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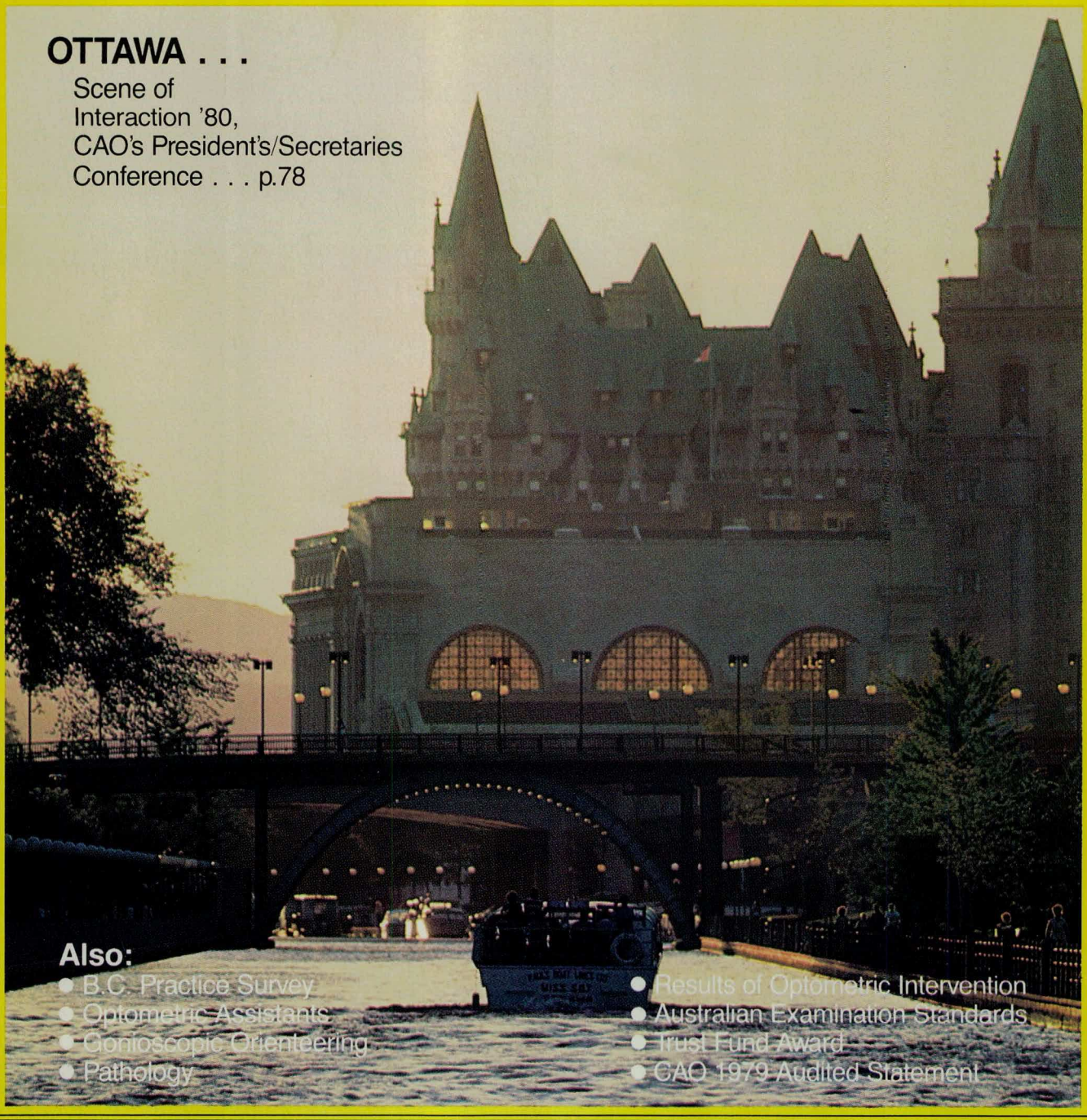
THE CANADIAN JOURNAL OF Optometry



OTTAWA . . .
Scene of
Interaction '80,
CAO's President's/Secretaries
Conference . . . p.78

Also:
- B.C. Practice Survey
- Optometric Assistants
- Conioscopic Orienteering
- Pathology
- Results of Optometric Intervention
- Australian Examination Standards
- Trust Fund Award
- CAO 1979 Audited Statement

LA REVUE CANADIENNE d'OPTOMÉTRIE

JUNE/JUIN 1980

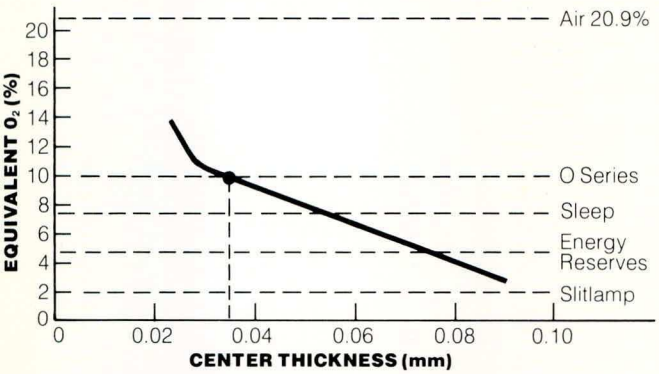
VOL. 42. NO. 2

Introducing a lot less lens. And a lot more oxygen.

Bausch & Lomb brings more oxygen to the cornea with the new O Series SOFLENS (polymacon) Contact Lenses

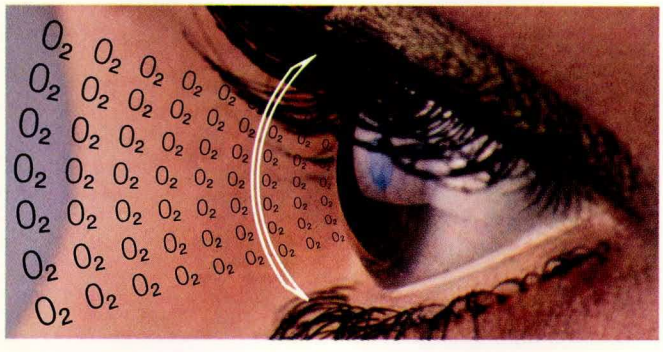
Greater oxygen transmissibility

The new O Series Soflens Contact Lens transmits more oxygen than our standard lens or even our Ultra Thin lens. In fact, during daily wear with O Series, the eye receives more oxygen than during sleep.[1]



"Equivalent oxygen" responses to a series of HEMA (Bausch & Lomb 38.6% water content) lenses having center thicknesses of less than 0.10 mm.[2]

Thinner than other soft contact lenses



This high oxygen transmission is possible because the new O Series soft contact lenses are only .035 mm in center thickness—one third the thickness of standard soft contact lenses, 50% thinner than other "thin" lenses and consistently thinner than lenses from any other source.

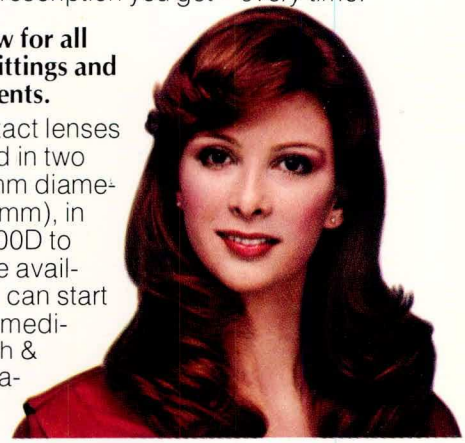
Reduced likelihood of edema

The greater oxygen transmissibility of new O Series SOFLENS Contact Lenses should reduce the likelihood of corneal problems, such as edema.

Excellent reproducibility

As with other Bausch & Lomb SOFLENS Contact Lenses, the O Series is spincast which means the prescription you order is the prescription you get—*every time.*

Available now for all your new lens fittings and replacements.



O Series soft contact lenses are manufactured in two series, 03 (13.5 mm diameter) and 04 (14.5 mm), in powers from −1.00D to −9.00D. They are available *now,* so you can start fitting patients immediately. Your Bausch & Lomb Representative is ready with all the details—to help you order them *today.*

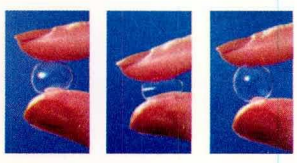
1. Hill, R.M. Hydrogel Lens Design: The Second National Research Symposium, The Thick and Thin of It, Aug. 16 & 17, 1975.
2. Ibid.

Fit the best first.

O Series SOFLENS

(polymacon) Contact Lenses

BAUSCH & LOMB SOFLENS (polymacon) Contact Lenses



Prescribed more than any other soft contact lens.

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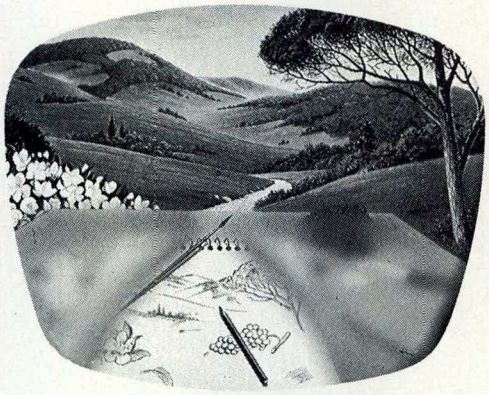
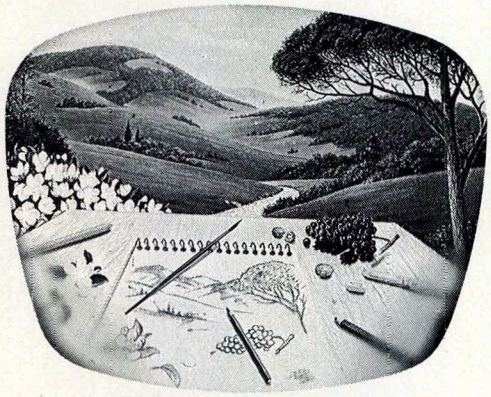


"Invisible" bifocals:
a fuzzy central zone.



Varilux 2: clear, clean
vision at every distance.

Varilux 2, from Essilor, is the only true progressive lens in the world—a happy revolution in the world of optics. Unlike invisible bifocals, Varilux 2 does it all: eliminates major aberrations and assures maximum visual comfort **up close, far away and in between.** Varilux 2 is a clear advantage your patients will appreciate. It's the far-sighted answer to the psychological trauma of presbyopia.

VARILUX 2

ESSILOR

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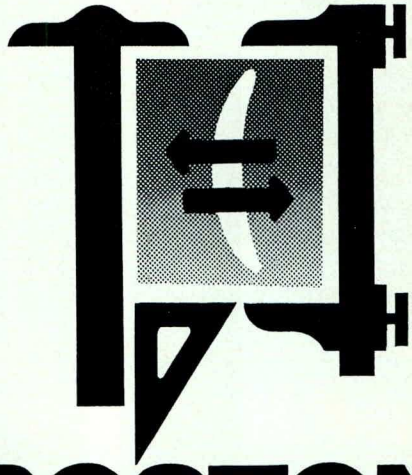

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Power -4.25	PC Tool 10.75	Blend Type B

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LETTERS

Dear Maurice,

May I congratulate you on the new format of the Journal, and especially thank you for the March issue. The article on contact lens polymers and solutions by Dr. Inns was especially valuable. The editorial on Primary Health Discipline and the Part III report on the Trust Fund were most valuable. Thank you for the time and effort and expertise you put into our Journal.

Today my wife and I leave for Waterloo to attend the graduation exercise when my son Ross graduates. He is to join me August 1st, the 60th anniversary of the founding of the office by Harry S. Nowlan.

Yours sincerely,
H.W. Moore, O.D.

Editor's Note:

As most optometrists are aware, Harry Nowlan was one of Canada's pioneer optometrists who devoted much of his life to the advancement of the profession. Born in 1887, he gravitated towards optometry via watch-making in Toronto and Winnipeg where he became the head of the watch-making department at Birks Jewellers. He became interested in dispensing and studied optometry at night until finally he began his own practice in 1920.

Dr. Nowlan was a fine optometrist, a good public speaker and was devoted to his profession, participating in community and association work including his service as president of the Manitoba Optometric Society. In 1947 he was elected to the Council of the Canadian Association of Optometrists, became Vice-President in 1948 and President in 1951 when CAO's Congress was held in his home city of Winnipeg.

As Director of the Professional Advancement program, Harry Nowlan was devoted to the "fee for service" philosophy and worked hard to see it become a reality. In 1967 he was awarded an Honourary Membership in the Canadian Association of Optometrists in recognition of his many years of service to optometry. Dr. Nowlan passed away in 1977.

Dear Dr. Belanger:

I would like to congratulate Dr. Inns on his excellent article which leads the way through a maze of soft contact lenses and related solutions. (Vol. 42 #1).

During my short career as an optometrist I have never seen a clearer, more comprehensive, up-to-date article on the subject.

However, I must point out a few small errors. Dr. Inns neglected to include 0.005% chlorhexidine as a preservative in both Burton-Parsons' "Normol" and "Flexsol" and Barnes-Hinds' "Soft Lens Storage and Rinsing Solution".

He also contradicted himself with regards to B.P.'s "Flex-Care System". In Table 2 he mentions that the enzymatic cleaners are said to be compatible with the system whereas in Table 3 one is told explicitly NOT to use the enzymatic cleaner with "Flex-Care".

Other than these small mistakes, it is a terrific article of which Dr. Inns can be extremely proud and I'm sure it will be a boon to many practitioners.

Sincerely,

Earl A. Lautenschlager, O.D.

CONTACT LENS PIONEER CELEBRATES 75TH

Consul Wilhelm Peter Sohnges, a NERF* member and contact lens pioneer, celebrated his seventy-fifth birthday, February 22.

He was born in 1905 in Krefeld, West Germany. After passing the examination for optical master in 1930, he founded his first optical enterprise in 1931, followed by the foundation of three subsidiaries in Berlin one year later.

Research activities in the field of the scleral contact lens, having been interrupted during the Second World War, were resumed at the end of the war and in 1950 the retail outlet. Sohnges Optik Wilhelm P. Sohnges, was incorporated with the trade register in Munich. One year later, he met Frank Dickinson, optometrist of the United Kingdom, and Prof. John Neill, of the U.S., and this meeting had decisive importance for the further development of the contact lens. The three men established the International Society of Contact Lens Specialists in 1954, the first president of which, Wilhelm P. Sohnges, is still the chairman.

He formed the Deutsche Contact Linsen GmbH in Munich in 1956 and was awarded a doctorate of ocular science by the Illinois College of Optometry in 1957. Several awards followed during the next years—the Frederick William Herschel Medal in gold in 1959, the Distinguished Service Cross of the Federal Republic of Germany and the Mercurio d'Oro of Italy in 1970, the Moracan Order of the Federal State of Bavaria in 1974.

*National Eye Research Foundation

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Fortunately today, there's a solution for this problem. The complete and effective Hydrocare system of soft contact lens care. Once-a-week cleaning with Hydrocare Protein Remover effectively removes filmy residues and prevents buildup of tenacious deposits. Safely eliminates eye irritation and fogging due to protein build-up so vision is clear again.

And daily lens care with Hydrocare Soaking Solution eliminates the need for separate cleaners, heating units or other complicated regimens. One convenient bottle cleans, hydrates and disinfects.

After prolonged treatment with other soaking solutions, the binding of the chemicals on the lens can produce yellowing and can cause red eyes from burning and allergic reactions. But non-binding Hydrocare soaking solution is not adsorbed into the lens so wearing is comfortable and vision is clear.

Start your patients on the Hydrocare System the day you first fit them with soft contact lenses. This daily and weekly routine will give them improved vision through clear protein-free lenses.

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THE CANADIAN JOURNAL OF OPTOMETRY

LA REVUE CANADIENNE D'OPTOMETRIE

Vol. 42 OTTAWA, ONTARIO, JUNE, 1980 No. 2

Contents

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EDITORIALS

MORE ON OPTOMETRY A PRIMARY HEALTH DISCIPLINE

In a previous discussion we outlined the responsibilities of the optometrist as a primary health care provider.[1] It was pointed out that the optometrist's fundamental contribution was in the enhancement and protection of vision in humans and the treatment by optical means and/or rehabilitation of any deficiencies found.

However, as primary health care practitioners, optometrists cannot limit their services solely to problems of refraction and binocularity. From the turn of the century optometrists have employed the ophthalmoscope to examine the interior of the eye. Optometry has accepted the responsibilities of its role in the care of the health of patients. This aspect of practice has been improved and its importance emphasized over the years. The training program in pathology detection, physiology and pharmacology is now so sophisticated that optometrists tend to overlook some of the basic optics concepts taught them in their undergraduate years.

Ophthalmoscopy has been part of optometric practice since its formative years. Its importance cannot be overemphasized. Expressing its importance in simple language is not always an easy task. The following description by Jones and Newcomb[2] is concise and brings out what can be accomplished by a careful ophthalmoscopy:

> "It is surprising that so few lay people realize the human eye is a sensory end organ which is in direct contact with the body's central nervous and circulatory systems. The eye is the only place in the body where nervous tissue and blood vessels can be examined *in vivo* without exploratory surgery.
>
> As such, every eye exam is actually a "mini" health exam. The instruments necessary for this examination are non-threatening and relatively inexpensive, and in the hands of a skilled clinician can provide a wealth of information about ocular as well as systemic health problems. For example, in the course of a basic optometric examination half of the cranial nerves are routinely tested (optic, oculomotor, trochlear, ophthalmic division of the trigeminal, abducens and facial) while others may be probed, if indicated, by non-invasive techniques designed to elicit responses of smelling, hearing, chewing, swallowing, speaking and contracting the neck muscles. The eye is truly a microcosm for the study of systemic disease affecting man, and as such, periodic optometric examinations would be indicated for children even in the absence of highly prevalent visual disorders.
>
> This information, in addition to that pertaining to specific visual disorders and recommended intervals of appointments must be placed in the hands of parents to

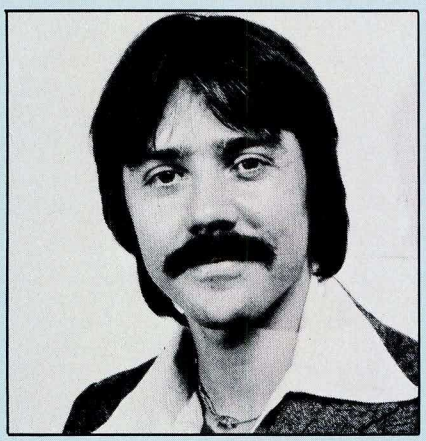
Continued on p. 74

TOM LITTLE IS LEAVING!

Some 18 months ago the *Canadian Journal of Optometry* took on a new look. It expanded in size and content and its new presentation and appearance were, to say the least, revolutionary. The management was the recipient of congratulations and felicitations; only favourable comments were to be heard for the journal's transformation.

The expanded journal, in size and content, may have definite technical and academic advantages over its previous format but its attractive presentation has been the main reason that the "new look journal" has been so enthusiastically accepted.

The editor acknowledges all the letters of praise which have been received but wishes to recognize that the new look has not been his doing. It is to Tom Little, Business and Advertising Manager, to whom all credit is due for the attractive and appealing appearance of the journal. Tom, a graduate in journalism from Carleton University in Ottawa, has been the guiding light in the transformation. Not only has he assumed the mechanical production of the publication but he has innovated and designed most of the physical changes in the book.



It is therefore with deep regret that we accept Tom's resignation as he heads back to his native British Columbia. The editor, staff, and management thank him for his excellent work with the Canadian Journal and wish him well. With talents such as he has displayed with us he cannot but succeed in his new environment.

A sad good-by and God speed him on his way!

G.M.B.

Continued from p. 72

assure their children of having timely optometric care."

Although the quotation relates to child care, the need for ophthalmoscopy and assessment of oculomotor function and reflexes does not depend upon the age of the patient. In fact, the need for ocular examination increases with age. These procedures have been taught to optometrists from the very beginnings; with the first didactic courses organised by a few far-sighted physicians and refracting-opticians nearly 100 years ago. The first formal colleges of optometry developed from these modest beginnings.[3][4][5]

No eye examination can be qualified as complete if such procedures are omitted. Simply by carrying out a routine optometric examination the optometrist fully justifies his claim to be a primary health care practitioner.

G.M.B.

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4. Fisher, E.J., Optometrical Education in Canada, *Can. J. Optom.*, 29(3), 81-98, Dec. 1967.
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Report From the Auxiliary to the Ontario Association of Optometrists

As my term of office as President of the Auxiliary to the Ontario Association of Optometrists draws to a close, may I address a plea to all optometrists.

Our most important job is that we share a common interest and a common goal to advance the profession of optometry and to serve as a medium by which information about vision reaches the public.

Please, may we have more support from the CAO and the OAO? We do need it. Although we have worked hard and long the Ontario Auxiliary numbers only 133 when there are 650 registered optometrists in Ontario. It does seem there is support needed.

Nevertheless, with only 133 members and about 30 very active members we have done the following:

- established a yearly scholarship to the School of Optometry at Waterloo as it was needed,
- donated $1,000 grants for summer projects for the School of Optometry,
- presented a grant to Dr. M. Samek four years ago in the amount of $3,800 from our Vision Research Fund for a project in low-field vision,
- at present, we have $1,500 in the student-loan fund at the School at Waterloo for the use of any student whether they are in optometry or not, furthering the work of optometry,
- sponsored the "Joy of Seeing" Art Contest in two areas in the elementary schools which reached thousands of children. This included setting up displays in various malls for one to two weeks, plus appearing on CHCH-TV which was seen all over Ontario,
- provided and will continue to provide large print books for libraries. These are expensive and badly needed. Most of our districts now do this,
- provided and distributed hundreds of pamphlets into schools, day nurseries, etc.,
- sold 10,602 copies of the Susan and Sam vision care activity book across Canada. Imperial Optical is now promoting this project both inside and outside Canada, which is certainly taking the word of optometry out into the public domain,
- at Congress are always available to assist in any way possible. At the March Congress in Toronto, the Auxiliary provides a suite to foster friendship and good fellowship,
- presented five life memberships (over 40 years active service in the Ontario Auxiliary) and twenty 25 years awards.

Just think what the Auxiliary could do with an increased and active membership. We do understand some areas are too small to sponsor a local Auxiliary but we need their membership of $10.00. Of this $5.00 is kept in the local Ontario district for any use they wish, $1.00 is sent on to the Vision Research Fund, and $4.00 is kept for operating costs.

We have heard that other parts of Canada are interested in forming their own Auxiliary and I know the Ontario executive would be only too happy to assist in any way possible.

I have been on the executive for over thirty years in some capacity or other. It is time for the "Young" group to take over. I am sure they will have plenty of exciting ideas. The Auxiliary works both ways. If a spouse is interested, they in turn keep the optometrist active. I enjoyed writing the Susan and Sam book and hope that I have contributed to optometry.

We still need YOU, the optometrist, to back us. We need YOU to be interested in what we do, and realize we can be of some use, for the good of optometry.

Thank you for the opportunity of addressing you.

Yours in optometry,

Partricia Clay Thomson,
President,
Auxiliary to the Ontario
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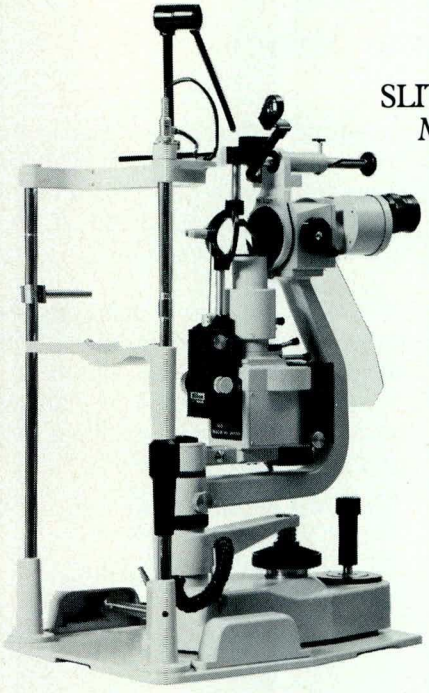

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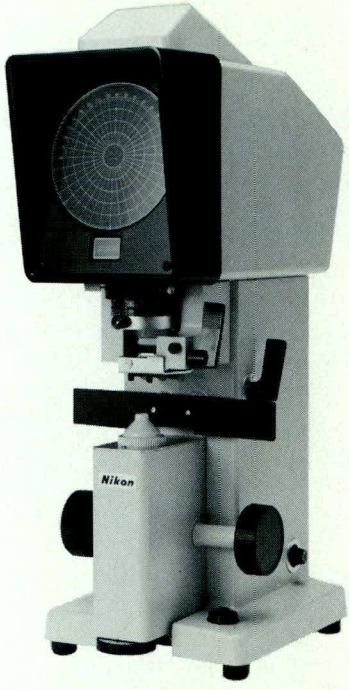

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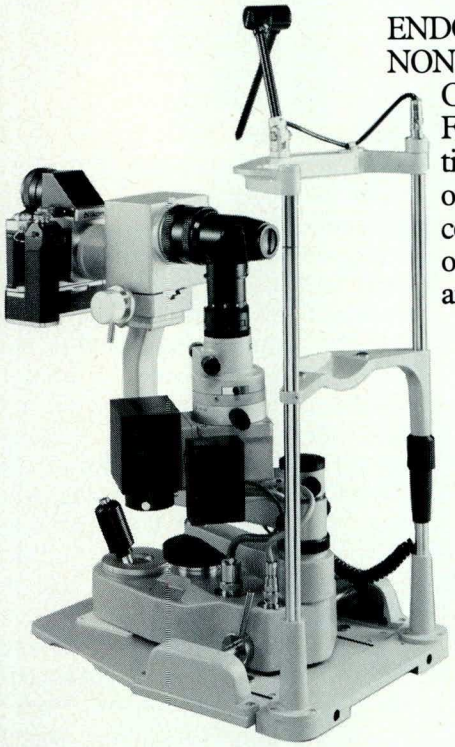

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OPINION

A special section of the Canadian Journal reserved for expressions of opinions by our readers on controversial topics or for putting forward new thoughts or philosophies to provoke discussion among members of the profession.

The Editorial Board reserves the right to select such papers and realizes that these papers *may not* always have the scientific tenure of an academic or research paper.

The Board considers these papers to be more than "letters to the editor". However, the opinions expressed are solely those of the author. Acceptance for publication does not imply endorsation of these opinions by the Editorial Board and the Canadian Association of Optometrists. We invite your comments on this, or any other article in the Journal.

Overview of the "Elizabeth Arden Eyewear Selector"*

This selector uses three variable parameters to determine a choice of frames for a patient; these parameters being face shape, hair colour, and wardrobe colour. By determining these variables, a three-digit number is found, and by cross-reference, three frames are indicated as possible choices.

