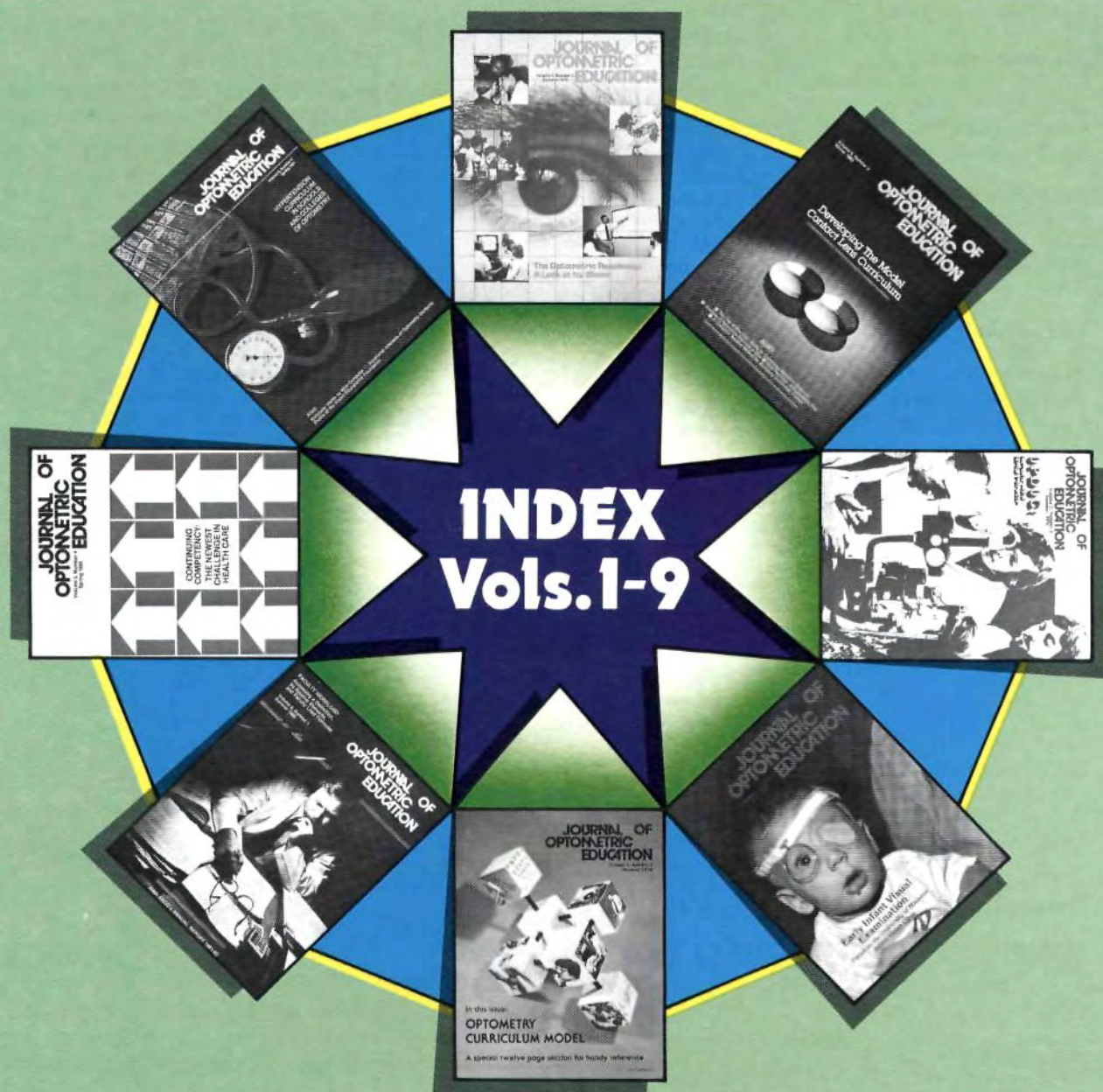


Volume 9, Number 4
Spring 1984

JOURNAL OF OPTOMETRIC EDUCATION



Association of Schools and Colleges of Optometry

The Association of Schools and Colleges of Optometry (ASCO) represents the professional programs of optometric education in the United States and Canada. ASCO is a non-profit, tax-exempt professional educational association with national headquarters in Washington, D.C.

Officers and Members

President

Dr. Richard L. Hopping, Pres.
Southern California College
of Optometry
Fullerton, California

President-Elect

Dr. Edward R. Johnston, Pres.
State University of New York
State College of Optometry
New York, New York

Vice-President

Dr. Jack W. Bennett, Dean
Ferris State College
College of Optometry
Big Rapids, Michigan

Secretary-Treasurer

Dr. F. Dow Smith, Pres.
The New England College
of Optometry
Boston, Massachusetts

Immediate Past President

Dr. Willard Bleything, Dean
Pacific University
College of Optometry
Forest Grove, Oregon

Executive Director

Lee W. Smith, M.P.H.

Dr. Henry B. Peters, Dean
University of Alabama
School of Optometry
Birmingham, Alabama

Dr. Jay M. Enoch, Dean
University of California
School of Optometry
Berkeley, California

Dr. William R. Baldwin, Dean
University of Houston
College of Optometry
Houston, Texas

Dr. Boyd B. Banwell, Pres.
Illinois College of Optometry
Chicago, Illinois

Dr. Gordon G. Heath, Dean
Indiana University
School of Optometry
Bloomington, Indiana

Dr. Arthur J. Afanador, Dean
Inter American University
of Puerto Rico
School of Optometry
San Juan, Puerto Rico

Dr. Jerry Christensen, Dean
University of Missouri-St. Louis
School of Optometry
St. Louis, Missouri

Dr. Claude Beaulne, Dir.
University of Montreal
School of Optometry
Montreal, Quebec, Canada

Dr. Chester H. Pfeiffer, Dean
Northeastern State University
College of Optometry
Tahlequah, Oklahoma

Dr. Frederick W. Hebbard, Dean
The Ohio State University
College of Optometry
Columbus, Ohio

Dr. Melvin D. Wolfberg, Pres.
Pennsylvania College of Optometry
Philadelphia, Pennsylvania

Dr. Spurgeon B. Eure, Pres.
Southern College of Optometry
Memphis, Tennessee

Dr. Walwyn S. Long, Dir.
University of Waterloo
School of Optometry
Waterloo, Ontario, Canada

Sustaining Members

AO Scientific Instruments Division,
Warner Lambert Technologies, Inc.
Barnes Hind/Revlon Vision Care
International

Bausch & Lomb, Soflens
Professional Products Division

CooperVision Optics

Corning Glass, Optical Products
Division

Logo Paris, Inc.

Multi-Optics Corporation

Journal of Optometric Education

Editorial Council

John F. Amos, O.D., M.S.,
Chairman
University of Alabama
in Birmingham
School of Optometry

Henry W. Hofstetter, O.D., Ph.D.
Indiana University
School of Optometry

Penelope Kegel-Flom, Ph.D.
University of Houston
School of Optometry

Thomas L. Lewis, O.D., Ph.D.
Pennsylvania College of Optometry

Robert Rosenberg, O.D., M.S.
State University of New York
State College of Optometry

Editorial Review Board

Arol R. Augsburger, O.D., M.S.
Felix M. Barker, II, O.D., M.S.
Morris Berman, O.D., M.S.
Tom Brungardt, O.D., M.S.
Freddy W. Chang, O.D., Ph.D.
David W. Davidson, O.D., M.S.
Richard H. Dohrn, M.S., O.D.
Ben V. Graham, Ph.D.
Eric R. Greene, O.D., M.A.
Wayne W. Hoeft, O.D.
William Larson, L.Sc.O., M. Eng.
Nira R. Levine, Ed.D.
William F. Long, O.D., Ph.D.
Paul L. Pease, O.D., Ph.D.
Donald C. Reynolds, M.Opt.,
M.P.H.
Jack E. Richman, O.D.
Robert P. Rutstein, O.D., M.S.
J. James Saladin, O.D., Ph.D.
Paulette P. Schmidt, O.D., M.S.
Clifford Scott, O.D.
Leo Semes, O.D.
Richard D. Septon, O.D., M.S.
James W. Walters, O.D., Ph.D.
T. David Williams, O.D., Ph.D.
G. Woo, O.D., Ph.D.

Table of Contents

Spring, 1984

Volume 9, Number 4

JOURNAL OF OPTOMETRIC EDUCATION

Official Publication of the Association of Schools and Colleges of Optometry

Teaching Clinical Teachers

D. Leonard Werner, O.D.

The problems of identification, preparation and evaluation of clinical teachers in optometry are dealt with.

8

Minimum Separation: Not Always Occurring at the Symmetry Points

Michael P. Keating, Ph.D.

Optical systems are described in which symmetry points give a local maximum in the separation.

13

Skills in Clinical Teaching: A Faculty Development Program for Resident Optometrists

Larry Bauer, M.S.W., and Arthur H. Alexander, O.D., F.A.A.O.

A workshop program to impart teaching skills to optometry residents is described.

16

SPECIAL FEATURE

Index to JOURNAL OF OPTOMETRIC EDUCATION, Volume 1 through Volume 9. Author and subject index to the first nine volumes of JOE are provided.

20

DEPARTMENTS

Editorial: "Making Sense Out of Certification"

Richard H. Kendall, O.D.

4

Newsampler

5

"Keeping Up with People"

7

The **JOURNAL OF OPTOMETRIC EDUCATION** is published by the Association of Schools and Colleges of Optometry (ASCO). **Art Director:** Dan Hildt. Graphics in General. Business and editorial offices are located at 600 Maryland Ave., S.W., Suite 410, Washington, D.C. 20024. **Subscriptions:** JOE is published quarterly and distributed at no charge to dues-paying members of ASCO. Individual subscriptions are available at \$10.00 per year, \$15.00 per year to foreign subscribers. Postage paid for a non-profit, tax-exempt organization at Washington, D.C. Copyright © 1984 by The Association of Schools and Colleges of Optometry. Advertising rates are available upon request.

Making Sense Out of Certification

Certification has been a topic of discussion among members of the optometric community for more than sixteen years. Many differing attitudes have developed during the years. Some of the concerns are personal—how will it affect me? Others may say that certification will fragment optometry, while others believe it will be beneficial for the profession in the years to come. Because the optometric profession has been slow to react to the growth of the profession, other organizations have developed programs of certification. Some organizations do not accept the fact they are in the business of certification, while other organizations—national in scope—advertise the fact they are the only organizations conducting a program of certification. Whenever a group develops a list of individuals who appear to have some expertise that others do not, or have not demonstrated, the process of certification has developed.

At the present time there is no national organization charged with the responsibility of coordinating certification programs or providing guidelines which would govern certifying agencies. Uniformity in certification programs would indeed make some sense out of certification. If consumers of vision care are not ultimately benefited, then certification is truly a program of ego building. It seems proper that the largest optometric professional association would be given the charge to carry out the mission of developing the coordination mechanism for certification. By the American Optometric Association accepting the challenge of such a program there is always a control through the House of Delegates where individuals or states may be heard. This means there will always remain the potential for membership input.

The 1968 AOA Study Committee concluded that optometry is a specialty program in itself, dealing with vision and eyes. The profession recognizes and accepts state licensure as sufficient evidence for any optometrist to perform any service within the scope of optometry. This is all well and good, but over the past decade and a half the profession has matured. The body of knowledge has increased. One person cannot do it all. This is why there are various sections in AOA, a national association interested in contact lenses and another national organization concerned with vision therapy. The AOA Project Team of Certification does not advocate specialization in optometry. It does, however, desire to make sense out of the many certification programs now being conducted. It also believes programs of certification in special interest areas should be the same from one state to another.

The plan being presented to the 1984 AOA House of Delegates is one that is workable, will create a quality certification program, and will establish direction to the now non-incentive continuing education programs now in existence.

The recommendation of a commission by the project team is sound. The commission will establish guidelines, policies, and procedures to implement the commission's responsibilities and activities. The commission would recognize specialties in optometry, only if and when such specialties meet the criteria for recognition and approve the qualification for certification in each recognized field of specialization in optometry to grant cer-

tification and recertification to qualified individuals. Finally the commission would serve as the coordinating agency and clearing house for information among organizations and groups representing the various recognized fields of specialization in optometry.

There are seven recommended criteria for specialties in optometry:

- 1) The area of specialization in the practice of optometry rests on a specialized knowledge of optometric sciences, which have their basis in the biological, and behavioral sciences, and not on the basis of managerial, procedural, or technical services, nor solely on the basis of the environment in which optometry is practiced.

- 2) The area of specialization shall be one for which specially trained practitioners are needed to better fulfill the responsibilities of the profession of optometry in improving the health and welfare of the public.

- 3) The area of specialization shall represent an identifiable and distinct field of practice that calls for special knowledge and skills acquired by education and training and/or experience beyond the basic optometric education and training.

- 4) The area of specialization shall be one in which schools of optometry and/or other organizations offer recognized education and training programs to those seeking advanced knowledge and skills in the area of specialty practice so that they may perform more competently.

- 5) The area of specialization shall be one in which there is an adequate educational and scientific base to warrant transmission of knowledge through teaching clinics and scientific base to warrant transmission of knowledge through teaching clinics and scientific and technical publications immediately related to the specialty.

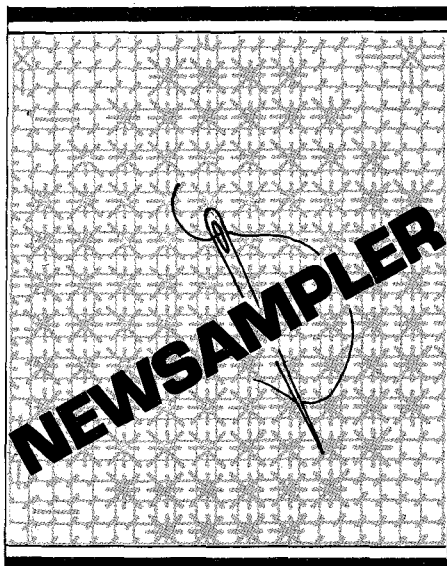
- 6) The area of specialization shall be one in which there exists a significant and clear health care demand to provide the necessary public reasons for certification, and

- 7) The area of specialization shall be comprised of a reasonable number of individuals who devote much of their time and practice to the specialty area or maintain special interest in the area of practice.

To conduct certification in any clinical area of practice there must be an organization capable to developing standards that define the specialty, create requirements for individual certification and recertification programs, develop and administer examinations. In brief, the organization must have the ability to carry out all of the mechanisms of a certification program under the guidelines developed by the commission.

One cannot deny the fact that certification is here today. For the benefit of the profession, the optometrist, and the public, a well organized certification program should be adopted that will make sense out of certification. □

Dr. Richard H. Kendall, O.D., Executive Director of the California Optometric Association, Chairman of the AOA Project Team on Certification.



Sabbaticals Established for Full-Time Faculty Members at ICO

The Illinois College of Optometry Board of Trustees' commitment to fostering clinical research and innovative teaching methods has resulted in a sabbatical leave policy for full-time faculty.

"The sabbaticals were established for research, study, writing or other creative endeavors contributing to a faculty member's professional development and effectiveness as a scholar and teacher," said President Boyd B. Banwell, O.D. "We are delighted three of our faculty are enriching themselves and, in turn, advancing ICO through this program of faculty development."

Darrell Schlange, O.D., associate professor in the Division of Optometric Sciences, completed his five-month sabbatical in the summer of 1982. He visited major infant vision research laboratories that study preferential looking techniques.

At the University of Houston College of Optometry, Dr. Schlange studied the newly-developed, computer-based PL technique for infant visual acuity testing developed by Ruth Manny, O.D., Ph.D., and Stan Klein, Ph.D. Dr. Manny and her associates use a Commodore VIC-20 computer with "Baby Bert" software that incorporates operant conditioning of the baby's responses.

Dr. Schlange also worked with Indira Mohindra, O.D., a noted researcher in PL techniques at Massachusetts Eye and Ear Hospital and at the Massachusetts Institute of Technology laboratory of Richard Held, Ph.D.

Yuzo Chino, Ph.D., associate professor in the Division of Basic Sciences and ICO's director of research, recently returned from his sabbatical in Japan

where he was an invited professor at Tokyo's Women's Medical College and a visiting scientist at St. Marianna University in Kawasaki.

Peter Nelson, O.D., associate professor in the Division of Optometric Sciences and director of continuing education, currently is in the United Kingdom for a six-month sabbatical at the Optometry Department at City University in London where he will teach in the general and contact lens clinics in addition to a weekly assignment in the London Refracting Hospital's General Clinic and Moorfields Eye Hospital's Contact Lens Clinic.

American Interprofessional Foundation Members Meet

The 2nd National Meeting of the American Interprofessional Foundation was held at the Westgate Plaza Hotel in San Diego on February 12, 13, and 14, 1984.

Living Treasure Awards™ were presented to: Dr. Paul LaShorne of Seymour, IN; Dr. Robert Morrison of Harrisburg, PA; and Dr. George Iacono of Tucson, AZ. The Living Treasure Award is given to eye care practitioners who have made a significant contribution to the advancement of eye care.

Dr. Iacono and Dr. Morrison were honored for their work in the field of myopia containment and enhancement. Dr. LaShorne was cited for his contributions in the detection of health problems (such as high blood pressure, diabetes and arterial stenosis, etc.) in his optometric examination routine.

Drs. LaShorne, Morrison and Iacono also spoke and conducted workshops at the meeting, sharing their findings and expertise with their colleagues.

