CORRESPONDENCE

Myopia in diethylstilboestrol exposed amblyopic subjects

EDITOR,—Diethylstilboestrol (DES) is a synthetic, non-steroidal pseudo-oestrogen. It was prescribed for many pregnant women between 1948 and 1971 with the intention of preventing spontaneous abortions and premature delivery.¹

Embryonic neural tissue is particularly sensitive to gonadal hormones which play a vital part in axonal growth.² "Estrogen and androgen appear to induce inherent neural programs in which androgen increases neurite arborization and the receptive field of individual cells, increasing the likelihood for inter-cellular communication, while estrogen actually induces this communication, in the form of spines, synapses, and gap junctions."³ High myopia rates in opposite sex twins has been attributed to ocular development in the unusual hormonal environment.⁴ DES, among various oestrogenic compounds, is the most effective competitive inhibitor for binding oestrogen receptors in the developing monkey brain.⁵

The purpose of this retrospective study was to assess the effect of DES exposure in utero on ocular development and explore its relation with refractive status associated with amblyopia.

The DES exposed subjects were recruited by placing a notice in the newsletter "DES Action News", asking for people with amblyopia who had been exposed to DES in utero to provide their visual acuity and refractive error measurements. Thirteen DES exposed amblyopic subjects responded. The refractive errors of 10 are shown in Table 1.

The refractive status of the DES exposed group of amblyopes was compared with 255 amblyopic patients with no history of DES exposure. Thirty nine amblyopic subjects with a myopic spherical equivalent in both eyes were identified in the group of 255 patients

(15.3%). It was assumed that this represents the true frequency of myopia among the non-DES exposed amblyopic population. The probability that 10 out of 13 amblyopic subjects will be myopic in a sample of amblyopes was found to be $p \leq 3.4 \times 10^{-6}$ using the exact binomial test.⁶

Table 2 compares the spherical equivalents for both eyes of a group of bilaterally myopic subjects with amblyopia to the DES exposed amblyopes. It is noted that the average and median values indicate that there is a higher degree of myopia among the DES exposed group.

These findings suggest that prenatal exposure to DES, which blocks oestrogen receptors in developing neural tissue, may be a factor in the appearance of myopia among some amblyopic patients who were born in the two decades beginning in 1950. Similarly, prenatal exposure to other pseudohormones which are present in some plants and pesticides, may also affect ocular development.⁷

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- 1 Rotmensch J, Frey K, Herbst AL. In: Mori T, ed. *Toxicity of hormones in perinatal life*. Boca Raton: CRC Press, 1988:144.
- 2 McEwen BS. Steroid hormones and brain development. *Environmental Health Perspectives* 1987; 74:177-84.
- 3 Lustig RH, Hua P, Smith LS, et al. An in vitro model for the effects of androgen on neurons employing androgen receptor-transfected PC12 cells. *Mol Cell Neurosci* 1994;5:587-96.
- 4 Miller EM. Reported myopia in opposite sex twins: a hormonal hypothesis. *Optom Vis Sci* 1995;72:34-6.
- 5 Sholl SA, Kim KL. Estrogen receptors in the rhesus monkey brain during fetal development. *Dev Brain Res* 1989;50:189-96.
- 6 Siegel S. *Nonparametric statistics for the behavioral sciences*. New York: McGraw Hill, 1956:36-42.
- 7 Knight DC, Eden JA. A review of the clinical effects of phytoestrogens. *Obstet Gynecol* 1996; 87(5 Pt 2):897-904.

Cataract and season of birth

EDITOR,—Harding and van Heyningen¹ have done me the honour not only of testing a tentative hypothesis relating to a possible link between the season of birth and the prevalence of [one type of] cataract, but also of quoting from a preprint I sent them. The latter showed that a statistically significant variation of the season of birth is to be observed in the prevalence of mixed nuclear and posterior subcapsular cataracts both in an immigrant Indian population and among natives of the British Isles.

The latter observation does not seem to have caught the authors' eyes, and I made no claim for the conditions described in their paper. While my results may not be valid for Oxfordshire, they refrained from defining the types and distribution of cataracts on which their analysis is based. Consequently we do not know whether Oxfordshire patients with mixed nuclear and subcapsular cataracts may

not perhaps share the observed characteristic, and their results are merely confounded by the addition of those patients who do not.

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- 1 Harding JJ, van Heyningen R. Is month of birth associated with cataract in later life? *Br J Ophthalmol* 1998;82:526-7.

Reply

EDITOR,—We are grateful for Professor Weale's comments on our attempt to test his hypothesis that the risk of cataract may depend on the season of birth. Our results indicated that season of birth was of no importance in an Oxfordshire population,¹ whereas he reported an excess of cataract patients, with some types of cataract, born in the spring on the Indian subcontinent.² The two studies differed in both design and the populations studied. Our results were based on the dates of birth of 723 cataract patients and 1217 controls who took part in two case-control studies of cataract in Oxfordshire.^{3,4} The controls were from both hospital sources and the community (age and sex registers of general practitioners). Each control group was age and sex matched to the cataract group. Dates of birth of all subjects were recorded. All subjects in Professor Weale's study were outpatients at Moorfields Eye Hospital. There was an excess of births reported on New Year's Day in those born on the Indian subcontinent which was dealt with by partial elimination. The Moorfields patients were divided into three ethnic groups: native British, Indian, and Caribbean. There were no controls so he attempted to account for the known seasonal variation in birth rate by using a published monthly birth index. Our use of controls from exactly the same area matched for age and sex would seem preferable. There was a seasonal variation in births of patients in Oxfordshire but it corresponded to that in controls. The different designs could explain the different results.

Professor Weale found an excess of pooled cataract patients born in the spring on the Indian subcontinent. This excess was due to an excess in those with a combination of nuclear and subcapsular cataracts.² The same type of cataract was associated with birth in both the summer and December in "native British", again compared with a birth index, assumed to represent a British control population. In his letter he suggests that we may have lost a significant effect because the critical subtype was diluted by all other cataracts, but that did not occur in his study, indeed the highest level of significance was found when he pooled all types of cataract ($p=0.00032$ compared with 0.0168 for the nuclear plus posterior subcapsular combination). This of course provides the greatest numbers (362). The major disadvantage of subdivision is that the numbers dwindle away and thus the power of the study is diminished. It is not surprising that novel risk factors have mostly been identified in studies on mixed cataracts.⁵

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- 1 Harding JJ, van Heyningen R. Is month of birth associated with cataract in later life? *Br J Ophthalmol* 1998;82:526-7.

Table 1 Refractive errors of 10 amblyopic subjects who had been exposed to DES in utero

Right eye			Left eye		
Sphere	Cylinder	Axis	Sphere	Cylinder	Axis
-11.5			-10.50		
-8.00	+2.50	85	-3.25	+0.50	95
-7.25	+1.75	110	-7.00	+3.50	77
-7.25	+3.25	25	-17.25	+5.25	109
-6.00	+0.50	36	-6.75	+1.75	14
-5.50			-3.50		
-3.00	+2.25	05	-7.00	+2.25	05
-2.50	+3.00	80	-2.50	+2.00	95
-6.25	+2.75	180	-5.75	+2.25	180
-4.00	+5.00	07	-100		

Table 2 Statistical comparison of spherical equivalents for both eyes of two groups of amblyopic subjects

	DES exposed amblyopes (n=10) Spherical equivalent	Amblyopic without DES (n=39) Spherical equivalent
Minimum myopia	-14.63	-18.00
Maximum myopia	-1.00	-0.13
Average	-5.33	-2.67
Standard deviation	3.49	2.86
Standard error	0.78	0.33
Median	-5.38	-1.50

- 2 Weale R. Cataract, glaucoma and season of birth amongst patients born on the Indian sub-continent. *Indian J Ophthalmol* 1998;(in press).
- 3 Van Heyningen R, Harding JJ. A case-control study of cataract in Oxfordshire: some risk factors. *Br J Ophthalmol* 1988;72:804-8.
- 4 Harding JJ, Harding RS, Egerton M. Risk factors for cataract in Oxfordshire: diabetes, peripheral neuropathy, myopia, glaucoma and diarrhoea. *Acta Ophthalmol* 1989;67:510-17.
- 5 Harding JJ. *Cataract: biochemistry, epidemiology and pharmacology*. London: Chapman and Hall, 1991.

Osteo-odonto-keratoprosthesis surgery

EDITOR,—We wish to point out some inaccuracies portrayed by the media on osteo-odonto-keratoprosthesis (OOKP) surgery offered at our hospital. In 1996, we performed our first OOKP operation that was televised as a BBC "Tomorrow's World" programme. In the programme, the operation was described as "new". This was not true as the technique of OOKP was invented by the late Benedetto Strampelli over 30 years ago.^{1,2} A number of surgeons in Britain adopted his technique but their results were disappointing and the technique was abandoned.^{3,4}

Professor Giancarlo Falcinelli of San Camillo Hospital, Rome, made stepwise improvements on the original technique in the past 20 years, and has been obtaining excellent visual and retention results.⁵⁻⁷ One of us (CL) was put in touch with the San Camillo team by Mr Michael Roper-Hall in 1993 and learnt the technique over the course of the ensuing 3 years. Sergio Pagliarini and Christopher Liu independently surveyed Falcinelli's results in 1994.⁸

The "newness" of the operation only related to the introduction of Falcinelli's OOKP technique into Britain for the first time.

We took the opportunity to offer the launch of the Falcinelli technique in Britain to the BBC, when Professor Falcinelli and his team were invited to assist with the first few operations. In the event, Professor Falcinelli was keen to do most of the surgery himself but the television programme had not portrayed him as being the lead surgeon.

Colleagues abroad informed us recently that abridged versions of the programme claimed that Brighton was the only place in the world where OOKP surgery is offered. This is not true. There are many types and techniques of artificial corneas or keratoprostheses (KPro).⁹ An international KPro study group exists and has met every 3 years for exchange of ideas and experience.¹⁰

We can be grateful to the media for increasing the awareness of KPro surgery, but we must make it clear that there have been unfortunate inaccuracies as detailed above.

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Correspondence to: Mr Liu.

- 5 Falcinelli G, Missiroli A, Pettiti V, et al. Osteo-odonto-keratoprosthesis up to date. *Acta XXV Concilium Ophthalmologicum* 1986. Rome: Kugler and Ghedini; 1987:2772-6.
- 6 Falcinelli GC, Barogi G, Corazza E, et al. Osteo-odonto-cheratoprotesi: 20 anni di esperienze positive ed innovazioni. *Atti LXXIII Congresso Soc Oftalmologica Italiana* 1993;529-532.
- 7 Falcinelli G, Barogi G, Taloni M. Osteo-odonto-keratoprosthesis: present experience and future prospects. *Refract Corneal Surg* 1993;9:193-4.
- 8 Liu C, Sciscio A, Smith G, et al. Indications and technique of modern osteo-odonto-keratoprosthesis (OOKP) surgery. *Eye News* 1998;4:17-22.
- 9 Liu C, Tighe B. Striving for the perfect keratoprosthesis. [Editorial] *Br J Ophthalmol* 1998;82:3-4.
- 10 Proceedings of the 1st Keratoprosthesis Study Group Meeting. Miami, Florida, 6 November 1992. (Abstracts.) *Refract Corneal Surg* 1993;9:184-213.

Plasma endothelin-1 concentrations in patients with retinal vein occlusions

EDITOR,—I read with interest the article by Iannaccone *et al*¹ on the connection between venous plasma endothelin-1 (ET-1) level and retinal vein occlusions (RVO). The authors conclude that elevated ET-1 concentration in the peripheral circulation in their patients may be a systemic marker for retinal venous occlusions. Also, they think it possible that the elevated ET-1 level they found in the peripheral blood samples could directly promote the development of retinal vascular occlusions (RVOs).

This latter conclusion seems to be unlikely since local retinal vasoconstriction is supposed to be influenced much more by the local ET-1 concentration than the elevation of the systemic venous ET-1 level. If elevated ET-1 concentrations in the peripheral circulation induce RVO, one would suppose it to be experienced in many RVO cases—for example, in normal pressure glaucoma, which is frequently associated with elevated plasma ET-1 values.^{2,3} On the contrary it is primary open angle glaucoma with elevated intraocular pressure and mild to moderate systemic hypertension that is frequently associated with RVOs.⁴ Both of these conditions are characterised by normal venous ET-1 concentrations.^{1,5} These clinical considerations suggest that the direct influence of peripheral ET-1 levels on the retinal microcirculation is very unlikely.

The authors' main conclusion that RVOs cause a significant elevation in peripheral venous ET-1 concentrations seems to be relevant. However, the authors should have shown some more data to exclude a few factors with a potential influence on their result. Was there any difference in the severity of systemic hypertension between hypertensive RVO patients and the uncomplicated hypertensive control subjects? Severe hypertension does influence the systemic ET-1 level. One supposes that all patients were on medication at the time of the blood sampling for ET-1 measurements. Several medicines including antihypertensive drugs and, possibly, β receptor blocker eye drops have an influence on systemic ET-1 levels. Systemic and topical medications should have been compared between the groups in order to rule out their impact on the ET-1 level. It would have been especially interesting and might have supported the authors' hypothesis on the marker role of venous ET-1 level, if time dependency of the ET-1 level had been investigated individually, at least in the early cases. One may speculate that, early after the development of RVO, systemic ET-1 level may

increase, then decrease later till the onset of retinal neovascularisation, which might induce an increase again possibly via an increased expression of vascular endothelial growth factor (VEGF), since VEGF can cause an increased expression of endothelin converting enzyme.⁶ Interindividual differences might mask the time dependent changes. This may be a reason for the lack of time dependency found by the authors who plotted all individual ET-1 values as a function of time elapsed between the vein occlusion and blood sampling for ET-1 measurement. Finally, I congratulate the authors on their very interesting article.

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- 1 Iannaccone A, Letizia C, Pazzaglia S, et al. Plasma endothelin-1 concentrations in patients with retinal vein occlusions. *Br J Ophthalmol* 1998;82:498-503.
- 2 Sugiyama T, Moriya S, Oku H, et al. Association of endothelin-1 with normal tension glaucoma: clinical and fundamental studies. *Surv Ophthalmol* 1995;39(Suppl 1):S49-56.
- 3 Kaiser H J, Flammer J, Wenk M, et al. Endothelin-1 plasma levels in normal tension glaucoma: abnormal response to postural changes. *Graefes Arch Clin Exp Ophthalmol* 1995;233:484-8.
- 4 Sperduto R D, Hiller R, Chew E, et al. Risk factors for hemiretinal vein occlusion: comparison with risk factors for central and branch retinal vein occlusion. *Ophthalmology* 1998;105:765-71.
- 5 Holló G, Lakatos P, Farkas K. Cold pressor test and plasma endothelin-1 concentration in primary open-angle and capsular glaucoma. *J Glaucoma* 1998;7:105-10.
- 6 Dey D D, Liu F, King G L. Regulation of endothelin converting enzyme 1 mRNA expression by vascular endothelial growth factor (ARVO Abstracts). *Invest Ophthalmol Vis Sci* 1997;38:S762 (Abstract 3524).

Reply

EDITOR,—We would like to thank Dr Hólló for his interest in our work. He raises a variety of important issues, which gives us the opportunity to clarify and expand some points that we raised in the discussion of our paper. First and foremost, we very much agree with him on the very low likelihood that the elevated endothelin-1 (ET-1) plasma concentrations we observed in our patient population may have pre-existed, or be the cause of, the retinal vascular occlusion (RVO). Although we cannot provide conclusive evidence to rule out this possibility, which could be addressed only by a large prospective study on ET-1 levels in a population at risk for RVOs, by no means do we support it. In fact, we concluded that the elevated ET-1 levels are likely to be a consequence of the occlusive event.

We also agree that establishing a precise relation between ET-1 concentrations and time elapsed from RVO diagnosis may indeed be crucial in understanding the role that ET-1 plays in RVOs. Similar to what has been observed in patients with myocardial infarction,¹ it is quite possible that, immediately following the occlusion, ET-1 concentrations may have been elevated to a greater extent, and that ischaemic neovascular complications ensued only in those patients in whom ET-1 levels persisted above a certain threshold level. By inducing experimentally ischaemic branch RVOs, Pournaras and colleagues² showed that ischaemic retinal areas are always hypoxic, yet progression to neovascularisation occurs in only about 50% of cases. They postulated the need for persist-

- 1 Strampelli B. Keratoprosthesis with osteodontal tissue. *Am J Ophthalmol* 1963;89:1029-39.
- 2 Strampelli B. Tecnica E Risultati Della Osteo Odonto Cheratoprotesi. *SOI Proc XLIII* 1964;288-91.
- 3 Casey TA. Osteo-odonto-keratoprotesi and chondrokeratoprosthesis. *Proc Roy Soc Med* 1970;63:313-14.
- 4 Roper-Hall MJ. Why are keratoprostheses not given more attention? *Eur J Implant Refract Surg* 1991;3:79-81.

ence of critically low PO_2 levels for neovascularisation to develop. We suggest that elevated intraretinal ET-1 levels in the area of the occluded vessel may be at least one of the critical factors in causing the low PO_2 retinal levels. A self reinforcing cycle may be taking place locally, in which ET-1 released by endothelial cells following RVO could diffuse in the vicinity of the occluded vessel to the abluminal side of neighbouring pericytes and induce capillary non-perfusion. The ensuing ischaemia could further enhance ET-1 release by retinal endothelial cells, maintaining and extending retinal non-perfusion. Long lasting hypoxia can induce upregulation of vascular endothelial growth factor (VEGF) receptors, VEGF overexpression, and lead to retinal neovascularisation.³ Recent experimental evidence supports the possibility that elevated ET-1 levels occur in retinal neovascularisation and precede VEGF upregulation.⁴ Since ET-1 also exerts a dose dependent mitogenic effect on retinal pericytes,⁵ it is tempting to speculate that persistence of ET-1 about a putative threshold level could perpetuate the ischaemic condition and contribute, hand in hand with VEGF, to the complex chain of events that leads to retinal neovascularisation in RVOs. These hypotheses, although intriguing and well substantiated, await further verification.

The potential effect of confounding factors on ET-1 determinations is also very important. Maximal care was placed in selecting the outpatient population. In fact, nearly half of the population we examined clinically was excluded from the study because it did not meet our stringent inclusion criteria. Lerman and colleagues⁶ have shown elegantly that ET-1 elevations are proportional to the severity of the associated vasculopathy. Other than the RVO itself, we have no evidence to suggest that the control group of uncomplicated hypertensive subjects may have had less severe hypertensive vascular damage than the investigated RVO population. In addition, if this were the case, it would contradict the hypothesis that the observed peripheral ET-1 elevations reflected the local retinal event, on which both Dr Hölló and we seem to agree. All but one of our RVO hypertensive patients (No 18 in the study) were on either mono- or multitherapy for hypertension (range 1–3). Pre-RVO medications included angiotensin converting enzyme (ACE) inhibitors (n=6), calcium channel blockers (n=4), nitrates (n=3), diuretics (n=2), and β blockers (n=1). Although not exactly matched, uncomplicated hypertensives had a similar medication pattern. It has been suggested that ACE inhibitors may reduce ET-1 plasma levels in some disease states.⁷ Our RVO patients on ACE inhibitors, however, did not have ET-1 concentrations (15.05 (SD 5.2) pg/ml) significantly different from the mean ET-1 levels observed in the study (14.22 (4.6) pg/ml) for all RVO patients, yet significantly greater than both normals and uncomplicated hypertensives ($p < 0.01$). The same applied to the RVO patients on calcium channel blockers (16.82 (4.52) pg/ml). We also plotted ET-1 concentrations as a function of the number of hypertensive medications (data not shown), which failed to reveal significant correlations ($R = 0.396$; $p = 0.26$). All seven RVO patients with a history of elevated intraocular pressure were on topical β blockers, but, as addressed in our paper, they had ET-1 plasma levels superimposable to those of RVO patients with normal ocular pressure. Therefore, there is no indication that our measurements may have been

influenced by either systemic or topical treatment regimens. These additional considerations, prompted by Dr Hölló's acute remarks, further confirm our conclusion that the elevated ET-1 levels are most likely accountable for by the retinal occlusive event.

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- 1 Rodeheffer R, Lerman A, Heublein DH, *et al.* Plasma endothelin concentrations are increased in humans with congestive heart failure. *Mayo Clin Proc* 1992;67:719–24.
- 2 Pournaras CJ, Tscapopoulos M, Strommer K, *et al.* Experimental retinal branch vein occlusion in miniature pigs induces local tissue hypoxia and vasoproliferative microangiopathy. *Ophthalmology* 1990;97:1321–8.
- 3 Takagi H, King GL, Ferrara N, *et al.* Hypoxia regulates vascular endothelial growth factor receptor KDR/Flk gene expression through adenosine A_2 receptors in retinal capillary endothelial cells. *Invest Ophthalmol Vis Sci* 1996;37:1311–21.
- 4 Lukiw WJ, Gordon WC, De Turco ER, *et al.* Co-induction of transcriptional activators AP2, HIF, TFIID and of endothelin-1 (ET-1) and vascular endothelial growth factor (VEGF) during retinal neovascularization. *Invest Ophthalmol Vis Sci* 1998;39 (4 suppl):S517.
- 5 Chakravarthy U, Gardiner TA, Anderson P, *et al.* The effect of endothelin 1 on the retinal microvascular pericyte. *Microvasc Res* 1992;43:241–54.
- 6 Lerman A, Edwards BS, Hallett JW, *et al.* Circulating and tissue endothelin immunoreactivity in advanced atherosclerosis. *N Engl J Med* 1991;325:997–1001.
- 7 Galatius Jensen S, Wroblewski H, Emmeluth C, *et al.* Plasma endothelin in congestive heart failure: effect of the ACE inhibitor, fosinopril. *Cardiovasc Res* 1996;32:1148–54.

OBITUARY

Ronald Francis Lowe

, MB,BS(MELB), MD(MELB), FRCS(ENG), FRACS,
FRACO, FCOPH(UK), PHC(MELB), 1913–98

Ronald Francis Lowe was devoted to the very highest standards of ophthalmology. Born in 1913, he died at the age of 84 in March 1998 after a lifetime of service to the Royal Victorian Eye and Ear Hospital and his profession. A tall and imposing man, he also stood tall intellectually and demanded the highest standards of himself and those who worked with him.

Ron Lowe initially trained as a pharmacist before changing to medicine. He graduated in 1939, with first class honours and the prize in surgery. The war years saw him serving in Papua New Guinea and Darwin but towards the end he was seconded ex-army, to the Royal Victorian Eye and Ear Hospital in Melbourne, where he began his career in ophthalmology.

After the war, he became a fellow of the Royal Australasian College of Surgeons and was later awarded the first ever fellowship in ophthalmology by the Royal College of Surgeons, England. On his return to Australia and The Royal Victorian Eye and Ear Hospital he held many senior positions, being a senior ophthalmic surgeon, member of the board

of management and ophthalmologist in charge of the glaucoma unit from 1963 to 1975.

He promoted the international standing of Australian ophthalmology, being a foundation professor and vice president of the Academia Ophthalmologica Internationalis and in 1958 a foundation member of the Asia-Pacific Academy of Ophthalmology. He has been the only Australian president of this organisation.