For purposes of a trial, rejection or acceptance of the "computed" choice was based on patient reaction to the appearance, and suitability of the prescription. All high prescriptions were, of necessity, rejected from the trial because of the relatively large size of the frames.

A random sampling of 30 female subjects was used; these consisting of University personnel, optometric interns, optometrists and "naive" subjects. Of these subjects, six satisfied the above mentioned criteria for acceptance giving a rejection or failure of 80% of the trials.

The display and its selector generated a great deal of interest among all interns—both male and female.

The high failure rate could be attributed partly to the limited selection of the parameters and criteria for fitting. There was a limited size variation of the frames, wardrobe colour choice was insufficient for many of the subjects, and although face shape was considered, it was within rigid bounds.

Although the display does seem to be a clever marketing item, this selector cannot help an inexperienced fitter, nor is it any substitute for experience. This type of advertising novelty should not have a place in a professional optometric office.

*James P. Johnson, O.D., F.A.A.O.
Clinical Supervisor, School of Optometry
University of Waterloo, Waterloo, Ontario

W.G. MAYBEE MEMORIAL TRUST FUND

A Final Report

The W.G. Maybee Memorial Trust Fund was established in June, 1945. It had four primary objectives: (a) rehabilitation of veterans into optometry, (b) assistance to new graduates in establishing practices, (c) establishing scholarships or interest-free loans to under graduate students, (d) promotion of research scholarships, grants or loans.

The name was established as a memorial to W.G. Maybee who gave leadership in the passing of the Manitoba and the Ontario Optometry Acts in 1907 and 1919 respectively. He served as the first chairman of the Board of Examiners in Optometry in Ontario until his death in 1925. W.G. Maybee also conducted training programs across Canada for those who wished to be or were engaged in the practice of Optometry. He was one of the instructors in the first formal program of optometrical education at the Central Technical School in Toronto.

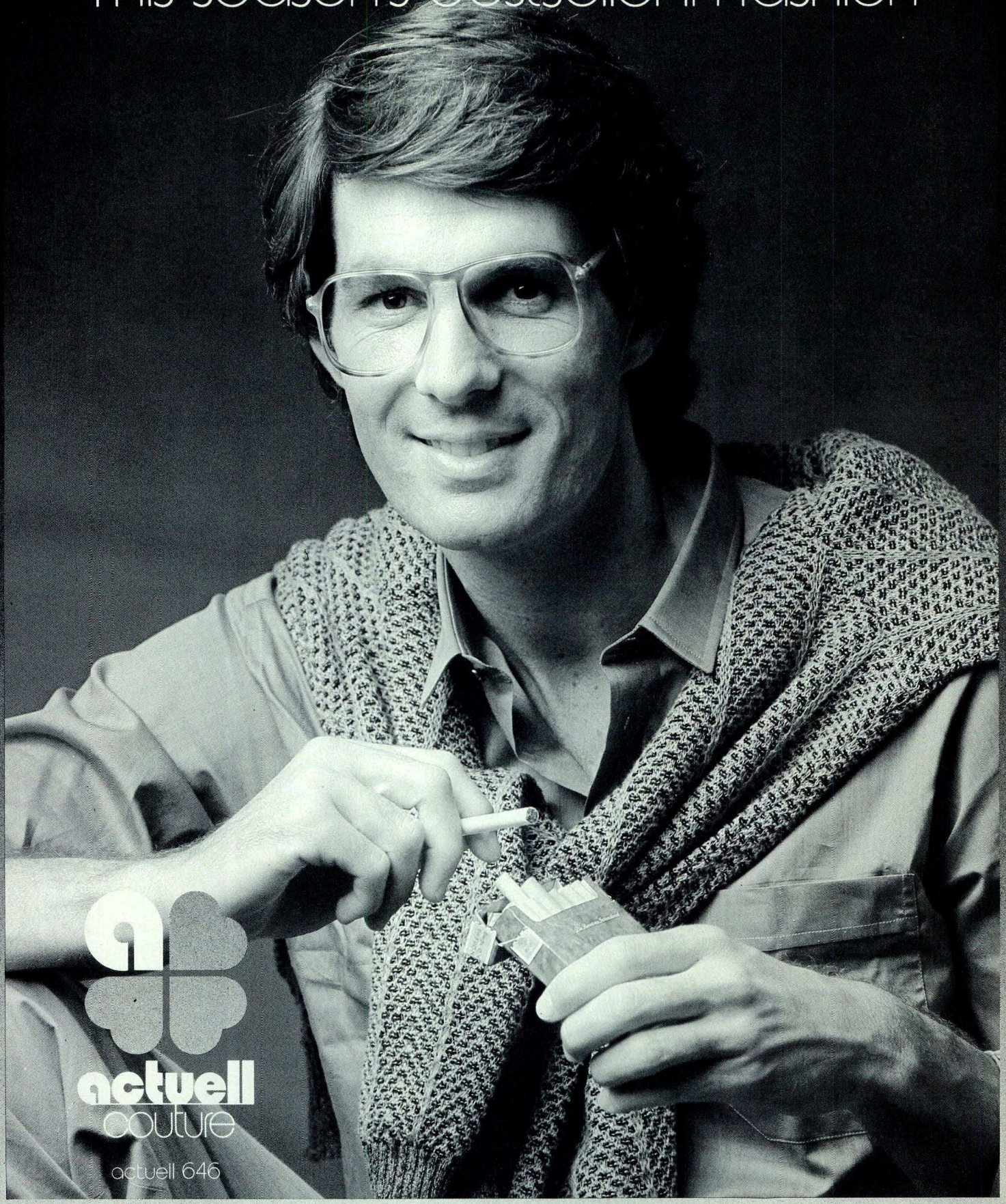
The amount of $15,183 was collected for basic capital. Some of this was invested and interest accrued. Since the fund was established, a total of $30,600 was loaned interest free to 77 different individuals. Some of these loans were for assistance in starting practices while others were made to undergraduate students. In addition outright grants for research projects and support of graduate education were made to 9 individuals in the total amount of $11,789.

Over the years, the trustees of the fund have been: Dr. E.F. Attridge, Dr. G.M. Bosnell (deceased), Dr. J.W. Dee (deceased), Dr. E.J. Fisher, Dr. J.M. Graham present Secretary-Treasurer, Dr. E. Lindo (deceased), Dr. R.D. Pellowe, Dr. G.W. Keevil (deceased), Dr. H.A. Stein (deceased), Dr. G.S. Stemp (present chairman).

Requests for assistance have dwindled in recent years, and the trustees felt it would be wise to devote the balance of the fund to optometrical education. The matter was discussed with legal counsel and in March 1979 the Ontario Association of Optometrists approved the transfer of the entire residue ($18,483.52) to the University of Waterloo's fund established to provide endowment for a Chair in Physiological Optics.

The Board of Directors of the Ontario Association of Optometrists along with all those who were assisted over the years, join in saying "thank you" to the aforementioned, for a job "well done."

This season's bestseller in fashion



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C.A.O. BULLETIN

INTERACTION PARTICIPANTS PLOT FIVE YEAR OBJECTIVES

Presidents, vice-presidents, secretaries and CAO Councillors of each provincial optometric association met to discuss current and future five-year objectives during CAO's Interaction '80 in Ottawa on June 16. Topics included legislation, education, communications, the Trust Fund, and provincial issues in optometry. On Day II of the conference, the participants were joined by representatives of the schools and colleges of optometry and students associations to foster a full and open exchange of views from the optometric community. Dr. Harding LeRiche delivered the Keynote Address (see next item). In addition, reports were received from both schools of optometry. The next issue of the Journal will feature a full conference wrap-up.

EPIDEMIOLOGIST ADDRESSES INTERACTION '80

Dr. Harding LeRiche, an epidemiologist from the University of Toronto who has studied the delivery of vision care by ophthalmologists and optometrists, presented the Keynote Address on Scope of Practice to some 50 optometric leaders June 16 during CAO's Presidents/Secretaries Conference—Interaction '80—in Ottawa. He was asked to comment on the role of the optometrist and compared aspects of primary vision care as delivered by optometrists and ophthalmologists. His speech was followed by group discussions of the issues by conference participants, culminating in a consensus geared towards concrete future objectives.

Dr. LeRiche undertook a study of vision care delivery by ophthalmologists in a 1977 study for the Ontario Medical Association. He is also responsible for a 1979-80 study on optometric care done for the Ontario Ministry of Health. (At press time Dr. LeRiche's address was not yet available, however, we will be carrying a full report in our next issue along with our regular Interaction '80 coverage.)

CAO COUNCIL MEETING

CAO Council held it's summer meeting June 14 in Ottawa just prior to Interaction '80. Topics included the discussion of a new political action program necessitated by the reinstatement of new lieral government this spring, CAO involvement in federal government programs, consolidation of the new CAO committee structure, the 1980 public information program, interprofessional relations, and the 1981 Biennial Congress in Quebec City.

BCOA PREVENTS OPTICIAN FROM PRACTISING OPTOMETRY

A 1979 B.C. Supreme Court case in which the British Columbia Optometric Association sought to prevent a contact lens firm from illegally practising optometry has been resolved in favour of the B.C.O.A.

The court found that the use of an ophthalmometer and slit lamp by employees of the optician ". . . to measure the curvature of the parts of the eye . . . to assess the lens strength . . . constituted the practice of Optometry. . ."

The court also ruled that advice given concerning the necessary type of lens ". . . having regard to the possible functional involvement of the organic disorder in the patient's right eye, constituted the practice of optometry. . ."

Finally the court ordered that the contact lens firm desist from practising optometry, ". . . in particular, from conducting the investigation of the function of the human eye by means of test lenses, test cards, trial frames and other instruments or devices . . . specifically Ophthalmometers and Slit Lamps and the adaptation of lenses, or the use of orthoptic instruments of any kind for the purpose of improving or correcting the visual function."

THIRD PARTY ACTION MOVES AHEAD

The National Advisory Committee on Vision Care Benefits has been working diligently to ensure the creation of a uniform system of vision care benefit plans in Canada. The committee's work is well on target with recent action being taken to consolidate its information base and identify the appropriate format of presentations to insurance carriers, industry and labour. The Advisory Committee has produced an introductory brochure and each provincial representative has agreed to have his provincial association identify target groups with a potential interest in vision care plans. Each province is also selecting a committee to negotiate with these groups.

Members of the national committee are: Jean-Marie Rodrigue (Chairman, Quebec); John Snow (Nfld.); Greg Beer (P.E.I.); Ron Haines (N.S.); Wayne Lenehan (N.B.); Guy Lamoureux, (Legal Counsel, Quebec); Bob Newhouse (Ontario); Harry Basman (Manitoba); Dick Watts, (CAO representative, Alberta); Jim Krueger, (Sask.); Brian Cox, (B.C.); Don Schaefer (General Manager, Ottawa).

CIVIL AVIATION REFERRALS NEED FURTHER CLARIFICATION

In 1979, Transport Canada implemented a CAO request which required eye examination notices to pilots to include the option of using an optometrist for the test. However, some Regional Aviation Medical Officers have not been accepting optometric reports and CAO will be requesting a further meeting with department officials to clarify the matter.

OTTAWA OPTOMETRISTS PARTICIPATE IN CPHA'S NATIONAL CONFERENCE

Several Ottawa optometrists took part in the 71st Annual Conference of the Canadian Public Health Association in Ottawa June 23-26. Aside from the lectures they attended, the practitioners manned the CAO booth in the display area, discussing vision care with hundreds of visiting health care practitioners and administrators. The Conference theme this year was "Public Health in the '80's—Opportunity or Demise?"

MEDIC ALERT BRACELET COULD SAVE VISION

Glaucoma and contact lens patients are in danger of suffering vision loss in the event of an incapacitating accident or sudden illness if authorities are unaware of the patient's special needs. Optometrists can help reduce this danger. CAO has made arrangements with the Medic-Alert Foundation to publicize the need for these patients to be aware of the Medic-Alert program. By wearing an identity bracelet and carrying an Alert card, these patients can ensure they receive the proper care during an emergency. Please check the envelope that brought you this edition of the Journal for Medic-Alert information in order to better advise your patients who may benefit from the Medic-Alert program.

CAO REPRESENTED AT I.O.O.L. MEETING IN JAPAN

Dr. George Woo was in attendance at the 53rd Congress of the International Optometric and Optical League and acted as CAO's representative during the proceedings in Nagoya, Japan May 26-30. Dr. Woo also participated as a lecturer in the educational program which included many leading lecturers from around the world. The Congress will be followed by the 3rd Annual Meeting of the International Federation of Asian and Pacific Associations of Optometrists in Hong Kong and both events are expected to stimulate further improvements to the field of vision care in Asia.

MANITOBA O.D. ON C.N.I.B. MANAGEMENT BOARD

The Manitoba Optometric Society is making excellent progress in its relationship with the CNIB in that province. Dr. Bruce Rosner has become a member of the CNIB Manitoba Division's Board of Management in what is believed to be the first time an optometrist has held this position on a provincial level.

Dr. Steven Mintz has recently delivered a lecture for CNIB on Safety Goggles in Sports, the first time in Manitoba an optometrist has been publicized as a CNIB speaker.

MOS is also working with CNIB and the Manitoba government to set up a geriatric vision screening program, following the success of the provincially sponsored Vision Conservation Program for children. (See report in CJO, December, 1979).

CAO'S NEW PUBLIC INFORMATION COORDINATOR

CAO's Public Information Office has secured a new Coordinator, Mr. Alex Saunders, 26, who brings a variety of valuable qualities to the position. Alex combines his recent experience as a publicist/public relations officer for the St. Lawrence Parks Commission in Kingston with a professional degree in Journalism from Carleton University.

He commenced full-time duties June 14 following a two week orientation period which led to his participation in the Presidents/Secretaries Conference June 15-16. Alex received a thorough introduction to his new role from Tom Little who has now re-located in Vancouver after three years with CAO.

PUBLIC INFORMATION PROGRAM

CAO's public information program is continuing to meet the needs of the public in many areas as demand for vision care information grows. The series of six new pamphlets has received an overwhelming response, with over 25,000 pamphlets sent out as of May 15 and the third English printing underway. The first French pamphlets were mailed with the March Journal and early response has been excellent.

Two public service announcement TV films were distributed this spring, the 30 second "general" film and the 60 second "old age" film. Television stations air them without charge, thus raising public awareness in a way that would otherwise cost hundreds of thousands of dollars.

Seven news releases have been issued in the first six months of the year: Vision and Smoking, Low Vision, Vision and Diabetes, Vision and Mental Retardation, Medic-Alert Bracelets, Sunglasses and Holiday Tips. The first five were part of CAO and provincial association's efforts to extend inter-professional relations to other organizations in the health care field.

$145,000 AIR TIME FOR PSA's IN MONTREAL

During 1978-79 free air time valued at $145,133 was provided by a Montreal television station for broadcast of the vision care public service films produced by CAO. According to information from l'Association Professionnelle des Optometristes du Quebec, CFTM-TV aired the 60-second messages 63 times in 1978 and 54 times in 1979. They also broadcast the 30-second message 12 times in 1978. Word was also received from two other stations, CKRS in Jonquiere, who aired the 30-second message 30 times ($1800) and CHLT in Sherbrooke, who aired the same message 78 times ($5,145).

$30,000 CAMPAIGN IN READER'S DIGEST BEGINS

The Manitoba, Alberta and British Columbia Optometric Associations are jointly sponsoring a $30,000 public information campaign that will carry a one page announcement in five issues of Reader's Digest. The magazine has a circulation of 446,000 in the three provinces and optometrists there will each contribute $100 to support the program. The Alberta Association has levied an extra $100 in the event that additional announcements are placed in the Reader's Digest in Alberta alone.

A complimentary program costing the three provinces $8,295 would see additional information reach the public through colour eye charts, sports posters, general news releases and television and radio public service announcements.

Canadian Optometric Education Trust Fund*

Part IV: The Optometric Manpower Threat to Scope of Practice[1]

This is a continuation of our series outlining the practical and urgent needs your Trust Fund is attempting to meet.

One of the principles underlying the establishment of the Trust Fund is that, until we stabilize and then expand our available manpower, our present rather limited pattern of service delivery will continue. As a result, the unmet vision care needs of the public (as identified in previous articles) will be provided by the optometrist.

Within this section of our "Issues in Optometry" position papers, we will develop an overview of the factors that must be considered in the projection of the profession's immediate and future manpower needs. In addition to a number of important areas* the Trust Fund will contribute to both current schools of optometry as well as a third school to ensure manpower needs are met.

The profession of optometry benefitted from a notable expansion of educational facilities immediately after World War II. A significant number of veterans of higher than average college entrance age were graduates of the 1946 to 1950 period. These individuals will be looking forward to retiring in the coming 10 to 15 year period and as a result we will be suffering from a high manpower attrition rate.

An analysis of the current age profiles, with their potential manpower losses, resulted in CAO investigating a wide range of related manpower issues in the 1970's. CAO then concentrated on a western school and has developed a series of detailed briefs on optometric manpower issues for the consideration of health planners in provincial and federal governmental agencies. We will therefore summarize the more important of these manpower issues, as identified by CAO, in a concise and realistic manner.

*By Donald Schaefer, Trust Fund General Manager

[1]Please see previous issues for parts I-III.

Current Supply of Optometrists – A False Sense of Security

The latest edition of Health and Welfare's publication, "Canadian Health Manpower Inventory, 1976" allows us to analyze trends associated with the past (1967) and the current (1977) supply of optometrists from the following perspectives:

- There has been a 32% increase (447 practitioners) in the number of active optometrists in Canada from 1967-77.
- There have been 460 graduates from our existing schools of optometry in the five year period from 1973 to 1977 for an annual average of 92 new practitioners.
- There has been a net increase of 29 optometrists due to immigration from 1967-77 for an annual average of 3 new practitioners.
- The population ratio to active optometrists has improved from 1:15,764 in 1967 to 1:12,734 in 1977

However,when these rather optimistic statistics are viewed in terms of other complicating factors, the profession must develop a deeper concern for the Canadian public's ability to gain access to primary vision care services from an optometrist.

Population Ratio Problem

CAO has advocated the establishment of a conservative population-to-active optometrist ratio of 1:10,000. A review of world literature on this point indicates that the ideal ratio for optometric and medical manpower has been estimated at one optometrist for 7,000 population and one ophthalmologist for 35,000 population, giving a 5:1 mixed ratio. These estimates have been confirmed by studies of group practices and health maintenance organizations within the United States and abroad, where optometrists and ophthalmologists work together as a team to provide total vision and eye care to an entire community.

There was an immediate national requirement in 1977 for an additional 503 optometrists to reach the minimum acceptable ratio of 1:10,000 active optometrists. In order to achieve the international ideal ratio of 1:7,000 in Canada there is an immediate need for an additional *1,508* optometrists.

We recognize the limitations of the use of ratios as an indicator of optometric manpower requirements especially when developed without an assessment of other vision care related categories of health care workers. We would therefore stress that the achievement of the ideal optometric manpower ratios would be meaningful only if accomplished along with the corresponding medical manpower ratio of 1:35,000. But the use of such ratios does serve to reveal the present status of available optometric manpower and our concern for the profession's future ability to deliver quality care at affordable prices to Canadian citizens in response to their complete range of primary vision care needs.

Population Growth Problem

If the nation continues to experience, as indicated from 1967 to 1977, an annual population growth of 1.4%, we will require an additional 36 practitioners per year to offset this growth and achieve the desired 1:10,000 ratio.

Manpower Attrition Problem

As already stated, the attrition rate experienced by the profession due to death and retirement will be a

major factor in the coming 10 to 15 year period. When the profession experiences the estimated annual 3% manpower loss, we will have a sustained need for *59 practitioners per year to replace our current manpower at the 1:12,734 ratio.*

Aging Population Problem

The optometric manpower situation is further complicated by the fact that in the immediate future there will be a noticeable increase in the percentage of Canadians over 55 years of age. With old age comes gradual deterioration of vision. Consequently, there will be an increased demand for the vision care services offered by the optometrist that our present training facilities will not be able to offset.

Conclusion

It can be concluded that our present ability to graduate from our two existing schools of optometry, only 95 new optometrists each year is just barely sufficient to offset the current long term pattern of attrition among practising optometrists (59 optometrists) and the need for addiitonal practitioners to offset population growth (36 optometrists). This unfortunate reality is further complicated by the fact that the present ratio of optometrists/population of 1:12,734 is not allowing the profession to provide the unmet vision care needs of the public in a manner that is consistent with our education and capability for quality care at affordable prices.

It would seem then that optometrists with concern for the continued strength and development of the profession will look to the Trust Fund as a means of guaranteeing solutions to the problems discussed in this series of articles. Please do not underestimate the strength of our collective action when pledging your financial suppoert to this worthwhile and necessary campaign.

DONATIONS FOR SPECIAL OCCASIONS

In this mailing of the Journal you will find a special donation card to enable you to honour special occasions with a contribution to the Trust Fund.

Such occasions may be a birth, death, graduation, marriage, retirement or other moment that you may wish to commemorate with a special pledge.

Check your Journal envelope for the special card and keep it on file for an appropriate occasion.

TRUST FUND CHAIRMEN

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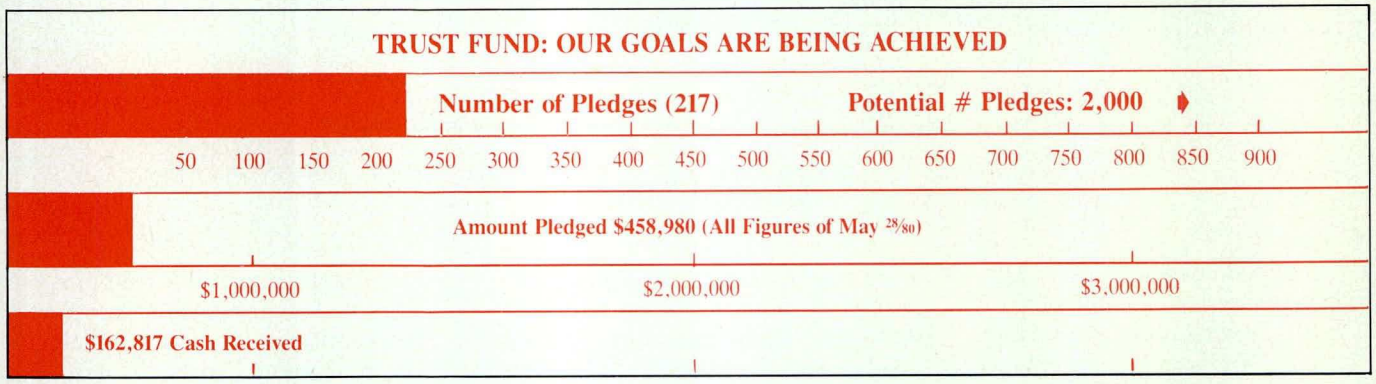

*Not including 58 donations without pledge cards and special donations.

New Ways to Help the Trust Fund — You Could be a Winner!

The Trust Fund has been the beneficiary of some rather novel fund raising techniques, for which the Trustees are very grateful. In fact the Trustees would like to challenge all our readers to try and top the following schemes, if not financially, then at least in terms of originality: (with a prize to the scheme generating the greatest revenue-see below).

Members of the New Brunswick Optometrical Society raised the grand total of $13 during a spring golf party and forwarded the proceeds to the Trust Fund. Not to be outdone, the staff and optometrists in the practice of DesGroseilliers & DesGroseilliers in Ottawa contributed the profits of their coffee fund: $32.00.

Can you, and/or your colleagues beat that? Consider the gauntlet thrown—prize for the highest contribution by December 31, 1980 is a free subscription to any Canadian journal or magazine, or any optometric journal in the world.

Provincial Breakdown of Donations

	Pledged	Received
B.C.	$ 91,100	$32,925
Alta.	$132,850	$34,870
Sask.	$ 49,150	$28,975
Man.	$ 62,480	$25,572
Ont.	$ 87,150	$22,357
Que.	$ —	$ —
N.B.	$ 16,900	$ 7,713
N.S.	$ 11,750	$ 6,330
P.E.I.	$ 2,100	$ 2,100
Nfld.	$ 5,500	$ 1,350
Misc.		$ 625
Grand Total	**$458,980**	**$162,817**

First Trust Fund Award Granted

Trustees of the Trust Fund have awarded the fund's first grant, a research assistantship, to Miss Karen Smith, 22, an optometry student at the University of Waterloo who will be entering Third Year this fall.

Miss Smith has received $2400 to serve as research assistant to Dr. J.S. Lovasik in his investigation of the neural mechanisms controlling ocular accommodation. The award falls under Section C of the Optometric Manpower Development section of the Trust Fund: Undergraduate Programs. This provides students showing a special interest and aptitude in investigative studies an opportunity to engage in research early in the educational process. Not only is this useful in guiding students toward a career in research but it also provides valuable assistance to research programs.

Miss Smith spent last summer with the Occupational Health and Safety Branch of the Ontario Ministry of Labour writing and compiling abstracts of current Canadian research in the field. Of particular interest to her was the research associated with visual health and safety and this sparked her desire to enter the field of research.

Describing her return to Waterloo last fall, Miss Smith said, "Dr. Lovasik's work fascinated me the most. We spent many hours discussing his research. I share his enthusiasm and his excitement in his work . . . through Dr. Lovasik's research, and the work of others in related areas, I am confident that optometrists and other vision care practitioners will have a better understanding of accommodation and accomodative anomalies in humans."

Miss Smith wants to enter graduate research after receiving her O.D. degree in 1982. Dr. Lovasik, who directs the Electro-Diagnostic Clinic at the School of Optometry, is introducing her to electro-retinography, visually-evoked cortical potentials, and electro-oculography.

"I find these tests particularly interesting since they combine basic neurophysiology with clinical applications. This extra training will be an invaluable clinical diagnostic tool . . . Through my participation in the Trust Fund research program I hope to develop skills in research and specialized clinical procedures based on electro-physiological techniques."

Miss Smith grew up in Toronto where she developed a wide range of interests. In high school, as chairperson of the Welfare Committee, she worked on numerous projects for the Red Cross, Cancer Society, United Way and did volunteer work at Doctor's Hospital. She is an accomplished swimming and scuba diving instructor, and enjoys jogging, squash, calisthenics, cycling and skiing. She has also learned piano and violin and enjoys sculpture, ballet and jazz dancing and has danced with Toronto's Joan Kohal Dance Company.

Clinical Note*

The following report is taken from the results of an investigation carried out by the "Nederlandse nie voor Opticiens" at the Christian Huygens School in Rotterdam on two auto-refractors: the Dioptron and the Acuity Systems Model 6600.

The investigation was requested by the Netherlands Public Health Ministry and made by the faculty of the Huygens School, optics section.

The original report will be found in Oculus, August 1979 issue, the official publication of the Union of Netherlands Opticians.

The two instruments, the Dioptron and the Model 6600, perform the same function and provide the same information obtained by retinoscopy. Their operation is relatively simple and they provide printouts of the results thereby permitting office assistants to operate them.

