JOURNAL OF OPTOMETRIC EDUCATION

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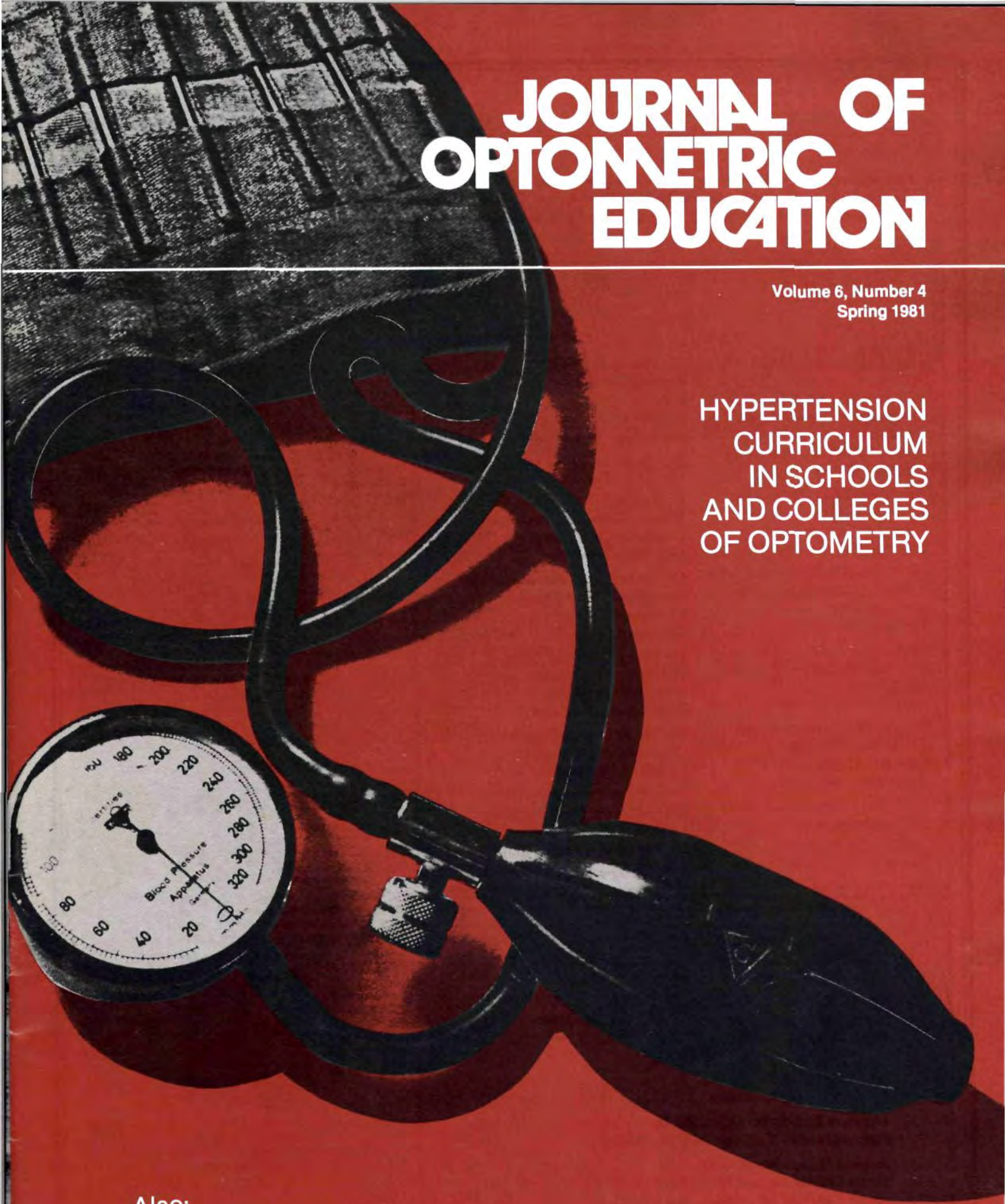

HYPERTENSION CURRICULUM IN SCHOOLS AND COLLEGES OF OPTOMETRY

Also:

Binocular Vision by Mini Computer □ Vocational Interests of Optometry Students
Profile of the Vision Educational Foundation

ASSOCIATION of SCHOOLS and COLLEGES of OPTOMETRY

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

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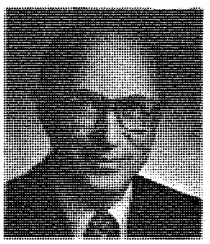

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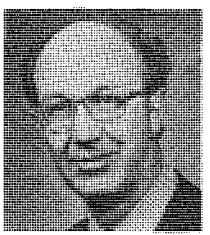

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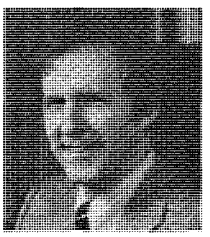

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DEPARTMENTS

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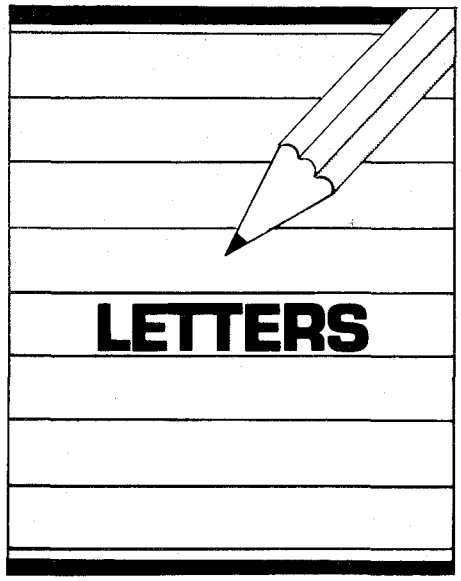


Dear Editor:

I am Virginia State Director for VOSH and at our last Virginia Academy meeting a motion was made to donate some money to VOSH, which was tabled until I provide the Academy with more information on VOSH.

Would it be possible to obtain fifty reprints of your "Face to Face" article with Russ Dorland, O.D., past president of VOSH, which I can present to the membership in my effort to raise money for VOSH?

Awaiting your reply,

Anthony W. Anneski,
O.D., M.Ed., F.A.A.O.
Pulaski, Virginia

Dear Editor:

Thank you for sending me the article about VOSH that appeared in JOE and thanks very much for helping VOSH by publishing the interview with Dr. Dorland. Such articles are not only helpful to VOSH and optometry but to the poor people who receive our services. Some of these people enjoy good eyesight for the first time in their lives.

Yours in humanitarianism,

Ed Foote, O.D.
President, VOSH International
Warren, Arkansas

Dear Editor:

What a nice article about VOSH and Dr. Russ Dorland. Russ did a wonderful job during his term as president of VOSH/International. Thank you for giving him the credit he deserves.

V.E. Falkenhain, O.D.
President Elect/VOSH
P.O. Box F
Rolla, MO 65401

Dear Editor:

I am returning the Reader Survey of the *Journal of Optometric Education*. I do feel that the *Journal* serves a very useful purpose and that strenuous efforts might be made to increase its international circulation. This would be helped by a greater frequency of publication. If monthly publication were possible, then I am sure the *Journal* would have a greater impact in areas such as Great Britain.

One topic which I feel is important and would be extremely useful to optometric teachers is a publication on the discussion between experienced teachers from the U.S.A. and U.K. and other countries on mutual educational problems. Perhaps a whole journal might be devoted to this at some future stage.

With kind regards.

Professor G.V. Ball, Head
Department of Ophthalmic Optics
University of Aston in Birmingham
England

ANNOUNCEMENT

Sixth Symposium on Ocular and Visual Development

The topic of this year's symposium will be, "Cellular Communication During Development," to be held at the Holiday Inn, Philadelphia, Pennsylvania, June 8 and 9, 1981. Sessions will include "Synaptogenesis," moderated by E. Raviola; "Cell Coupling," moderated by M.V.L. Bennett; and "Humoral Factors," moderated by D. Beebe. Also scheduled is a clinical lecture, "Theories of Magnification Involved in Low Vision," by R. Brilliant and other contributed papers.

The symposium is sponsored by Temple University and the Pennsylvania College of Optometry. Coorganizers are R. Hilfer and J. Sheffield, Department of Biology, Temple University, Philadelphia, PA 19122.

The Importance of Physical Diagnosis in Primary Care Optometry

Our profession has advocated the use of the terminology "primary care optometry." Primary care implies an entry point into the health care delivery system. As one entry point into the health system, the optometrist must be able to provide primary vision/eye care. He must also be able to recognize ocular manifestations of systemic disease and have the abilities to further investigate the complex of signs and symptoms of systemic disease. The optometrist as a primary care provider must act as a triage practitioner. He must have a working knowledge of the medical specialty areas in order to more effectively refer patients with specific diseases. The ramifications of this role have yet to be recognized by the profession. The terminology "primary care optometry" implies to the public and other health care practitioners that the profession should be able to recognize not only problems confined to the visual system, but also related manifestations of systemic disease.

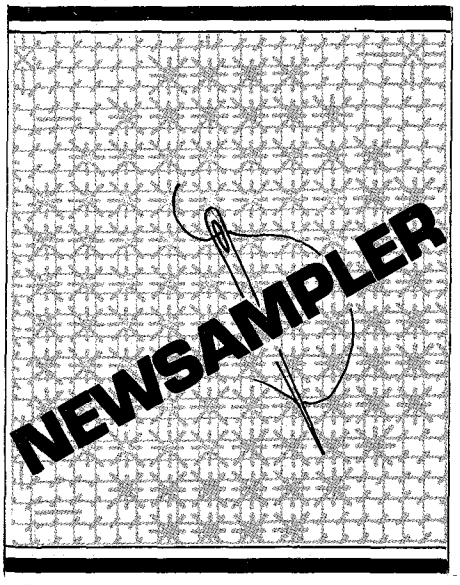
If the profession is to continue to use the primary care model it must address the problems of diagnosis of systemic diseases that may relate to ocular complaints and the prescription of a plan for appropriate management.

To provide these services requires education in systemic pathology, systemic pharmacology, and ocular pharmacology in addition to the standard human science courses of study. More important is a comprehensive course of study in human physical diagnosis. The profession has scratched the surface in physical diagnosis by addressing hypertension and diabetes. Most practitioners employ hypertension screening in their practices. Diabetes is also screened in some practices. Practitioners are making great strides and need to continue expanding their screening services.

The list of systemic diseases that may manifest in an optometric examination is endless. General areas of concern are neurology, cardiovascular disease, hematology, endocrine dysfunction, rheumatology, infectious diseases, hereditary diseases, neonatal complications and psychiatric dysfunction. Each of these areas can provide specific examples that will underscore the importance of recognition and further investigation of ocular signs and/or symptoms that may relate to a disease complex.

My question to the profession is, do you recognize the responsibility implied by the terminology "primary care professional?" The optometric professional must have the necessary training to manage the implications of a complaint of a dry eye in a 26 year old female, pain behind the eye in a 35 year old female, a Roth's spot in an 18 year old female, sudden onset of diplopia in a 22 year old male, or repeated periods of loss of vision in the right eye of a 55 year old male. I maintain that to better represent the model of the "primary care practitioner" the profession must strengthen the professional curriculum and continuing education programs in the area of physical diagnosis. This would then enhance patient care and fortify the usage of the phrase "primary care optometry."

Larry J. Alexander, O.D.
Assistant Dean for Student Affairs
UAB School of Optometry



Health Professions Education Legislation

In the face of sweeping budgetary reforms proposed by the new administration, federal health professions education programs have been dealt a severe blow with regard to prospects for continuing support. Among the proposals called for by President Reagan are a cutback in subsidies and a change in priorities for the training of health professionals and elimination of new scholarships for the National Health Service Corps programs.

In addition, reforms outlined for the Guaranteed Student Loan (GSL) and Pell grant programs would sharply reduce student aid, focusing on the "truly needy" instead, and curtail loans to middle and upper income families.

Rep. Henry Waxman (D-Calif.) has introduced a revised version of last year's health manpower bill (H.R. 2004), and hearings were held in mid March. The bill provides for a two-year phase out of "capitation" authority, start-up and financial distress grants, various student support programs and a continuation of the NHSC scholarship program.

In the Senate, delays were encountered in introducing legislation. On March 25, Sen. Orrin Hatch (R-Utah) introduced S. 799 amending the Health Professions Education Assistance Act and S. 801 dealing with the NHSC scholarship program.

Key elements of S. 799 include continuation of the Health Professions Student Loan program without any further federal capitalization and establishment of a new 9 percent interest rate; continuation of financial distress and start-up assistance for schools presently in the program; availability of construction and renovation loans; but termination of institutional support, project grant authority and exceptional need scholarships. All funding authorizations provided are minimal.

The administration has yet to submit its proposed legislation for health professions education. However, S. 799 closely follows the position taken by DHHS Secretary Richard Schweiker. It appears that the best opportunity to restore some level of support for health professions education will be in the Committee of Conference following passage of a House and Senate version of the legislation.

NBEO Adopts New Scoring Procedures

Establishing itself as a leader in national testing programs for health professions, the National Board of Examiners in Optometry (NBEO) has announced the adoption of criterion-referenced scoring for its 1981 National Board examinations. The procedure, which does not require a predetermined failure rate, will no longer cause candidates to compete against each other as in norm-referenced scoring. Instead, it will establish a standard based upon the difficulty of a test item, and, consequently, the level of examinee performance expected.

In addition, a policy beginning with the April, 1981, administration has been adopted which will require passing the National Board examinations by the part rather than by a combination of section scores. In the past, a candidate was required to meet a certain combination of section scores as well as an overall part score, with totals developed from weightings of items and sections within the part. Now, this "recipe" policy has been replaced by an overall part score decision with each item having equal weight.

NBEO also is considering the dropping completely of the pass/fail decision and replacing it with a score report plus recommended pass levels, as requested by several state boards. Comments are invited on this proposal before the board's Annual Meeting in Las Vegas, June 17-20.

European Schools Form Association

Two years following its conception in May, 1979, the Association of European Schools and Colleges of Optometry (AESCO) has become a reality. First proposed at the 1979 International Congress of the International Optometric and Optical League (IOOL), AESCO has issued its first communication, "Communication 1. 1981," and plans a two-day meeting May 16-17 prior to this year's IOOL International Congress in Paris.

The stated purpose of the organization is to promote the standardization and improved training levels of programs in ophthalmic optics and optometry. As part of its initial work, a survey has been conducted of member schools to obtain preliminary data concerning the teaching of ophthalmic optics in Western Europe. Further information will be added as contacts with Eastern European countries are completed.

New Optometry Recruitment Brochure

A new recruitment brochure entitled, "Career Opportunities in Optometry," has been developed by the Association of Schools and Colleges of Optometry (ASCO), Council on Student Affairs, Project Team on Recruitment.

The eight-panel, four-color brochure fully describes career opportunities, admission requirements, curriculum, financial aid, post graduate study and licensure in a comprehensive, brief introduction to the profession. It offers an attractive, low cost information piece for use in recruitment activities and other programs.

Special acknowledgement for development of the brochure goes to J. Paul Crippan, chairperson of the Project Team on Recruitment, Dr. David Davidson, a member of the project team and Dr. Michael H. Heiberger, chairperson of the Council on Student Affairs. The American Optometric Association shared in the initial cost of the brochure.

APHA Seeks Award Nominees

The Vision Care Section of the American Public Health Association (APHA) is seeking nominees for its first annual awards program. Awards to be presented include Outstanding Paper/Project Award, Vision Care Outstanding Student Award, and Vision Care Distinguished Achievement Award.

Interested persons should contact Alinda Perrine, Awards Chairperson, Box 114, UAB School of Optometry, University Station, Birmingham, AL 35294.