The problem of hyperphoria was addressed at the meeting by Dr. Akira Ta-

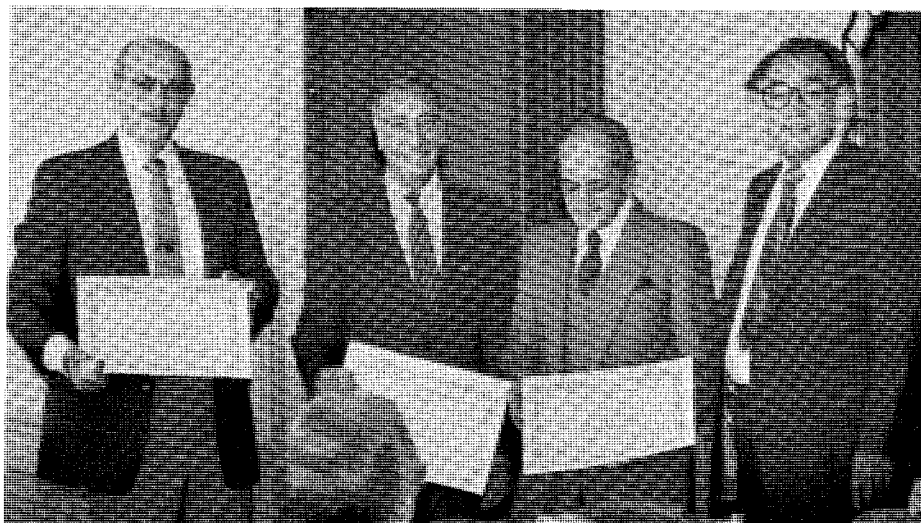
jiri of Reedly, CA. Dr. Tajiri is a pioneer in the research and treatment of this condition.

Dr. Tajiri uses techniques of correcting hyperphoria, which cannot usually be detected by observation of the patient, but requires specialized testing by a competent practitioner. Some types of learning disorders in children can be attributed to hyperphoria according to Dr. Tajiri. If the children cannot see images properly, reading may become a difficult task. Parents may detect a problem when their children have trouble reading or doing other near tasks, but have no problem in comprehension of things told to them or read to them. The brain interprets material presented through the ears or other senses, but there is confusion in input from the eyes. Often these children have problems in sports since the eyes provide confused information to the brain and motor coordination becomes more difficult. In adults, small amounts of this vertical imbalance can result in headaches, seasickness symptoms, irritability, difficulty in sustained reading and a variety of other symptoms.

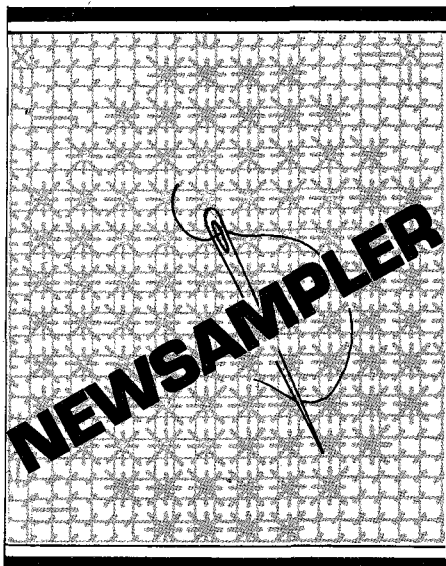
Other highlights included a presentation on Good Nutrition in Eye Care by Mrs. Janet Mansfield of San Diego, CA and the role of Vision in Sports Performance and Training by Dr. Wayne Martin of Seattle, WA.

The meeting also presented a consumer panel to its attendees. The panel, composed of persons not involved in the eye care field, presented patient concerns, confusions and needs to the meeting. The panel expressed the public confusion over the different roles of optician, optometrist and ophthalmologist. They were also interested and concerned with the effectiveness and/

(continued on next page)



Dr. Newton K. Wesley (far right) presents *The Living Treasure Award™* to (from left) Dr. Paul LaShorne, Dr. Robert Morrison, and Dr. George Iacono at the AIF Meeting in San Diego.



(continued from previous page)

or safety of the various vision treatments and surgery available today.

International Club Begun at ICO

The arts, sciences and heritage of five of the seven continents have met on Chicago's South Side in an Illinois College of Optometry International Club formed by more than 20 foreign students.

"We hope to educate and serve as a reference to ICO students and faculty about optometric education and practice in other countries and to integrate incoming and current international students academically and socially," said International Club President Lance Alpert, a student from South Africa.

Oscar Lillo, a second-year student from Spain, serves as club vice president and Alex Kouklakis, a first-year student from Greece, acts as treasurer.

Hyman Wodis, O.D., ICO assistant dean, professor and foreign student advisor, proposed forming the club and now serves as its faculty advisor. He and the club officers hope to plan activities involving all students to better acquaint American and foreign students with differing optometric procedures and different cultures.

Foundation for Funding Vision Research in Australia Established

Following discussions between The National Vision Research Institute of Australia, The Optometric Vision Research Foundation of New South Wales and The Vision Research Foundation of Australia there has been set up The National Vision Research Foundation of Australia.

This new body will become the center of a major fund raising drive to enable vision research projects to proceed and to provide grants and scholarships.

Every Australian capital city has at least one Vision Research Group involved in either basic or applied research work; in some cases more than three groups in one center are involved in research.

Professor Austin Hughes, Director of The National Vision Research Institute of Australia, says, "For a country of 14 million people, Australia has an extraordinarily large population of basic and clinical vision scientists of world standing. However, government funding is limited and there is no representative group for the professions involved in ophthalmic science. In addition, the increasingly multidisciplinary nature of vision research requires closer cooperation between ophthalmology, optometry and basic visual science."

The National Vision Research Foundation has been established with the aim of consolidating fund raising and management for vision research throughout Australia. It will work towards provision of block grants for groups, project grants, fellowships and scholarships for vision research regardless of profession or affiliation.

One initial goal will be upgrading of the facilities of the National Vision Research Institute of Australia.

SCCO Student Research Symposium Held

The Southern California College of Optometry (SCCO) held its Fifth Annual Research Symposium February 21

in Fullerton, CA. Thirty-one research papers were reviewed by SCCO faculty, from which 10 papers were selected for presentation at the Symposium. Optometric research is undertaken by fourth-year students at SCCO in partial fulfillment of graduation requirements.

"The Student Research Symposium provides a forum for SCCO students to report on new information based on results of their scientific endeavors," said SCCO Dean of Academic Affairs Douglas H. Poorman, Ph.D. "The variety and caliber of papers presented at the Symposium reflects the diversity of the field of optometry and the enthusiasm our students demonstrate in their quest for knowledge."

Monetary awards were given to the three papers judged as best at the event: First Place, \$500; Second Place, \$300; and Third Place, \$200. First Place honors were awarded to Loryn B. Chapin for her paper entitled "Nerve Regeneration in the Corneas of Rabbits." Faculty Advisors for the project were Roger Beuerman, Ph.D., and Bernard Schimmelpfennig, M.D., Stanford University; and SCCO Faculty Advisor Richard P. Hemenger, Ph.D., O.D.

Second Place winners were Warren H.K. Chue and Debra L. McLaurin for their presentation, "Mydriatic and Cycloplegic Response to 1.0% Hydroxymphetamine Combined with 0.05%, 0.1%, 0.25% and 0.5% Tropicamide: A Dose Response Study." Faculty Advisor for this project was K. Michael Larkin, O.D.

"Comparative Ophthalmic Preservatives Cytotoxicity Measured by Depression of Corneal Respiration," won Third



Pictured (l-r) are the SCCO Student Research Symposium finalists: First Place, Loryn B. Chapin; Third Place Catherine E. Harrison and Karen K. Toki; and Second Place winners Warren H.K. Chue and Debra L. McLaurin.

Place honors for Catherine E. Harrison and Karen K. Toki; Faculty Advisor Siret D. Jaanus, Ph.D.

Each paper, presented within a 15 minute format, was evaluated by a panel of seven judges in six areas relating to both content and delivery. Judges were James E. Bailey, M.Opt., Ph.D.; Robert M. Boynton, Ph.D.; Peter A. Simmons, Ph.D.; Frederick Cresitelli, Ph.D.; Edward I. Goodlaw, O.D., D.O.S.; Miles D. McCarthy, Ph.D.; and Bettye Smith, Ph.D. Kenneth E. Brookman, O.D., Ph.D., served as coordinator of the Student Research Symposium.

The Symposium is supported by a grant from the California Optical Laboratories Association in memory of Roy Marks, O.D., D.O.S., F.A.A.O. Dr. Marks served as Executive Secretary of the Association from 1973 until his death in 1979. Student Research Symposium expenses are provided by the Dr. John R. Dean Endowment for Research. Dr. Dean is a 1923 graduate of the College.

Keeping Up with People...

An Ohio State University optometrist is creating quite a spectacle outside his office with a starry-eyed display.

His celebrity eyewear collection exhibits both the eyeglasses and a photograph of the famous person wearing the glasses.

Arol R. Augsburger, clinical associate professor of optometry, started collecting eyeglasses from celebrities last spring. He displays them in a showcase at the Optometry Building, 338 W. 10th Ave.

He's hopeful the collection will help the average person feel more comfortable about wearing glasses when he or she sees that someone famous and admired has worn them, too.

"The purpose [of the collection] is to call attention to good vision for successful people," Augsburger said.

Part of being successful is being able to perform at optimum levels, Augsburger said. Without good vision, people have difficulty performing well.

In addition, people who feel uncomfortable about how glasses may alter the way they look can find comfort in seeing that celebrities have learned to cope with the change in appearance, he said.

Augsburger admits that the glasses in his collection are not unique or unusual, but that they are of interest because of their former owners.



Dr. Arol Augsburger, O.D.

Augsburger also is the curator of the Optometry Museum located in the basement of the Optometry Building. The museum is the home for antique eyewear and instrumentation dating back to the 1600s.

It's difficult to gauge at this early stage just how much Augsburger's display is comforting prospective eyeglass wearers. He said, however, that while sitting in his office, he often hears people laughing as they stop to peek at and enjoy his unusual spectacles.

Barry J. Barresi, O.D., director of Outreach Clinical Programs, has been elected to the Governing Council of the American Public Health Association (APHA). Dr. Barresi is one of three optometrists on the Council. Over 50,000 memberships in the APHA make it the largest organization of health care professionals in the nation.

Dr. Barresi has also been appointed to the Curriculum/Development Committee of the AOA's Geriatric Optometry program. The Committee will be responsible for developing a textbook on the subject.

Speaking of books . . . Dr. Barresi's new text "Ocular Assessment" has recently been released. Dr. Barresi edited the publication in which five SCCO Faculty are listed as contributing authors. They are: Morris Applebaum, O.D.; Larry M. DeDonato, O.D.; Neal N. Nyman, O.D.; John W. Potter, O.D.; and Michael W. Rouse, O.D.

Michael R. Spinell, O.D., of Huntingdon Valley, has received the prestigious Diplomate Certificate in Corneal and Contact Lenses from the American Academy of Optometry. This award is presented to select eye care professionals who successfully complete a series of exams that test their knowledge of all facets of corneal and contact

lens care. Dr. Spinell is now recognized as one of approximately 150 professionals throughout the world who have been presented this symbol of outstanding academic achievement.

An Associate Professor of Optometry at the Pennsylvania College of Optometry (PCO) Dr. Spinell completed the exams after three years of intensive study. Individuals are normally allotted five years in which to finish the test. The test consisted of clinical, oral and written exams, identification of pathological slides and the presentation of case reports on some of Dr. Spinell's patients.

Dr. Spinell, a 1970 PCO graduate, is the sixth PCO staff member to have been honored with this certificate. He joins Associate Professors of Optometry Elwood H. Kolb, O.D.; Herbert L. Moss, O.D.; and Joel A. Silbert, O.D. and Assistant Professors of Optometry Mitchell J. Fink, O.D. and Harry Kaplan, O.D. in this select category.

Joel S. Waldstreicher, O.D. has been appointed Director of Continuing Education for the State University of New York's State College of Optometry. An Assistant Clinical Professor at the College and specialist in vision training, Dr. Waldstreicher will be working closely with various optometric groups, private practitioners and College faculty to offer programs to meet the needs of the expanding profession.

During the next few months, Dr. Waldstreicher will be planning courses to meet the State relicensure requirements of the new diagnostic pharmaceutical agents (DPA) law.

A graduate of Columbia University, School of Optometry and the Massachusetts College of Optometry. Dr. Waldstreicher also holds a Master of

(continued on page 31)

Teaching Clinical Teachers

D. Leonard Werner, O.D.



Clinical teaching has long been a problem within the health professions. While most educators in these disciplines agree that their clinical faculty are the key persons in their programs, the ones directly responsible for the most vital aspects of the health education process, there is little specific agreement relating to such essential concerns as:

1. How do we identify people with potential as clinical educators?
2. Once identified, how do we prepare them to function in this role?
3. Once functioning, how do we evaluate their effectiveness?
4. How do we use this information to aid in their continued growth and development?

The universality of these problems is of such dimension that one can review the literature of all of the health professions and observe the commonality of this situation. Nobody has found the answers to the puzzle, although there is reason to believe that we are closer to solving some parts of it.

Tikoff likens the clinical teacher to an endangered species because of the high attrition rate. He suggests that they are similar to the shock troops of the Ottoman Empire Era in that they are perceived to be of lower class in the educational system performing hazardous duties with the greatest risks and fewest rewards.¹ The clinical faculty must perform two difficult tasks simultaneously, patient care and teaching, and with each encounter (s)he places professional reputation and license "on the line."² The recompenses of this activity are limited since the clinical faculty is often at the back of the line when the rewards of the teaching profession, tenure and promotion, are dispensed. One of the reasons given for this apparent inequity is that we do not have the traditional criteria to judge clinical as we do with the didactic teaching. This may be further compromised by the observation that "in no other field does the nature of the material demand of the teacher this degree of preparedness without preparation."³ Finally, we have the dilemma of the clinical educator who is either untrained and/or inappropriately scheduled to perform significant research, which is often considered to be required

for advancement in academia, and whose clinical teaching skills may go unrecognized.

Clinical teaching began in an apprenticeship system and to some extent hasn't varied greatly with time. The success of the apprentice system required a special relationship between the student and mentor. This chemistry is also the hallmark of good clinical teaching. Along with this relationship, which often has too little time to develop, is the need for the teacher to have the breadth of styles to teach the entire group assigned to him/her. When one views the large amount of research and writings relating to teaching in general it becomes apparent that relatively little research (and training) has gone into clinical teaching. Those studies published have identified the attributes of the clinical faculty person and rated those that aid and those that distracted from effective clinical teaching. Stritter, Hain and Grimes⁴ and others^{5,6,7,8,9,10} reported that the most effective teacher has enthusiasm, dynamism and energy. (S)he sets objectives for students and teaches problem solving as opposed to factual recall, encourages student questions and provides feedback. Students should be ac-

While much writing has gone into the identification of the positive attributes of the excellent clinical faculty, there is also some agreement concerning what that person should not be. The poorest clinical teachers were arrogant, disliked teaching (or gave that impression), lacked self-confidence, were inaccessible, unorganized, dogmatic and boring.¹² Evans and Massler⁵ added other negative traits of clinical faculty. They found that negative and caustic individuals were considered poor teachers. They concluded that effective teaching was not synonymous with popularity; liking the teacher and learning from the teacher are separate and distinct. One of the most significant results of their study was to recognize that students related differently to specific approaches, with the top 10-15% of the class being more positively oriented to the more theoretically based faculty while the weaker students preferred more demonstrations of clinical techniques by their faculty. They concluded that a well balanced program has the people and ability to meet all of the needs of all of their students. The institution must also create a teaching atmosphere and a time schedule which allows this to flourish.^{3,13,14}

<p><i>"The most effective teacher has enthusiasm, dynamism and energy . . . sets objectives for students and teaches problem solving . . ."</i></p>							
--	--	--	--	--	--	--	--

tive participants in the environment created by the effective teacher. (S)he is accessible and provides time for discussion, is friendly and students perceive (s)he enjoys dealing with them. The competent faculty person is also interested in both the students and patients and is sensitive to their needs and encourages students to share their feelings, values and experiences. Mattern³ and others^{11,12,5} indicated the additional need on the part of the clinical faculty to establish their clinical credibility. The interns and residents must respect the faculty person's knowledge and skills.

ish.^{3,13,14} This implies that time must be allowed for proper preparation.