However, it is incorrect to consider the results provided by these auto-refractors as the correct lens formula to be prescribed. In this respect, the following objections must be put forward:

1. Spherical power, cylinder power and axis orientation are not exact.

2. These instruments are strictly monocular and provide no information on the binocular status of the subject. Heterophorias, cyclophorias possible suppressions and other binocular anomalies cannot be measured. Finally the maximum correction is frequently too uncomfortable for clinical wear.

3. Although these instruments will apprise the operator that a measurement cannot be taken they do not inform as to the cause of the non-measurement. They do not provide any information on the status of the eye which has been measured.

4. Near point corrections cannot be measured.

* Translation from the original French text by CJO staff.

CAO 1979 AUDITED STATEMENT

The accompanying portions of the CAO audited statement outline our income and expenditures for 1979. As a member of your provincial association, you have a right and obligation to be fully informed on how CAO spends the money entrusted to us. CAO council and administrative staff appreciate the fact that your CAO contribution is the largest single budgetary expenditure made by your association. We welcome any enquiries that you have and stand prepared to further explain any expenditure made.

We are pleased to report our financial performance for 1979 resulted in a net operating surplus of $14,559. The reasons for the surplus can be attributed to the following situations:

(1) The Edmonton Congress resulted in a profit of $4,186 as recorded under the heading Projects.
(2) We were able to generate $2,230 investment income.
(3) The C.J.O. had an operating profit of $9,880 vs. a loss of ($4,868) in 1978. (It should be noted that approximately $5,000 of the profit is attributed to the publication of a congress souvenir program).
(4) Revenue from provincial associations was $4,413 higher than anticipated.
(5) We spent only $741 of our budgeted $7,500 on committee travel.

On a negative note, our general expenditures for each of the remaining items were fairly close to the budgeted amounts with the exception of:

— employee benefits (+1,651)
— Executive Director travel (+1,461)
— miscellaneous (+1,792)
— printing & office supplies (+1,806)
— salaries (+3,771)
— telephone (+1,480)

The over-spending with regards to each of these items can be directly attributed to either changes in staff or an increase in our administrative activity.

We will continue to monitor our 1980 expenditures with the same level of fiscal restraint as we did in 1979. We are ever mindful of the fact that since we do not have a large cash surplus to draw on ($12,037) or a ready means of raising money other than by taxing our members, we are very vulnerable to uncontrolled spending trends.

If you have any further questions, please contact Mr. Don Schaefer, CAO Executive Director or our Secretary-Treasurer, Dr. Reid MacDuff.

AUDITORS' REPORT

To the members
Canadian Association of Optometrists

We have examined the balance sheet of The Canadian Association of Optometrists as at December 31, 1979 and the statements of revenue and surplus and changes in cash position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the association as at December 31, 1979 and the results of its operations and the changes in its cash position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Deloitte Haskins & Sells
Chartered Accountants

OTTAWA, Canada
February 15, 1980

CANADIAN ASSOCIATION OF OPTOMETRISTS

STATEMENT OF CHANGES IN CASH POSITION

YEAR ENDED DECEMBER 31, 1979

	1979	1978
Cash receipts		
Revenue for the year	$149,207	$125,340
Add (deduct) changes in receivables	(4,924)	1,786
Sale of short term deposits	-	5,000
	144,283	132,126
Cash expenditures		
Expenses for the year	134,648	135,567
Add (deduct) non-cash charges:		
Depreciation	(1,997)	(1,795)
Change in accounts payable	8,559	(10,579)
Cash paid to trustees of trust fund	-	300
Prepaid expense	(1,033)	1,033
Additions to fixed assets	2,027	-
	142,204	124,526
Excess of cash receipts	2,079	7,600
Cash on hand, beginning of year	9,958	2,358
Cash on hand, end of year	$ 12,037	$ 9,958

CANADIAN ASSOCIATION OF OPTOMETRISTS

STATEMENT OF REVENUE AND SURPLUS

YEAR ENDED DECEMBER 31, 1979

	1979		1978	
	Actual	Budget	Actual	Budget
Revenue				
Membership contributions (Note 1)	$132,703	$128,290	$124,008	$120,946
Literature sales	208	1,000	1,261	1,200
Investment income	2,230	-	71	800
National Council of Optometry	-	-	-	1,200
Canadian Journal of Optometry - Net	9,880	-	-	-
Projects	4,186	-	-	-
	149,207	129,290	125,340	124,146
Expenses				
Bad debts	52	-	294	-
Bank charges and interest	26	75	78	75
Canadian Journal of Optometry - Net	-	1,050	4,868	800
Committee travel	741	7,500	2,329	7,500
Depreciation	1,997	1,500	1,795	1,500
Equipment rental	95	275	168	250
Employee benefits	3,411	1,760	2,272	1,855
Executive and Assistant Director				
General	570	550	300	500
Travel	4,761	3,300	2,943	3,000
Honorarium	-	-	840	-
Insurance	188	300	188	275
Legal and audit	2,025	2,645	3,010	2,300
Maintenance and repairs	965	660	735	600
Meetings	24,882	25,000	16,181	13,150
Miscellaneous	2,092	300	618	300
Postage	3,380	2,700	2,465	1,800
President				
Office	675	900	900	900
Travel	3,881	4,400	3,878	4,000
Printing and office supplies	5,806	4,000	8,311	3,000
Projects	-	5,360	10,076	11,850
Recruiting	-	-	2,266	-
Rent, light and cleaning	7,419	8,000	7,310	7,250
Salaries	63,502	59,731	58,800	55,709
Telephone and telegraph	8,180	6,700	4,942	4,000
	134,648	136,706	135,567	120,614
Revenue (expenses)	14,559	$ (7,416)	(10,227)	$ 3,532
Surplus, January 1	4,610		14,837	
Surplus, December 31	$ 19,169		$ 4,610	

See accompanying notes.

Where occlusion therapy is indicated-new child size

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A VISIT TO ZEISS

Some months ago Carl Zeiss Company decided to market their own products themselves rather than through contractual arrangements with independent distributors. A pilot project to advertise and market only their sunglass lines was organized for Germany. The Zeiss line of sunglass frames were advertized in the mass media with the added slogan "to see your optician". In short the plan was to market them only through the optical profession.

Zeiss directors decided to expand the project. The program has already been instituted in Great Britain. It is expected that the project will begin in the United States and Canada this spring. Consequently, Zeiss management decided to extend an invitation to the optometric and optical press from Canada and U.S.A. to attend a symposium on their products and visit their various production facilities.

The editor of the *Canadian Journal of Optometry* was among those to receive an invitation as a representative of the optometric press in Canada. Mr. Garry Owens, Past-President of the Ontario Association of Dispensing Opticians, represented organized opticianry. The third member of the Canadian delegation was Mr. Mark Hertz, general manager of Carl Zeiss Canada Ltd.

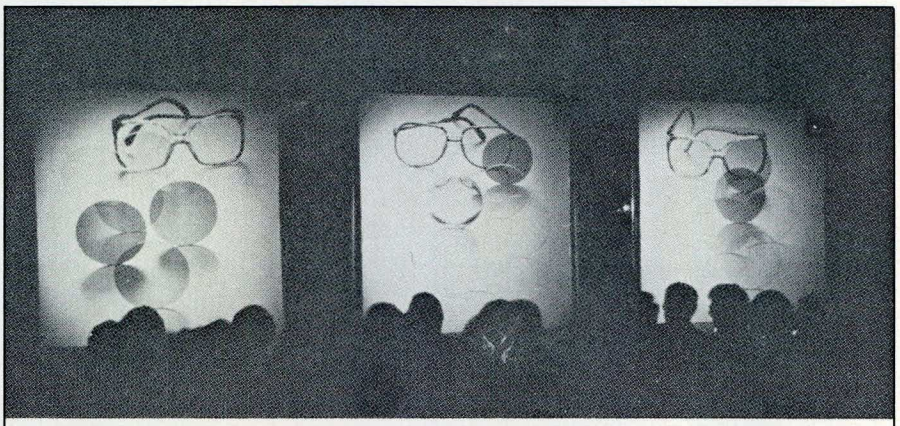
Several editors of well-known American optometric publications were unable to accept due to prior commitments. The U.S. delegation consisted of two Zeiss representatives and eight editors or publishers: Martin Topaz, publisher of *Optometric Monthly;* Margaret Dowaliby, professor of ophthalmic optics, Southern California School of Optometry and author of two books on optics and dispensing; Miss Lynn Faught, editor of $^{20}/_{20}$ magazine — a publication directed at the optical industry in general; Miss Alice Soder, editor of *Eye Talk* — a new publication directed to ophthalmic assistants and aides; Leo Robert, Manager of Advisory Enterprises Inc., publishers of *Optometric Management, Contact Lens Forum, 20/20* magazine and *Eye Talk* magazine. In addition there were two representatives of fashion magazines.

Departure was from New York with a stop-over in London, during which the 1980 Zeiss collection of sunglasses was introduced at a fashion show. Some 300 English optometrists and opticians attended the show which, incidentally, was an excellent production.

If any criticism could be mentioned it would be a lack of emphasis on the frames themselves. It was a theme presentation of glasses for the beach, for driving, for sport, for casual wear but the lighting effects did not play up the head and face of the participants sufficiently to enhance the frames. The dress and choreographic movements of the models drew more attention than the frames. From a strict theatrical point of view the fashion show was a superb presentation and it would have missed its objective of highlighting the collection had we not been able to view the entire 1980 line in the adjoining salon.

All in all the purpose of the evening was attained — an impressive introduction of attractive frames that practitioners would not likely omit or forget when dispensing sunglasses.

Our next destination was Stuttgart, where the afternoon was spent at Marwitz Hauser inspecting and discussing optyl frame production. The final quality of any product can be no better than the quality of the ingredients used and of the workmanship involved. Marwitz Hauser



An attentive audience watches the slide show

One of the several discussion sessions: (front row) Gary Owens, Toronto; (second row) Michael Teitelman, Zeiss, New York; Leo Roberts, Advisory Enterprises Inc.; Dr. Maurice Belanger, Editor, CJO; Martin Topaz, Publisher, Optometric Monthly; (third row) Dr. Margaret Dowaliby, Southern California College of Optometry; Martha Foley, Editor, Town & Country; Lynn Faught, Editor, 20/20; (fourth row) Mr. W. Bononi, Production Mgr. Marwitz & Hauser; Mr. S. Kessler, President, Zeiss USA; (fifth row) Mark Hertz, Zeiss Canada; and J. Fresz, G. Gasparek, G. Bechstein, Marwitz & Hauser.

is quite aware of this principle and applies it vigorously. Quality control of the basic ingredient is routine as is careful mixing with step by step inspections in the manufacturing process. This inspection covers not only the optyl material but also the moulds used to shape the different frame designs. Optyl frames are not injection moulded under pressure but the material is drawn into the moulds by an ingenious vacuum method. This technique produces frames with a minimum amount of internal stresses and strains. Temples are formed by the same manner of vacuum suction. Hinges are no longer polymerized into the frames and temples as a separate step of manufacture but are cast in place in the moulds thus providing sturdier and more durable construction.

The moulds with the optyl material are then passed through a tempering oven which causes polymerization of the resin and hardener. Upon removal of the fronts and temples from the moulds excess material is cleaned away and the frames are placed in an annealing oven where they assume their final shape. Subsequently the lens grooves are machined and the pads are milled. After a final deburring, frames are returned to the oven where any remaining internal stresses are removed through heat and the resiliency of the optyl.

The inspection tour was followed by a discussion in which it was pointed out that Zeiss frames are aimed at three distinct groups of consumers: the conservative-minded, the up-to-date types, and the high fashion trend setters.

Plating process being explained, (l to r): G. Owens; G. Gasparek; P. Simon, Editor, Gentleman's Quarterly; W. Muelberger, host, C. Zeiss, Aalen; A. Soder, editor, Eye Talk; L. Roberts; M. Topaz; J. Fresz; L. Faught; M. Foley; M. Belanger.

Our next tour took us to the Marwitz Hauser metal frame factory. Here again, inspection of primary materials is important. For this visitor, who is familiar with precision tooling and machine shop and gauge inspection, it was evident from the tooling and gigs used in the plant that frame production must now be considered to be in a class of high technology.

Materials must be corrosion resistant, malleable, elastic or rigid, have sufficient hardness and tensile strength to perform the job intended. Such qualities are achieved by the use of suitable alloys made from combinations of the following metals: gold, silver, copper, rhodium, palladium, chrome, ruthenium, titanium, nickel and beryllium. Some of these metals when not in alloy form are used for plating to obtain specific colours, for example ruthenium for a gun metal effect.

Aluminium in alloy form can be machined easily and shaped for decorations or more usually for metal temples. Colours are obtained by an anodizing process which serves as a protection against corrosion. Plastic trim for metal zyl frames, lens rims temple covers, plastic bridges and nose pads are made from acetate material. Some frames are also made from acetate but chassis are milled out of flat sheets and not stamped. This guarantees the shape and size of the frames and reduces any internal stress and variations in rim thickness and size resulting from a stamping process.

Upon completion of the tours, we were joined by several directors and production managers to discuss manufacturing details and criteria for evaluating metal frames. For the clinician perhaps two checks can be suggested:

a) Rigidity and elasticity of the eye wires to resist deformation by pressure,
b) The resistance of the whole frame to deformation by pulling the temples apart and allowing them to return to their original shape, or as close as possible.

During our time in Germany we also visited the Zeiss telescope laboratory at Oberkoken. Arriving somewhat late we were unable to see

L to R: L. Roberts, A. Soder (hidden), M. Foley, P. Simon, L. Weyer, M. Belanger, G. Gasparek, G. Owens, W. Muelberger, L. Faught, M. Dowaliby.

work proceeding on a 3.5 metre telescope lens destined for an observatory in the Pyrennees Mountains. The massive lens required 18 months of controlled cooling to avoid cracks and has already had 12 months of hand polishing. A laser ray is used to measure the accuracy of the polishing.

We also saw many of the specialized optical instruments being produced in other Zeiss labs including a computer-assisted infra-red surveyor's transit with a three-mile range, aerial cameras and photogrammetry equipment and a host of microscopes including an electron-microscope able to photographically record cellular mitosis at fixed intervals.

Another day saw us taken to Aalen to visit the Zeiss lens plant. Dr. Dowaliby, Gary Owens and myself were joined by Mr. Brandt, the production manager, to discuss lens types, performance and production standards. Mr. Brandt had set up samples of every type of lens made at Aalen or produced for Zeiss by other large lens makers.

I was most impressed by the back surface fused bifocal segments and the existence of a prism segment bifocal similar to the old Panoptik. The quality and tolerances of cataract lenses was also to be noted. The wide variety of both plastic and glass multifocal types was outstanding compared to the minimal selection to be had in North America. The trend to plastic lenses in the U.S.A. and to a lesser extent in Canada may have a detrimental effect upon this selection when Zeiss begins operations on this side of the Atlantic. However, recent changes in ANSI standards may favour a return to a wider use of glass lenses.

As we prepared to depart from Aalen for the long trip home to North America, Martin Topaz acted as the group's spokesman and thanked Zeiss for a most informative and entertaining week. The generosity and hospitality of the Zeiss organization was outstanding and deeply appreciated by all, and the technical education was most valuable indeed.

MOBILE OPTOMETRIC UNIT IN N.B.

The New Brunswick Optometrical Society has begun working with the Lions Club in an attempt to provide greater vision care service to New Brunswickers. The Society approached the lions in early February with the suggestion that they donate a Mobile Unit and the response was favourable. The purpose of the van would be to screen school children and to provide complete service to institutionalized senior citizens. This project would depend upon cooperation from the Department of Health in covering operating costs as well as a contribution from the Lions.

All Lions Clubs in the province have been asked to donate $1,000.

OCCUPATIONAL VISION CONFERENCE ATTRACTS 250

The Quebec optometrist's association (APOQ) sponsored a multidisiplinary conference April 26 entitled "The Worker—Vision and Safety" which attracted 250 delegates to hear discussion on an impressive array of topics.

Some of the featured speakers were: Dr. Yves La Casse from Montreal's Santa Cabrini Hospital speaking on Toxicology, Mr. Jean-Louis Bertrand, Vice-President for Prevention with Quebec's Health & Safety Commission, speaking on the implications of Quebec's new occupational safety law, Mr. Luc Des-Noyers of the University of Quebec at Montreal on eye protection in the work place, Dr. Pierre Simonet, of the School of Optometry at the University of Montreal, Dr. Jean Belanger, an optometrist from Montreal and Dr. Emil Boudreau, Director of Safety for the Quebec Federation of Labourers (FTQ), on the need for new ophthalmic standards. In addition, representatives attended from various health and safety associations and unions. Several news conferences were held during the conference resulting in good news coverage.

The Alberta Optometric Association is also planning a similar conference in the near future.

Optometry school will train residents*

To get better instructors for its clinics, the University of Waterloo's optometry school will start a new program in September to train recent graduates how to teach.

The program, called an optometric residency, provides clinical teaching education and training in a special area of the field. About 10 students are expected to enrol this fall.

The two-year full-time program will also allow students to produce clinical research of "high quality," says a report outling the program's structure and goals.

"The need for trained clinical teaching personnel is acute within the (UW) optometry program," the report says.

"The school of optometry is currently meeting a considerable part of its clinical teaching by the employment of graduates with less than three years' experience in clinical practice and with little or no teaching experience.

"The nature of their employment provides neither time nor opportunity for on-the-job training in teaching and research methodology."

Dr. Emerson Woodruff, optometry school director, said that of the 35 part-time clinical supervisors, 23 have "too little experience" in teaching undergraduate students. But they are "all good people," Dr. Woodruff noted, adding that they must have been in the "upper third of their (graduating) class to be employed."

It's just that they have "minimal experience" in teaching students as they don't have an overview of all aspects of optometry, the director said.

He said the aim of the program is to train "someone with a depth of experience in an area and a broad outlook on the optometry field—we are not creating specialists."

Dr. Woodruff said the program will provide its graduates with clinical practice and teaching experience as well as an opportunity to do research by using the school's library, laboratories and "advanced instrumentation." In fact, to receive the "diploma of residency," a student must produce two papers showing research into clinical aspects he or she found interesting during the training years.

One reason why the school finds it hard to hire people with enough experience in clinical teaching and research is that it can't match the salaries optometry graduates can get when they open their practices, Dr. Woodruff said.

"Lots of grads go out to practice—they can command a starting salary of $23,000. And about a third of the class go to other provinces." (UW's optometry school is the only English-speaking one in the country.) He said the nine full-time clinical supervisors are fully qualified to do their work since they have "enough experience" in the clinical field.

To upgrade the teaching and research skills of current part-time supervisors, the school offers another special program—provided they can find time to take it.

The school's graduate studies officer, Dr. Ross Beauchamp, said the residency program is aimed at recent graduates since it would be unfeasible for an optometrist to leave a practice to take the full-time course.

The current supervisors would also have to leave that job if they wanted to take the program.

The program will allow students to specialize in areas such as binocular vision, community health and environmental vision, contact lens practice, low vision and ocular health.

"The first year of the residency will provide a broad experience in several clinical areas and participation in didactic and laboratory activities," says the program's report.

"The second year will provide clinical courses and experience exclusively in the areas of the residency."

Students may be required to take courses in clinical teaching, depending on their background in the optometry field.

The official goal of the program is to "provide persons skilled in specialized optometric services and produce teachers with research capability."

*Reprinted from the U.W. Gazette

Erythema Multiforme Exudativum

William M. Lyle*

Abstract

Erythema multiform is an unusual but potentially serious reaction which develops in a few patients. It is believed to be an immune response to certain drugs or to other stimuli.

The Stevens-Johnson syndrome represents the ocular manifestations when the reaction involves the mucous membranes.

Penicillin has in rare instances precipitated erythema multiforme and requires that those who administer it be aware of this potential and be prepared to treat the patient if such an unwanted development occurs.

Abrégé

Erythème multiforme est une reaction peu commune mais potentiellement sérieuse observée chez un petit nombre de personnes. Il semblerait que la condition est un effet secondaire de quelques médicaments ou autre stimulant.

Le syndrome Stevens-Johnson est une manifestation oculaire de cette réaction quand les membranes muqueuses sont impliquées.

La penicilline peut, en de rares situations, précipiter l'erythème multiforme et exige que le praticien traitant soit averti de cette possibilité et soit prêt à soigner le patient si une telle réaction survenait.

Erythema multiforme is an acute, inflammatory skin disease of uncertain origin[1-4] which occurs mostly in children and young adults especially males.[1,5,6] Other names which have been used are: mucocutaneous-ocular syndrome, eruptive fever-stomatitis-ophthalmia syndrome, dermatostomatitis, ectodermosis erosiva pluriorficialis, mucosal respiratory syndrome, erythema multiforme bullosum. The condition has been confused with Lyell's disease,[1,7] hemorrhagic measles[8], exfoliative dermatitis[7] and herpetic stomatitis[1].

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In the prodromal stage the patient develops malaise and the signs and symptoms usually seen with upper respiratory tract infections.[2,4,8] Fever is usual,[9,10] local lymph nodes become enlarged,[2] joint pain occurs[1] and headache can be severe.[7] The active stage supervenes within one or two weeks with the typical skin and sometimes mucous membrane reactions. The symmetrically distributed skin lesions take the form of macules or papules, followed by bullae and ulcers.[4] Often the lesions become hemorrhagic.[10] The individual lesions are described as annular "iris", target or bull's eye lesions, up to 1 cm in diameter with a clear center surrounded by a red ring.[11] Later the center becomes purple. The rash usually appears first on the body but eventually on the dorsum of the hands and feet as well as on the palms and soles. Some say the rash appears on the hands and feet first.[8] If the reaction continues to worsen the patient becomes quite ill with joint pains, prostration, weak pulse and weakness.[11] In Steven's and Johnson's two original patients, leukopenia was noted.[9] The nails are often affected,[1,7,12] and may be lost. Scaling, a little scarring and minor changes in pigmentation develop later.

In about 25% of cases the mucous membranes become involved and a few develop only the mucous membrane reaction. Inflammation with ulceration and erosion may occur in the mucous membranes of the nose, mouth, throat, rectum, urethra, vagina, penis and conjunctiva.[2,3] From 10 to 20% of those who develop severe reactions die.[7,13]

In the third stage cicatrization and shrinkage of mucous membranes occur but skin pitting does not.

About 2/3 of those with skin involvement develop ocular involvement.[5,12] Among those with mucous membrane involvement over 90% show ocular involvement.[3] Ocular tissue reaction is a feature of the severe form called Stevens-Johnson disease[6] and ocular damage may continue to produce symptoms long after the systemic disease appears to have ended.[2]

The ocular manifestations take the following form:[6,8,12,14]

Catarrhal or purulent conjunctivitis[9,10,15] is an early sign and in severe cases a pseudomembrane forms.[2,7] The conjunctiva develops chemosis, vesicles, bullae and ulcers.[4,16] Secondary bacterial infections are usual. The orifices of the lacrimal glands become occluded so that the conjunctiva becomes dry and keratinized.[3,14] A mucin deficiency[17] and loss of goblet cells[14] is associated with the keratoconjunctivitis sicca. The severe drying requires tarsorrhaphy in many cases.[14] Symblepharon formation is typical.[15] When scarring and shrinkage take place the fornices tend to be obliterated.

The eyelids frequently manifest the skin conditions described above usually with marked edema.[10] The blepharitis is followed by epidermalization of the palpebral conjunctiva. The scarring can result in ectropion or entropion and trichiasis with secondary damage to the cornea. Adhesions between the lids and eyeball are common[3,18] and generally require surgery.

In most cases the cornea develops punctate keratitis followed by superficial pannus, often inferiorly.[19] Vascularization occurs and photophobia is a prominent symptom.[4,8] Ulceration can lead rapidly to perforation and be followed by severe scarring or even by endophthalmitis.[8-10] The cornea suffers keratitis sicca, with epidermalization and often sustains stromal scarring and opacities.[3]

In a few affected eyes anterior uveitis occurs[3] and eyes have been lost from panophthalmitis. Extraocular muscle function is impaired by adhesions between the lids and the eyeball.

Soft contact lenses may help the cornea to heal.[14] Contact lenses help to relieve the pain of keratitis but

should only be fitted in the acute stage if the tear supply is adequate.[14] Scleral lenses have been used to prevent symblepharon formation and loss of the fornices.[5,6,20] Tarsorrhaphy is required to prevent corneal exposure in some eyes.[14] Tear substitutes or supplements are necessary in most cases.[6,13]

Immune, infective and allergic mechanisms have been held to be responsible for erythema multiforme.[1,2,14] Reactions to drugs are frequently implicated[21] and secondary bacterial or viral infections almost always complicate the illness.[8,22] In severe cases blindness or death can result.[9,16,21] Usually the systemic disease is self-limited with its acute stage lasting four to six weeks,[2,4,7], but it may recur year after year in some patients.[1]

Persons most likely to develop erythema multiforme are those with:

— a personal or family history of allergy[7], or asthma[11,13]
— a history of herpes simplex infections[1,2,6,22]
— other recent viral infections,[6,7] or bacterial infections[1,2,7]
— active or latent fungal infections
— recent vaccination[1,6] or deep x-ray therapy[1,7]
— pregnancy[1]
— malignant[6] or chronic disease (e.g.: ulcerative colitis[21]) of the internal organs[1,7,21]

Recently in Toronto a 30-year-old man lost his sight from ertythema multiforme apparently developing as a reaction to penicillin. Although the penicillins are the least toxic of all antibiotics and are effective against most pathogenic cocci they carry the risk of causing an allergic or hypersensitivity reaction. About 5% of the population is allergic to penicillin.[13] Allergic dermatitis develops in 16% of eyes treated with topical penicillin.[24] So penicillin should not be applied topically on the eye.[13] An exception is the use of penicillin against some bacterial corneal ulcers, for example carbenicillin to treat Pseudomonas ulcers of the cornea.

Two types of reaction to penicillin have been reported:

(a) *immediate*

Within minutes the patient develops an anaphylactic reaction[25] with laryngeal edema, angioedema, urticaria and swelling of lips, tongue and periorbital tissues, and goes into shock. Penicillin is the most common cause of anaphylactic shock.[13] Anaphylactoid reactions occur in about 0.025%. A few die promptly. Among those treated with penicillin as many as one in 50,000 are said to die from anaphylaxis. Although these deaths are attributed to penicillin it is likely that some are not due to penicillin itself. Fatalities occur in nine to 13% of those who experience a severe reaction.[13]

(b) *delayed*

The most common reaction[13] is a serum-sickness type which develops within one or two weeks. Affected patients get urticaria, rash, fever, malaise, diarrhea and pains in muscles and joints. While they rarely suffer exfoliation, thrombocytopenia or eosinophilia, a few develop nephritis leading to renal insufficiency. Although they may be ill for weeks, most recover.