(continued on p.30)

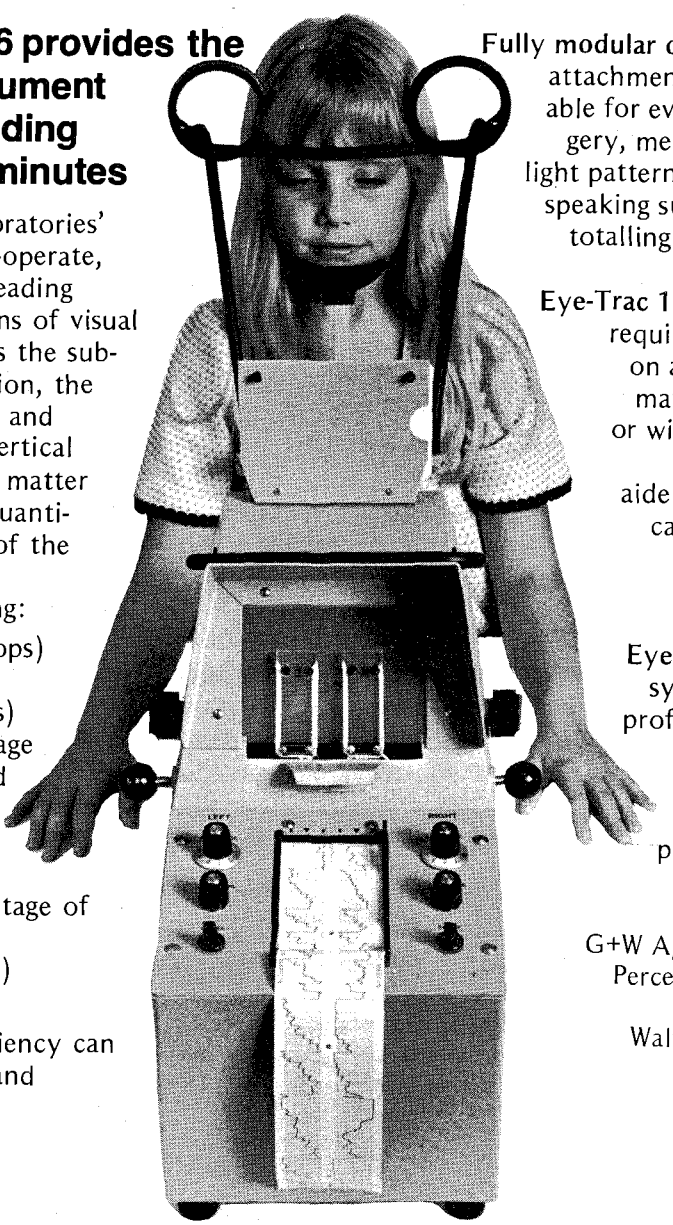
Why Joanie can't read.

G+W's Eye-Trac®106 provides the data needed to document and analyze her reading efficiency in 3 to 5 minutes

G+W Applied Science Laboratories' Eye-Trac 106 is an easy-to-operate, self-contained system for reading diagnosis and the evaluations of visual perceptual development. As the subject reads a standard selection, the system continuously tracks and records the horizontal or vertical position of both eyes. In a matter of minutes, you obtain a quantified, permanent recording of the key elements of binocular visual performance including:

- fixations (forward eye stops)
- regressions (right to left or reverse eye movements)
- span or recognition (average number of words or word parts per eye pause)
- duration of fixations (average eye pause time)
- directional attack (percentage of left-to-right movement)
- rate (with comprehension)
- re-reading

From this data, visual efficiency can be accurately determined, and remedial action initiated.



Fully modular options include: stimulator attachments making the system suitable for evaluating the effects of surgery, medication, etc; programmed light patterns for use with non-English speaking subjects; digital counter for totalling fixations, regressions, etc.

Eye-Trac 106 is a non-contact system requiring no electrodes to paste on and no films to develop. It may be used on subjects with or without glasses. Operation is simple enough so that an aide or paramedical technician can easily perform the tests, providing data for your evaluation and diagnosis.

Eye-Trac 106 is a field-proven system in use in schools and professional facilities throughout the world. Write for our descriptive product brochure, detailed performance specifications, price and delivery to:

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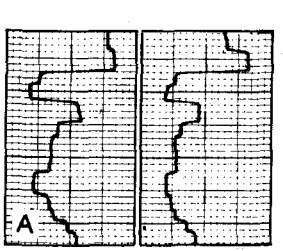
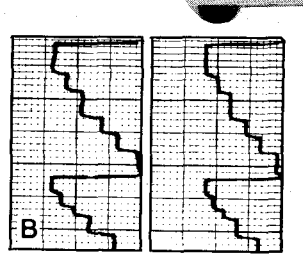
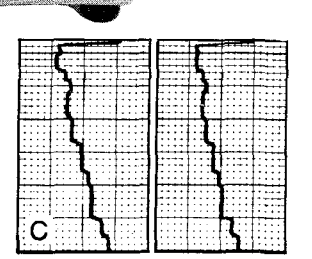
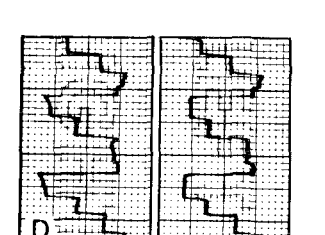


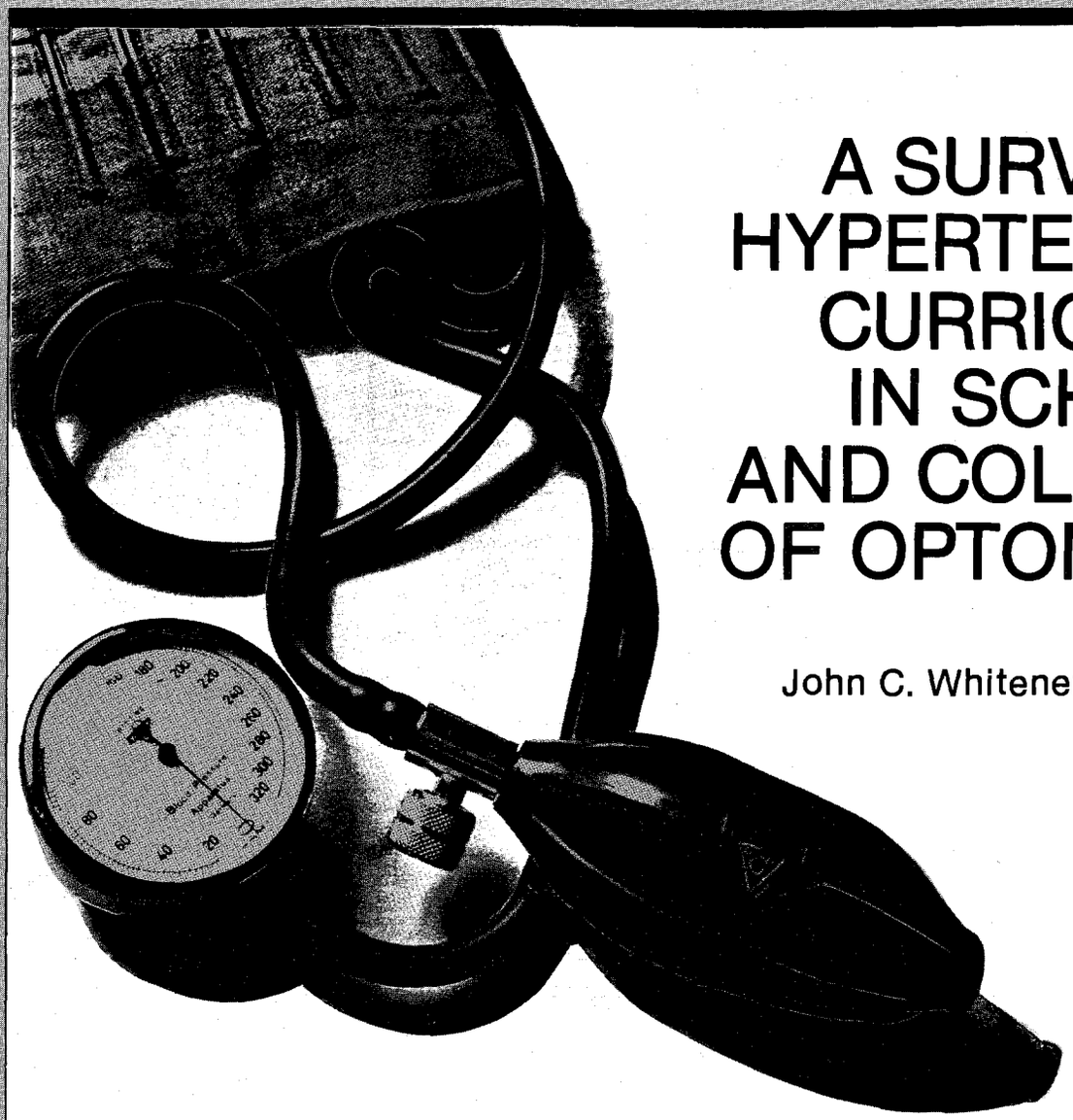


Poor vs. good directional attack: Graph A shows random, inefficient approach to reading. Graph B shows orderly, efficient directional attack.





Inefficient vs. efficient reading: Graph C shows slow, laborious reading with many long fixations. Graph D shows direct, efficient reading that is 3 to 1 lines faster than Graph C.



A SURVEY OF HYPERTENSION CURRICULUM IN SCHOOLS AND COLLEGES OF OPTOMETRY

John C. Whitener, O.D., M.P.H.

Hypertension, one of the most chronic diseases in the United States today, is a contributing factor in the deaths of at least 250,000 Americans each year.[1,2]

Approximately one out of six Americans has high blood pressure that merits treatment. It is estimated that another twenty-five million have borderline high blood pressure that requires surveillance. Hypertension is the greatest risk factor contributing to stroke, heart disease and kidney failure.[3] *One in four Black Americans has uncontrolled hypertension, representing the number one health problem for this group.*[4] *For persons over 65 years of age, approximately 40 percent of the white population and more than 50 percent of the black population have hypertension.*[5]

In spite of the high prevalence of hypertension in the population, many are unaware of its presence; others under treatment do not fully comply with an appropriate control regime. That is unfortunate, because hypertension is one of the few chronic conditions that can be effectively treated.[6]

Optometry, as a primary eye/vision care provider, serves as a valuable resource in providing detection, education, referral and follow-up services for patients with high blood pressure. According to Robert Levy, M.D., Director of the National Heart, Lung and Blood Institute, "Participation in high blood pressure control activities is a meaningful extension of the optometrist's function. For many persons, the optometrist serves as an important contact point with [sic] the health care system."[7]

In recognition of the importance of high blood pressure measurement by optometrists, the American Optometric Association (AOA) House of Delegates adopted Resolution 20 in 1975 which encouraged optometrists to measure the blood pressure of their patients. Management guidelines for screening for high blood pressure were subsequently developed.[8] The 1980 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure *published by the National Heart, Lung and Blood Institute gives an updated, comprehensive consensus by health professionals of recommendations for the detection, confirmation, and referral of patients.*[9]

High Blood Pressure Screening in Optometric Offices

A national panel of 500 optometrists geographically distributed to reflect regional attitudes was surveyed in 1977 concerning screening procedures for hypertension.[15] The results showed that 45 percent of the optometrists perform sphygmomanometry while another 12 percent plan to add this test to their standard exam. Table 1 indicates those optometrists who perform sphygmomanometry according to the age category of the patients.

In addition, preliminary results of a 1980 national AOA membership pool indicated that 56 percent of optometrists take high blood pressure measurements in their office.[16] No further questions were asked in this survey pertaining to high blood pressure screening in the optometrist's office or clinic.

A 1977 Survey of Dentists by the American Dental Association reports that 6.4 percent of all dentists take blood pressure measurements on all adult patients.[17] This can be compared to the 1977 national optometry panel results (Table 1), which indicate that from 5.6 to 27.6 percent of all optometrists take blood pressure measurements for adults over age 18.

The National High Blood Pressure Education Program recommends that blood pressure measurements be made on all adults over age 18. Under the age of 18 years there is no agreement as to the norm for high blood pressure.

The 1980 Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure recommends that health care professionals in all specialities measure blood pressure at each patient visit.[4] Data from the National Ambulatory Medical Care Survey for 1979, indicates that ophthalmologists take blood pressure measurements on 0.6 percent of all patient visits and 0.9 percent of all patient visits of patients over 45 years.[18] That ophthalmologists only take high blood pressure measurements on a very small percentage of their patients can possibly be attributed to the expected concentration on secondary and tertiary health care by many ophthalmologists. The high percentage of optometrists performing blood pressure measurements is in keeping with optometry's provision of primary care services.

John C. Whitener, O.D., M.P.H., is coordinator of federal research and development for the American Optometric Association Washington Office.

At least two sphygmomanometry readings are taken by 21 percent of the national panel of optometrists surveyed in 1977, while 11 percent take three and 2 percent take four or more readings. Only one reading is taken by 9 percent of those surveyed.[19] According to the National High Blood Pressure Coordinating Committee the average pressure should be recorded as the value for the patient after taking two or more measurements.[4]

The percentage of those optometrists surveyed in 1977 using various measurement devices revealed that 32 percent use the aneroid device, 8 percent use the mercury device, 3 percent use an electronic device, 1 percent use another device, and 1 percent did not indicate the type device that they use.[19]

TABLE 1
Percent of Optometrists Who Perform Sphygmomanometry

Age of Patient	Percent
Under 18 years	0.4
19-24 years	5.6
25-35 years	11.2
36-45 years	21.2
45 and over	27.6
All ages	8.8

SOURCE: Guerrein, R.L. "Who's Screening for What—And Who Should Be?" *Opt. J. Rev. Optom.* 114(9): 69, 1977.

Report of the Interdisciplinary Task Force

The Subcommittee on the Report of the Interdisciplinary Task Force on Provider Roles (ITFPR) of the National High Blood Pressure Coordinating Committee recommends to professional schools the following:

> Recognizing the autonomous nature of professional schools in determining the content of curriculum, the Coordinating Committee suggests that:
>
> (1A) student professionals be exposed to principals about the patient's role in hypertension control;
>
> (1B) principles supportive of interdisciplinary cooperation be conveyed to student professionals;
>
> (1D) any professional school which lacks such programs design a basic clinical practicum to prepare students in that discipline for the "real world" complexities of health care delivery.
>
> Recognizing that many professional schools are already involved in teaching a core curriculum related to high blood pressure and are exposing their students to experience in clinical practice wherein they encounter interdisciplinary cooperation, the Coordinating Committee reminds them of the desirability of:
>
> (1E) identifying core elements of curriculum related to hypertension to be taught to students in all disciplines;
>
> (1G) making available clinical practice opportunities to reinforce interdisciplinary team concepts taught in professional schools.[20]

Student exposure to hypertension screening is one of the many benefits of multidisciplinary clinical training for optometry students. The sharing of knowledge and skills among health care providers cannot result in less than an increase in the quality of care of services. Furthermore, the increase of awareness of professional competencies should help to remove the barriers to interdisciplinary cooperation. Schools should consider providing students with opportunities for exposure to didactic and practical interprofessional cooperation.

Hypertension Curriculum in Optometry Schools and Colleges

In December, 1980, a questionnaire was sent to 17 schools and colleges of optometry in the United States and Canada requesting information about high blood pressure training of students. Inter-American University in Puerto Rico which began operation in January, 1981, was not included in the survey. By March, 1981, 100 percent of the schools had responded. Two of the optometry schools, the University of Montreal and the University of Missouri-St. Louis, currently do not have high blood pressure training in their curricula; thus the data are derived from the remaining 15 schools and colleges.

Eighty-eight percent of the schools and colleges of optometry provide training in blood pressure measurement with the majority of schools offering lectures and lab hours during the first year of optometry school (see Table 2). The third professional school year is the next most frequently chosen for hypertension lectures and the second year for lab courses.