Optometry shares the dilemmas of the other health professions in attempting to elevate the level of clinical teaching and clinical teachers. At a workshop on optometric clinical education the most important problem identified related to the selection, development and retention of clinical faculty.¹⁵ The methods itemized for the selection of potential clinical faculty were the traditional ones of interviews, guest lectures, evaluating publications and direct clinical observation. While all of these are of

Dr. Werner is Professor of Optometry at the State University of New York, State College of Optometry.

some help, they have varying relationship with the task to be accomplished, which is the teaching of an intern or resident within the patient care setting. The interview might give one some appreciation of the personality and communication skills of the prospective candidate and the direct observation of this person (if accomplished without disturbing the doctor-patient relationship) will possibly indicate how (s)he relates with and treats patients. However, these identified skills are but a part of clinical teaching. We cannot always learn from an interview or observation how this candidate will teach and render patient

care simultaneously in the pressure of the teaching setting. Observing guest lectures or reviewing the candidate's publications are even less rewarding for this specific task.¹⁶

Once we hire our faculty we then must attempt to evaluate their effectiveness. Student involvement in this process is essential since the students are the ultimate consumers of the product. Student evaluations using properly designed forms and carried out in an atmosphere that is consistent with the importance of the task has been shown to be quite valid and reliable, more so than peer review.^{6,11,17} One important aspect

of the clinical teaching program that is extremely difficult to identify, even with student input, is missed teaching opportunities. One study of observed ward rounds reported that in 75% of the situations the clinical teacher missed opportunities to make significant patient observations with the student.¹⁸ The more recent innovation of video taping holds the promise of observing clinical teaching in an unobtrusive fashion and also to provide the feedback mechanism to the faculty and students involved.^{19,20}

In spite of the conventional wisdom that suggests that clinical teachers are born, there is increasing evidence that

Clinical Teaching Evaluation (Student Evaluation of Instructor)

Teacher: _____

Class Year of Evaluator: _____

Date: _____

Circle Appropriate Clinical Specialty Area:

PCO CL VT
Low Vision Special Test
Other: _____

Rating Scale:

1 = Poor 4 = Good
2 = Fair 5 = Excellent
3 = Adequate 6 = N/A

RATING

a) Preparation for clinical teaching encounter (e.g., equipment availability, previous patient record reviewed, knowledge of room and student assignments).	
b) Clinical teaching began punctually.	
c) Devotes full time to teaching/patient care activity during session.	
d) Sets clinical teaching objectives for encounter (e.g., appropriate methods identified for children, elderly, handicapped).	
e) Makes maximal use of the patient as a teaching vehicle (e.g., uses all appropriate available clinical methods while patient is present, such as alternate testing procedures and/or therapy approaches).	
f) Clinical teaching oriented toward patient's primary problem.	
g) Applies and teaches problem solving method to patient care (e.g., explains the "how" and "why"(s) he arrived at clinical decision to student.)	
h) Is enthusiastic about clinical teaching.	
i) Teaches doctor patient communication skills to student.	
j) Provides timely and appropriate feedback to student on his/her performance.	

k) Comments: (Use other side if necessary) (e.g., What advice would you give future students regarding this teacher? What comments would you make to this instructor regarding his/her clinical teaching?)

clinical teaching skills can be taught. Although such behaviors as enthusiasm, role modeling, general knowledge and clinical experience are important, they do not represent the entirety of clinical teaching. In nationwide surveys of a clinical instruction in medicine, Meleca²⁰ and Jewett²¹ reported that the skills needed for clinical teaching can be improved when it is recognized that they may differ from those needed in the classroom and may also have to vary in specific clinical teaching environments. They and others^{22,23} reported that the vital element in an improvement program is the cooperation and

endorsement of both the students and the clinical faculty.

The identification of the weaknesses of clinical faculty and their remediation are separate yet inter-related elements. As mentioned earlier, a potentially good vehicle for this is the use of videotaping. This should be accomplished with the knowledge and agreement of all of the people being taped: the student, faculty and patient. Gerbert¹⁸ reported that none of the patients in her video study objected to this process and only 6% felt it changed the visit; however, 30% of the physicians felt it altered the visit in some way, and 25% of the physicians

reported feeling personally uncomfortable. (It was not revealed whether it was those physicians who were uncomfortable who also felt the video camera altered the encounter.) The advantage of videotaping is that it allows for replay of the patient visit as often as necessary, which can be extremely useful for remediation. It also allows the observer to see aspects of the encounter that are essential in the evaluative and corrective process.

A program for clinical teaching development is now possible with videotaping as the key vehicle in the process. Programs of this nature have been

Clinical Teaching Evaluation (Clinical Chief's Evaluation of Faculty)

Teacher: _____

Date: _____

Evaluator: _____

Rating Scale:

1 = Poor

4 = Good

2 = Fair

5 = Excellent

3 = Adequate

6 = N/A

RATING

a) Preparation for clinical teaching encounter (e.g., equipment availability, previous patient record reviewed, knowledge of room and student assignments).	
b) Clinical teaching began punctually.	
c) Devotes full time to teaching/patient care activity during session.	
d) Sets clinical teaching objectives for encounter (e.g., appropriate methods identified for children, elderly, handicapped).	
e) Makes maximal use of the patient as a teaching vehicle (e.g., uses all appropriate available clinical methods while patient is present, such as alternate testing procedures and/or therapy approaches).	
f) Clinical teaching oriented toward patient's primary problem.	
g) Applies and teaches problem solving method to patient care (e.g., explains the "how" and "why"(s) he arrived at clinical decision to student.)	
h) Is enthusiastic about clinical teaching.	
i) Teaches doctor patient communication skills to student.	
j) Provides timely and appropriate feedback to student on his/her performance.	

k) Comments: (Use other side if necessary)

reported and appear to be viable for optometry. The program that I propose has the potential for success in an arena that has seen few successes.^{22,23,24,25,26}

Proposed Faculty Development Program

Any program of this nature must have the interest and support of the faculty, for without that it is literally doomed. Therefore, the first attempt should be with volunteer faculty with the agreement and acknowledgement of all that it is not for evaluative purposes and the results will not influence their standing. In order to assure this, it is suggested that it be a program administered by a committee of clinical faculty.

Stage I—A clinical faculty evaluation form was developed by a committee of faculty, clinic administration and students. Specific behaviors were identified as appropriate for faculty evaluation. This form allows for self, peers and student input. Initially we have instituted these for student evaluation of clinical faculty as well as clinic chief evaluation of the same faculty. These forms were presented to the entire clinical faculty to acquaint them with the criteria with which they are measured. Clearly this itself helps to evaluate the teaching process because it makes it quite clear to all the expectations of the institution. The fact that all instructors had representation in its formation helped in its acceptance. One item on the form that is revealing is the request to interns, "What advice would you give future students regarding this teacher?"

Stage II—A process will be created to evaluate this program utilizing the same forms. Since these forms are distributed and completed quarterly, we can compare evaluation score changes with time, using those who do not participate in the videotaping portion as a control group with those who do.

Stage III—Utilizing staged encounters we can improve the standardization of the evaluative document and its criteria.

Stage IV—Once satisfied with the tool, real-life encounters should be taped. The teacher(s) involved should observe the initial screening of these videotapes to allow for self-evaluation.

Stage V—The entire group will ob-

serve the videotape and a discussion is led by the doctor taped evaluating the encounter based upon criteria established. At this time alternative teaching and patient care strategies can also be discussed.

Conclusion

It should be apparent to the reader that this development program has not been completed at the time of the submission of this manuscript. It is hoped that this paper will act as a stimulant to dialogue within and among the colleges of optometry. It is anticipated that

another article will follow to report on the results of this program. In the interim the author would appreciate all comments and suggestions.

It also should be obvious that I did not shed any light on the first problem identified, "How do we identify people with potential as clinical teachers?" Perhaps as the process identified in this article is refined we can tape Residents and Fellows in teaching and patient care activities to identify those who appear to have the potential to become excellent clinical teachers. This, too, may be material for a future article for J.O.E. □

References

1. Tikoff, Gerasim, Is The Clinical Teacher A Modern Janissary—An Endangered Species?, *The Pharos*, Spring, 1980, p. 27.
2. Kapp, Marshall, Legal Implications of Clinical Supervision of Medical Students and Residents, *J. of Med. Ed.*, Vol. 58, 1983, p. 293.
3. Mattern, William D., Don Weinholz, and Charles R. Friedman, The Attending Physician As Teacher, *N. Eng. J. of Med.*, Vol. 308, May 12, 1983, p. 1129.
4. Stritter, Frank T., Jack D. Hain, and David A. Grimes, Clinical Teaching Re-examined, *J. of Med. Ed.*, Vol. 50, Sept. 1975, p. 876.
5. Evans, Joseph R., Maury Massler, The Effective Clinical Teacher, *J. of Dent. Ed.*, Vol. 41, 1977, p. 613.
6. Irby, David and Philip Rakestraw, Evaluating Clinical Education in Medicine, *J. of Med. Ed.*, Vol. 56, March 8, 1981, p. 181.
7. Markus, John, et. al., Written Versus Oral Feedback: Their Effect on Learning in an Internal Medicine Clerkship, published in Eighteenth Annual Conf. on Research in Medical Education, Washington, D.C., 1979, p. 239.
8. O'Shea, Helen Spustek and Margaret Kidol Parsons, Clinical Instruction Effective and Ineffective Teacher Behaviors, *Nursing Outlook*, June 1979, p. 411.
9. Gil, Doran H., et al., Students Perception of Evaluative Feedback, published in Proceedings of the Twenty-first Annual Conf. of Research in Medical Education, 1982, p. 77.
10. Margolis, Carmi Z., Use of Clinical Algorithms, *J. of Amer. Med. Assoc.*, Vol. 149, Feb. 4, 1983, p. 627.
11. Stafford, Linda, and Carl C. Graves, Jr., Some Problems in Evaluating Teaching Effectiveness, *Nursing Outlook*, August 1978, p. 494.
12. Irby, David M., Clinical Teacher Effectiveness in Medicine, Annual Conference on Research in Med. Ed., Vol. 16, 1977, p. 161.
13. Abplanalp, Paul H., and William R. Baldwin, Good Teaching—A Rewardable Feat, *J. of Opt. Ed.*, Vol. 8, Winter 1983, p. 19.
14. Pavone, Ben W., Profile of the Future Teacher of Clinical Dentistry, *Operative Dentistry*, Supplement 2, 1981, p. 2.
15. A Faculty Workshop on Clinical Instruction For Optometry Education, *J. of Opt. Ed.*, Vol. 5, Winter 1980, p. 20.
16. Ibid, p. 23.
17. Donnaly, Michael, et. al., What Should Students Evaluate? A Comparison of Faculty and Student Perceptions published in Eighteenth Annual Conf. on Research in Medical Education, Washington, D.C., 1979, p. 165.
18. Gerbert, Barbara, et. al., Utilization of Videotaped Observations To Assess Physician Care: A Methodology For Evaluating Treatment, published in Proceedings of the Twenty-first Annual Conf. of Research in Medical Education, 1982, p. 123.
19. Jackson, Max G. and Ronald E. Pinkenton, Videotaped Teaching in Family Practice Residencies, *J. of Med. Ed.*, Vol. 58, 1983, p. 434.
20. Meleca, C. Benjamin, et. al., Clinical Instruction in Medicine: A National Survey, *J. of Med. Ed.*, Vol. 58, May 1983, p. 395.
21. Jewett, Leslie S., Larrie W. Greenberg, and Rhonda M. Goldberg, Teaching Residents How To Teach, *J. of Med. Ed.*, Vol. 57, May 1982, p. 361.
22. Stritter, Frank T., and Jack H. Hain, A Workshop in Clinical Teaching, *J. of Med. Ed.*, Vol. 52, Feb. 1977, p. 155.
23. Patridge, Mark I., Ilene B. Harris, and Robert A. Petzel, Implementation and Evaluation of a Faculty Development Program To Improve Clinical Teaching, *J. of Med. Ed.*, Vol. 55, Aug. 1980, p. 711.
24. Wolcott, Robert B., Teaching in Clinical Dentistry, *Operative Dentistry*, Supplement 2, 1981, p. 5.
25. Consideration in Clinical Evaluation, Publication No. 16-1764, National League for Nursing, 1979.
26. Bazuin, Charles H., and Annette Yonke, Improvement of Teaching Skills in a Clinical Setting, *J. of Med. Ed.*, Vol. 53, 1978, p. 377.

Minimum Separation:

Not Always Occurring at the Symmetry Points

Michael P. Keating, O.D.

For a thin lens in air, the minimum separation between a real object and its conjugate real image occurs at the symmetry points. Since the symmetry points are part of the set of cardinal points for any optical system, there tends to be a belief that minimum separation always occurs at the symmetry points. However, for many systems the minimum separation doesn't occur at the symmetry points, and there are some systems in which the symmetry points actually give a local maximum in the separation.

Introduction

It's well known that for a converging thin lens in air the minimum separation between a real object and its conjugate real image occurs when the object and image are at the symmetry points of the lens. Since the symmetry points of the lens are each twice the focal length away from the lens on opposite sides, the minimum separation between the real object and its conjugate real image is four times the focal length.

The symmetry points are part of the set of cardinal points for any optical system. Therefore, it might seem reasonable to assume that the minimum separation between a real object and its conjugate real image also occurs at the symmetry points for optical systems other than thin lenses. But surprise! The reasonable assumption is wrong! Even for a system as simple as a single spherical refracting surface, minimum separation between a real object and its conjugate real image doesn't occur at the symmetry points!

The minimum separation properties are usually not explicitly discussed in

optics texts.¹⁻⁶ From my experience on the Optics Test Construction Committee of the Optometry National Board and from conversations with faculty at several different optometry schools, it appears that the fact that minimum separation doesn't always occur at the symmetry points is not well known. Therefore, I feel that a short discussion would be worthwhile.

In Section 2, I discuss in some detail the symmetry points and minimum separation for a single spherical refracting surface. In Section 3, I briefly comment on the relationship between the symmetry points and minimum separation for a coaxial system of multiple spherical refracting surfaces.

Single Spherical Refracting Surface

Consider a single spherical refracting surface with an object space index n_o , an image space index n_i , and a dioptric power P . The general imaging equation for such a surface is

$$n_i/v = P + n_o/u, \quad (1)$$

where u is the object distance and v is the image distance. (The standard Cartesian coordinate system is assumed, and light is traveling to the right.) The

general lateral magnification equation is

$$m = n_o v / n_i u. \quad (2)$$

Paraxially, when an extended real object is at optical infinity, the conjugate real image is inverted, much smaller than the object, and in the secondary focal plane of the surface. As the real object is moved closer to the surface, the conjugate real image moves away from the surface and gets larger (see Fig. 1).

Since the image starts out smaller than the object and ends up larger than the object, there must be an intermediate object position that results in a conjugate image with a size equal to that of the object. The equal sizes occur when the object and image are at the symmetry planes (respectively marked $2F_1$ and $2F_2$ in Fig. 1). Since the conjugate real image is still inverted relative to the object, the lateral magnification is -1 for the symmetry planes. The object distance u for the axial symmetry point is given by

$$u = -2 n_o / P, \quad (3)$$

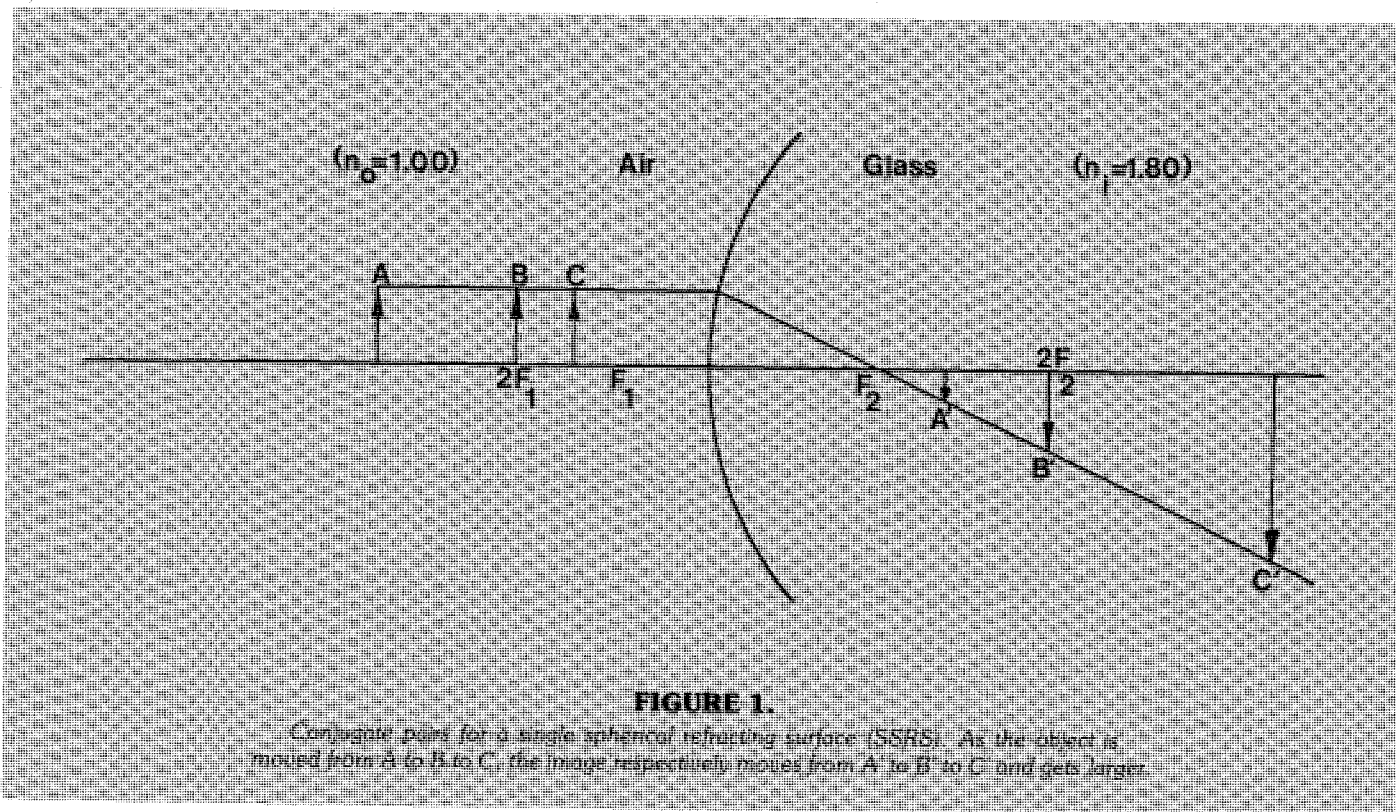
and the conjugate image distance is

$$v = +2 n_i / P. \quad (4)$$

The separation or distance w from an object to its conjugate image is given by

$$w = v - u. \quad (5)$$

Dr. Keating is Professor of Optometry, Ferris State College, College of Optometry.



From Eqs.³⁻⁵ the symmetry point separation is

$$w = 2(n_o + n_i) / P. \quad (6)$$

The minimum separation between a real object and its conjugate real image is an extreme of the separation function w . The extremes of a function occur either at the end points of the function or at the critical points of the function. The critical points are those points for which the derivative of the function either is equal to zero or doesn't exist.⁷

For an SSRS, the minimum separation between a real object and its conjugate real image occurs at a critical point given by a zero derivative. The equations for the minimum separation are found as follows. First Eq. (1) is solved for the image distance v , and the result substituted into Eq. (5) for the separation w . Then the derivative of the separation w with respect to the object distance u is found and set equal to zero. The result is a quadratic equation for two critical point object distances u .

