

On the 200th anniversary of the Madras Eye Infirmary, the first ophthalmic hospital in Asia

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The first eye hospital, not only in India but in the whole of Asia as well, and the second oldest in the world, known as ‘Madras Eye Infirmary’ (MEI) as a public facility was established in Madras city (now Chennai) in 1819 to address the ophthalmic problems of residents of the city and the neighbourhood. Robert Richardson was its first superintendent. Whereas the Madras General Hospital, in the early days of its establishment serviced only the British army personnel and civilians, the MEI, right from inception, serviced Indians for reasons unknown. This facility moved around the town during its early days, but settled in its current location in Marshalls Road (now Rukmini Lakshmiapati Sālai), Egmore (Ézhumbūr) in 1886. The MEI changed names over time: ‘Government Ophthalmic Hospital’ (GOH, in 1886), and presently the ‘Regional Institute of Ophthalmology and Government Ophthalmic Hospital’. Local people fondly refer to it as the Ézhumbūr Kaṅ Āspatiri. Robert Elliott (1904–1913), Henry Kirkpatrick (1914–1920), Robert Wright (1920–1938), K. Koman Nayar (1940–1945) and R. E. S. Muthayya (1947–1956) are significant names in the annals of GOH. Elliott is remembered by ophthalmic surgeons throughout the world for his pioneering surgical-management technique of glaucoma, which involved a novel improvement made over the one proposed by Pierre Félix Lagrange of Bordeaux in 1907. This note recounts the key milestones and scientific landmarks in the pages of the history of this public facility, while referring to the science promoted by the medical men who led this hospital at various times until 1956 and placed it on the world map of medicine.

Human retina requires greater energy than other human tissues, due to high metabolic rate of photoreceptor cells. Consequently the outer retinal cells, with ageing, deteriorate more rapidly¹. One early solution for achieving better vision with advancing age was using eyeglasses. Who invented eyeglasses remains unresolved. Salvino degli Armati (1258–1312) of Florence, Italy, is considered the inventor². However, what is generally accepted is that the spectacles are a late 13th century Italian invention³. Early eyeglasses consisted of two small, circular convex lenses, hinged along the top ends of their handles (Figure 1a), somewhat similar to the pince-nez of the 19th century. Franciscan missionary Roger Bacon (1219–1292) wrote on the science of corrective glasses in 1266 in *Opus Majus* (https://en.wikipedia.org/wiki/Opus_Majus#/media/; accessed on 10 January 2020), but there is no evidence that he developed eyeglasses. American scientist–philosopher Benjamin Franklin (1706–1790) designed bifocals in the mid-1700s (letterpress manuscript: Benjamin Franklin to George Whatley, 23 May 1785. Manuscript Division, Library of Congress (36); <https://www.loc.gov/exhibits/franklin/franklin-scientist.html>, accessed on 14 January 2020).

Early eyeglasses were more of magnifying glasses (Figure 1b): they were thick, heavy and shattered easily. They did not rectify nearsightedness, but enabled people to read. They were developed by grinding and polishing quartz, rather than glass. Early spectacles were usually knotted behind the head with ribbons. Edward Scarlett (1688–1743), a British ophthalmic optician, first developed the rigid temple arms for eyeglasses

in 1730. James Ayscough (1720–1759), another British ophthalmic optician and eyewear designer, improved it by developing folding arms in 1752.

Whereas eyeglasses helped humans to lead a better lifestyle in the Medieval and early Modern Periods, diseases of the eyes have been known for ages^{4,5}. One principal reason for establishing a dedicated eye hospital in London was that the soldiers returning after the Napoleonic



Figure 1. a, An early (the earliest?) depiction of eyeglasses in a wall fresco in the seminary of the Basilica San Nicolo, Treviso, north of Venice. Cardinal Hugo de Saint-Cher (1200–1263) is shown at his writing desk with paired eyeglasses. b, Another fresco in the same seminary showing Cardinal Nicholas de Rouen using a magnifying glass for reading. Both frescoes were painted by Tommaso da Modena (1326–1379). (Source: <http://www.historyof-information.com/detail.php?id=1447>, accessed on 18 January 2020.)

battle at Abu Qir (Mediterranean coast of Egypt, 1799) were affected by keratoconjunctivitis (popularly ‘Egyptian ophthalmia’). Other reasons were cataract and influenza-related ophthalmia that frequented among the British civil populations in the early decades of the 19th century. Before the establishment of dedicated eye hospitals, such as the Moorfields Eye Hospital, asylums for the vision impaired existed in Britain. They served the purpose of keeping the visually challenged in a restricted space – considered meaningful by that society. That the St. George’s Blind Asylum in London later grew into the Moorfields Eye Hospital is a different story^{6,7}.

