Trachoma, from the dawn of history to the threshold of 20th century

G. Balanikas

Trachoma has been recognized as a clinical entity for over thirty five hundred years and is one of the first diseases of mankind to be described. Trachoma is a disease of the conjunctiva and cornea caused by microorganisms spread from person to person through contaminated towels, hands and other objects. It can progress from a mild form to blindness. Characteristic clinical symptoms include the formation of granules on the conjunctiva, especially of the upper eyelid, then follicular hypertrophy followed by pannus formation in the cornea (Fig. 1-4) The causative agent, the microorganism *Chlamydia trachomatis* was not identified until the late 1950s, but the disease plagued humans as early we have written records and probably before. It was said that the Chinese of the 27th century BC and those living in Mesopotamia during the 20th century BC had to contend with the eye disorder. Trachoma persists today in areas with poor sanitation and poverty. Historically one of the leading causes of blindness in the world, it still affects millions of people, particularly in Africa, Asia, and the Middle East.

A' Ophthalmologic Clinic of Aristotle University of Thessaloniki, Greece.

Corresponding author: G. Balanikas
e-mail: dioskouridis@yahoo.com

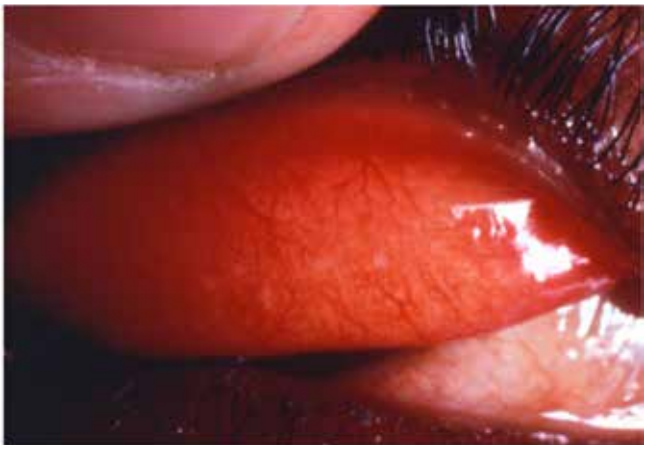


Fig. 1

Fig. 2

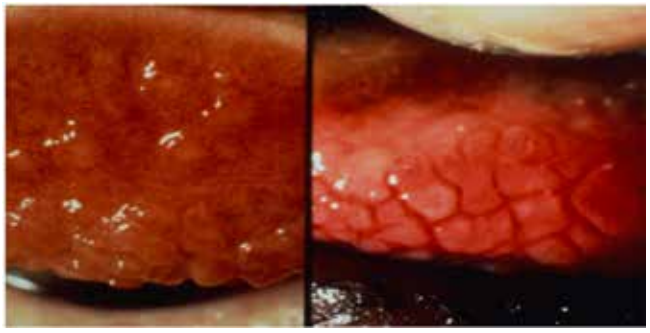


Fig. 3

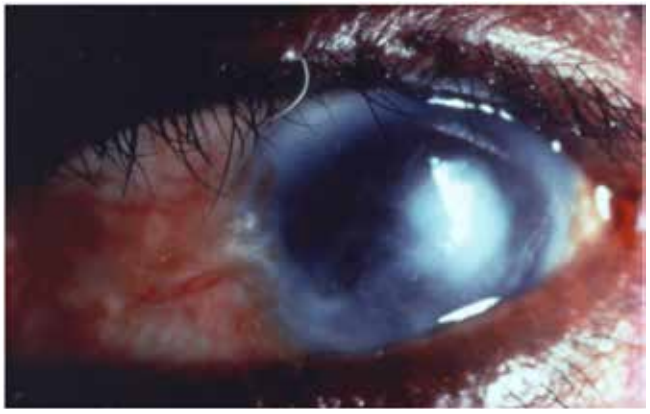


Fig. 4

Ancient Egypt, Greece and Rome

The Ebers[1] papyrus in 1500 BC records the exudative and cicatricial features and advises its treatment mainly with copper salts. (Fig. 5)

