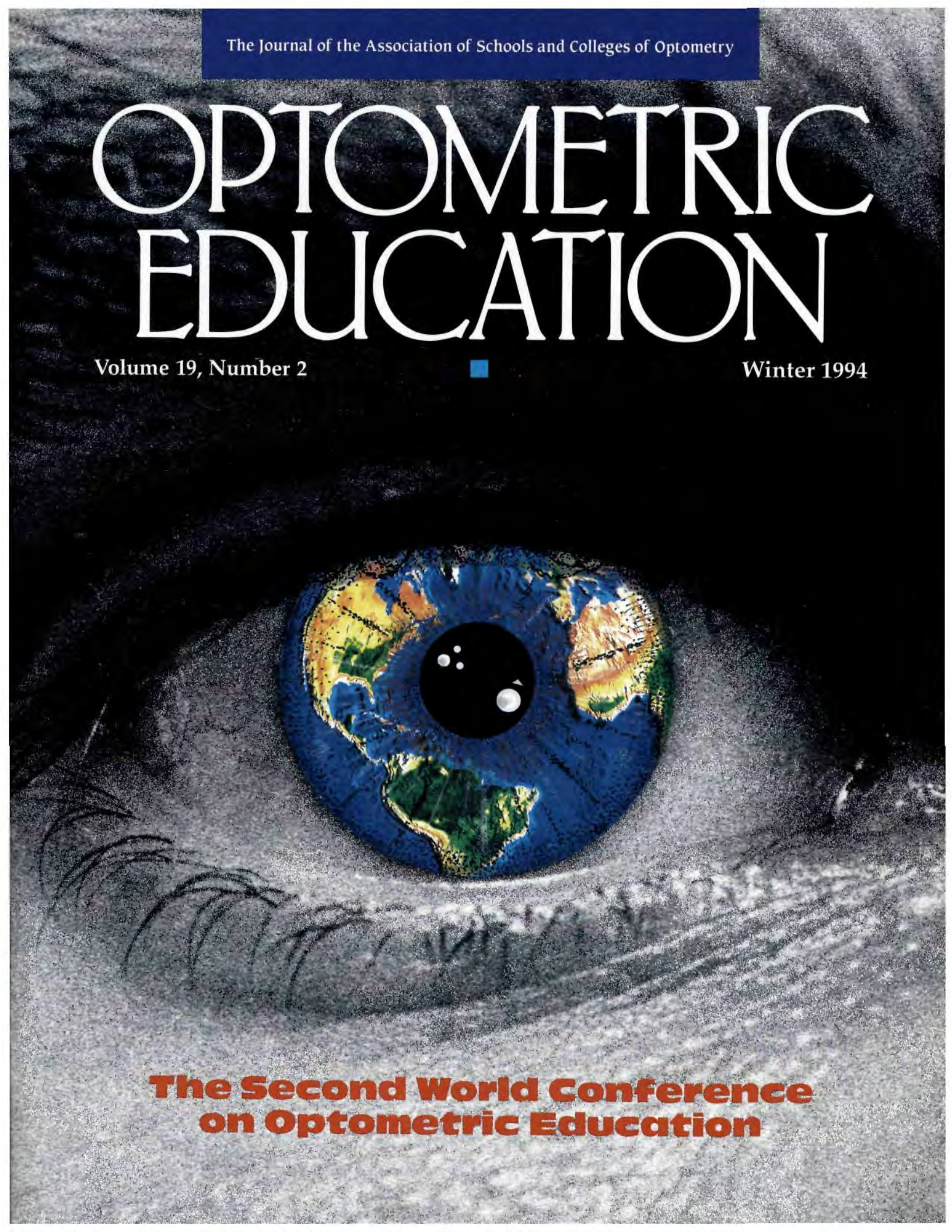
The Journal of the Association of Schools and Colleges of Optometry

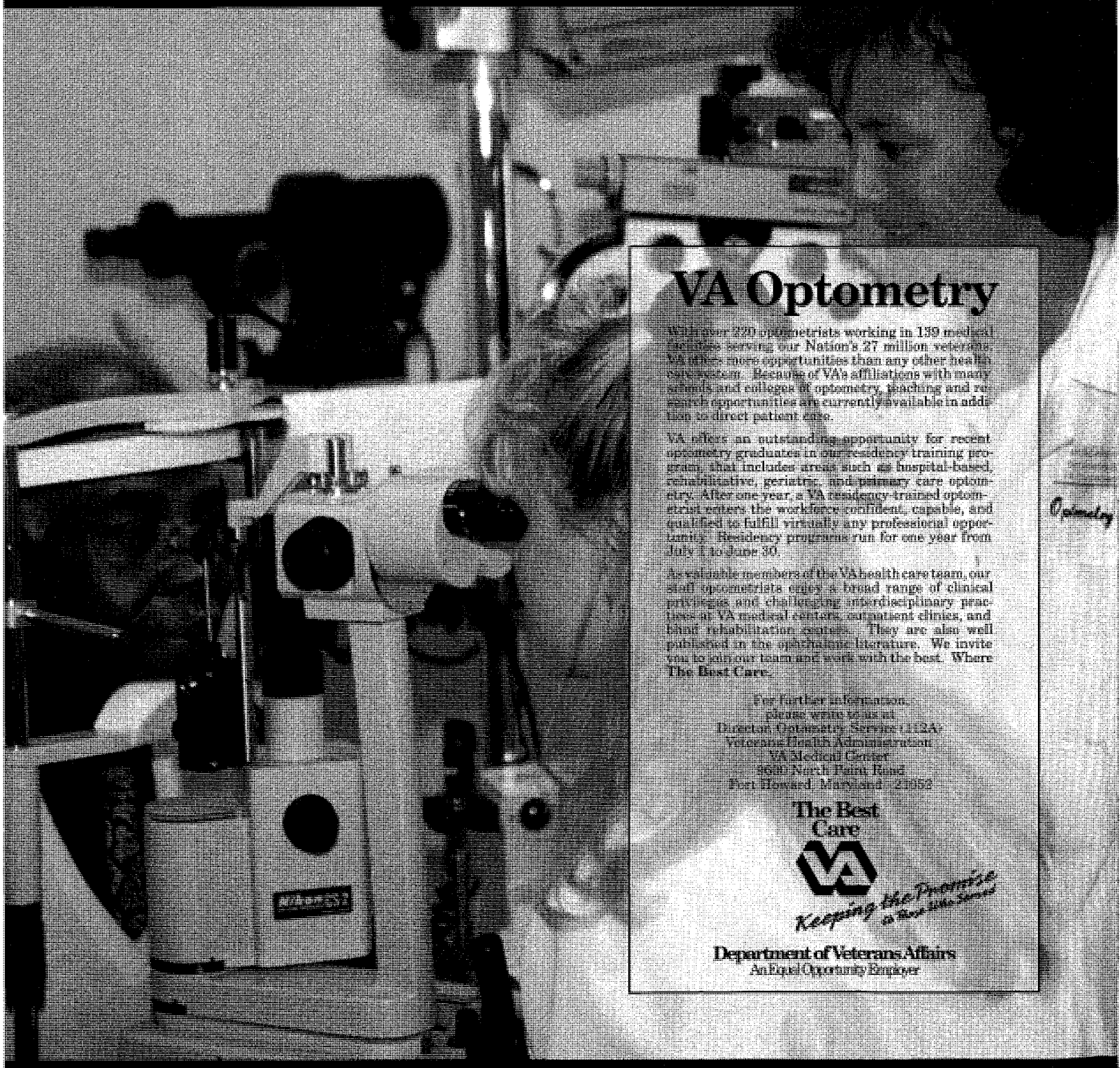
OPTOMETRIC EDUCATION

Volume 19, Number 2 Winter 1994



The Second World Conference on Optometric Education

Looking Toward the Future...



VA Optometry

With over 220 optometrists working in 139 medical facilities serving our Nation's 27 million veterans, VA offers more opportunities than any other health care system. Because of VA's affiliations with many schools and colleges of optometry, teaching and research opportunities are currently available in addition to direct patient care.

VA offers an outstanding opportunity for recent optometry graduates in our residency training program, that includes areas such as hospital-based, rehabilitative, geriatric, and primary care optometry. After one year, a VA residency trained optometrist enters the workforce confident, capable, and qualified to fulfill virtually any professional opportunity. Residency programs run for one year from July 1 to June 30.

As valuable members of the VA health care team, our staff optometrists enjoy a broad range of clinical privileges and challenging interdisciplinary practices at VA medical centers, outpatient clinics, and blind rehabilitation centers. They are also well published in the ophthalmic literature. We invite you to join our team and work with the best. Where The Best Care.

For further information, please write to us at:
Director, Optometry Service (113A)
Veterans Health Administration
VA Medical Center
3900 North Point Road
Fort Howard, Maryland 21052

The Best Care

Keeping the Promise to Those Who Served

Department of Veterans Affairs
An Equal Opportunity Employer

Keeping an Eye On Our Past.

OPTOMETRIC EDUCATION

ISSN 0098-6917

VOL. 19
NO. 2

CONTENTS

WINTER
1994

The Journal of the Association of Schools and Colleges of Optometry

SPECIAL FEATURE

ARTICLES

COMMUNICATIONS

DEPARTMENTS

MEMBER

OPTOMETRIC EDUCATION is published by the Association of Schools and Colleges of Optometry (ASCO). **Managing Editor:** Patricia Coe O'Rourke. **Art Director:** Dan Hillet, Graphics in General. Business and editorial offices are located at 6110 Executive Boulevard, Suite 690, Rockville, MD 20852 (301) 231-5944. **Subscriptions:** JOE is published quarterly and distributed at no charge to dues-paying members of ASCO. Individual subscriptions are available at $20.00 per year, $25.00 per year to foreign subscribers. Postage paid for a non-profit, tax-exempt organization at Rockville, MD. Advertising rates are available upon request. OPTOMETRIC EDUCATION disclaims responsibility for opinions expressed by the authors. Article copies, 16mm microfilm, 35mm microfilm and 105mm microfiche are available through University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan 48106.

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, Canada and a number of foreign countries. ASCO is a non-profit, tax-exempt professional educational association with national headquarters in Rockville, MD.

OFFICERS AND MEMBERS

President
Dr. Arthur J. Afanador, Dean
Inter American University
of Puerto Rico
School of Optometry
San Juan, Puerto Rico 00919

President-Elect
Dr. Lesley L. Wells, Dean
Pacific University
College of Optometry
Forest Grove, Oregon 97116

Vice-President
Dr. Larry Claussen, President
The New England College
of Optometry
Boston, Massachusetts 02115

Secretary-Treasurer
Dr. Thomas L. Lewis, President
Pennsylvania College of Optometry
Philadelphia, Pennsylvania 19141

Immediate Past President
Dr. Bradford W. Weil, Dean
University of Alabama at Birmingham
School of Optometry
Birmingham, Alabama 35294

Executive Director
Martin A. Wall, CAE

Dr. Jack W. Bennett, Dean
Indiana University
School of Optometry
Bloomington, Indiana 47401

Dr. Jerald Stockdale, Dean
University of Houston
College of Optometry
Houston, Texas 77204

Dr. Anthony J. Adams, Dean
University of California
School of Optometry
Berkeley, California 94720

Dr. Allen N. Haffner, President
State College of Optometry
State University of New York
New York, New York 10010

Dr. Alan L. Lewis, Dean
Ferris State University
College of Optometry
Big Rapids, Michigan 49307

Dr. Richard F. Hoppenfeld, President
Southern California College
of Optometry
Fullerton, California 92631

Dr. Boyd R. Banwell, President
Illinois College of Optometry
Chicago, Illinois 60616

Dr. Richard M. Hill, Dean
The Ohio State University
College of Optometry
Columbus, Ohio 43210

Dr. William E. Coetzee, President
Southern College of Optometry
1245 Madison Avenue
Memphis, Tennessee 38104

Dr. Jerry L. Christensen
University of Missouri-St. Louis
School of Optometry
St. Louis, Missouri 63121

Dr. Stewart Abel, Dean
Southeastern University
College of Optometry
North Miami Beach, Florida 33162

Dr. William A. Monaco, Dean
Northeastern State University
College of Optometry
Tahlequah, Oklahoma 74464

Affiliate Members
Dr. Anthony Cullen, Director
University of Waterloo—Optometry
Waterloo, Ontario, Canada N2L 3G1

Dr. John V. Lovasik
University of Montreal—Optometry
Montreal, Quebec, Canada H3T 1P1

Dr. Oswaldo Vargas, Dean
Escuela de Optometria
Universidad Santa
Catolica de LaSalle
Bogota, Colombia

Mr. Ndleta Sipho Moses
University of the North
Sovenga, South Africa

Dr. Charles F. Mullen
Director, Optometry Service
Department of Veterans Affairs
Washington, D.C. 20420

Sustaining Members

***Alcon Laboratories, Inc.**
Allergan Optical
Bausch & Lomb, Inc.
***Ciba Vision Care**
Corning Glass, Optical Products Division
Humphrey Instruments, Inc.
Luxottica Group
Marchon/Marcolin Eyewear, Inc.
Pilkington Barnes Hind/Paragon Vision Sciences
Polymer Technology Corporation
Reichert Ophthalmic Instruments
Sunsoft Corporation
***Varilux Corporation**
***Vistakon, Inc.**
***Volk Optical, Inc.**
Wesley-Jessen

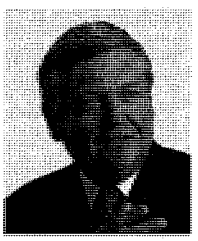
*Advertisement in this issue of the *Journal*

Editorial Review Board

Editor: Felix M. Barker II, O.D., M.S.

William Bobier, O.D., Ph.D.
Roger L. Boltz, O.D., Ph.D.
Nancy B. Carlson, O.D.
Linda Casser, O.D.
David W. Davidson, O.D., M.S.
William M. Dell, O.D., M.P.H.
Ellen Richter Ettinger, O.D., M.S.
Richard D. Hazlett, O.D., Ph.D.
Lester E. Janoff, O.D., M.S.Ed.
Nada J. Lingel, O.D., M.S.
William A. Monaco, O.D., M.S.Ed., Ph.D.
James E. Paramore, O.D.
Hector Santiago, Ph.D., O.D.
Paulette P. Schmidt, O.D., M.S.
Julie A. Schornack, O.D, M.Ed.
Leo P. Semes, O.D.
Dennis W. Siemsen, O.D.
Pierre Simonet, O.D., M.Sc., Ph.D.
Thomas M. Wiley, O.D., M.S.

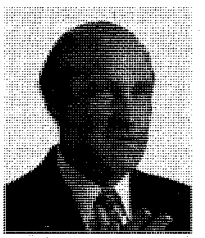
Why Daily Wear Two-Week Replacement?



• Better Compliance

"My daily wear two-week patients simply comply better than my conventional lens patients. Better compliance gives me greater control of my contact lens patients."

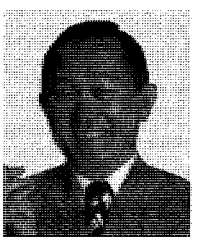
— Kirk Smick, O.D., F.A.A.O. Atlanta, GA



• Practitioner Satisfaction

"I believe 90% of contact lens complications I see involve dirty lenses. Replace lenses every two weeks, and I believe you eliminate 90% of the problems."

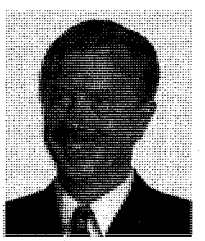
— John Herman, O.D., F.A.A.O. Pittsfield, MA



• Patient Satisfaction

"My patients get the comfort and convenience they want with daily wear two-week replacement. In my opinion, it's the best way to prescribe daily wear today."