In India, Vyāsārājā (1460–1539), the 11th pontiff of the Mādhva Matā in Mūlbāgal (13°10’N, 78°24’E) in the Vijayanagarā kingdom during the reign of Kṛṣṇadēvarāyā (1471–1529), is indicated to have used convex eyeglasses for reading – presented to him by a visiting Portuguese trader – in 1520 (ref. 8). When the Marāṭa dynasty ruled Faṅjāvūr in the 1770s (Fūlajā, 1773–1777; Sarabōji II, 1788–1832), naturally available quartz crystals – popularly referred as the Vallam ‘diamonds’ – available as transparent and smoky types were extracted from Vajratirtam in Vallam Vadakkusetti village (presently in Faṅjāvūr district, Tamil Nadu, 10°43’N, 79°5’E; ref. 9, p. 198). The transparent quartz crystals were ground and polished for use as eyeglasses (ref. 10, p. 126), by specific lapidary families who specialized in this task¹¹. Incidentally the United States of America imported both types of Vallam crystals for crafting fashion jewellery in the early decades of the 20th century (ref. 12, p. 198). Talking of Faṅjāvūr, it would be relevant to recall the ophthalmic science promoted by Sarabōji II – Sarabēndra Bhūpala Bhūpati – the titular ruler of Faṅjāvūr kingdom in 1787–1793, 1798–1832. Science and arts flourished in Faṅjāvūr kingdom during Sarabōji’s reign¹³. He was deeply interested in medicine in general and ophthalmology in particular¹⁴. The contemporary Chennai (Madras) ophthalmic surgeon Sēngamēdu Badrinath speaks of Sarabōji’s cataract extractions in detail¹⁵.

References to cataract extraction can be found in the *Suśruta Śamhita* (Uttara Faṅtrā, c. 800 BC)¹⁶. Suśruta describes this procedure done via couching (or reclination), in which the ocular lens was pushed to the rear section of the eye

using a needle. The corrected eye was dressed with clarified butter and banded¹⁷. Couching for cataract, referred as jin-pi-shū in Mandarin, spread to China during the period of the later Western Han Dynasty (200 BC–200 AD) and spread throughout that country in AD 600–900. This practice later combined with the Chinese acupuncture and got integrated into Chinese medical practice¹⁸.

In the 19th century, asylums for the visually impaired existed in India as well. Udit Narayan Singh, king of Banaras (now Vāranāsi), built one in 1826 (ref. 19). Another one, established by Christian missionaries and partly supported by the local government, functioned in Allahabad at the same time²⁰. These facilities sheltered the visually challenged. They did not offer either reparative or remedial action, as the eye infirmary in Madras or the Ophthalmic Hospital in Calcutta did.

The Madras Eye Infirmary (1819), the Government Ophthalmic Hospital (from 1886)

Frederick Pinsent Maynard (1864–1921), Ophthalmic Surgeon attached to the Bengal Medical Service, Calcutta, lamented (ref. 21, p. 208):

‘The new eye hospital for Calcutta is still only in the state of being proposed. The Madras Ophthalmic Hospital had made considerable progress towards its present condition ...’

while writing on the hope of establishing a new eye hospital in Calcutta in the 1910s. The Madras Eye Infirmary (MEI) was a heartburn to medical professionals and administrators in other Indian Presidencies and Principalities in the early decades of the 20th century.

The MEI, renamed as the Government Ophthalmic Hospital (GOH), Madras (13°5’N, 80°16’E) in 1886, has withstood the test of time and grown by building reputation, reliability and tradition. Today it stands toweringly as the ‘Regional Institute of Ophthalmology and Government Ophthalmic Hospital’ starting humbly in 1819. It is the oldest exclusive eye hospital in Asia and the second oldest dedicated ophthalmic facility in the whole world, next only to the Moorfields Eye Hospital in London, established in 1805.

1819–1901

With rising eye problems of soldiers of the Madras army, the Board of Directors at Fort St George decided to establish an eye hospital in Madras, naming it the MEI, somewhere at the rear of the Madras Club (suspected as the Compton’s Gardens) in Royapettah, Madras, in July 1819 (Figure 2). Robert Richardson was appointed as the superintendent of MEI in July 1819. Available information pertaining to the appointment of Richardson is conflicting. One is that he was a student of then well-known British ophthalmic surgeon Benjamin Travers, who was also the health adviser to English East India Company; Travers recommended Richardson and sent him to Madras to establish the MEI. According to Treacher-Collins (ref. 22, pp. 37–38):

‘Travers held the appointment of surgeon in London to the East India Company. In 1819 its Honourable Directors became impressed by the great prevalence of eye disease in the large and populous districts over which they ruled, and applied to Travers in the matter. He pointed out to them the excellent results which had followed the establishment of the Eye Infirmary in London, and that similar Institutions might be started in India. This advice was accepted, and Mr R. Richardson, one of the Company’s surgeons, who had studied ophthalmology under Travers, was sent to Madras, where he founded the Madras Eye Infirmary.’