As Table 2 indicates, most of the clinical training in hypertension in the schools takes place during the third and fourth years. In the third year the hours range from 3 to 20 hours, and in the fourth the hours range from 2 to 20. Several schools indicated that the blood pressure measurement is only one part of a block of subjects in the category of

TABLE 2
Curriculum Hours for Training in Blood Pressure Measurement

	Lecture		Seminar, Lab or Workshop		Clinic	
	Hours	N	Hours	N	Hours	N
First year	1.7	11	2.9	11	0	0
Second year	2.1	4	2.7	9	1.5	2
Third year	2.4	7	5.0	2	8.3	6
Fourth year	4.0	1	12.0	1	10.7	6

TABLE 3
Curriculum Hours for Training in Management of Hypertensive Patients

	Lecture		Seminar, Lab or Workshop		Clinic	
	Hours	N	Hours	N	Hours	N
First year	1.1	4	2	1	0	0
Second year	4.1	8	1.5	2	0	0
Third year	3.3	8	2	1	4	2
Fourth year	1.8	5	1.5	2	6	2

primary care optometry taught in the clinic.

The second question in the survey was, "How many hours in your curriculum are devoted to specific training in patient management of hypertension?" The data in Table 3 indicate that most schools provide didactic hours in patient management of hypertension in the second and third professional years for an average of three to four hours. Only two schools indicated clinic time devoted to hypertension management training, which is given in the third and fourth years.

Question three in the survey asked the type of blood pressure measurement device used in student training. All the schools use the mercury device. Eleven schools also use the aneroid and six use electronic instruments.

Eighty percent of the schools reported that blood pressure measurements are taken on patients of all ages; however, 40 percent of those schools also indicated that measurements are made on adults of all ages only when signs, symptoms or case history is indicative of high blood pressure. One school indicated that blood pressure measurement is taken on all patients 13 years and older.

Regarding the referral of patients with suspected hypertension, all 15 schools refer patients to family physicians. In addition, one school refers patients to a hypertension clinic, while another school refers patients to the general outpatient clinic of a hospital, an ocular disease clinic, social service agency, or an internist.

Conclusions

The majority (88 percent) of the schools and colleges of optometry in the United States and Canada has incorporated specific training in the measurement of blood pressure, as well as in the management of hypertensive patients, in their curricula. The training of optometry students by the schools and colleges, along with the American Optometric Association's encouragement of its members to measure blood pressure, indicates a commitment on the part of the profession to actively participate in detection, education, referral and follow-up services for patients with high blood pressure. As a primary health care profession, this involvement is a logical extension of the optometrist's responsibilities.

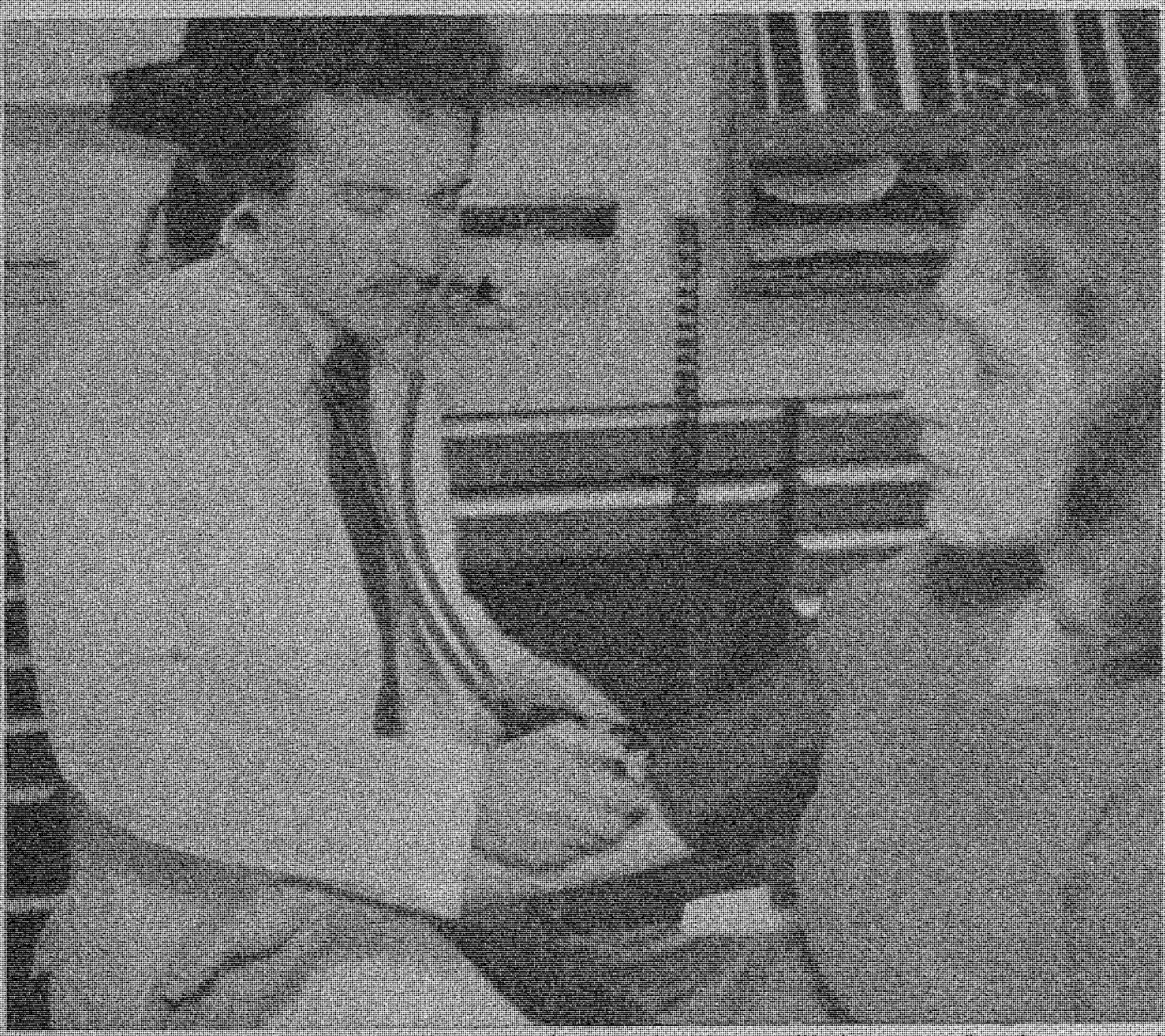
For future surveys it would be interesting to know if a higher percentage of the recently graduated optometrists perform blood pressure measurements than the less recently graduated optometrists. This information could be indicative of the effect of didactic courses and clinical practicum in the schools and colleges on the actual practice of measurement of blood pressure by optometrists.

According to a survey of all graduates from the University of Alabama School of Optometry from 1973 to 1979, a vast majority of the optometrists has incorporated blood pressure measurement into their office routines. This seems to indicate that school training in hypertension results in optometrists taking blood pressure measurements on their patients.

As indicated in the 1977 and 1980 national surveys, the majority of optometrists takes high blood pressure measurements on their patients. Whether this is a result of the training in the schools and colleges of optometry or continuing education courses sponsored by professional groups is unclear, since most practicing optometrists probably graduated before hypertension courses were part of the optometric curriculum. The continued emphasis given to high blood pressure detection and follow-up services by the profession of optometry, however, is clearly in the interest of public health.

Many national organizations can assist schools and colleges by offering technical assistance and educational materials. Resources include the American Heart Association, the National Kidney Foundation and the American Red Cross. In addition, the Veterans Administration has developed a manual, *Hypertension Specialist Training Program*, for a four-week course for nurses in the management of hypertensive patients in ambulatory care settings. This manual, edited by Carol A. Craft, R.N., M.S., is available from Grace Meyer, R.N., Staff Assistant III, Veterans Administration, Vermont & H Streets, N.W., Washington, D.C. 20420.

The National High Blood Pressure Education Program also offers information services on all aspects of high blood pressure. To obtain free information, publications and professional education tools, contact the High Blood Pressure Information Center, 120/80 National Institutes of Health, Bethesda, Maryland 20205, telephone (301) 652-7700.



The majority of schools and colleges of optometry has incorporated specific training in the measurement of blood pressure, as well as in the management of hypertensive patients, in their curricula. (Photo by Jon Cassel, UAB School of Optometry.)

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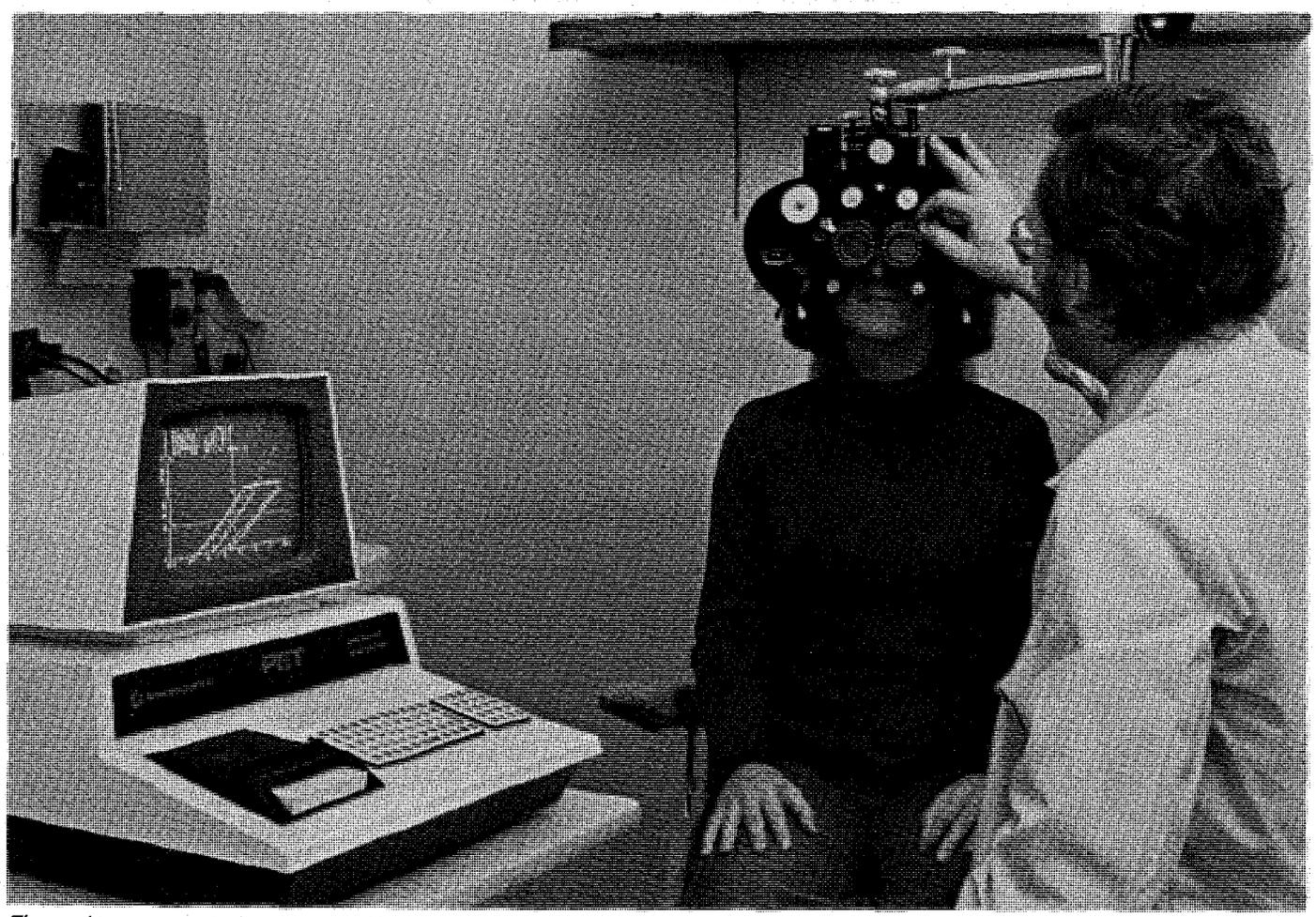
Graphical and Normative Analysis of Binocular Vision by Mini Computer: A Teaching Aid and Clinical Tool

Clifton Schor, O.D., Ph.D., and Martin Kees, O.D.



The graphics computer is shown as it would appear in an examination room while being used to analyze the zone of clear single binocular vision during a standard visual examination.

An inexpensive computer graphics system (Commodore PET) was used as a video aid for teaching eighty students advanced case analysis. The course provided students with the analytical tools for evaluating with graphical and statistical techinques and treating with lenses, prisms and orthoptics various anomalies of binocular vision. The computer is used to augment the students' experience solving individual patients' visual disorders by a normative statistical analysis developed by Morgan[1] and with a classical analytical tool, graphic analysis.[2] This later technique uses a two dimensional graphical plot of all possible combinations of accommodative and convergence stimuli to which a given person can respond.[2] The students learn several diagnostic criteria such as Sheard's[3] and Percival's[4] that serve as initial guidelines in the formulation of a prescription utilizing lenses, prisms and orthoptics.[5,6] The graphical tool is also used as a heuristic model to illustrate the complex interactions that occur between accommodation and convergence during binocular viewing conditions. By solving various problems with graphical analysis the student interacts with the model and gains experience about the subtle interactions between accommodation and convergence. Although many practitioners discontinue formal usage of graphical analysis in clinical practice, their initial experience with it provides a basis or rationale for the prescription of lenses and prisms to treat various binocular disorders.

At the time that students learn graphical analysis their exposure to clinical patients is limited so that most of their experience is gained through problem sets. It is important to motivate the learning process during this introductory period so that the analytical tool will not be replaced prematurely by intuition gained from one or two quarters of clinical experience. The premature intuitive approach often overlooks the subtle aspects of the patient's problem that would ordinarily be revealed by a thorough normative and graphical analysis.

We have utilized a small computer with which the student can interact to gain experience with and understanding of graphical analysis. We designed and implemented a software program to fulfill four goals: 1) to provide an interactive teaching device that could expose the student to graphical analysis without the student having to concern himself with the minutiae of the manual graphing procedure; 2) to make it easy for the student to experiment with data; that is, given a set of data for a patient, make it easy to change one of the parameters and see how this change affects the graph and subsequent analysis; 3) demonstrate the predictive power of graphical analysis by using the computer to extrapolate from the graph and thus provide analyses at distances different than those used during data collection; and 4) to relate the information given by graphical analysis to another type of case analysis (Morgan's normative analysis) with a minimal increase in time expenditure. The system chosen to implement these goals was the Commodore PET™ 2001. This computer was chosen because of its graphics capabilities relative to low system cost and because of its widespread use in the department. The system uses cassette tape to store the program and a matrix printer for hardcopy of the results. The cassette deck, keyboard, and video screen are contained in one unit. The system has 8K of memory. A flow chart of the program and example of the printout are shown in Figures 1 and 2.

The program was written in PET Basic. A listing of the program can be obtained from us upon written request. Once the initial data is entered and is graphed and analyzed, the user has a number of options that are easily accessible by giving the computer a single letter command. After each command option is performed, the program assumes a wait cycle until another option is selected. The data entry routine was designed so that after the initial set of data is analyzed, only those specific items that the student wishes to

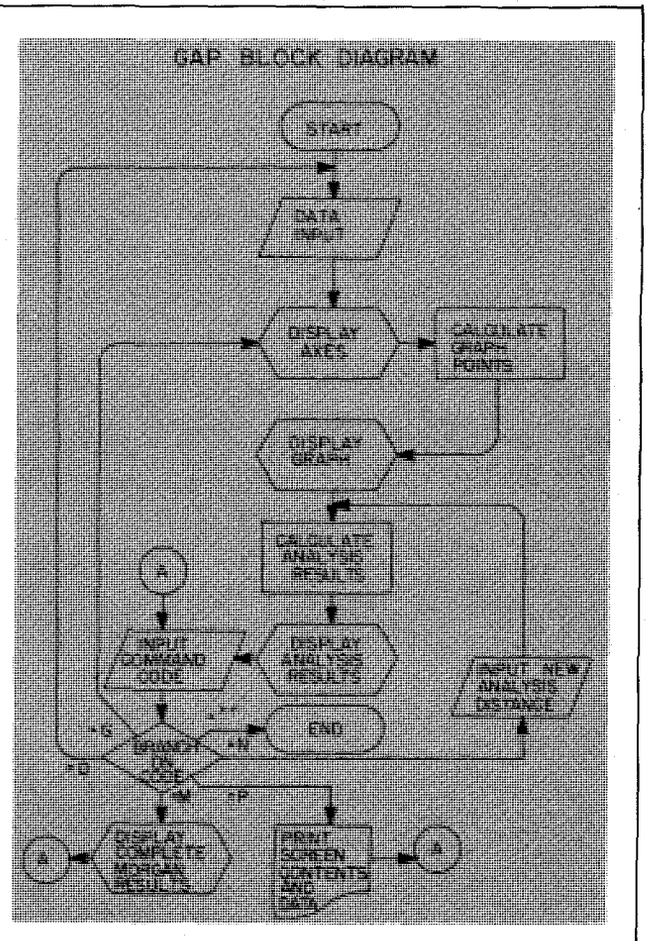


Figure 1. Flow chart of the GAP program. Letters N, P G and D located near the branch code are codes for the various command options to the user.