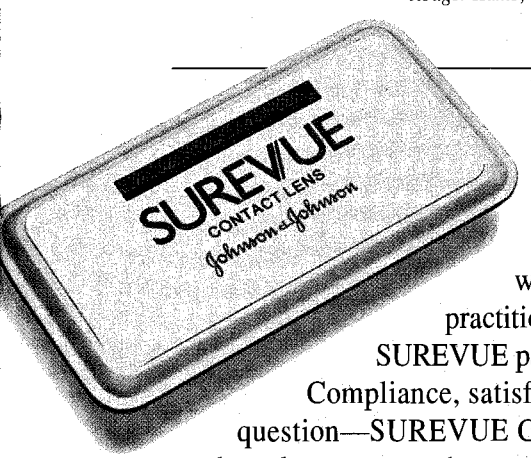
— Rodger Kame, O.D., F.A.A.O. Los Angeles, CA



• Practice Growth

"My daily wear two-week patients are so happy, they tell their friends. Furthermore, my practice enjoys a 94% renewal with these patients, ensuring continued practice growth."

— Lee Rigel, O.D., F.A.A.O. East Lansing, MI



SUREVUE® daily wear two-week replacement.*

In a recent survey involving 100 practitioners and 750 patients[1], over 8 out of 10 eyecare practitioners said patient compliance is better with SUREVUE than with conventional soft daily wear lenses. More than 3 out of 4 patients and practitioners said they are very satisfied with SUREVUE. And more than half of all SUREVUE patients said they've recommended their lenses to an average of 4 people.

Compliance, satisfaction, practice growth. There's no question—SUREVUE Contact Lenses for daily wear two-week replacement are better for your patients *and* your practice.

VISTAKON™
Johnson&Johnson VISION PRODUCTS, INC.

Switch your daily wear patients to SUREVUE® today.

[1]Data on file.
*Recommended wear schedule.

Ask about the Lens-Back Guarantee. 1-800-372-2900

GUEST

EDITORIAL

Optometry — A Worldwide Profession

Larry R. Clausen, O.D., M.P.H.

As new economic, political and demographic realities affect our colleges on the domestic front, escalating pressure and opportunities appear as well on the international flank. We are witnessing unprecedented growth in our profession in every corner of the world. Appeals from abroad for assistance in establishing or improving optometric education and eye care services are more prevalent than ever before. Enrollment of international students in this nation's schools and colleges of optometry is at its highest level and growing. Such trends compel the Association of Schools and Colleges of Optometry and its member schools to step back and reassess their respective positions with regard to international programs and policies.

We cannot disengage from the question. Few schools, if any, will be able to avoid the debate or ignore the influence of international trends on their future. Whether it be the issue of admitting foreign-educated applicants or the reinterpretation of mission from a global perspective, most schools will be affected by such debate. A number of U.S. optometry schools have already developed formal programs or centers in response to needs abroad, including The New England College of Optometry, the Pennsylvania College of Optometry and the State College of Optometry, State University of New York. Others have established and maintained affiliations with optometry institutions abroad. The list will and should grow.

The issues in international optometry are complex. Our understanding of them and our ability to respond become compromised by our ignorance and xenophobia, our outdated image of foreign nations and policy, and our discomfort with the use of scarce resources to support students or programs abroad. This lack of understanding limits our ability to react to international needs, and it focuses optometry on one nation rather than on one world. Optometry is a worldwide profession, and the advances in one country can and should stimulate advances in another. If we view it otherwise, we will debate specious arguments for decades.

In a similar vein, the arguments about the North American Free Trade Agreement were more than economic arguments. Rather they reflected the distorted image that many Americans have of the Mexican people. The quadrupling of exports to Mexico in the last four years the emergence of a vast middle class and Mexico's rapidly growing economy — all were ignored in the arguments against NAFTA. Although the debate over NAFTA became intense in almost all sectors of American society, optometric education in general and ASCO in particular failed to use the debate as a stimulus for discussion of our relationships and responsibilities to optometric education in Mexico.

Optometry is an unregulated occupation in Mexico, and the majority of practicing optometrists do not hold a degree. Education is key to the professional recognition of optometry in Mexico. We have a role in this process. We have ignored Mexico's schools of optometry far too long.

Our consideration of international issues must not be limited to our close neighbors, but rather must focus on all parts of the world. Nicholas D. Kristof, the Beijing bureau chief for *The New York Times*, has written that the rise of China, if it continues, may be the most important trend in the world for the next century. While the business community is beginning to respond, others have not yet fully assessed the impact of the changes occurring within China.

If it continues, optometry's emergence in China as the sole discipline responsible for primary eye care will have profound implications for all of Southeast Asia and other parts of the developing world. Optometry in China is still in its infancy, operating with limited resources in a largely poor country. The recognition of optometry by the Ministry of Public Health in 1992 opened the door for optometry's continued advancement in China. We need to be a partner in that advancement.

China and Mexico are but two countries which demand our attention. The report on the Second World Conference on Optometric Education in this issue of the Journal identifies specific trends and needs in the development of optometry and its educational programs in Europe, Asia and Africa. It should be read carefully for it outlines not so much the future of optometry in other lands as it does our mutual destiny. □

Dr. Clausen, president of the New England College of Optometry, is currently ASCO's vice-president. Dr. Clausen was ASCO's representative at the Second World Conference on Optometric Education.

Alcon

THE OPTI-FREE® SYSTEM

Everything Your Patients Need For Comfortable Contacts

INDUSTRY NEWS

Companies appearing on these pages are members of ASCO's Sustaining Member Program. Sustaining Members are listed on the inside front cover of each issue. Membership is open to manufacturers and distributors of opthalmic equipment and supplies and pharmaceutical companies.

Optometry Students Receive Awards From Vistakon

For the fifth consecutive year, Vistakon, a division of Johnson & Johnson Vision Products, Inc., recognized top optometry graduates with the "Vistakon Excellence in Contact Lens Patient Care Award." The awards, which consisted of a plaque and a check for $1,000, were presented to the students at their respective optometry schools and colleges. In cooperation with Vistakon, the American Optometric Foundation assisted in administering the award.

Vistakon invited all of the schools and colleges of optometry across the country to select one graduating student to receive the award. Winning students were selected based on outstanding clinical contact lens patient care, as demonstrated by their knowledge, skill and professionalism, as well as classroom performance.

This year's award recipients are as follows: Thomas Joseph Balda, **Illinois College of Optometry;** Jed Beck, **SUNY State College of Optometry;** Sonya M. Braudway, **University of Houston, College of Optometry;** Lance L. Brown, **Northeastern State University, College of Optometry;** John Anthony Dadah, **New England College of Optometry;** John Essinger, **University of Alabama at Birmingham, School of Optometry;** Christine Hall, **Indiana University, School of Optometry;** Robert Ogden Hatfield, **University of Missouri - St. Louis, School of Optometry;** Farhad Kapadia, **Ferris State University, College of Optometry;** Daniel Larsen, **University of California - Berkeley, School of Optometry;** Bobbette Sue Nale, **Southern College of Optometry;** Russell Todd Ragan, **The Ohio State University, College of Optometry;** Colleen E. Renchko, **Pacific University, College of Optometry;** Vivian Rosenbusch, **Southeastern University, College of Optometry;** Jeanne F. Santilli, **Pennsylvania College of Optometry;** Julie Anna Shin, **Southern California College of Optometry;** and Sheryl Slimmon, **University of Waterloo, School of Optometry.**

"As part of our ongoing commitment to quality education, we feel it's important to recognize excellence in both the classroom and the clinic," said George W. Mertz, O.D., F.A.A.O., director of academic affairs for Vistakon. "The students receiving these awards promise a bright future for the optometry profession. It's our way of congratulating them for all they have achieved so far and wishing them luck in all they will achieve in their careers as optometrists."

CIBA Sponsors Lecture at Northeastern

CIBA Vision Corporation recently donated a diagnostic bifocal fitting set valued at over $15,000 to the **Northeastern State University College of Optometry** in addition to sponsoring a bifocal contact lens lecture.

The lecture was given by Jan J. Rigney, O.D., who is in private practice in Oklahoma. He lectured on the unique aspects of fitting bifocal contact lenses.

"CIBA Vision is proud to sponsor such worthwhile lectures as the one given by Dr. Rigney," said Sally M. Dillehay, O.D., M.S., manager, professional services, CIBA Vision. "In addition, the diagnostic bifocal fitting set offers the students hands-on experience to successfully fit patients with bifocal contact lenses."

CIBA Vision Corporation offers a wide range of vision care products and services, including soft contact lenses, lens care products, and ophthalmic pharmaceuticals. CIBA Vision products are available in 70 countries worldwide.

VOLK Optical Introduces New Lenses

VOLK is pleased to introduce the new ***Superfield NC*** wide field non-contact slip lamp lens.

The *Superfield NC* has been scientifically designed to provide a 120° field of view along with magnification equal to that of the 90D *and* the high resolution of a Goldmann type contact lens. This new lens provides the widest field and highest resolution of any slit lamp lens available.

"We've had numerous requests from practitioners desiring a 90D type lens with the wide field of the VOLK QuadrAspheric," said Don Volk, president of Volk Optical. "VOLK has designed the new *SuperField* lens using Double Aspheric optics combined with a very special high index of refraction Lanthanum glass. Not only is the *SuperField* corrected for the common aberrations of field curvature and astigmatism but also for pupil aberration, thus providing further optical improvement and slit lamp optimization. The result is an ultra wide field non-contact lens with an exceptionally clear view of the retina even at the highest slip lamp magnification settings."

The *SuperField NC* comes standard with VOLK's technologically advanced electron beam evaporated, dielectric multi-coating, applied at 300° centigrade from the highest efficiency most durable laser/AR coating possible. Available in your choice of Supra-Coat, an argon laser and diagnos-

tic coating, or with AR/DI diode laser coating.

The *SuperField NC* lens can be ordered from any authorized VOLK distributor or by calling VOLK direct at (800) 345-8655.

Varilux Announces '93-'94 Award Program

Varilux Corporation is proud to announce the 1993-1994 Student Grant Award Program. The program is open to third and fourth year optometry students in the United States. Students submit case reports to the clinical staff on patients fit with Varilux lenses. The clinical staff will select one school recipient based on dispensing skills, application of Varilux lenses to patient needs, analysis of the case(s), and analysis of lens design and lens performance (optional/extra).

Reports should include student name, address and phone number, patient's old and new Rx, occupation, hobbies and any other pertinent information. Maximum length 1000 words. Entries must be postmarked by April 1, 1994.

Awards were in the sum of $500.00 per recipient plus entry into national judging. National award winner and faculty advisor will each receive a trip for two to the AOA Congress meeting June 24-28, 1994, in Minneapolis, MN. The Annual Varilux Student Grant Award is part of the ongoing educational support provided by Varilux Corporation to the schools and colleges of optometry.

For questions and further information, contact Rodney Tahran, O.D., Consultant, Professional Services, 477 Gim Gong Road, Oldsmar, FL 34677, 1-800-BEST-PAL, Ext. 385 or Danne Ventura, F.N.A.O., Manager, Professional Services, 477 Gim Gong Road, Oldsmar, FL 34677, 1-800-BEST-PAL, Ext. 169.

Corning Awards Low Vision Prize

Eight optometric students from across the country have been awarded the Corning Low Vision Prize for their outstanding work in the low vision field.

Corning Medical Optics presented a Corning®Glare Control™ Lens Clip-on Trial Kit to selected graduates of participating optometric schools for use in their own practices. "We wanted this award to have some practical application," said Rhoda Derbigny, national sales manager. "Optometric schools chose the winners based on their interest and exceptional clinical proficiency in the area of low vision."

Recipients of the 1993 Corning Low Vision Award are Kenneth S. Calhoun, O.D., **University of Houston College of Optometry;** Michael Ferreri, O.D., **Southern California College of Optometry;** Gregory J. Goetzinger, O.D., **University of Missouri - St. Louis, School of Optometry;** Charles T. Holt, O.D., **University of California - Berkeley, School of Optometry;** Timothy Osius, O.D., **Illinois College of Optometry;** Julie Ritter, O.D., **Ferris State University, College of Optometry;** Vivian Rosenbusch, O.D., **Southeastern University, College of Optometry;** Kurt Joseph Tichy, O.D., **New England College of Optometry.**

The Corning trial kit, valued at $255, consists of three Corning Glare Control Clip-on Lenses, a blue light filter demonstrator card, and educational and support materials. This kit allows patients and practitioners to "see and compare the CPF differences for themselves," said Derbigny.

Corning Medical Optics manufactures Corning Glare Control Lenses, designed to offer relief of glare symptoms for people with light sensitive conditions such as developing cataracts, glaucoma, macular degeneration and other problems caused by the normal process of aging.

For more information on the Corning Low Vision Award, contact Rhoda Derbigny, Corning Medical Optics, Corning, Inc., MP 21-2-2, Corning, NY 14831 or call (607) 974-7823.

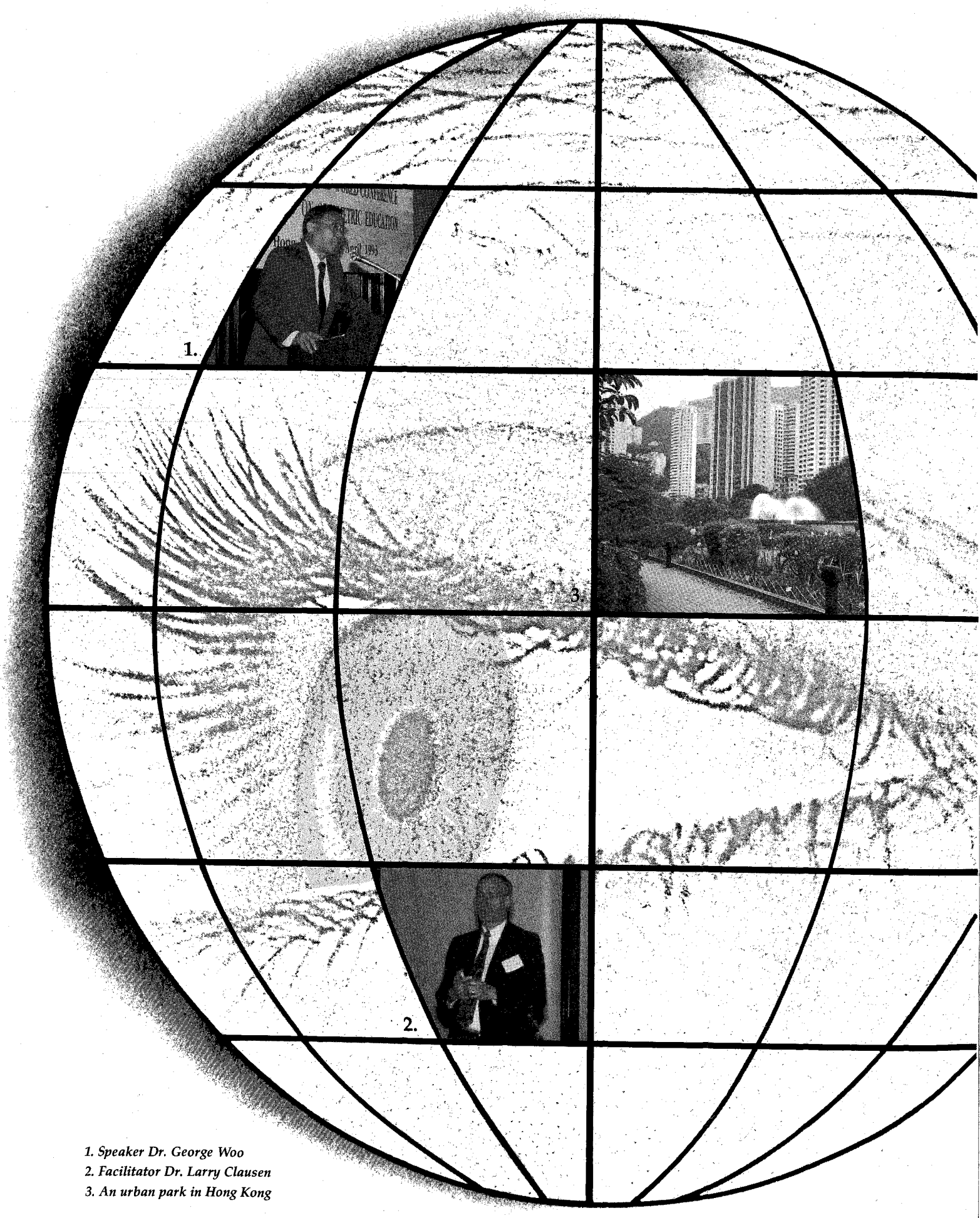
Paragon Move Spurred by PBH Reorganization

Paragon Vision Sciences, a Pilkington Barnes Hind company, has established its corporate headquarters at 110 E. Bell Rd in Phoenix, Arizona.