The other is that Richardson was serving with the Madras Medical Service as an Assistant Surgeon from 1905 and was recruited as the foundation-stone Superintendent of MEI at the rank of full surgeon in 1819. Diron Grey Crawford²³ indicates (p. 293):

‘523. Richardson, Robert. M.R.C.S. (1802). Surg. Mate. Ceres, 1802–03 (1802-built ship). Surg. Canton, 1804–05 (1790-built ship). A. S. (Assistant Surgeon) 15 July 1805, Surg. 18 February 1819. D. at Madras, 31 May 1824, S.A.L.L.M. (Service Army Lists Medical, Madras) gives the first date of commission as 15 July 1807.’

1842

Alexander Lorimer, Garrison Assistant Surgeon, Fort St George, prepared the *Report on the Medical Topography and Statistics of the Presidency Division of the Madras Army*²⁴, based on the instructions from the Directors of the Court at Fort St. George and authorized by George Pearse, Secretary, Medical Board, Fort St. George. Since this report includes excellent comments on MEI in the years 1830–1836, we reproduce be-

low two of Lorimer’s remarks (p. 54), that are self-explanatory:

‘The eye infirmary was established in 1819, and is open for the reception of European and native soldiers, as well as for Europeans and natives not belonging to the service. The medical charge is vested in the Company’s oculist; the duties being conducted under the general supervision of the Superintending surgeon, and of the Medical Board. Assistant surgeons

recently arrived from Europe are enjoined to pay every possible attention to the practice in this institution; and they are ordered to attend there frequently, and especially on the day set a part for operations.’

‘The eye infirmary is situated at the S.W. extremity of Vepery, in a large enclosure adjoining the Poonamallee road. The edifice which has a southern aspect is built of brick and terraced, and consists of a centre and two wings. The centre portion which is two stories high, is the residence of the superintendent; the wing on either side, of one story, forming the wards for the patients; one wing consists of a ward 133 feet (40.5 m) long, and 20 (6.1 m) broad, capable of containing 103 patients, and the other is divided, into four separate apartments, viz. one for sepoy, a second and a third for natives, and the fourth for all serious cases, particularly those who have undergone any operation. This wing can accommodate 105 patients, so that the whole house is calculated for 208 patients. It is well ventilated by doors, and Venetian windows; and there is an ample supply of good water on the premises. A commodious surgery and rooms for the medical subordinates are attached, also a room natives to take food, with cooking-rooms, and other conveniences.’

The MEI was shifted to a building (which does not exist anymore) on the road referred today as the E. V. K Sampath Salai (until recently, the Randalls Road), closer to Poonamallee (High) Road in Vepery in 1820. Thomas Moore-Lane was appointed as a deputy to Richardson in October 1823. He succeeded Richardson in May 1824 as superintendent and held the position until 1844. Moore-Lane had earlier trained at Moorfields as an oculist (ophthalmologist). He earned his Fellowship of the London Royal College of Surgeons in 1844, the year he died because of cholera. During his tenure in Madras, he was also the consulting physician to the 12th Nawab of Arcot Ghulam Mohammed Ghouse Khan.

Lorimer²⁴ furnishes details of treatments provided for amaurosis, incipient and morgagnian (read ‘morgänian’) cataracts, acute, chronic and suppurative



Figure 2. Map of the city of Madras, c. 1914. The star at the top shows the approximate the second location of the eye infirmary in Vepery (1820–1885). The star in the middle shows the final destination of the Government Ophthalmic Hospital in Marshalls Road (see the notation ‘Ophthalmic Hospital’). The star at the bottom shows the approximate location of the first established eye infirmary in Royapettah in 1819. (Source: Baedeker, K., *Indien – Handbuch für Reisende*, Verlag Karl Bädeler, Leipzig, Germany, 1914.)

HISTORICAL NOTES

Table 1. Presiding Officers of Madras Eye Infirmary (1844–1885) and Government Ophthalmic Hospital (1886–1901)