Treatment: *

While the responsibility for the administration of drugs for therapeutic purposes is borne by the physician, optometrists need to be familiar with potential effects and able to monitor these patients and discuss their progress with physicians.

Prevention

— penicillin should be used only where appropriate
— it is not used for high risk patients[26], an adequate history should be taken
— it is not applied topically unless absolutely necessary[13]

* The author wishes to emphasize that this treatment procedure is not a therapy to be carried out by the optometrist, but is described herein for the information of the optometrist.

For the immediate reaction:

— be prepared to deal with such a reaction,[26] keep patient in the office for 30 minutes to be sure that an acute reaction is not going to occur away from prompt help.
— give 0.5 ml of 1/1000 epinephrine SC or IM or in severe cases 0.2 to 0.3 ml diluted in 10 ml of saline given slowly IV
— provide oxygen
— make sure the airway is open, this may require insertion of a plastic airway or even tracheostomy
— may need IV fluids eg. 5%

Among the potential causes for erythema multiforme the following drugs have been held to be responsible:[1,3,5-7,11,14,20-23]

acetoaminophen
amithiozone
arsenicals
barbiturates
belladonna derivatives
bromides
carbamazepine
chlorpropamide
chloroquine derivatives
coal-tar derivatives
codeine
cortisone
diphenylhydantoin
gold salts
iodides
meprobamate
mercury
methylphenidate
neoarsphenamine
novobiocin
para-aminosalicylic acid
paramethadione
penicillins
phenacetin
phenolphthalein
phenothiazines
phenytoin
phenylbutazone
propranolol
pyrivinium
quinine
salicylates
succinimide
sulfonamides (one or two cases per million doses of the long-acting sulfas)
sulfur
tetracyclines
thiacetazone
thiazides
thiouracil
tolbutamide
triamethadione
tyrothricin

glucose in water. (A few develop ventricular arrhythmia)
— corticosteroids (with caution),[12] some give antihistamines parenterally eg. 50 mg of diphenhydramine hydrochloride IV.
— some advise use of penicillinase but it can itself cause anaphlaxis[13]. It may be useful against the delayed-type reaction.

Later those who develop a Stevens-Johnson reaction may need:
— antibiotics to control secondary infections[1]
— tarsorrhaphy to decrease the need for tears and to prevent corneal opacification[14]
— contact lenses to protect the cornea from aberrant lashes[6]
— epilation of lashes[6]
— surgery for symblepharon or to correct lid position[6,18,20]
— occlusion of puncta to conserve tears[6,14]
— corneal transplant[27]
— transplant of a parotid duct to the conjunctiva to supply fluid to the conjunctival surface[6]

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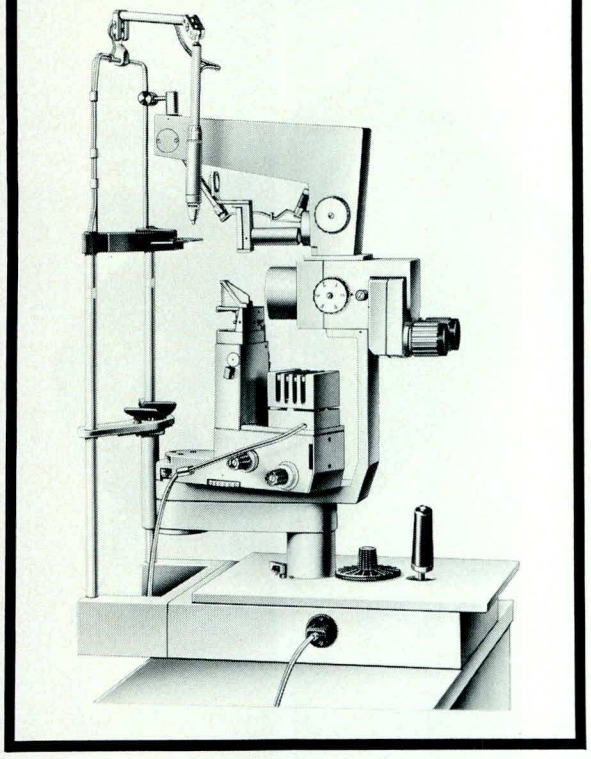
CARL ZEISS
JENA



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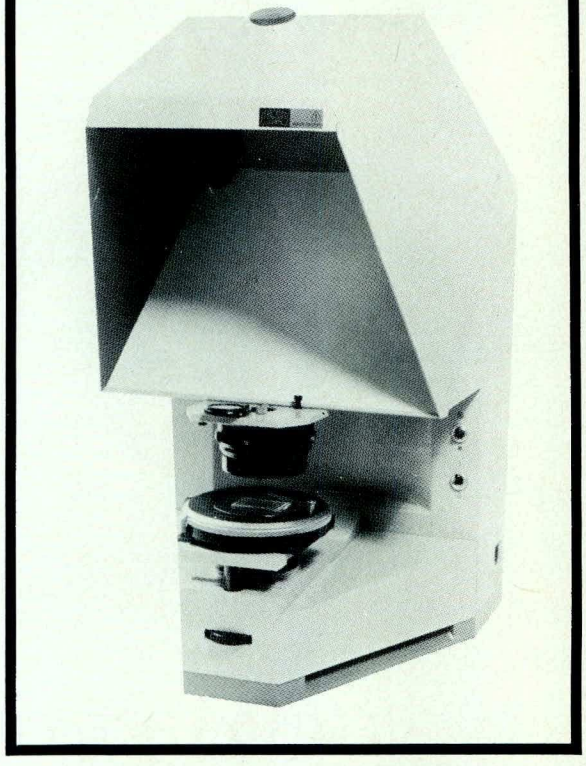

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GONIOSCOPIC ORIENTEERING

(or: how not to get lost in the anterior chamber)

T. David Williams*

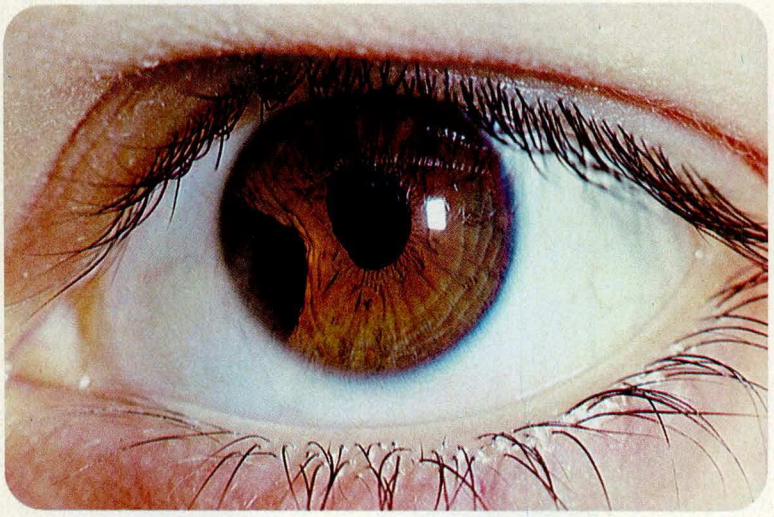

Fig. 1

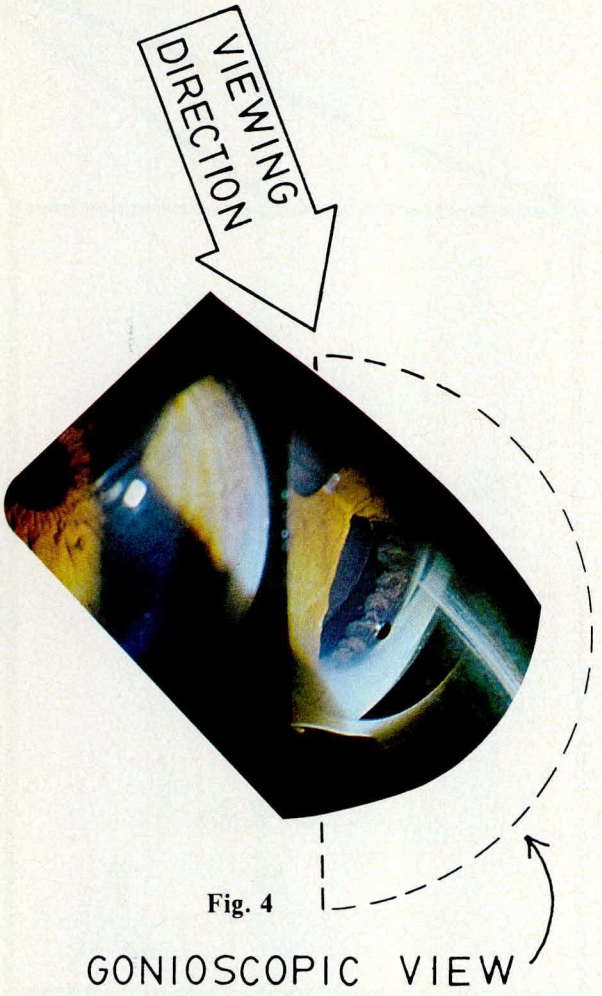

Fig. 4

FRONTAL VIEW

GONIOSCOPIC VIEW

Patients with iris anomalies (traumatic, surgical, or congenital) afford an excellent opportunity for the practitioner to examine structures behind the iris plane.

Having overcome the mechanical difficulties (more apparent than real) of placing a 3-mirror contact lens on the cornea and bringing the iris into focus at the slit lamp, the practitioner may feel somewhat bewildered by the details seen.

Consider as an example the patient shown in Figures 1 and 2. At age nine, this patient suffered a blunt injury to the left eye, due to a thrown rock. Aside from the iridodialysis (iris root torn from the ciliary body) extending from 7:30 to 9:30 o'clock, and the consequent D-shaped pupil (with the flat side of the D adjacent to the iridodialysis) there were no adverse ocular effects. Visual acuity is excellent, and there is no monocular diplopia.

Several landmarks are identified in Figure 2, which is a schematic representation of Figure 1. Points A, B, C, D, and J lie on an imaginary line which bisects the pupil and the iridodialysis. Poins A and J are in the cornea, just inside the limbus; point B is on the temporal side of the pupil, while point C is on the nasal side of the pupil (the flat side). Points E, D, F, and J mark the limits of the externally visble iridodialysis. Points E, D, and F are on the iris.

Figure 3 shows what would be seen if the eye were cut in half along the dotted line shown in Figure 2. Notice that many of the landmarks are visible in Figure 3, (E and F are out of the plane of Figure 3). Two new landmarks are included in Figure 3: G marks the lower nasal edge of the crystalline lens, while H marks a ciliary process extending from the ciliary body. In Figure 3 the effect of the iris injury may be seen: the point D was originally attached to the ciliary body near (and ahead of) H, in the same manner as the normal iris root is still attached to the ciliary body on the temporal side.

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Acknowledgement

Figure 1 was very kindly supplied by Dr. W.F. Long, School of Optometry, University of Waterloo.

Also shown in Figure 3 is a cross-sectional view of the gonioscope. In order to view the angle on the side of the dialysis, it will be necessary to rotate the gonioscope so that the mirror lies adjacent to A so the light will be reflected into the lower nasal side of the anterior chamber. The *ingoing* path of light from the slit lamp is also shown in Figure 3. Of course, the *outgoing* path of light will be just the reverse of what is shown.

Figure 4 is a photograph taken at the slit lamp with the gonioscope set up as shown in Figure 3. Figure 5 is a schematic drawing of Figure 4: the same landmarks are shown. The wrinkled edge of the crystalline lens is now easily recognized (see point G in Figures 5, 4 and 3). The ciliary processes look very similar to de-veined shrimp (see point H in Figures 5, 4, and 3).

To orient yourself to the details shown in Figure 4, lay the figure flat on your desk with the 'VIEWING DIRECTION' marker pointing away from you. You will now see the angle details in the same manner as if you were the little stick-figure shown sitting on the mirror in Figure 3.

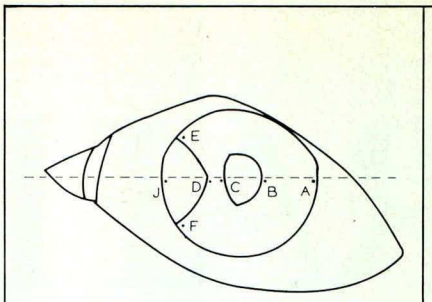

Fig. 2

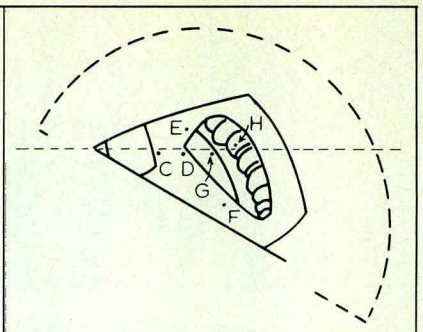

Fig. 5

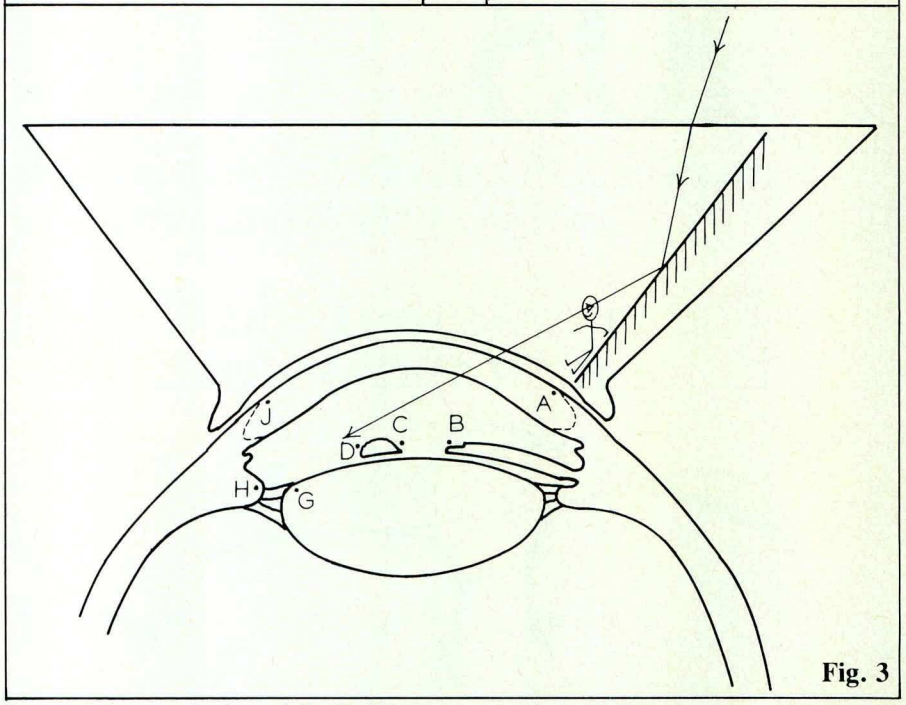

Fig. 3

Once you have oriented yourself in this fashion, it will come as no surprise that pulling back on the slit lamp joystick will bring the pupil into focus, while pushing in with the joystick will bring the lens and ciliary processes into focus (in that order). The zonular fibers are just beyond the resolution of the indirect gonioscope/slit lamp system; however, they may be seen with a direct (Koeppe type) goniolens. Most practitioners will prefer the ease of handling and examination afforded by the indirect (Goldmann type) goniolens.

Once the practitioner has sorted out these principles of anterior chamber 'orienteering', he/she will have little difficulty in locating and evaluating any anterior chamber anomalies.

Figure 1.

Left eye of patient injured by thrown rock 13 years previously. Note diamond-shaped iridodialysis where iris root detached from ciliary body and resulting D-shaped pupil. All pupillary responses normal.

Figure 2.

Schematic drawing of Fig. 1 with following landmarks noted (see also Fig. 3): A and J are in the cornea, just inside the limbus; B, C, D, E and F are points on the Iris.

Figure 3.

A theoretical cross section of the eye and gonioscopy lens. The dotted line in Fig. 2 gives the orientation of the section. Landmarks are as noted in Fig. 2, with the addition of gonioscopically visible points G (in the crystalline lens) and H (a ciliary process). When Fig. 4 is viewed so that the 'viewing direction' arrow points away from you, then your view of the anterior chamber is the same as that seen by the stick figure seated on the mirror.

Figure 4.

Goniophotograph obtained with gonioscopy mirror positioned as shown in Fig. 3. See Fig. 5 for explanation of visible landmarks.

Figure 5.

Schematic drawing of Fig. 4. Points C, D, E and F are points on the iris (shown also in Figs. 2 and 3). Point G is actually on the nasal edge of the crystalline lens: the curving bluish line passing close to G is the edge of the crystalline lens. Point H is a ciliary process; more ciliary processes may be seen on either side of H.

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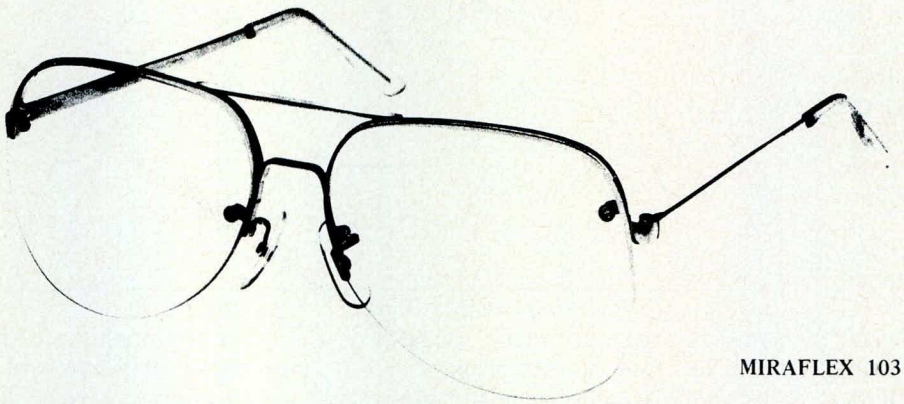

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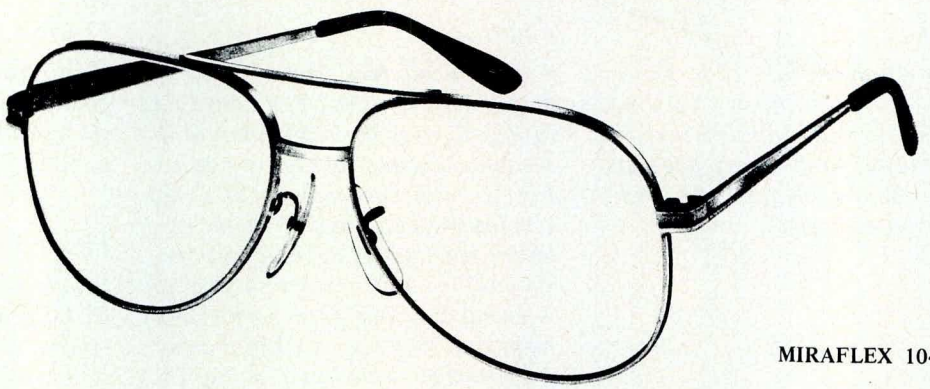

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OPINION

The Use of Auxiliaries In Optometric Practice

F.H. Griffith*

"Every truth passes through three stages before it is recognized. In the first stage it is ridiculed, in the second stage it is opposed, and in the third stage it is regarded as self-evident."

Schopenhauer

Abstract

As demand for health services increases and as capital and operating costs also increase the providers of health services must maximize their productivity while maintaining quality and patient satisfaction. The professions in Ontario, with the exception of optometry, make extensive use of auxiliaries as a means of increasing productivity. In the United States optometric assistants, trained in community and optometric colleges, are used widely. The paper presents a point of view urging the removal of restrictions on the appropriate use of well trained assistants.

Abrégé

Afin de maitriser le coût croissant des services de santé et de satisfaire une demande croissante pour ces services causée par l'usage de plus en plus répandu des plans d'assurance santé soit publiques ou privés, les professions doivent avoir recours à des auxiliares.

Ce travail présente les raisons tant sociales qu'économiques motivant l'emploi d'auxiliaires, questionne la lenteur de l'optométrie à s'engager dans le système quand la plupart des professions y sont déjà engagées. L'auteur fait une liste des fonctions pouvant être déléguées, discute de l'éthique de ce geste et décrit les trois modèles d'assistants possible et leur formation.

Enfin l'auteur soulève l'intérêt publique vis à vis des professions autonomes et leur attitude de monopole et de restriction et recommende l'abolition de toutes restrictions sur l'emploi d'auxiliaires bien entrainés.

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Optometry in Ontario will continue to be confronted with rising costs of capitation and operation, a growing demand for service and some net addition to the number of active practitioners. The economic and social necessity of producing more service while maintaining high quality personal care creates a problem for the practitioner. Unless the practitioner can significantly improve productivity without lowering standards of care the increasing overhead will have to be met at the expense of professional income. Despite the evident necessity of improving productivity little change has occurred in instrument delivery, office design, or techniques which would significantly increase productivity. In optometry in the United States and in other professions in Ontario the use of trained clinical assistants has been shown to be a means of increasing productivity as well as improving professional life style. The desirability of employing clinical assistants has been recognized by ophthalmology and courses are now being taught in community colleges in both Eastern and Western Canada.

In Ontario and in several other provinces, dentistry has responded to this problem very positively. New instrumentation, new instrument delivery systems, new work methods derived from time and motion study, new office layout, and new types of assistants are all helping to provide an increase in productivity. The increase in productivity has been accomplished while maintaining high quality care and patient satisfaction with a reduction in tension and fatigue for both staff and patients. Optometry in the United States has responded strongly in the development of specially trained optometric assistants but much remains to be done in instrument delivery and examining techniques. In dentistry, the development of all of these techniques allows increases in producitivity of three to five times—can the same be done in optometry?

The median age of optometrists practising in Ontario in 1974 was fifty. Many factors offset the number of optometrists who will be in practice in twenty years, but it appears that there will be a relatively small net addition. In the same period it has been estimated that the provincial population will increase to 10,763,715 and that the age/sex distribution will demonstrate a higher percentage of elderly people and a higher percentage of females. These demographic trends with the increased percentage of elderly in th population, and the increased numbers of females all indicate increased demand for service.

In the past few years labour contracts have included dental insurance[1] with increasing frequency. Many studies indicate that insured populations have higher rates of medical utilization than non-insured populations, and it is reasonable to presume that the same phenomenon would be observable in dental utilization. It is becoming increasingly common for negotiators to include vision and optical care in their contracts and this trend will continue. Increased insurance will be combined with increased visual safety programs, school programs, driver programs, optical company promotion, etc., to stimulate demand.

The population of the province will continue to experience "urban drift". Many studies indicate that urban populations have higher health care utilization rates than rural populations for many reasons including availability, accessibility, income,

etc. It can be reasonably assumed that "urban drift" will also increase the demand for optometric care.

The ideal ratio of optometrist to population obviously depends on such factors as those mentioned previously. In the United States[2] the current ratio is 1:9321 with significant variations from state to state. Along the Ontario border the ratios range from Illinois at 1:4766 to Michigan at 1:10,907. It would appear that in Ontario the ratio in 1976 was of the order of 1:17,126 and that in 1996 it will be 1:10,251. The supply will improve but whether or not it will improve enough to meet apparent increases in demand is a question. The American Optometric Association[3] established that the optimum ratio was 1:7162 under current conditions.

Improvements in productivity will help meet the demand; if at the same time they can improve professional incomes as well as the quality of professional and social life while maintaining the quality of care, there are compelling arguments in favour of the changes which will increase productivity.

". . . all of the health professions are faced with the demands for and expectations of greater and more efficient utilization of manpower, combined with the assurance of acceptable quality health care for all citizens."[4] The constraints that prevent the substitution of manpower create problems and "far more attention needs to be paid to how these constraints to further manpower substitution might be eased, if not removed entirely."[5]

Any ill informed discussion of the use of various types of assistants immediately includes a series of objections around quality, patient acceptance, cost, payment, liability, etc. On the other hand, the extensively documented literature, especially in other disciplines, clearly shows:

1. Patient acceptance is high.[6]
2. Quality is at least maintained, if not improved.[6]
3. Productivity gains more than offset cost.[7]
4. The gains in professional and personal life are substantial.[7]
5. Liability insurance is easily obtained and the risk is not exceptional.[8]
6. The artificial legal barriers can be removed by the profession.[9]

The assistants who are able to achieve this success must be:

1. well trained for the duties assigned;
2. working against standing orders in well defined tasks;
3. functioning in a physical plant designed to maximize their effectiveness and that of their principal;
4. associated with a principal who has been trained to maximize the effectiveness of his associates and physical plant.

Assistants can produce the same productivity gains in optometry as in the other professions.[6] Ophthalmology has been quick to see the advantage, therefore, ophthalmological technicians with a variety of training are increasingly common. In any physician's office a variety of people are taking visual acuities and other tests, however, such help is denied an optometrist. In striking contrast to other professions, where simple repetitive tasks as well as tasks of some complexity are assigned to lesser trained people, allowing the principal to function for most of the time at the highest and most satisfying level of his or her training, optometry demands that the most menial tasks creating the least income be done by the principal.

In the United States there are 23 junior colleges and five colleges of optometry which are conducting formal training for optometric assistants or technicians.

The following section is based on "A National Study of Assisting Manpower in Optometry"[3] prepared for Manpower Administration, U.S. Dept. of Labour by Jerome Sherman, O.D. The report states: "because of the limitations on manpower resources, increased emphasis should be placed upon the maximization of existing primary health professionals, through the use of ancillary personnel."

Lone health care practitioners are fast becoming anachronisms. Increasingly they must attain the supervisory role, programming and delegating the more routine duties to various assistants who are under their direct and immediate responsibility and supervision. One may suggest responsibly, even in the absence of confirming economic data, that it is economically unfeasible for a health practitioner to perform those routine duties which can easily be performed by someone with much less technical training and knowledge. It therefore follows that each profession must analyze every duty performed, decide what blends of skill and theory are needed to perform the task competently and efficiently, and then to establish various training levels which are commensurate with the tasks performed. This report also quotes from "A Proposal for Career-Ladder Training of Ocular Allied Health Personnel". In that report the American Optometric Association is quoted after an in-depth study by a "highly competent and qualified cross section of the A.O.A." as being in favour of three levels of training for ancillary personnel and recognized that "this report constitutes a radical innovation in optometric concept as heretofore expressed. However, the commission feels strongly that the course of technological evolution is of sufficient influence so that total vision care services for the benefit and welfare of the public would be ultimately augmented."

The proposal for "Career-Ladder Training" was also adopted by ophthalmology and a point stressed by both optometry and ophthalmology was that "since it is mandatory that the well-being of the patient be protected at all times through the maintenance of high quality professional care, it is necessary that suitable constraints on the autonomy of ocular allied health personnel be imposed to preclude the possibility of such individuals adopting the role and authority of licensed practitioners of medicine or optometry." Another point of agreement between optometry and ophthalmology is that "any curricula proposed for the training of personnel at one level be designed so that at least some of the academic credits can be applied to an educational program at a higher level in the ocular science field." (This latter principle is currently in effect in the training of expanded duty dental personnel in Ontario). The Commission proposed several practice models but

made the following comments on components of the optometric examination relating to auxiliaries.