Recognized as one of the nation's leading manufacturers of Oxygen Permeable (OP) materials for contact lens manufacturing, Paragon Vision Sciences also produces ComfortCare GP One Step and Concept brand solutions for OP and soft contact lens users. In addition, the company produces and distributes finished Oxygen Permeable contact lenses to customers through a nationwide network of authorized distributors in the United States.

The Paragon move was spurred by recent streamlining within the Pilkington Barnes Hind (PBH) group. PBH, headquartered in Sunnyvale, CA, had previously acquired Paragon Optical of Mesa, a specialist in OP material manufacturing. The Paragon operations recently joined the PBH U.S. Lens Care Division, which produces lens solutions. It also assumed responsibility of the portion of the PBH business that produces Oxygen Permeable lenses. All of these operations now fall under the umbrella of the newly named Paragon Vision Sciences, the headquarters of which has been placed in Phoenix.

Corporate headquarters for the firm will be located within the 150,000-square-foot Bell Road facility, which recently passed Federal Drug Administration approval for production of a variety of contact lens solutions. Manufacturing, research and development of OP materials will remain at the former Paragon Optical site in Mesa, which has been dubbed the company's Technology Center. Finished lens manufacturing is handled at separate facilities in San Diego, CA and Atlanta, GA. The company employs approximately 200 within metropolitan Phoenix and, according to President Joe Sicari, will be expanding by as many as 50 people by year-end.



1. Speaker Dr. George Woo
2. Facilitator Dr. Larry Clausen
3. An urban park in Hong Kong

The Second World Conference on Optometric Education

David A. Heath, O.D., Ed.M.,

Douglas K. Penisten, O.D., Ph.D.,

Peter Hendicott, Dip. App. Sc. (Optom.),

Feike Grit, B.Sc.

Abstract

The Second World Conference on Optometric Education was held in Hong Kong on April 5-7, 1993. The meeting was organized through the International Optometric and Optical League (IOOL) and represents the continuing efforts of the IOOL to enhance the educational foundation of optometry in all regions of the world. The conference was organized by region (Africa, Asia, Europe) to examine the barriers to the growth of the educational base of optometry and to develop strategies for overcoming those barriers. This article provides an overview of the conference, reports from representatives of the regional working groups and a discussion of global trends and developments.

Key words: *International education, IOOL, Second World Conference on Optometric Education*

Introduction

David A. Heath, O.D., Ed.M.

The International Optometric and Optical League (IOOL) held the Second World Conference on Optometric Education (SWCOE) in Hong Kong, April 5-7, 1993. Approximately eighty participants, composed of academic program heads and representatives from IOOL member associations from more than twenty-five countries, convened to engage in information exchange, debates and strategic discussions relative to the development of the educational base of optometry worldwide. The SWCOE was developed by a fifteen-member planning committee, led by Dr. Willard Bleything (chair) of Pacific University and Mr. Peter Roost, president, IOOL.

David A. Heath, O.D., Ed.M., is the associate dean of academic affairs and director of international programs at the New England College of Optometry. Dr. Heath is an associate professor and a past editor of the Journal of Optometric Education.

This international gathering of optometric educators represented the continuation of a process begun by the IOOL, with the support of Bausch and Lomb, when it sponsored the First World Conference on Optometric Education (FWCOE), in Houston, Texas, in December 1990. Dr. G. Burtt Holmes, then President of the IOOL, expressed the purpose of that first meeting as being "to bring optometric educators together to cooperate in the improvement of optometric education in those subject areas that are common to all optometric curricula, and to create opportunities for greater interaction and exchange."[1] Participants at the FWCOE reviewed prevailing patterns of optometric practice and then, through presentations followed by breakout discussion groups, focused upon three themes: 1) Quality Clinical Education, 2) Evaluation Criteria and 3) Cooperative Programs. Since the scope of optometric practice varies considerably around the world, the emphasis was placed on educational issues with which any educational program must struggle regardless of the country of origin.

The Second World Congress on Optometric Education (SWCOE) was designed to focus participants on the obstacles or barriers to the continued development of educational programs which support the goals of the profession and to discuss strategies for eliminating those barriers. Thus, rather than concentrating on issues internal to academic programs, the planning committee acknowledged the interdependency between the educational programs and the ability of the profession to evolve. The conference sought to examine forces both internal and external to the profession and its educational programs that are hindering development. Over a period of two days, the SWCOE participants sought to accomplish four specific objectives:

- To examine the linkage between the scope of optometric practice and the educational base.
- To examine governmental structures within various nations which control the destiny of optometry.
- To examine perceived barriers in the growth of the educational base for optometry.
- To explore strategies and develop actions to deal with the perceived barriers in the growth of the educational base for optometry.

Extensive preconference reading materials were developed to explore the first objective and to update partici-

pants on the current state of optometry in various regions of the world (Table 1). Each objective was explored through a combination of panel presentations and breakout discussion groups. The conference recognized that, although the scope of practice may change dramatically across a single border, there is also a great deal of commonality within regions of the world. The SWCOE was therefore organized to focus discussions around three distinct regions of the world: Africa, Asia and Europe. Each regionally based working group was assigned a facilitator whose task was to keep the discussion oriented towards the stated objectives, and a recorder whose charge was to develop a report to be brought back to the larger group.

Three articles were developed from these discussions. The author of each served as either the facilitator or recorder for Africa, Asia or Europe respectively. As a representative of his working group, each author was asked to provide a regional summary of discussions on 1) the current status of optometry, 2) recent developments, 3) principle barriers or obstacles relative to the continued development of educational programs and the profession and 4) the strategic priorities of educational programs. ■

TABLE 1
Preconference Reading Materials

An International Perspective on Optometric Education. William R. Baldwin, O.D., Ph.D., F.A.A.O., Dean Emeritus, College of Optometry, University of Houston, U.S.A.

Educational Base/Scope of Practice Linked to Eye/Vision Care Needs of a Particular Nation. Selwyn Super, Dip. Optom., M.Ed. (Psych.), D.Ed., F.A.A.O., Professor, Department of Optometry, Rand Afrikaans University, South Africa.

Comparison of Optometric Educational Models. Henry W. Hofstetter, O.D., Ph.D., Dean Emeritus, School of Optometry, Indiana University, U.S.A.

"Credentialing" for Practice, Based on Education. Robert Fletcher, Professor Emeritus, City University, London, United Kingdom, and Kongsberg Engineering College, Norway.

The Current State of Affairs in the Nations of Africa Relative to Optometry. Douglas K. Penisten, O.D., Ph.D., Associate Professor, College of Optometry, Northeastern State University, U.S.A.

The Development of Optometric Training in Nigeria. Paul O. Ogbuehi, Ph.D., O.D., F.A.A.O., Professor of Optometry, King Saud University, Saudi Arabia.

Eye Care Train Brings Hope to Thousands (press release). Jannie Ferreira, Professor, Rand Afrikaans University, South Africa.

The Current State of Affairs Within the Various Nations of Asia Relative to Optometry. Claro M. Cinco, O.D., F.A.A.O., Dean Emeritus, Cebu Doctors' College, Philippines.

Visual Optics in China, Ge Qi, Department of Chinese, Journal of Ophthalmology.

Report on Optometric Education in Wenzhou Medical College During Last Four Years. Mingguang Shi, M.D., Chairman, Department of Ophthalmology and Optometry, Wenzhou Medical College, People's Republic of China.

Distributed at the SWCOE:

Evolution of Legislation Concerning Optometry. George Woo, O.D., Ph.D., School of Optometry, University of Waterloo, Ontario, Canada.

Eye Care in China, Guang-Ji Wang, O.D., M.D., New England College of Optometry, U.S.A.

AFRICA

Douglas K. Penisten, O.D., Ph.D.

Current Status and Recent Developments

The next time you are with a group of optometric educators ask for someone to describe the status of optometric education on the African continent; or better yet, simply ask for a summary of eyecare services in any one of the many African countries. You are likely to be met with a deafening silence. The reasons for this state of ignorance are many, but perhaps the most significant cause has been the lack of easily accessible information on optometry in Africa. In addition, there have been no organizations to promote and represent optometric education specifically for the African continent. Developments during the past two years have gone far to alter these deficits. In particular, the announcement in Hong Kong of the formal creation of the Association of African Optometric Educators (AAOE) was one of the high points of the Second World Conference on Optometric Education and a true milestone for the profession of optometry in Africa.

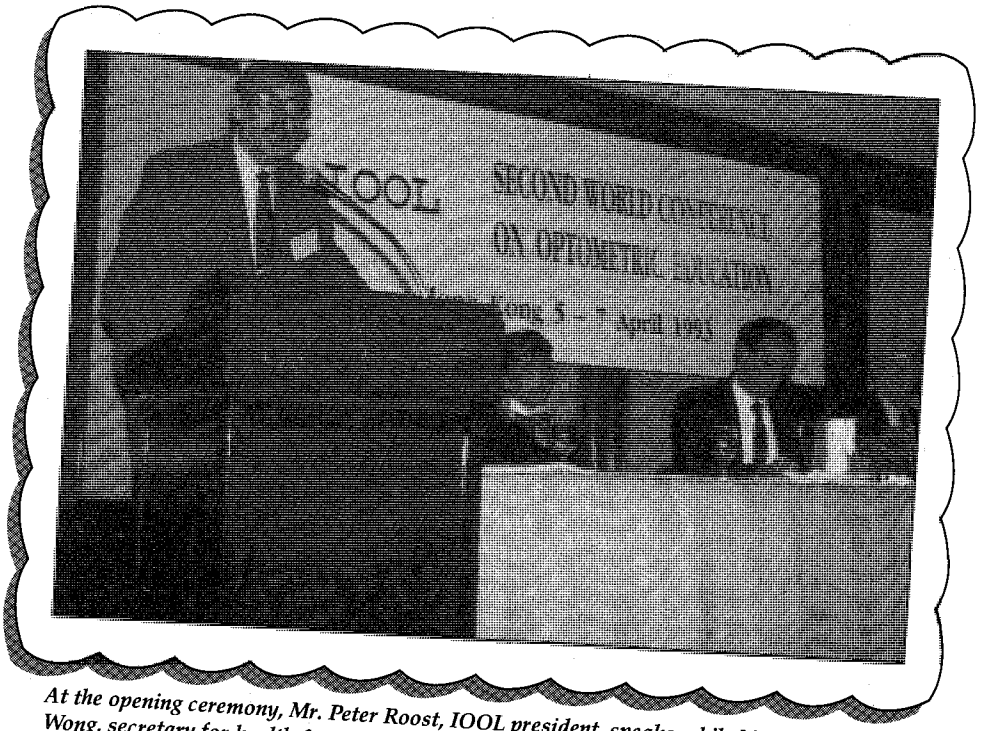
Seven optometric teaching programs can be found in four African countries:

Douglas K. Penisten, O.D., Ph.D. is an associate professor at the Northeastern State University College of Optometry. Dr. Penisten has spent a considerable amount of time in Africa and has published widely on optometry in that region of the world. Dr. Penisten served as the facilitator for the Africa breakout group.

Nigeria, South Africa, Tanzania and Ghana.[1,2] These programs vary somewhat in their length and educational scope, but all strive to train practitioners who can provide primary eyecare in their respective countries.[3] Until this decade, these four African countries worked in relative isolation from each other with respect to optometric affairs. This unfortunate situation took a dramatic positive turn in 1990 at the First World Conference on Optometric Education in Houston when representatives from these four countries met informally and agreed to hold a conference in Africa for optometric educators.

The First African Optometric Educators Conference was held on November 26-28, 1992, in Windhoek, Namibia.[4] Participants had the opportunity to learn about the state of optometry and optometric education in various African countries and soon realized that they shared many of the same problems and goals.[5,6] Acknowledging that a continuing forum for mutual cooperation was needed, a proposal for the establishment of an Association of African Optometric Educators (AAOE) was accepted[7].

On April 7, 1993, in Hong Kong, the constitution of the AAOE was formally adopted. With the primary aim of the organization being a "forum for uniting African optometric educators and to promote optometric teaching and education throughout Africa," the stage was set for the conference's sessions on Africa during which Association members and other participants identified the principal needs and barriers to the future development of the optometric profession in Africa.



At the opening ceremony, Mr. Peter Roost, IOOL president, speaks while Ms. Elizabeth Wong, secretary for health & welfare, Hong Kong, Mr. Gary Orsborn, Bausch & Lomb, and Dr. Willard Bleything, conference committee chair, look on.

Barriers and Strategies

Four areas were discussed: material resources, human resources, practitioner numbers and professional recognition.

Lack of teaching material resources, especially ophthalmic equipment, is a chronic problem at all of the teaching institutes and an acute problem at several. Participants pointed out that equipment needs vary and an accurate assessment of the needs from each of the teaching programs would be required if assistance is to be truly profitable.

A common problem at the teaching programs in Africa is equipment maintenance. Once a piece of equipment is aquired, failure of some sort is naturally inevitable, but often particularly accelerated in countries with tropical climates. The importance of training equipment technicians at each institution and a dependable procurement process for equipment parts were discussed.

The discussion on human resources centered on strategies for increasing and retaining faculty. The need to develop faculty from within the respective country was stressed. It was generally agreed that in order to successfully provide stable faculty numbers for the schools, qualified graduates should be nurtured towards becoming faculty. At the same time, participants encouraged faculty recruitment from other regions of the world. Attention was drawn to the logic of inviting applications from regions not historically tapped by the African optometry schools. Australia was noted as an example. The phenomenal prospects for research at the African schools are an enticement which should be emphasized.

The need for more optometrists throughout the African continent is overwhelming. Although various mechanisms for increasing the number of optometrists were discussed, it was acknowledged that the formation of new optometric teaching institutes in Africa in the immediate future is unlikely. It was therefore concluded that efforts should be directed towards establishing communications and contractual agreements with those countries neighboring the four African countries with existing programs.

Regarding the fourth and final area, the need for expanded and continued publicity for the profession in Africa was deemed essential. It was suggested that this occur on all levels: locally, nationally and internationally. Each school was encouraged to cultivate contacts with local newspapers and television broadcasters. The group agreed on the importance of educating government officials in each African country about optometric education and the services the profession provides. The need to educate international health organizations such as the World Health Organization (WHO) about the profession was also underscored.

Since the Hong Kong conference, the Association of African Optometric Educators (AAOE) has initiated follow-up communications with members and meeting participants worldwide in order to begin implementing the actions which were endorsed[8]. The many contacts established at the conference are continuing. Coordination of the AAOE activities is being pursued by the organization's chairman, Francis Morny of Ghana.