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change need be reentered into the computer. This feature makes experimenting with the data items a very simple procedure. Since changing the analysis distance is one of the key parameters, a command option is devoted to this task. There is insufficient room on the video screen to give complete Morgan's normative analysis while the zone graph is being displayed. A separate command option is provided to display this information.

A number of decisions had to be made involving limitations of the graphics capability of the computer and how to deal with special data cases. The scale division on the axes limit the size of the zone that can be displayed. For the PET screen it was convenient and reasonable to select values allowing a maximum BO vergence demand of 50 prism diopters and a maximum BI demand of 20 prism diopters. The maximum accommodative stimulus value was chosen to be 10 diopters. These values limit the number of cases that can be completely displayed on the screen; however,

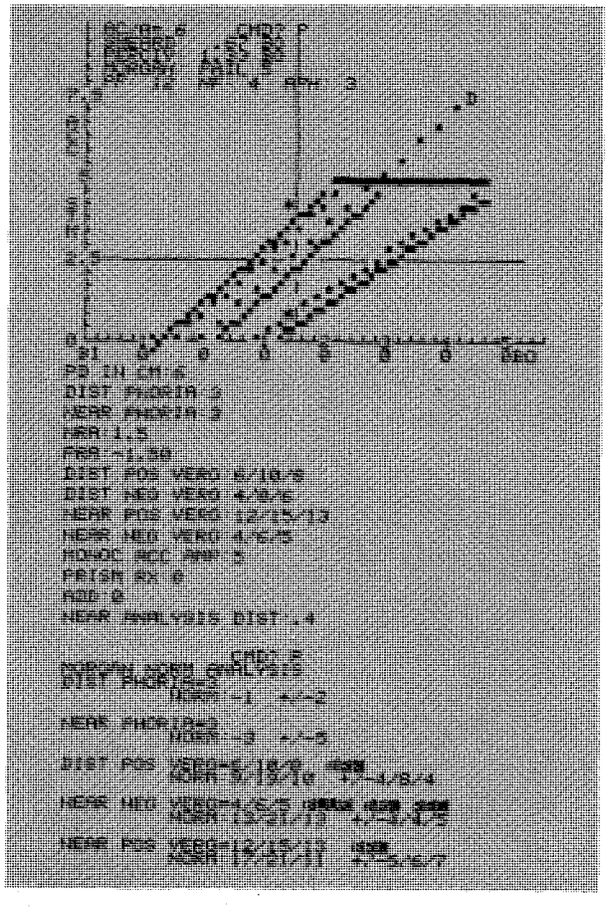

Figure 2. Typical printout of a Zone constructed by GAP following the entry of data listed below the plot. Also shown is a list of Morgan's norms that were failed and the expected values for these functions.

the graphs can easily be extended by hand on the printed copy of the graph. The BI limits are determined by the values given for the near BI vergences and the slope of the phoria line. The BO limits are determined by fitting a line to the two data points if they are available or using the phoria line slope and a single data point if only one value is available. Sheard's and Percival's results are calculated under the assumption that the BI and BO limits are parallel to the phoria line. This assumption was made to simplify the calculation and conserve memory space.

A user's guide (Appendix) was prepared for the students that assumes no previous computer experience on the part of the student. It is a step-by-step guide to the mechanics of using the program. We have included the user guide in this article to illustrate a method of introducing general terms, concepts and mechanics associated with the use of computers.

Using this manual, students learned to do graphical analysis with the computer during their ten-week laboratory sessions. In addition, a classroom demonstration was presented with the aid of TV monitors which duplicated the computer's video output before small groups of students. The initial response to this method of case analysis was extremely positive and much more enthusiastic than in previous years without the video terminal.

Evaluation of the Graphical Analysis Program (GAP)

The initial response of the second year class to the graphics program was positive. The class was asked to evaluate the GAP on a scale of 0-5, with zero indicating NOT HELPFUL and 5 indicating VERY HELPFUL. As a clinical tool the mean rating was 3.2 and as a learning aid the mean rating was 4.1. However, as of this time the second year class has not yet entered clinic. Utilization of the GAP outside of classtime occurred with 11 percent of the class despite the fact that these students were not seeing patients in clinic. Survey response indicates that 57 percent of the class intend to use it as part of their introductory clinical session this summer.

There were a number of problems that reduce the value of the program relative to the above stated goals. Chief among them are problems associated with the program storage on cassette tape. Before analysis can be performed the computer has to be loaded with the program. It takes the computer 2.5 minutes to read the program tape thus adding time overhead to the use of the program. The cassette recorder is not 100 percent reliable as far as program storage is concerned. Data dropouts occur much more frequently than is desirable. This problem is compounded if the tape is being used on a different machine than the one that originally recorded the program on that tape. A disk based system would help to solve these problems but at the sacrifice of extra expense. This expense could be justified if there were a library of programs with clinical applications stored on disk. A less expensive solution would be to store the pro-

Using the Graphics Analysis Program User Guide, students learned to do graphical analysis with the computer during their ten-week laboratory sessions....The initial response to this method of case analysis was extremely positive and much more enthusiastic than in previous years without the video terminal.

gram permanently in a programmable read only memory chip installed within the PET.

Another problem was access to the computer. At the present time it is not possible for each student to have immediate access to the computer from his examination room. Use involves traveling to another part of the clinic. For the majority of students, this access problem tends to limit the use of the program to post-examination analysis procedure.

Summary

The computer has proved very useful as a teaching aid to students learning to analyze vision disorders. The use of this tool in the clinic is currently limited by accessibility to a single computer and loading time. However, these latter problems could be overcome with additional graphics display units and a program stored permanently in a programmable read only memory chip within the PET or with a fast loading floppy disk system. It is our opinion that the computer increased student enthusiasm while learning graphical analysis and, as a result, accelerated the learning curve for mastering this form of case analysis.

Acknowledgement

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Appendix

Graphics Analysis Program User Guide

This guide will help you make effective use of the Graphics Analysis Program (GAP). For those familiar with computers (the PET in particular) much of the following will be very basic. However, the GAP is not totally self-explanatory so a careful reading of this guide is essential to proper use.

A. Getting Started

1. Turn on PET. The power switch is located at the left rear of the computer. The screen will display a message ending with READY.
2. Insert the GAP cassette into the cassette deck and rewind the tape if it is not already rewound.
3. Type LOAD and then press the RETURN key. The PET will respond with the message PRESS PLAY ON TAPE #1. Do so.
4. The screen will respond with:
   OK
   SEARCHING
   FOUND GRAPHICS ANAL
   LOADING
   READY
5. Type RUN and RETURN. The GAP will now ask for various pieces of data.

B. Data Entry

Each time you see a flashing box on the screen (called the cursor) the PET is waiting for data or a command. You will see a prompt phrase followed by a question mark followed by the cursor.

Usually you will type the appropriate data, then press the RETURN key. The program will repeat this process until all data are entered.

If you make an error while typing data, you can use the cursor control keys on the top row of the numeric pad. The key marked DEL will delete the last character typed. Just press the DEL key until you have removed the error from the screen. Be careful not to type data in the space immediately to the right of the question mark. PET will ignore the data in that position.

If you notice an error in the data after you have typed RETURN, you cannot use the cursor to correct it. You can either:

a. Start over: press RETURN without entering any data. PET responds with READY. Then type RUN-RETURN.

b. *Continue with the bad data.* Later on you will have an opportunity to change the data after the first graph is displayed.

Enter all data as requested. Sign conventions for prism are − for BI and + for BO. It is not necessary to type + for positive data. The vergence data is entered as you would normally record it; i.e. 15/20/8 or X/17/10. Use the slash located on the numeric pad.

For monoc amp you should enter a value of about 6D. This is to avoid running the graph off the edge of the screen. Experiment with higher values if you wish. However, the screen can only display a zone 10D high.

The values entered for prism Rx and add do not affect the position of the zone on the screen. They will shift the demand line but will not change analysis results. Usually you will want to enter zero for these values at first then after analysis you can give prism and/or add and see how the demand line shifts in relationship to the zone.

C. The Graph

After all the data has been entered, the PET will draw the graph. Notice the "play-by-play" commentary at the top of the screen. Since the screen becomes cluttered by the various boundaries of the ZCSBV, the play-by-play notation makes later interpretation easier.

The horizontal axis is graduated in prism diopters of vergence demand, and the vertical axis is graduated in diopters of accommodative stimulus. The first two lines drawn cross at the true near demand. GAP assumes a near test distance of 40cm. The last line drawn (ending with a D) is Donder's line. It should intersect the true near demand point.

Due to limitations of the graphic capability of the PET, a high degree of accuracy cannot be expected. The lines are fat and disjointed and for steep slopes might better be called points. The lower right hand corner of each data square will give the most accurate reading on the axes scales.

When the graph is complete, PET will display the calculated AC/A ratio in the upper left hand corner of the screen. Following this is the Sheard and Percival analysis results for near, then Morgan's normative analysis results.

You will also see the cursor flashing after the prompt "CMD?" after which you can enter any of the command notations listed below.

D. Command Mode

After the graph is displayed, you have a number of options. They are selected by typing a code for the particular option you wish followed by RETURN.

Command List

G—Draws current graph again.

D—Lets you change any or all data.

M—gives complete Morgan analysis results.

P—Prints screen contents and data on printer.

N—Lets you select new analysis distance.

G—This option lets you see the graphing process again. This instant replay might be useful in interpreting the data points if your zone is cluttered.

D—The old data will be displayed with the cursor at the left most character of the data string. If you do not wish to change this item, just press RETURN. If you do wish to change the data you can use the cursor control keys to move the cursor to particular portions of the data string or you can retype the entire data line.

M—Morgan analysis values given are + / − one standard deviation. When the program says MORGAN: FAIL 3, this means that in three categories you have entered data that is outside the + / − SD range. This might not mean that the patient is deficient; i.e., the patient could have a high recovery value outside Morgan's norms. This would FAIL the patients in that category, but would not imply that the patient has a problem.

P—Make sure the printer is ON and there is paper in the carriage before you select this option. Paper can be eaten up quite fast so only print zones you really want to keep.

N—This option recalculates Sheard and Percival results for the analysis distance entered. To the right of the Sheard results are the analysis distance values for Positive and Negative Relative Vergence (labeled PF and NF). The value labeled APH is the phoria at the analysis distance. When you select this option the graph is not replotted so the near demand point will not change on the screen. To change the near crossing point use the "D" command option and change the near analysis distance data.

E. Hints and Bugs

Don't be afraid of pressing keys and experimenting with the cursor control keys. The worst that can happen is you will get an error message or the computer will appear not to be responding to your input. You can always turn off the PET and start over.

Experiment with data. You will get some strange looking zones. Try to change the data until you get a more normal looking zone. This will help you visualize the relationships between the various vergences and how the break and blur lines move in relationship to the phoria line.

All computer programs have bugs. With certain data unpredictable results will occur. The GAP program will be updated to try to solve some of these problems as they are discovered.

You can copy the program onto your own cassette. To do so, load the program, then insert your cassette. Type SAVE "GRAPHICS ANAL" and press the record and play buttons as requested. To make sure your tape is correct, rewind it, then type VERIFY. The PET will read the tape and either respond with OK or VERIFY ERROR. If there is an error, try saving it again. Repeated errors could be due to a faulty tape.

The Vocational Interests of a Sample of Optometry Students

Robert C. Emling, Ed.D., J. Paul Crippan, B.A., John J. Crozier, O.D.,
Lawrence H. McClure, M.A., Paul A. Green, M.A.

For many years there has been an interest in the process people use to select a vocation. Early work was carried out on an empirical basis. Psychological researchers like Strong[1] involved themselves in describing the make-up of groups in various occupations. He surveyed hundreds of people in different occupations as to their personal and professional interests. As the data began to accumulate, it became apparent that within specific groups, people held very similar interests. That is, physicians were more like other physicians than they were like teachers or lawyers. In the 1950's a reseacher named Holland proposed a theoretical framework which pulled groups together by broadly expressed interests.[2,3] He proposed domains or themes of vocational "types". This work, in conjunction with Strong's, lead to the theory that people searching for a vocation identify with those already in a profession or occupation on the basis of interests. Another term for this is role modeling.

The work of Strong and Holland are combined in an inventory called the Strong-Campbell Interest Inventory (SCII).[4] People take the inventory by indicating their preferences for 325 interest items. The expressed interests of hundreds of people in 124 occupations make up the inventory. When a respondent's preferences are like those given by people in a particular occupation, the respondent receives a high score on that scale. Where the respondent's preferences only partially match those given

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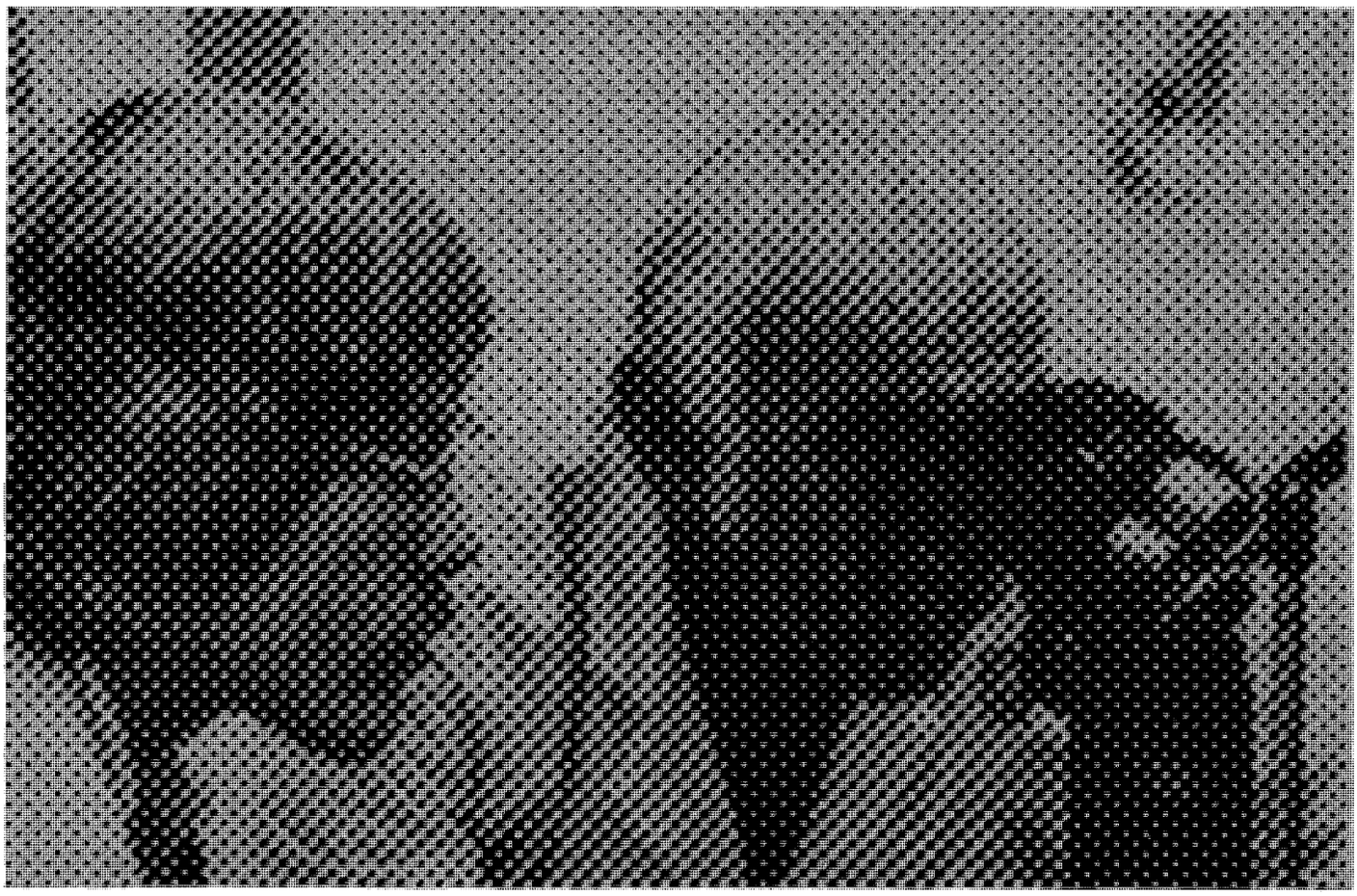

by people in a particular occupation, the respondent is given an average score. When a respondent's preferences do not match those given by people in an occupation, the respondent receives a low score in that occupation.