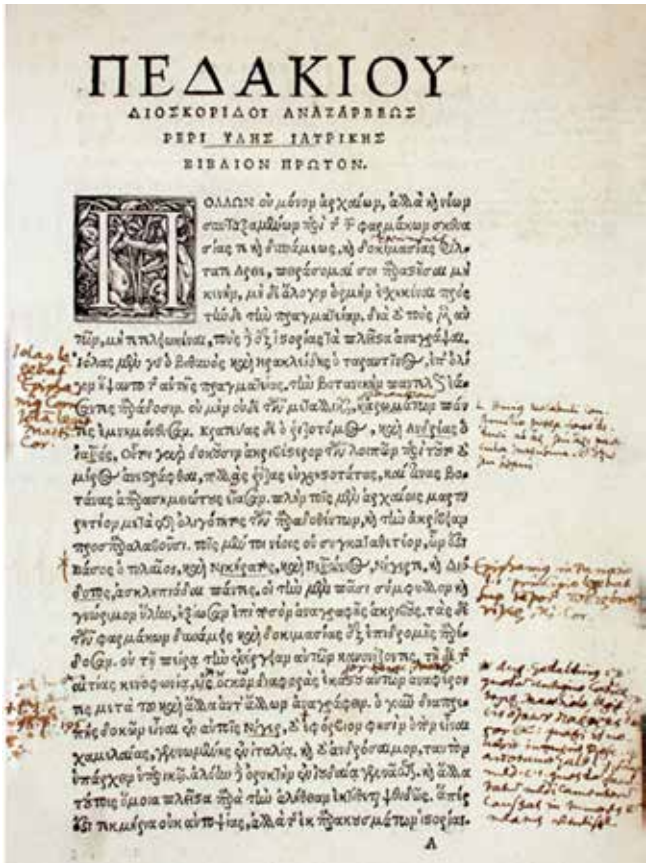
Trachoma was common in Greece and in the fifth century BC Hippocrates[2] wrote in detail of this disease. He describes many conditions of purulent conjunctivitis and Hirschberg[3] considers it as chronic trachoma. Aristophanes also mentioned the consequences of the disease (390 B.C.). It was prevalent during the Peloponnesian Wars (431-404 B.C.). At this time the treatment consisted of rubbing the inner surface of the lids with wool wound around a stick or scraping the granulations with sharp instruments.

The classical Romans were familiar with it and it is believed that Paul of Tarsus, Cicero, Horace and Pliny the Younger were infected by it. Trachoma (roughness) of the Greek writers is translated into Latin as *aspritudo* by Aulus Cornelius Celsus[4] (c. 25 BC-50 AD) in his work *De re Medicina*, (Fig. 6,7) also by Scribonius Largus (around 43 A.D.) and occasionally by Marcellus (beginning of the 5th century A.D.). Actually it was aspritudo oculorum, palpebrarum. From the adjective asper (rough) is derived a second noun asperitas which Pliny interprets as hoarseness (lippitudo) in his work *'Natural History'*, but Cassius Felix (447 AD) interprets as trachoma. The medieval physicians preferred the term *asperitas*. Celsus describes the symptoms of aspritudo and suggests treatment for the severe cases by scarification of the thickened and hard lids with a fig leaf or a rough probe or with knife. For milder cases suggests baths,

Fig. 5

Fig. 6

Fig. 7



ΠΕΔΑΚΙΟΥ
ΔΙΟΣΚΟΡΙΔΟΥ ΑΝΑΖΑΡΒΕΩΣ
ΠΕΡΙ ΥΛΗΣ ΙΑΤΡΙΚΗΣ
ΒΙΒΛΙΟΝ ΠΡΩΤΟΝ.