In a very short span of time, the optometric educators of this continent have transformed themselves from a state of virtual isolation to an organization of educators united in promoting the development of their profession. The unmet eyecare needs on the African continent are staggering, but the formation of the AAOE and actions being initiated by this organization are

very significant steps towards addressing these vision needs. ■

References

1. Penisten D. Africa and the Middle East. In: Hofstetter H, ed. Transactions of the First World Conference on Optometric Education. London: International Optometric and Optical League, 1992: 38-52.
2. Penisten D. Optometry and optometric education in Africa: past, present, and future; S Afr Optom 1992; 51(4): 161-71.
3. Penisten D. Optometric education and optometry in Africa. J Am Optom Assoc (in press).
4. Penisten D. First African optometric educators conference. Interoptics 1993 Winter; 99: 1-2.
5. Rubin A. A report of the first conference of African optometric educators. S Afr Optom, 1993; 52(1): 30-2.
6. Penisten D. American-African co-operative optometric affiliations. S Afr Optom 1993: 52(2) 6-7.
7. Penisten D. The current state of affairs in the nations of Africa relative to optometry. In: Transactions of the Second World Conference on Optometric Education. London: International Optometric and Optical League, 1993.
8. Morny F. Association of African Optometric Educators Mailing, May 8, 1993.

ASIA

Peter Hendicott, Dip. App. Sc. (Optom.)

Current Status and Recent Developments

In Asia, the word optometry covers a profession which takes many forms, ranging from opticianry (optical dispensing) to a primary health care profession. Legislation governing the profession of optometry is non-existent in some countries, under discussion or preparation in others, and in place in only a few.

Currently, legislation governing the practice of optometry is in place in the Philippines, where it has been in existence for many years, Indonesia (since 1979), and most recently in Malaysia (1991). The Philippine regulations are currently under review, and, as is typical,are meeting with opposition from medicine and some optometric groups.

Legislation in Malaysia has a two-tiered structure. Opticians with one year of relevant experience can be licensed for refraction[a] and the dispensing of spectacles (contact lenses if three years of experience) is one tier. Optometrists with recognized optometric qualifications are a second tier which practices optometry in the fuller sense.

This legislative arrangement in Malaysia typifies the problems existing in this region. The largest group of practitioners in most Asian countries, and, more specifically, Southeast Asian, is the self-taught optical dispenser or optician. Optometrists (as in the North American sense) are a minority among practitioners. Governments therefore have two conflicting concerns when drawing up optometric legislation: 1) controls to safeguard the public and 2) a need to continue the livelihood of practitioners currently involved in optometry (albeit without formal qualifications). The result is this tiered registration structure for optometrists, with differing scopes of practice which are defined by education and experience.

Reflecting this approach, the legislation to control the practice of optometry in Hong Kong (in development since 1984) will also have a tiered structure with differing scopes of practice dependent upon qualifications. For those without a formal optometry education, acceptance into the register for optometrists will be by virtue of experience and examination. Recently written legislation controlling contact lens practice is expected to be in place in Singapore in 1995 and will require all contact lens practitioners to have recognized qualifications. Most other countries in the Southeast Asian region do not have legislation which controls the practice of optometry.

The major gains for optometry within this region of the world are related to the development of optometric education. In many countries, the educational arm of optometry is outstripping the development of legislative control on the practice of optometry. The style of education developed generally approximates either the U.S. model (the Philippines and, most recently, the curriculum at the Wenzhou Medical College in China); or the British/Australian model (Malaysia, Hong Kong, India). Post-graduate education in optometry is also available in Malaysia and Hong Kong. Development of optometric education in China is being supported by links with other schools of optometry, particularly the New England College of Optometry.

In other countries, the education is more closely related to the practice of dispensing and/or confined to refraction (Korea has eleven schools with 1000 students/year with the courses oriented to dispensing, rather than to optometry). Indonesia has five government recognized schools which train "refractionist opticians." And Singapore recently introduced a course relating to contact lens practice in response to the legislative developments in that country.

Barriers to the Growth of Optometry in Asia

Economic or resource barriers

The greatest hindrance to ongoing development of optometry and optometric education in Asia, whichever model of optometry is adopted within a country, is the lack of educational resources — faculty, texts, teaching materials, instruments. The greatest need is for optometry faculty. Many of the countries wishing to develop optometry as the primary eyecare provider do not have the initial and critical resource of knowledgeable and skilled faculty members. Underlying this dilemma is the problem of financial resources to support faculty development.

Indirectly, economics is also a barrier to optometry development in the form of medical (ophthalmological) opposition. The perception of optometry in much of Asia is not that of a primary eyecare profession. The specter of an optometric profession which is capable of providing primary eye care represents an economic threat to medicine. It should be stressed that this does not apply, however, to all areas in Asia. Good cooperation is found in some countries, largely perhaps because in these countries ophthalmology is playing a controlling or defining role in the development of optometry.

At times, the economics of the optical industry also poses a barrier in some countries. This obstacle is in the form of the optical industry running brief "training courses" which meet the immediate needs of the industry—the creation of sales—by increasing the number of "practitioners." This is not meant to detract from the positive role the optical industry has had in the development of the optometric profession in Southeast Asia. Indeed, industry has also been quite supportive in some areas, such as funding scholarships and

Peter Hendicott, Dip. App. Sc. (Optom.), recently returned to the Queensland University of Technology in Brisbane Australia. Mr. Hendicott was previously a senior lecturer, Department of Optometry at Hong Kong Polytechnic. Mr. Hendicott was the recorder for the Asia breakout group.

[a] The term "refraction" as used here indicates the act of objective and/or subjective refraction.

faculty development programs for some developing schools.

Ignorance
As noted, the perception of optometry in Asia is not that of a primary eyecare provider. This perception exists not only within the public, but in government and also within those involved in optometry. A significant component of this obstacle to the development of optometry is frequently the profession's own lack of an internal consensus as to the direction in which to evolve. Subsequent challenges include the need to convince the government of the public need for improved eyecare, and then to increase public awareness of the services and benefits of optometry.

Strategies to Overcome Barriers

The working group on Asia felt that the keys to the development of optometry are 1) the identification by the profession of where and how it can address the unmet health care needs of the public; and 2) the promotion of its ability to address these needs to government and to the public. Once the awareness of the profession and its role in eye care is enhanced, legislative definition of optometry, largely nonexistent in this region, needs to be pursued.

Faculty development is crucial to the evolution of optometric education. This could take the form of curriculum training packages for Asian schools, prelecture material or lecture support packages which are needs specific or faculty exchange. Faculty exchange programs were thought to be of more intrinsic value when faculty from established schools went to developing schools as faculty trainers. Some programs such as these are in existence [e.g. Contact Lens Educator Fellowship through the International Association of Contact Lens Educators, (IACLE)].

The working group on Asia also concluded that a coordinating body which could act as an information clearing house for optometric educators should be developed and suggested a world-wide ASCO-type (Association of Schools and Colleges of Optometry) body be formed. This suggestion has been taken up by the Education Committee of the International Federation of Asian Pacific Optometric Associations (IFAPOA) and is currently being discussed. Similarly, we also noted that in countries in which optometry is new or developing, there is a need for a process to get the assistance of "established" optometry for promoting its goals to government and to the public and to counter opposition to optometry's growth. ■

Acknowledgements:

Thanks to the spirited and committed group of Asian optometrists for their lively discussions at SWCOE.

Thanks to Mrs. Marion Edwards, secretary, education committee, IFAPOA, for background materials.

EUROPE

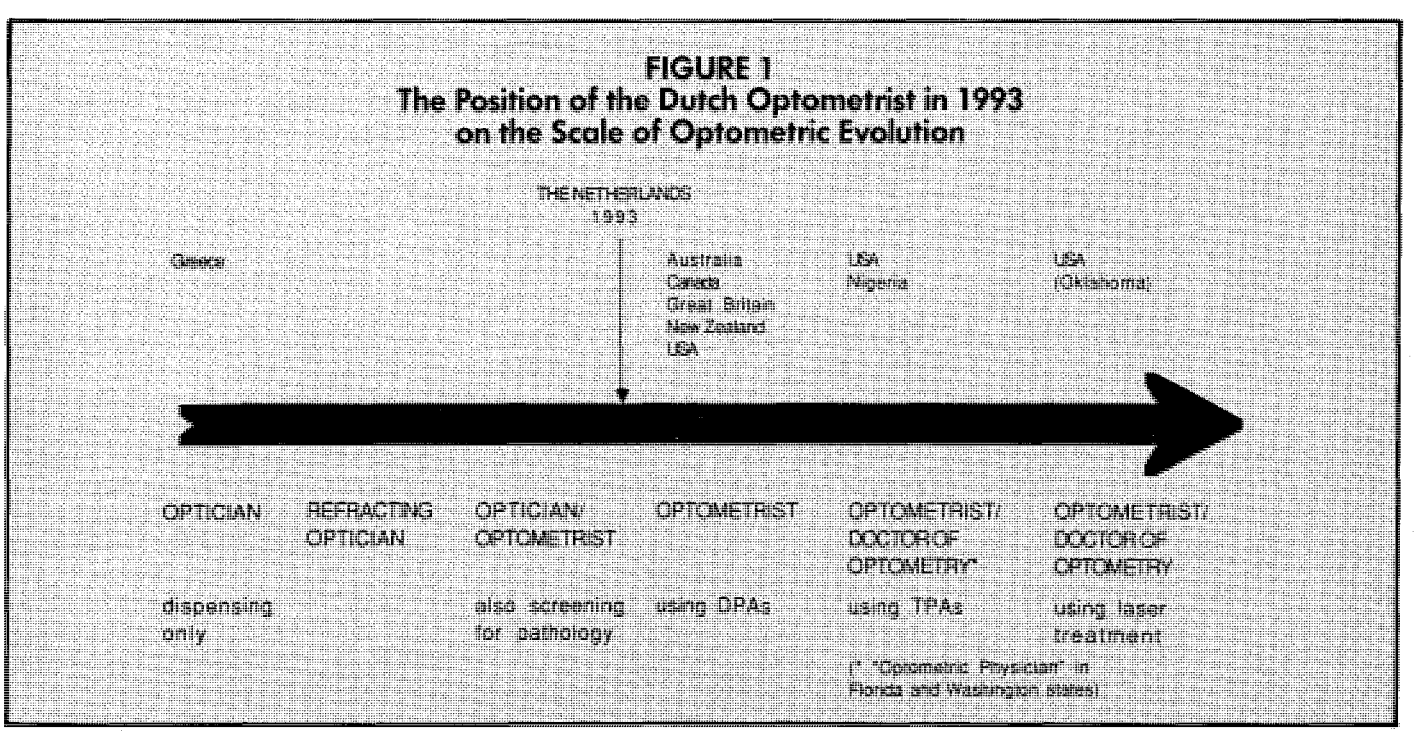
Feike Grit, BSc, FBCO, FAAO

Current status and recent developments

The world changes continuously, and after several decades of relative peace, Europe in particular is on the eve of major transformations. The borders of countries within the European Common Market are disappearing, the Soviet Union has dissolved, East and West Germany have reunited and a war is being fought in the Balkans. These events will restructure Europe and will certainly reflect on the practice of optometry in this part of the world.

One can see a range in the scope of practice and changes occurring in European optometry, which may also be observed in other regions of the globe. Optometry in the Netherlands and Hong Kong is in a similar position. The only country in Europe where the scope of practice is similar to that in North America is Great Britain, where

Feike Grit, B.Sc. is the president-elect of the Dutch Optometric Association and is in private practice in Gouda, The Netherlands. Mr. Grit is a fellow of the American Academy of Optometry and chairs the Academy's International Meeting Arrangments Committee. Mr. Grit was the recorder for the breakout group on Europe.



The Panel on Asia discusses the current status and recent developments of optometry.

optometrists have had the legal right to use DPA's and the legal obligation to detect pathology for almost half a century.

In all other parts of Europe, optometry is on the lower end on the scale of optometric evolution (Fig. 1), but the profession is in a process of fundamental change, and everywhere a transformation is taking place, from the dispensing-only optician (as in Greece) to the refracting optician to the optician/optometrist who screens for pathology. Recession, high unemployment, deregulation, rising costs and budgeting of health care, strong opposition from medicine and high numbers of ophthalmologists have negative and positive effects on this transformation process.

Schools of optometry at the university level have been established in a number of countries including Germany, the Netherlands, Norway, Spain and traditionally Great Britain. In February 1993, the Swedish government approved a new, three-year university course in optometry at the Karolinska Institute in Stockholm, a most prestigious university, which is well-known for its involvement in the nomination for the Nobel Prize in Medicine.

In Paris, France, in November 1992, the Commission of Optometric and Optical Organizations in the European Community and the Pan European Group of the I.O.O.L. amalgamated to become the European Council of Optometry and Optics (ECOO), which now covers the whole of Europe instead of only the European Community.

At its first meeting in Venice, Italy, in April 1993, the ECOO decided to establish a European Diploma of Optometry by 1995. The diploma will reflect the highest level of optometric practice in Europe. The European Diploma will facilitate the free circulation of the profession in Europe, which is still not as easy as the European Community's First General Directive on the Mutual Recognition of Professional Qualifications might suggest.

With the help of AESCO (The Association of European Schools and Colleges of Optometry), ECOO will write an examination syllabus in 1993/94 and hold a trial-examination in 1995; candidates will be able to take written and practical examinations using their mother tongues.

Anticipating these events, the British College of Optometrists (BCO) organized in April 1993 in collaboration with the National Board of Examiners in Optometry (USA), an Overseas Preliminary Examination in Basic Science (PQE 1) and in Clinical Science (PQE 2) for certain optometrists wishing to practice in the United Kingdom (UK). The principal source of questions for the examinations was the National Board's database of items.

The collaboration between the National Board and the BCO started four years ago, when the Board came to the UK to study the Professional Qualifying Examination 3 (PQE 3), the British practical, patient care, examination, which the Board considered to be a very good examination. It seems likely that the National Board will also be involved in the examination process for the European Diploma. It would be a waste of time and resources if every country were to separately go through the whole examination process. In view of the internationalization of standards, it is advantageous to have one examination.

In April 1993, the IOOL held its annual General Delegates Meeting in Venice, Italy. This meeting occurred two weeks after the SWCOE. During that meeting the ECOO agreed on a number of important goals for the future, including:

- conducting a study of the structure of the profession in Europe.
- developing a manifesto for optometry emphasizing its value in primary health care.
- defining a common scope of practice
- procuring formal recognition of ECOO by the EC authorities in Brussels.

As Europe continues to integrate, so will the optometric profession. The implications of a European Diploma of Optometry are tremendous, in that it could effect a standard of optometric care not only for the 320 million people within the EC, but also worldwide!

In the meantime, the levels of qualifications in the profession vary greatly across Europe, whether it is the technical standard in Germany or the clinical standard in Great Britain. This disparity causes many challenges. An example of the problems caused by this disparity occurred during the Second World Conference on Optometric Education in Hong Kong in April 1993, when a delegate from Germany stated that an important part of the curriculum must be dedicated to glazing and dispensing. Delegates from other parts of Europe disagreed. They stated that more time must be spent on the clinical aspects of optometry, since modern, computerized edging machines have made glazing so simple that it can be learned during one weekend. Indeed, Norway has closed its one-year dispensing college and teaches its optometry students to delegate dispensing. The delegate from Spain added that they also were moving the emphasis away from dispensing and towards clinical subjects.

A number of progressive European optometrists visit meetings in the United Kingdom and the United States of America. They become fellows of professional organizations, for example, the British Contact Lens Association and the American Academy of Optometry. They obtain Degrees in Optometry at universities in Anglo-Saxon countries, and they return to their countries to inspire and encourage their colleagues. This method is showing results.

The Swedish Optometric Association

has appointed an International Advisory Committee to help them with their new university course. On this committee are internationally well-known optometrists : Jan Bergmanson, O.D., Ph.D., professor of optometry in Houston, Texas, USA; Hans Bleshoy, O.D., Ph.D., optometrist in Denmark; Tony Cullen, O.D., Ph.D., director, School of Optometry, Waterloo, Canada; and Geoff Woodward, O.D., Ph.D., head of Optometry Department, City University, London, UK.