These results are very useful for identifying match-ups for individuals who are exploring the world of work. The results are also very useful to guidance counselors and those helping others to channel their training and education. Finally, the results are used for research in describing the interest make-up of selected groups and either comparing them to other groups or monitoring any change in the interest of groups over time.

The SCII and its earlier versions have been used to describe and study college students.[5-13] It has also been used to describe medical and dental students.[14-20] Since the SCII has a vocational title called Optometry, it was thought to be of interest to develop a profile of a sample of current second year students in an optometry school and to compare the students with samples of practicing optometrists used by the SCII in developing its male and female scales. According to the SCII manual,[4] the female optometrist scale is the result of sampling 122 practicing women optometrists in 1973. The mean age given is 42.7 years, with an average of 17 years' experience. The male sample was 405 practicing optometrists in 1963. No mean age or years' experience is reported for the male practitioners. All the SCII subjects were members of the American Optometric Association. The sampling procedure for these norm groups is not known.

Methods

A class of second year optometry students (52 male, 20 female) responded with their preferences to the 325 items on the SCII. A computer matched what they chose to the choices made by people in various other occupational settings. The results were printed out in three major categories: General Occupational Themes (GOT), the Basic Interest Scale (BIS), and the Occupational Scales (OS).

The GOT

This scale is composed of six themes which represent the six major work "environments" defined by Holland. According to the SCII manual,[4] the personalities of the people within occupations define the work environment as much as the work does. Therefore, each of the six themes are dominated by people of similar interests. In order to score high on a theme, the respondent selects "like" on the same items that the people in the base samples liked. A brief description of the theme characteristics can be seen in Figure 1.

The BIS

The GOT themes are further broken down on the BIS into subsets which represent interrelated areas within the themes (see Figure 2). When a respondent has a high score on the BIS, it represents a high percentage of like responses. A low score represents a high percentage of dislike responses. Because both like and dislike responses are considered in the matching process, the BIS is more discriminate and specific compared to the GOT. For instance, while both mathematicians and optometrists might have high GOT scores in the Investigative theme, they could be separated out on the BIS by Mathematics and Medical Science, respectively.

The OS

The most discriminate of the scales is the OS. Here, the respondent is compared to the choices given by people in 124 different occupations. The OS is actually a further breakdown of the BIS and to score high in a specific occupation the respondent must have agreement in "like" and "dislike" responses to the items offered. It is important to note that being similar to people in an occupation does not denote that the respondent is gifted in his/her work. In other words, being found "very similar" to Artist does not mean that one can suddenly draw pictures. It does signify, however, that the respondent likes and dislikes many things that the Artist's sample responded to, respectively.

Conveniently, all the scales on the SCII have been normed to a mean of 50 and a standard deviation of 10. Thus, one can tell at a glance whether one's scores are similar (high) or dissimilar (low) to a given scale because the "average man or woman" will get a score of 50 on the GOT and BIS scales. Members of an occupation will average a score of 50 on their own scale on the OS.

Results

General Occupational Theme (GOT)

The mean scores for this sample of optometry students can be seen in Table

Realistic (R):
These people usually have good physical skills and enjoy creating things, they like working with their hands, and prefer working with things rather than people. They are generally conventional in political and economic opinions.

Investigative (I):
These people tend to center around activites which are scientific. They like solving problems and prefer thinking things through. They have a tendency toward creative and original thoughts.

Artistic (A):
These people like situations which offer opportunities for self-expression. There is generally little interest in problems that are very structured, and they are less assertive about their own opinions and capabilities.

Social (S):
The extreme types are very sociable with humanistic orientations. They express themselves well and like group attention. They like situations with group problem solving and establishing relationships with others. They often describe themselves as popular and good leaders.

Enterprising (E):
Usually very good with words and are effective in transmitting ideas and leading. They are self-confident and dominant and prefer roles of leadership. They are generally impatient with precise work.

Conventional (C):
These people prefer very organized setting such as large organizations. They like well established rules and knowing what is expected of them. They describe themselves as stable, well-controlled, and dependable.

Figure 1. General Occupational Themes

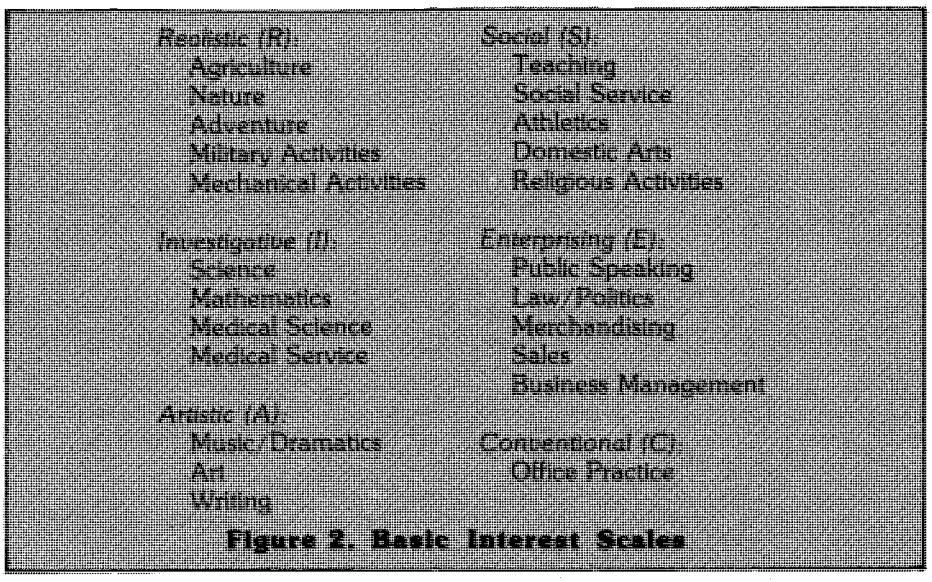

Figure 2. Basic Interest Scales

1. The mean scores are separated out by male and female. The GOT scores for the SCII optometry scale samples also are listed. No standard deviations are reported for the SCII group. In addition to the six themes, there are two other indices included in Table 1. These are the Academic Orientation (AO) and the Introvert/Extrovert (IE) scales. The Academic Orientation scale was developed from a sample of Ph.D.'s and represents the degree to which the respondent will seek and pursue advanced studies. It is not a measure of intelligence. The IE scale indicates the respondent's interest in working alone (high score) versus working closely with others in groups (low score).

The first set of scores in Table 1 belongs to the male students. The highest mean score for the male students was in the Investigative theme. This was followed by the scores in the Realistic and Artistic themes. The general GOT profile for these male students therefore can be established as an IRA. This profile can be described generally as centering around activities which are scientific, creative, self-expressive, and having good physical skills. These people would enjoy problem-solving and generally working alone.

The female students' scores were highest in Artistic, Investigative, and Social. The general GOT profile for these female students therefore can be established as an AIS. This profile can be described generally as resembling the male profile in being introspective and problem-solving, but with a greater need for individual expression. These people are original and more intuitive and have a strong need for interpersonal relationships and understanding others.

Some caution needs to be exercised when comparing the female to male students' scores. That is, since it is more common, in general, for females to score higher on the Artistic and Social themes than males do, the actual differences between these two groups is relatively small.

Table 1 also demonstrates the profiles for both the male and female SCII samples. These profiles can be used to compare male practitioners to male students, and female practitioners to female students. According to the SCII manual[4] a mean score difference of three points on the GOT is the minimal difference worth considering when doing comparative studies between groups. The profile established by the manual for the male optometry sample is the IRC. The male students' lowest GOT score was in the Conventional theme, while it was the second highest score for the SCII male sample. This reflects a degree of difference which would be reflected in the behavior of these two groups. The SCII sample will tend to avoid ambiguous situations and problems involving interpersonal relationships. They will more highly value material possessions and status.

The profile of females for the SCII sample is the most complex of the four groups. The reason for this is the relative "balance" of the scores other than Investigative. Since no clear composite profile emerges, the manual describes female optometrists as singularly Investigative. When comparing the female students to the SCII female sample, it is clear that the students are more Artistic and Social. This can be interpreted as meaning that the female students are more expressive, group oriented and enjoy establishing relationships with others.

The Academic Orientation scales for the male and female students differed rather sharply with females having a much higher AO score. On the Introvert/Extrovert scale it was found that the male students are slightly more introverted. This is also borne out by the higher female student score in the Social theme.

Basic Interest Scales (BIS)

Males and females have different mean scores on these scales and so reporting raw scores can be misleading. For example, the average woman will score 46 on the Mechanical Activities scale, while the average man will score a 54 on the same scale. The average mean and standard deviations for the

TABLE 1
Mean Scores on the General Occupational Themes

	Students		SCII (optometry sample)	
Theme	**Male**	**Female**	**Male**	**Female**
Realistic	53.1 (9.8)*	50.2 (8.7)	51**	46**
Investigative	55.1 (7.6)	55.2 (7.5)	56	54
Artistic	48.6 (11.8)	56.0 (8.3)	49	50
Social	47.9 (10.9)	54.37 (6.2)	51	47
Enterprising	48.1 (7.3)	49.4 (6.4)	51	49
Conventional	46.6 (8.7)	50.0 (8.1)	52	50
Academic Orientation	47.2 (12.2)	56.5 (10.8)	***	***
Introvert/ Extrovert	50.1 (10.8)	45.9 (7.9)	***	***

( )*Standard deviation
**No standard deviation reported
***No scores reported

male students on these scales were compared to the average mean and standard deviations for the female students. It was found that the female and male students had scored almost identically on these scales except for Music/Dramatics and Art where the female students scored higher (Music/Dramatics: 57.1 vs. 48.6 and Art: 58.9 vs. 48.2, respectively). This was reflected in the higher Artistic scale scores on the GOT indicated above. Since male and female students scored so similarly on the BIS, the scores were pooled and a new mean derived for the optometry students as a group. Table 2 lists the total optometry student group scores on this scale.

It can be seen in Table 2 that the students scored highest on Medical Science with an even spread of means among the other Investigative theme scales. This information more accurately details the contributing interests of these students to their interest profiles. Other occupations scoring high on the Medical Science scale are dentists, physicians, veterinarians, medical technologists, and physical therapists. Interestingly, one occupation which scores low on the Medical Science scale is artist. Thus, it becomes clearer that, while the female optometry students scored high on the GOT scale of Artistic, they are distinctly different from artists. It must be kept in mind that a keen interest in art is only one of the factors making up the profile of professional artists.

It can also be seen from Table 2 that these students have their lowest interests in the area of Office Practices and Business Management. This is important in that it may be reflected in the motivation these students express toward courses offered in this area of professional education.

TABLE 2
Mean Scores on the Basic Interest Scales for the Optometry Student Sample

Theme—Scale	Mean	Std. Dev.
R—Agriculture	50.3	8.2
R—Nature	50.8	10.8
R—Adventure	55.1	8.6
R—Military Activities	49.3	8.3
R—Mechanical Activities	53.0	10.2
I—Science	54.9	7.6
I—Mathematics	54.0	7.8
I—Medical Science	59.3	7.2
I—Medical Service	53.7	7.1
A—Music/Dramatics	51.5	10.5
A—Art	49.8	11.7
A—Writing	45.9	11.1
S—Teaching	49.6	9.9
S—Social Service	47.8	9.9
S—Athletics	54.9	8.7
S—Domestic Arts	49.1	10.9
S—Religious Activities	45.6	10.1
E—Public Speaking	47.6	8.8
E—Law/Politics	46.8	8.6
E—Merchandising	46.8	8.6
E—Sales	47.8	7.2
E—Business Management	46.3	8.5
C—Office Practices	44.9	8.2

The Occupational Scales (OS)

Most of the OS scales are specific for either male or female respondents. There are some scales where only male or female categories exist because there are insufficient numbers to develop adequate scales for the other sex. Table 3 represents the male and female scores on 32 selected professional occupations where both male and female scales are listed. The scales are listed with the SCII profile for each occupation. To aid the reader in interpretation, general ranges of scores have been coded as being "similar," "dissimilar" or "average." Scores over 44 on a scale indicate that the respondent has made selections similar to those in that respective occupation. Scores below 26 are considered dissimilar. Any scores between the 44 and 26 parameters are considered to indicate some similarities and some dissimilarities. This is the range where "people in general" score.

It can be seen from Table 3 that both the female and male students, as groups, scored on the Optometrist scale as people in general would score. While it is apparent from the GOT and BIS scores that these students share some essential interest with the practicing optometrists on the SCII, they also differ in essential ways. The male students are more like male dentists than they are like optometrists. Females are more like physical therapists than any other group. Both male and female students are distinctly different from the E and C theme occupations. Their scores are generally dissimilar to these groups. What becomes apparent from Table 3 is that this group of students is not a solid "match" to other occupations. In this regard they are unique. While they are definitely people oriented toward the health sciences (GOT and BIS), they do not share profiles with the other health occupations, with the previous exceptions noted.

Specific Item Analysis

The items listed in Table 4 represent those for which the highest percentage of the students indicated a "like" preference. The students reacted positively to two rather distinct sets of items. First, they liked medical and science oriented items. Secondly, they seemed to like excitement and things which cause diversion. Some of the highest negative responses are listed in Table 5. It appears from Table 5 that the students do not like the "clerical" items or those things which involve convincing strangers to purchase things.

Discussion

Both male and female optometry students sampled in their second year of school were found to be very similar in interest patterns. The samples of optometrists used by the SCII to establish their occupational scales seem to differ essentially from the student sample used in this study. First, the SCII sample

of males is more conventional than the male student group. The female students were found to be both more Artistic and Social than their practicing counterparts as sampled by the SCII. This means that they are more expressive and group oriented. While it could be intuitively argued that these students are young (mean age 21) and inexperienced in optometry, and that the SCII does not accurately measure their true "professional" interests or knowledge at this stage, it has been demonstrated that the SCII is quite stable at this level.[4] The short term (30 day) test-retest reliability for the GOT is given as .86, for the BIS it is .87, and for the OS it is .87. Some long-term studies demonstrate profile stability over 20 years.[7]

If these reliabilities hold true, then several points need serious consideration. First, based on the SCII Optometry sample, the student sample's scores would not have led to the prediction that this group of people would enter optometry. Therefore, perhaps enough time has passed and enough change has occurred to consider that today's students are not like those of 1963 (male) and 1973 (female). By the same reasoning, it appears that these students are not just drifting into optometry from larger groups headed for the other health professions. This is evident from the fact that they did not match most of these other groups either. Finally, it must be considered that this particular optometry school may not be selecting the "typical" prototype for admission to its program. If any of these propositions is true then the real question becomes one of whether these students will find compatibility with their professional elders once they enter practice.