Only one of the two solutions to the quadratic equation applies to the real object—real image case. From this solution, the object distance for minimum separation is

$$u = -(n_o + \sqrt{n_o n_i}) / P. \quad (7)$$

Then from Eq. (1) the conjugate image distance can be found and is

$$v = + (n_i + \sqrt{n_o n_i}) / P. \quad (8)$$

"The minimum separation between a real object and its conjugate real image is an extreme of the separation function."

From Eqs. (2), (7), and (8), the lateral magnification equation for the minimum separation situation is

$$m = -\sqrt{n_o / n_i}. \quad (9)$$

The minimum separation can be obtained from Eqs. (5), (7) and (8), and in simplified form is

$$w_{\min} = (\sqrt{n_o} + \sqrt{n_i})^2 / P. \quad (10)$$

Note that Eqs. (7), (8), and (10) are different from Eqs. (3), (4), and (6) for the symmetry points, and that the lateral magnification at minimum separation, Eq. (10), is not equal to -1. Clear-

ly, for a single spherical refracting surface, the minimum separation between a real object and its conjugate real image doesn't occur at the symmetry points.

Multiple Spherical Refracting Surface Systems

The box in Fig. 2 represents a coaxial system of spherical refracting surfaces with a central thickness q , and respective object and image space indices n_o and n_i . The distance from the front surface of the system to the object is u , and the distance from the back surface of the system to the image is v . The separation w between a real object and its conjugate real image is

$$w = v - u + q. \quad (11)$$

The minimum separation can occur at the endpoints or at the critical points of w . As for the single spherical refracting surface, the critical points are found by setting the first derivative of w with respect to u equal to zero. The result is again a quadratic equation for the critical points. It follows that the critical points occur for object distances u and image distances v that give a total lateral magnification of

$$m = \pm \sqrt{n_o / n_i} \quad (12)$$

The symmetry points still occur at a lateral magnification of -1. For unequal object and image space indices, Eq.

(12) clearly shows that the symmetry points are not critical points, and thus the minimum separation between a real object and its conjugate real image doesn't occur at the symmetry points.

However, when the object and image space indices are equal, Eq. (12) simplifies to ± 1 . In the latter case, the symmetry points ($m = -1$), and the principal points ($m = +1$) are critical points for the separation function w .

The sign of the second derivative of w specifies whether w is a local maximum or a local minimum at the critical points. It can be shown that the sign of the second derivative of w at the critical points is determined solely by the sign of the equivalent dioptric power of the system.

It turns out that for a multiple refracting surface system with equal object and image space indices and a positive equivalent dioptric power, the symmetry points do give a local minimum in the separation. A converging thin lens in air is the simplest example of such a system.

On the other hand, for an equi-index system with a negative equivalent dioptric power, the symmetry points give a local maximum in the separation. An example is a system consisting of a $+8.00$ D thin lens in air located 50 cm in front of a $+5.00$ D thin lens in air. The two lens system has an equivalent dioptric power of -7.00 D.

Conclusion

For coaxial systems of spherical refracting surfaces in which the object and image space indices are not equal, minimum separation between a real object and a real image doesn't occur at the symmetry points. The simplest example is a single spherical refracting surface.

For coaxial systems of spherical refracting surfaces in which the object and image space indices are equal, the minimum separation between a real object and a real image can occur at the symmetry points when the equivalent dioptric power is positive. However, when

"The minimum separation between a real object and its conjugate real image doesn't occur at the symmetry points."

the equivalent dioptric power of an equi-index system is negative, the symmetry points give a local maximum in the separation between a real object and its conjugate real image.

According to Southall, the symmetry points were introduced by Toepler in 1871 under the name negative principal points, and later renamed the symmetry points by S.P. Thompson.⁸ Apparently the name "symmetry points" together with the fact that the minimum separation for a thin lens in air occurs at the symmetry points has led some people to the misconception that minimum separation always occurs at the symmetry points. Perhaps the same "negative nodal points" would not have been as seductive! □

References

1. Southall JPC. *Mirrors, Prisms, and Lenses*. (3rd ed.) New York, Macmillan, 1949.
2. Fry GA. *Geometric Optics*. Philadelphia, Chilton, 1969.
3. Fincham WHA. and Freeman MH. *Optics*. (9th ed.) London, Butterworths, 1980.
4. Jenkins FA. and White HE. *Foundations of Optics*. New York, McGraw Hill, 1957.
5. Hecht E. and Zajac A. *Optics*. Reading, Addison-Wesley, 1974.
6. Klein MV. *Optics*. New York, John Wiley, 1970.
7. Johnson RE. & Kiokemeister FL. *Calculus with Analytic Geometry*. Boston, Allyn and Bacon, 1962, pp. 121-133.
8. Reference 1, pp. 338-339.

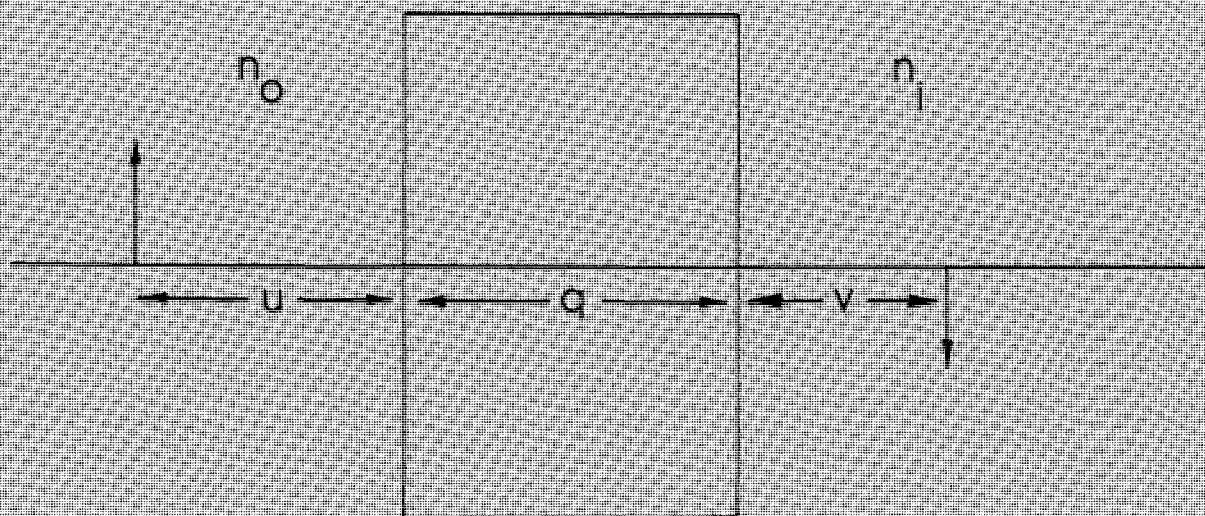


FIGURE 2.

The box represents a multiple spherical refracting surface (MSRS) system with a central thickness of q . The object space index is n_o and the image space index is n_i . The distance from the front surface of the system to the object is u , and the distance from the back surface of the system to the image is v .

Skills in Clinical Teaching:

A Faculty Development Program for Resident Optometrists

Laurence C. Bauer, M.S.W., and Arthur Alexander, O.D., FAAO

Introduction

Residents at the Pennsylvania College of Optometry are required to participate in patient care activities, and to teach optometry students who rotate through the College's Eye Institute.¹ Since these teaching responsibilities confront the residents with a challenge

which few had been prepared to handle, a clinical teacher preparation program is included as part of the total residency program. The program is designed to increase the clinical teaching skills of resident optometrists.

Overview of the Program

Each year between 1980 and 1982, a workshop was offered by the Office of Faculty Development of the Department of Family & Community Medicine of The Milton S. Hershey Medical Center, Pennsylvania State University. The workshop focused on a set of communication skills and a model of instruction

which had proven helpful to clinical instructors in other primary care settings. It also provided a means to evaluate the effects of the workshop. The evaluation measured changes in the residents' skill level, and evaluated participant opinion regarding the helpfulness of the training immediately following and again, six months after the program. The workshop was offered to a total of 25 participants: 8 residents and 1 faculty person in 1980, 7 residents in 1981; 9 residents in 1982. In 1980 and 81, the workshops involved three days of training, and were offered at a site away from the college. The 1982 workshop was of-

Mr. Bauer is Director of Faculty Development, Department of Family and Community Medicine, Milton S. Hershey Medical Center, Pennsylvania State University.

Dr. Alexander is Assistant Professor of Optometry, Pennsylvania College of Optometry.



ferred at the college and involved 2 days of training.

Description

The overall purpose of this workshop was to improve the resident's clinical teaching ability. The particular objectives of the training were:

- To review basic educational concepts pertinent to clinical teaching.
- To introduce participants to a set of communication skills useful in clinical teaching.
- To introduce participants to an action oriented model of clinical teaching.
- To provide practice opportunities so that participants could develop expertise with the communication skills and the model of clinical teaching.
- To stimulate participants to review their attitude toward clinical teaching.

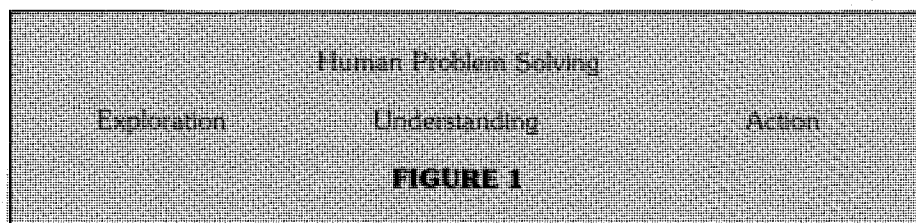
To accomplish these objectives, a skills-based model of clinical teaching was presented. The model of clinical teaching and the process used to instruct the residents were developed by The Carkhuff Institute of Human Technology, Amherst, Massachusetts, through a Health Resources Administration grant.

Content

The teaching model used in the workshop is based on Robert Carkhuff's formulation of the human problem solving process (Figure 1).²

As learners, we explore where we are. What knowledge and skills do we have to help us solve a problem with which we are confronted? If we cannot readily solve the problem, we need to identify our deficits. What do I need to learn to resolve this problem? Can I apply my existing knowledge and skills in a new way or do I need to use a resource to learn new information or a new skill? Finally, now that I've understood what I need to do, how will I proceed until I've resolved the problem?

A facilitative clinical teacher allows and expects a student to reveal what (s)he knows about a given patient's problem. Once the student has shared his/her assessment of the problem and thoughts about diagnosis and treatment the teacher is able to focus his/her instructional activity. While an effective clinical teacher should act as a role model in the area of clinical problem solving, it is not appropriate to take over the handling of every patient's problem



and place the student in the role of passive observer. The clinical teacher's job is to direct the student through the problem solving process. Figure 2 shows some of the implications of the model for clinical learning.

There is an explicit assumption which underlies this model. Learning begins from the learner's frame of reference. This means that the effective clinical teacher begins with an assessment of what the learner knows and doesn't know. Once the instructor has assessed the learner, (s)he can focus his/her instructional activity. Teaching is more than sharing a set of facts and procedures. As Mager points out, "If teaching were the same as telling, we'd all be so smart we could hardly stand it."³ An effective teacher assesses the learner's knowledge about a problem area and how the learner organizes his/her problem solving activity.

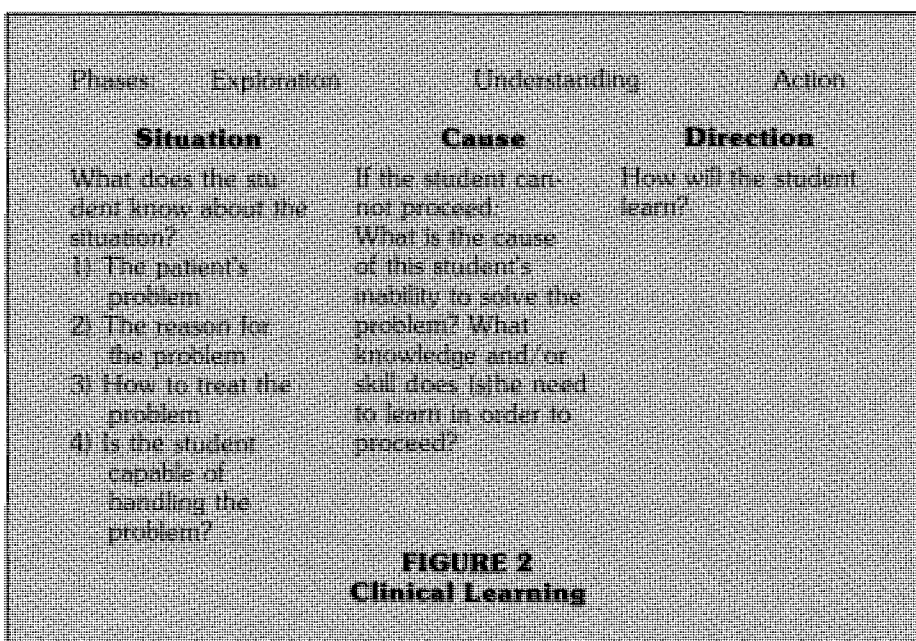
The model overviewed above provides a cognitive structure for the clinical teaching process. Yet like most interactions between people, how a teacher interacts with a student is often more critical than what the teacher has to say. The best clinical advice when given in

an interpersonally distasteful manner may not be heard by the student whose psychological defenses have been triggered. This is not to say that being "nice" is the answer. It does mean that useful clinical advice needs to be presented in a manner that facilitates the student's willingness to listen.

A large portion of the workshop is focused on a set of interpersonal skills which will improve a clinical teacher's ability to engage a student in the problem solving process. These interpersonal skills fall into two areas. A clinical teacher needs to get the student's perspective and give his/her perspective about the situation, cause and the direction.

The teacher's ability to get the student's perspective and to give his/her perspective will determine how accurately the problem is explored and the accuracy with which the cause of the problem will be identified. The skills will also influence the student's willingness to talk about his/her deficiencies. The get/give process is the basis of effective clinical teaching.

During the workshop, a number of skills that will improve the clinical teach-



er's ability to involve a student in the get/give process are discussed and practiced. The following breakdown overviews the relevant skills.

I) Getting the student's perspective involves:

a. Communicating interest in the student

The teacher's ability to communicate an openness to a student as well as a readiness and enthusiasm to teach.

b. Gathering information about the student's performance

The teacher's ability to collect accurate information about the student.

c. Asking facilitative questions

The teacher's ability to ask questions that encourage the student's presentation of information.

d. Demonstrating understanding of what the student says

The teacher's ability to show that (s)he has understood the student's perspective.

II) A teacher can give his/her perspective through a series of techniques

a. Use of genuineness

The teacher gives his/her perspective by sharing his/her feelings about the student and/or the student's work.

b. Self Disclosure

The teacher can give his/her perspective by sharing experiences which may support or alter the student's perspective.

c. Description

The teacher's ability to objectively state what (s)he has seen or heard.

d. Confrontation

The teacher's ability to present incongruities or discrepancies in the student's problem solving.

Teaching Methods

A variety of instructional methods are used to help the participants acquire the skills. This begins with the workshop leader (first author) who models use of the communication skills throughout the training experience. This type of role modeling allows the participants to experience the effects of the skills.

A micro-teaching strategy is used for each of the skills introduced. This involves a Tell-Show-Do method. Each

"Faculty development activities can be successful if the skills clinical teachers need to learn can be defined in clear and concrete terms."

skill is introduced and the steps involved in the performance of each skill are reviewed. After the content of the skill has been reviewed a series of practice exercises are used to help the participants acquire the skill by putting it into action.

The following provides an illustration of this process for the skill of demonstrating understanding of what the student says. The behavioral steps involved in performing this skill include:

- 1) Pay attention to the student
- 2) Observe the student's non-verbal behavior
- 3) Listen to the student's verbal behavior
- 4) Review the important content expressed by the student
- 5) Identify any strong feelings expressed by the student
- 6) Give a response which summarizes the feeling(s) and key point(s) expressed by the student.

A series of practice exercises encourage the participants to use this skill. Participants are shown a series of videotaped student expressions to which they are asked to write a response demonstrating their understanding of what they heard. Each participant's response is discussed and constructive feedback concerning how to be more accurate and/or succinct is provided. During a

second role play exercise, participants are asked to use the skill in a simulated teacher-student interaction. Discussion and constructive feedback follow. Each exercise is designed to provide the participants with an opportunity to test their learning in an atmosphere that is supportive.

Evaluation Methods and Results

In order to evaluate the impact of the training, two methods of evaluation were used, a performance test and participant evaluation.

Performance Testing

In the performance test the participants were asked to construct their most helpful response to a student presenting a clinical problem. They were tested immediately before and after the workshop occurred.

The 1980 and 1981 groups were tested with a pencil and paper form of the performance test in which they read a statement from a student and wrote their response. In the last workshop, a set of 3 videotaped stimuli, developed by the Carkhuff Institute of Human Technology, were used before and after training. These stimuli involved optometric students who were videotaped as they presented a clinical problem to a preceptor who remained unseen on the tape. The participants were put in the

TABLE 1
Performance Test Scores

	Pre-Workshop Scores	Post-Workshop Scores
	Mean (S.D.)	(Mean (S.D.))
1980	1.1 (.18)	3.1 (.35)
1981	1.1 (.09)	2.7 (.40)
1982	1.5 (.35)	3.2 (.34)

TABLE 2
The Average Responses of the Twenty-Five Participants
Immediately After the Workshop

	Strongly Disagree 1	2	3	Strongly Agree 4	5
"Most of what was covered in this program will not be very helpful when I get home"	1.8				
"The staff at this workshop seemed very competent."				4.8	
"I feel good about this workshop experience."				4.4	
"I feel better about being a teacher because of this workshop."				4.1	
"I would recommend this workshop to a colleague."				4.4	
"Too much time was spent on non-productive activities."	2.1				
"The presenters were poorly prepared."	1.1				
"The workshop leader(s) seemed to be using the skills they were urging me to use."				4.7	
"I was satisfied with how much I actively participated in the workshops."				4.0	
"There were enough practice opportunities available for each new skill presented."				4.0	
"The teaching skills were presented in a clear and understandable way."				4.4	
"The other people who participated in this course with me facilitated my learning."				4.3	
"My expectations for these workshops were met."				3.8	
"I felt comfortable asking questions during the workshop."				4.3	
"I was given constructive, helpful feedback on my use of the skills taught in this workshop."				4.6	

position of responding as if the student had directed the problem to them. In either case, participants were allowed three minutes to construct their responses to each item.