The Netherlands did the same; Jan Bergmanson and Tony Cullen have been advisors to the Dutch Optometric Association for several years, and they visit the Netherlands on a regular basis. The City University of London, and especially Professor Woodward, were involved in the start of the new school in Holland. The American Academy of Optometry will organize its next international meeting in Amsterdam, Holland, and this will give Dutch optometrists an excellent opportunity to learn more about optometry in the United States (May 27-30, 1994).

The Dutch have been fighting for legislation for more than 50 years, so far without any results. Eyecare in Holland is still regulated by a law of 1865 (!), before the invention of the contact lens and before the word optometry became known. Theoretically, only subjective testing by trial frame and trial case is permitted, but not only to opticians and optometrists, also to greengrocers and milkmen. The Dutch optometrists were so frustrated with this situation, that in 1988, without governmental approval, they started a new school with a four-year, full-time optometry course at university level according to the Anglo-Saxon model. Fortunately, government approval and funding came last year, and the first students received Bachelors Degrees in optometry last month. The course was developed in close collaboration with the City University of London, UK, and the students spent some time during their training at universities in the UK (Manchester), USA (Houston), and Canada (Waterloo). Lectures are sometimes in English and textbooks are primarily in English.

Although optometry is still not legalized in Holland, in 1992 sixty-seven percent of all sight tests were done by optometrists, and eighty-seven percent of all contact lenses were fit by optometrists. Eight percent of the total population — the highest percentage in the world after the USA — wear contact lenses. Optometrists in Holland do use ophthalmoscopes, tonometers, fundus cameras, etc. They expect legislation of their profession within five years.

Optometrists in Germany are also finding out about North American optometry. A group of ten optometrists visited the State University of New York (SUNY) College of Optometry recently for a two week course on eye pathology. They were very enthusiastic about their study trip.

Barriers and Strategies

The recent developments in European optometry are numerous and served as the basis for the discussions during the Second World Conference on Optometric Education in Hong Kong in April 1993 in the breakout group which focused on Europe.

The group came to the following conclusions:

On economic barriers: Optometry should be on par with other health professions and get the same clinical facilities. Funding may come from state funds and/or private funds. A combination seems to be preferred. In Canada, optometry gets 60% of the funds medicine gets and dentistry gets 80% of the funds medicine receives. In Norway, an optometry student costs approximately US$ 7,100 per year, a medical student costs US$ 51,700 per year.

Shortage of qualified staff: There should be greater exchange of students, lecturers and lecturing materials. Educators also need enough time to conduct research at their own institution or as part of the exchange program. Retired professors are an excellent source for exchange programs. A fellowship program will also increase the standard.

Ignorance: Optometrists have to learn to adapt to the changing circumstances. The role of optometry may be the same, but the scope changes continuously. In legislation it is important to be politically aggressive and we must keep the public informed continuously about our changing scope of practice. Education must precede legislation.

Opposition from medicine: We have to learn how to use medicine to achieve our goals. A primary health care practitioner can relate to us, the primary eyecare practitioners. Our demographic distribution makes us kindred souls with general practitioners.

Multinational Corporations: The optometrist should be free to practice the full scope of optometry without interference from his/her employer. Dispensing is part of optometry, but this does not preclude the optometrist's right to delegate certain technical tasks.

Legislation: European optometrists must fight the drugs barrier in order to better examine children.

The Hong Kong meeting shows that optometrists have the same problems all over the world. Such meetings are therefore extremely useful, since attendees can learn from each other ways in which to address the problems and barriers to the continued development of optometric education and optometry. ■

DISCUSSION

David A. Heath, O.D., Ed.M.

Assessing the value or impact of a meeting such as the Second World Conference on Optometric Education (SWCOE) is never an easy task as the outcomes are frequently difficult to measure. Three years ago, at the conclusion of the First World Conference on Optometric Education, two pages with twenty-three recommendations to the IOOL were extracted from the proceedings by Dr. Norman Wallis.[2] Each recommendation began with "IOOL should. . . ." Many of these recommendations, particularly those casting the IOOL as a catalyst to information transfer and organizational development, are being done to one degree or another. Others, particularly those which require significant resources either in terms of money or expertise, have not been achieved. For recommendations which have not been addressed, the issue may not be one of validity or desire as much as one of being currently unrealistic in the face of restricted resources worldwide.

As noted by Dr. Willard Bleything, the SWCOE was designed to give paticipants insights and strategies to solve their own problems. This was in contrast to the FWCOE which tended to expect that the IOOL was to be the solution to issues facing world optometry. In fact, those invited were carefully chosen relative to their role of influence in thier own country. Indeed, discussions at the SWCOE emphasized specific actions that can be taken on a programmatic, national or regional level and upon what is achievable

within the confines of available resources. Little time was spent reconciling divergent views on what the scope of optometric practice should be.

The second phenomenon may well have been facilitated by the proceedings of the IOOL's "Think Tank" meeting held November 11-13, 1992, in Paris. One specific outcome of that meeting was a definition of optometry:

> *"Optometry is a health care profession that is autonomous, educated and regulated (licensed/registered) and optometrists are the primary health care practitioners of the eye and vision care, which includes refraction and dispensing, the detection/diagnosis and management of disease of the eye and the rehabilitation of conditions of the visual system."*[3]

This definition was formally approved by the General Delegates Meeting in Venice, two weeks after the SWCOE.

Only in the United States and, most recently, in the People's Republic of China, does the scope of optometric practice meet or exceed this definition of optometry. For much of the world, the definition is inclusive, yet clearly indicates the need for the significant expansion of optometric scope of practice and the educational base upon which it is founded.

With the lessening conflict over definitions, cooperative action on a regional level was in evidence. The catalysts toward regionalization are numerous and include both the internal forces of program need and external forces of politics and economics.

As noted by Dr. Penisten, it was at the SWCOE that the bylaws of Association of African Optometric Educators were reviewed and ratified. For many programs, such as those in Africa, the need for intellectual and material resources is massive. Clearly, the seven programs in Africa, acting as a group, will be in a much better position to command interest and attract needed equipment, faculty and educational materials. Postconference communications indicate the AAOE will be an active and energetic organization.[4]

In Europe — where the variability in professional definition is great — the external political and economic pressures emanating from the ongoing development of the European Community have facilitated dialogue on international definitions and standards for optometry. The reported progress towards a European diploma is remarkable. The successful achievement of the European diploma and international certification is dependent upon developing a consensus among optometric leaders in Europe with diverse opinions. This effort may be greatly facilitated by the recent IOOL approval of a definition of optometry.

While there were numerous observations and recommendations made at the conference and in the writings of Drs. Penisten, Hendicott and Grit, many of the significant outcomes of both the First and Second World Conferences on Optometric Education have evolved out of the understanding and personal relationships developed at the meetings. These relationships have helped to establish cooperative efforts between programs and institutions which transcend geography.

For many programs and in all regions of the globe, faculty and faculty development are of the highest priority. In the past few years, cooperative efforts and programs aimed at enhancing the faculty pool worldwide have expanded tremendously. Examples of programs designed explicitly for this purpose include the articulated agreement between Pacific University (USA) and Kikuchi College of Optometry (Japan), and the New England College of Optometry (USA) and the Wenzhou Medical College (PRC).

While many students and optometrists have traveled abroad to study (most notably to the United States, Canada and Great Britain), there are increasing efforts to deliver educational programs in areas where the need is great. While many of these programs are continuing education in nature and perhaps most beneficial to the practitioner rather than to faculty, others are degree programs. Examples include the New England College of Optometry's Advanced Standing Doctoral Program in Italy and the Pennsylvania College of Optometry's Masters Program in Spain. Each of these points to the ability to successfully deliver high quality educational programs in areas of need.

Other efforts for faculty development are being supported through corporate sponsorship and organizations such as the International Association of Contact Lens Educators (IACLE) or through "twin or sister" school agreements. While the need for faculty development far exceeds the opportunities available, the trends indicate increasing access and international cooperation.

Programs and national associations are also more clearly defining their educational needs and establishing relationships with the individuals and organizations which can provide guidance and assistance. The aid provided to the School of Optometry, Kilimanjaro Christian Medical Center in Tanzania by the Swedish International Development Authority and the Swedish Optometric Association is a longstanding example of international and inter-organizational support.

There is also an increasing use of international advisory boards to help with program development. Among others, these are being used by the Swedish Optometric Association, The Dutch Optometric Association and the National Optometry Center of the Wenzhou Medical College in the People's Republic of China. The cooperative effort between the British College of Optometrists and the National Board of Examiners in Optometry (U.S.) is of a similar nature and notable.

From the three reports contained herein, it is apparent that while there is much variability in the education and practice of optometrists, the bonds developing out of our common interests are stronger and a great deal of progress is being made. A number of significant accomplishments have been noted, and there are certainly as many that escaped mention. It is hoped that through this report on the proceedings of the Second World Conference on Optometric Education, the needs and priorities of optometric education around the world will be better understood and their goals facilitated. ■

Acknowledgements

1. Special thanks to Feike Grit, Peter Hendicott and Doug Penisten for giving their time (mostly during summer vacations) and effort to this report.
2. Ms. Dorothy Leason, secretary of the IOOL, for her valuable assistance and quick response to numerous faxes.
3. Dr. Willard Bleything and Dr. Larry Clausen for their review and assistance in developing the article.
4. As a participant at the SWCOE, I would like to thank Bausch & Lomb, Inc. for their generous financial support of the conference.

References

1. Holmes GB. Foreword, *Transactions of the First World Conference on Optometric Education.* 1992, Pg. IV.
2. Wallis N. Recommendations from the First World Conference on Optometric Education. Unpublished document drawn from the *Transactions of the First World Conference on Optometric Education.*
3. Interoptics, Bulletin of the International Optometric and Optical League. Issue No. 100 Spring 1993.
4. Morny F. Association of African Optometric Educators Mailing, May 8, 1993.

Curriculum and Program Operation for Optometric Preceptorships

Irving L. Dunsky, O.D., M.S.

Abstract

This is a follow-up paper to one that appeared in the spring 1992 issue of **Optometric Education**, *and described a curriculum and program operation process involved in the development of an optometric preceptorship for schools and colleges of optometry. Other processes (goal delineation and program development) involved in optometric preceptorships have been described earlier. The curriculum process of preceptorship development includes a discussion of guidelines for development, informal and formal teaching methods and materials and the learning resources needed. The program operation process includes a discussion of the orientation needed for group participants, debriefing of students after the preceptorship experience, logistical arrangements, personnel and costs, funding sources available for a preceptorship and liability issues.*

Key Words: *preceptorship development, program operation*

A definition of specific program goals is the foundation for nearly all decisions in developing and administering an optometric preceptorship program. Delineation of goals is essential in order that all other program elements — program development, curriculum development, program administration and program evaluation — be effective. In a previous report,[1] we discussed goal delineation and program development as the first steps in a cyclical process. This report will discuss two additional steps in preceptorship development, namely curriculum development and program administration, designed for optometric faculty and administrators interested in creating a preceptorship program.

The specific curriculum used in preceptorship programs may be highly variable. The content to be learned and the methods of teaching optometric students will be influenced by (1) whether the program is required or optional within an optometry school or college; (2) whether it is operated outside the auspices of an optometry school and therefore not necessarily subject to academic credit; (3) the educational level of students involved; (4) whether the preceptorship program is oriented to and run by an optometric department or an interdepartmental arrangement; (5) length of the preceptorship experiences, and (6) the objectives or goals defined by the preceptorship program.

Because the nature of a curriculum is unique, this discussion will not focus on the details of any one type of curriculum, but will provide information about the varieties of curriculum method and materials.[2,3] The individual program developer can determine which are appropriate for his/her preceptorship.

General Guidelines: The degree of detail and specificity in the curriculum desired by a particular program will be determined by the personal preference of the program developer and by the optometry schools' constraint that may necessitate formal methods and materials. However, the greatest strength of a preceptorship experience lies in its potential for providing a unique, individualized experience in optometric care. As such, a program may suffer if too much structure and too many specific teaching and learning methods are attached to it.[4]

As a way of preserving the uniqueness of the experience and still ensuring that program goals are met, the general guidelines shown in Table 1 may be used.

By encouraging the participants to develop and use their own structure, the danger of either imposing rigid external expectations or creating too vague a learning situation may be avoided. For many optometry students, the preceptorship experience may be their first opportunity to set their own learning objectives and identify their own preferences in methods of learning. This may have great value in the area of continuing education as students become practicing optometrists. The preceptorship should not be viewed merely as a mini-optometry school experience, but as an opportunity for self-directed learning and for career and role exploration.

Informal Teaching. Informal teaching is an important feature of a preceptorship experience. Most programs do not restrict the preceptor's teaching style;[5] rather, they permit preceptors to vary their methods for different students. However, many optometrists new to

Dr. Dunsky recently retired as a professor at the Southern College of Optometry.

TABLE 1
Guidelines for a Preceptorship Curriculum

1. Provide both preceptors and preceptees with an adequate description of program goals and expectations.
2. Provide preceptors with a list of diagnostic, therapeutic and laboratory skills in which participating students are competent.
3. Encourage the preceptee and preceptor to develop together a set of learning objectives that fit within the program goals and meet the particular needs of the individual student as well as the special interests and competencies of the preceptor.
4. Encourage preceptee and preceptor to review these learning objectives at different times during the preceptorship to determine the extent to which they are being met, modify them based on realistic assessment and evaluate the adequacy of the setting for accomplishing the objectives.
5. Encourage preceptee and preceptor to evaluate the extent to which program and individual goals have been met.
6. Provide an opportunity for development of preceptors as faculty by conducting workshops.

the role of preceptor appreciate some direction as to the appropriate methods for precepting optometry students.

New preceptors generally have three basic questions:[6] (1) What are effective methods of teaching? (2) How should I delegate optometric responsibility for my patients? (3) What does the school or college of optometry expect of me? It is useful to anticipate and address these questions.

If an orientation session for new preceptors includes experienced preceptors, the experienced group often can answer questions and provide information on teaching techniques. Site visits by optometric faculty and program staff also provide opportunities for consultation with preceptors concerning teaching methods. Typical teaching strategies for preceptorships involved in direct patient care by optometry students are shown in Table 2.

In presenting the business and monitoring aspects of an optometric practice, the curriculum should familiarize students with the work of the facility bookkeeper, third-party payment forms, purchase of supplies and equipment, study of relative costs to the patient of optometric procedures, laboratory tests and medication. The student should be aware of the relationship between clinical procedures ordered and the patient's financial situation, and should be able to examine the optometrist's record-keeping system and its use in patient work-ups.

Table 2
Typical Teaching Strategies of a Student Patient Care Preceptorship

1. Initial work-up of patients by students, followed by preceptor's examination and subsequent discussion of consistency and discrepancies of findings. The preceptor should make certain that the student is provided with a variety of patient problems.
2. Nursing home visits, hospital rounds.
3. Student-conducted, in-service programs for special groups, such as schools, community groups, nursing homes, on such topics as diabetes, glaucoma, visual related learning problems and low vision aids.
4. Participation in all areas of the preceptor's daily activity, including social and recreational.
5. Preceptor observation of the student's interaction with patients and discussion of his/her performance.
6. Student's observation of the preceptor interacting with patients and discussion of the preceptor's procedures.
7. Student performance of selected laboratory, diagnostic and therapeutic procedures, consonant with his/her level of training, under the supervision of the preceptor.

Formal Teaching Methods and Materials

The more formal teaching methods used within programs are shown in Table 3.[7]

Case Presentation: Students may be assigned individual patients or families for work-up as case histories. More advanced students may present these cases to the staff of the facility or to the faculty of the school or college of optometry.

Lectures and Seminars: In programs where several students are placed in a single site, it may be desirable to plan a variety of didactic lectures and seminars on topics relevant to the preceptorship experience. For students, these seminars and lectures within a local medical community may allow them to observe the continuing education and intellectual stimulation available to preceptors and other health professionals.