TABLE 3
Mean Scores on Selected Occupational Scales for the Optometry Student Sample

Scale—Profile	Mean	Std. Dev.	Interpretation
Army Officer (f)—RE	29.8	10.0	Average
Army Officer (m)—RIC	25.5	13.5	Dissimilar
Engineer (f)—IR	33.9	11.2	Average
Engineer (m)—IR	37.3	10.4	Average
Physical Scientist (f)—I	16.3	17.9	Dissimilar
Physical Scientist(m)—IR	30.1	10.7	Average
Dentist (f)—IR	34.2	9.3	Average
Dentist (m)—IR	46.8	8.1	Similar
Physician (f)—I	35.8	12.5	Average
Physician (m)—IRS	41.8	11.1	Average
Math-Sci. Teacher (f)—ICR	37.1	10.0	Average
Math-Sci. Teacher (m)—IRS	39.0	11.3	Average
Comp. Programmer (f)—IRC	37.1	11.7	Average
Comp. Programmer (m)—IRC	36.4	10.0	Average
Optometrist (f)—I	35.1	10.9	Average
Optometrist (m)—IRC	41.5	9.0	Average
Mathematician (f)—I	24.2	10.1	Dissimilar
Mathematician (m)—I	28.6	9.8	Dissimilar
Veterinarian (f)—I	32.2	10.5	Average
Veterinarian (m)—RI	35.1	7.6	Average
College Professor (f)—IA	37.6	7.5	Average
College Professor (m)—IA	42.2	7.9	Average
Speech Pathologist (f)—IS	35.1	8.4	Average
Speech Pathologist (m)—IS	36.3	14.7	Average
Psychologist (f)—IAS	31.0	12.5	Average
Psychologist (m)—IAS	37.2	11.8	Average
Artist (f)—A	26.8	9.4	Average-Dissimilar
Artist (m)—A	32.1	11.1	Average
Musician (f)—A	37.1	11.3	Average
Musician (m)—A	42.3	12.5	Average
Interior Decorator (f)—AE	20.1	14.9	Dissimilar
Interior Decorator (m)—AE	26.5	9.2	Average-Dissimilar
Advertising Executive (f)—A	29.3	9.8	Average
Advertising Executive (m)—AE	31.0	10.7	Average
Librarian (f)—A	26.8	11.5	Average-Dissimilar
Librarian (m)—A	24.6	14.9	Dissimilar
Reporter (f)—A	27.7	11.5	Average
Reporter (m)—A	29.0	10.8	Average
English Teacher (f)—AS	27.6	13.4	Average
English Teacher (m)—AS	27.1	15.4	Average
Physical Therapist (f)—IRS	46.3	8.4	Similar
Physical Therapist (m)—SIR	38.0	11.5	Average
Registered Nurse (f)—SI	36.4	8.4	Average
Registered Nurse (m)—RI	37.3	9.5	Average
Social Worker (f)—S	31.5	11.8	Average
Social Worker (m)—S	21.6	12.1	Dissimilar
Elementary Teacher (f)—SC	31.1	8.9	Average
Elementary Teacher (m)—SEA	31.1	12.9	Average
Social Science Teacher (f)—SEC	31.2	7.0	Average
Social Science Teacher (m)—SEC	25.5	9.8	Dissimilar
Life Insurance Agent (f)—E	26.5	10.8	Average-Dissimilar
Life Insurance Agent (m)—ES	19.0	12.3	Dissimilar
Lawyer (f)—E	27.1	10.7	Average-Dissimilar
Lawyer (m)—E	27.8	9.9	Average-Dissimilar
Buyer (f)—EC	24.8	12.8	Dissimilar
Buyer (m)—ECS	17.8	13.0	Dissimilar
Credit Manager (f)—CE	25.6	12.7	Dissimilar
Credit Manager (m)—ECS	23.9	11.5	Dissimilar
Accountant (f)—C	23.6	11.3	Dissimilar
Accountant (m)—CE	10.6	13.9	Very Dissimilar
Banker (f)—CE	25.8	10.8	Dissimilar
Banker (m)—CE	20.9	13.1	Dissimilar
Business Ed. Teacher (f)—CE	13.4	8.5	Very Dissimilar
Business Ed. Teacher (m)—CES	25.4	9.7	Dissimilar

TABLE 4
SCII Items Selected as "Like" by at Least 75% of the Students

Item	Percent Selecting
Airline Pilot	89
Watching Open-Heart Operation	87
Physiology	87
Biologist	80
Giving First Aid	80
Win Friends Easily	79
Amusement Parks	79
Entertaining Others	79
Zoology	77
Photographer	77
Night Clubs	77
Skiing	76
Continually Changing Activities	76

TABLE 5
SCII Items Selected as "Dislike" by at Least 75% of the Students

Item	Percent Selecting
Traveling Salesman	86
Typist	83
Checking Typed Materials	80
Hospital Records Clerk	80
Selling House to House	79
Office Clerk	79
Receptionist	76
Military	76

Since the Academic Orientation scales for male and female students differed rather sharply, it appears that female students seem to be much more apt to see their education in optometry school as an acquisition of knowledge. Perhaps the males are more oriented to viewing their education as a means to an end (practice). Further research on this point is warranted.

It also was found in this study that the sample of second year optometry students has general similarities to other health professionals in the Investigative theme. As a group, these students will tend to be interested professionally in scientific matters and those involving problem solving. It is also clear that these students are oriented toward medical science in particular. Due to the students' Medical Service scores it would seem that these students are more interested in the "science" of optometry than they are in the actual delivery of care. The mean scores on this scale are only slightly higher than that of "people in general" (mean of 50).

Finally, some insight was offered by the SCII into the personality make-up of this group of students. They have a very high level of what psychologists call "variety seeking." They are adventuresome and drawn toward exciting activities. As practitioners they may seek high visibility in their chosen communities. What importance this has for the reshaping of the role modeling influence and the subsequent recruitment of similar young people into optometry is unknown. What importance their need for excitement and challenge originally had on their selection of optometry is unknown. Finally, whether the practice of optometry will be able to meet the desire for adventure and challenge is perhaps the more important question. □

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RESOURCE REVIEWS

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Sight and Sounds in Ophthalmology, Volume 4: Diabetic Retinopathy, A Slide Tape Presentation, by Stuart L. Fine and Arnall Patz. C.V. Mosby Co., St. Louis, 1980 (100 slides, 3 one-hour cassette tapes and a 61 page companion script).

As a result of the National Eye Institute's Diabetic Retinopathy Study (DRS), there have been significant changes in the course and treatment of diabetic retinopathy. This slide-tape presentation discusses the DRS, as well as its results and their implications for the current management of the diabetic patient.

The slide-tape format is designed to bring the viewer's knowledge quickly into line with this rapidly changing field. A total of three hours of easily paced vocal narrative clearly illustrates the important teaching points depicted in the 100 slides. The slides in the series are actual fundus photos from the DRS with diagrammatic illustrations designed to provide clear comprehension of the learning material presented. The final ten slides comprise a self-assessment quiz which is also presented and answered by vocal narrative on the tape. For those who prefer to read the script or to follow along reading as the tape plays, there is a slide-by-slide written script included.

The subject content of this excellent series begins with a description of the various forms of diabetic retinopathic changes. The uses of laser photocoagulation as recommended from the DRS are discussed, including the side effects and complications of this now proven-effective treatment modality. Vitrectomy, macular edema and many other related topics are also covered.

The up-to-date content and learning oriented organization of this slide-tape presentation make it an excellent tool for individual and group teaching. *Diabetic Retinopathy* is recommended for your consideration.

Current Ocular Therapy, edited by Frederick T. Fraunfelder and F. Hampton Roy. W.B. Saunders, Philadelphia, 1980, 647 pp. ($42.50).

Designed with the busy clinician in mind, *Current Ocular Therapy* is a handbook of concise current therapy for a wide variety of ocular and related systemic disorders. Over 350 recognized specialists form the list of contributors, each writing about disease processes within their area of expertise.

The text is logically divided into general sections for quick access to the subject of interest. Each disease entity is presented in a standardized format of: a brief description, ocular manifestations, medicinal therapy, surgical therapy, precautions, comments and references. Seldom does one of these short synopses exceed two pages in length which makes meaningful reference while the patient is still in the office a realistic possibility.

While not an indepth source concerning ocular pathology, *Current Therapy* is very useful in providing quick insights into disease processes encountered daily in a clinical setting. I think you will enjoy using it.

Headache by Neil H. Raskin and Otto Appehzeller. Volume XIX in the "Major Problems in Internal Medicine" series. W.B. Saunders, Philadelphia, 1980, 244 pp., illus. ($19.50).

This volume on headaches is a real contribution to the clinician who has to deal with sorting out headache types in his patients.

The authors discuss all the known causes of headaches but place special emphasis upon the diagnosis and treatment of migraine headaches, tension headaches, cluster headaches and headaches associated with primary disorders of the central nervous system.

Headache is a short, well written text that can be read cover to cover in a matter of hours with good comprehension. I recommend it to your attention.

Cataract Surgery and Its Complications, 3rd ed., by Norman S. Jaffe. C.V. Mosby Company, St. Louis, 1981, 671 pp. with 1283 illus. ($57.50).

Staying abreast of any body of knowledge can be a difficult task. The field of cataract surgery is no exception. The recent public interest in intraocular lenses has increased the need for the optometrist to discuss potential surgery with his own patients and with patients seeking second opinions prior to surgery.

Dr. Jaffe's well-organized text provides indepth discussions regarding current indications and techniques for cataract removal, as well as thorough treatment of potential complications.

COMMENT

Retinal Image Size Calculations in Visual Optics

Henri Obstfeld, M.Phil.

Editor's note: *This department will focus on brief communications received by the Journal which are of particular interest to a segment of our readers or offer especially thought provoking messages. JOE considers such communications of significant interest to warrant publication and will consider similar short communications or items of interest to limited groups for inclusion in future issues. Address all correspondence to the managing editor in care of the business and editorial office listed at the front of this magazine.*

When British optometry and opticianry students are taught to calculate retinal image sizes for the purpose of understanding the optics of the eye (whether or not corrected), objects have usually been taken to subtend an angle up to the limit of the paraxial region. Emsley[1] gave the subtense of the paraxial region as the space surrounding the optical axis of a system up to a slope angle of 2°. On this basis one finds sharp retinal image sizes of up to ½ mm.[2]

The question I wish to raise is: do such retinal image sizes give a realistic insight into actual retinal image sizes in daily use for accurate vision in the human eye?

As we know, the highest resolving power of the retina is found within the macular area of the retina, in particular in the fovea. The diameter of the fovea is variously given as 1.5 mm.[3] and 1.9 mm.[4] The area would, therefore, subtend a visual angle of 5° to 6½° (calculated on the basis of the standard reduced emmetropic eye of Emsley.[1]

The foveola, however, measures only 0.35 mm.[3,4] and subtends just over 1°. Le Grand[4] indicated that the area within which a fixation point will be imaged (the fixation area) measures up to 5 minutes of arc because the eye cannot be kept perfectly still during fixation. It is of passing interest to note that Le Grand felt that the fixation point is defined neither by the physiologically achievable maximum visual acuity nor by a receptor of special anatomical property, but that this area is simply equivalent to a region in which a function achieves its summit.

There is no compulsion to introduce as a factor the distance between the centers of the two adjacent cones in the foveola (given by Pirenne[6] as (1.002 to 0.0025 mm.) since the basis of the human eye's visual acuity is not the point of discussion.

In recent British examination papers, values were given which gave rise to retinal image sizes up to almost 3 mm. in a standard reduced emmetropic eye. They would extend over a distance of almost twice the diameter of the fovea.

Some letter charts include letters that will subtend (at the usual testing distance of 20 feet) only 2½ by 2 minutes of arc. It is also useful to note that the smallest letters on a modern British near test chart (the Freeman-Archer unit) subtend 9 minutes of arc when held at ⅓ m. from the eye.

The above details show that realistic retinal images subtend several minutes of arc and not a few degrees.

This raises the question why, thus far, calculations have been based on these very large angles. The answer appears to be that the four-figure tables that students have been recommended to use during their studies did not facilitate calculations involving minutes of arc with any accuracy. Nowadays, this limitation is no longer an obstacle since students have the use of pocket-size calculators which give trigonometric functions with sufficient accuracy. Hence the question: should we now teach visual optics calculations employing realistic retinal image sizes instead of these exorbitantly large retinal images used thus far?

If the answer would be affirmative, it becomes imperative to consider the convenient unit in which to measure these image sizes. Thus far, millimeters have been used. However, since a distant object subtending, say, 5 minutes of arc at a standard reduced emmetropic eye will have a retinal image size of 0.024 mm., it could be considered more meaningful to give retinal image sizes in future in micrometers. The distant object mentioned above would then have a retinal image size of 24μm.

As an aside I would like to point out that it is incorrect to use the symbol μ on its own for the micrometer, and the International Standard ISO 1000: 1973, "SI Units and Recommendations for the Use of Their Multiples and of Certain Other Units," indicates that this unit should be abbreviated as μm.

Comments on the above raised points are invited and should be addressed to the author at the Department of Applied Optics, City & East London College, Bunhill Row, London EC1Y 8LQ, England. □

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Vision Educational Foundation–

A Source of Strength for Optometry

Debbie Spielberger

Optometry has grown significantly in recent years and so have the demands on the practicing optometrist. Beyond the day-to-day requirements, one must meet educational and professional responsibilities, keep pace with technology and face constant challenges to the profession.

In the process, optometry may tend to become so involved in caring for patients and managing practices that its vision becomes less than 20/20 when viewing its own future. That is why the Vision Educational Foundation exists—to focus clearly on the future of the optometric profession and to serve as a continuing source of strength for optometrists and optometry.

Since its formation in 1973 from a concept envisioned by the Alumni Association and Board of Trustees of Southern College of Optometry, the Vision Educational Foundation has evolved into a totally independent organization, expanding every year with programs and projects to meet the challenges of the optometric profession. The foundation is a nonprofit, tax-exempt corporation guided by a distinguished board of directors and supported by the efforts of an experienced staff working to meet the day-to-day and long term needs of the foundation.

Debbie Spielberger is vice president of the Vision Educational Foundation, Memphis, Tennessee.

Leadership is provided by Dr. M. C. Mauney, Jr., president and chief executive officer of VEF. Both the American Optometric Association and the American Optometric Student Association have established liaisons to the Vision Educational Foundation. Through these and other ties with optometric organizations, VEF is kept abreast of the needs of the profession.