Fig. 8

Fig. 9

Fig. 10

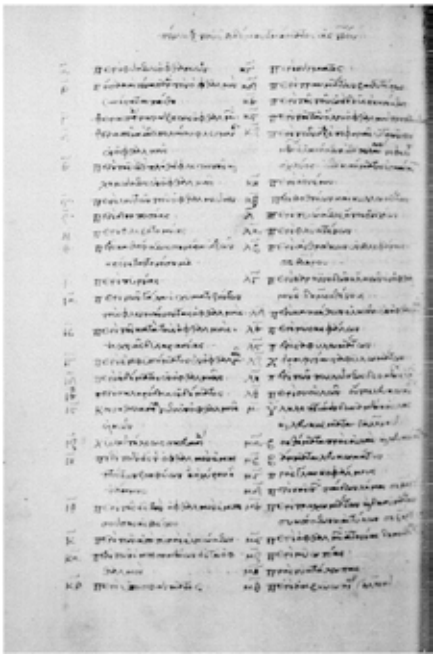


Fig. 11

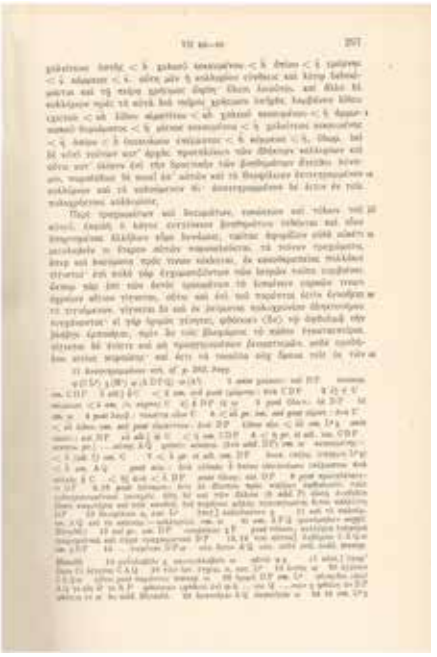


Fig. 12

gymnastics, warm compresses, special diet with spicy and diluted food and appropriate medications as the *'imperial collyrium'*[*]

Another medication was the *'Hierax ointment'*[**] made by frankincense one drachm[***] and shaving of patina four drachms. As the alternative remedies, was applied bile of a goat or a very fine honey.

The disease was given the name 'trachoma' by the physician Pedanius Dioscorides[5,6,7] in about 60 A.D. in his work '*De Materia Medica*' (Fig. 8,9). He defines trachoma as: '*…roughness, especially of the inner surface of the lids, it cleans the leucomas and the trachomas melt…*'

Galen clearly described the second stage of the disease '*... We call the inner surface of the lids rough if they appear hyperemic upon eversion and if they seem to be fleshy and granular. The conjunctiva is thickened if the hids appear hard after eversion and more fleshy than the conjunctiva in the first stage...*'

Byzantium, Arabs and Medieval era

Aetius of Amida[8] (550 AD), emperor's Justinian physician describes with great details the four stages of trachoma in his work 'Aetii Amideni Libri Medicinales VII'[9,10,11]. In the paragraph 'με′' describes the symptoms of the disease and its cure. He uses the same remedies and repeats the views of the Greek and the Roman physicians, as collyriums by copper, use of the fig leaves, woman's milk etc (Fig. 10-12).

Arabs didn't have a clear conception of trachoma, but described its four stages and they were the first to mention the term 'pannus'. During the last of the 'Arabian period' of Medicine, ophthalmic practitioners in Salerno, Spain and France began to describe infectious eye diseases and to suggest appropriate treatments. Benevenutus Grassus[12] from Jerusalem and a student at Salerno in 12th century recommended removal of the inner lid granulations and abrasion with fig leaves as had his predecessors.

Egypt, Western Europe and Britain

From the Middle East where the disease had been endemic since antiquity, trachoma was spread over Europe during the Crusades by the returning Knights.

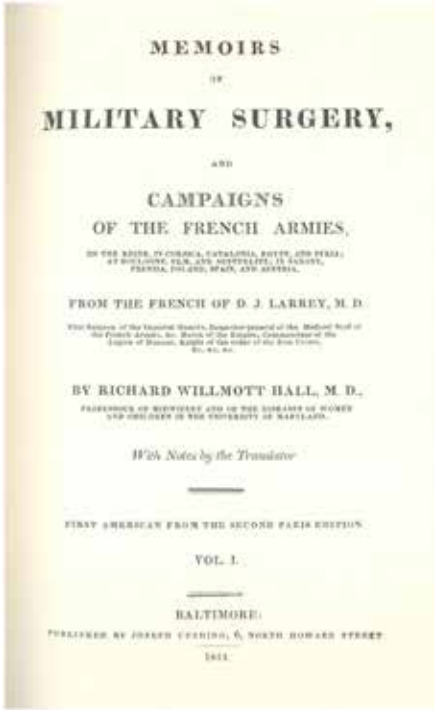
Another massive epidemic followed the Napoleonic campaign in Egypt in 1798-99 when the French Army and the British forces fell victim to it. The disease became then known as 'military ophthalmia'.