Name	Title	Designation	Period
W. B. Thompson	Surgeon	Superintendent	1844–1851
J. Shaw*	Surgeon	Superintendent	1851–1857
J. L. Paul	Surgeon	Relieving Superintendent	1857–1859
J. Shaw	Surgeon	Superintendent	1859–1862
G. Smith	Surgeon	Superintendent	1862–1869
H. C. Brodrick**	Surgeon	Superintendent	1869 (two months only)
Turnbull***	Apothecary	In-charge	1869 (May–September)
E. F. Drake Brockman	Assistant Surgeon	Relieving Superintendent	1869–1870
W. N. Chipperfield*	Surgeon	Superintendent	1870 (June–September)
M. C. Furnell*	Surgeon	Superintendent	1870–1872
W. N. Chipperfield	Surgeon	Superintendent	1872–1873
E. F. Drake Brockman	Surgeon	Relieving Superintendent	1873 (May–December)
M. C. Furnell*	Surgeon	Superintendent	1874
E. F. Drake Brockman	Surgeon	Superintendent	1875–1877
C. Sibthorpe	Surgeon	Relieving Superintendent	1877–1878
E. F. Drake Brockman	Surgeon	Superintendent	1878–1884
C. Sibthorpe	Surgeon	Superintendent	1878 (February–December)
E. F. Drake Brockman	Surgeon	Superintendent	1884–1892
T. H. Pope	Surgeon	Superintendent	1892–1895
R. H. Elliott	Surgeon	Superintendent	1895–1896
T. H. Pope	Surgeon	Superintendent	1896–1901

*Were Principals of the Madras Medical College at some stage. **Died in office. ***No further details available.



Figure 3. Government Ophthalmic Hospital in Marshalls Road (1886).

ophthalmias, ulcerated corneas, nebula, albugo and night blindness to both lying-in patients and outpatients at the MEI (pp. 55–58), supplemented by relevant statistics.

1844–1901

Table 1 lists the names and service periods of successive presiding officers, from 1844 to 1901. In 1886, during Drake-Brockman's third-phase superintendence (1884–1892), the MEI shifted to its present location on Marshalls Road (now Rukmini Lakshmi pati Sālai) enabled with new buildings and renamed as the Government Ophthalmic Hospital, fully supported by the Government of Madras.

Joseph Fayer²⁵, professor of surgery, Calcutta Medical College, Calcutta (1859–1872) remarks (p. 235):

‘The practice of the hospital (GOH, Madras) is open to all members of the medical profession, both European and Native, and affords an extensive field for acquiring knowledge in the diseases of the eye.’

New Marshalls Road precinct

The buildings in the new precinct were designed by the consulting architect of the Government of Madras, Robert Fellowes Chisholm (1840–1915), who championed the Indo-Saracenic style of construction in Madras (e.g. Madras

Central Station, the Presidency College, Senate House of the University of Madras) and elsewhere in India (e.g. Laxmi Vilas Palace, Vadodara; Napier Museum, Thiruvananthapuram and All Saints' Church, Bengaluru).

The principal hospital complex at GOH consisted of three two-storied blocks that ran north–southerly in a row (Figure 3), with a large water tank opposite to the main entrance. An ornamental railing enhanced the beauty of the constructed buildings. The middle block was meant for administration, which included a surgical theatre, offices, an examination room, and more than one medical store. The southern block, intended for female patients, could accommodate nine European and 20 Indian women. The northern block was identical to the southern block, but was for male patients. Both female and male blocks included separate resting rooms with two beds each, for house surgeons and junior duty medical personnel. In 1889 and 1891, two separate inpatient wards with six beds each were added for Indian army personnel and privileged Indian civilians. Separate outpatient clinics functioned for Europeans and Indians. A residential accommodation adjoining the hospital was available for the residing duty medical officer. The outpatient clinic opened at 7 a.m. every day and patients were seen by the Superintendent until 9 a.m.

Promotion of the science of ophthalmology

Surgeons who led the hospital then not only practised ophthalmology by treating patients, but also promoted the science of ophthalmology by publishing details of various procedures they performed in professional medical journals. Papers referring to their work are available in journals published in both Madras and elsewhere. Three are cited below as examples:

- (i) 1842: Moore-Lane, T(homas): case of strabismus with some observations on the performance of the operations for the cure of that disease. *Madras Quarterly Medical Journal*, IV, 66.
- (ii) 1901: Pope, T(homas) H(enry): on cataract in the Madras Presidency. *Indian Medical Gazette*, 36, 237.
- (iii) 1889–1890: Drake-Brockman, E(dward) F(orster): Fibro-cartilagenous tumour of the upper eyelid. *Transactions of the South-Indian Branch of the British Medical Association*, Madras, III, 226.

The *Indian Medical Gazette*²⁶ includes a summary of an article by Drake-Brockman, earlier published in the *Ophthalmic Review* in 1888, in which Drake-Brockman had referred to hundreds of cataract extractions performed during his stay at the MEI. This report includes the following remarks (ref. 26, p. 236):

‘The 1,626 operations were made up as follows: primary capsule rupture 1,433 (268 with iridectomy; 1,165 without), 105 Mooren’s, 59 Teale’s, 15 Pagenstecher’s operation, and 14 linear. The cataracts are classified as follows: cortico-nuclear 939; hard senile 377, morgagnian 209; congenital 53; cortical, traumatic 21; lamellar 3 (total 1,626). ... Madras the ‘mixed’ cataract is the most frequent form, and after it the ‘hard senile’. The nature of the food of Madras Hindoos is said to influence the formation of mixed and diabetic cataracts’.