Purposes

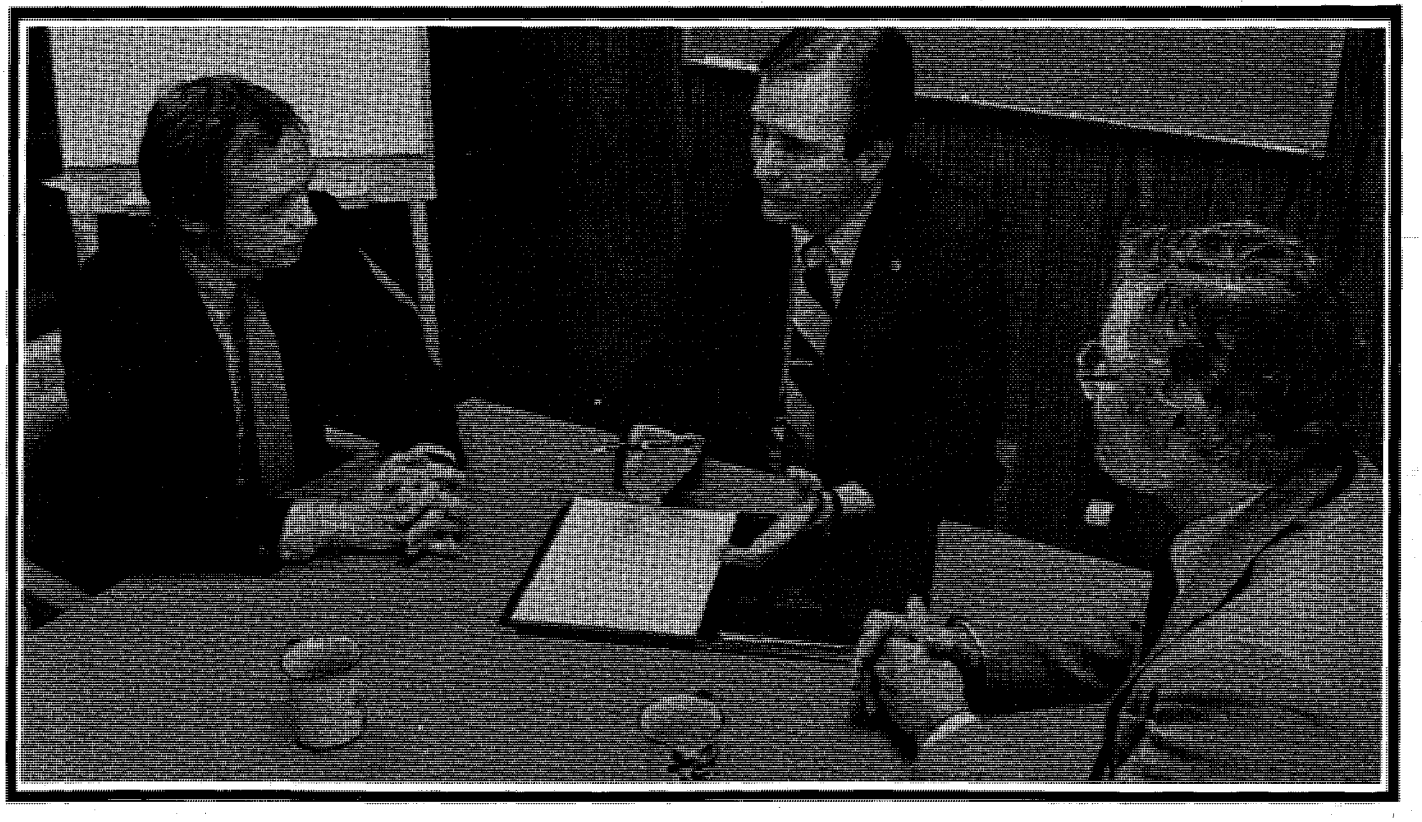
The purposes of the foundation are to:

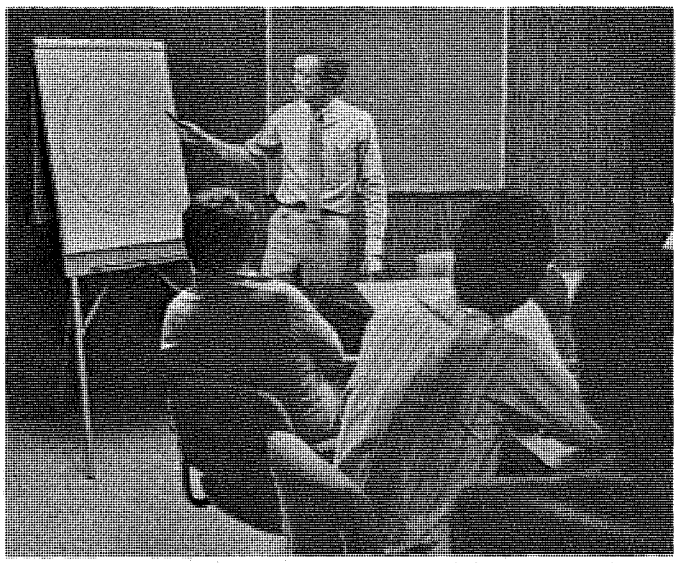
- Provide a long range program of support and assistance to optometric educational institutions;
- Build an endowment fund for the betterment and advancement of optometric educational institutions and general welfare of their alumni;
- Generate funding to be used to educate and better train graduates to serve society; and
- Foster and encourage other visual educational projects.

To meet these purposes, VEF has initiated programs which encompass a wide range of activities. They include:

Contract places. Aware of the increasing competition to get into optometry schools during the last decade, VEF has purchased three contract places from an optometry school

Dr. M.C. Mauney, optometrist and president of VEF (center), meets with the medical director of the VEF Center, Dr. Robert Lennon, ophthalmologist (left), and Dr. Berney Kahn, Georgia optometrist and Center advisory board member, to discuss plans and programs.





Regular seminars, ranging from lectures on diabetic retinopathy and anterior segment disease to "hands on" courses exploring various optometric procedures, such as indirect binocular ophthalmoscopy, gonioscopy and electrodiagnosis, have been prepared at the Center.

to make it possible for members to sponsor deserving students for these reserved spaces. This program costs VEF $48,000 annually.

Emergency student loans. When state funds were cut off for Nebraska optometry students, a $15,000 loan from VEF's emergency student loan fund ensured they could continue their studies.

Impact study. Through the Regional Economic Development Center at Memphis State University, VEF sponsored a study of the financial impact of an optometry school on its community. This study has been used by the American Optometric Association and several states seeking the creation of a new school in their state.

Pharmacology course. With the need growing for clinical continuing education for practicing optometrists, VEF has funded the creation of a pharmacology course with a clinical emphasis at one optometry school.

Pledge for new school. When money was needed for a new regional optometry college, VEF raised $100,000 in pledges.

Borish Card. The Borish Nearpoint Vectographic Card promised to be a valuable tool for optometrists, but no money was available for development until VEF provided funds for testing, production and marketing. Proceeds from the sale of Borish Cards go to the Optometric Research Institute to finance additional research projects.

Educational and Diagnostic Center

In October, 1980, the VEF Educational and Diagnostic Center opened its doors to patients and students. Located in an area dense with hospitals and medical buildings, about twenty minutes from downtown Atlanta, the center is the first of its kind in the nation, providing secondary and tertiary eye care on a referral basis only.

Staffed jointly by optometrists and ophthalmologists, the center works for optometry by giving area doctors access to advanced diagnostic technology while serving the ethical referral and continuing education needs of the optometric profession.

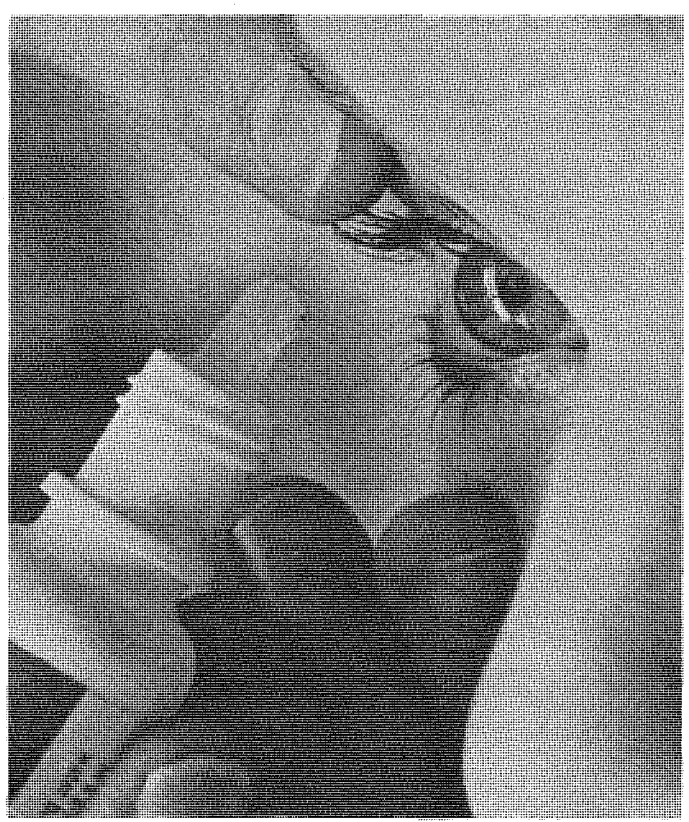
AOA President, Dr. Jack Von Bokern said at the opening of the Atlanta Center, "This concept of the VEF Referral and Teaching Center is one of the most exciting things I've seen in a long time. It demonstrates what optometrists can do when they work together to solve mutual needs. . . and it could very well be the model for other areas throughout the country. It seems ideal for those areas where ophthalmology is attempting to disrupt traditional two-way referrals."

Educational Opportunities

Optometry is benefiting in two ways from the services of this center. First, the practicing optometrists are receiving the best in continuing clinical education. The VEF program conducted in this clinical setting is designed to help these practitioners keep up with new technology and expand their professional skills. With this education, they will be better able to turn to the legislature to obtain the legal right to practice at their professional potential.

Regular seminars, ranging from lectures on diabetic retinopathy and anterior segment disease to "hands on" courses exploring various optometric procedures, such as indirect binocular ophthalmoscopy, gonioscopy and elec-

"Hands on" seminars give the practicing optometrist the clinical experience he needs to expand the scope of his practice.



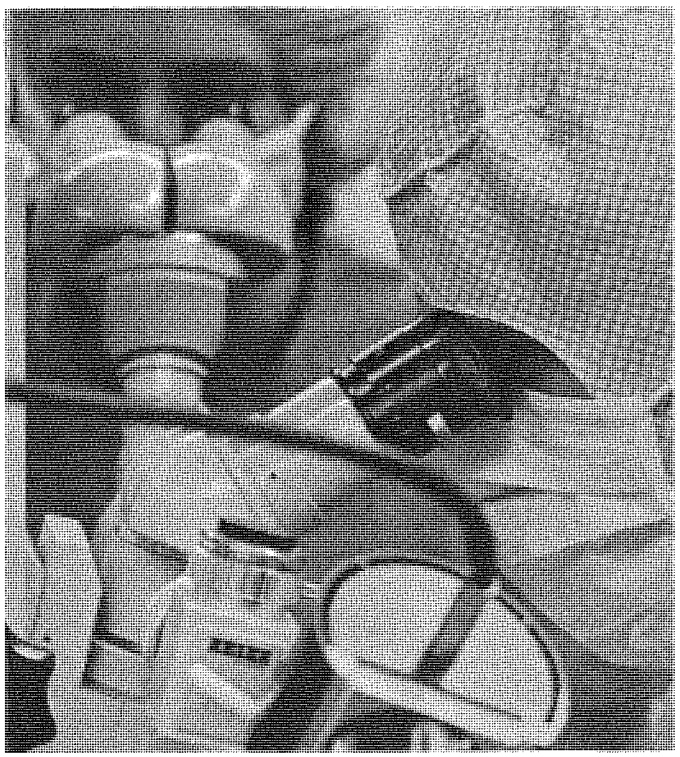
trodiagnosis, have been presented at no charge. All courses so far have filled quickly and waiting lists have been necessary.

These short seminars are only the beginning of extensive educational offerings at the center. Both transcript quality and transcript credit courses, in conjunction with cooperating schools and colleges of optometry, ranging in length from a few days to a week or more are being planned on such subjects as diagnosis and management of red eye, ocular diagnosis and therapeutics, and management of the cataract patient, all emphasizing "hands-on" clinical experience.

Student externs from the University of Houston College of Optometry and Southern College of Optometry are also recipients of education at the VEF center. Rotating quarterly through the clinic, these externs conduct initial patient examinations under the supervision of the optometric director, then participate with the ophthalmologist in his examination. They not only gain additional exposure to pathology, but also learn to operate the advanced diagnostic equipment. In addition, they visit the practices of area O.D.'s and M.D.'s and observe surgery being performed on patients.

Houston extern Tom Cossick said recently, "This has been a great educational experience for me. In just a few months I've encountered ocular conditions that I might not see in twenty years of practice."

A unique feature of the VEF center is its audio visual equipment. All pathological cases referred to the center, as well as technical use of equipment, are documented on tape

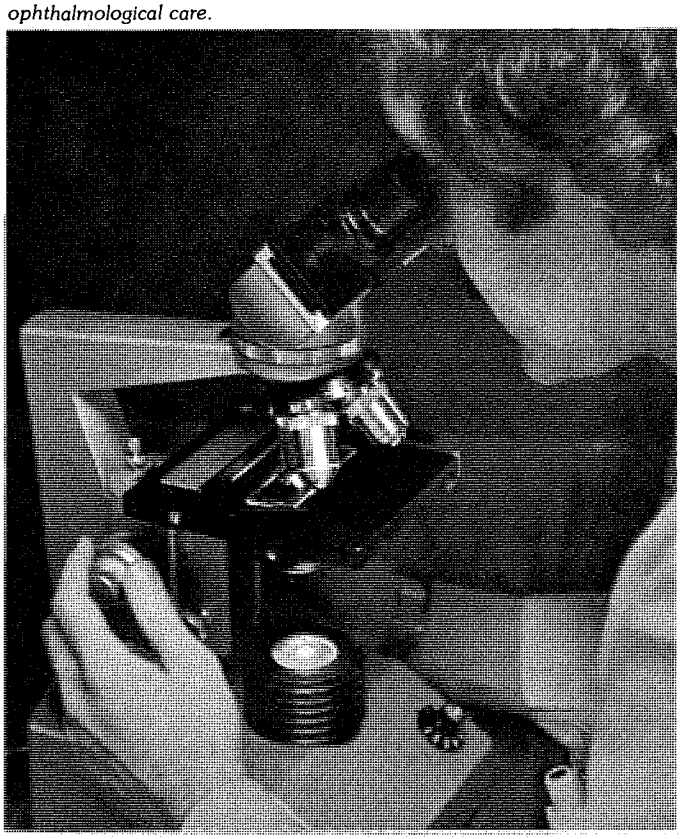


Observing surgical procedures by VEF Center ophthalmologists is an educational experience available to both VEF practicing optometrists and student externs.

or by photograph and used in the educational seminars. A TV camera on a slit lamp photographs anterior views of the eye, while a retinal camera photographs posterior views.

Dr. Mauney said, "Advancing optometric education has always been the primary goal for Vision Educational Foundation, and we are proud to have been instrumental in sponsoring a project as innovative and exciting as this."

Access to the most advanced diagnostic equipment and expertise gives doctors the assurance that their patients are receiving the finest ophthalmological care.



Patient Care and Referral

Even though meeting the clinical education needs of the practicing optometrist is the main purpose of the center, a clinical facility with a constant flow of patients is needed in order to provide a superb clinical education program. This is where the second benefit to optometry comes in. Area doctors have access to the most advanced diagnostic technology. They send all their ophthalmological referrals to the VEF center, being assured that their patients are receiving the best care available and will be returned to them for follow-up care. Comprehensive diagnostic data including photographs and a treatment plan are also returned to the referring optometrists.

Unusual pathological eye conditions are invaluable for teaching purposes at the center, but its ultimate success depends on routine ophthalmological referrals as well. Dr. Robert Lennon, an ophthalmologist and medical director of the center, urges area doctors to use the center for all of their ophthalmological referrals.

"Basically the types of cases we're prepared to see here are cases with interesting ocular pathology. . .because it's only through seeing the unusual that we can compare that

to the norm and get an appreciation for pathological conditions of the eye. We're also prepared to diagnose and treat cataracts, retinal detachments, diabetic retinopathy, abnormal corneal diseases or any conditions usually referred for ophthalmological care," Dr. Lennon said.

Dr. Mauney said that he is quite pleased with the progress of the center during its first six months of operation and added that as the center grows, he hopes to be able to involve more doctors in its programs.