Dominique Jean Larrey[****], a physician who followed Napoleon in his campaign to the Middle East, Egypt and Italy described[13] cases of a very severe 'ophthalmia':

'*...This disease in many cases left a species of membranous thick, dense unguis, in the greater angle of the eye, behind the caruncula lacrymalis. This unguis, which might be compared to the membrana nictitans of aquatick birds, grows rapidly until it acquires the size of a lentil, and then remains stationary, or increases imperceptibly. It thus injures vision and prevents the motion of the eye, and the closing of the eye-lids, and keeps up a perpetual irritation. Sometimes the membranous ring extends, and gradually covers the transparent cornea and the pupil, so as to intercept the rays of light...*' And he continues:

'*...I saw a great number of these membranous tubercles among the Arabian horses that are very obnoxious to them. They occupied one half of the surface of the eye: two of my horses were so affected. I requested M. Loir, the veterinary*

[*] *Imperial collyrium or Caesarianum. It is a copper ointment with iron, zinc and antimony.*
[**] *Hierax was a physician who invented a collyrium against trachoma known to Asklepiades.*
[***] *Drachm was a weight unit equal to 4 grams.*
[****] *Dominique Jean Larrey (1766-1842). A famous French physician, military surgeon and a close friend of Napoleon (he said about him: '…He is the most important man who I ever met...' He followed Napoleon in his campaigns to Middle East, Egypt, Italy and Russia until the battle of Waterloo. He wrote the book: 'Memories de Chirurgie Militaire et Campagnes' where he describes many cases not only of military surgery but of many diseases as trachoma, plague and leprosy.*


MEMOIRS
OF
MILITARY SURGERY,
AND
CAMPAIGNS
OF THE FRENCH ARMIES,
FROM THE FRENCH OF D. J. LARREY, M. D.
BY RICHARD WILLMOTT HALL, M. D.,
With Notes by the Translator
FIRST AMERICAN FROM THE SECOND PARIS EDITION.
VOL. I.
BALTIMORE:

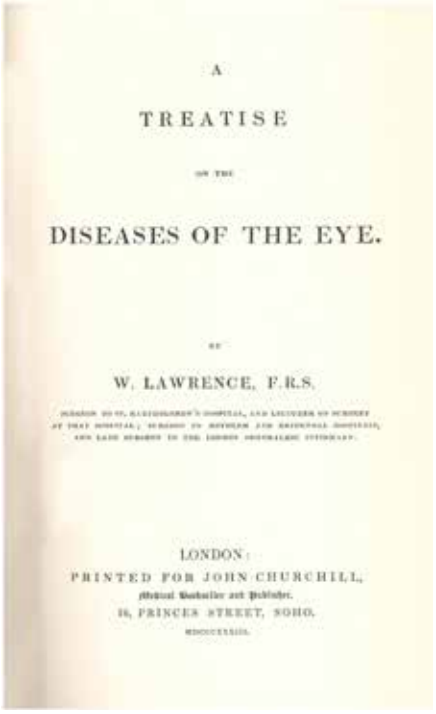

A
TREATISE
ON THE
DISEASES OF THE EYE.
BY
W. LAWRENCE, F.R.S.
LONDON:
PRINTED FOR JOHN CHURCHILL,
Medical Bookseller and Publisher,
16, PRINCES STREET, SOHO.

Fig. 13 *Fig. 14* *Fig. 15*

surgeon of the army, to extirpate them, which he did with ease. I had performed this operation on many soldiers (Fig. 13).

Trachoma was a constant problem for armies on the move. When troops returned to Britain from the Napoleonic wars (1798-1800) they brought trachoma with them, one of several diseases included in the clinical category 'Egyptian ophthalmia' (it could also was gonorrheal and/or Koch-Weeks conjunctivitis). As trachoma and related diseases spread through the general population, eye hospitals were opened, textbooks were written and ophthalmology became more specialized and increasingly professionalized.

John Vetch (1783-1835) treated ophthalmia with a controversial method, the venesection (Fig. 14). He fought with William Adams (1783-1827) over appropriate treatments. Adams failed to cure trachoma in the Prussian army. He used the ancient practice of removing inner-lid granulations and washing with copper sulfate solutions.

Henry Walker in 1811 proposed the ocular inoculation with gonorrheal pus.

Sir William Lawrence, a British physician, dedicates in his popular textbook 'A Treatise of Diseases of the Eye' a chapter (IX)[14] titled '..Purulent Ophthalmia in the Adult' where he sets out a wide reference to the disease which calls '*Egyptian ophthalmia*' or scientifically '*ophthalmia purulenta or puriforms*'. He presents a subcategory '*blepharitis grandularis contagiosa, or blephar-ophthalmitis grandulosa*', a precise description of trachoma (Fig. 15).

In Britain the physicians believed that trachoma was an imported disease. Almost one hundred years later (1904) the British physicians insisted in that, as the translator of J. Boldt's 'Trachoma'[15] J. Herbert Parsons, wrote '...*Trachoma in England at the present day is an alien disease, imported by aliens, propagated amongst aliens, and handed on to the native population by aliens*...'

