

Journey of the Ophthalmologist

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Understanding vision has been the challenge of learned men from time immemorial. Ophthalmologist therefore, is one of the earliest documented specialist! In the evolution of human race, a hunter depended on his vision mainly for his prowess. This probably led to the process of understanding the exquisite sense organ of vision. Ophthalmos, the source of the word Ophthalmology, appears in Homer's epic work ODYSSEY. The famous papyrus Ebers of the ancient Egypt had a significant portion dedicated to the diseases of the eye.

In Greek mythology, Panoptes had eyes all over the body and was probably the originator of the concept of Visual field. Iris (the anterior part of the uveal tract) was the mythological messenger with colours of rainbow. Pres by, meaning arms too short; the word presbyopia originates from this. Many symptoms and diseases of the eye still reminiscent of the same – Amaurosis, cyclopia, etc. As per Greek mythology, Apollo was the celestial healer and probably the first Ophthalmologist. In Indian mythology, the twin Ashwini Kumaras, sons of Surya, Sun god are the celestial ophthalmologists. Literary works have always lauded the eyes as an indicator of beauty and character. That apart, scientifically the Anatomy of the eye has been described in many ancient text books of the west and the east.

Optics, a sub speciality of physics is the fundamental science used in Ophthalmology. Sun light was catalyst in understanding visual science. It originated from observing natural phenomena like shadow, rainbow, eclipse, etc.. Sun was worshipped as the creator of life from time immemorial. Sun gazing is a part of some religious practice even today. In some ancient Indian temples the wave theory of light has been demonstrated in the simple pin hole camera. The scientific recording and measuring of visual acuity was essentially evolved from early man's ability to see the

stars and celestial bodies, based on the concept of visual angle. The electro magnetic properties of light was depicted as mythical energy of Gods. The instruments in diagnostics and treatment of eye care were built upon principles of optics, derived from fundamental observation of universal phenomena. Many natural optical phenomena have influenced naming of the symptomatology of eye diseases. Description of corneal opacities as nebula and macula, 'Steamy Cornea' the description of oedematous cornea in acute congestive glaucoma, coloured haloes like the colours of the rainbow, etc., are some examples. The famous ancient Indian surgeon Sushruta described many eye diseases and their treatment including cataract surgery(Couching) and detailed the instrumentation; practiced under aseptic techniques.

Spectacles can be called as the earliest documented medical aids/devices. Glass making, which led to spectacle making, many centuries later probably started in Egyptian and Chinese culture. In 15th century, magnifying glasses were existing. Leuwenhock, an Austrian optician, happened to invent the first light microscope while working with lenses. Needless to say that this discovery and visualization of microbes was a turning point in science. Isaac Newton described the physical properties of light and Galileo built the first telescope in the same era. Optics progressed by leaps and bounds in 16th and 17th centuries. Daviel in early 18th century described the intra capsular cataract extraction, which was considered the ultimate technique for a long time as the earlier prehistoric technique of Couching could not stand the test of scientific times. Invention of ophthalmoscope by Babbage and Helmholtz, Regional anaesthesia in 19th century by Kolner, understanding the intra ocular pressure by Von Graefe, use of pilocarpine are some events that have revolutionized optics, instrumentation and ocular pharmacology.

The first eye hospital was the Moore fields eye hospital (1805) which pioneered the establishment of ophthalmology as a specialized branch. 19th and 20th centuries were the period of tremendous progress in Ophthalmology, which slowly evolved as a technology based branch. Every invention and progress in science found a place in Ophthalmology. The slit lamp bio microscope by Gullstrand was the next revolutionary invention. The science of Ortho keratology probably used in ancient Egypt, the modern refractive surgery evolved in late 19th century. Sato, Barraquer, Fyodorov initiated corneal incision procedures to correct refractive errors and astigmatism.

Physical optics and clinical optics being obvious counterparts, development of new concepts in optics and electronics have led to the development of new devices making Ophthalmology a tech savvy speciality. Discovery of LASERS with pioneering work of R. Srinivasan heralded the era of LASER procedures on the cornea- Trokel performed PRK. LASERS have helped in management of many a retinal diseases like diabetic retinopathy and glaucoma. In order to retrace steps of Ophthalmic history, Sir John Parson's text book – The Pathology of the Eye first published in 1911 must be acknowledged as the first clinical textbook of ophthalmology in the modern times. The next revolutionary discovery was the fall out of Second world war!! It was the discovery of the all important ophthalmic implant, the intra ocular lens. The innovative mind of British war surgeon, Sir Harold Ridley observed the inert nature of intra ocular foreign bodies made from Perspex, a polymer used in windshields of warplanes and this astute discovery is indeed an example of the Ophthalmologist as an inventor. There are innumerable examples. Allvar Gullstrand a Swedish ophthalmologist received Nobel Prize for work in ophthalmology. He applied the methods of physics and mathematics to understand the optical and refractive system of human eye. He explained the process of accommodation, designed the slit lamp. He was in fact, nominated for Nobel Prize in physics also, which he apparently declined. Hjalmar Schiøtz, Karl Kollner, Jules Gonin were some eminent ophthalmologists nominated for Nobel Prize. Granit and Wald were awarded for chemistry and physiology of vision, Hubel and Wiesel for neuronal signal processing in the visual system, Medawar for work on immunology; all are excellent examples for the marriage of ophthalmology with technology. Michelson's interferometer which forms the basis of Optical coherence

tonometry, another Physics Nobel prize winner. Discovery of Ivermectin, drug for treatment of River blindness by Campbell and Omura also won the Nobel Prize.

Initiative by WHO to eradicate cataract blindness has given a never before opportunity to the ophthalmologist to work with the elderly, socially under privileged population across the world. Thus, an Ophthalmologist stands at the helm of innovation as a scientist, healer, academician, social scientist and flag bearer of humanities and ethics. Ophthalmology has become a technology dependent speciality; but the man behind the machine is still the vital factor. Today, an Ophthalmologist has to be competent to handle state of the art electronic equipment in order to interpret the results of various ocular diagnostic equipments. Basic clinical skills often elicited with simple instruments and an astute mind. It is indeed a great privilege to be an ophthalmologist today and say "Let There Be Light".

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