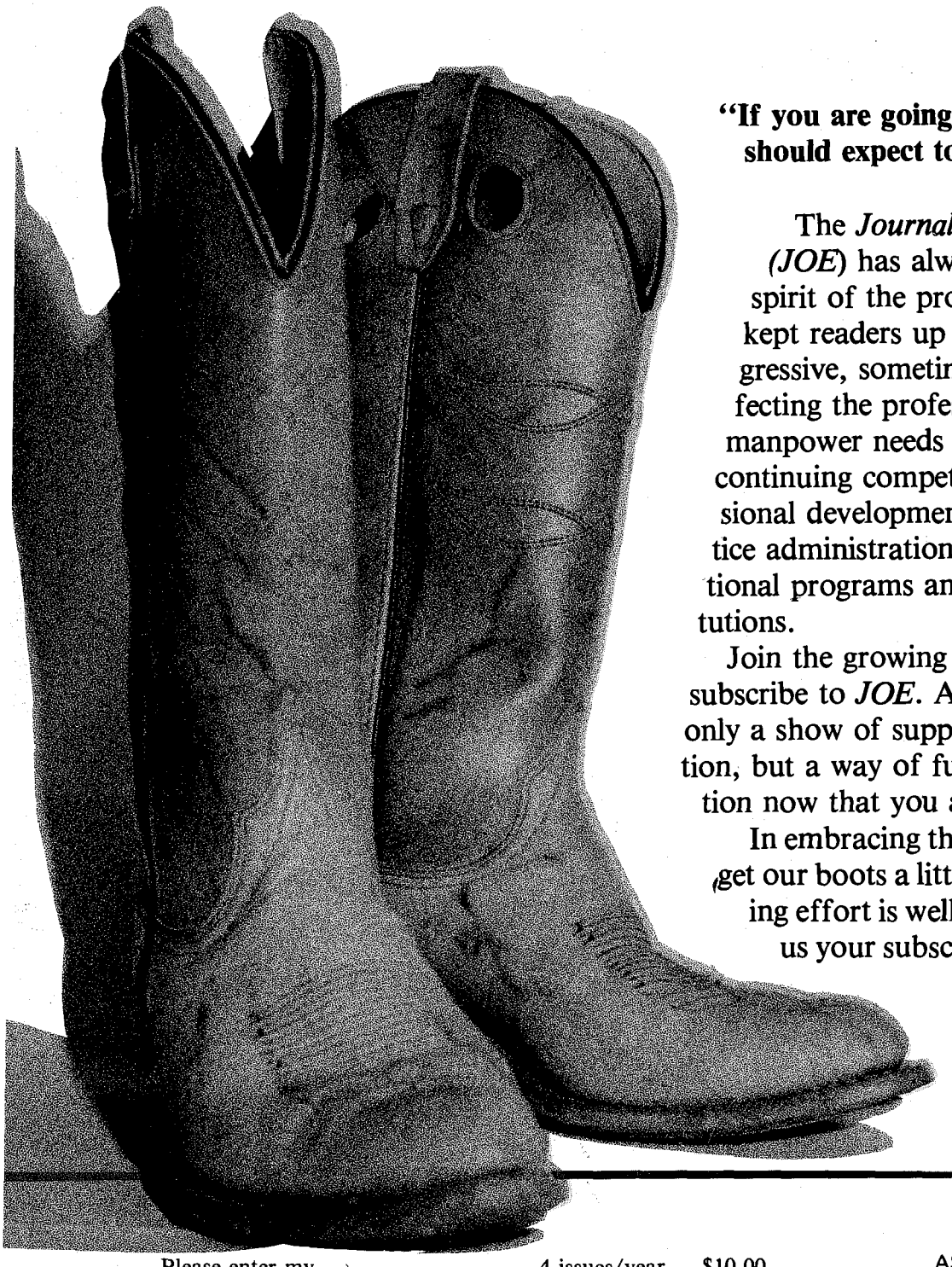

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