Trachoma attracted also the attention of physicians outside the Britain particularly in countries with high incidence, such as China or those along military or shipping routes. In Italy Naples surgeon Paolo Assalini (1759-1840) who also

attended to Napoleon, wrote that he opposed venesection as a treatment for other than very recalcitrant cases.

Alessandro Quadri (1827-1869) of Naples, diagnosed ophthalmia in 4000 of 20000 soldiers. The same year, there were an estimated 10000 cases in Portugal. Military ophthalmia created greater interest in ophthalmology in Belgium. The return of soldiers from the Napoleonic wars resulted in an epidemic, in 1815. It was estimated that 600000 or 14% of the Belgian population became infected. Belgian physicians described in their own monographs various ophthalmias, as the treatise by Jean Romuald Marinus (1800-1874). Most prominent according to Gorin[16], were Louis Salomon Fallot (1783-1872) and Jean Francois Vleminckx (1800-1876). Fallot first believed military ophthalmia was caused by some contagion spread from person to person, an idea he abandoned in 1837.

Vleminckx, held a more controversial view on etiology. In 1825 in the textbook 'Essais sur L' Ophthalmie des Pays Bas' he blamed restrictive helmets and collars worn by soldiers for causing congestion and thus ophthalmia.

Among the many hospitals and dispensaries that appeared as a result of rising public concerns about ophthalmia was the Belgian Eye Institute which founded in 1839 by Frederic Hairion (1809-1887). Hairion, a professor of Ophthalmology at the University of Louvain specialized in venereal disease, dermatology and syphilology, believed in both the miasmatic and contagious theories of the disease. He used daily either a paste of lead acetate called plombage, thought capable of reducing the size of granulations, or cauterization by rubbing with pencils made of silver nitrate or copper sulfate.

At the end of the 19th century, Belgian ophthalmologists were still fighting trachoma, as Victor Deneflee (1835-1908) at the University of Ghent and Jean-Baptiste Coppez (1840-1930) at the University of Brussels.

Late nineteenth century

Physicians in Eastern Europe and the Middle East combated trachoma particularly at times of social stress leading to crowding and unsanitary conditions. In occupied Warsaw, Marian Zuchert (1894-1944) edited *the Journal of Trachoma and Social Ophthalmology*. In Hungary Emil Grosz (1865-1941) served both as Commissioner of Health and Hospitals and as chair of the League Against Trachoma. He and his fellow colleagues as Karoly Hoor (1858-1927), published dozens of papers on the diseases and worked to cure World War I recruits.

At the turn of the century in Egypt, where Europeans traveled to study trachoma, the eye disease affected most of the population, albeit in a mild form. German and then British ophthalmologist worked with local practitioners to establish traveling hospitals and other facilities to reduce the number of cases. A disease as widespread as trachoma attracted a great deal of attention from researchers about the microbial etiology in the late 19th century. In 1823 Wilhelm Werneck had demonstrated that the disease could be transmitted from one person to another through transfer of purulent matter. But unfortunately, the etiologic agent responsible for trachoma was impossible to be identified. *Chlamydia trachomatis* proved difficult both to detect microscopically and to cultivate in the laboratory. In 1907 Ludwig Halberstaedter and Stanislaus von Prowazek (1875-1915) found infectious inclusions bodies in pus cells from trachoma cases.

The challenges caused by trachoma were also related to social events other than war. Slave trading before the mid-19th century and immigration in the late 19th and 20th centuries brought new cases to countries and exacerbated the spread of disease by the crowding and poverty that frequently occurred in urban areas settled by new arrivals. Trachoma cases in Canada, were decreasing until 1900 when an increase of cases was caused by immigration to North America. In the United States, trachoma was one of the diseases for which immigrants could be refused entry into the country.

During the end of the nineteenth century trachoma gradually subsided in Northern Europe.

Conclusion

The recognition and study of trachoma has a long history, from the Ancient Egypt, Greece, Rome and Middle East to the Western Europe in 20th century affecting millions of people during its 3500 years history. Its history shows that trachoma was prevalent in stressful and unsanitary conditions such as poverty, wars, immigration and trading routes. It was classified among other similar conditions under the general term 'Ophthalmias' and it took a long time to be recognized as a contagious and infectious disease. In the first quarter of 20th century the etiological agent remained unknown. It was not until 1957 when a group of Chinese researchers isolated and cultured the etiological agent, Chlamydia Trachomatis in the laboratory.

Trachoma still exists today and affects millions of people in the poor areas of our planet, in Africa, Asia and Middle East (Fig. 12-15).

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