The same issue of the *Indian Medical Gazette*²⁶ also includes two other short paraphrased reports (p. 237): (i) on Drake-Brockman’s (cataract) operation: primary capsule rupture, and (ii) on T. H.

Pope’s cataract procedure in the Madras Presidency.

1901–1956

By 1909, 76 beds existed in the GOH. Every day 120–130 outpatients were seen. New inpatient wards, ‘Connemara’ for the military personnel and the ‘Lady Lawley Block’ were inaugurated in 1911 by Annie Allen Cunand, wife of Arthur Lawley, Governor of Madras (1905 and 1911). Robert Henry Elliot (1904–1913), Henry Kirkpatrick (1914–1920), Robert Ernest Wright (1920–1938), K. Koman Nayar (1940–1946), and R. E. S. Muthayya (1946–1956) are noteworthy names in the annals of the GOH (indicated years refer to their periods of superintendence of the GOH).

Robert Henry Elliot (1864–1936)

Robert was born as the son of an army officer in Bombay (now Mumbai) in 1864. He entered the Indian Medical Service (IMS) in 1892 and served in Madras for several years, mostly as an ophthalmic surgeon. While serving as the superintendent of the GOH, he also held the conjoint professorship of ophthalmology in Madras Medical College (MMC). He returned to England in 1914 due to poor health. In 1913 and 1922, Elliot travelled to USA and participated in the American Ophthalmic Society meetings. In 1923, he published ‘the mists and haloes of glaucoma’ in the *American Journal of Ophthalmology*.

Elliot expanded the hospital substantially by making significant changes and improvements. He laid out plans and secured them for the better teaching and practice of ophthalmology.

Elliot pioneered, while at the GOH, in performing sclero-corneal trephining to treat chronic glaucoma, which has come to stay as the Elliott’s operation^{27,28}, which was widely referred to throughout the world as a premier procedure in glaucoma management at least until the 1970s. Elliot’s procedure combined trephining with iridectomy, wherein he modified the technique proposed by Pierre Félix Lagrange of Bordeaux²⁹. Based on 50 procedures he had performed earlier, Elliot reported his improved technique of sclero-corneal trephining in the then popular British

journal *Ophthalmoscope*²⁷ first, and as the book *Sclero-corneal Trephining in the Operative Treatment of Glaucoma*³⁰, five years later. Since the Glasgow surgeon Andrew Freeland Fergus had applied trephining to the sclera before 1909, Elliot’s work was intensely debated for its novelty and priority. However, Fergus was not successful in using the trephine adequately forwards to tap the anterior chamber. Elliot was the first to propose dissecting a short passage into the cornea before using the trephine. In principle, Elliot’s sclero-corneal trephine surgery involves the provision of a sub-conjunctival fistula through which aqueous humor can drain from the eyeball into the conjunctiva (Figures 4 and 5).

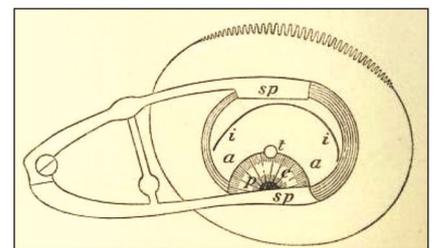


Figure 4. Sclero-corneal trephining developed by Elliot in Madras. *sp*, Speculum; *ii*, Incision in conjunctiva; *c*, Cornea; *t*, Trephine hole; *p*, Pupil; *aa*, Uncut conjunctiva which serves to allow filtering fluid from the neighbourhood of the trephine hole to pass into the rest of the sub-conjunctival space. (Source: Elliot³⁶, p. 42, figure 12A.)

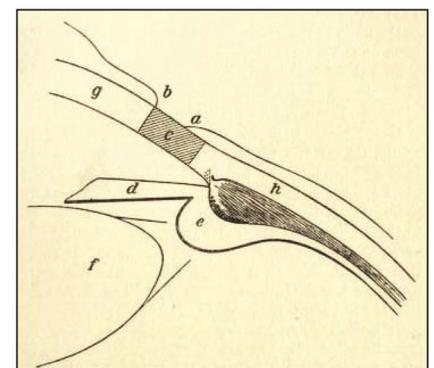


Figure 5. Sclero-corneal trephining developed by Elliot in Madras: diagram shows in section the relation of the parts in a trephined eye. *a*, Normal position of conjunctiva; *b*, Conjunctiva reflected onto the cornea, after splitting of that membrane; *ab*, Area of the crescent formed by splitting the cornea; *c*, Piece of sclero-cornea removed by the trephine (shown shaded); *d*, Iris; *e*, Ciliary body; *f*, Lens; *g*, Cornea; and *h*, Sclera. (Source: Elliot³⁶, p. 43, figure 12B.)

