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THE LIFE AND CONTRIBUTIONS OF GEORG JOSEPH BEER

BY

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A thesis submitted to the faculty of the
College of Optometry
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Adviser:

JURGEN MEYER-ARENDT, M.D.
Christopher Medina started his schooling in the Phillipines and completed his high school studies there. His family moved to Guam in 1983. Christopher received his B.A. in Biology at the University of Guam. He was accepted into Pacific University in 1988 at the College of Optometry. He will be completing his O.D. in May 1992.

Christopher plans to practice on Guam upon completion of his studies. Guam is currently in need of optometrists and other health professionals. Christopher plans to practice full-scope optometry.
INTRODUCTION:

In the early nineteenth century in Vienna, Georg Joseph Beer established ophthalmology as an independent scientific speciality and founded the first ophthalmological school and clinic. Beer was well recognized as an ophthalmologist, surgeon, inventor, teacher and author.

As a writer, he published a number of books with emphasis on the diagnoses and treatment of eye diseases. One of his finest texts which made him famous was the Lehre der Augenkrankheiten (the knowledge of eye diseases), the first volume was published in 1813 and the second in 1817. It contained information such as ocular inflammation, principles of treating post-traumatic inflammation and most important of all the discussion of cataract and its treatment which up to this date still fascinates our present day physician. A fellow writer by the name of Hirschberg who did the only comprehensive review of Beer's life and contributions once quoted "There is no doubt that no other book on ophthalmology of the eighteenth century comes even close to Beer's contributions. Beer's books are outstanding in their content and form, are based on personal experience and keen observation, present new information and give excellent guidelines for therapy. The form of presentation is perfect."
Beer, as a skilled surgeon, performed dozens of successful cataract extractions which during that time was very prevalent as the cause of blindness. As an inventor, Beer devised a cataract knife shaped triangularly which was designed to make an incision more accurately without the iris prolapsing onto the knife while the aqueous flowed slowly. He also invented iridectomy during a time when infectious diseases such as scarred corneas and occluded pupils were common in Europe. With his newly improved knife, Beer performed this procedure with great success.
THE LIFE AND CONTRIBUTIONS OF GEORG JOSEPH BEER:

Born in Vienna on December 23, 1763, Georg Joseph Beer learned that life was not easy at all. Being brought up from a family who had to fight poverty Beer experienced how it is to be a responsible person at an early age. His father passed away when he was only 15 years old so he had to shoulder all the responsibilities his father left behind since he was the oldest child in the family. He worked hard to keep his siblings and mother alive.

As a growing boy he was interested in music and painting in contrary to his father's wishes for him to become a priest. He started a career in the school of painting of the Academy of Fine Arts and because of his excellent artistry was accepted to a top school in Rome to further his studies in art. However, his interest in art was overshadowed by his desire to become a physician and he pursued his medical studies instead.

A brief background about the Austrian ophthalmic history should be reviewed in order to understand how Beer established the Viennese School of Ophthalmology. Baron Michael de Wenzel was one of the best ophthalmic surgeons in Europe in the late 18th century. He was well known for his courageous deed in performing a
cataract surgery on a lady of the court of the Empress Maria Theresa that no other oculists dared to do. He did this with great precision and was successful in doing so, thereby, saving her vision. Baron Wenzel was eventually asked by the Empress to train Joseph Barth in ophthalmic surgery which was an attempt to improve the poor state of ophthalmology in Austria.

Joseph Barth of Malta, was the finest product Baron Wenzel produced. He later became Professor of Surgery and Ophthalmology in Vienna in 1773, trained three oculists, retired in 1791 and then went back to Vienna to become an instructor in ophthalmology. Although an ophthalmologist with outstanding credentials internationally, he was unsuccessful in establishing an ophthalmological school in Vienna.

Georg Joseph Beer was a student of Joseph Barth in medical school. His background as an artist led him to become Barth's anatomical illustrator and for seven years recorded the details of Barth's dissections. A textbook in the anatomy of the muscles published by Barth in 1786 included Beer's beautiful illustrations of the ocular muscles. Beer graduated from the University of Vienna in
1786 at the age of 23 years with a degree of Doctor of Medicine. After graduating, Beer decided to pursue a career in ophthalmology under Barth's supervision but was denied. In fact, Barth refused to give him any assistance in gaining a career in ophthalmology. Beer continued to work for Barth as anatomical illustrator hoping that the latter would reconsider Beer's proposal but to no avail. The two broke completely and Beer became his own teacher in ophthalmology. He mastered this area so well that he was granted ophthalmology as his specialty which came as a complete surprise to Barth. He also married at that time.