"New advances in technology and challenges to optometry stimulated the innovative concept of the center, and it took years of hard work and the support of many friends of VEF and optometry to see it actually become a reality" Dr. Mauney noted. "It will take more hard work and support by our friends to see it become the ultimate success that we all envision. There are plans underway to expand the facilities in Atlanta and we are having discussions with doctors all across the country who are interested in having a VEF center in their area."

Practice Loan Program

New Graduates

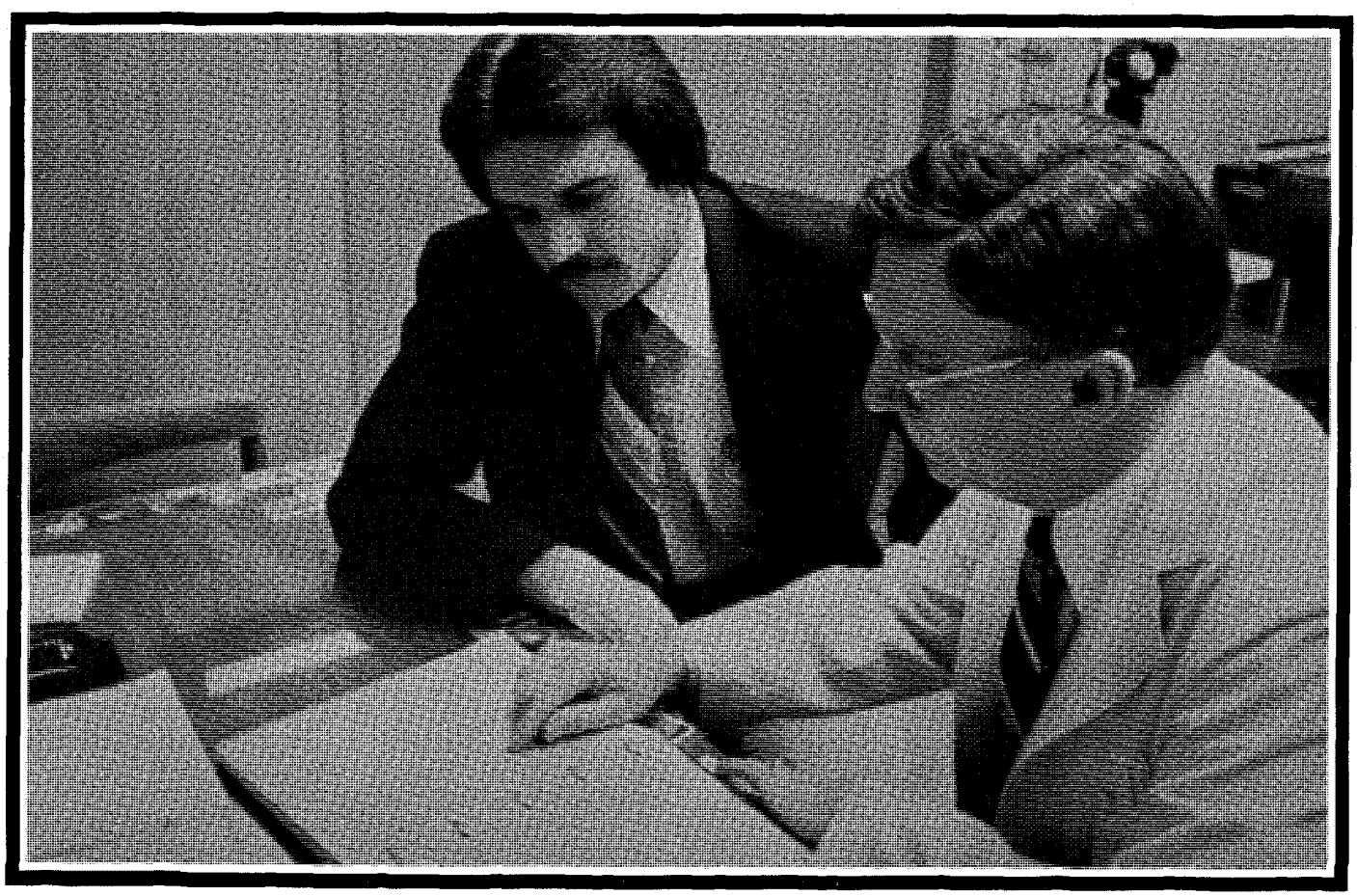
In this, the newest of VEF programs, the foundation is offering two solutions to problems facing today's graduates: 1) VEF helps new graduates find established practices for sale or ones in which the practitioner wishes to associate; and 2) VEF has established a program, along with Western Financial Capital Corporation, to finance new practices.

Financing a practice today can be one of the greatest challenges facing a new graduate. It will cost him a minimum of $30,000 for equipment and furnishings to begin a practice, and he may already be in debt paying for his education.

How can he go about borrowing this money? He is a poor risk at the banks. Even if he does find a bank that will take a chance on him, a five-year loan is usually the longest he can get. Many young O.D.'s have been forced into bankruptcy when they could not meet the high payments these short term loans require. Others have been forced into commercial practices, primarily because they did not have the necessary money to choose another alternative.

Recognizing this dilemma, VEF has developed the Practice Loan Program to help provide funding for these optometric practices. Working with Western Financial Capital Corporation whose president is Dr. Fred Rosemore, an Alabama O.D. and recognized financial expert, VEF is sponsoring new graduates for these loans. Dr. Rosemore and VEF have created this program to provide new and established practitioners a source of borrowing funds with repayment over a fifteen-year period. This longer amortization period allows payments to be much lower during the

The Practice Loan Program (1) helps new graduates find established practices for sale or ones in which the practitioner wishes an associate and then helps them (2) finance these new practices.



Electrodiagnosis is one of the diagnostic techniques used at the VEF Center and is the subject of "hands-on" clinical courses available to practitioners at the Center.

first few critical years of practice, and gives the new graduate a much better chance of surviving in private practice. This new concept could revolutionize the financial ability of the new O.D.'s to succeed in private practice.

To help ensure a successful practice, this program also provides counseling and financial advice from leaders of the profession. VEF and WFCC are often able to advise a new O.D. on how to establish a practice with a lesser financial obligation. And, if he has financial difficulties later, a group of his peers is available for consultation.

Established O.D.'s who wish to remodel, expand, build a new office or take in an associate can also look to VEF and WFCC as a means of long-term financing for all or part of their needs. No penalty is assessed for early repayment.

Retiring Practitioners

This new VEF program can be of equal benefit to older practitioners. First, it can help establish a practice valuation that is fair to both buyer and seller. Then the practitioner who is selling all or part of his practice is assured of payment under a system which allows him maximum tax advantage and gives him the satisfaction of seeing his practice survive with good vision care for his patients.

This can be very important to the future of professional optometry as well. Fifty-five percent of the O.D.'s now in practice will be at retirement age within ten years. A system whereby these established practices can be taken over by new practitioners undoubtedly will strengthen professional optometry greatly.

Finances

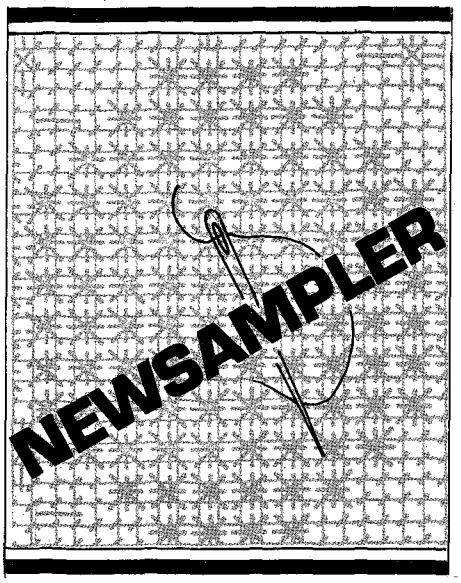
Each year VEF raises money from the profession through an annual giving campaign in addition to its Lab Bill Program through which optical laboratories match the participating optometrists' contributions. Contributions to the foundation are tax deductible under section 501(c)3 of the IRS code of regulations for an educational foundation. To date, more than $570,000 has been raised from the profession through these programs.

Even though VEF's fund raising has been quite successful —placing in the top 10 percent of all organizations raising money for educational purposes and being recognized by the National Council for the Advancement and Support of Education for three years—the money received from fund raising represents only a small amount of VEF's operating budget. The foundation's assets total more than $1.5 million and its annual budget is in excess of $500,000. Income is received from the management of these assets, through interest, dividends and property rental. VEF also is paid a monthly retainer to provide services to SCO in public relations and alumni affairs.

Each year, an annual report and balance sheet are prepared on the foundation, copies of which are available to anyone requesting them.

Since its beginning, VEF has collected over $570,000 from the profession, but through its projects has given back more than $728,000. VEF has managed to absorb fund-raising costs, pay for its yearly operations in full, accumulate reserves and increase assets. Thus, VEF has put more into optometry than it has collected.

As the demands on optometry have grown in recent years, Vision Educational Foundation has helped optometrists meet those demands. Whether through its past accomplishments, present programs, or plans to meet the challenges of the future, Vision Educational Foundation serves as a continuing source of strength for the profession.□



(continued from p.6)

Keeping Up with People...

Dr. Glenn A. Fry, former dean of the Ohio State University School of Optometry, and Massachusetts State **Senator Gerard D'Amico** were awarded honorary degrees by the New England College of Optometry (NEWENCO) at the school's commencement exercises March 8.

Second place winner in the Nikon Corporation's annual essay contest was **Gary Shephard,** a second year student at the New England College of Optometry. Mr. Shephard received an OL-5 Vertexometer for his paper which discussed the differences between commercial optometry and private practice and explained why both should cooperate to successfully provide the vision care needs of today's society.

The eleventh book by **James R. Gregg, O.D.,** *The Revised Edition of the Business of Optometric Practice,* has been released by Advisory Enterprises, One Holland Avenue, White Plains, New York 10603. Dr. Gregg, who has been associated with the Southern California College of Optometry for 33 years, is a long-time faculty member and has served as interim dean. He currently serves as grants administrator.

Dr. Janice Jurkus, assistant professor of optometry at the Illinois College of Optometry, was selected one of the Outstanding Young Women of America for 1980. Illinois College of Optometry President **Alfred A. Rosenbloom, Jr., O.D.,** has been re-elected a director of the Illinois Society for the Prevention of Blindness. Dr. Rosenbloom will be serving his second term on the ISPB executive committee.

Dr. Robert Rosenberg, chairman of the Department of Basic Optometric Sciences at SUNY College of Optometry, and **Dr. William Brown,** assistant professor of physiological optics and optometry at the Ohio State University College of Optometry, attended the Mini White House Conference on Aging and Vision in Washington, D.C., in January, 1981, sponsored by the American Optometric Association, the American Foundation for the Blind and a number of other organizations concerned with the welfare of older Americans. The purpose of the three day meeting was to develop a series of recommendations for the White House Conference on Aging scheduled to be held in December. Both Dr. Rosenberg and Dr. Brown attended as representatives of the Association of Schools and Colleges of Optometry (ASCO).

Dr. David W. Davidson has been named associate dean of the University of Missouri-St. Louis School of Optometry by **Dr. Jerry Christensen,** dean of the school.

Dr. B.C. Matthews, president, University of Waterloo, has announced the appointment of **Dr. Walwyn S. Long** as director of the UW School of Optometry. Dr. Long's term begins July 1, 1981, and will continue for a period of three years. He succeeds **Dr. Emerson Woodruff,** who is completing two consecutive terms as director which began in 1975.

Dr. Woodruff will undertake a sabbatical serving as consultant to the Ministry of Health, Province of New Brunswick in Frederickton, New Brunswick, Canada. He will arrange and provide for a program for screening of preschool and grade one children on a province-wide scheme which will be carried out in conjunction with the New Brunswick Optometric Association.

Dr. Bradford W. Wild, associate dean and director of the professional program of the University of Alabama in Birmingham School of Optometry, chaired the Annual Meeting of the American Academy of Optometry in Chicago December 10-17, 1980. Dr. Wild received the president's gavel at the final session signifying the conclusion of his two-year term as president of the Academy.

Dr. Gordon Heath, dean of the School of Optometry, Indiana University, will represent ASCO as a delegate to the 1981 International Congress of the International Optometric and Optical League (IOOL) to be held in May in Paris, France.

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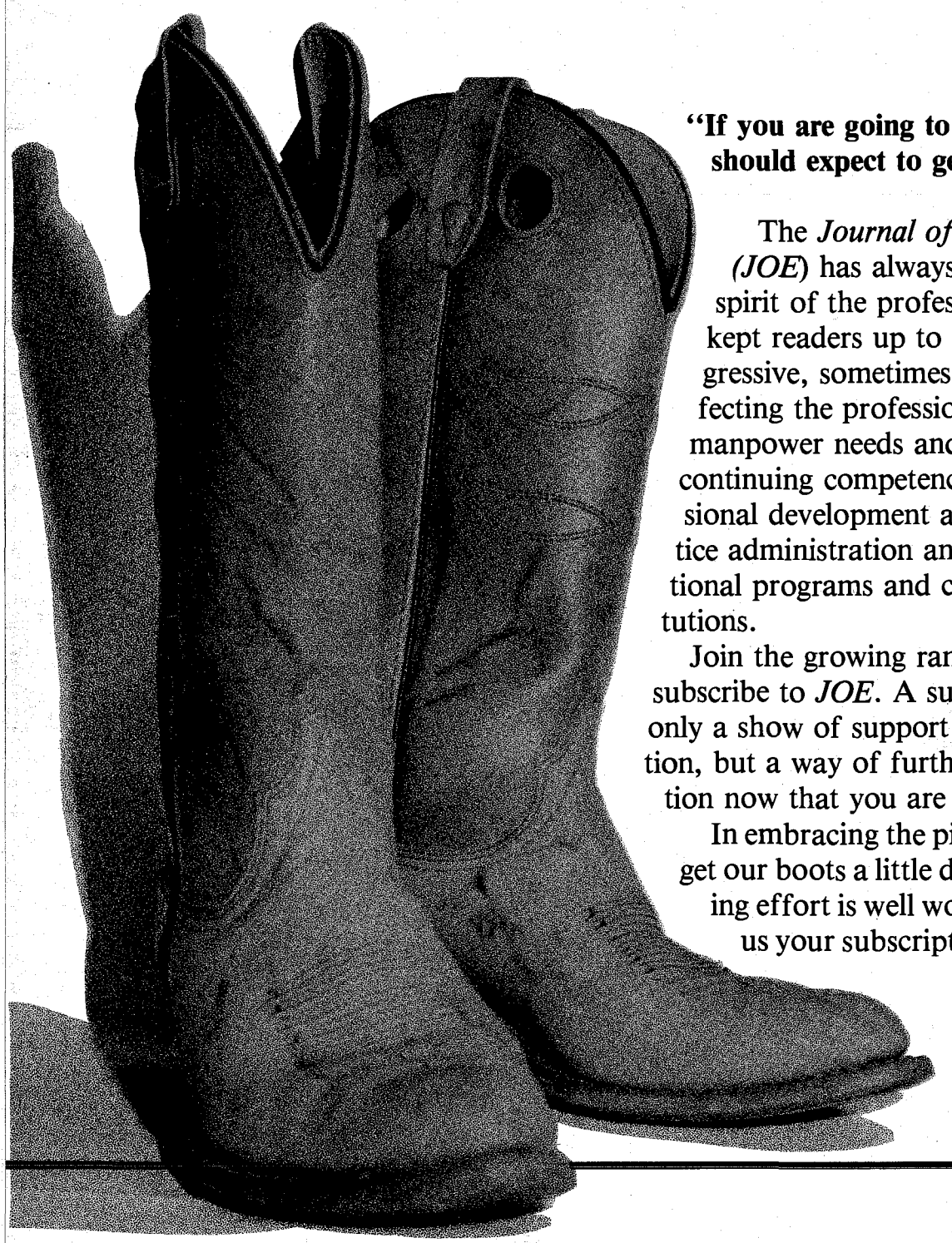

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