Ron published prolifically in many international journals, with his main contributions being in the field of angle closure glaucoma. He produced over 60 papers on this topic and studied anterior chamber geometry, glaucoma screening, and the racial and geographical variation in angle closure glaucoma. His latest writings were of a more historical nature, devoted to chronicling of the development of ophthalmic pioneers, both in Australia and overseas.

I remember sitting with him a few years ago in his austere Melbourne office, several floors above Collins Street, with its rattling trams and a driving rain upon the window. He described how he first came to practise ophthalmology at a time when it was not considered a specialty in its own right. He explained his quest to understand angle close glaucoma; how he listened to his patients, how he recorded his observations, how he reflected on possible mechanisms. He described his travels to China and the regional differences in the presentation of glaucoma and how well received he was by his Asian colleagues, eager to learn from this Australian who physically towered over them.

Increasing age had not dimmed his enthusiasm, his knowledge of the literature, or his curiosity about glaucoma in all its forms. He enjoyed great devotion from his patients and was much admired by his peers. His first wife, Lois, died in 1985 and in 1987 Ron married Zena, a fellow ophthalmologist and great companion, with whom he shared many and varied interests. He is survived by Zena, his son, Richard, and his younger brother, Rupert. They can take comfort from the fact that his influence and contributions will long endure.

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NOTICES

Primary Eye Care

The latest issue of the *Community Eye Health* (no 26) discusses the importance of primary eye care, particularly in the developing world. For further information please contact *Community Eye Health*, International Centre for Eye Health, Institute of Ophthalmology, 11–43 Bath Street, London EC1V 9EL. (Tel: (+44) 171 608 6910; fax: (+44) 171 250 3207; email: eyeresource@ucl.ac.uk) Annual subscription £25. Free to workers in developing countries.

Residents' Foreign Exchange Programme

Any resident interested in spending a period of up to one month in departments of ophthalmology in the Netherlands, Finland, Ireland, Germany, Denmark, France, Austria, or Portugal should apply to: Mr Robert Acheson, Secretary of the Foreign Exchange Committee, European Board of Ophthalmology, Institute of Ophthalmology, University College Dublin, 60 Eccles Street, Dublin 7, Ireland.

7th Rotterdam International Skull Base Day/Esner course

The 7th Rotterdam International Skull Base Day/Esner one day course on orbital and peri-orbital lesions will be held on 23 January 1999. Further details: Mrs K Sipman, PO Box 1738, 3000 DR Rotterdam, Netherlands. (Tel: +31 10 40897787; fax: +31 10 4362762).

Ophthalmic technologies

The 9th Ophthalmic Technology Conference will be held on 23–24 January 1999 during the International SPIE symposium on biomedical optics. Further information: The SPIE Organisation, PO Box, Bellingham, WA 98227-0010, USA. (Fax: (+1) 360-647-1445; email: www.spie.org/info/pw)

Laser eye injuries

A conference on the epidemiology, prevention, diagnosis, and therapy of laser eye injuries will be held in San Jose, California on 25–26 January 1999 during the International SPIE symposium on biomedical optics. Further information: The SPIE Organisation, PO Box, Bellingham, WA 98227-0010, USA. (Fax: (+1) 360-647-1445; email: www.spie.org/info/pw)

Office of Continuing Medical Education

The 21st Annual Wilmer Institute's Current Concepts in Ophthalmology will be held on 4–9 February 1999 at the Hyatt Regency Cerromar Beach Hotel, Dorado, Puerto Rico. Further details: Program Coordinator, Johns Hopkins Medical Institutions, Office of Continuing Medical Education, Turner 20/720 Rutland Avenue, Baltimore, MD 21205, USA. (Tel: (410) 955-2959; fax: (410) 614-8613; email: cmenet@som.adm.jhu.edu)

XVII Asia-Pacific Academy of Ophthalmology Congress

The XVII Asia-Pacific Academy of Ophthalmology Congress will be held in Manila, Philippines on 7–12 March 1999. Its theme is