In well-managed conditions, the aqueous humor will diffuse over the eyeball and be gradually absorbed into the general circulation under the cover of an intact conjunctival epithelium. Elliot's sclero-corneal trephining combined with a peripheral iridectomy, done under a conjunctival flap, was revolutionary and proved brilliant. His procedure set the gold standard to deal with high-pressure glaucoma, up to the 1970s.

On his return to England in 1914, Elliot worked as an ophthalmic surgeon at the Tropical Diseases Hospital and lectured in ophthalmology at the School of Hygiene and Tropical Medicine, London. Copies of his publications, original drawings, slides and catalogues are archived at the London School of Hygiene and Tropical Medicine. These archived materials include hand-drawn and colour illustrations of diseases of the cornea. For many years, Elliot was the Madras correspondent of the *Ophthalmoscope* (Britain). In 1912, 1913, and 1924, he participated in the production of the *Ophthalmic Yearbook* (USA). In 1917, Elliot was the John Hunter lecturer at the Royal College of Surgeons, when he spoke on the traditional Indian practice of cataract extraction by couching, which was published in 1918 (Figure 6). His book *Sclero-corneal Trephining*³⁰ ran

two editions, and so also his *Treatise on Glaucoma*³¹. Elliot was a skillful conjurer (see Indian conjuring. *Nature*, 1936, **137**, 425–427). He was interested in the problems caused by snakebites (see Researches into the nature and action of snake venom. *The British Medical Journal*, 1900, **1**, 309, 1146, **2**, 217).

Elliot published several books and monographs:

- (i) 1917: *Glaucoma, A Handbook for the General Practitioner*, Paul B. Hoeber, New York, USA, p. 60.
- (ii) 1918: *The Indian Operation of Couching for Cataract: Incorporating the Hunterian Lectures*, Paul B. Hoeber, New York, USA, p. 94.
- (iii) 1918: *Glaucoma: A Textbook for the Student of Ophthalmology*, Paul B. Hoeber, New York, USA, p. 546.
- (iv) 1920: *Tropical Ophthalmology*, Henry Frowde, Hodder and Stoughton, London, UK, 1920, p. 525.
- (v) 1921: *The Care of the Eye Cases – A Manual for Nurse Practitioner and Student*, Henry Frowde, Hodder and Stoughton, London, UK, p. 172.

During Elliot's superintendence, an Australian, George Paul, after training in Moorfields (London) and qualifying from the Royal College of Surgeons in London in Ophthalmology, trained at the GOH in 1911 (ref. 32), very likely in glaucoma management, with Elliot. For what length of period he trained in Madras is not available. Paul later served as an honorary eye surgeon in Sydney Eye Hospital for about a decade and died prematurely in a road accident in 1924.

Henry Kirkpatrick (1871–1958)

Henry Kirkpatrick entered IMS in 1898. First he was appointed physician at the GOH. He concurrently served as the professor of pathology in MMC. Kirkpatrick reorganized the pathology museum at MMC, assisted by T. S. Tirumurti, who later became the professor of pathology at MMC. During his stay at MMC, Kirkpatrick periodically collaborated with Elliot of GOH in various projects. Fitzpatrick officiated relieving superintendent of the eye hospital when Elliot went on leave. On Elliot's retirement in 1914, Kirkpatrick became the superintendent of the GOH, holding a conjoint position of professorship of ophthalmology at MMC.

In 1918, he left Madras on leave, pending retirement from 1920. He was the primary architect of the Elliot School of Ophthalmology, a teaching facility, which opened in 1920, when his successor Robert Wright was the acting superintendent. A report on the work done at GOH during his superintendence includes impressively detailed statistics of the in- and outpatients treated, cataract procedures, iris prolapse, vitreous-escape repairs, corrective measures carried out for dislocated lenses, senile lenses, glaucoma, optic atrophy and corneal infections³³. This report also refers to treatments offered to eye problems associated with syphilitic infections.

On retiring from service, Kirkpatrick practised ophthalmology in London. Elliot in *Tropical Ophthalmology*³⁴ acknowledges Kirkpatrick's assistance (pp. xi–xii):

‘Lieut.-Colonel H. Kirkpatrick has most kindly contributed chapters on the Madras operation for cataract, and on the ophthalmoscopic appearances found in natives of India. He has also assisted me most liberally by means of personal communications, and by his advice on a number of difficult points. Last, but not least, he has furnished me with a number of drawings and paintings which only require to be seen to be appreciated.’

Like Elliot, Kirkpatrick also worked as an ophthalmic surgeon at the Tropical Diseases Hospital and lectured in ophthalmology at the London School of Hygiene and Tropical Medicine. During that time, he published two books:

- (i) 1921: *Cataract and its Treatment*, Henry Frowde, Hodder, and Stoughton, London, UK, p. 228.
- (ii) 1936: *Diseases of the Eye: A Manual for the Practitioner*, Butterworth & Company, London, UK, p. 164.