In the same year after his graduation, Beer founded the first private eye institute in history in his apartment. He set up two rooms used mainly for admitting and treating indigent patients. Each year, many poor patients needing cataract surgery were referred to him by the provincial government. In addition, he admitted emergency patients with dangerous disease that required treatment and constant medical care. These patients stay with him at no charge and are cared for just like a paying patient. He administered his eye clinic for twenty years without any outside support.
The new specialty, ophthalmology, was first recognized officially in the field of social welfare by treating the poor. It was in 1797 when Beer suggested to the government the establishment of an eye clinic at the general hospital in Vienna where he had been allowed to carry out cataract operations. His suggestion was denied but he continually pursued on this quest and after years of hard work and perseverance his effort finally paid off. In 1812 by special decree of the Emperor an eye department was founded in the general hospital of Vienna and ophthalmology was made a required course for students in medical school. Beer was named its director and also appointed as professor of ophthalmology.

Reports of Beer’s skill as a surgeon were remarkable. Chelius commented about Beer’s "unexcelled skill as a surgeon". Weller noted that "it was a pleasure to watch Beer perform difficult cataract operations." Mckenzie admired Beer’s "profundity and amazing dexterity". W. Soemmering documented, "Professor Beer performs with his peculiar skill and ease the corneal incision". Jungken stated "though his hand trembled somewhat, he guided the knife securely and gently so that aqueous escaped slowly".
practice was limited to treating eye diseases after being fully trained in medicine and general surgery.

Beer made an important contribution to cataract surgery with the invention of his triangular cataract knife which was a more improved knife than Berringer's "half-moon knife" introduced in 1756. When utilized, a very precise and accurate incision is achieved. The iris stayed in place without prolapsing into the knife while the aqueous escaped slowly. Beer also designed an anterior chamber irrigator- which was composed of an elevated water container surrounded by ice. A tube led from the container into the eye where it turned slightly upward and ejected at its end a small fountain of fluid.

Beer was well noted for his invention of iridectomy during a time when Europe was plagued with scarred corneas and occluded pupils. In 1798, he demonstrated that by excising a wedge-shaped piece of iris, an "artificial" pupil is formed. His method, which was published in 1805, was to incise a small portion of the limbus with his triangular knife and then with forceps a fold of iris is pulled out
of the eye. He excised this tissue with a pair of scissors. This procedure created a new peripheral pupil and restored some vision to eyes with an occluded pupil or a central corneal opacity.

As an author, Georg Joseph Beer wrote a number of books explaining in great detail the etiology and management of every eye diseases that he encountered in his practice and illustrations of the various instruments he used in each surgical procedure. His highly acclaimed book, Lehre der Augenkrankheiten, discussed ocular inflammation, the treatment of post-traumatic inflammations such as penetrating and perforating injuries as well as injuries to the orbit, and an understanding of cataract and its treatment which remains fascinating to the present day physician.

One of the best subjects that ever appeared in the literature then was Beer's discussion on glaucoma. He viewed glaucoma to be the most malignant disease next to cancer which involved the eye. He believed that the cause was due to the narrowing or blockage of the excretory vessels with a normal or increased function of the afferent vessels and the treatment was evacuation of the aqueous.

The constriction of the visual fields to that time was best
described by Beer in his Augenkrankheiten of 1817. He was precise in differentiating floaters from circumscribed visual field defects. Even before the invention of the ophthalmoscope, Beer believed that a symptom of floaters usually indicated an early retinal detachment (a diagnosis that happened to be correct).

Beer's other work include the discussion of congenital and senile changes in the eye. He explained coloboma of the iris perfectly and described areus senilis as an occlusion of the small vessels at the limbus similar to vascular sclerosis in older patients.

Beer published in 1791 the first monograph dealing with ocular signs of systemic disease in his book, "Practical comments about various eye diseases, especially, those which are derived from systemic diseases", which mentioned adhesions of the lids, lid ulcers, trichiasis, epiphora, ocular inflammations and lacrimal fistulas.