"Ophthalmology in the Asia Pacific Region for the 21st century", the main topics being Cataract, Infection and Inflammation, Glaucoma, and Vitreoretinal disease. Further details: Secretariat, Philippine College of Surgeons' Building, 3/F, 992 North EDSA, 1105 Quezon City, Metro Manila, Philippines. (Tel: (632) 927-2317 or (632) 925-3789; fax: (632) 924-6550; email: pao@pao.org.ph)

Office of Continuing Medical Education

The 16th Annual Wilmer Institute's Current Concepts in Ophthalmology will be held on 14–19 March 1999 at the Manor Vail Lodge, Vail, Colorado, USA. Further details: Program Coordinator, Johns Hopkins Medical Institutions, Office of Continuing Medical Education, Turner 20/720 Rutland Avenue, Baltimore, MD 21205, USA. (Tel: (410) 955-2959; fax: (410) 614-8613; email: cmenet@som.adm.jhu.edu)

Ophthalmological Clinic, University of Creteil

An international symposium on the macula will be held on 26–27 March 1999 at the Ophthalmological Clinic, University of Creteil. Further details: Professor G Soubrane, Chef de Service, Clinique Ophtalmologique Universitaire de Creteil, Centre Hospitalier Intercommunal, 40 Avenue de Verdun, 94010 Creteil, France. Fax: 01 45 17 52 27.

Leonhard Klein Award 1999

The Leonhard Klein Award 1999, valued at DM30 000, will be given for innovative, scientific works in the field of development and application of microsurgical instruments and microsurgical operating techniques. It can be conferred on an individual as well as a group of researchers. The work must be submitted in either English or German by 31 March 1999. Further details: Stifterverband für die Deutsche Wissenschaft eV, Herrn Peter Beck, Postfach 16 44 60, D-45224 Essen, Germany.

12th Annual Meeting of German Ophthalmic Surgeons

The 12th annual meeting of German Ophthalmic Surgeons will be held on 10–13 June 1999 at the Meistersingerhalle, Nürnberg, Germany. Further details: MCN Medizinische Congress-Organisation Nürn-

berg GmbH, Weilandstrasse 6, D-90419 Nürnberg, Germany. (Tel: ++49-911-3931621; fax: ++49-911-3931620; email: doerflinger@mcn-nuernberg.de)

XII Congress European Society of Ophthalmology

The XII Congress European Society of Ophthalmology will be held in Stockholm, Sweden on 27 June–1 July 1999. Further details: Congress (Sweden) AB, PO Box 5819, S-114 86 Stockholm, Sweden. (Tel: +46 8 459 66 00; fax: +46 8 661 91 25; email: soe@congrex.se; <http://www.congrex.com/soe/>)

4th Meeting of the European Neuro-Ophthalmology Society

The 4th meeting of the European Neuro-Ophthalmology Society will be held on 29 August–2 September 1999 in Jerusalem, Israel. Further details: Secretariat, 4th Meeting of the European Neuro-Ophthalmology Society, PO Box 50006, Tel Aviv, 61500, Israel. (Tel: 972-3-514000; fax: 972-3-5175674/972-3-5140077; email: Eunos99@kenes.com)

Ophthalmological Clinic, University of Creteil

An international symposium on the macula will be held on 1–2 October 1999 at the Ophthalmological Clinic, University of Creteil. Further details: Professor G Soubrane, Chef de Service, Clinique Ophtalmologique Universitaire de Creteil, Centre Hospitalier Intercommunal, 40 Avenue de Verdun, 94010 Creteil, France. Fax: 01 45 17 52 27.

Jules François Prize

The 2000 Jules François Prize of \$100 000 for scientific research in ophthalmology will be awarded to a young scientist who has made an important contribution to ophthalmology. All topics in the field of fundamental and/or clinical research in ophthalmology will be considered. The application should be sent jointly with a curriculum vitae, the list of all publications, and three copies of the candidate's 10 most relevant publications to Jules François Foundation Secretary, Professor Dr M Hanssens, Dienst Oogheelkunde, de Pintelaan 185, B-9000 Gent, Belgium. Deadline for applications 31 December 1999.