Case History
"The majority of eye practitioners take their own case histories in their entirety. An alternative to this is a check list administered by an assistant and then briefly reviewed and expounded upon by the optometrist."

Lensometry
"An ancillary person can take over this duty in its entirety."

Visual Acuity
"This easily performed test can be done by optometric ancillary personnel without overt difficulty."

Keratometry
"The optical construction involved is quite complex but an assistant can be taught to develop the skill to use the keratometer without understanding precisely either the theory of astigmatism or the optics involved."

Retinoscopy
"Later consideration may be given to the eventual downward transfer of this skill. . ."

Frame Selection
"One may conclude that this segment of the service can be performed by the ancillary person with just one minute reserved so the choice can be verified by the optometrist."

Dispensary and Prescription Verification
"The calculated seven minutes spent here by the optometrist can be transferred to the assistant with one minute reserved to the optometrist to 'O.K.' the procedure.

Tonometry
"It has been clinically demonstrated that a trained ancillary person can learn to perform electronic tonometry on all patients over thirty-five years without any decrease in efficiency as compared to the professional man.

Visual Field Testing
"An assistant can readily be instructed in the use of a screener without any detailed knowledge of the complexities of the visual pathway. An abnormality will then warrant a detailed field study performed by an optometrist."

Visual Skills Testing
"An assistant can be taught to administer this battery in a very short period of time."

Colour Vision Testing
"The testing procedure is quite simple and can be administered by an ancillary person with no difficulty."

In the "Statement of Need—Grant Proposal", Dr. Brown outlined three types of personnel:

1. the Optometric Assistant/Technician whose training and responsibility will be more directly related to dealing with patients as an aid to the doctor in gathering diagnostic data. This is an existing program of the College. The modified curriculum will place major emphasis on these doctor-technician relationships.
2. the Dispensing Assistant who will be responsible for the technical aspects of providing the ophthalmic eyewear. This is a nine month program with the student having the option of taking an additional three months in fabrication.
3. the Ophthalmic Fabricator shall have the responsibility of generation, fabrication and quality control of ophthalmic eyewear.

Each of these individuals would receive an Associate of Science degree or a Certificate of Proficiency. The functions of the Trainees are listed in Appendix 1. The Joint Interprofessional Relations Committee Michigan Ophthalmological Society—Michigan Optometric Association formulated and approved the guidelines in Appendix II. It is obvious that an optician as recognized in Ontario is well trained to fulfill the roles of both the dispensing assistant and the ophthalmic fabricator.

In "Studies in the Economics of the Profession of Optometry", Coate stated: "The results of our investigation support the claim that optometrists are under-utilizing aide input in the production of optometric services. The average optometrist could profitably increase his or her employment of auxiliaries to about two and one half times their present level according to the results in the previous section. According to our estimated production functions, the output of the average optometric practice would increase by about 30 per cent if such an expansion in aide employment took place."

In his study he also concludes, as stated earlier, that "the results appear to be sensitive to the setting in which health services are delivered." The reasons for the reluctance of the majority of Ontario optometrists to fully utilize assistants are a matter of speculation—such factors as unused optometrists' time during a normal day, lack of availability of well trained assistants, unawareness of the advantages, etc. The reasons for the legal enforcement in Ontario of the "prevailing orthodoxy" are also matters of speculation. Among the speculators are those in government whose concern is consumer affairs and combines restrictions. The professions must now be aware of the combines legislation and govern themselves in such a manner as to be seen to be in accord. Dr. Sylvia Ostry, while Deputy Minister responsible for ensuring that Bill C-2 was functioning in the regulation of the professions, has publicly raised questions relating to the licensing mechanisms, possible relationship to a cartel, the fee schedule as price fixing, etc. which are all possible areas for study in terms of the federal legislation. The Deputy Minister raised the question as to whether the prohibitions relating to "the form and manner in which professional services are supplied" are truly in the public interest. She has suggested that the evidence suggests they are more often providing "a substantial effect in reducing competition, impeding innovation and change and raising costs and prices for professional services."

The British Monopolies Commission also expressed a similar concern that was quoted by the Deputy. "Collective arrangements which significantly limit the freedom of the parties in the conduct of their business may be expected to result in higher prices, less efficient use of

resources, discouragement of new developments and a tendency towards rigidity in the structure and trading methods of those businesses. Such collective restrictions tend to reduce the pressures upon those observing them to increase their efficiency. They may also delay the introduction of new forms of service and the elimination of inefficient practitioners."

In commenting on the last statement Dr. Ostry pointed out that most observers would be inclined to express the latter point more forcefully. The Deputy continued saying that "members of the self-regulating professions are strongly encouraged to conform to the 'prevailing orthodoxy' and if they want to remain in good standing, they are severely limited in the kind of experimentation they can undertake. The result has most certainly been to delay the introduction of new forms of service and to lend support to the inefficient and uninnovative practitioners." Continuing to cite various examples of restrictive practices Dr. Ostry mentioned steps to "generally prevent the abuse of power by professional bodies." She states, "In practical terms I would hope that the result would be a more careful consideration of such issues as the functions of para-professionals, and the length of professional training, both of which, of course, directly affect the price of professional services as well as the economic return to existing practitioners." Later in her comments, Dr. Ostry added that "A third response is to focus directly on the activities and rules of the professional bodies and to try to ensure that these are in the public interest."

There are no Collegial restrictions on innovation of instrument delivery and office layout but here again the profession has shown little imagination. Those optometrists in the median age group can remember the dentist's office of their youth and can compare it with a modern open concept office maximizing capital and staff. They will also be able to compare the optometric office of those early days with the one they are in now. How has it changed? The patient and practitioner are in the same position; the practitioner is doing the same tasks, the instruments are delivered in the same way. Maybe somebody in the early days did in fact create the perfect system; more likely we haven't exercised sufficient questioning to create a demand for greater efficiency. Care is not being provided nor income generated by the exhausting gymnastics necessary in the usual practice setting.

In the immediate future artificial restrictions on the use of assistants which limit innovation in practice must be removed. Ethics cannot be measured by the mix of people providing service any more than can the quality of care. Unless the profession responds positively and forcefully to the need of innovation in the use of auxiliaries and all aspects of the delivery of care it will stagnate into oblivion. Optometry does not have a monopoly in supplying vision and eye care. It is time that those practitioners who do not accept the status quo as perfection are given the right to develop their practice to maximize their skills and investment for the public welfare and their own. As costs go up for staff, space and capital equipment, and as the volume of care that can be provided in a practice reaches its peak, there are only two variables-

1. a positive response to increase productivity through a better delivery system, time management, etc.
2. the net income of the optometrist can be reduced by the increase in costs.

It cannot be argued that any particular combination of skills in an optometric practice is intrinsically unethical. It cannot be stated that an optometrist in Ontario prevented from developing a rational, efficient, high quality, professionally satisfying and economically rewarding practice mode is *ipso facto* more ethical than an optometrist in Florida who has used current knowledge to maximize productivity. Optometry in Ontario stands alone among the professions in maintaining a "push cart" philosophy towards the organization of practice. The Association recognized this situation at the 67th Annual Meeting where the following motions were adopted:

> It was moved, seconded and carried that the Ontario Association of Optometrists recommends to the College of Optometrists of Ontario that the College consider a regulation allowing for the hiring of an optician by a member of the College.
>
> It was moved, seconded and carried that the Board of the Ontario Association of Optometrists consider the use of assistants by optometrists, and that the Board make the appropriate recommendation to the College of Optometrists of Ontario.

There can be no real reason for the restriction on auxiliaries so obviously desired by the Association, therefore, it is time that the artificial barrier imposed by the regulations which prevents the ethical maximizing of quality and of productivity should be removed.

There are some optometrists for whom the added problems of managing staff will not be worth the gains in productivity. There are some for whom the added costs are not worth the added return. There are some optometrists who are totally individualistic and do not want an assistant dealing with their patients. There are some patients who only want to see the doctor.

There are some optometrists who will manage staff skillfully and who will derive great satisfaction with a team approach and who will make significant gains in productivity.

There are some optometrists who will realize that an assistant can deal with a multitude of problems allowing them to maximize their interests. Although some optometrists won't believe it, there are even some patients who will ask to see only the assistant.

There is no question that assistants will fit into every practice—there is also no question that where they fit they should be recognized.

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Continued on p. 108

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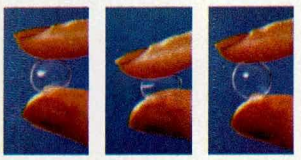

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General Practice Patterns and Workload Distribution B.C. Optometrists Core Group

M.J. Samek[1] and B.T. Schmidt[2]

A government appointed task force in British Columbia investigated and made recommendations on the delivery of vision care services in that province[1]. Alternative means of delivery were considered within role definitions of optometrists and ophthalmologists and their respective workloads. During these deliberations, the paucity of information on optometric practice patterns became evident. However, one of the recommendations of the Task Force was aimed at increasing optometric workload. The underlying premise of this recommendation was the under-utilization of optometric manpower.

This recommendation and others emphasized the need for current information on optometric practice. Availability of practice patterns information could provide the basis for more rational planning in the future, including redistributing responsibilities or designating new responsibilities of optometrists.

SURVEY

In the summer of 1978, the authors conducted a survey of all *active* practitioners in the province. It was anticipated that the information gained would provide better understanding of optometric practice and certain attitudes of the optometrists. The usable response rate to the survey was 84% with a geographically representative sample. A detailed analysis of the overall responses is published elsewhere.[2]

The authors, upon further deliberation and with particular consideration of the workload issue, decided to analyze the data by looking at a specific subsample of respondents. The original sample was partitioned to isolate what was labelled the "Core Group," comprising 33% of all practitioners in the province (54). It was selected on the basis of:

1. Graduation on or before 1976 (the respondents were to answer questions on the basis of 1977 practice year. Thus this factor would ensure at least a full year in practice prior to being included in the subsample).
2. Working 45 weeks or more per year.
3. Working 35 hours or more per week (excluding lunch and travel time).
4. Spending 40% or more time performing oculo-visual assessments.

These criteria were assumed to isolate what might be called full-time equivalent practitioners. The assumption was that these individuals would represent busier practices operating at generally higher workload levels. This data would provide knowledge on practice factors more reflective of optimum work levels and more accurately reflect potential for modification in practice activity.

RESULTS

The significant questions asked of the optometrists are shown at the beginning of each category outlining the results.

A. Demography

The age distribution of the core group highlights the encroaching retirement of a large proportion of these practitioners (Figure 1). Their median age of 52 emphasizes this point. The age ranged from 27 to 67 years.

The geographic distribution of these practitioners, by community size, is not significantly different

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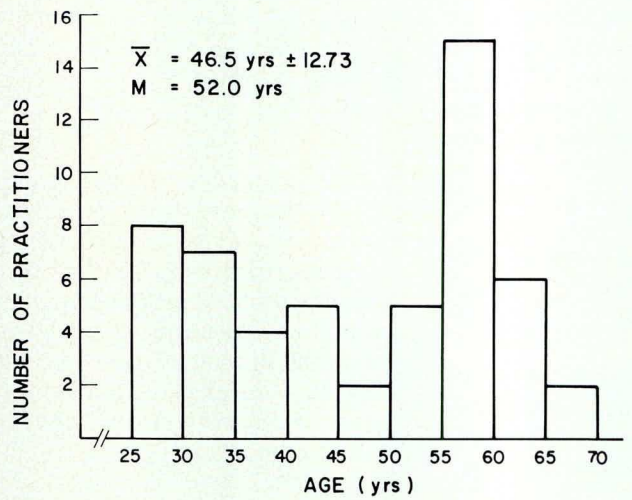

Fig. 1 AGE DISTRIBUTION OF OPTOMETRISTS B.C. CORE GROUP

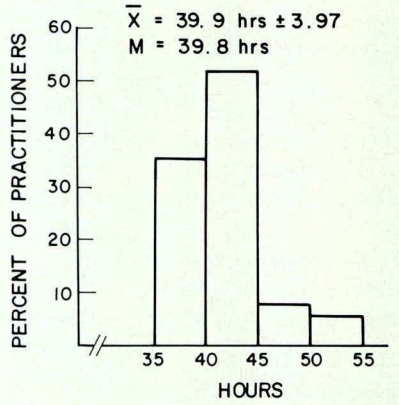

Fig. 2 DISTRIBUTION OF HOURS WORKED/WEEK B.C. CORE GROUP

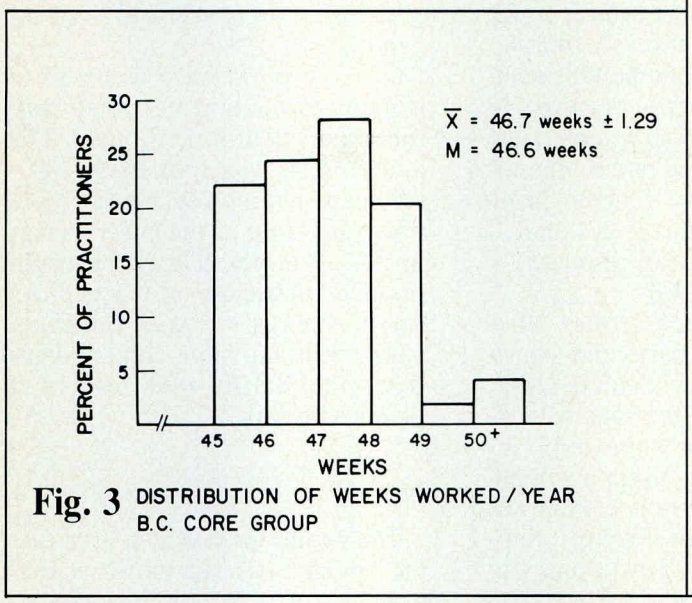

Fig. 3 DISTRIBUTION OF WEEKS WORKED / YEAR B.C. CORE GROUP

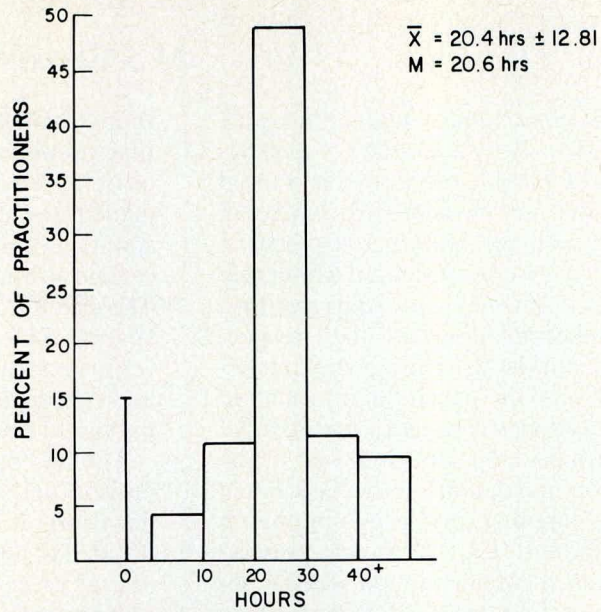

Fig. 4 DISTRIBUTION OF TIME SPENT IN FORMAL CONTINUING EDUCATION – B.C. CORE GROUP

from the general body of respondents ($x^2 = 0.094$) (Table 1).

Size of Community	Practitioners Core N(%)	All N(%)
5,000+	2 (3.7)	3 (3.6)
10,000+	8 (14.8)	13 (15.7)
20,000+	15 (27.8)	21 (25.3)
50,000+	9 (16.7)	13 (15.7)
100,000+	20 (37.0)	31 (37.3)

Table 1: Distribution of practitioners by Community Size — B.C. Optometrists.

B. Mode of Practice

Of this core group, 63% were in solo practice with the balance in group practice or partnerships. In addition, 33% of these practitioners operated satellite practices devoting 25% of their time to these practices.

Time:

What is the average number of hours you work per week? (excluding travel and lunch time) ___ *Hours*

How many weeks did you work last year? (Be sure to exclude two weeks of statutory holidays in addition to your vacation). ___ *Weeks.*

These practitioners worked on the average 40 hours per week (excluding lunch time) with 13% working between 45 and 55 hours (Figure 2). Analysis of community size and number of hours worked showed little consistency. However, it could be said that fewer practitioners, from communities of less than 20,000 population (40% of this group), worked 40 hours or more per week than practitioners from larger communities (approximately 70% of the latter group). The work year extended beyond 47 weeks for half the core group with 52% working between 46 and 48 weeks per year (Figure 3).

The core group of practitioners spent on the average 20.5 hours in continuing education activities, although 15% did not take any continuing education during 1977 (Figure 4). It should be noted that continuing education was not mandatory during 1977.

Consulting:

Are you serving in the capacity of an optometric consultant ___, *a clinician* ___, *or both* ___, *(check one).*

Please indicate the area in which you have served as a consultant and/or clinician and the amount of time that you devoted to these activities.

Only 11% of the core group spent any time in community or consulting services such as school screenings, examinations at geriatric institutions, hospitals, etc.This is a low value but it might be presumed that since this group was selected on the basis of activity in practice they would be less likely to provide services outside of their practice.

C. Delegation

How many assistants/secretaries (not including otpicians) are in your office(s) in total? ___*(increments of ½)*

What proportion of their time is related to general office duties? ___%

What proportion of their time is related to optometric activities? (i.e. ordering Rx's, C.L. training, frame selection) ___%

TOTAL ___%

Fifty percent of the core group of practitioners employed approximately 1.5 or more auxiliaries/secretaries (Figure 5). On the average the practitioners estimated that their secretary/assistants spent 60% of the time in administrative activities and 40% in delegated functions (eg. ordering prescriptions, checking prescriptions, etc.).

Dispensing:

Does your office provide a dispensing service? ___*YES* ___*NO*

Do you employ opticians in your

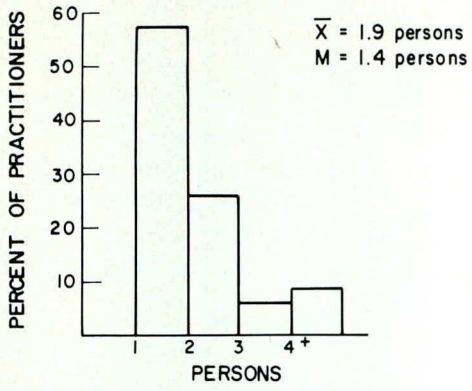

Fig. 5 EMPLOYMENT OF SECRETARY/ASSISTANTS BY OPTOMETRISTS – B.C. CORE GROUP

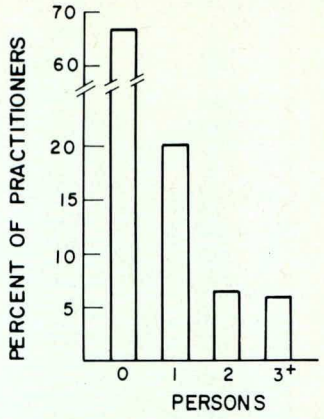

Fig. 6 EMPLOYMENT OF OPTICIANS BY OPTOMETRISTS – B.C. CORE GROUP

practice? ___YES ___NO
If so, how many? ___.
If you currently provide dispensing services in your office, would you be willing to relinquish dispensing completely if your practice activities could be increased in other areas? (ie. contact lenses, visual exams) ___YES ___NO
If NO, would you be more willing to relinquish dispensing completely if dependent opticians were licensed? ___YES ___NO
If you provide a dispensing service in your practice, and do not wish to relinquish it completely, would you be willing to relinquish the dispensing to an optician working for you in your office?

Only 6% of the core group did not provide dispensing services for their patients. Of the practitioners providing dispensing services 33% employed one or more opticians. The question was asked of the willingness of practitioners to relinquish dispensing completely if their professional activities could be increased in other areas. Only 24% indicated a willingness to relinquish these services. In addition, those optometrists who responded negatively were asked their willingness to relinquish this service completely if opticians were licensed. To this question only 22% of the original *no* respondents agreed. (Fig. 7 not shown). Thus a total 38% would be willing to assign dispensing to opticians. However, 87% responded positively to delegating this activity to opticians employed in the office.

D. Distribution of Workload

Please estimate your usual (average) allocation of time spent in the professional activities listed below so that the sum of the estimates add up to 100%. Only indicate the amount of your PERSONAL TIME spent in these activities. Indicate 0% along activities in which you have no involvement. Please review this list first, then place your estimates in the space to the right of each category.

a. Major visual examinations — MSC Code #2899 ..... %
b. Re-checks and Minor examinations — MSC Code #2898 ..... %
c. Tonometry only — MSC Code #2897. %
Note: Please remember to indicate the percentage (%) of your **PERSONAL TIME.**
d. Associated dispensing of your prescriptions ..... %
e. Office Administration (your time) ..... %
f. Contact lens diagnosis and fitting ..... %
g. Contact lens training (insertion, removal, etc.) ..... %
h. Contact lens re-checks ..... %
i. Orthoptics — diagnosis and treatment . %
j. Sub-normal (Low) vision diagnosis and treatment ..... %
k. Research and teaching (including school presentations) ..... %
l. Consultations (Total percent time spent in the activities listed in #13) ..... %
m. Dispensing of other's prescriptions .... %
n. Other (specify) ..... %

TOTAL ..... %

Vision care services in British Columbia are partially funded under

Activity	Time (%) Mean	Time (%) Median	Mean (% zero excluded)	
Oculo-Visual Assessment	60.8	60.0	—	—
Minor Examination	6.2	5.0	—	(2)
Tonometry	1.1	1.0	1.3	(15)
Associated Dispensing	8.2	6.0	9.0	(9)
Contact Lenses				
Dx and Fitting	7.3	5.4	7.9	(9)
Training	3.3	3.0	4.0	(17)
Rechecks	5.7	5.0	5.9	(6)
Office Administration	5.2	5.0	5.9	(13)

Table 2: Percent of Optometrists' Time Spent in Various Professional Activities — B.C. Core Group.

Activity	Time (%) Mean	Time (%) Median	Mean (% Zero Excluded)	
Dispensing — Others	0.6	—	1.4	(56)
Visual Training	0.4	0.5	1.2	(65)
Low Vision	0.4	0.5	1.4	(67)
Community	0.2	—	0.4	(87)
Research & Teaching	0.1	—	1.3	(91)

Table 3: Percent of Optometrists' Time Spent in Various Professional Activities — B.C. Core Group.

the provincial health care scheme. Those services being funded are essentially diagnostic procedures and include:

1. Oculo-visual assessments or complete eye examinations.
2. Minor examinations or rechecks.
3. Tonometry only.

All other professional service fees are borne directly by the patient-consumer.

Practitioners were requested to respond to the proportion of time devoted to various professional activities on the basis of their practice in 1977 (Tables 2,3). To allow analysis, only for those practitioners who spent time in these various activities, the tables include the means where individuals not spending any time (zero time) have been excluded.

Diagnostic Services:

The responses to workload distribution revealed that these practitioners devoted on the average approximately 61% of their time to major eye exams. On the basis of a 40 hour work week this would be 24 hours. Only 6% of the practitioners devoted 80% or more of their time to this activity (Figure 8). Generally the older practitioners spent more time in this activity than the younger ones. Approximately 36% of the practitioners age 50 and over were spending 70% of their time performing oculo-visual assessments. In comparison only 6% of the practitioners less than age 40 spent the same amount of time.

Minor examinations and rechecks required between 5 and 20% of the time of half the core group (Figure 9).

Tonometry required a minimal amount of the practitioner's time. The median was found to approximate 1% with a high of 5% of office time. Of the core group, 15% stated they did not spend any time performing recheck tonometry.

Only 9% of the core group did not devote any time to dispensing services associated with their own prescriptions. On the average they spent 8% of their time in this activity (3 hours/week) (Figure 10).

Contact Lenses:

Contact lens diagnosis and fitting required approximately 7% of practitioners time (3 hours), with 10% of practitioners spending between 15 and 30% of their time in these services (6-12 hours). However, rechecks required slightly less time, approximately 65. Whereas 9% of these practitioners did not diagnose or fit contact lenses only 6% did not evaluate contact lens fits (Figure 11).

Administration:

Administration required 5% of the practitioner's time (2 hours/week). 13% of the practitioners did no devote any time to this, presumably these may be younger practitioners who are junior members of a practice. The top end of the range was 30%.

Other Services:

Other diagnostic and treatment services required minimal amounts of practitioner's time as outlined (Table 3).

Discussion

British Columbia includes a land mass of 366,255 square miles and has a population approximately 2,500,000. The ratio of vision care professionals to population is 1:20,000 for ophthalmologists and 1:15,000 for optometrists. An over-representation of ophthalmology is indicated according to the World Health Organization which suggests an optimum ratio of 1:30,000. This over-representation of ophthalmology is suggested as one of the factors contributing to reduced optometric workload.