Robert Ernest Wright (1884–1997)

Robert Wright, after earning his IMS title, trained in bacteriology with David Semple at Kasauli (30°9'N, 76°9'6'E). After a short stint in northern Burma, he was appointed as the assistant superintendent of the Pasteur Institute at Coonoor (11°35'N, 76°82'E) in 1911. At this time his research focus was on filariasis

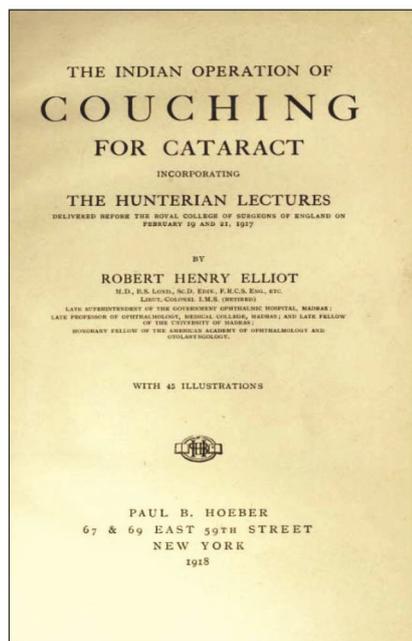


Figure 6. Robert Elliot's monograph on the ancient Indian practice of couching for cataract extractions (1918).

and its agents and the transmitting vectors. Wright was the relieving professor of pathology at MMC in 1913. After a brief posting in Mesopotamia (West Asia, between Euphrates and Tigris rivers) during World War I, he entered Madras Medical Service and was appointed as the deputy to Fitzpatrick in 1919. From 1920 he took over as superintendent of the GOH and concurrently held the professorship of ophthalmology at MMC.

Wright served at the GOH for 18 years. During this stint he conducted a range of eye surgeries. He saw relief freedom from blindness for Indians as the primary task. In his own words (ref. 35, p. 250):

‘In an article in the *Lancet* for April 11, 1931, which has probably passed unnoticed by the International Association for the Prevention of Blindness, I tried to show that keratomalacia (not ophthalmia neonatorum) was the greatest cause of preventable blindness in India. I referred to the difficulty of dealing with such a huge economic problem. This, note of pessimism, has become even more justified in the last months. Still I am convinced that a great deal of good might be done by well-directed efforts to combat preventable blindness. The prevention of blindness is a problem to which any philanthropic organisation, carefully advised and controlled, might well direct its attention, but in so far as blind relief goes, the Government ophthalmic organisations in this country are in a better position to extend such relief than any philanthropic body. Public money, which is given with a view to the relief of blindness in India, would be much more economically administered by the existing machinery, and thus save the cost of reduplicating administrative staff.’

Wright initiated the specialist academic programme ‘Licentiate in Ophthalmology’ (LO), first of its kind in the whole of India. He developed the Elliot School of Ophthalmology further, by integrating a museum to it, including several unique specimens of ophthalmic science. Although during early days he spent his furloughs advancing knowledge with many well-known European ophthalmic surgeons of that day, after 1926, Wright

was greatly inspired by American ophthalmologists and pathologists. On retirement, he returned to England and served as lecturer at the London School of Hygiene and Tropical Medicine for some time. When World War II broke out, Wright directed the ophthalmic department of the Cambridge Military Hospital, Aldershot. He died at 93, on 22 December 1977.

Unlike his predecessors Elliot and Kirkpatrick, Wright published only journal articles. A few are mentioned below, which were published when he was the superintendent of the GOH.

- (i) 1921: Blocking of the facial nerve in cataract operations. *American Journal Ophthalmology*, **4**, 445–446.
- (ii) 1923: Blocking of the main trunk of the facial nerve in cataract operations. *Archives of Ophthalmology*, **52**, 166–167.
- (iii) 1926: Blocking of the main trunk of the facial nerve in cataract operations based on experience of over 150 cases. *Archives of Ophthalmology*, **55**, 555–559.
- (iv) 1929: Akinesia during extraction of cataract. *Archives of Ophthalmology*, **2**, 691.
- (v) 1929: Ophthalmology in relation to research. *Indian Medical Gazette*, **64**, 217–225.
- (vi) 1930: Superficial punctate keratitis. *British Journal of Ophthalmology*, **14**, 257–291.

- (vii) 1933: Details of cataract extraction. *American Journal of Ophthalmology*, **16**, 228–231.
- (viii) 1933: The operative treatment of cataract. *Irish Medical Science—Sixth Series*, **94**, 549–566; **95**, 509–610.