The responses were rated using an index of facilitative communication developed and validated by Robert Carkhuff, Ph.D. (Carkhuff, 1969). The index is a criterion-referenced, 10-point scale with a high of 5 and a low of 1. Ratings of 1.5, 2.5, etc. are possible. One rater rated and later re-rated each response. Agreement in 90% of the ratings was achieved. The results are presented in Table 1.

The goal of the workshop was to bring the participants to a minimally acceptable level of skill performance, which is a 3.0 on this scale. The 1980 and 1982 groups both achieved slightly above the goal level. The 1981 group average was slightly below the 3.0 level. Examination of the scores for the three groups revealed that 20 of the 25 participants had achieved a minimally acceptable or better score after the training. While these results are based on only three responses after training for

each participant, we believe this method does provide an efficient way of monitoring the impact of the training.

Participant Response

A second evaluation instrument was used to elicit participant opinion regarding the helpfulness of the training. Participants were asked to complete a fifteen item questionnaire. The average response to each question for all 25 participants is shown in Table 2. The response indicated that the participants felt the material covered in the program was relevant to their work, the training was conducted in an organized and effective manner, and they did learn as a result of the training.

Six months after the training an eleven item questionnaire was sent to each participant. Results from the three groups showed that the participants believed the material covered in the course was relevant to their teaching situations, the workshops had helped them become better teachers, and they would recommend the program to other residents and faculty. They also suggested that the program could be im-

proved by adding a follow-up session held two to three months after the initial training.

Conclusions

Based on our experience we have reached the following conclusions:

1) Faculty development activities can be successful if the skills clinical teachers need to learn can be defined in clear and concrete terms, and if sufficient opportunities for practice and constructive feedback are incorporated into the training.

2) Instruction in interpersonal and clinical skills can improve an instructor's performance.

3) Residents find the opportunity to participate in this type of faculty development to be rewarding and productive.

References

1. Alexander, Arthur and Joann Klopfer. *Journal of Optometric Education*, 8, No. 4 (Spring, 1983) 20-23.
2. Carkhuff, Robert. *Helping and Human Relations*, Holt Rinehart and Winston, Inc., 1969.
3. Mager, Robert. *Goal Analysis*, Fearon Publishers, Inc., 1972.

I · N · D · E · X

**Vols.
1-9**

A

ABPLANALP, P.:

Behavioral objectives: a means to establish professional-wide clinical performance standards—Vol. 8, No. 2, p6

and Baldwin, W.R.: Good teaching—a rewardable feat—Vol. 8, No. 3, p19

ADLER-GRINBERG, D.: Association of Optometric Educators—Vol. 5, No. 1, p14

ALLEN, J.R.—See Redmond, D.W.

ALEXANDER, A.H., and Klopfer, J.: Residencies at The Eye Institute of the Pennsylvania College of Optometry—Vol. 8, No. 4, p20

ALEXANDER, L.J.: The importance of physical diagnosis in primary care optometry—Vol. 6, No. 4, p5 see Bauer, L.

American Academy of Optometry: Clinical competence measurement in optometry, symposium—Vol. 7, No. 2, p8

AMOS, J.F.:

A look at the year ahead—Vol. 5, No. 1, p9

An area of vital interest—Vol. 4, No. 2, p3

On solid footing—Vol. 9, No. 1, p5
The year in review: a look at JOE's progress—Vol. 6, No. 1, p4
and Long, H.E.: A debt overdue—Vol. 9, No. 2, p5

ASCO

activities and board briefs: Vol. 2, No. 3, p3; Vol. 3, No. 1, p4; Vol. 3, No. 2, p2; Vol. 4, No. 1, p4; Vol. 4, No. 3, p6; Vol. 5, No. 1, p4; Vol. 5, No. 3, p8

faculty workshop on clinical instruction—Vol. 5, No. 3, p16

plan for an educational program in rehabilitative optometry—Vol. 7, No. 4, p12

priorities and purposes—Vol. 4, No. 3, p28

Author Index

Recommendations for the development of future federal health manpower initiatives—Vol. 6, No. 1, p19
sustaining member section—Vol. 8, No. 3, p31

ASCO Annual Report

1979-80, Vol. 6, No. 1, p12

1980-81, Vol. 7, No. 1, p22

1981-82, Vol. 8, No. 1, p23

1982-83, Vol. 9, No. 1, p12

ASCO Council on Academic Affairs

optometric curriculum model—Vol. 1, No. 3, p96

optometry curriculum model—Vol. 4, No. 1, p11

pharmacology curriculum guidelines for continuing education courses—Vol. 2, No. 3, p16

pharmacology curriculum model—Vol. 4, No. 4, p18

professional development and administration curriculum—Vol. 5, No. 2, p18

ASCO National Office

Update on OCAT—Vol. 2, No. 2, p12

Report on ASCO policy positions—Vol. 2, No. 2, p25

Association of Optometric Educators, Adler-Grinberg, D.—Vol. 5, No. 1, p14

Association of Visual Science Librarians: Guidelines and standards for visual science libraries—Vol. 2, No. 2, p21

AUGSBURGER, A.: Analysis of optometric practices in Ohio—Vol. 8, No. 3, p16

AVERILL, R.: ASCO, education and the profession—Vol. 3, No. 1, p20

B

BALDWIN, W.R.:

A call for consensus—Vol. 2, No. 2, p6

Comment: a primary health care model—Vol. 7, No. 1, p19

Evaluating optometric education—Vol. 6, No. 3, p5

National goals for optometric education—Vol. 1, No. 1, p2

Tomorrow's challenge: developing trends in optometric education and how they will affect the future of optometric practice—Vol. 1, No. 2, p74
see Abplanalp, P.

BALL, G.V.: Educational progress and problems in optometry; view from Great Britain—Vol. 1, No. 4, p132

BARKER, F.M.: Producing competent clinicians: the role of behavioral objectives—Vol. 8, No. 2, p4

BARRY, S.H. and Shansky, M.S.: Enriching the optometric curriculum through student research—Vol. 3, No. 3,4, p36

BAUER, L. and Alexander, A.H.: Skills in clinical teaching: a faculty development program for resident optometrists—Vol. 9, No. 4, p16

BENNETT, E.S.:

A mini-course on patient communication for optometry students—Vol. 8, No. 2, p10

and Soni, P.S.: Developing the model contact lens curriculum—Vol. 8, No. 3, p8

BLEYTHING, W.B.: The optometric residency: its bloom—Vol. 5, No. 1, p16

BLUME, A.J.: Needed: A coalition of clinicians—Vol. 5, No. 3, p4

BOLTZ, R.L.—See Manny, R.E.

BORISH, I.M.: Clinical training via external or adjunct assignments—Vol. 7, No. 3, p4

BRAZELTON, F.A.: The status of academic optometry in projecting clinical competence from existing written examinations—Vol. 7, No. 2, p9

BROOKMAN, K.E.: Orientation of the new optometry student through clinical case presentation—Vol. 8, No. 2, p20

BUTTERFIELD, P.: ASCO profile, the second time around: a look at MCO's accelerated program—Vol. 2, No. 1, p17

C

CARTER, J.—see Godske, S.

CASAMASSIMO, P.S.: An employment checklist for prospective dental educators—Vol. 5, No. 4, p17

CHANG, F.W.—see Rapp, J.

CHRISTENSEN, J.L.:
Characteristics of professions: some implications for optometric education—Vol. 3, No. 3,4, p8

and McKittrick, J.: An innovative approach to professional-level optometry courses—Vol. 5, No. 4, p12

CLASSE, J.G.:
An analysis of education in the health professions—Vol. 3, No. 2, p22

Alabama SOSH goes to Guatemala—Vol. 4, No. 3, p24

The need for relevant practice management in the optometric curriculum—Vol. 5, No. 2, p16

CLAUSEN, L.R.: Future directions for public and community health curricula in optometry—Vol. 3, No. 2, p5

COSTABILE, J.D.:
Council on Optometric Education; Report to AOA House of Delegates—Vol. 1, No. 3, p16

Council on Optometric Education; Report to AOA House of Delegates—Vol. 2, No. 3, p18

Council on Optometric Education
1977-78 Annual Survey of Optometric Educational Institutions—Vol. 4, No. 2, p27

1978-79 Annual Survey of Optometric Educational Institutions—Vol. 5, No. 4, p27

1979-80 Annual Survey of Optometric Educational Institutions—Vol. 6, No. 2, p23

1980-81 Annual Survey of Optometric Educational Institutions—Vol. 7, No. 3, p22

1981-82 Annual Survey of Optometric Educational Institutions—Vol. 8, No. 2, p24

1982-83 Annual Survey of Optometric Educational Institutions—Vol. 9, No. 3, p24

CRIPPAN, J.P.—see Emling, R.C.

CROZIER, J.J.—see Emling, R.C.

D

DANIELSON, D., and Myers, K.: The Journal looks at the Veterans Administration—Vol. 3, No. 1, p6

DIPPNER, R.S.—see Giambalvo, V.

DISTEFANO, A.F.—see Siegfried, J.B.

DIXON, N.—see Liddle, E.M.

DOCTORS, S.: Affirmative action: Walking tightrope between equal opportunity and reverse discrimination—Vol. 1, No. 2, p64

DOMNITCH, D.—see Giambalvo, V.

DORLAND, R.: Face-to-face—Vol. 6, No. 3, p15

DUNSKY, I.L.: The optometric practitioner as a teacher of students—Vol. 7, No. 3, p18

E

EBERSOLD, L.A., and Weiss, R.: Tenure: the ivory tower goes to court—Vol. 1, No. 3, p102

EGAN, E.: Guidelines and standards for visual science libraries serving optometric institutions—Vol. 2, No. 3, p8

ELLIOTT, R.B.:
Continuing education in schools of optometry in the United States—Vol. 6, No. 1, p25

Financing continuing education in schools and colleges of optometry—Vol. 7, No. 2, p26

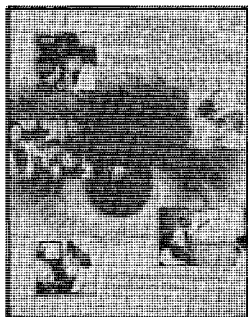
EMLING, R.C.; Crippan, J.P.; Crozier, J.J.; McClure, L.H.; and Green, P.A.: The vocational interests of a sample of optometry students—Vol. 6, No. 4, p17

ENOCH, J.M.: Research in optometry: a crucial need—Vol. 9, No. 3, p5

ESKRIDGE, J.B.:

An optometric clinical practicum examination model—Vol. 5, No. 1, p27

Assessment of clinical competence in a practical setting—Vol. 7, No. 2, p12



EURE, S.B.: Full cost tuition and the academic common market—Vol. 4, No. 4, p13

F

FILER, C.: Pacific University in profile—Vol. 1, No. 3, p113

G

GIAMBALVO, V., Dippner, R.S., and Domnitch, D.: Computer assisted National Board reviews in optometry—Vol. 3, No. 3,4, p28

GIBSON, M.R.: Programmed instruction: one answer to the challenge to the basic pharmaceutical sciences—Vol. 1, No. 4, p146

GREEN, P.A.—see Emling, R.C.

GREENSPON, T.S.: Training for clinical practice: an educational dilemma—Vol. 1, No. 1, p28

GROSS, L.J.:

Education and credentialing in optometry: critical issues—Vol. 7, No. 1, p8

On the use of combined-response options in multiple-choice items—Vol. 7, No. 4, p22

Psychometric advances in measuring clinical problem-solving skills—Vol. 7, No. 2, p15

The standardized two-dimensional PMP: a new assessment technique in optometric credentialing and education—Vol. 9, No. 1, p8

GODSKI, S. and Carter, J.: Profile—The University of California, Berkeley, School of Optometry—Vol. 4, No. 2, p4

GOLD, A.R.: Optometric education in the seventies—Vol. 1, No. 3, p120

GOLDBERG, F.: Hold fast to dreams—Vol. 5, No. 2, p25

H

HAFFNER, A.N.:

Constraints on all sides—crisis and opportunity—Vol. 4, No. 3, p5

Elements in the achievement of excellence in optometric education—Vol. 2, No. 1, p22

The expanding role of the optometrist—Vol. 4, No. 4, p6

In defense of professionalism, Vol. 5, No. 1, p10

Is professionalism in the professions obsolete?—Vol. 6, No. 1, p5

Optometry to the year 2000: the need for a public study—Vol. 6, No. 2, p5

- HANEN, M.E., and Kouzes, R.T.: OpDoc: computer aided clinical instruction—Vol. 2, No. 2, p8
- HANLON, S.D., and Jue, N.: Review clinic: a measure of quality—Vol. 9, No. 3, p12
- HARRIS, P.: AOSA—The American Optometric Student Association—Vol. 4, No. 2, p18
- HARRISON, B.J.: Student's right-to-know basis of new law; Buckley Amendment—Vol. 1, No. 1, p30
- HEATH, D.A., Hines, C., and Kamens, H.R.: Meeting optometric student needs: a proposed tutorial model—Vol. 8, No. 4, p9
- HEBBARD, F.W.: Ohio State tradition: innovation and professional excellence—Vol. 1, No. 2, p70
- HEGEMAN, S.: Comparison of pharmacology courses for optometry and medical students, Indiana University, Bloomington—Vol. 9, No. 1, p22
- HEIBERGER, M.H., and Soroka, M.: Optometric shortage areas—changes in federal policy—Vol. 4, No. 2, p15
- HINES, C.—see Heath, D.A.
- HIRSCH, J.A.: Training in ocular pathology—Vol. 1, No. 3, p107
- HOFSTETTER, H.W.:
An educator's trilogy—Vol. 1, No. 4, p138
From Saint Louis to Milan—Vol. 4, No. 4, p5
Journal preferences among our beginning students—Vol. 4, No. 4, p28
Profile: The School of Optometry at Inter American University of Puerto Rico—Vol. 7, No. 1, p20
Recent optometric education developments in the Republic of South Africa—Vol. 6, No. 1, p8
- HOUSTON, University of, profile—Vol. 3, No. 1, p28
- HOWARD, C.F.: Biochemistry in optometry curriculum—Vol. 3, No. 3,4, p23

I

- ILLINOIS, College of Optometry, profile—Vol. 3, No. 3,4, p40

J

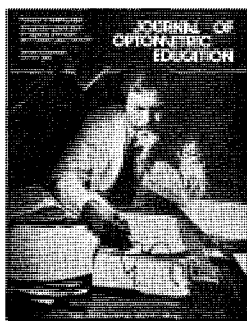
- JANOFF, L.E.:
A survey of attitudes of optometry instructors—Vol. 3, No. 1, p22
Optometric education: its need to create an effective learning environment—Vol. 1, No. 4, p135
The need for training optometric educators—Vol. 1, No. 1, p14

- University school or free standing: the dilemma of optometric education—Vol. 2, No. 1, p31

- JOHNSON, D.F.: The use of non-print media in continuing education programs—Vol. 8, No. 3, p12
- JOHNSON, H.D.: How to give up lecturing for fun and profit—Vol. 1, No. 3, p100
- JONES, J.—see Matthews, H.
- JOLLEY, J.L.: Outreach clinical programs: an experiment in diversification of clinical optometric education—Vol. 4, No. 2, p20
- JUE, N.—see Hanlon, S.D.

K

- KAMENS, H.R.—see Heath, D.A.
- KANE, M.: COVD: a full scope optometric care organization—Vol. 8, No. 2, p22
- KATZELL, M.E.: Characteristics of OCAT applicants—Vol. 2, No. 1, p12
- KEATING, M.P.: Raleigh's criterion: why 1.22? An intuitive answer without using Bessel functions—Vol. 6, No. 2, p19
Minimum separation doesn't always occur at the symmetry points—Vol. 9, No. 4, p13
- KEES, M.—see Schor, C.
- KENDALL, R.: Making sense out of certification—Vol. 9, No. 4, p4
- KLOPPER, J.—see Alexander, A.H.
- KORS, K.:
The lensometer as a teaching aid—Vol. 1, No. 3, p110
On the fine art of adjusting spectacles: the teaching and learning of it—Vol. 2, No. 2, p14
- KOUZES, R.T.—see Hanen, M.E.
- KRAFT, B.:
Bates v. State Bar of Arizona—Vol. 3, No. 2, p14
State advertising prohibitions for optometrists—Vol. 3, No. 2, p15



L

- LARSON, W.L.: Applying high technology in teaching laboratories—Vol. 9, No. 3, p17
- LEWIS, D.: The new health professions law and optometric education—Vol. 2, No. 3, p27
- LEWIS, M.: A report from the Association of Vision Science Librarians—Vol. 4, No. 1, p25
- LEWIS, T.L.—see Rapp, J.
- LEVINE, N.R.:
Characteristics of applicants to schools of optometry—1971-72 to 1977-78—Vol. 4, No. 2, p8
Coping with the admissions avalanche: role of ASCO's OCAT committee—Vol. 1, No. 1, p34
- LIDDLE, E.M., and Dixon, N.: Continuing competency: the newest challenge in health care—Vol. 5, No. 4, p8
- LIPPEY, G.: Computer Assisted Test Construction—Vol. 1, No. 2, p63
- LONG, H.E.—see Amos, J.F.
- LYLE, W.M.—see Woo, G.