A study by Langer found Ontario optometrists, in 1969, spent approximately 43% of their time performing major visual examinations.[3] Whereas, the B.C. core group spent 61% of their time in this activity. The B.C. results indicate a proportionate increase in basic diagnostic activities compared to 1969, perhaps

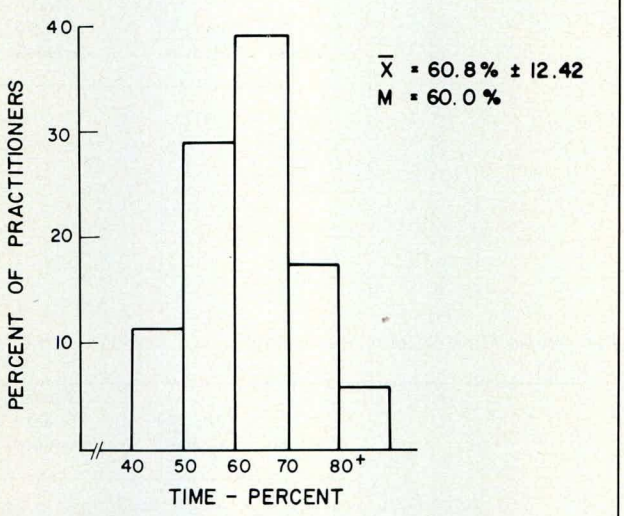

Fig. 7 DISTRIBUTION OF PERCENT OF TIME SPENT IN MAJOR OCULO-VISUAL ASSESSMENTS
B.C. CORE GROUP

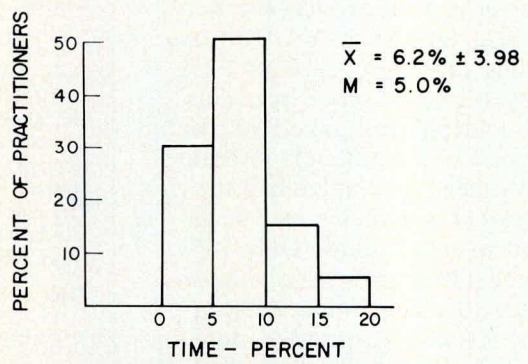

Fig. 8 DISTRIBUTION OF TIME SPENT IN RECHECKS AND MINOR EXAMINATIONS
B.C. CORE GROUP

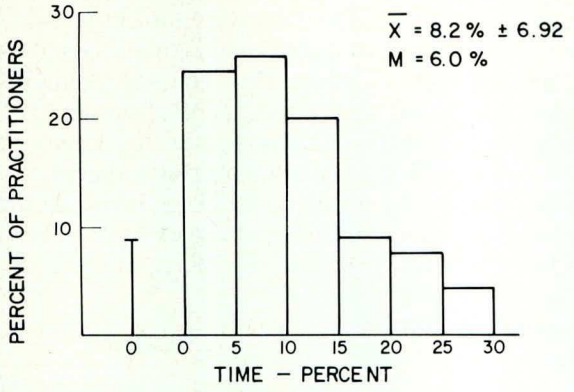

Fig. 9 DISTRIBUTION OF TIME SPENT IN ASSOCIATED DISPENSING ACTIVITIES B.C. CORE GROUP

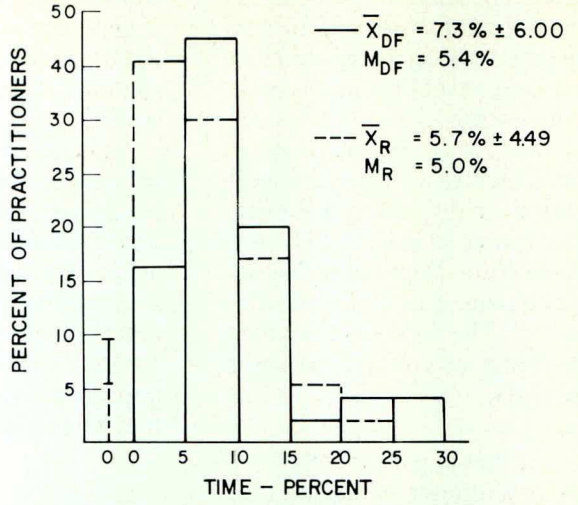

Fig. 10 DISTRIBUTION OF TIME SPENT IN CONTACT LENS DIAGNOSIS/FITTING AND RECHECK B.C. CORE GROUP

as a result of government sponsored insurance schemes. In addition, the older B.C. optometrists were generally devoting more time to examination activities. This may be a reflection of more active practices due to practice development and the delegation of activities thus allowing more time for this service. Though the younger practitioners devoted less time to examination activities, they also devoted less time to dispensing activities, which indicates that they were spending more time in other services, such as contact lenses.

The allocation of the optometrist's time, as a provider of a complete service to a patient, includes consideration of the examination and dispensing or treatment services. The core group of optometrists indicated that they spent 69% of their time in this regard. A study reported in the B.C. Vision Care Task Force Report suggests that 1750 patients could be seen yearly for complete examinations including dispensing, if the proportion of time alloted for these activities was 70%.

A recent analysis of optometric services,[4] in British Columbia, paid by the provincial health insurance plan, indicated that full-time equivalent optometrists (144) were reimbursed for an average 1600 services in 1976-77.* This value includes visits for complete and partial examinations and specific tonometry services, as previously outlined. Reanalysis of this data to isolate 54 of the more active optometrists** reveals the mean number of billed services for this group as 2113 with a range of approximately 1600 to 3200 services. Needless to say, the assumption that these randomly selected optometrists match the survey core group of 54 is tenuous, but assuming so provides a basis for looking at capacity.

As noted, the randomly selected group of optometrists were providing approximately 2100 paid services on an annual basis. Based on data from other jurisdictions approximately 85% of these services are for oculo-visual assessments. However, in British Columbia 93% of the total services provided were for primary eye examinations.*** The core group of optometrists on this basis, would be performing on the average approximately 1950 complete examinations per year. Thus, at least for the core group the workload would appear optimal (providing the assumptions are valid). Further increases in capacity would require delegation of other duties (to assistants or opticians) or shortening of examination time. Both options require consideration of the effect on quality of care. Other options would include increased work hours or weeks.

The distribution of time for contact lens associated activities was indicated as 16% approximately. However, about 3% of the practitioner's time was spent on training with the balance (13%) on diagnosis, fitting and rechecks. Again this value appears as a significant increase from the 1969 Ontario data indicating allocation of 9% of the optometrist's time.[3] Though 9% of the B.C. practitioners did not provide contact lenses only 6% did not do rechecks. Thus, it appears inevitable that knowledge of contact lens therapy is crucial for almost all practitioners if they fit contacts or not. Whether time devoted to this phase of practice will continue to increase rests with future developments in the contact lens field.

Dispensing of spectacles and dispensing of other's prescriptions consumed on the average 9.4% of the practitioner's time. It also is interesting to note that 44% of the B.C. core group provided dispensing services for prescriptions written by other vision care practitioners. The value of devoting this amount of time to activities which can be delegated to

*Full-time equivalent optometrists, as classified by the Medical Services Commission in B.C., are those individuals billing $10,000 or more during the year.

** These 54 were an 84% random sample of the 65 optometrists with the highest workload.

*** Personal communication from the President of the British Columbia Optometric Association, based on data from the year ending March 31, 1977.

ancilliary help may be construed as questionable. However, the general attitude of optometrists with respect to delegation of dispensing activities plays an important part in this area. It is interesting to note, however, that optometrists in Saskatchewan in 1972 indicated that they spent 14% of their time in dispensing activities. The lower value in B.C. in 1977 may be an indication of optometry's gradual relinquishing or delegation of this activity. The merits of this trend are currently of concern to some optometrists.

The fact that approximately 65% of these practitioners indicated they did not devote any time to orthoptics or low vision is disconcerting. Perhaps this can be rationalized, at least for orthoptics, by saying that the optometrists may be prescribing prism, lens or home therapy, which does not require specific additional practitioner office time, in lieu of in-office orthoptics. This is an area that requires further investigation in order to establish practitioner behavior. Perhaps it is an area for optometric educators to assess in light of optometric curricula.

The minimal time devoted to consulting or clinical community activities is exceptionally low (0.2%). This may be attributed on one hand to busy practitioners not being interested or having time, and on the other hand, the general reticence of other health professionals to deal with optometrists. Since optometry generally has been taught at institutions where little exposure to other health disciplines occurs a barrier is established. The lack of educational exposure means other health professionals are poorly informed of the optometrists' role and responsibilities. This fact leads to distrust, suspicion and questioning of the ethics of optometrists.[5] Thus, attempts by optometrists to gain access to health care institutions (long term care facilities, geriatric or psychiatric institutions) would be viewed skeptically by the medically oriented system. Though these barriers are slowly receding it requires active approaches by optometrists to further rectify this situation.

Conclusion

It appears that the core group of optometrists, isolated for this study, may be functioning at optimal workload levels. Means of increasing capacity, at least amongst these optometrists, is restricted to several options which may be unacceptable if quality of care is affected. However, by delegation of activities to auxiliary personnel some increase in workload possibly can be accomplished.

The optometrists in this study represent only one-third of B.C. optometrists. Attempts to increase the workload of the remaining two-thirds rest with optometrists themselves becoming more active in community/consulting activities. Though barriers exist towards participation of optometrists in health care facilities these can be lessened by informing (educating) other health professionals as to optometry's role (capabilities). In addition, the recommendation such as made by the B.C. Vision Care Task Force that inter-referrals between physicians and optometrists be permitted and encouraged can be fully appreciated only with individual cooperation. Thus, the major onus rests with the profession of optometry (practitioners) to educate and inform other health care practitioners. Access at the institutional level can then lead to improved relationships and increased professional activity.

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9. *The Health Disciplines Act, 1974: Statutes of Ontario, 1974,* Chapter 47, amended 1975; Chapter 63, August 1975 96 (i) The Council of the College is given power to make regulations "authorizing persons other than members to perform specific acts in the practice of optometry under the supervision or direction of a member."

OUTCOMES OF THE APPLICATION OF THE OPTOMETRISTS ROLE AS PRIMARY HEALTH CARE WORKERS*

M.E. Woodruff**

Abstract

By education, training, and in many jursidctions by statutory provision, optometrists play a comprehensive role as primary health care providers. The widespread distribution of optometrists in North America and other highly developed countries contribute to their ability to apply this role. Experience within service programs of the School of Optometry of the University of Waterloo show the role is also applicable to such diverse remote and underdeveloped regions as the Canadian North and various Caribbean and African countries. The high prevalence of visual anomalies among those who are healthy and an increased prevalence of such anomalies as well as impaired visual function among those in ill health result in optometrical practices being primary points of entry ot the health system. The optometrist thus has considerable opportunity for health education, health surveillance, health maintenance, as well as the application of specific optometrical therapies.

Documentation of optometrical activities in various service programs of the School of Optometry directed toward general and specific segments of the Canadian population demonstrate the effectiveness of this role in both rural and urban settings.

The paper cites the results of the application of the Primary Health Care role with data drawn from general populations in Canada and such specific underserviced populations as the institutionalized aged, the mentally retarded, preschool children, Canadian Eskimo, as well as small isolated Northern Ontario Communities.

*Presented to the annual meeting of the Canadian Public Health Association, Halifax, N.S., June 1978.

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abrégé

L'éducation, la formation professionnelle et dans certaines jurisdictions une provison statutaire, équippent l'optométriste pour la tache de pratitien de première lighe. La distribution des optométristes au Canada, aux Etats-Unis et ailleurs dans les pays développés renforce ce role de l'optométriste.

L'expérience acquise par l'école d'optométrie de Waterloo dans ses cliniques externes démontre que ce rôle est possible dans les régions éloignées du nord Canadien et les pays de la Caraïbe et de l'Afrique.

La haute fréquence des anomalies visuelles parmi la population bien portante et une augmentation de cette fréquence aussi bien qu'une diminution de la fonction visuelle chez la population en mauvaise santé amène la population à consulter l'optométriste confirmant ainsi son rôle comme praticien de première ligne.

Cette situation permet à l'optométriste de faire de l'éduation populaire et de surveiller et maintenir la santé de ses patients sans omettre la pratique de sa profession vis à vis de ces mêmes gens.

Les résultats des différents projets des services de clinique externe de l'école démontrent bien l'application effective de ce rôle de l'optométriste à l'endroit de populations spécifiques candiennes tant urbaines que rurales.

Ce travail présente les résultats de l'application du rôle de l'optométriste comme praticien de première ligne à l'endroit de divers groupes de notre population: population générale, les personnes agrées, les handicappés mentaux, les enfants d'âge préscolaire, les Inuits, et quelques petits villages isolés du nord de l'Ontario.

When definitions of primary health care are compiled,[1] a number of elements common to many of the definitions can be abstracted. Among the more common elements are the following:

1. It is the first health service contact for the person with health needs.
2. The patient is usually ambulatory.
3. The problems for which primary health care is sought usually have broad distribution among the populace and most of the conditions can be cared for by the professional providing the first contact, that is, it is comprehensive.
4. The health care provider is accessible.
5. The service is coordinated with other health services and has continuity and accountability.

A majority of definitions recognize that a spectrum of health care providers are active in rendering primary care, for example, Tonkin says,[2]

Primary health care is a complex process involving a basic level of services with a broad orientation and provided by a variety of health professionals who offer some form of continuity of care. Differentiation of health problems is a key element in the process and requires that primary health care providers perform three essential functions—as guardian, gatekeeper and chronicler.

Optometry is identified as one of the professions providing primary health care in many professional and governmental documents.[3,4,5] In this paper I wish to examine optometry's activities in Tonkin's three essential functions.

The curriculum of optometrical education provides the basis for the activities of the profession in primary vision and health care.

Students in Optometry enter a four year professional program after from two to four years of preparation in the sciences basic to health education, i.e. biology, physics, mathematics, chemistry and psychology. Each of these science streams are expanded in advanced courses during the professional program.

Optometry programs include in depth study of embryology, anatomy, neuro-anatomy, physiology, both normal, abnormal and ocular, general and ocular pathology, organic and biochemistry, geometrical and physical optics and physiological optics as the more important core subjects. Clinical sciences and clinical care of patients plus social, legal and administrative functions form the balance of the curriculum.

The primary vision and health care role which this educational process fits a graduate to fulfill has been extensively described.[6] The role encompasses guardianship, gatekeeping and chronicling and encompasses primary, secondary and tertiary levels of prevention.

What does Tonkin mean by guardianship, gatekeeping and chronicling? Guardianship means accepting responsibility for an individual's care, performing specific caring function, and in the caring process, establishing an ongoing relationship. Gatekeeping describes a health provider who is aware of the available health resources and who knows how to facilitate entry to these resources for the client. The chronicler's role consists of originating, maintaining health records and communicating with patients and other health providers on those facts in the record which are important to the client's health maintenance.

Are these functions part of optometric training?

Optometrical clinical training and education programs take place within clinics at the University as well as many community locations remote to it where these functions are practiced by faculty and students. These internal and external clinics are becoming increasingly integrated into the organized health care system. Today's optometry graduates by the time of graduation are prepared and competent to meet most situations that are found in day to day practice and to communicate with patients and other health workers. The optometrist is prepared to diagnose and manage approximately 95% of the most prevalent anomalies that trouble human vision. The optometrist is also competent to detect and recognize both general and ocular disease, the side effects of medication, provide spectacles, contact lenses, orthoptics and vision training and to counsel and advise the patient on ocular problems and to refer the patient when the problem lies outside his scope of practice or level of competence. The optometrist is also prepared to accept the responsibility of supporting the health activities of other workers within the health care field and to maintain records supportive of such responsibility.

Most ocular problems and many general health problems manifest themselves in altered visual function or some change in ocular structure. Thus, many people use the optometrical practice as an initial point of entry to the health care system. They generally enter an optometrical practice with minimal anxiety regarding their vision or health. They develop strong personal relationships with their optometrist. Most optometric patients are also ambulatory. Few population centers of 2000 or over population are without optometrical services either full or part time and thus optometrical services are readily accessible to a majority of the population.

Of the health problems which beset mankind, vision and ocular anomalies are second in prevalence only to dental caries.

Optometrists are fully capable of providing care for the majority of the public with vision and ocular anomalies. Even in the presence of a broad spectrum of physician's services, optometrists continue to provide the majority of eye care services. For example, Catania[7] has shown that in a large group health practice 70.5% of the vision and eye problems were managed by optometrists, 28.0% by physicians and ophthalmologists and 1.5% by ophthalmic technicians.

Thus by education, training and practice, otpometrists fulfill the functions of guardianship, gatekeeping and chronicling. Optometric practice in Canada is generally carried out by individuals or groups of two or more optometrists in private offices and as a result optometrical activities and the extensive interchange between optometrists, physicians, ophthalmologists, dentists, nurses, social workers and other members of the health care team have not been widely documented or reported. Neither is the value and extensive use of optometric health records generally appreciated. The outcomes of optometric work remain unknown except to the individual who benefits.

To remedy this situation the various vision care programs of the School of Optometry, University of Waterloo have been extensively documented in the process of epidemiological studies and thus provide an excellent source of the material for the examination of the outcome of the optometrist's role in primary care.

The programs examined range from pediatric to geriatric populations and they encompass both community and institutionalized samples and include ethnic minorities such as Amerind and Eskimo peoples. They also include groups identified by handicaps, such as the mentally retarded and by geographic location such as the unorganized municipalities of Northern Ontario. Collectively these populations are representative of Canadian society. It is thus likely that the outcomes reported are representative of optometric practice in Canada.

Service to Small Isolated Northern Ontario Communities[8]

In Northern Ontario a Mobile Optometric Clinic housed in a 35 foot specially designed and equipped trailer visited 23 small communities with populations between 100 and 750 persons between May and August, 1976. Table 1 shows the outcome of 1181 primary care contacts with the optometry team. Table 2 shows the prevalence of vision anomalies among this population.

While table 2 provides percentages of the population with various vision anomalies, a number of persons had multiple problems. The total requirement for optometric vision care services exceeded 48% of

all those who attended the clinic. This population ranged in age from one to over 80 years of age. There were 47 persons (4%), all of whom were ambulatory, identified as requiring a physician's assessment. In addition to the foregoing 47 persons, the specified need for health education and counselling in regard to compliance with health treatments, and assessment for drug side effects can be estimated by considering that 312 persons either had a health problem or a familial history of health problems. The continuing need for oculo-visual assessment services is evident in both the high prevalence of visual anomalies as shown in table 2 and in the fact that 363 ocular health problems were also present.

Service to Institutionalized and Community Based Mentally Retarded Persons[9,10]

From September 1974 to August 1975 the Optometry Clinic at the Huronia Regional Centre for the Mentally Retarded examined 1242 residents. The age of this population ranged from six to 83 years, 74% of these were less than 29 years old. Of this population, 54% were found to have one or more ocular pathology conditions. Table 3 shows the interprofessional activity related to ocular pathology within the hospital unit over one year's time. Due to the fact that the residents are under the constant care of physicians there is less likelihood of detecting undiscovered systemic pathology. There is frequent consultation between physicians and optometrists on systemic health of residents, particularly in regard to ocular side effects of systemic medication. Thus, the optometrist to physician referrals were not recorded except where referral was for an ocular pathology. Periodic review of all previously diagnosed ocular pathological states occurs on a planned schedule.

A sample of 168 mentally retarded in the schools of the Waterloo Region was also assessed by optometrists from the University of Waterloo. Table 4 shows the extent of physician-optometrist consultations regarding the persons in this sample. In all 168 there was interaction between optometrist-nurse-teacher-psychologist either verbally or in writing. In Table 5 the visual conditions requiring optometrical diagnosis and therapy are contrasted for these institutional and community based mentally retarded populations. While approximately 50% of the retarded persons living in the community require optometrical therapies, the need within the institution increased to over 66%.

As 62.9% of the institutionalized population were taking prescribed medication, a compilation of the possible side effect of these drugs was made and the residents were examined for such effects in the Optometry Clinic. A number of side effects have been found and this has resulted in the origination of a specific protocol of examination for such side effects at each oculo-visual examination. This activity has required a considerable increase in consultations between optometrists and physicians. Among the retardates residing in the community, only 20.0% are on prescribed medication. No ocular side effects of drugs was found during the oculo-visual assessment of this group.

Within both institutional and community primary care settings for the retarded, optometrists confer with nurses, psychologists, social workers, teachers and ward aids on almost all patients. The optometrist is also a regular participant in the health and rehabilitation conferences held for all residents and new admissions to the institution.

Table 1

PREVALENCE OF OCULAR AND SYSTEMIC HEALTH PROBLEMS DETECTED AMONG RESIDENTS OF SMALL ISOLATED NORTHERN ONTARIO COMMUNITIES BY AN OPTOMETRIC TEAM

	No.	%
Optometric Oculo-Visual Assessments	1181	
Referred to Physician with previously undiagnosed health problem	13	1.1
Referred to ophthalmologist with previously undiagnosed ocular health problem	18	1.5
Eyes with elevated intraocular pressure referred to ophthalmology	16	1.4
Referred to nurse for counselling with health problems	1	0.1
General health problems with diagnosis or treatment reported in case history	201	17.0
Family health history of hypertension and diabetes	111	9.4
*Total ocular health problems present with or without medical diagnosis	363	

*A number of persons showed multiple ocular health problems thus no percentage of the population is shown since such a percentage is not meaningful.

Table 2

PREVALENCE OF VISION ANOMALIES AMONG PERSONS IN SMALL ISOLATED NORTHERN ONTARIO COMMUNITIES

Vision Anomaly	% of Population
Myopia	20.3
Hypermetropia	8.5
Astigmatism	7.0
Anisometropia	14.6
Presbyopia	17.5
Amblyopia and muscular anomalies	5.3
Low vision	2.2

Table 3

NUMER OF INTERPROFESSIONAL REFERRALS BETWEEN OPTOMETRISTS, FAMILY PRACTICE PHYSICIANS AND OPHTHALMOLOGICAL CONSULTANTS AT THE HURONIA REGIONAL CENTRE FOR THE MENTALLY RETARDED OVER A ONE YEAR PERIOD

	No.	%
Referred to ophthalmology by physicians	53	4.3
— Requiring treatment	28	—
— Requiring no treatment	25	—
Referred to optometrists by physicians	70	5.6
— Treated in infirmary by physicians post referral	53	—
— Treated by ophthalmologists after referral	13	—
— No treatment	4	—
Number of residents with one or more ocular pathology present	669	54.0
Number of residents requiring review of ocular tissues and visual functions for ocular side effects of drugs	781	62.9

This results in the visual capabilities and ocular problems being taken into account in planning health, education and rehabilitation training programs which are established for each individual. Ward aids are also coached on the necessity for the continuous use of optical appliances and are trained to encourage their proper use and wear. Controlled studies[11] have indicated that correction of vision anomalies has salutory effects on a wide spectrum of behavior among mentally retarded popultions.

Vision Care Requirements of Belcher Island Eskimos[12]

A group of 138 persons who constituted 76.6% of the Belcher Island Eskimo population were examined in 1971 by an optometrical team from the School of Optometry, University of Waterloo. An ophthalmological resident was also present during the working visit along with a family practice physician. He assessed all ocular pathologies detected and referred by the optometrists. A total of 10.1% of the population required referral to his service for ocular pathology assessment. The optometric team found 25.4% of the population required optometric therapy. Table 6 shows the number of pathologies detected and the number of persons requiring medical treatment. Of the treatable ocular conditions, only one case required one specialized judgement of an ophthalmologist. The balance could have been managed by a family physician. Table 7 shows the numbers and kind of visual anomalies detected by the optometrists.

The Institutionalized Aged in Ontario Residential and Nursing Homes[13]

In a comprehensive survey of 43 residential and nursing homes, the institutionalized aged have been shown[11] to have a high prevalence of ocular and visual anomalies. Acting as primary health care practitioners within these institutional settings, optometrists and optometrical internes of the School of Optometry examined 1112 individuals and recorded the data shown in Tables 8 and 9. When it is considered that this population is monitored by both physicians and nurses, the data shows the added value of a third

Table 4

Number of Optometry Referrals and Consultations With Physicians and Ophthalmologists Regarding Ocular Conditions Among a Community Sample of Mentally Retarded Children

	No.	%
Referred to ophthalmologists for undiagnosed ocular health problem	7	4.3
Detected ocular health problem with prior physician's diagnosis	20	12.4
Children evaluated for ocular side effects of drugs	35	21.6

Optometrists conferred with the family physicians in all cases where the child was on medication

Table 5

Prevalence of Visual Problems of Mentally Retarded Populations in Institutional and Community Settings

Visual Problem	% Institution Population	% Community Population
Myopia	17.9	17.5
Hypermetropia	35.4	23.3
Astigmatism	28.9*	19.7
Anisometropia	11.3	19.1
Presbyopia	9.5	0.0
Amblyopia and muscular anomalies	24.2	24.7
Low vision	9.2	3.7

*While 57.3% of the population require spectacle correction only 4.0% require correction for astigmatism only.

Table 6

Prevalence of Ocular Pathologies Among a Population of Belcher Island Eskimos

	No.	%
Total ocular pathologies detected and referred	52	—
Total ocular pathologies requiring treatment	14	10.1

Table 7

Prevalence of Visual Anomalies Among a Population of Belcher Island Eskimos

Visual Problem	%
Myopia	6.9
Hypermetropia	6.9
Astigmatism	12.0
Anisometropia	Not Recorded
Presbyopia	4.2
Amblyopia & muscular anomalies	6.5
Low vision	0.0

Table 8

Enumeration of Optometrical Referrals for Ocular and systemic Disease Among 1112 Residents of Nursing and Residential Homes For The Aged

	N	% of N
Persons with ocular anomaly detected and referred to ophthalmology	58	5.2
Persons with an undiagnosed systemic health problem detected and referred to a physician	72	6.5
Discussions with nurses and ward aids were held on all patients	1112	100.0
Referred to ophthalmological evaluation of suspected glaucoma	45	4.0

Table 9

Visual Problems of the Elderly in 43 Residential and Nursing Homes

Visual Problem	No.	%
Myopia		30.1
Hypermetropia		58.6
Astigmatism		20.5
Presbyopia	All except the blind	
Amblyopia and muscular anomales	Not compiled	
Low vision (best corrected acuity 20/70 or worse)	262	23.6
Number requiring immediate vision examination to improve vision (represents unmet need for refractive eye care)	216	19.4

primary care practitioner, the optometrist within geriatric care institutions.

While the items documented among these specific populations are extensive, they do not relate the complete story of optometrical diagnostic and therapeutic services and the counselling, health education and other optometrist's activities which integrate with and support the role of other health workers. Many aspects of the primary care activities do integrate with and support the role of other health workers. However, many aspects of the primary care activities of optometrists still need to be fully explored and documented.

The addition of electrodiagnostic tests, external and internal photography of the eye, dark adaptometry and static and dynamic visual field exploration have already extended the optometrists utilization and integration within primary health care. The data presented leaves little doubt that optometrists play an extensive and effective role in primary care. The full potential of optometrists as guardians, gatekeepers and chroniclers must be exploited to provide the quantity and quality of vision care, eye care and health care needed by Canadians.

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Recommended Primary Eye-Care Examination

A POLICY STATEMENT BY THE AUSTRALIAN OPTOMETRICAL ASSOCIATION

Based on a Report by John Nathan

This statement is published by National Executive Council of the Australian Optometrical Association as a guide to the procedure appropriate to a consultation and examination by an optometrist providing primary eye care. The purpose of the statement is to establish guidelines for peer and consumer review, and to remind practitioners of the responsibilities they hold to their patients.

It is emphasised that the clinical protocols described in the statement should not be regarded as mandatory for any particular patient, or for every patient, and those protocols must be interpreted in the context of the total statement.

It is also emphasised that this statement does not attempt to standardize clinical attitudes or methods, or to be in any way restrictive to change or to the exercise of clinical judgement.

Basic Principles

Examination of the role, responsibilities and consequent clinical activities of the optometrist requires that a number of professional principles be stated.

A. Concept of Responsibility and Competence

Optometrists, by accepting the role of a professional advisor and accepting a fee for that service, are accountable to their patients (the consumers) and sometimes to government, which often has a third party role in the payment of fees. Optometrists, as members of a profession and as licencees under certain statutes, are also accountable to their peers.

It is incumbent upon practitioners to ensure that the welfare of the patient is their foremost concern, and this requires that the practitioner must maintain:-

(i) a satisfactory level of competency, including awareness of current knowledge, techniques and instrumentation,

(ii) a safe regimen of hygiene in the consulting room and laboratory,

(iii) full and accurate records,

(iv) good relations with professional colleagues and with related professional persons, for purposes of patient referral, and

(v) responsibility for any ophthalmic prescriptions written and, whenever possible, control over the quality of their dispensing.