The Elliot School of Ophthalmology

In 1919, when Kirkpatrick was the superintendent, this School honouring Elliot was formally opened on 16 February 1920. It was developed as a postgraduate training facility in the field of ophthalmic pathology, in which Kirkpatrick had long experience. Wright greatly enhanced the quality of this school by adding a museum that included a delightful range of important medical specimens and clinical sketches. Today, the Elliot School is a key constituent of postgraduate training in ophthalmology at the GOH (Figure 7). Two recent popular articles (<https://www.thehindu.com/news/cities/chennai/chen-downtown/a-storehouse-of-ophthalmic-artifacts/article46-81607.ece>, accessed on 25 January 2020; <https://www.newindianexpress.com/cities/chennai/2018/jul/16/200-years-of-a-clear-vision-1843760.html>, accessed on 25 January 2020) supply information about this School. Notable that this School celebrates its centenary in the present year, i.e. 2020.

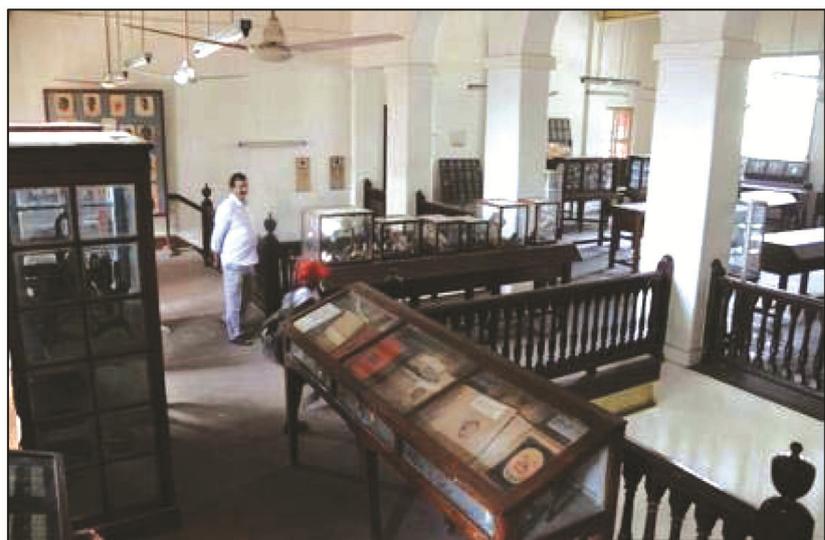


Figure 7. A view of the Elliot School of Ophthalmology at the Madras Government Ophthalmic Hospital. (Source: <https://www.thehindu.com/news/cities/chennai/chen-downtown/a-storehouse-of-ophthalmic-artifacts/article4681607.ece>, accessed on 24 January 2020.)

K. Koman Nayar

The first Indian superintendent of the GOH was Koman Nayar, who took over in 1940 after Robert Wright left in 1938. The LO programme initiated by Wright was revamped and upgraded as the Diploma in Ophthalmology (DO) in 1942. Nayar retired in 1945 and was succeeded by K. C. Shankar Menon, who served as the superintendent until 1947. Both Nayar and Menon had qualified for the Diploma in Ophthalmic Medicine and Surgery (DOMS), which was offered as a specialty training jointly by the Royal Colleges of Physicians and Surgeons, London, from 1921.

R. E. S. Muthayya

A skilled eye surgeon and pathologist, Muthayya (Figure 8, in office 1947–1956) was appointed as the superintendent in 1947. He held a DO from the University of Oxford, further to the title of Master of Surgery. He envisaged and established India’s first ‘eye bank’ at the GOH in October 1947 with the Government’s permission to collect eyes from the dead and use them to provide vision to cornea-blind persons. He performed a corneal transplant surgery in 1948, the first ever attempt in India. During Muthayya’s term as the superintendent, the present-day programme of advanced

training in ophthalmology was introduced. He also launched the MS programme in ophthalmology with an annual intake of two candidates in 1949. Muthayya retired in 1956.

Conclusion

Two mobile ophthalmic units were introduced with support from the Government of Madras in 1957. These mobile units were actively involved in providing relief for eye ailments in the villages located in a radius of 100 miles (c. 160 km) around the GOH. Under the second Five-Year Plan of the Government of India, a request to train an optometry-support team saw the commencement of a School of Optometry at the GOH in 1962. It was India’s first diploma programme in optometry with a provision to train 30 students each year. Ever since, the School has been training scores of optometrists, delivering service in India and abroad.

Today, the Regional Institute of Ophthalmology and Government Ophthalmic Hospital stands with dignity and pride. It has grown as a national facility enabled with equipment and expertise to deal with photocoagulation, contact lens, glaucoma, vitreo-retina, orbit and oculoplasty, uvea and low-vision aid, further to specialist departments of strabismus-paediatric ophthalmology and neuro-ophthalmology. Two hundred years of commendable service to the Indians, from a modest beginning as an infirmary in 1819.



Figure 8. R. E. S. Muthayya.

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