Audio and Video Tapes: Audiovisual aids may be used as part of the orientation for students, as well as while they are at the site. Where equipment is available, tapes on selected clinical topics may supplement the clinical experience. A list of tapes, slides or movies available should be provided to the student.

Video Taping of Student-Patient Interaction: This method has proven valuable in preceptor programs of sufficient length where it can be used as an evaluation technique and teaching method. Where equipment is available, these taping sessions may be reviewed by students, preceptors and faculty.

Formal debates: Formal debates on current issues in optometric patient care and optometric training are an effective technique for stimulating interaction among preceptors, preceptees, staff and community members.

Student Projects: Preceptorships may require or recommend that students undertake a project that deals with some aspect of community optometry. The nature of the project is decided mutually by preceptor and student. A common goal of community-based projects is encouraging the preceptee/student to discover larger, more pervasive issues affecting health than he/she might confront in the treatment of individual patients in an office or hospital setting.

Reading Assignments: Students may be assigned required or recommended reading in journals or books as an adjunct to their experience.

Daily Log: Students may be required to keep a daily log of patient contacts, detailing histories, patient disposition, diagnosis and follow-up. These may be used to evaluate and improve student performance. In addition, compilation of such information for a succession of preceptees may yield valuable material about patient compliance and patterns of ocular problems in the community. These data may help orient and teach future students.

Learning Resources

Rural preceptor sites generally do not have medical library facilities available. Some preceptorship programs may provide students with a list of recommended optometric books or journals that they might bring to the site; others provide reprints of articles and materials essential to the preceptorship experience. Optometry schools may provide photocopy or loan services of their libraries to preceptors.

Site visits by faculty either during or after the preceptorship also serve as a teaching resource.[8] Both options have advantages and disadvantages. Some students feel a visit during the program is not relevant or necessary. If handled with sensitivity, however, the visit allows a faculty member to assess student effectiveness, provide some specific patient-oriented consultative services and troubleshoot as appropriate. A site visit after the student has left provides an opportunity for the faculty member and preceptor to discuss the student's evaluation.

Program Operation

Adequate orientation for each group of participants in the preceptorship program is an important key to the program's success.[9] An understanding of program and individual expectations by preceptors, students and faculty will minimize misunderstandings and inappropriate activities. The orientation, whether formal or informal, should include different emphasis for the different participants.

Orientation should prepare students for what they will be doing, allay anxieties and provide information related to their participating and/or living in a community setting. The student's orientation may be formal, as in an organized group meeting at the school or college of optometry, or informal, as in one-to-one meetings with program faculty, preceptors and former student participants. Ideally, students will receive an orientation at the institution prior to leaving and another with the preceptor upon arrival at the site. At the institution, students and faculty should discuss the overall goals and expectations of the program. In particular, evaluation requirements and grading criteria should be discussed. Students might be encouraged to look at the practice and lifestyle of the optometrist (how he/she handles phone calls, "gets away," social life, spouse's lifestyle and opportunities); office management; economic determinants of care, role of other health professionals, etc.

Written information, such as site descriptions and final reports of former preceptees, are helpful background information. Former optometric preceptees and/or their spouses are an invaluable resource, and can provide the new student with practical information about their own experiences. It is also beneficial for the student and preceptor to have an opportunity to talk prior to the student's arrival. It is important for the optometrist to orient the student to the operation of the practice and to the community in general.

The information described in preceptor selection and recruitment[1] should be provided to the preceptor during orientation and the topics shown in Table 4 should be discussed. The duration and frequency of orientation for preceptors will depend on their past experience. The orientation should clarify the preceptor's role in relation to institutional faculty in responding to any concerns the preceptors might have. Orientations may take place either at a central site with all preceptors attending or with individual preceptors in their community. The nature of the orientation will depend particularly on resources available, desire and ability of preceptors to attend a central orientation and distances involved. It is important for program administrators to urge rather than to insist that preceptors come to central orientations. It also might be advantageous for the faculty representative to discuss with the optometrist the liability coverage provided the student by the optometry college and the coverage that the optometrist is expected to provide.

Table 3
Formal Teaching Methods

- Case Presentation
- Lectures and Seminars
- Audio and Video Tapes
- Video Taping of Student-Patient Interaction
- Formal debates
- Student projects
- Reading assignments
- Daily Log

The community can be oriented to the program by publicizing the student's arrival and activities. An article in the paper prior to an individual student's arrival works well, as does having the student talk with local clubs, e.g., Rotary, Chamber of Commerce, during his/her stay. In addition, a brochure describing the preceptorship and explaining the student's role in the optometrist's practice might be provided to patients. Patients must be assured that they need not be examined in the student's presence or by the student.

Debriefing: A debriefing for students after the preceptorship experience can be useful for several purposes. When held with participants from other preceptorship sites, the session offers students an opportunity to discuss and integrate what they have learned into their overall education. This also helps the student's reentry process into the academic environment. Informal feedback about student experiences can be

Table 4
Topics for Discussion During Orientation

1. Number of patients a student should see.
2. Types of community projects the student will be expected to do.
3. The educational—not service—nature of the program.
4. The importance of the optometrists's orienting patients, office or hospital staff to the student's presence and role.
5. Information about the optometry school and how the preceptorship experience fits into the overall curriculum.

Table 5
Potential Funding Sources for Preceptorship Program

Source	Comments
1. Federal Government	Contracts and special projects grants are the best known means of obtaining funds.
2. State Legislatures	Some states are still concerned with attracting optometry students to practice in areas of need. State legislatures may provide funds to implement and maintain programs with appropriate goals.
3. City/County Governments	Funding may be available from these governments as well. In large urban centers with inadequate optometric care in inner city areas a program aimed at retaining young optometrists may prove attractive.
4. Private Foundations	A number of large foundations address aspects of health care distribution problems. Support for preceptorships may fall within the guidelines of these foundations. There also are smaller foundations that confine their endeavors to certain geographic areas. Many are concerned with health issues and may be worth investigating.
5. Chambers of Commerce	Local Chambers of Commerce often are concerned with health care as an incentive in retaining and attracting the population needed for a financially healthy community. They may support a preceptorship as a method of encouraging young optometrists to return.
6. State and Local Optometric Societies	Such groups may be involved in the design and implementation of preceptorship programs, and where funds are available, may be willing to provide financial as well as personnel support.
7. Optometrists	Private practicing optometrists, in addition to volunteering their time as preceptors in some programs, have provided stipends to students placed with them. Some also provide room and board.
8. Private social and service clubs	Like some foundations, many social and service organizations are concerned with health issues. the Kiwanis Club, Rotary, Women's League may provide support. Appropriate groups to approach vary in different areas.

useful for staff evaluation of preceptors and sites. One effective format is a small group discussion, where each student takes 10 to 15 minutes to describe his/her experience, followed by group brain-storming on how the project could be changed to be more effective.

Most programs should have a mechanism for continuous feedback. Feedback to the optometrist on faculty and the student's perceptions of the program can be used to provide positive reactions and to discuss potential problem areas. The preceptor's assessment of student performance also may contain insights not stated in the formal written evaluation.

Logistics: Certain logistical arrangements that must be made before the student begins his/her program relate to whether the student's spouse and/or family goes along, housing, transportation and financial assistance. The spouse issue is an important one, particularly if one of the objectives of the program is to interest the student in practice in a particular area. Most current preceptorship programs favor taking the spouse; some may not because they feel the spouse might demand time the student would otherwise spend in the preceptorship. Some spouses can't go because they are working. The spouse issue would probably have to be flexible, depending on individual student needs. Preceptees might live with their preceptors, stay in unoccupied hospital beds or live in an apartment or trailer. Living with the preceptor or a member of the community often leads to meaningful and enjoyable experiences; however, care must be taken to ascertain that this will not be an imposition on the family and that differences in lifestyle will not cause a strain.

Depending on project resources, financial assistance may or may not be provided to the students. Some projects provide no reimbursement; other provide transportation costs, a stipend and per diems.

Personnel and Costs: A project director will be needed to coordinate the entire program and assure smooth operation. Depending on the scope of the project, this person might work half-to-full time. Clerical support also should be available.

A program evaluator is essential to

ongoing assessment of the preceptorship.[10] Depending on the scope of the project, this person should be either part-time or full-time. His/her responsibilities might include questionnaire development, or might encompass interviews with participants, site visits, structured feedback to preceptors, etc. Evaluation too often is given little emphasis. As a result, the evidence to justify continued commitment to a program is lacking. With funds for optometric education under increasingly close scrutiny, programs should plan ahead and prepare answers related to their effectiveness and eventual impact on the health care delivery service.

In addition to salary costs, expenses of running the program may include preceptor salaries, student stipends and/or living allowances; teaching materials; orientation and debriefing programs; travel for preceptors students and faculty; data collection and analysis costs; communication costs (e.g., telephone, postage, printing and supplies). With regard to stipends, the traditional concept that a student receives no pay for educational programs no longer is universally accepted. Some institutions recognize that paying the student to cover his moving and housing expenses at the site is justifiable and that such funding does not impair the preceptorship's educational value.

Funding sources: Preceptorships required within an optometry school curriculum may receive all or some financial support from the institution. In many cases, however, the added financial burdens of housing students, travel to sites and payments of preceptors and program staff may require other sources of funds.[11] Potential sources for funding are shown in Table 5.

If a program hopes to obtain local support, it may be necessary to find several different sources, depending upon the nature and scope of the project. This requires much time and planning but may be of advantage because the commitment of funds by each source may be more easily maintained, as compared to a large funding commitment by a single source.

Liability Issues: With the passing of therapeutic drug legislation by many states, malpractice suites have become uppermost in the minds of many practicing optometrists. Concurrent with the potential for malpractice suites comes student liability and insurance coverage. The coverage provided students varies from school to school, ranging from insurance only when the student is engaged in patient contact within the confines of the optometry school to coverage of the student while in an approved program at another institution or an extracurricular activity not part of the teaching program.

Most students and many faculty members are unaware of the extent of liability coverage provided. A pervasive feeling has been that students, not being full "professionals," would not be sued. That feeling seems to exist today. However, an Association of American Medical Colleges survey[12] of 22 institutions (of 79 responding) stated that their institution had experienced incidents, "involving potential student liability." Only 17 of 60 institutions responded that their students are covered when engaged in patient contact that is not part of the regular teaching program such as while externing or participating in a free clinic.

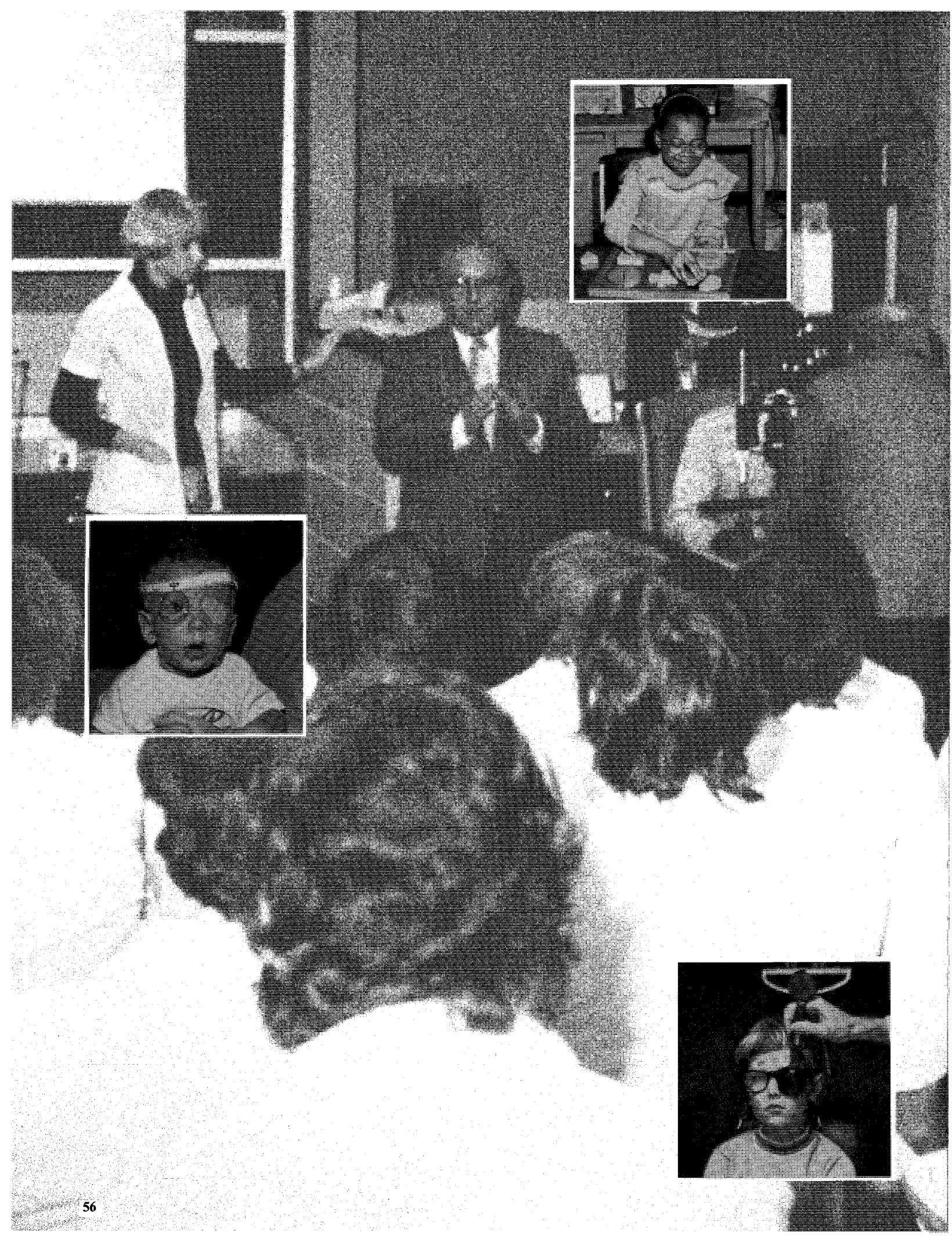
Faculty developing a preceptorship should investigate the type of liability coverage their school will provide for participating students in the preceptors' offices and at hospitals in which these optometrists practice. Options for providing coverage include giving the preceptor a faculty appointment so that regular institutional coverage is applicable; having a student placed on the payroll of the preceptor's clinic to obtain regular employee coverage; negotiating a comprehensive student policy through the college or university; examining the preceptor's policy to determine whether students under his/her supervision are automatically covered or whether an inexpensive rider for such coverage could be attached. The situation will vary for each institution.

Conclusion

This paper has presented information relevant to some aspects of preceptorship development. It discusses in detail aspects of a preceptorship curriculum and various considerations of program operation, such as liability issues, funding sources, costs, and logistics. A future paper will discuss the participation process of an optometric preceptorship program. ■

References

1. Dunsky IL. Developing optometric preceptorships: Goal delineation and program development. J Optom Educ 1992; 17(3):90-4.
2. Shapiro IL. Externships can shape the future of your profession. OEP 1983, 56(2):39.
3. Margolis CF, Harrison JA, Kues JR. Status and teaching ability of preceptors in a first year clinical course. Jour Med Educa 1985; 60(5):410-12.
4. Zinser EA, Wiegert HT. Describing Learning Experiences of Undergraduate Medical Students in Rural Settings. Report USPHS, DHEW, 72-4240, 1974.
5. Stuart MR, Urzano AJ, Eidus R. Preceptor development in residency training through a faculty facilitator. J Fam Pract 1980; 11(4):591-95.
6. King G. Preceptors experience Arizona Medical 1971; 28(11):831-33.
7. Stritter FT, et al. Clinical teaching reexamined. Jour Med Educ 1975; 50:877-81.
8. Verby JE. The Minnesota Rural Physician Associate Program for medical students. Jour Med Educ 1988; 63(6):427-37.
9. Travill AA, Bryan AM. An embryological learning experience. Jour Med Educ 1975; 50(4):401-02.
10. Der Mer JL. et al. Standardizing, monitoring, evaluating preceptorships: A model for decentralized medical education. Jour Med Educ 1975; 56:471-73.
11. Spee E, et al. State role of financing medical education. Jour Med Educ 1972; 46:358-62.
12. Haller JA. Preceptorships-a vital ingredient in medical education. Pharos 1978; 41(4):27-30.