B Concept of Change

The frontiers of knowledge are continuously shifting forward and, in response, the expectations of optometrists and their patients are also subject to continuous change. Many clinical procedures which are today performed routinely or regularly were not considered part of the responsibility or scope of interest of optometrists only several years ago, and many other non-conventional procedures did not exist longer ago. Procedures as yet undiscovered, or procedures presently considered experimental or exotic may come to be regarded as indispensable in years hence. Scope of practice, and frontiers of knowledge and responsibility are being changed by research and technological development. In addition, societal needs are influencing evolving professional identity and role by changing community demands, and increasing government involvement in the organisation and delivery of health care has added extra pressure for professional change.

The concept of change applies also to the statutory control of the practice of optometry.The eight State and Territory legislations which govern the practice of optometry in Australia are all different, and all are amended from time to time. In particular, the laws governing the use of facilitative drugs by optometrists vary widely, as they do between Australia and other parts of the world where optometry exists as an autonomous, clinical discipline. This particular aspect of professional practice is undergoing obvious change, and the recommendations within this statement relating to the use of facilitative drugs must be interpreted in the context of existing and potential statutes. Nonetheless, any recommendations relating to use of facilitative drugs do define the possible extent of professional responsibility.

The importance of recognising change is the understanding that recommended clinical standards must, if they are to remain relevant, be reviewed and updated at regular intervals.

C. Concept of Clinical Judgement

A practitioner commences a consultation by taking a

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history which should normally question for the presenting complaint, past ocular history, general health status, family ocular history and a definition of the patient's vision requirements. As a result of the information solicited, the practitioner will determine the direction of examination and the choice of examination procedures. The findings from any of these objective and subjective tests will in turn influence the choice of subsequent tests. After an appraisal of all of the information acquired during this examination the optometrist must decide upon a certain course of action in relation to the patient.

The ability to assemble the relevant information about a patient and the quality of the conclusions reached depends not only upon the technical competence of the optometrist but also upon a less easily definable characteristic known as clinical judgement. Good clinical judgement requires competence, intuition, understanding, clinical experience and aptitude.

Within the limitations of reasonable competency and responsibility the exercise of clinical judgement is the indisputable right of an optometrist, as it is of any other professional person.

D. Concept of Expedience

A practitioner will normally set aside a certain interval of time to conduct a consultation and examination. This interval will and does vary between practitioners, normally from between twenty to sixty minutes. The factors which influence the choice of scheduled duration of a primary eye-care examination include:

(i) the experience of the practitioner,
(ii) the number of procedures routinely employed,
(iii) the degree of automation or non-professional assistance employed, and the ergonomic efficiency of the consulting room layout,
(iv) the emphasis placed on special areas of clinical practice e.g. contact lenses, low vision etc.,
(v) the pressure of patient demand for appointments.

The time given to each patient, the number of procedures employed and the sophistication of instrumentation are only a partial index of the quality of the patient care given in the consultation and examination. They indicate the degree of conscientiousness and perhaps training, but are not necessarily wholly reflective of clinical expertise.

What can be achieved with one patient in one standard consultation and examination time period will vary widely. For instance history taking, which is an invariable component of any first visit attendance, may consume just a few minutes or the entire appointment duration. Similar patient to patient differences occur in procedures associated with refraction, external and internal eye examination, assessment of binocular vision integrity and other identifiable segments of the examination protocol. Usually, what is not completed or accomplished at a first attendance is carried over to a second or subsequent visit by the patient.

However, there are recognised circumstances which may necessitate the practitioner spending less time in attendance upon a patient than is customary in his practice. In such circumstances, the minimum set of procedures may not be possible or even sensible, nor may the arrangement of a return appointment, the normal procedure when all has not been achieved at the first attendance, be practical or sensible. Urgency of presentation, severity of symptoms or frank signs of a disorder requiring other forms of professional care, are examples of the necessity for expediency as a recognised clinical option.

Expediency is also appropriate for the class of patients whose attendances have the purpose of regulation of a known disorder, or who attend to consult on a specific vision problem. Those clinical procedures which have basically a screening function, and which form part of the first attendance examination protocol for that purpose, may not require repeating at recurrent attendances, or at special purpose consultations.

Thus, the clinical protocol of procedures which is recommended as a routine for a first attendance consultation and examination is not always expedient, and this concept of expediency must always be applied when any particular patient care episode is evaluated.

Recommended Routine Clinical Protocol

The recommended standard protocol for a primary eye-care consultation and examination is tabulated below. The table lists the essential elements of each procedure, and the essential equipment required to accomplish the procedure. The list order of the various procedures and their components is arbitrary. The minimum equipment is described because it is meaningless to list procedures without indicating the minimum method of their execution. Only basic equipment is described, and no attempt is made to specify ideal instrumentation in respect of either range or manufacturer.

Disinfection procedures are not listed but they do apply. Optometrists have the same obligations and responsibilities to maintain asepsis as do other practitioners who have physical contact with their patients. It is assumed that optometrists have immediate access to a hand basin, and that every care is taken not to transmit infection through hands or instruments, and that appropriate precautions are taken to prevent contamination of, and by, drops, staining agents and trial contact lenses.

Clinical recording procedures are also not listed but, again, optometrists have a responsibility to maintain adequate clinical records. Proper records enable clinical continuity, and represent the only means by which the practitioner or another person can audit the standard of patient care given.

From the Australian Journal of Optometry, Nov./Dec., 1979.

RECOMMENDED PRIMARY EYE-CARE EXAMINATION

Standard Procedures	Components	Basic Equipment
History Taking	Presenting complaint, personal details, past ocular history, family ocular history, general health, definition of requirements on vision.	Vertometer (lensometer)
Measurement of vision	Unaided and aided vision Visual fields Colour vision [1]	Distance and near acuity charts Tangent screen or field screener [2] White and red targets Pseudoisochromatic plates Confrontation targets.
Refraction	Objective Subjective, distance and near Visual acuity	Retinoscope Placido disc or keratometer Trial lens case and frame Distance and near acuity charts. Range of distance and near low vision aids.
Oculo-motor examination	Excursions Cover test, distance and near Convergence Accommodation Pupil reactions Binocular vision assessment	Fixation light Near point chart Fusion/stereopsis chart Fixation disparity device Trial prisms
External and anterior eye examination	General inspection Examination of lids and adnexae, conjunctiva and sclera, tears and tear drainage, cornea, anterior chamber assessment, iris, lens.	Overhead adjustable light Magnifying loupe Focal illuminator Slit biomicroscope [3] Staining agents U. V. light source
Internal eye examination (posterior)	Vitreous Ocular fundus	Direct ophthalmoscope Indirect ophthalmoscope [4] Mydriatic [5]
Intra ocular pressure measurement [6]	Instrument tonometry	Indentation or applanation tonometer Topical anaesthetic
Case assessment		
Discussion	Explanation – diagnosis Counselling – prognosis Treatment plan	
Disposal	Further consultation Prescription writing Referral	

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Explanatory Notes:

1. Colour vision: Although screening for colour vision defects may be regarded as a standard test of a basic vision function, it may not be necessary to carry this out in adult patients whose vocations do not call upon colour vision.
2. Tangent screen or field screener: Although measurement of visual fields is a basic test, it is unrealistic to consider that full assessment of the complete visual fields should be a routine procedure. The presence of most significant field defects can be demonstrated if the central 30^0 of field is explored with a sufficiently sensitive stimulus. If a tangent screen examination is not carried out then a reliable sensitive tachistoscopic screening instrument should be used. In some cases careful confrontation may be regarded as sufficient.
3. Slit biomicroscope: This instrument is essential for viewing finer detail in the anterior eye and is essential equipment for any practitioner working with contact lenses. A number of optometrists who received their basic training prior to the wide acceptance of slit biomicroscopy in general clinical practice may still continue to work without this instrument. Such practitioners are placing a heavy reliance on symptoms and gross appearances in assessing an anterior eye condition.
4. Indirect ophthalmoscope: These instruments give a wider angle of view than direct ophthalmoscopes and permit a better view of the fundus through unclear media. Their use by optometrists has been hampered by legal or self-imposed restrictions on the use of mydriatics. There are now available indirect monocular instruments that, without the use of mydriatics, give added information about the ocular fundus in certain conditions. It should be expected that such instruments will be regarded as essential equipment in the near future.
5. Mydriatics: Mydriatics are essential for the viewing of the peripheral fundus, and in some cases, their use considerably aids the inspection of the central and mid peripheral areas; the crystalline lens and vitreous can also be better examined through a dilated pupil. In some States the use of mydriatics is prohibited, in one State a special licensing system has been introduced, and, in other States, the relevant sections of the Optometry Acts are open to interpretation.
   In those States in which use of mydriatics is legally permissible, and the optometrist is confident of his training in this area of work, mydriasis should be employed when clinically indicated.
6. Intra-ocular pressure: Intra-ocular pressure measurement is a guide to the diagnosis of glaucoma and may provide the first indiction of its presence or possible development. For some years it has been measured as a matter of routine in all or most patients over the age of forty. This is obviously an arbitrary age limit and glaucoma is not restricted to patients in the upper age group. Routine examination of younger patients yields few positive diagnoses in the absence of other indications such as a suspect anterior angle or optic nerve head, family history or symptoms. Tonometry should be regarded as a routine measurement in patients over forty years of age, and should be used in younger patients as clinically indicated.

Contact Lens Consultation

The prescription and fitting of contact lenses involves additional responsibilities and clinical procedures. Generally, the additional procedures consume the equivalent of one standard consultation time, either immediately following the initial attendance or at a further visit.

Although a patient may present for the express purpose of being fitted with contact lenses, the attending optometrist continues to have responsibility for all other aspects of vision and eye-care. Thus, an optometrist must remain vigilant for signs of disorder unrelated to contact lens wear, and must be ready to consider general causes for symptoms or signs apparently attributable to contact lens wear.

Because most patients for whom contact lenses are the indicated or desired optical therapy are either myopic or aphakic, and because these two categories of patient are statistically more prone to ocular complications, more rather than less care must be devoted to history taking and to examination of the internal and external eye.

Additional Clinical Protocol for Contact Lens Practice

Standard Procedure	Equipment
Specific history in relation to motivation, allergies and lifestyle	
Detailed assessment of cornea, conjunctiva and tears	Slit biomicroscope Keratometer Schirmer strips
Assessment of lens fitting and patient suitability	Adequate range of trial contact lenses

This statement is based on a commissioned report in September 1978 to National Executive Council of the Australian Optometrical Association by John Nathan BSc MAppSc LoSc, Senior Academic Associate, Department of Optometry, University of Melbourne, and immediate Past-President of the Victorian College of Optometry.

From the Australian Journal of Optometry, Nov./Dec., 1979.

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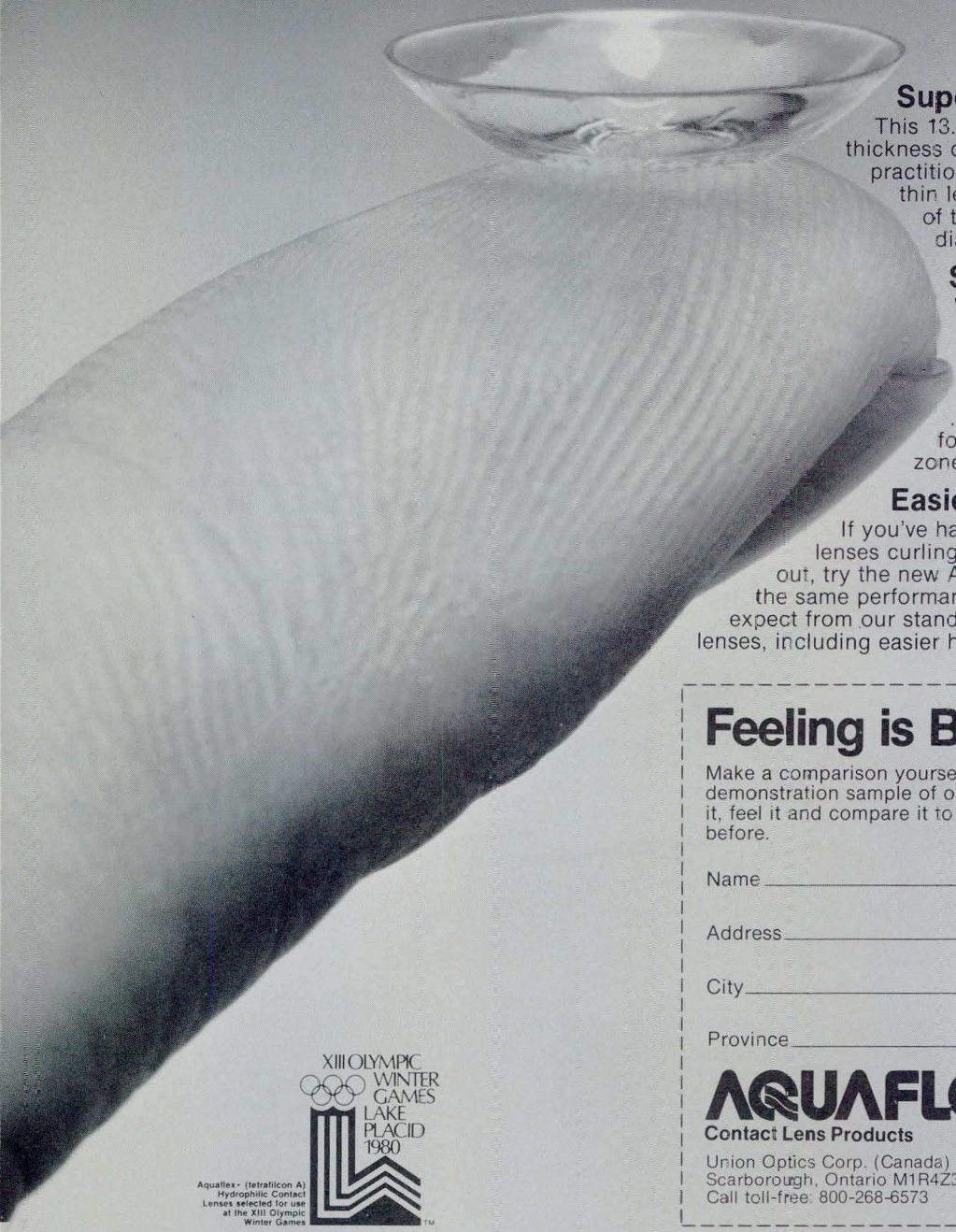

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L'exposition aux microondes présente-t-elle des dangers?

L'exposition aux microondes présente-t-elle des dangers?

Il semble n'y avoir eu au Canada aucun cas établi de maladie causée par l'exposition aux radiations des microondes. Cependant les résultats de recherches menées à l'étranger suggèrent que l'exposition prolongée à des taux de radiations de microondes dépassant 50 milliwatts au millimètre carré pourrait causer des cataractes. Afin de protéger les usagers de fours à microondes, le gouvernement canadien a donc établi des normes pour les rayonnements de fuite.

Règlements de sécurité imposés par le gouvernement canadien

La Direction générale de la protection de la santé a établi des règlements, incorporés le 13 novembre 1974 à la *Loi et aux Règlements sur les dispositifs émettant des radiations*. Ces règlements visent à diminuer les risques de radiations liés à l'usage des fours à microondes vendus au Canada et stipulent, entre autres:

- un rayonnement de fuite ne dépassant pas un milliwatt au centimètre carré en tout point distant d'au moins 5 centimètres de la surface extérieure du four;
- un indicateur signalant si le four est en marche;
- au moins deux enclenchements pour assurer que la porte du four ne puisse s'ouvrir sans que l'énergie des microondes n'ait été coupée et que l'énergie des microondes ne puisse être mise en circuit quand la porte du four est ouverte;
- un dispositif qui coupe automatiquement l'énergie du four si l'un des enclenchements de la porte fait défaut;
- une étiquette d'identification du four sur sa face extérieure indiquant le nom du fabricant, le numéro du modèle et de la série, la date et lieu de fabrication, le type de générateur, la tension de crête, la fréquence de fonctionnement et la puissance de sortie normale de l'élément général;
- une mise en garde sous forme de triangle inversé en deux couleurs contrastantes, identifiable à trois pieds de distance et offrant, comme dans le dessin ci-dessous, une représentation symbolique du générateur de microondes avec la mention bilingue: "ATTENTION — MICROONDES, CAUTION — MICROWAVES".

Comment se servir en toute sécurité du four à microondes

Voici les mesures de prudence que recommande le Bureau fédéral de la radioprotection, de la Direction générale de la protection de la santé:

- Lire et suivre les directives du guide fourni par le fabricant.
- Faire examiner le four par un spécialiste afin de s'assurer qu'il n'est pas endommagé ou en mauvais état, qu'il n'y a pas fuite de rayonnements et que les dispositifs d'enclenchement de la porte fonctionnent bien: ceci, au moins tous les 2 ans et plus souvent encore si on en fait un usage régulier.
- Ne pas utiliser un four qu'on soupçonne être défectueux et recourir aux services d'un technicien compétent.
- Ne pas se servir de plats ou d'ustensiles métalliques à l'intérieur du four sauf sur avis du fabricant, mais employer le papier, la poterie ou le verre.
- Ne pas faire fonctionner le four à vide.
- Durant la période de cuisson, éviter de regarder par la fenêtre du four et si ce dernier n'est pas de fabrication récente s'en tenir éloigné d'au moins une longueur de bras.
- Ne jamais insérer d'objet, comme une fourchette, par la fenêtre du four ou autour de la porte ou dans ses jointures étanches. Ne rien laisser coincé dans la porte, pas même une serviette de papier.
- Ne jamais manipuler les enclenchements de la porte chargés de couper le circuit quand celle-ci est ouverte.
- Nettoyer régulièrement la porte du four, les jointures étanches et l'intérieur à l'aide d'un chiffon humide. Eviter d'utiliser la laine d'acier ou d'autres abrasifs.

Bibliographie

"Règlements sur les dispositifs émetteurs de radiations — Fours à microondes", Lettre de renseignements de la D.g.p.s., no 384, mars 1973, et no 432, novembre 1974.

"Règlements sur les dispositifs émettant des radiations — Modifications", Gazette du Canada partie II, vol. 3, no 21, novembre 1974.

Reprinted from Health & Welfare Canada, Bulletin No. 38, Spring 1975, Educational Services, Health Protection Branch

How Safe Are Microwave Ovens?

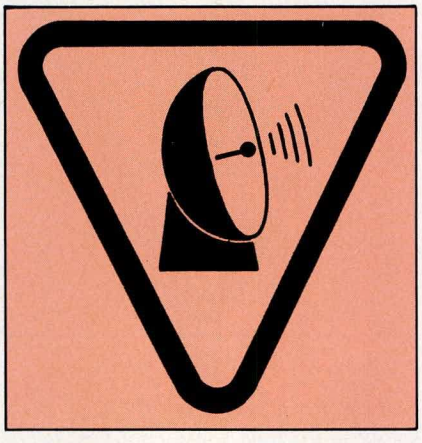
Microwaves are a non-ionizing form of radiation which disappears as soon as the magnetron is turned off. They will not make food or the oven materials radioactive. Therefore, foods cooked in a microwave oven are perfectly safe to eat. Also, providing the oven is in good working condition and proper operating procedures are followed, the microwave oven itself is entirely harmless.

However, if the door seals are not tight, or if the door interlock switches are inoperative, the oven may leak radiation. So as a safety precaution, because research in other countries has suggested that persons exposed to levels of microwave radiation in excess of 50 milliwatts per square centimeter for extended periods of time may develop cataracts, the Canadian government has established exposure limits much lower than this amount to provide substantial safety margins for the protection of the oven user.

Government Safety Regulations

The Heatlh Protection Branch recently established standards governing the design, construction and functioning of microwave ovens sold in Canada. These regulations, incorporated into the *Radiation Emitting Devices Act and Regulations* on November 13, 1974, are intended to reduce any possible radiation hazards involved in the operation of microwave ovens. Some of the requirements in the regulations state that:

- Ovens must have off-on indicators;
- Oven doors must have at least two interlock switches to ensure that the door cannot be opened until the microwave power generator has been turned off, and that the microwave power generator cannot be switched on while the door is open;
- If a door interlock fails, the oven must be rendered automatically inoperable;
- Ovens must have a permanently affixed label showing the manufacturer, model number, serial number, date and place of manufacture, type of microwave generator, peak operating voltage, operating frequency and the normal power output;
- Microwave radiation leakage from the oven must not exceed one milliwatt per square centimeter measured five centimeters from the external surface of the oven;
- A warning sign, like the one depicted below, must be visible on the oven from a distance of at least three feet. This sign must be a two-colour inverted triangle containing a symbolic representation of a microwave generator, and must contain the words "CAUTION—MICROWAVES, ATTENTION—MICRO-ONDES".



Precautions to be Taken by the User

Even a device manufactured according to stringent government standards can be hazardous if it is used improperly. For the safe operation of microwave ovens, the Radiation Protection Bureau of the Health Protection Branch recommends the following guidelines:

- Follow carefully the operating instructions in the manual provided by the manufacturer.
- Have the oven checked for wear, damage, tampering, and radiation leakage by a qualified serviceman every two years, or more frequently if the oven is subjected to heavy use.
- Never operate an oven which is damaged, or thought to be damaged, until it has been repaired or checked by a qualified serviceman.
- Do not use metal cookware except as advised by the manufacturer. Une only paper, earthenware, or glass cookware.
- Do not operate the oven when it is empty.
- Avoid the habit of watching foods while they are cooking. With older ovens, stay at least an arm's length away from the front of the oven while it is on.
- Never insert any object (such as a fork) through the viewing screen or between the door and the door seal. Never allow even a paper towel to stick out of the door.
- Never tamper with or inactivate the door interlocks which are designed to shut off the power when the door is opened.
- Clean the door, door seals, and inside of the oven regularly with a wet cloth. Avoid using steel wool or abrasive pads.

References

"Radiation Emitting Devices Regulations — Microwave Ovens", Health Protection Branch, I.L. 384, March 1973, and I.L. 432, November 1974.

"Radiation Emitting Devices Regulations, Amendment", Canada Gazette Part II, Vol. 108, No. 21, November 1974.

BOOK REVIEWS

Visual Impairment in Children and Adolescents by James E. Jan, Roger D. Freeman and Ellen P. Scott, Grune & Stratton, 111-5th Ave., New York, 1977, 398 pages.

This excellent book is written by a multi-disciplinary team comprising a pediatric neurologist, a child psychiatrist and a social worker. They are part of a team involved in studying the entire blind population of British Columbia born between 1944 and 1973 who developed blindness before their twentieth birthday-a total of 454 children.

They emphasize that existing definitions of blindness are based on a single physiological measure (visual acuity) rather than on measures of functional ability. They suggest a classification system in which the term blind would only be applied to those who are totally blind or have only light perception (comprising one third of the "blind" population). The other two-thirds of their sample had some useful vision. Instead of the term legal blindness they recommend the term "visual impairment"—a loss of either visual acuity or one or more functions of the visual system. This is a term optometrists have employed for many years. For 30 years S. Howard Bartley and numerous optometric investigators and clinicians have stressed that impairment due to dysfunction of cells or tissue results in reduced or modified performance. Therefore vision must be evaluated by performance criteria.

With the virtual disappearance of ophthalmia neonatorium, ocular disorders due to syphillis, and retrolental fibroplasia, the major known causes of visual impairment in children are now due to heredity or rubella. This indicates the major thrust in prevention of blindness needs to be via genetic counselling and immunization against rubella. A short chapter provides a brief review of some salient genetic concepts.

One of the most compelling statistics from their study revealed that more than 70 per cent of the visually impaired had additional handicaps. This included mental retardation (25%), hearing loss (10%), epilepsy (8%), and cerebral palsy (6%). This, of course, vastly complicates care since the multi-handicapped need a team approach in evaluation and follow-up. In terms of diagnosis they emphasize that description of ocular pathology is not synonomous with etiology. Thus the pathology might be optic atrophy but the etiology might be brain tumour, increased intra-cranial pressure, infection, hypoxia, etc.

Observation by parents and professionals is an important element of early detection. Lack of normal eye contact between infant and mother, abnormal eye movements such as a roving nystagmus, and an "out-toeing" walk with a wide base all suggest visual impairment and resultant delayed motor development. The authors stress the importance of presenting the original diagnosis to both mother and father. It is also important all family members be involved in habilitation, fathers and siblings as well as mother. Obviously these families have extra stress and tension placed on them and face family problems of attitude and emotion which must be met and resolved. Nevertheless, surprisingly, there was no increased prevalence of divorce or separation as compared to control group families.

As would be expected there are numerous effects of blindness on general development. In the absence of sight, these infants live in a frightening world. Mother suddenly comes upon them and may equally as suddenly disappear. Similarly, when movement is achieved many objects are first sensed only by bumping into them. For infants in the prone position, head lifting with arching, normally triggered by visual curiosity, is infrequent. Hearing will not compensate for this lack of sight until after one year of age when it can trigger motor activity. Vision normally acts to unite the tactile and sound qualities of objects. Until the end of the first year these qualities remain separate for the blind child. Eye-to-eye contact is an important part of the development of the infant-mother bond. This too, is of course lacking, delaying the development of this critical aspect of emotional growth.

The infant's watching of his own hand at four months is the beginning of visual-motor coordination. Sighted children can learn hand skills by imitation and hand and mouth develop separate autonomy. For the blind child the hand remains in alliance with the mouth and acts as if there was nothing out there. At five to six months the lack of vision interferes with the developing of creeping. Grasping or walking toward an object also cannot occur until conceptual development is far enough advanced to permit association of the object with the sound cue. Independent walking is markedly delayed probably because of the lack of development of a mental map of the environment. Vision plays a major role in good postural balance but the totally blind must rely entirely on vestibular and proprioceptive information.

Speech is less firmly connected with sensory experience so that vocabulary may be acquired even though the meaning may not be understood due to a lack of visual experience. In communication, sighted children imitate gestures and expressions of other people. They also thereby learn to understand unspoken body language and facial expression and to communicate by their own body language. Lack of sight often results in blind mannerisms. These stereotyped mannerisms often distrub parents and observers. They tend to evoke suspicion of mental retardation or emotional disturbance. They include rocking, eye poking, hand-flapping and hand movements from side to side. These are likely to decrease with time and early mobility.

Multiple stimulation and experience permits the child to acquire behaviour patterns incompatible with stereotyped behaviour. Vision also facilitates smiling which is delayed in blind babies. Subtle facial expressions are developed by imitation and their absence in the blind may cause difficulties for observers in understanding and interpreting their feelings.

BOOK REVIEWS

Perceptual and cognitive development is adversely affected by visual loss. Space perception involves body image, constancy and visualization. Vision is of great importance in learning to differentiate the self from the non-self. The blind need special help in developing self concepts. The conceptualization of space is very difficult for the blind child lacking visual information of surrounding space. Hearing confers object constancy only at a later age. Mobility is obviously handicapped by a lack of vision. Even a small amount of vision seems to provide a useful framework for interpreting information from other perceptual modalities and effecting inter-modality organization.