M

- MANNY, R.E., and Boltz, R.L.: The University of Houston infant vision clinic—Vol. 6, No. 2, p12
- MAISIAK, R.—see Wild, B.W.
- MARSHALL, E.C.: Assessment of the need for optometric education in Puerto Rico—Vol. 9, No. 2, p8
- MATTHEWS, H., and Jones, J.: A programmed course in geometric optics—Vol. 8, No. 4, p12
- McCLURE, L.H.—see Emling, R.C.
- McINTOSH, J.: Some answers to questions about mandatory continuing education—Vol. 7, No. 4, p20
- McKEE, G.W.: Optometry and elementary education—Vol. 2, No. 1, p6
- McKITRICK, J.—see Christensen, J.L.
- MILLER, G.E.: Teaching and Learning in Medical School—Vol. 1, No. 2, p63
- MONACELL, R.E.: Education for primary care—a student's view—Vol. 3, No. 2, p19
- MORTON, S.—see Woo, G.
- MOSHOS, F.: A profile of Indiana University's School of Optometry—Vol. 2, No. 3, p22
- MOU, T.W.: Teaching health care under one roof; optometric education in an integrated setting—Vol. 1, No. 2, p80

MULLEN, C.F.: The Eye Institute—a health care delivery center—Vol. 4, No. 1, p8

MURRAY, M.R.: Profile: Ferris State College of Optometry—Vol. 4, No. 4, p24

MYERS, K.J.: Veteran' Administration: we train health professionals—Vol. 1, No. 2, p58
and Danielson, D.: The Journal looks at the Veterans Administration—Vol. 3, No. 1, p6

N

NAFF, D.: Profile: The University of Alabama in Birmingham—Vol. 1, No. 4, p142

NEI Report:

Laser therapy effective in SMD treatment—Vol. 8, No. 2, p19

Optometrists invited to apply for NEI small grants—Vol. 7, No. 4, p29

Vol. 9, No. 1, p11

NELSON, H.A.: University involvement in community health, Vol. 3, No. 2, p10

NUSSENBLATT, H.: University of Houston College of Optometry externship program—Vol. 7, No. 3, p15

O

OBSTFELD, H.: Retinal image size calculations in visual optics—Vol. 6, No. 4, p24

O'ROURKE, K.D.: Health care: a profession or a business?—Vol. 8, No. 3, p4

P

PARAMORE, J.E.: Quality assurance in the off-campus clinical program of the College of Optometry, Ferris State College—Vol. 7, No. 3, p12

PEASE, P.L.:

The accelerated O.D. program: the two-year program after ten years—Vol. 8, No. 4, p15

Criterion-referenced scoring of the National Board examinations—Vol. 5, No. 2, p5

Self-scoring tests—Vol. 6, No. 1, p23

PERTSCHUK, M.: The Federal Trade Commission, advertising and consumer self protection—Vol. 4, No. 1, p6

PETERS, H.B.:

Critical optometric manpower issues—Vol. 4, No. 4, p8

The future of optometric education—Vol. 7, No. 2, p24

Health policy, optometric education and interprofessional relations—Vol. 5, No. 2, p29

Optometric education in an academic health center—Vol. 4, No. 1, p17

PHEIFFER, C.H.:

ASCO: prince or pauper—Vol. 2, No. 2, p5

Elements of excellence: the Journal as a forum—Vol. 2, No. 1, p5

Hello JOE! A salute to the new journal—Vol. 1, No. 1, p46

Journal preferences among beginning optometry students—an inter-institution comparison—Vol. 5, No. 4, p22

Needs for optometric educators—Vol. 3, No. 3,4, p7

Veterans Administration—Vol. 3, No. 1, p3

PICARELLI, J.J.—see Rapp, J.

PORTER, V.F.: Faculty workloads in a recessionary economy—Vol. 8, No. 1, p4

PROPERT, P.: No shrinking violet; profile of Pennsylvania College of Optometry—Vol. 1, No. 1, p24

Q

QUINN, T.G.: A contact lens record review system for quality assurance—Vol. 9, No. 3, p20

R

RAPP, J.; Picarelli, J.J.; Sack, R.; Chang, F.W.; and Lewis, T.L.: Symposium: the role of biological sciences in the optometric curriculum—Vol. 5, No. 3, p9

REDMOND, D.W., and Allen, J.R.: Analysis of optometric students, academic year 1975-76—Vol. 5, No. 2, p7

ROSENBLOOM, A.A.:

A constructed cost study of optometric education—Vol. 1, No. 1, p8

Relationship of the self-study process to institutional effectiveness and accreditation—Vol 7, No. 1, p13



RUSKIEWICZ, J.: Evaluation of quality assurance programs for externships—Vol. 7, No. 3, p8

S

SACK, R.—see Rapp, J.

SAMEK, M.J., and Woodruff, M.E.: Continuing education and the role of the optometrist—Vol. 3, No. 3,4, p16

SCHMITT, E.P.: Student disciplinary due process: a schoolman's occupational hazard—Vol. 1, No. 4, p150

SCHOENER, B.: Women and perceived barriers relative to optometry as a profession—Vol. 4, No. 3, p8

SCHOR, C., and Kees, M.: Graphical and normative analysis of binocular vision by mini computer: a teaching aid and clinical tool—Vol. 6, No. 4, p12

SELDEN, W.K.

A closer look at accreditation—Vol. 7, No. 1, p5

The role and responsibility of a trustee—Vol. 8, No. 4, p4

SEPTON, R.D.: A computer assisted method for analyzing curriculum content—Vol. 8, No. 3, p24

SHANSKY, M.S.—see Barry, S.H.

SIEGEL, S.L.: Counseling women in professional schools—Vol. 4, No. 3, p21

SIEGFRIED, J.B., and DiStefano, A.F.: Searching for a dean—Vol. 2, No. 2, p18

SMITH, L.W.:

Cost of education—whose responsibility?—Vol. 7, No. 4, p4

The federal role in health professions education—Vol. 5, No. 4, p5

SONI, P.S.—see Bennett, E.W.

SOROKA, M.—see Heiberger, M.H.

SPIELBERGER, D.:

Profile: Southern College of Optometry—Vol. 4, No. 3, p16

Vision Educational Foundation—a source of strength for optometry—Vol. 6, No. 4, p25

STANFILL, W.; Traylor, R. and Smith, M.: Pharmacy and optometry: an opportunity for cooperation—Vol. 6, No. 2, p8

STEPHENS, G.G.: Health manpower in relation to urban health care—Vol. 3, No. 2, p16

SUCHOFF, I.B.:

Curriculum planning in vision training: a proposed model—Vol. 1, No. 1, p20

Visual-spatial development in the child: an optometric theoretical and clinical approach—Vol. 1, No. 4, p145

V

VERMA, S.B.:

Geriatric optometry—today and tomorrow—Vol. 7, No. 4, p8

Optometric services for the non-ambulatory—Vol. 9, No. 3, p8

W

WALLIS, N.E.:

Challenge of optometric clinical competence—Vol. 7, No. 2, p5

Stop, look and listen—Vol. 1, No. 2, p52

On assuming the presidency of ASCO—Vol. 1, No. 3, p95

Why a journal?—Vol. 1, No. 1, p5

WEISS, R.: see Ebersold, L.A.—Vol. 1, No. 3, p102

WERNER, D.L.: Monitoring the quality of care in an optometric clinic—Vol. 3, No. 3,4, p19

Teaching clinical teachers—Vol. 9, No. 4, p8

WHIKEHART, D.R.: The visiting scholars program at the School of Optometry, University of Alabama in Birmingham—Vol. 8, No. 4, p24

WHITENER, J.C.:

A survey of hypertension curriculum in schools and colleges of optometry—Vol. 6, No. 4, p8

A survey of research projects in schools and colleges of optometry—Vol. 6, No. 3, p22

WILD, B.W.:

Eyes on the accreditors—Vol. 7, No. 1, p11

and Maisiak, R.: An analysis of optometric practices in rural Alabama—Vol. 6, No. 3, p8

WILLIAMS, J.F.

Communicating with parents: procedural guidelines in vision development—Vol. 2, No. 1, p8

Parent guidance—an integral part of vision therapy—Vol. 1, No. 2, p84

WOO, G.:

Aspects of optometric education in Australia—Vol. 3, No. 3,4, p32

and Lyle, W.M.: A survey on intramural and extramural practice in selected professional schools—Vol. 2, No. 3, p5

and Morton, S.: Publications by faculty of the School of Optometry, University of Waterloo, 1976 to 1978—Vol. 5, No. 3, p24

WOODRUFF, M.E.:

The pros and cons of optometry in an academic health centre—Vol. 1, No. 4, p154

see Samek, M.J.

Profile: The School of Optometry, University of Waterloo—Vol. 5, No. 1, p22

WORTHINGTON, S.P.: Building for the future; a profile of the State University of New York—Vol. 3, No. 2, p25

Y

YOUNG, F.A.: Can early diagnosis aid in treatment—Vol. 1, No. 2, p54

Impact of holistic medicine, medical groups and health concepts, Vol. 5, No. 3, p30

Introduction to patient care: a basic science course for medical students, Vol. 4, No. 3, p15

Medical student research: a program of self education, Vol. 7, No. 3, p21

Modern aging research: aging and human visual function, Vol. 8, No. 3, p23

New concepts in the teaching of behavioral science in the preclinical curriculum, Vol. 5, No. 3, p30

Optics guide, Vol. 6, No. 3, p21

Physicians and health policy, Vol. 6, No. 1, p30

Premed stereotype, Vol. 6, No. 1, p30

Problem-based criterion-referenced examination of clinical competence, Vol. 4, No. 3, p15

Retrolental fibroplasia: efficacy of vitamin E in a double blind clinical study of preterm infants, Vol. 7, No. 3, p21

Should the cost of insurance reflect the cost of use in local hospital markets, Vol. 8, No. 3, p23

Sounding board—can the education of the physician be made more rational?, Vol. 7, No. 3, p21

Sounding boards, Vol. 6, No. 3, p21

Suggested curriculum for distance vision training with optical aids, Vol. 6, No. 1, p30

Teaching medical interviewing: a critique of educational research and practice, Vol. 6, No. 1, p30

Teaching residents how to teach: a one-year study, Vol. 8, No. 3, p23

Toward independent learning: curricular design for assisting students to learn how to learn, Vol. 7, No. 3, p21

Women physicians in a non-metropolitan area, Vol. 6, No. 3, p21

Academic

freedom and tenure, Schmitt, E.P., Vol. 4, No. 1, p27

health centre, Woodruff, M.E., Vol. 1, No. 4, p154

health center, education, Peters, H.B., Vol. 1, No. 1, p17

Accelerated

O.D., Pease, P.L., Vol. 8, No. 4, p15

program, MCO's, Butterfield, P., Vol. 2, No. 1, p17

Accreditation

organizations, Wild, B.W., Vol. 7, No. 1, p11

self-study process, Rosenbloom, A.A., Vol. 7, No. 1, p13

Adjusting spectacles, Kors, K., Vol. 2, No. 2, p14

Journal of Optometric Education

Subject Index

A

Abstracts

Academic information in the academic health sciences center: roles of the library in information management, Vol. 8, No. 3, p23

Academic and personal predictors of clinical success in medical school, Vol. 4, No. 3, p15

An admission interview to measure good dentist attributes, Vol. 4, No. 4, p23

Are the case records obsolete?, Vol. 5, No. 3, p30

Beyond biology: a curriculum in methods of analysis for clinicians, Vol. 6, No. 3, p21

Competition in the delivery of medical care, Vol. 6, No. 1, p30

Current concepts in psychiatry: conversion symptoms, Vol. 7, No. 3, p21

Diseases of the curriculum, Vol. 4, No. 3, p15

Economic versus professional incentives for cost control, Vol. 8, No. 3, p23

External examinations for the evaluation of medical education achievement and for licensure, Vol. 7, No. 3, p21

God and the doctor, Vol. 6, No. 1, p30

Iatrogenic night blindness and keratoconjunctival xerosis, Vol. 5, No. 3, p30

Admissions, ASCO's OCAT, Levine, N.R., Vol. 1, No. 1, p34

Advertising restrictions, Kraft, B., Vol. 3, No. 2, p15

Affirmative action, Doctors, S., Vol. 1, No. 2, p64

Alabama

optometric practices, Wild, B.W., and Maisiak, R., Vol. 6, No. 3, p8

SOSH goes to Guatemala, Classe, J.G., Vol. 4, No. 3, p24

Alabama, University of, Naff, D., Vol. 1, No. 4, p142

visiting scholars, Whikehart, D.R., Vol. 8, No. 4, p24

AOSA, Harris, P., Vol. 4, No. 2, p18

ASCO

activities, Vol. 2, No. 3, p3; Vol. 3, No. 1, p44; Vol. 3, No. 2, p2; Vol. 4, No. 1, p4; Vol. 4, No. 3, p6; Vol. 5, No. 1, p4; Vol. 5, No. 3, p8

education and the profession, Averill, R., Vol. 3, No. 1, p20

policy, Vol. 2, No. 2, p25

priorities and purposes, Vol. 4, No. 3, p28

sustaining member section, Vol. 8, No. 3, p31

ASCO Annual Report

1979-80, Vol. 6, No. 1, p12

1980-81, Vol. 7, No. 1, p22

1981-82, Vol. 8, No. 1, p23

1982-83, Vol. 9, No. 1, p12

Applicants

OCAT, Katzell, M.E., Vol. 2, No. 1, p12

characteristics, Levine, N.R., Vol. 4, No. 2, p8

Arizona, state bar v. Bates, Kraft, B., Vol. 3, No. 2, p14

Assessment, PMP, Gross, L.J., Vol. 9, No. 1, p8

Attitudes of instructors, Janoff, L.E., Vol. 3, No. 1, p22

Australia, optometric education, Woo, G., Vol. 3, No. 3,4, p32

B

Bates v. Arizona state bar, Kraft, B., Vol. 3, No. 2, p14

Behavioral objectives, performance standards, Abplanalp, P., Vol. 8, No. 2, p6

Berkeley, University of California, Godske, S. and Carter, J., Vol. 4, No. 2, p4

Binocular vision, analysis by mini-computer, Schor, C., and Kees, M., Vol. 6, No. 4, p12

Biochemistry curriculum, Howard, C.F., Vol. 3, No. 3,4, p23

Biological sciences, Rapp J., Vol. 5, No. 3, p9

Book Reviews

Aging and Mental Health, Vol. 4, No. 4, p23

Color Atlas of Contact Lenses, Vol. 8, No. 3, p30

Computer Assisted Test Construction, Vol. 1, No. 2, p63

Construction and Use of Written Stimulations, Vol. 3, No. 1, p25

Developing Programs for Faculty Evaluation, Vol. 1, No. 1, p33

Selection and Evaluation of Teachers, Vol. 1, No. 1, p33

Teaching and Learning in Medical School, Vol. 1, No. 2, p63

Visual-Spatial Development in the Child: An Optometric Theoretic and Clinic Approach, Vol. 1, No. 4, p145

Buckley Amendment, Harrelson, B.J., Vol. 1, No. 1, p30

C

Challenge

education trends, Baldwin, W.R., Vol. 1, No. 2, p74

programmed instruction, Gibson, M.R., Vol. 1, No. 4, p146

Characteristics of professions, Christensen, J.L., Vol. 3, No. 3,4, p8

Clinical

binocular vision analysis, Schor, C., and Kees, M., Vol. 6, No. 4, p12

instruction, computer aided, Hanen, M.E., and Kouzes, R.T., Vol. 2, No. 2, p8

instruction, faculty workshop, ASCO, Vol. 5, No. 3, p16

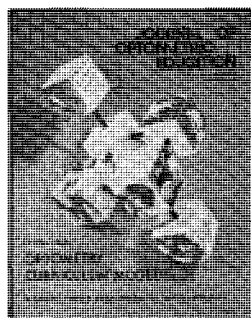
outreach programs, Jolley, J.L., Vol. 4, No. 2, p20

performance standards, Abplanalp, P., Vol. 8, No. 2, p6

practice training, Greenspon, T.S., Vol. 1, No. 1, p28

program, Ferris State College, Paramore, J.E., Vol. 7, No. 3, p12

practicum examination model, Eskridge, J.B., Vol. 5, No. 1, p27



psychometric advances, Gross, L.J., Vol. 7, No. 1, p15

skills in . . . teaching, Bauer, L., Alexander, A.H., Vol. 9, No. 4, p16

teaching . . . teachers, Werner, D.L., Vol. 9, No. 4, p8

student orientation, Brookman, K.E., Vol. 8, No. 2, p20

Clinical competence

American Academy of Optometry, Vol. 7, No. 2, p8

assessment, Eskridge, J.B., Vol. 7, No. 2, p12

status of academic optometry, Brazelton, F.A., Vol. 7, No. 2, p9

Combined-response options, Gross, L.J., Vol. 7, No. 4, p22

Communication

parents, Williams, J.F., Vol. 2, No. 1, p8

patient, Bennett, E.S., Vol. 8, No. 2, p10

Community health

curricula, Clausen, L.R., Vol. 3, No. 2, p5

university involvement, Nelson, H.A., Vol. 3, No. 2, p10

Computer

aided clinical instruction, Hanen, M.E., and Kouzes, R.T., Vol. 2, No. 2, p8

analyzing curriculum, Septon, R.D., Vol. 8, No. 3, p24

assisted National Board reviews, Giambalvo, V., Dippner, R.S., and Domnitch, D., Vol. 3, No. 3, 4, p28

binocular vision analysis, Schor, C., and Kees, M., Vol. 6, No. 4, p12

simulation, Nussenblatt, H., Vol. 9, No. 1, p24

Contact lens

curriculum, Bennett, E.S., and Soni, P.S., Vol. 8, No. 3, p8

record review, Quinn, T.G., Vol. 9, No. 3, p17

Continuing competency, Liddle, E.M., and Dixon, N., Vol. 5, No. 4, p8

Continuing education

curriculum, Vol. 2, No. 3, p1

financing, Elliott, R.B., Vol. 7, No. 2, p26

mandatory, McIntosh, J., Vol. 7, No. 4, p20

non-print media, Johnson, D.F., Vol. 8, No. 3, p12

role of optometrist, Vol. 3, No. 3,4, p16

United States, Elliott, R.B., Vol. 6, No. 1, p25

Cost, optometric education, Rosenbloom, A.A., Vol. 1, No. 1, p8

Council on Optometric Education
 1975 report to AOA House of Delegates, Vol. 1, No. 3, p116
 1976 report to AOA House of Delegates, Vol. 2, No. 3, p18
 1977-78 Annual Survey of Optometric Educational Institutions—Vol. 4, No. 2, p27
 1978-79 Annual Survey of Optometric Educational Institutions—Vol. 5, No. 4, p27
 1979-80 Annual Survey of Optometric Educational Institutions—Vol. 6, No. 2, p23
 1980-81 Annual Survey of Optometric Educational Institutions—Vol. 7, No. 3, p22
 1981-82 Annual Survey of Optometric Educational Institutions—Vol. 8, No. 2, p24
 1982-83 Annual Survey of Optometric Educational Institutions—Vol. 9, No. 2, p24