Using Problem-based Learning with Large Groups

Andrew R. Buzzelli, O.D., M.S.

Abstract

The purpose of this project was to determine whether large group problem-based learning approaches, currently used in other health professional educational institutions, could be utilized in an optometric curriculum. A core curriculum course (pediatric optometry) was presented in a revised interactive problem oriented format to a large third year professional level academic class of 147 students. New instructional objectives, class presentation, and topic selections were prepared for the course. The results of pre- and post-course student questionnaires indicate moderate student acceptance of the program.

Key words: *problem-based learning, learning theory, optometry curriculum, behavioral education, patient-focused*

Introduction

Optometry's scope of practice has become increasingly sophisticated since the awarding of the first Doctor of Optometry degree. Optometry students are faced with an ever-expanding information base needed for effective clinical practice. In this day of an holistic approach to health care, the question has arisen, "Are we merely training students in diagnosis and treatment, thus failing to sensitize them to help solve patients' related problems such as compliance with recommended treatment, comfort with diagnostic procedures or appropriate visual hygiene?"

Optometry students receive state-of-the-art instruction in basic science and clinical technique; they are also expected to develop the compassion and empathy necessary to care for a person's total visual health. Problem-based learning may be a way to accomplish both ends.

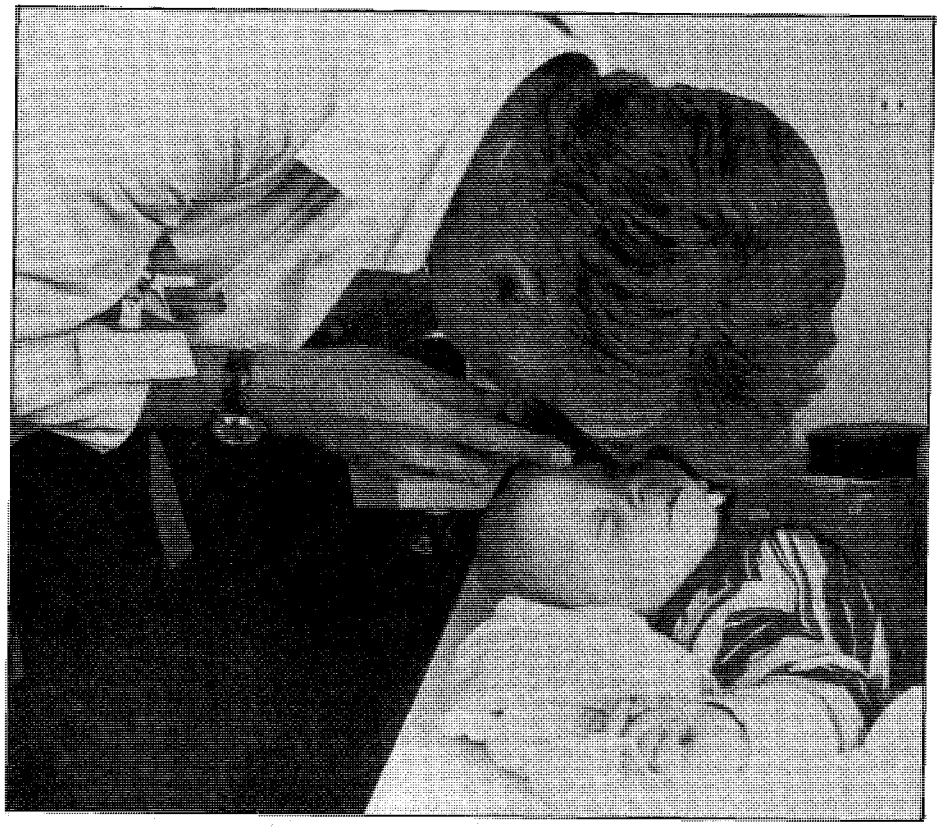
Dr. Buzzelli is an associate professor of optometry at the Pennsylvania College of Optometry and a lecturer in education and neurophysiology at Georgia Court College.

Problem-based learning is not new.[1] Harvard University Medical School was among the first to introduce the concept of problem solving to large groups of students. Success was achieved by assigning specific disease entities to small groups. These students in turn presented simulated patient encounters, while being observed by the rest of the class. Later analysis of this technique revealed no decrease in students' performance using problem-based learning in a large group setting.[2] Evidence of the effectiveness of this technique also exists in continuing health professional approaches. Medical students attending case presentation sessions retained and even increased their cognitive knowledge beyond those attending only lecture sessions.[3]

The current lecture/written exam style of education produces a highly technical person; it does not necessarily deliver a compassionate one. The traditionally educated student may not develop the ability to apply his or her knowledge to commonly encountered clinical problems.[4] Compassion, problem-solving, and patient management admittedly are desirable traits to foster in optometric students. Problem-based learning possibly can be a valuable tool in teaching the application of techniques, as well as in sensitizing students to caring and understanding.[5,6,7]

Optometrists commit to a lifetime of professional learning. Optometric educators are responsible for teaching students how to continue to learn and how to respond to patients.[8] Thus scientific information can no longer be the sole content of a curriculum; such information must be combined with the goals of decision-making and professional responsibility.[9,10] The group encounter and sharing necessitated by large group problem-based learning methods may represent a step forward in this area.

These are different methods employed when using simulated patient encounters to apply knowledge to diagnosis and patient management, such as computer simulation, play acting and video display.[11,12] Students are taught to manage problems in pediatric optometry by conducting staged examinations of preschool patients with various anomalies. The challenge: Could problem-based learning be effective when presented in a large group setting?



Methods

The Pediatric Optometry course at the Pennsylvania College of Optometry was selected as an appropriate arena to begin the application of group problem-solving techniques. First, a syllabus was developed which clearly outlines the objectives of both the course and the problem-based learning approach.

The course, which originally featured a two-and-a-half hour weekly lecture, was divided into two sections; a typical lectureby the course instructor the first day tied into the student's presentation the next day, but went beyond the scope of the presentation to provide a proper and fuller context. Selected textbook and journal readings and a quiz question designed to focus student thinking preceded the first day lecture. For example, students were tested about the proper treatment of bacterial conjunctivitis for a one-year-old child the day before the student's presentation. The second day the presenters covered the complete interview, examination, diagnosis, and treatment of the assigned problem.

During the last twenty minutes of class, observing students asked questions of the presenters related to their diagnosis and treatment protocols. The instructor acted as facilitator, and then closed out the class by highlighting the important points of the presentation and relating them to the previous day's lecture and readings.

The students were assigned specific roles by the group facilitator to ensure an even distribution of work. Assigned roles were:

1. Group facilitator - facilitates the organization and coordination of group activity.
2. Background researchers - prepare references for distribution to the class.
3. Facilitator - explains to the class why the doctor has proceeded in a certain manner during the testing and why the doctor has chosen to do certain tests; outlines the therapy program which the doctor explains to the patient.
4. Doctor and patient simulators.
5. Audio-visual aid providers - prepare appropriate handouts to be delivered to the student's note-taking service before the presentation.
6. Evaluators - prepare appropriate self-assessment questions to guide the other students in the self-appraisal.

The presentation of the clinical problems was well-rehearsed. Students who acted as the doctors were required to take a case history, perform a complete examination, demonstrate new diagnostic techniques, and provide both an assessment and treatment plan. The role of the facilitator was crucial in conveying to the class exactly why the doctor was asking certain questions or performing a particular test. The class thus had a running narrative as the exam progressed. Students prepared the evaluation section and submitted it to the instructor at least 10 days before the presentation. The appropriate notes and handouts had to be distributed no later than one day before the presentation. This enabled the instructor to be certain that students were covering the appropriate material in a manner understandable to the class. Students were required to present basic science aspects as well as diagnostic and treatment protocols.

The topics were selected to provide an example of the most common variations of pediatric examinations. They were:

1. Preschool Vision Examination
2. Pennsylvania College of Optometry Visual Information Processing Evaluation (laterality, visual-form)
3. Pennsylvania College of Optometry Visual Information Processing Evaluation (visual-motor, visual-auditory)
4. Pediatric Medical Evaluation
5. Pediatric Ocular Trauma
6. Infant Vision Evaluation
7. Denver Development Screening Test
8. Pennsylvania College of Optometry Preschool Developmental Evaluation
9. Pediatric Ocular Disease
10. Learning Disability Evaluation

The instructor provided the students with his home telephone number and made himself available for direction during the evening hours when they usually convened. The students operated under no rigid guidelines while designing their presentations. Indeed, creativity was encouraged and often emerged in the form of small quiz-styled game shows and video presentations. The instructor evaluated students on a twenty-point scale including:

1 .Quality of the group activity - 5 points
2. Depth of the background research - 5 points
3. Presentation and clarity of diagnostic and therapeutic techniques utilized - 5 points
4. Individual degree of participation - 5 points

The score accounted for 20% of the student's overall grade. The desired objectives were also assessed during the midterm and final evaluation, as well as during weekly class quizzes which

included the topics covered by the students.

The results of the differences in reading format used in this instructional program were evaluated by a survey of the class (approximately 3 months after completion of the course). The students surveyed were assigned to the Pediatric and Binocular Vision Unit of the Pennsylvania College of Optometry. The students were asked to rate their perception of their preparation to perform the clinical duties expected of them in the unit. The ten questions on the survey (figure 1) related their preparation to various aspects of the problem-based learning method. They were directed to relate this teaching method to their preparation for other primary care and speciality clinical units learned in other more traditional lecture - style courses.

Results

The results of the questionnaire distributed to the students are shown in table 1. The respondents showed considerable variability of opinion; 60% of the respondents concluded that this method prepared them as well for providing eye care to children as more traditional lecture-style classes. The remaining students were equally divided in their opinion that the problem-based learning teaching style was responsible for helping them be better prepared to examine children (20%) or was less effective than other methods (20%).

Questions six and seven were the only topics that drew a significant negative opinion from the students. These questions concerned integration of information from other disciplines and case history taking. According to the survey, students believed there was an improvement in learning when this teaching technique was utilized. The first three questions reveal a reversal in the students' negative opinions at the beginning of the course (90%) to an overall student acceptance rate (76%) after having experienced the course.

TABLE 1
Student Questionnaire

	Less Prepared Than Previous Classes	As Well Prepared As Previous Classes	More Prepared Than Previous Classes
1. This method represented an improvement over the normal lecture style of teaching.	0	80%	20%
2. I was concerned about the new method of teaching at the start of the quarter.	0	40%	60%
3. I felt more comfortable with this style of teaching at the end of the quarter.	0	60%	40%
4. This method helped me develop an ability to research clinical problems.	20%	60%	20%
5. This method helped me develop an ability to apply appropriate clinical treatment methods.	20%	60%	20%
6. This method helped me develop an ability to integrate information from other disciplines into my clinic problem solving approach.	60%	40%	0
7. This method helped me develop my case history taking skills.	60%	20%	20%
8. This method facilitated my integration of didactic and practical optometric information.	20%	60%	20%
9. This was a stimulating learning experience for me.	20%	60%	20%
10. I would like to see this method of problem-based learning continued in the pediatric optometry course.	20%	60%	20%
Total Percentage of all Student Response:	20%	60%	20%

Discussion

Analyzing improvements in clinical performance presents a formidable task for the instructor. Statistical analysis is problematic because numerous variables are involved. Any increase or decrease in clinical performance by a given group of students could occur because of changes in the group itself, changes within the clinic environment, or changes within other courses in the curriculum. A survey was chosen to see if student perception of adequate clinical preparation could be related to satisfaction with a particular teaching method. They were also the first group which had a mandatory rotation through the Pediatric/Binocular vision unit. Students having little interest in pediatrics might evaluate a course negatively in an area in which they are required to examine young patients.

The students in this survey were also involved in an earlier patient simulation, a problem-based learning course concerning Normal and Abnormal Binocular Function. This, by itself, or in conjunction with the problem-based approach of the Pediatric course, certainly would affect student attitudes or opinions reflected in the questionnaire. The variability of responses seen in the questionnaire, specifically in questions 4-10, may be related to student interest in either pathology-oriented or low vision aspects of their clinical rotation. The variability may also be attributable to some students who were still adjusting to exposure to direct patient contact within The Eye Institute.

There is, however, more to consider than the analysis of the information. It

is difficult for all the reasons cited to single out the effects of problem-based learning. It will take time, national boards, and state board evaluations along with graduate feedback to give a clearer picture. The student questionnaire results point to the problem-based method as being at least comparable to the lecture style of teaching. Lecturing can be a very poor atmosphere in which to foster problem-solving skills, research ability, and clinical examination methods. If large group problem-based learning methods can provide these results to a small degree, even if only to part of the class, it should be encouraged. The results of this survey indicate that from a student's perspective it is comparable to the lecture style teaching method with no apparent adverse effects on student clinical preparation.

Problem-based learning affords a new holistic approach to teaching. It will not solve the problems involved in teaching, but problem-based learning may be a way of delivering a good deal of information. Students need to become confident practitioners. We often speak of the art involved in all healing professions, yet our lecture halls remain chained exclusively to the science of healing. Problem-based learning moves away from the sequential, compartmentalized thinking that characterizes our left brain approach to instruction. The imagination and creativity of the right brain may be tapped by the problem-based learning approach. As Matthew Fox claims: "Education needs to include the disciplinary and motivating of the right as well as the left brain. For wisdom does not proceed from either right or left brain, but from the marriage of the two, functioning well as equal partners in pursuit of truth."[13]

CALENDAR

ASCO Committee Meetings — March 11, 1994. State College of Optometry, State University of New York. Contact: Rebecca M. Defibaugh (301) 231-5944.

ASCO Executive Committee Meeting — March 11, 1994. State College of Optometry, State University of New York. Contact: Martin Wall (301) 231-5944.

ASCO Board Meeting — March 12-13, 1994. State College of Optometry, State University of New York. Contact: Martin Wall (301) 231-5944.

Interestingly, at the outset, 90% of the students opposed the problem-based learning approach. Survey results show a dramatic reversal after participation in the course. This agrees with Moore's study which shows that students who are exposed to a problem-based learning curriculum, even on an involuntary basis, come to prefer this type of instruction. Ineffective educators, rather than a defect in the teaching innovation, may be the reason some students do not achieve a satisfactory level.[14] Future studies must review measures needed to evaluate innovative teaching. Patients as well as student evaluations, post-graduate analyses of new provider confidence, and re-certification processes for established providers need to be investigated as appropriate measures of how well we have trained our students in patient interaction, problem solving, and continued professional learning.

This survey shows that large group problem-based learning experiences eliminate some of the inadequacies and inefficiencies found in the traditional lecture approach of optometric education. This technique may allow us to move beyond the current "word-centered" teaching to a more "person-centered" educational approach. Small student groups may be desirable in using problem-based learning, but large student groups also can successfully utilize this approach. ■

Acknowledgements

The author thanks Lloyd Applegate for his expertise with the preparation of the manuscript.

References

1. Scheiman M, Whittaker S, Dell W. Problem-based learning as a potential teaching approach: A literature review. J Optom Educ 1989; 15(1):9-15.
2. Barrows HS, Tamblyn RM. Problem-based learning: An approach to medical education. New York: Springer Publishing Co., 1980.
3. Greenberg LW, Jewett LS. The impact of two teaching techniques on physicians' knowledge and performance. J Med Educ 1985; 60:390-396.
4. Shahadbudin SH. Content coverage in problem-based learning. Med Educ 1987; 21:310-313.
5. Whiteside M, Whiteside A, Tysinger J, Rank R. Techniques for using computer-delivered patient cases by groups of students to develop problem-solving skills. Conference proceedings of learning technology in the health care sciences. 1990:54-59.
6. Rouse MW. Problem-based learning: An alternative to traditional education. J Optom Educ 1990; 15(4):111-112.
7. Barrows HS. Simulated patients (programmed patients). Springfield: Charles C. Thomas-Publisher, 1971.
8. Scheiman M, Whittaker S. Implementing problem-based learning in the didactic curriculum. J Optom Educ 1990; 15(4):113-118.
9. Barrows HS, Myers A, Williams RG, Moticka EJ. Large group problem-based learning: A possible solution for the "2 sigma problem." Med Teacher 1986; 8(4):325-331.
10. Newble DI, Clarke RM. The approaches to learning of students in a traditional and in an innovative problem-based medical school. Med Educ 1986; 20:267-273.
11. Schmidt HG. Problem-based learning: rationale and description. Med Educ 1983; 17:11-16.
12. Barrows HS. A taxonomy of problem-based learning methods. Med Educ 1986; 20:481-486.
13. Fox M. Original Blessing. Santa Fe: Bear Co., 1983:23-29.
14. Moore GT. The effect of compulsory participation of medical students in problem-based learning. Med Educ 1991; 25:140-143.

IN REVIEW

Allergy and Immunology of the Eye, Mitchell H. Friedlaender, M.D., Raven Press, New York, 1993, 337 pages, 141 figs. (B & W), 14 Tbls., $89.00.

When asked to review the new edition of Mitchell Friedlaender's text, Allergy and Immunology of the Eye, I readily agreed. The first edition had been written over 15 years ago, and an updated version was clearly necessary. Immunology is one of the areas of basic clinical medicine that has seen many changes in both the theories of immune mechanisms and in the management of immune disorders. I find the subject clinically important, challenging, and very exciting. You can imagine my disappointment when I realized the Friedlaender's book failed to incorporate any new insight into the subject.

The book follows the standard format of most clinical texts. The first three chapters are devoted to describing the basic elements of the immune system and their relationship to the eye. This section is probably the most worthwhile. It offers students a simple review of the classic elements and mechanisms of the immune system. The remainder of the text is devoted to a description of immune/allergic disorders with ocular involvement. The author describes each clinical entity by its immunopathology, clinical features, and treatment options.

This is where the text fails miserably. I had expected a cutting edge approach to the management of immune disease that incorporated the latest theories of the immune process coupled with the latest therapeutic strategies. I also expected a unique clinical perspective, which reflected Dr. Friedlaender's personal experience in managing allergic/immune disorders. What I got was a rehash of standard, frequently outdated, approaches to managing allergic/immune disorders. For example, the section on H. Zoster ophthalmicus cited recent articles on management of the disease. These "recent" articles were published in the 1970's. Current theories of management that include the use of oral acyclovir to prevent trigeminal neuralgia are sadly lacking. Unfortunately, this example was repeated throughout the book.

The subject range within the text is quite ambitious. Topics range from the immune component of infectious disorders to ocular tumors. Unfortunately the coverage tends to be cursory at best with no special insight in management. I was personally amazed that "the definitive text" on ocular allergy included no discussion of GPC. Furthermore, a text that incorporates treatment information should include a chapter on therapeutic modalities and their mechanisms, i.e., drugs. This was lacking.

The singular text on allergy/immunology should incorporate the most up-to-date theories of allergy/immunology and curent management techniques. One will, unfortunately, need to look elsewhere.

Guest Reviewer:
Bruce E. Onofrey, R.Ph.
Lovelace Medical Center
Albuquerque, New Mexico

Clinical Management of Strabismus, Elizabeth E. Caloroso and Michael W. Rouse, Butterworth-Heinemann, Boston, 1993, 367 pp., including index, hardbound, $75.00.

Caloroso and Rouse have written an excellent account of how they diagnose and treat strabismus. Using flow charts to augment their text, they share their clinical decision process with the reader and give their reasons for each step in the procedure. In keeping with the title, this is a text on clinical management, incorporating numerous treatment options, including no treatment where this can be in the patient's best interest. They give specific insights into the use of lenses, prisms, occlusion, home and office vision therapy, pharmacological therapy, surgery, and various combinations of each of these modalities. This is a highly readable text and several of the chapters are outstanding. The discussion of occlusion, for instance, gives sophistication to a treatment modality that is often crudely applied.

The authors have succeeded in their mission of providing a practical guide to management of strabismus and amblyopia. The reader can follow their thought processes and apply their methods in his/her own practice. Noteworthy is the authors' emphasis that full and complete binocular function, not just improved cosmeisis, should be the treatment goal. This does not generally appear in the medical literature.

This text is strongly recommended, but the philosophical core which underlies it will disappoint optometrists who also train strabismus successfully using other models. While the approach offered is function, the function is largely confined to the binocular vision system itself. Caloroso and Rouse make suppression the enemy which must be rooted out by making the patient aware of diplopia under as many circumstances as possible. The authors seem to be only minimally influenced by the work of Brock, who gets only passing mention, and others who view suppression as an often useful adaptation and less of an obstacle to fusion. Other vision therapy approaches can reduce the risk of persistent diplo-

pia when, for instance, surgery is not optimal. This text lumps intermittent and constant strabismus together, as they are in most medical models, despite the fact that the sensory behavior of intermittent strabismics is much closer to normals than to constant strabismics. When the intermittent exotrope is looked at this way, very different effective treatment strategies emerge which are more functional than those offered by Caloroso and Rouse.

Clinical Management of Strabismus should be studied by all who treat strabismus. The primary care doctor will gain insight into the variety and complexity of the treatments available to manage a commonly encountered condition. Those who routinely refer children for surgery may wish to consider other options more beneficial for their young patients.

The vision therapy practitioner will benefit from a systematic presentation of classical treatment of strabismus, done in a coherent fashion. Those who disagree with the authors will still gain, for there are strabismics who require the almost brute force, closely controlled orthoptics based approach that is detailed. Some patients with constant turns cannot achieve normal sensory abilities other than in the amblyoscope. This method should be in the repertoire of those serious about treating strabismus.

Optometric students should digest this text and learn the craft it contains like the artisan must master basic tools. They should then move from this base to explore other avenues in strabismus care as well, for this model is not always the optimum way to go. There is no more challenging phase of optometric practice than the treatment of strabismus. This text makes a strong case for one approach. Studying and practicing all viable treatments ultimately leads to the best possible patient care.

Guest Reviewer:
Dr. Nathan Flax, Professor Emeritus
State College of Optometry
State University of New Yor

The Contact Lens Manual: A Practical Fitting Guide,

Andrew Gasson and Judith Morris, Butterworth-Heinemann, Oxford, U.K., 1992, 321 pp, soft cover, $49.95.

The Contact Lens Manual: A Practical Fitting Guide is a comprehensive clinical guide for eyecare practitioners and staff members. The 31 chapters, providing information on ocular physiology, fitting, care, special designs and aftercare, are primarily written in outline form. This text was written for the clinician as a reference guide on all clinical contact lens topics.

The feature I like most about his text is the use of summary guides at the end of each section of every chapter. These guides, termed "Practical Advice" and "General Advice," typically consisted of practical clinical applications of the information presented in that

section. Some of the chapters are particularly beneficial for the clinician including those pertaining to physiology, instrumentation (biomicroscope, keratometry), fluorescein pattern evaluation, soft lens fitting characteristics and soft lens fitting.

There are several areas of concern with this text, however. Although this text was published in 1992, the emphasis on antiquated lens materials is apparent. PMMA lenses represented the focus of many chapters and sections of other chapters including lens materials, design, fitting, bifocals, fenestrations, aftercare and aphakia. Fluoro-silicone/acrylate lens materials, which are used on the great majority of all new rigid lens patients in the United States are mentioned only as a problem-solving lens whereas CAB and silicone/acrylate lenses are often recommended. Five pages are devoted to the fitting of the Bausch & Lomb Soflens "letter" series of lenses, which were phased out in the U.S. several years ago.

A second problem for U.S. practitioners is the terminology. The terminology for lens design parameters is often different from what clinicians in the U.S. are accustomed to; likwise, the standards, materials and designs (notably, aspheric) pertain understandably to the United Kingdom. In addition, although this is a clinical manual, there are few tables or appendices and only about 70 diagrams; illustrations on insertion and removal, modification and verification were notable by their absence. Likewise, the primary disadvantage of an outline format is insufficient explanations and this was apparent in the sections on preliminary examination (the advantages/disadvantages of corrective options and materials were listed) and the two-page chapter on disposable lenses simply listing the advantages and disadvantages.

In summary, *The Contact Lens Manual: A Practical Fitting Guide* is an easy-to-read, practical, clinical contact lens manual . . . However, for clinicians in the United States, its best application is that of a reference source.

Guest Reviewer:
Dr. Edward S. Bennett
University of Missouri — St. Louis
School of Optometry

Migraine and Other Headaches, The Vascular Mechanisms,

Olsen J., ed., Raven Press Ltd., New York 1992, 358 pages, $94.50.

This book on the vascular mechanisms of migraine and other headaches is volume one in the series *Frontiers in Headache Research.* It is largely dedicated to research of regional cerebral blood flow as a method for gaining greater understanding into the nature of migraine and other headaches. In this regard, it is primarily of inter-

est to those involved in research to more clearly understand the pathophysiology of migraine headaches.

The book is divided into ten sections. These include: methods, interictal studies in migraine with aura; the onset of migraine attacks with aura; spontaneous attacks of migraine with aura; mechanisms of migraine with aura; interictal studies of migraine without aura; attacks of migraine without aura, transcranial Doppler studies in migraine, cluster headache and other headaches and effects of antimigraine drugs. Each section concludes with discussion summary.

Many of the chapters describe the results of cerebral blood flow (CBF) as measured using various forms of xenon or other inert gases. These gases may be administered by the routes of inhalation or intravenous injection. The nature of the cerebral blood flow may then be recorded using a brain dedicated single photon emission computed tomography (SPECT) system. In this manner the nature of cerebral bloodflow may be studied in various types of migraine or other headache types over time. Specific patterns related to specific types of migraines begin to emerge and may be consistent with the evolving nature of migraine change over time.

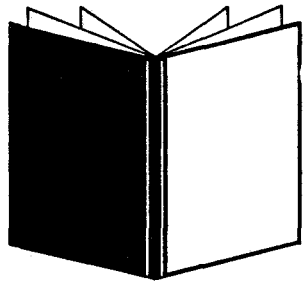
Technically this book is pleasantly designed with relatively large print, tables and both color and black and white figures used appropriately throughout the book.

The primary focus is the neurologic researcher interested in gaining a better understanding of the vascular pathogenesis of headache. This book will not be of interest to many optometrists. It may, however, be a resource for those wishing to understand the vascular changes related to migraine and other types of headaches.

Guest Reviewer:
Dr. John Amos
University of Alabama at Birmingham
School of Optometry

Physiology of the Eye — An Introduction to the Vegetative Function, Irving Fatt and Barry A. Weissman, Stoneham, MA, Butterworth-Heinemann, 1992, 2nd edition, 275 pp., including index, hardbound. $35.00.

It is probably fair to say that this book, the first edition of which appeared in 1978 (authored by the present first author), is closer to a monograph than to a textbook. For example, it might surprise a naive reader to find that it does not deal at any length with what most people think of as the "vegetative functions" of the eye. (The authors suggest using the 1984 editions of Davson's *The Eye,* volumes 1A and 1B, as supplements to the book). The strong focus here is the biophysics of the eye — particularly the behavior of fluids, solutes, and gasses in the various ocular tissues.



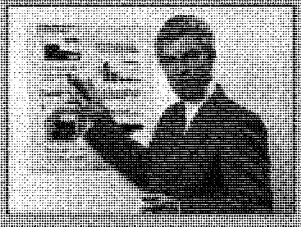
The organization of the book is similar to the first edition: a brief review of the anatomy, medium-sized chapters on aqueous humor and intraocular pressure, brief chapters on vitreous and lens, and then two very large chapters (about half of the book) on the cornea. Concluding the book are brief chapters on sclera and retina, and a somewhat expanded chapter on tears and blinking. Much of the text in the major sections has undergone relatively little change. There have been some efforts to update the material, often in the form of a brief supplement to a pre-existing section; for the topics given relatively little weight, this has sometimes led to skimpy consideration of areas of research (for example, lens elasticity). In the book's central topics, there have been greater efforts to incorporate new material; for example, there is some treatment of rigid gas permeable contact lenses. It is a shame, though, that more time could not have been devoted to the substantial body of work in areas of contact lenses, corneal swelling, etc., that has accumulated since the first edition.

Two other chapters that have been augmented deal with vitreous and tears — the material here is interesting and idiosyncratic. In the vitreous section, some unpublished work, studying fluid flow with an electrical model, has been incorporated. (Here, a little more detail would have been helpful.) In the tears section, the authors' dissatisfaction with current notions of tear film structure and tear breakup has led to some studies with a model eye and speculations regarding the tear film and its breakup. These areas where there is plenty of room for investigation, and the speculations may spur further study. (Unfortunately, the biophysics of tear drainage, another little-studied area, was not addressed in either edition.)

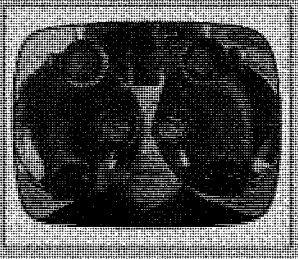
These considerations aside, it must be realized that this is a unique book. The first author has been a major contributor to understanding the biophysics of the eye and there are few places to go for a grounding into the area. (Most ocular physiology texts touch these topics so lightly that they will be missed if the reader blinks.) While it is possible that basic courses in ocular physiology may find the treatment too unbalanced, anyone who wants to come to grips with ocular biophysics will do well to study this volume. And here there is welcome news: the material has been made much more readable by division into sections with appropriate headings. Moreover, the singularly awkward equation typography of the first edition (flushed to the page margin) has been abandoned in favor of the centered form. These changes have made a landmark body of work more accessible.

Guest Reviewer:
Dr. Harry Wyatt
State College of Optometry
State University of New York

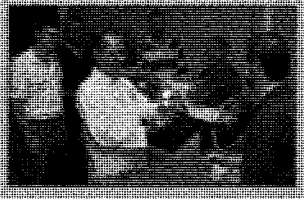
Why Is Varilux The Professional's First Choice?



A) ***A Focus on the Independent Professional.*** The profitability of independents is our top priority. Our sales team trains your staff to maximize progressive lens opportunities.

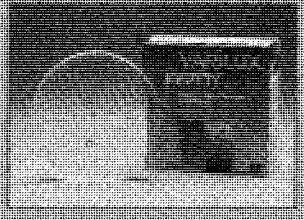


E) ***National TV Advertising*** will reach over 40 million presbyopes this year and direct patients right to practices like yours.

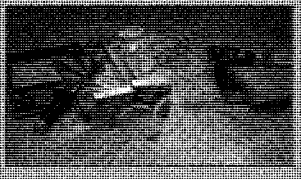


B) ***A Select Laboratory Network.*** Our *only* means of distribution, providing you with an indispensable competitive advantage.

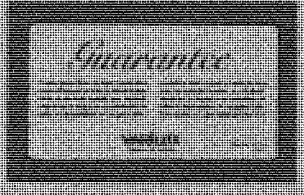
F) ***Generous Co-op Advertising Support*** and in-office materials reinforce the national campaign and build your practice.



C) ***High Quality Lenses.*** The most advanced designs, available in a wide assortment of materials to meet the needs of all presbyopes.



G) ***All of the Above.*** Only from Varilux and its authorized laboratories.



D) ***A Comprehensive Patient Satisfaction Guarantee*** backing you every step of the way.

If these answers beat the ones you're getting from other progressive lens manufacturers, call toll-free, 1-800-BEST PAL today.

VARILUX®

Your Partner in Presbyopia Management