Some cognitive deficits may arise because no other input channel can match the rate of visual processing. Other apparent deficits may be due to the fact that the tasks are influenced by visual cues and lower performance reflects lack of vision and not lack of cognitive ability. It is unclear whether significant differences in perception and cognition occur in the long run. However, it is necessary to structure the experience of the visually impaired to facilitate the development of compensatory non-visual channels.

Developmental disorders are present in 41% of the blind but only 8% of those with partial sight. This points out the importance of vision, even reduced vision, to general development. Behavioural problems are much more prevalent among the visually impaired although not inevitable. They have more problems in peer relationships and have fewer social opportunities. Behaviour disorders are often associated with family factors making it essential that there be early and ongoing supportive programs for families.

Very little information is provided for assisting the partially sighted. Suggestions are primarily with respect to placement close to the blackboard, utilizing a felt pen for writing and an easel for reading, and individual teaching assistance. There is only cursory mention of low vision aids. The authors stress that there should be a multi-disciplinary approach to rehabilitation and recommend that low vision clinics should be within an agency serving the blind.

The chapter on the Deaf-Blind Child perhaps most effectively illustrates the principle which must be applied in the habilitation of children with impairment whether mild or severe as discussed here. The enormity of the loss of the two major teleseptors can certainly be understood by any optometrist. The basic goal of the program is to establish communication by whatever means can be received by the child, to develop a positive self image from birth, and to utilize whatever residual vision and hearing remains. Underlying these three areas must be an emotional bond established between the therapist and the child as well as the parents and the child.

The actual programming of education involves seven areas; 1) Social and emotional development, 2) Living skills, 3) Orientation and mobility, 4) Language development, 5) Cognitive (conceptual) development, 6) Perceptual development, 7) Gross and fine motor development.

This is a program whose principles could be applied not only to gross visual impairment but also to all less severe visual dysfunction. While this book only touches on the area of therapy, optometrists will recognize that the developmental principles which apply to therapy for strabismus, heterophoria, visual-motor and perceptual-motor difficulties also apply, and should be instituted, in the therapy for the blind. The optometrist has a valuable role to play because of his/her unique background in those areas.

As so often happens, consideration of pathological dysfunction helps our understanding of normal physiological development and function. This book is useful not alone for its insight into the nature of the adjustments that must be made by the impaired in all areas of life. It is equally valuable for its contribution to understanding the impact of reduced vision on development of function and behaviour.

This book should assist every optometrist to broaden his/her understanding and clinical management of the visually impaired.

Marvin A. Langer, M.Sc., O.D.

The Pathogenesis of Nerve Damage in Glaucoma: Contributions of Fluorescein Angiography, by George L. Spaeth, M.D. Published by Grune and Stratton, 1977, Clothbound, 153 pages plus index and table of contents. Price $19.50 U.S. funds.

The author discusses two theories concerning the pathogenesis of optic nerve and retinal damage in glaucoma and classifies glaucoma patients into four categories. The theories are:

a) The mechanical theory (Müller) incorporates these factors:

— the vitreous presses the optic nerve fibers against the edge of the cup (and may also squeeze out extracellular fluids from the disc)
— secondary atrophy of glial and nerve fibers occurs
— retinal ganglion cells and their axons are damaged
— a decreased flow of axoplasm occurs in the optic nerve
— possibly a distortion of fenestrae in the lamina cribrosa due to the direct pressure.

b) The vascular concept (von Jaeger) includes:

— decreased capillarity of the disc
— the vascular supply of the lamina from the "posterior scleral wreath" suffers when these vessels are compressed
— foci of necrosis in the optic nerve. Cavernous changes in the optic nerve resulting from vascular insufficiency
— selective atrophy of radial peripapillary capillaries (but their role is not yet clear)
— inadequate perfusion of the optic nerve occurs in systemic hypotension or ocular hypertension. As many as 60% of patients with chronic open-angle glaucoma have cardiovascular disease. There may be a local disease of vessels in the eye.
— systemic hypotension can produce an oval scotoma in the Bjerrum area
— fields deteriorate when blood pressure is lowered but higher systemic pressure protects glaucoma patients from field losses

— increased IOP decreases blood flow in both the choroid and the prelaminar portion of the optic nerve and reduces oxygenation of the tissues supplied by the uveal circulation and the deep prelaminar portion of the optic nerve
— retinal oxygenation decreases when the IOP is raised or BP is lowered if the extent of these changes is sufficient to overcome the autoregulatory capacity of the retina or the surface of the optic nerve head
— the prelaminar disc tissue is more sensitive to increased IOP than is the central retinal circulation
— occlusion of the short posterior ciliary arteries and the pial vessels results in optic nerve damage
— vascular insufficiency of the choroid seems not to be significant in the development of glaucomatous nerve damage.

Glaucoma patients can be classified into the following four categories:

1. Analysis indicated that 12% of his glaucoma population belonged in the first category. Here the intraocular pressure is elevated and no ischemia is apparent, the patient shows:
— a normal fluorescein angiogram, but some enlargement of the optic cup
— some posterior displacement of the disc surface
— field losses which tend to be more peripheral than central
— little or no relation between the course of glaucoma and the systemic blood pressure.
2. About 11% of his glaucoma patients made up his second category. In these patients primary ischemia of intraocular structures is presumed to be the mechanism, there is normal IOP but glaucoma-like involvement of the optic nerve head. More than ⅓ of them had diabetes, some had cardiovascular disease and a few had syphilis. The low tension glaucoma patients seem to belong here and fluorescein angiography is especially useful in these cases. Patients in the second category showed:
— hypofluorescence especially inferotemporally, focal ischemia of the disc
— shallow eccentrically placed cupping, saucerization
— more pallor than would be expected from the size of the cup
— some had small hemorrhages on the disc, inferotemporally
— a dense paracentral scotoma affecting the superior field. Patients were often aware of the field defect.
— IOP ranged from 15 to 19 mm Hg and the coefficient of aqueous outflow was normal.
3. About 36% of his glaucoma patients appeared to belong in the third category, these he considers to be suffering from secondary ischemia. In this group the hypoperfusion and disc damage are presumed to be the result of the elevated IOP. They showed:
— optic nerve hypoperfusion which varied with the height of the IOP
— inferotemporal or superotemporal cupping
— arcuate scotomas which varied with the height of the IOP.
4. Among his group of glaucoma patients 41% did not fit readily into any of the above three categories and therefore constitute a fourth category. The author concludes that in many cases the development of glaucomatous changes in the disc depends upon a combination of factors.

Some cases showed areas of hyperperfusion before field defects could be found. Spaeth emphasizes in *Transactions of the American Academy of Ophthalmology and Otolaryngology* 81(2): OP233, 1976 that visual field loss is the issue of central importance and the examination of the disc alone is not adequate for diagnosis nor follow-up of glaucoma.

Angiograms of 25 patients are shown and these are correlated with the other data obtained in a careful work-up of their condition. There are 64 black-and-white figures and extensive references.

Optometrists can learn much from this book.

W.M. Lyle, O.D., Ph.D.

Do You Really Need Eye Surgery? Second Edition, William H. Havener, M.D., Charles C. Thomas & Co. 301-327. E. Lawrence Ave., Springfield, Ill. 62717

This small text (87 pages) was written primarily for the patient who must consider the possibility of eye surgery. Its author, William Havener M.D., a professor of ophthalmology at Ohio State, has obviously had extensive experience in counselling patients regarding the necessity for eye surgery.

The book is divided into 13 balanced chapters, including discussions of cataract surgery, retinal detachment, glaucoma, strabismus, plastic surgery and corneal transplantation. In each chapter, Dr. Havener attempts to describe the methods of surgery and the associated risks involved without minimizing the benefits.

One area sure to find disagreement would be the chapter on orthoptics where he warns patients about the charlatans in the field and that a "sucker is born every minute" — hardly appropriate for a text of this type. As one would expect in a text written by an ophthalmologist, there is a decided propensity toward advising routine eye care by local ophthalmologists.

Truthfully, the majority of the text is quite simplistic in trying to give the layman some indication of the reasons for eye surgery and the accompanying risks. I felt that the most useful chapter for both layman and optometrist, especially in counselling his patients, was the chapter on "Meaning of eye symptoms" and some useful information in the "Prevention of Blindness". Dr. Havener discusses aches and pains, headaches, dryness, burning, itching, watering tired eyes, floating spots, diplopia and sudden loss of sight. He attempts to describe the possible danger of minimizing the warning signals and the danger of do-it-yourself diagnosis. The chapter is useful for all optometrists.

The chapter on the "Prevention of Blindness" is an added piece of information for the reader although not necessarily appropriate in a book about surgery. Dr. Havener gives some interesting statistics (i.e. there are 30,000 new cases of blind-

ness yearly in the U.S. alone with the cost of caring for the 300,000 blind approaching 150 million dollars). He also describes seven eye danger signals that are extremely well defined. Every patient would be helped if they knew the danger of:

1. Continuing redness
2. Continuing pain
3. Trouble in seeing — loss of vision (side), double vision
4. Crossed eyes
5. Growths
6. Continuous discharge and
7. Pupil changes. He goes on to give some good information regarding first aid.

Practising optometrists, in general, could find reasons for disappointment in this small text. The student, or some of our well informed patients, however do receive a useful discourse.

H.B. Mayers, O.D.

New and controversial aspects of vitreoretinal surgery, edited by Alice McPherson, C.V. Mosby, St. Louis, Missouri, 1977, 441 pages, index, $59.75.

This book is drawn from papers presented at a symposium on vitreous surgery held at the Texas Medical Center in Houston in 1975. It is clearly intended as a book on surgical technique: more than half the volume is devoted to discussion of instruments and techniques.

Retina-Vitreous Relations

The early chapters give a good review of the basic anatomy and pathology of the vitreous, and emphasize relations between the vitreous and retina: these relations play a major role in development of both vitreous and retinal problems. There is normally a blood-vitreous barrier, which controls (physically and physiologically) the entry of cells and other substances into the vitreous. When this barrier is altered (as by uveitis), white blood cells and fibrinogen may be allowed into the vitreous: this will lead to formation of clumps of cells and fibrin in the vitreous. These materials may be removed by phagocytes from retinal circulation; however, as the blood-vitreous barrier returns to normal, these deposits may not be entirely removed. Vitreous detachment may cause breaks in the internal limiting membrane of the retina: glial cells from the retina may wander through these breaks and proliferate to produce cellophane-like preretinal membranes which are known to produce folds and puckers in the retina as they contract. In diabetic retinopathy, it is postulated that increased glucose levels upset the metabolism of the vitreous cortex, causing it to thicken and develop stronger attachments to the large retinal blood vessels; increased glucose levels in the vitreous in turn are suggested to cause liquefaction of the vitreous, with the development of posterior vitreous detachment. This causes traction on the retinal blood vessels, leading to hemorrhage and anterior displacement of newly-formed blood vessels.

Instruments & Techniques for Vitreous Examination

Various scleral indentors and three-mirror contact lenses are evaluated. The reader is reminded that red-free illumination improves the contrast of vitreous structures (such as membranes). Close to the retina, however, vitreous structures are harder to see, due to retinal reflections: an image-intensifier slit-lamp attachment is described which makes it possible to employ a polarizer and analyzer to reduce retinal and other reflections. An interesting and novel development involves the addition of a line-filament light source and projection system to a conventional head-mounted indirect ophthalmoscope: this enables the observer to obtain a slit-lamp view of vitreous and retina at any time during the course of indirect ophthalmoscopy. Localization of vitreal and retinal abnormalities is thus greatly facilitated.

Clinical Testing

Preoperative evaluation of patients with vitreous opacities is discussed at length. The patient with extensive vitreous opacities is much less amenable to assessment than is the patient with dense cataract: light projection, red-green discrimination, Maddox Rod orientation, and Marcus Gunn pupillary response tests are of no prognostic value in patients with extensive vitreous opacity (e.g. in proliferative diabetic retinopathy). The authors suggest a very useful teaching technique to produce a Marcus Gunn response in a normal patient: placing a neutral density 2 filter before one eye will produce a marked positive Marcus Gunn pupillary response (positive swinging flashlight test). Even the Purkinje tree phenomenon, (the subjective report of seeing a black, tree-like pattern against a red background when the temporal globe is transilluminated through the closed lid), is of little value where the vitreous is very cloudy, as it may not be observed even in eyes with a perfectly normal posterior pole. Two additional diagnostic methods receive extensive discussion: bright-flash electroretinography and ultrasonography. In eyes with opaque vitreous, it may be necessary to increase the intensity of the ERG flash by 4 log units in order to produce a recordable ERG.

Vitreous Surgery

Vitreous surgery is accomplished by one of two methods: either by making an extensive incision around the limbus and turning back the cornea (the 'open sky' technique) or by insertion of a fine probe (about the diameter of a mechanical pencil lead) through the pars plana. The latter technique requires only a very small incision, which often will heal without the need for sutures. A large number of most ingenious instruments have been developed for the latter method: these instruments permit the cutting of vitreous and other structures; removal of this débris by suction; replacement of the aspirated materials with saline (so normal IOP is maintained); internal illumination of the eye during surgery; direct application of heat to intraocular blood vessels.

Counselling

This book is very useful for counselling patients with vitreous/retinal problems, as it gives a great deal of information on indications, contraindications, success and failure rates for surgery. Here are a few examples of conditions amenable to treatment by vitreoretinal surgery: vitreous hemorrhage, dense asteroid bodies, diabetic retinopathy, retinal detachment due to vitreous traction, and removal of secondary cataract (aftercataract). Most of the

authors advise against surgery for vitreous hemorrhage within 12 months of the bleeding: such opacities frequently will be reabsorbed spontaneously within that time. Vitreo-retinal surgery is contraindicated for patients who will not stand general anaesthesia (cardiovascular problems, kidney problems) and for patients with extensive rubeosis iridis (these patients usually develop an intractable glaucoma following surgery). Success rates are encouraging for patients with intraocular foreign bodies and cystoid macular edema due to vitreous traction (90%); non-diabetic vitreous hemorrhage is successfully treated in 80% of cases; diabetic vitreous hemorrhage and retinopathy are successfully treated in 60% of cases. An interesting note is made concerning possible future treatment of diabetic retinopathy: it may be preferable to obliterate new blood vessels using heat and then to remove the remnants by vitrectomy **before** any hemorrhage occurs.

Conclusion

This book would be useful to the optometrist in a large group, (or multidisciplinary), practice. I have attempted to present the highlights which I think could be of use to the general practising optometrist.

T.D. Williams, O.D., M.S., Ph.D.

Ophthalmic Dispensing (Third Edition) by Russell L. Stimson, Published by Charles C. Thomas, Springfield, Illinois, U.S.A.

This book, nearly 700 pages in length, "continues to emphasize preparation for the National Academy of Opticianry examination" in the U.S.A. In this edition new material has been added in the area of eye anatomy and physiology, optics and associated mathematics, as well as optical aids for sub-normal vision.

The book will have appeal to a broad segment of the optical industry despite the fact that certain parts of the book deal with explanations of various examination procedures which may lie beyond the interest of the majority of opticians.

The emphasis on accurate fitting techniques and the reasons for attaching such importance to them are well set out. It merits review by all who engage in dispensing ophthalmic materials. There are a few minor shortcomings but these do not detract from the worth of the new edition. All in all, a book worth having in the office library.

Ray Pellowe, O.D.

Reading Aids for the Partially Sighted: A systematic classification and procedure for prescribing, Louise L. Sloan, Ph.D., The Williams and Wilkins Company, 428E. Preston Street, Baltimore, Maryland. USA 21202

In her introduction, Sloan briefly describes the developments which have occurred in the field of low vision care since 1955. She points out that during this period a systematic procedure for the selection of low vision aids and a consistent system for rating low vision aids in terms of their magnification and uses, was never developed. Combined with this fact was the problem that practitioners were hesitant to prescribe low vision aids because they felt their patients would not accept them or use them. This, Sloan feels, is one of the greatest obstacles to the delivery of low vision care. Her book attempts to deal with each of these problems in turn.

The first chapters offer explanations of basic optical principles which should serve as a good review for most practitioners. Subsequent chapters deal with the low vision examination itself, and the modifications which must be made to a "standard" visual examination. She then goes on to point out the various inadequacies of the present classification methods in describing many optical low vision aids. She shows how they may be properly evaluated and systematically described in terms of their magnification. She then attacks the problem of selecting the proper low vision aid to suit the patient's low vision condition. This is done in a very orderly and logical manner which should prove quite valuable to anyone working with low vision patients for the first time.

Special problems in prescribing aids for children and other patients who require special illumination levels are discussed. The final chapter deals quite briefly with telescopic units. The book's three appendices describe (i) non-optical low vision aids (ii) factors relating to the success or failure of low vision aids and (iii) illustrative case histories of varied types of low vision patients and how they were treated. A special noteworthy point in appendix III is Sloan's discussion of the importance in knowing the central visual fields of the patient and how this knowledge is used in the selection of the proper aid as well as the proper method of training the patient in the use of the aid.

While Sloan's book is certainly not exhaustingly comprehensive in the discusion of low vision and all its ramifications, it does deal with a wide range of practical problems within the area. She seems to have succeeded in her efforts to deal with problems she mentioned in her introduction. Most optometric practitioners should find this book pleasant to read, easy to understand and valuable in terms of the practical knowledge which can be gained concerning the delivery of low vision care.

John D. Jantzi, O.D.

COMING EVENTS

18-20
22nd Annual Conference New Zealand Contact Lens Society
INVERCARGILL, N.Z.

Contact:
Mrs. E. Bloomfield,
Box 280,
Masterton, N.Z.

26-29
Mountain States Optometric Congress
DENVER, Colo.

Contact:
Robert Camp, O.D.
Box 484, Loveland,
California, 80537

AUGUST

14-15
San Jose Vision Training Conference

Contact:
Arthur Heinsen Jr.,
2730 Union Ave.,
SAN JOSE, Cal. 95124

16-17
Seventh National Research Symposium Contact Lens Research,CHICAGO, Illinois

Contact:
Ms. Karen Moore
Bausch & Lomb corp., Inc.
Soflens Division
14000 N. Goodman St.,
Rochester, N.Y. 14602

SEPTEMBER

Alberta Optometric Association Annual Meeting

Contact:
Mr. A. Berry,
1225A Kensington Rd. N.W.,
CALGARY, Alberta T2N 3P8

5-7
International Symposium on the Present and Future of Contact Lenses
ORLANDA, Florida

Contact:
Raymond I. Myers O.D.
Secretary International Society
for Contact Lens Research
950 Francis Place,
St. Louis, MO, 63105

24-29
6th Annual Contact Lens Seminar and Orthokeratology Congress
ORLANDO, Florida

Contact:
Dr. R. Timothy Carter,
Park Central Plaza,
P.O. Box 566,
Orange Park, Florida 32073

26-29
National Optical Congress University of Lancaster

Contact:
John Allcutt,
21 Spruce Way,
Formby, Liverpool,
ENGLAND, L37 2YF

10-12
Optifair West
ANAHEIM, Calif.

Contact:
Optifair Inc.,
Conference Mgmt. Corp.,
500 Summer St.,
STAMFORD, Connecticut,
06901

OCTOBER

11-12
Contact Lens Symposium
QUÉBEC CITY
Association professionelle des Optométristes du Québec

Contact:
M. Laplante,
APOQ, Suite 302,
614 ouest St. Jacques,
MONTRÉAL, Que. H3C 1E2

13-18
New Zealand Optometric Association 50th Jubilee
WELLINGTON, N.Z.

Contact:
E.R. Neal, Secty.,
NZOA,
40 Syndrum Ave.,
LOWER HUTT, N.Z.

20-22
Optifair Midwest
ST. LOUIS, Mo.

Contact:
Optifair Inc.,
Conference Mgmt. Corp.,
500 Summer St.,
STAMFORD, Connecticut,
06901

24-26
European Symposium on Soft Contact Lens
LONDON, England

Contact:
Dr. Stephen E. Schock,
Bausch & Lomb, Inc.,
Soflens Division,
1400 N. Goodman St.,
Rochester, N.Y. 14602

(Mid-October)
Nova Scotia Optometrical Association Continuing Education Seminars

Contact:
NSOA,
Mr. Jim Lotz,
Box 3393 South,
HALIFAX, N.S. B3J 3J1

NOVEMBER

Oct. 31-Nov. 5
Société d'Optométrie d'Europe Congress
LONDON, England

Contact:
H. Rosenwasser, O.D.,
1518 Walnut St.,
Suite 1401
PHILADELPHIA, Penn.
19102

5-8
5th Latin American Congress of Optometry and Optics

Contact:
Secretaria Fedopto
Apartado 53259,
BOGOTA D.E., Colombia
Suramerica

9-11
Saskatchewan Optometric Association Annual Meeting

Contact:
L.J. Koltun, O.D.,
#1, 2072 McIntyre St.,
REGINA, Sask. S4P 2R6

8-22
Optometry Down Under
Travel/Study Tour
LOS ANGELES - NEW ZEALAND
AUSTRALIA

Contact:
Richard B. Elliott,
Southern California,
College of Optometry,
2001 Associated Rd.,
Fullerton, CA 92631
by Sept. 1/80

10-17
Northern Rockies Optometric Conference
Kuilima, Oahu,
HAWAII

Contact:
Dr. Jack McNees,
P.O. Box 47,
win Falls, ID 83301

18-21
Annual Meeting - College of Optometrists in Vision Development
NEW ORLEANS, LA

Contact:
Robert Wold, O.D.
P.O. Box 285,
Chula Vista, CA 92010

20-22
2nd Int'l. Congress on Vision and Road Safety
PARIS, France

Theme: Night Driving
Languages: English, French, German
Contact:
R. Pansard,
La Prevention Routière Int'l.
Linas 91310,
MONTLHERY, France

20-23
International Optical Fair
World Trade Centre
SINGAPORE

Contact:
McComm Private Limited,
36 Prinsep Street,
SINGAPORE 0718

DECEMBER

11-16
American Academy of Optometry Annual Meeting
CHICAGO, Ill.

Contact:
Dr. J. Schoen,
115 W. Broadway,
Box 365,
OWATONNA, Minnesota.

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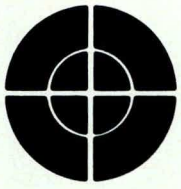

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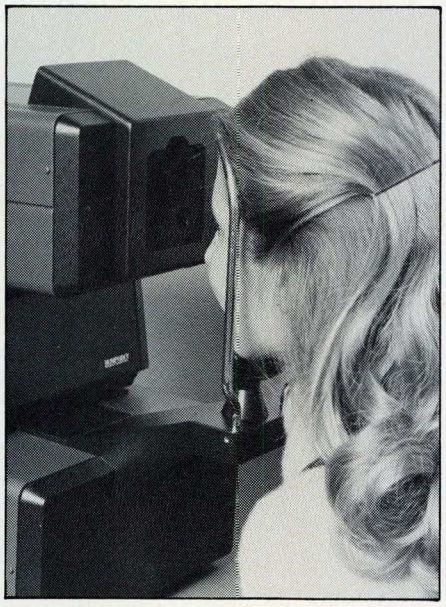

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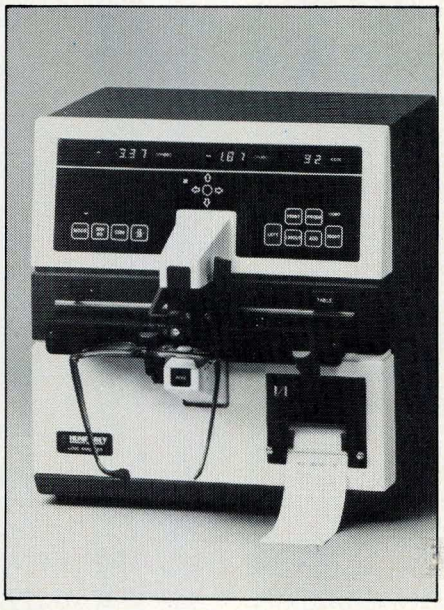

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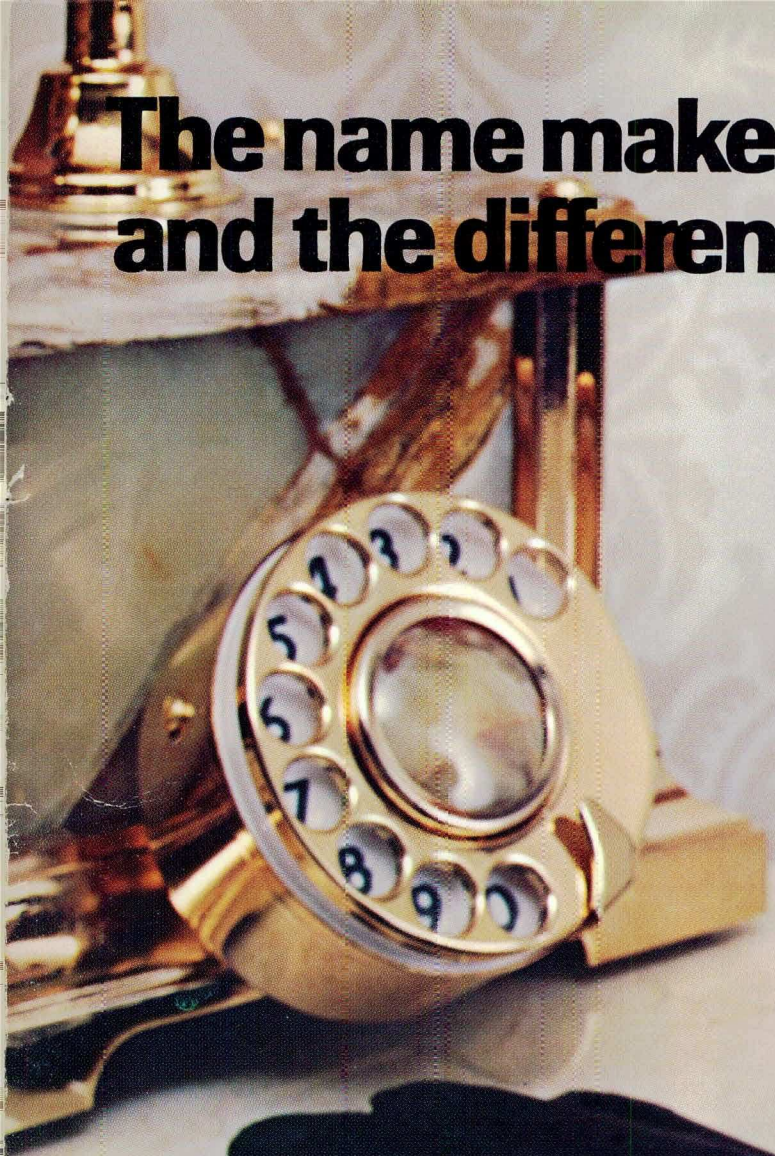

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