Counseling women, Siegel, S.L., Vol. 4, No. 3, p21

Course

geometric optics, Matthews, H., and Jones, J., Vol. 8, No. 4, p12
 professional-level, Christensen, J.L., and McKittrick, J., Vol. 5, No. 4, p12

COVID, Kane, M., Vol. 8, No. 2, p22

Credentialing

and education, Gross, L.J., Vol. 7, No. 1, p8
 PMP assessment, Gross, L.J., Vol. 9, No. 1, p8

Curriculum

ASCO model, Vol. 1, No. 3, p96
 biochemistry, Howard, C.F., Vol. 3, No. 3,4, p23
 biological sciences, Rapp, J., Vol. 5, No. 3, p9
 computer analyzing, Septon, R.D., Vol. 8, No. 3, p24
 contact lens, Bennett, E.S., and Soni, P.S., Vol. 8, No. 3, p8
 continuing education, Vol. 2, No. 3, p16
 hypertension, Whitener, J.C., Vol. 6, No. 4, p8
 model, ASCO Council on Academic Affairs, Vol. 4, No. 1, p11
 pharmacology, ASCO Council on Academic Affairs, Vol. 4, No. 4, p18
 practice management, Classe, J.G., Vol. 5, No. 2, p16
 professional development and administration, ASCO Council on Academic Affairs, Vol. 5, No. 2, p18
 public and community health, Clausen, L.R., Vol. 3, No. 2, p5
 student research, Barry, S.H. and Shansky, M.S., Vol. 3, No. 3,4, p36

vision training, Suchoff, I.B., Vol. 1, No. 1, p20

D

Dean, searching for a, Siegfried, J.B., and DiStefano, A.F., Vol. 2, No. 2, p18

Demographics, Puerto Rico, Marshall, E.C., Vol. 9, No. 2, p8

Dental, employment checklist, Casamassimo, P.S., Vol. 5, No. 4, p17

Diagnosis
 treatment aid, Young, F.A., Vol. 1, No. 2, p54

Discrimination, Doctors, S., Vol. 1, No. 2, p64

Discipline, student, Schmitt, E.P., Vol. 1, No. 4, p150

E

Editorials

A closer look at accreditation, Vol. 7, No. 1, p5

A look at the year ahead, Vol. 5, No. 1, p9

ASCO: prince or pauper, Vol. 2, No. 2, p5

An area of vital interest, Vol. 4, No. 2, p3

Challenge of optometric clinical competence, Vol. 7, No. 2, p5

Clinical training via external or adjunct assignments, Vol. 7, No. 3, p4

Constraints on all sides—crisis and opportunity, Vol. 4, No. 3, p5

Cost of education—whose responsibility?, Vol. 7, No. 4, p4

Criterion-referenced scoring of the National Board examinations, Vol. 5, No. 2, p5

Elements of excellence: the Journal as a forum, Vol. 2, No. 1, p5

Evaluating optometric education, Vol. 6, No. 3, p5

Faculty workloads in a recessionary economy, Vol. 8, No. 1, p4

Federal role in health professions education, Vol. 5, No. 4, p5

Federal Trade Commission, advertising and consumer self protection, Vol. 4, No. 1, p6

From Saint Louis to Milan, Vol. 4, No. 4, p5

Havighurst report: an update, Vol. 1, No. 4, p129

Health care: a profession or a business?, Vol. 8, No. 3, p4

Importance of physical diagnosis in primary care optometry, Vol. 6, No. 4, p5

Making sense out of certification, Kendall, R., Vol. 9, No. 4, p4

Needed: A coalition of clinicians, Blume, A.J., Vol. 5, No. 3, p4

Needs for optometric educators, Vol. 3, No. 3,4, p7

On assuming the presidency of ASCO, Vol. 1, No. 3, p95

On solid footing, Vol. 9, No. 1, p5

Optometry to the year 2000: the need for a public study, Vol. 6, No. 2, p5

Producing competent clinicians: the role of behavioral objectives, Vol. 8, No. 2, p4

Research in optometry: a crucial need, Vol. 9, No. 3, p5

The role and responsibility of a trustee, Vol. 8, No. 4, p4

Stop, look and listen, Vol. 1, No. 2, p52

Why a journal?, Vol. 1, No. 1, p5

Year in review: a look at JOE's progress, Vol. 6, No. 1, p4

Veterans Administration, Vol. 3, No. 1, p3

Education

academic health center, Peters, H.B., Vol. 1, No. 1, p17

A call for consensus, Baldwin, W.R., Vol. 2, No. 2, p6

achievement of excellence, Haffner, A.N., Vol. 2, No. 1, p22

ASCO and the profession, Averill, R., Vol. 3, No. 1, p20

Australia, Woo, G., Vol. 3, No. 3,4, p32

characteristics, Christensen, J.L., Vol. 3, No. 3,4, p8

clinical instruction, ASCO, Vol. 5, No. 3, p16

computer simulation, Nussenblatt, H., Vol. 9, No. 1, p24

cost study, optometric education, Rosenbloom, A.A., Vol. 1, No. 1, p8

credentialing, Gross, L.J., Vol. 7, No. 1, p8

educator's trilogy, Hofstetter, H.W., Vol. 1, No. 4, p138

effective learning environment, Janoff, L.E., Vol. 1, No. 4, p135

elementary, McKee, G.W., Vol. 2, No. 1, p6

federal program support, 1980-81, Vol. 6, No. 2, p16

future, Peters, H.B., Vol. 7, No. 2, p24

dilemma, Janoff, L.E., Vol. 2, No. 1, p31

health policy, Peters, H.B., Vol. 5, No. 2, p29

health professions, Classe, J.G., Vol. 3, No. 2, p22

international perspectives, Yarmovsky, R., Vol. 6, No. 3, p18

national goals, Baldwin, W.R., Vol. 1, No. 1, p2
 1970's, Gold, A.R., Vol. 1, No. 3, p120
 outreach clinical programs, Jolley, J.L., Vol. 4, No. 2, p20
 PMP, Gross, L.J., Vol. 7, No. 1, p8
 progress and problems, Great Britain, Ball, G.V., Vol. 1, No. 4, p132
 Puerto Rico, Marshall, E.C., Vol. 9, No. 2, p8
 rehabilitative optometry, ASCO, Vol. 7, No. 4, p12
 South Africa, Hofstetter, H.W., Vol. 6, No. 1, p8
 student's view, Monacell, R.E., Vol. 3, No. 2, p19

Educators

Association of Optometric, Adler-Gringer, D., Vol. 5, No. 1, p14
 optometric training, Janoff, L.E., Vol. 1, No. 1, p14

Employment, dental educators, Casamassimo, P.S., Vol. 5, No. 4, p17

Equal opportunity, Doctors, S., Vol. 1, No. 2, p64

Evaluation, externships, Ruskiewicz, J., Vol. 7, No. 3, p8

Examination, clinical practicum, Vol. 5, No. 1, p27

Externships

evaluation, Ruskiewicz, J., Vol. 7, No. 3, p8
 University of Houston, Nussenblatt, H., Vol. 7, No. 3, p15

Extramural practice, Woo, G. and Lyle, W.M., Vol. 2, No. 3, p5

Eye Institute

Mullen, C.F., Vol. 4, No. 1, p8
 residencies, Alexander, A.H., and Klopfer, J., Vol. 8, No. 4, p20

F

Faculty

publications, University of Waterloo, Woo, G., and Morton, S., Vol. 5, No. 3, p24
 skills in clinical teaching, Bauer, L. and Alexander, A.H., Vol. 9, No. 4, p16
 workload, Bleything, W.B., Vol. 8, No. 1, p6
 workshop, clinical instruction, Vol. 5, No. 3, p16

Faculty workload

defining, Bleything, W.B., Vol. 8, No. 1, p6
 elements, Bleything, W.B., Vol. 8, No. 1, p11
 formulas, Bleything, W.B., Vol. 8, No. 1, p18

Federal health, manpower recommendations, ASCO, Vol. 6, No. 1, p19

Federal policy, Heiberger, M.H., and Soroka, M., Vol. 4, No. 2, p15

Federal program support of optometric education, 1980-81, Vol. 6, No. 2, p16

Ferris State College of Optometry

clinical program, Paramore, J.E., Vol. 7, No. 3, p12
 profile, Murray, M.R., Vol. 4, No. 4, p24

Financing continuing education, Elliott, R.B., Vol. 7, No. 2, p26

G

Geometric optics, Matthews, H., and Jones, J., Vol. 8, No. 4, p12

Geriatric optometry, Verma, S.B., Vol. 7, No. 4, p8

H

Health

academic centre, Woodruff, M.E., Vol. 1, No. 4, p154
 manpower, Stephens, G.G., Vol. 3, No. 2, p16
 policy and education, Peters, H.B., Vol. 5, No. 2, p29
 professions, education, Classe, J.G., Vol. 3, No. 2, p22
 Puerto Rico, Marshall, E.C., Vol. 9, No. 2, p8

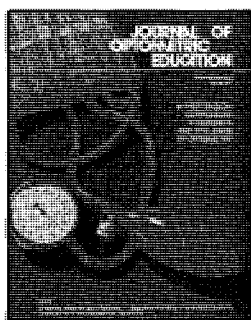
Health care

delivery center, Mullen, C.F., Vol. 4, No. 1, p8
 teaching, Mou, T.W., Vol. 1, No. 2, p80
 professions law, Lewis, D., Vol. 2, No. 3, p27
 urban, Stephens, G.G., Vol. 3, No. 2, p1

High technology, Larson, W.L., Vol. 9, No. 3, p17

Houston, University of

infant vision clinic, Manny, R.E., and Boltz, R.L., Vol. 6, No. 2, p12



externship program, Nussenblatt, H., Vol. 7, No. 3, p15
 journal preferences, Pheiffer, C.H., Vol. 5, No. 4, p22
 profile, Vol. 3, No. 1, p28
 Hypertension curriculum, Whitener, J.C., Vol. 6, No. 4, p8

I

IAU, Puerto Rico, Marshall, E.C., Vol. 9, No. 2, p19

Indiana University

pharmacology courses, Hegeman, S., Vol. 9, No. 1, p22
 profile, Vol. 2, No. 3, p22

Infant vision clinic, Manny, R.E., and Boltz, R.L., Vol. 6, No. 2, p12

Instruction, programmed, Gibson, M.R., Vol. 1, No. 4, p146
 M.R., Vol. 1, No. 4, p146

Instructors attitudes, Janoff, L.E., Vol. 3, No. 1, p22

Inter American University, Hofstetter, H.W., Vol. 7, No. 1, p20

International Perspectives, Yarmovsky, R., Vol. 6, No. 3

Interview, Russ Dorland, Vol. 6, No. 3, p15

Intramural, Woo, G., and Lyle, W.M., Vol. 2, No. 3, p5

J

Journal preferences

Indiana University, Hofstetter, H.W., Vol. 4, No. 4, p28
 University of Houston and Indiana University, Pheiffer, C.H., Vol. 5, No. 4, p22
 JOE, Pheiffer, C.H., Vol. 1, No. 1, p46

L

Laboratories, Larson, W.L., Vol. 9, No. 3, p17

Learning, Janoff, L.E., Vol. 1, No. 4, p135

Lecturing, Johnson, H.D., Vol. 1, No. 2, p100

Lensometer, Kors, K., Vol. 1, No. 2, p110

Libraries

visual science, AVSL, Vol. 2, No. 2, p21
 guidelines, Egan, E., Vol. 2, No. 3, p8

Librarians report, Lewis, M., Vol. 4, No. 1, p25

M

Manpower

- critical issues, Peters, H.B., Vol. 4, No. 4, p8
- federal health recommendations, ASCO, Vol. 6, No. 1, p19
- needs, Puerto Rico, Marshall, E.C., Vol. 9, No. 2, p13
- MCO's, accelerated program, Butterfield, P., Vol. 2, No. 1, p17
- Model, vision training curriculum, Such-off, I.B., Vol. 1, No. 1, p20
- Multiple-choice, tests, Gross, L.J., Vol. 7, No. 4, p22

N

- National Board, computer assisted reviews, Giambalvo, V., Dippner, R.S., and Domnitch, D., Vol. 3, No. 3,4, p28
- National goals, optometric education, Baldwin, W.R., Vol. 1, No. 1, p2
- NEI Report
 - laser therapy, Vol. 8, No. 2, p19
 - small grants, Vol. 7, No. 4, p29
 - Vol. 9, No. 1, p11
- New York, State University of, Worthington, S.P., Vol. 3, No. 2, p25
- Non-ambulatory, optometric services, Verma, S.B., Vol. 9, No. 3, p8
- Non-print media, Johnson, D.F., Vol. 8, No. 3, p12

O

OCAT

- admissions, Levine, N.R., Vol. 1, No. 1, p34
- applicants, Katzell, M.E., Vol. 2, No. 1, p12
- update, ASCO National Office, Vol. 2, No. 2, p12

Ocular pathology

- training, Hirsch, J.A., Vol. 1, No. 3, p107

- Ohio, optometric practices, Augsburger, A., Vol. 8, No. 3, p16

- Ohio State, Hebbard, F.W., Vol. 1, No. 2, p70

- Optometric clinic, monitoring quality, Werner, D.L., Vol. 3, No. 3,4, p19

- Optometric education, health professions law, Lewis, D., Vol. 2, No. 3, p27

Optometric practices

- Ohio, Augsburger, A., Vol. 8, No. 3, p16
- rural Alabama, Wild, B.W., and Maisiak, R., Vol. 6, No. 3, p8

- Optometric services, for non-ambulatory, Verma, S.B., Vol. 9, No. 3, p8

Optometrist

- continuing education, Samek, M.J., and Woodruff, M.E., Vol. 3, No. 3,4, p16
- role, Haffner, A.N., Vol. 4, No. 4, p6

Optometry

- applicants, Levine, N.R., Vol. 4, No. 2, p8
- and pharmacy, Stanfill, W., Traylor, R., and Smith, M., Vol. 6, No. 2, p8
- Orientation, clinical, Brookman, K.E., Vol. 8, No. 2, p20

- Outreach, Jolley, J.L., Vol. 4, No. 2, p20

P

- Pacific University, Filer, C., Vol. 1, No. 3, p113

Parent

- communicating with, Williams, J.F., Vol. 2, No. 1, p8
- vision therapy, Williams, J.F., Vol. 1, No. 2, p84

- Patient, communication, Bennett, E.S., Vol. 8, No. 2, p10

Pennsylvania College of Optometry

- Eye Institute, Mullen, C.F., Vol. 4, No. 1, p8
- profile, Propert, P., Vol. 1, No. 1, p24
- residencies, Alexander, A.H., and Klopfer, J., Vol. 8, No. 4, p20

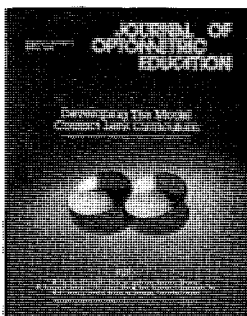
- Pharmaceutical sciences, Gibson, M.R., Vol. 1, No. 4, p146

Pharmacology

- continuing education curriculum, Vol. 2, No. 3, p16
- curriculum model, ASCO Council on Academic Affairs, Vol. 4, No. 4, p18
- Indiana University, Hegeman, S., Vol. 9, No. 1, p22

- Pharmacy and optometry, Stanfill, W., Traylor, R., and Smith, M., Vol. 6, No. 2, p8

- Policy, ASCO, Vol. 2, No. 2, p25



Practice

- intramural and extramural, Woo, G., and Lyle, W.M., Vol. 2, No. 3, p5
- management, Classe, J.G., Vol. 5, No. 2, p16

- Practitioner, as teacher, Dunskey, I.L., Vol. 7, No. 3, p18

- President's, national goals, Baldwin, W.R., Vol. 1, No. 1, p2

- Primary health care, Baldwin, W.R., Vol. 7, No. 1, p19

- Primary care, student's view, Monacell, R.E., Vol. 3, No. 2, p19

Professional

- development, ASCO Council on Academic Affairs, Vol. 5, No. 2, p18
- schools, Woo, G., and Lyle, W.M., Vol. 2, No. 3, p5

Professionalism

- in defense, Haffner, A.N., Vol. 5, No. 1, p10
- obsolete?, Haffner, A.N., Vol. 6, No. 1, p5

Profile

- Alabama, University of, Naff, D., Vol. 1, No. 4, p142
- Berkeley, University of California, Godske, S., and Carter, Jr., Vol. 4, No. 2, p4
- Ferris State College of Optometry, Murray, M.R., Vol. 4, No. 4, p24
- Goldberg, Dr. Fred, Vol. 5, No. 2, p25
- Houston, University of, Vol. 3, No. 1, p28
- Illinois College of Optometry, Vol. 3, No. 3,4, p40
- Indiana University, Vol. 2, No. 3, p22
- Inter American University, Hofstetter, H.W., Vol. 7, No. 1, p20
- New York, State University of, Worthington, S.P., Vol. 3, No. 2, p25
- Ohio State, Hebbard, F.W., Vol. 1, No. 2, p7
- Pacific University, Filer, C., Vol. 1, No. 3, p113
- Pennsylvania College of Optometry, Propert, P., Vol. 1, No. 1, p24
- Southern College of Optometry, Spielberger, D., Vol. 4, No. 3, p16
- Waterloo, University of, Woodruff, M.E., Vol. 5, No. 1, p22

- Psychometric advances, Gross, L.J., Vol. 7, No. 1, p15

- Public health curricula, Clausen, L.R., Vol. 3, No. 2, p5

- Publications, faculty, Woo, G., and Morton, S., Vol. 5, No. 3, p24

Puerto Rico

- education, Marshall, E.C., Vol. 9, No. 2, p8
- characteristics, Marshall, E.C., Vol. 9, No. 2, p8

vision care manpower needs, Marshall, E.C., Vol. 9, No. 2, p13
IAU, Marshall, E.C., Vol. 9, No. 2, p19

Q

Quality assurance

externships, Ruskiewicz, J., Vol. 7, No. 3, p8
clinical programs, Ferris State College, Paramore, J.E., Vol. 7, No. 3, p12
contact lens, Quinn, T.G., Vol. 9, No. 3, p17

Quality

of care, Werner, D.L., Vol. 3, No. 3, p19
review clinic, Hanlon, S.D., and Jue, N., Vol. 9, No. 3, p12

R

Raleigh's criterion, Keating, M.P., Vol. 6, No. 2, p19

Record review, contact lens, Quinn, T.G., Vol. 9, No. 3, p17

Rehabilitative optometry, ASCO, Vol. 7, No. 4, p12

Research

projects in schools and colleges, Whitener, J.C., Vol. 6, No. 3, p22

Residency

Eye Institute, Alexander, A.H., and Klopfer, J., Vol. 8, No. 4, p20
optometric, Bleything, W.B., Vol. 5, No. 1, p16
skills in clinical teaching, Bauer L. and Alexander, A.H., Vol. 9, No. 4, p16

Resource Reviews

Atlas of the peripheral retina, Vol. 9, No. 3, p23
Definitive study of your future in new optometric careers, Vol. 4, No. 2, p26
Cataract surgery and its complications, Vol. 6, No. 4, p23
Clinical guide to soft contact lenses, Vol. 5, No. 2, p6
Clinical optics, Vol. 4, No. 2, p26
COA practice reference manual, Vol. 8, No. 4, p27
Complications of contact lenses, Vol. 7, No. 2, p7
Contact lenses, Vol. 7, No. 2, p7
Cornea, cornea, cornea—keratitis and corneal injury, Vol. 9, No. 3, p23
Current ocular therapy, Vol. 6, No. 4, p23
Diabetic renal-retinal syndrome, Vol. 7, No. 4, p24

Diabetic retinopathy clinical evaluation and management, Vol. 7, No. 4, p24

Framework for student affairs at schools and colleges of optometry, Vol. 5, No. 2, p6

Guide to education for the health professions, Vol. 5, No. 2, p6

Handbook of health education, Vol. 5, No. 4, p6

Headache, Vol. 6, No. 4, p23

The lacrimal system, Vol. 9, No. 3, p23

Measuring medical education: the tests and experience of the National Board of Medical Examiners, Vol. 5, No. 4, p6

Microsurgery of the glaucomas, Vol. 5, No. 2, p6

Ocular anatomy embryology and teratology, Vol. 8, No. 4, p27

Ocular immunology, Vol. 7, No. 4, p24

Ocular pathology update, Vol. 6, No. 2, p30

Ocular therapeutics and pharmacology, Vol. 7, No. 4, p24

Optometry and health maintenance organizations, Vol. 6, No. 2, p30

Optometry handbook, Vol. 7, No. 2, p7

Optometry in third party programs, Vol. 2, No. 3, p15

Practical evaluation of eyes with opaque media, Vol. 9, No. 3, p23

Presurgical evaluation of eyes with opaque media, Vol. 9, No. 3, p23

Primary care, Vol. 3, No. 3, p15

Primary care optometry: a clinical manual, Vol. 8, No. 4, p27

Programmed text on optometric and medical terminology, Vol. 3, No. 3, p15

Public health optometry, Vol. 4, No. 1, p24

Public health and community optometry, Vol. 5, No. 4, p6

Rural optometry, Vol. 3, No. 3, p15

Safety with lasers and other optical sources, Vol. 6, No. 2, p30

The science of photo medicine, Vol. 8, No. 4, p27

Sight and sounds in ophthalmology, slide tape presentation, Vol. 6, No. 4, p23

Symposium on medical and surgical diseases of the cornea, Vol. 6, No. 2, p30

Vision: its impact on learning, Vol. 4, No. 1, p24

Retina, size calculations, Obstfeld, H., Vol. 6, No. 4, p24

Review clinic, Hanlon, S.D., and Jue, N., Vol. 9, No. 3, p12

Role, optometrist, Haffner, A.N., Vol. 4, No. 4, p6

S

Schools and colleges, research survey, Vol. 6, No. 3, p22

Searching for a dean, Siegfried, J.B., and DiStefano, A.F., Vol. 2, No. 2, p18

Self-scoring tests, Pease, P.L., Vol. 6, No. 1, p23

Self-study, accreditation, Rosenbloom, A.A., Vol. 7, No. 1, p13

Shortage areas, Heiberger, M.H., and Soroka, M., Vol. 4, No. 2, p15

Simulation, computer, Nussenblatt, H., Vol. 9, No. 1, p24

Southern College of Optometry, Spielberger, D., Vol. 4, No. 3, p16

Socioeconomic characteristics, Puerto Rico, Marshall, E.C., Vol. 9, No. 2, p8

Specialties

making sense out of certification, Kendall, R., Vol. 9, No. 4, p4

Spectacles, adjusting, Kors, K., Vol. 2, No. 2, p14

State University of New York, Worthington, S.P., Vol. 3, No. 2, p25

Student

AOSA, Harris, P., Vol. 4, No. 2, p18

Buckley Amendment, Harrleson, B.J., Vol. 1, No. 1, p30

discipline, Schmitt, E.P., Vol. 1, No. 4, p150

Journal preferences, Indiana University, Hofstetter, H.W., Vol. 4, No. 4, p28

Journal preferences, University of Houston and Indiana University, Pfeiffer, C.H., Vol. 5, No. 4, p22
orientation, clinical, Brookman, K.E., Vol. 8, No. 2, p20

patient communication, Bennett, E.S., Vol. 8, No. 2, p10

practitioner as teacher, Dunskey, I.L., Vol. 7, No. 3, p18

research, Barry, S.H. and Shansky, M.S., Vol. 3, No. 3, p36

survey, Redmond, D.W., and Allen, J.R., Vol. 5, No. 2, p7

tutorial, Heath, D.A., Hines, C., and Kamens, H.R., Vol. 8, No. 4, p9

view of primary care education, Monacell, R.E., Vol. 3, No. 2, p19

vocational interests, Emling, R.C., Vol. 6, No. 4, p17

South Africa, Hofstetter, H.W., Vol. 6, No. 1, p8

SOSH, Alabama, Classe, J.G., Vol. 4, No. 3, p24

Survey

- optometric educational institutions, 1977-78, Vol. 4, No. 2, p27
- optometric educational institutions, 1978-79, Vol. 5, No. 4, p27
- optometric educational institutions, 1979-80, Vol. 6, No. 2, p23
- optometric educational institutions, 1980-81, Vol. 7, No. 3, p22
- optometric educational institutions, 1981-82, Vol. 8, No. 2, p24
- optometric educational institutions, 1982-83, Vol. 9, No. 3, p24
- professional schools, Woo, G., and Lyle, W.M., Vol. 2, No. 3, p5
- reader, Vol. 7, No. 4, p25
- research projects, Whitener, J.C., Vol. 6, No. 3, p22
- student, Redmond, D.W., and Allen, J.R., Vol. 5, No. 2 p7

Symmetry points

- minimum separation, Keating, M.P., Vol. 9, No. 4, p13

Symposium

- biological sciences, Rapp, J., Vol. 5, No. 3, p9
- clinical competence, American Academy of Optometry, Vol. 7, No. 2, p8

T

Teaching

- adjusting spectacles, Kors, K., Vol. 2, No. 2, p14
- clinical teachers, Werner, D.L., Vol. 9, No. 4 p8
- good, Abplanalp, P.H., and Baldwin, W.R., Vol. 8, No. 3, p19
- health care, Mou, T.W., Vol. 1, No. 2, p80
- professional-level courses, Christensen, J.L., and McKittrick, J., Vol. 5, No. 4, p12
- skills in clinical, Bauer, L. and Alexander A.H., Vol. 9, No. 4, p16

Teaching aid

- binocular vision, mini computer analysis, Schor, C., and Kees, M., Vol. 6, No. 4, p12
- lensometer, Kors, K., Vol. 1, No. 2, p110

Teacher, as practitioner, Dunskey, I.L., Vol. 7, No. 3, p18

Tenure

- historical perspective, Schmitt, E.P., Vol. 4, No. 1, p27
- legal, Ebersold, L.A. and Weiss, R., Vol. 1, No. 3, p102

Tests

- self-scoring, Pease, P.L., Vol. 6, No. 1, p23

combined-response options, Gross, L.J., Vol. 7, No. 4, p22

Training

- clinical practice, Greenspon, T.S., Vol. 1, No. 1, p28
- ocular pathology, Hirsch, J.A., Vol. 1, No. 3, p107
- optometric educators, Janoff, L.E., Vol. 1, No. 1, p14

Treatment

- diagnosis, Young, F.A., Vol. 1, No. 2, p54

Tuition, Eure, S.B., Vol. 4, No. 4, p13

Tutorial, Heath, D.A., Hines, C., and Kamens, H.R., Vol. 8, No. 4, p9

Two-dimensional PMP, Gross, L.J., Vol. 7, No. 1, p8

U

University

- dilemma, Janoff, L.E., Vol. 2, No. 1, p31

University of Alabama

- profile, Naff, D., Vol. 1, No. 4, p142
- visiting scholars, Whikehart, D.R., Vol. 8, No. 4, p24

University of California, Berkeley, Godske, S. and Carter, J., Vol. 4, No. 2, p4

University of Houston

- infant vision clinic, Manny, R.E., and Boltz, R.L., Vol. 6, No. 2, p12
- externship program, Nussenblatt, H., Vol. 7, No. 3, p15
- journal preferences, Pheiffer, C.H., Vol. 5, No. 4, p22
- profile, Vol. 3, No. 1, p28

University of Waterloo

- faculty publications, Woo, G., and Morton, S., Vol. 5, No. 3, p24
- profile, Woodruff, M.E., Vol. 5, No. 1, p22

V

Veterans Administration

- interview with, Danielson, D., and Myers, K., Vol. 3, No. 1, p6
- health professions, Myers, K.J., Vol. 1, No. 2, p58

Vision Educational Foundation, Spielberger, D., Vol. 6, No. 4, p25

Vision

- development, communicating with parents, Williams, F.J., Vol. 2, No. 1, p8
- therapy, parent guidance, Williams, J.F., Vol. 1, No. 2, p84
- training curriculum model, Suchoff, I.B., Vol. 1, No. 1, p20

Vision care needs, Puerto Rico, Marshall, E.C., Vol. 9, No. 2, p13

Visiting scholars, University of Alabama, Whikehart, D.R., Vol. 8, No. 4, p24

Visual optics, retinal image, Obstfeld, H., Vol. 6, No. 4, p24

Visual science

- librarians report, Lewis, M., Vol. 4, No. 1, p25
- libraries, AVSL, Vol. 2, No. 2, p21
- library guidelines, Egan, E., Vol. 2, No. 3, p8

Vocational, student interests, Emling, R.C., Vol. 6, No. 4, p17

VOSH, Vol. 6, No. 3, p15

W

Waterloo, University of

- faculty publications, Woo, G., and Morton, S., Vol. 5, No. 3, p24
- profile, Woodruff, M.E., Vol. 5, No. 1, p22

Women

- counseling, Siegel, S.L., Vol. 4, No. 3, p21
- perceived barriers, Schoener, B., Vol. 4, No. 3, p8

Workload

- faculty, Bleything, W.B., Vol. 8, No. 1, p6

Workload, faculty

- defining, Bleything, W.B., Vol. 8, No. 1, p6
- elements, Bleything, W.B., Vol. 8, No. 1, p11
- formulas, Bleything, W.B., Vol. 8, No. 1, p18

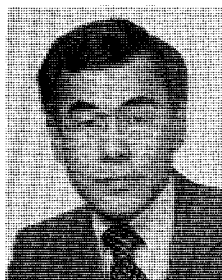
Workshop, clinical instruction, ASCO, Vol. 5, No. 3, p16

Single copies of the issues of JOE are available from Journal of Optometric Education, Suite 410, 600 Maryland Ave., S.W., Washington, D.C. 20024, at \$2.50 per issue postage paid. Individual reprints are not available.

(continued from page 7)

Science degree in Education from Yeshiva University.

Dr. Roy K.A. Wesley has been elected president of the National Eye Research Foundation by its Board of Directors. Dr. Wesley intends to "provide a new atmosphere of commitment and participation by eye care professionals in order to enable them to re-dedicate their lives to the quality of professional eye care in the best interests of the public."



Roy Wesley,
O.D., Ph.D.

Dr. Wesley has been a member of the National Eye Research Foundation Board of Directors for 11 years and a member of the Executive Committee of the Foundation for the past 3 years.

The Foundation is international in membership. Continuing education for the eye care professions is provided through meetings and symposia held in the United States and abroad and also by the publication of a journal of scientific and clinical findings. The Foundation sponsors students in ophthalmology and optometry through annual scholarship grants and also provides support for research scientists working on specific eye care problems.

Dr. Wesley holds his doctor of optometry degree from New England College of Optometry in Boston.

CALL FOR PAPERS

The *Journal of Optometric Education (JOE)* cordially invites all educators, administrators, students, practitioners and others with a demonstrable interest in optometric education to submit manuscripts for publication consideration for the academic year 1983-84.

The *Journal* is a national quarterly publication of the Association of Schools and Colleges of Optometry. Its circulation encompasses all U.S.

and foreign accredited optometric educational institutions, as well as private practitioners, government leaders and others in the health care field. Established in 1975 as a forum for the exchange of information pertinent to optometric education, the *Journal* now represents the only publication devoted entirely to the educational aspect of the profession.

All authors wishing to submit

manuscripts are directed to comply with the attached guidelines. Manuscripts will be formally reviewed by experts in the selected subject area, and authors will be notified of reviewer recommendations.

For further information or to submit manuscripts or queries contact:

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

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 8 1/2" 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 3600 words or approximately fifteen double-spaced typewritten pages.

References and Illustrations

References should conform to Index Medicus style and should be keyed to the text in numerical order. For journal references, give the author's name, article title, journal title, standard abbreviation, volume number, issue number, inclusive pages, month and year. For books, give the author's name, book title, location and name of publisher, and year of publication. Exact page numbers are required for direct quotations from books. Limit references to those specifically referred to in the text, with all references listed on a separate page at the end of the manuscript.

Tables or charts should be typed on a separate page, numbered, titled and cited in the text. Tables should be numbered consecutively and tailored to fit within column width or page width. Line and halftone illustrations should be of high quality for satisfactory reproduction and

should be submitted in duplicate if possible. Illustrations must be numbered and cited in the text. Please do not bend, fold or use paper clips on photographs.

Special charges to the author may be made whenever special composition costs exceed standard costs.

Proofing and Editing

The author should proof his copy both for content and mechanics. Manuscripts should be well-edited by the author before being submitted to *JOE*. The *JOE* editorial staff reserves the right to edit manuscripts to fit articles within space available and to ensure conciseness, clarity and stylistic consistency. Authors will be notified upon receipt of manuscripts and advised of any proposed significant editorial changes prior to publication.

Identification and Reprints

Authors must be identified by academic rank and institution, with brief biographical notes included on a separate page. Reprints of all articles are available upon request.



A successful optometrist needs two things. The Army offers both.

Experience: your future in optometry depends on the experience you can accumulate. And you'll get more experience in your first term in the Army than some optometrists do in a lifetime. You'll see and treat all kinds of eye problems to gain the skills and proficiency that build a rich

and rewarding career.

Independence: you can also avoid the heavy start-up costs of space and equipment for a civilian practice.

Instead of debts, the Army will give you officer's pay, plus special pay as a Doctor of Optometry, plus housing allowances, family

health care, 30 days paid annual vacation.

And you'll wind up with the means to finance a future of your own choosing.

If this practice sounds inviting, get all the details. Write: Army Medical Opportunities, P.O. Box 7711, Clifton, NJ 07015.

Army Optometry. It deserves a closer look.

ASSOCIATION OF SCHOOLS
AND COLLEGES OF OPTOMETRY
600 Maryland Ave., S.W., Suite 410
Washington, D.C. 20024

Non-Profit Org.
U.S. POSTAGE PAID
at Wash., D.C.
Permit No. 46070