Beer's "The care of healthy and weak eyes with a guideline on how to treat sudden ocular complications which do not need specific medical knowledge" was the first book on ocular hygiene written for the layman. In this work, he emphasized the deleterious effect of bright light, the use of proper artificial illumination and warned
about the exposure to noxious fumes. In addition, he clearly
described asthenopia advising irrigation of the eyes and good rest.

In Beer's "Concepts about the staphylomatous metamorphosis
of the eye and the new formation of a pupil", he described the
procedure on iridectomy pointing out its advantages over
iridodialysis. He also discussed the anatomical relationship of the
lens to the ciliary processes.

In Beer's Augenkrankheiten of 1813, he gave the first precise
description of iritis. The book describes an inflamed iris due to a
hyperemic white coat resulting in a red iris and a constricted pupil.
Symptoms include pain, photophobia, and a pulsation in the eye and
in the head.

Georg Joseph Beer's knowledge of the work of George Albert
Hamberger, a mathematician who wrote the book, Optica Oculorum
Vitia in 1696, put him far ahead of his time in the understanding of
refractive error. Beer, subsequently, wrote the first book on
refractive error from which later the classical book by Donders
evolved. Beer also had quite a grasp far ahead than any of his peers
on orbital cellulitis and lid abscesses.
In 1819, Beer suffered a stroke which left him incapacitated and he died in Vienna in 1821. He was succeeded by Anton Rosas and not the expected Friedrich Jaeger, Beer's son-in-law and most talented student.

CONCLUSION:

Georg Joseph Beer is a very important person to know because of his major role in the birth of ophthalmology. He founded in 1786 the first private eye clinic in history which consisted of two rooms in his own apartment. He provided his care and services to the indigent patients for free. As a result of his efforts, an eye department was founded in the general hospital of Vienna in 1812 by special decree of the Emperor. Beer was made its director and also named extraordinary teacher. He thus was founder of the Vienna School of Ophthalmology and through his teachings and writings was responsible for the establishment of "modern" ophthalmology as a recognized specialty in Austria, Germany and throughout Europe.

Beer's skill as a surgeon earned him the reputation of master
and innovator in cataract extraction with his more than 1800 successful cataract operations. As a contribution to cataract surgery he devised a triangular cataract knife which improved the accuracy of incision and an anterior chamber irrigator designed to maintain the fluid in the eye during the operation. He also invented, during the time when Europe was plagued with scarred corneas and occluded pupils, iridectomy which received even more credit than his contributions to cataract surgery.

Beer's biggest contribution to medical ophthalmology was his being a great writer. His best book, Lehre der Augenkrankheiten Volumes 1 and 2 which were published in Vienna in 1813 and 1817, respectively, earned him this status. He discussed in this book ocular inflammations, principles in treating post-traumatic inflammations such as penetrating and perforating injuries to the orbit, cataract and its treatment and gave a good description of iritis. His other works include: the understanding of both congenital and senile changes in the eye, the illustration of coloboma of the iris, the description of constriction of the visual fields, the discussion of glaucoma, guidelines in the care of the eyes,
methodology of iridectomy and intracapsular extraction and illustrations of various knives, scissors and forceps used in Vienna in the late eighteenth and early nineteenth centuries.

Being a teacher was Beer's most profound impact to ophthalmology. He was appointed as the first full professor of ophthalmology. His students, who looked up to him as their role model, became his messengers who spread out his teachings in the following generation.

As an honor to his mentor, Anton Rosas wrote the following passage regarding Beer: "Who would not know his great merits about our specialty to which he dedicated 30 years with his indefatigable diligence and with rare ambition? It is his constant ambition to improve ophthalmology on its way to a rational empiricism and perfection. He had a warm love for the welfare of mankind and therefore actively communicated to the entire world his knowledge and experience which he had acquired by laborious and difficult work. Many dogmas of our specialty which were previously known only to a small number of individuals became the common knowledge of all physicians: his keen ambition to stimulate
all his students and to transmit to them a love for our specialty; his
instructive and comprehensive bedside teaching; his supportive
attitude towards all patients who came to him for help and his
consolations for those who experienced misfortune; his numerous
informative monographs about eye diseases; all these are facts
which must secure for him the deepest admiration and the warmest
gratitude of his contemporaries and of all posterity."
REFERENCES:


