Title: Trachoma: its nature and treatment, with special reference to India

Author: Rao, Dhanavada Samuel Ramachandra

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Trachoma: its nature and treatment
with special reference to India.

There is no country in the world
which is exempt from the ravages of trachoma.
It has long ruled the world, inflicting incalculable
harm and misery on humanity, and in all the
eons and ages mankind the smoking of man as to its
ultimate nature—therefore as to its specific
treatment. Decease of the long-sufferers of great-
repute, was possessed presence of an astonishing
kind struggled to unravel the mystery of trachoma—
they were on the point of a great discovery—yet still
they the mystery remains as great a mystery as ever.

"Trachoma is as old as the Nile, Sinan and the East,"
goes the statement. "China past as it sounds. Egypt the
home of trachoma and its spread in Europe has been
particularly noticeable since the Napoleonic wars.
The ancient world was quite ignorant of the disease
just as the modern world is—the middle ages were
aware of it in their own way.

Though trachoma was well known in India before
the Napoleonic wars, while its extraordinary dis-
semination was due to the infection in Egypt of
the English, French and Italian armies.

Trachoma was not considered a extremely contagious
disease—so proper prophylactic measures were not
adapted to prevent its spread. The army was the source of infection in Russia. Recruits were taken while they were infected with trachoma—they spread it in the army. Where the army got disembarked, the infected men spread it among the civilians. So a vicious circle was set up—and the disease spread to an alarming extent.

But when rigorous measures were adopted to reject recruits with trachoma from the army, the disease felt检查ed rapidly.

In W.S. A., many regulations were enforced at the ports of entry to prevent infected immigrants from bringing it to England. Care in rejecting them here also, has reduced the disease.

Russia with her millions is still the home of trachoma in Europe. In Germany and Austria, the army has been saved from the ravages of trachoma by the rejection of infected recruits. Similarly, the field of trachoma in the British Army in India—a very notable fact—is due to the enforcement of similar measures. Again, every attempt was made to stop the infected men in the army and give them special care.
And supervision being made so that they should observe the ordinary de creases of life, if late there have considerable improvements in the methods of treatment of sanitary precautions. Therefore tuberculosis epidemics are not common — and perhaps the disease has lost its former virulence, due to immunity (natural) or some other cause.

Still tuberculosis exists in the world — and its dangers to the individuals are in full course. In the light of modern experience, there is no country, race, sex, latitude, age, or social status that is exempt from the menace of tuberculosis. Anybody may get it, anywhere — where once the disease starts in the eye, the prospects can at best be guarded.

4. Geographical distribution. Very few geographical distributions are known, so as to embrace the whole world — though in some countries it is widespread. Even in those — and all classes of people have the chance of infection; though the lower class becomes it more frequently.

In India, the disease is common — though not to the same extent as it is in Europe — and is responsible for much suffering and misery, particularly amongst the poor.

We have still plenty of the death of the ultimate cause of the disease, and we have come to entertain the idea that it is due to some microorganism, which has yet to be discovered.
There is no absolute certainty yet as to the nature or cause of the disease. We are not yet prepared for the coming treatment.

Still we are getting a measure of the disease every year and are slowly making progress with prophylactic, medical, and surgical methods. The disease might be stamped out of all civilized countries.

We learn to know a great deal about tuberculosis — a great many have written about it — yet there are uncertainties in the records and the opinions of the doctors and the conflicting interpretations of experiments and theories of treatment. This makes the subject all the more interesting.

We know everything about tuberculosis except the vital thing of the cause. Till that is known we have to go on testing as we know nothing.
The Symptoms of Trachoma.

Trachoma may be acute or chronic. In the acute variety, there is severe conjunctivitis, i.e., pain, redness, swelling, lacrimation, and photophobia — and often purulent infection. There is follicular formation, first in the palpable conjunctiva, especially in the neighborhood of the fornices staining, cornea, where they look as crude granulations, swell the size of a pin's head. The papillary body might sometimes swell up to obscure the follicles; hence the diagnosis difficult. Pus and crust where might occur as complications.

The follicles might finally be absorbed, the conjunctiva be restored to its normal condition, or the disease may gradually pass into the chronic stage.

Chronic Trachoma.

There are three stages in this chronic condition: (1) the development of the follicles, (2) their destruction, and (3) the process of cicatrization.

In the first stage, the subjective symptoms are slight. There is bright irritation in the eye and occasionally a slight sticking of the lids together during the night. The patient occasionally rubs the eye, and in tropical countries like India, squints bright lights. A few flakeFloat about in the lacrimal secretion.
And these symptoms are so slight at commencement so insidiously that one does not take notice of the trouble till it feels firmly established.

The objective signs: Symptoms are a slight swelling & redness of the palpebral conjunctiva, there might be a slight papillary hypertrophy in the upper tarsus. Primary pannus laminations can be seen in the tarsal conjunctiva & fornices. The come to prominence by the aid of a lens.

But in course of time, after the lapse of months or years the inflammatory symptoms gradually increase with the result that photo-encephal, associated with edema of the lids. There is some hesitancy in the opening of the lids, their edges being tightly opposed to the globe. The palpeble now in number & size present the appearance of close, cut velvet. They are less frequent look like sage prairie and also arranged like a string of pearls. They are surrounded by a net work of blood & lymph vessels.

There is more in motion, irritation - the discharge becomes more viscid, which irritates the lashes there is burning, a prickling pain - people in India compare it to the feeling of grains of sand in the eye, preening of the lids & lashes in the morning, photophobia, lachrymation, photophobia.
Diffuse superficial lesions, typical pus may appear; superficial bleeds and phlegmules are occasionally seen. I have rarely seen cases where cervical or even axillary glands were swollen.

Later on lymphoid infiltration of the adenoid tissue occurs and causes necrosis and thickening of the conjunctiva. Then we have the degenerative stage with the breaking down and ulceration of the follicles, which become confluent and appear as yellowish round spots. This characteristic appearance of this stage is the formation of a soft creamy-like plug from follicles on pressure and the presence of crateriform bleeds at the sites of the follicles.

Many of the follicles are transformed into dense fibrous tissue, as does the surrounding adenoid tissue. The secretion becomes purulent and highly infective.

It is quite possible to see the various stages of the disease in the same eye i.e. follicles, crateriform bleeds and scarring. A lesion is a great help in time, though marked eye appearances are striking enough. The upper eyelid is more affected in this second stage than the lower lid. The lid, being less stretched, is more at rest. The inflammatory products are easily absorbed — I have seen the condition passing without incision, subside or press on little cicatricial stage in the lower lid, while it was very active in the upper lid.
The subjective symptoms are those of more severe inflammation with an impairment of vision in the vast majority of cases due to pannus.

The lids were become involved and tubulose, specially the margins are tender irritable.

The complications are severe & quickly becoming:

1. Pannus develops with impairment of vision.
2. Staphyloma or bulging of the cornea, partially or completely through intraocular pressure, so the pannus forms the Cornea.
3. Corneal ulcers are formed: chlophylicids are very frequent.
4. Palpebral fissures are narrowed & the eye is held in a retracted position they are called "Chimarrapage!".
5. Lacrimal ducts get impeded, the tears back up and lacrimal sacs are distended with a clear watery fluid. Occasionally lacrimal abscess.
6. The limbal fold & caruncle are blended together into a single fibro-necrosis.

Finally, the conjunctiva becomes more and more disintegrated & finally, it is transformed into fibrous tissue. As this process continues, the inflammatory symptoms subside — and we have the merging of the process into the third stage — the stage of cicatrization. Thus the inflammation process ends in the conjunctiva being transformed into connective tissue.
The adenoid tissue is destroyed, the discharge gradually disappears, while altered Meibomian secretion is seen as a fine white foam. In less advanced cases, cicatrices appear as irregular strands, the conjunctiva presents a dull bluish appearance. In the severe cases, the conjunctiva loses its transparency, it presents a mass of greyish white or grayish yellow tissue. At first, it can be noticed in the upper lateral conjunctiva, from the fibers, present radially outward.

The contraction of the stratum causes disintegration of the tarsus and joint to restitution, submission, dissection, even to narrowing of the palpebral aperture in some cases—change in the lacrimal apparatus and lacrimal secretion. Lacrimal glands may be obliterated by cicatricial contraction, so that meibomian gland is not moistened. Thus kerato-conjunctivitis caused.

Adult trachoma is very rare at the present day, though it is quite possible to have it. It always attacks both eyes, where the chronic form attacks one eye, the other remaining well, perhaps for years. Chronic trachoma is very common. Due to lack of gestation, it is often a mistaken diagnosis. A mixed infection—focal or nodular infection of pus, sweeping, influenza and so on, is the site of trachoma.
There is also the possibility of the Chronic Trachoma being superadded to Simple Acute Conjunctivitis. But Kramsztyk doubts the existence of primary acute trachoma. (Kramsztyk Kryptolyechnka 1878, No. 8, S. 221)

But inoculation experiments have proved that adding Trachoma in the produced.

"Trachoma bodies" they have been regarded as characteristic of trachoma—new formations of specific significance (Graefe-Saemisch, loc. cit. S. 294-349.)

But the accumulated historical details of the present day makes us disregard the idea of any pathological significance. They are simply true lymph follicles but not specific formations. These follicles are found not only in trachoma but also in follicular Conjunctivitis, Conjunctival tuberculosis, typhus, etc. Therefore they are the result of irritation to the Conjunctiva, due to cause of the irritation the cells of trachoma, instead of a chemical substance, to the Conjunctiva is prone to produce the follicles, owing to the adenoid tissue there is in it. J. Boldt is of opinion that the trachoma bodies are partly pre-existent to partly newly formed follicles. So long as the follicles are superficially placed they get absorbed and thus disappear.
But if they are deeply placed, they shelter the conjunctiva as they grow, and lead to needful changes. The clinical manifestation of this disease are in fact, dependent on the anatomical changes occurring in the tissue generally, and in the follicles in particular.

It was considered by Rachmann that the follicles generally disappeared by the expulsion of their contents. But modern writers, favour the view that the granules undergo fibrin degeneration and cicatrization.

Bleuring describes 4 stages in the development of follicles: (1) Growth (2) fatty degeneration (3) ulcerous, melenes degeneration (4) atrophy & cicatrization.

I remember seeing a case in which the follicle were in a state of ulcerous-melenes degeneration. As I tried to scrape the follicle, with a Calumet knife, they yielded at the touch of the cold steel.

As regards a capsule of the follicle, this is difference of opinion whether it is ever quite closed.

Gelatinous trachoma: It represents an advanced stage of trachoma — here the "follicle" fuse into tumour-like masses; and the tissue assumes a gelatinous appearance. It is not easy to distinguish the individual granulations with the naked eye.

One can make it out only by experience. This variety (8) Bleuring, Von Graefe's Archiv, Bd. 15. 1869.)
is very amenable to treatment by expression.

Resective ulcer-morphosis is responsible, perhaps responsible, anatomically, to the gelenalmus degeneration.

It is of considerable importance to remember one or two anatomical changes brought about in the tarsus and conjunctiva for rational treatment—depends on the clear recognizing them.

The field drew attention to the fact that the infiltration of the thickening of the tarsus is greatest near its lower margin, along the line of the perforating blood vessels. The inflammatory infiltration travels chiefly along these vessels from the conjunctiva to the tarsus. Therefore the cicatricial chondritis is most marked along the subconjunctival vessels. In fact, in this line that the inflammation of the tarsus is most obvious.

Schnitz is of opinion that this cicatricial bond represents the whole of the Schnitzkean tubal conjunctiva, which has been dragged toward the edge of the lid. As this occurs, the retractive tarsal fold is drawn down until the posterior surface is covered over by the retractive tarsal fold.

Therefore (1) the excision of the tarsus at the point of appui is necessary to prevent cicatrisation, (2) but the excision of the retractive tarsal fold is contraindicated.

(8) Fundusheilbuch der Augenheilkunde; Leipzig, 1908; 2nd edition.)
Trachoma also affects the bulbar conjunctiva, especially in the neighborhood of the rete testis, testis and ductus deferens. The granules here are yellow and transparent — I have seen in some cases the conjunctiva, becoming confluent.

There may be also the trachoma of the lacrimal sac. This was found to be the case by German and Russian researchers of the Petropavlovsk, though Kuhn first suggested the possibility.

Typical trachoma bodies were found in the lining membrane of the nasolacrimal sacs. I have frequently seen trachoma patients suffer from dacryocystitis — the history indicated that the trachoma kept symptoms preceded those of dacryocystitis. I have also seen cases of dacryocystitis, due to nasal disease in which I could find no trachoma in the lids.

It is possible that trachoma virus might be carried from the nasal mucosa into the lacrimal duct, where it might cause a discharge of fluid which would later invade the nasal conjunctiva.

The lacrimal sac is a first painful swelling; the discharge of a fluid like water either into the skin surface or opens into the eye through the puncta. The sac can be emptied by pressure, but to fill up again in a day or two the sac may be blocked by the trachoma bodies, dilating the canaliculi may be closed.
Abortion forms of Trachoma.

We are big enthusiasts to Peters of Roscock, he contends, telling his...
I cannot do better than quote Dr. J. Boldt's comprehensive summary and definition of trachoma:

(From Boldt's 'Trachoma,' pp. 106.)

"Trachoma anatomically is a chronic deep dense lymphoid infiltration of the conjunctiva (and tarsus), appearing sometimes diffusely, sometimes as circumscribed masses of cells, leading to the destruction of the conjunctival tissue, transformation into fibrous tissue, and forming for a time at its front a certain abnormal secretion upon which its contagiousness depends."

Clinical aspects of trachoma.

Comparatively, hypertrophy is considered by Finches (1873) as by far the characteristic symptom of trachoma. He describes two varieties, i.e., the papillary and the granular. I have frequently seen both forms occurring together, the papillary form showing itself most prominently in the palpebral conjunctiva, the granulation over the fornices. A third form is described — mixed trachoma — where the papillae conjunctival granules or follicles.

Discharge in Trachoma.

There is usually discharge associated with trachoma. The Carré's pinnaceous of trachoma depends on the presence of the discharge. But I have had
abdomen, and even been, not infrequently, built

dry febrifuga. In this variety, treatment with
the mixture of silice brought about a
reactionary discharge the eyes lasting for
matted in the morning, so much that the patient

fured that they were setting worse.

(From monographs distinguished in the monographs
"De la Conjunctivite Granulante" Paris 1902,
"Une forme simple ou Sèche" from "une forme
Conjunctivite de Catarrhal"

Trachoma is a chronic infectious disease,
which may last years. Since at the outset no
serious discomfort is felt, the victim do not
put themselves under treatment till it gets well
established and impairs their vision by the
development of pannus, and considerable
irritation is set up in the eye. But early and
efficient treatment is by no means a panacea
of rapid and complete cure. The first

I have heard of Cases where spontaneous cure
occurred without any treatment in India.

I have been a case of a fair formation
without any adequate treatment. On the other

in spirit of the most scientific treatment, some Cases
never get cured. But in the usual course, without

Treatment, the terrible sequelae are bound to follow.
there are 3 stages in tuberculosis.

1) Development: the follicles, their number, condition and position give one an idea of the course of the disease.

2) Progressive Changes: severe inflammation, exudate, discharge - a stage of infection

3) Catarrhal: the scar formation. the end of the disease - perhaps a dormant phase.

Tuberculosis develops in adenoid tissue. But the scar formation destroys the adenoid tissue - so then, tuberculosis could not thrive. But by early and efficient treatment it is possible to cure tuberculosis before the 3rd stage is reached.

I have frequently seen cases in the 1st and 2nd stages, but very rarely in the 3rd stage.
Etiology of Trachoma:

It is considered

the disease of poverty & filth. Overcrowding & unsanitary conditions seem to help its spread.

It is generally held that trachoma is a contagion disease, and that the contagion is conveyed by the discharge from eye to eye. This eye to eye transmission may be due to actual touching — as when a surgeon examines a patient or indirectly by the discharge sticking to the fingers, which inadvertently touch the eyes of a person who is operating — bands which are used by several people are the frequent method of transmission. In those countries where several people work in the same washbasins or bath in the same tanker reservoir, the virus is transmitted indirectly from eye to eye.

Flies are said to be transmitters — but I think they do not stick to the eyes long enough to transmit the virus. But I have seen flies actually sitting on the secretions of the eyes of children. If there be sufficient discharge from the trachomatous eyes, there is some possibility of the transmission of the virus in that way. But in all probability, flies, just as on the lips, or their irritation makes the lips being rubbed frequently — perhaps, Contagion might get into the eye if the fingers be infected.
We have no means of knowing at present whether this treachery virus, if it exists, has any etiological existence — but the idea cannot be easily ignored.

Subzero believes in air and dust transmission.

Germann’s Clinical Observations led him to suggest that the germ lay in the soil, while Hirsching incidentally states that it may come from standing water.

Schmidt-Premsch, again, considers that in Egypt, for example, it is impossible to exclude air transmission.

Rieth advances the theory that in certain districts the soil or the water harbors the germs. J. Boldt, 1910, the germs may be carried in the dust by the air and then get deposited in the mucous membranes of the air passages, also in the conjunctiva.

I doubt the possibility of air transmission except through the presence of this dust, but unless we hold that the microorganisms (?) do live in the air it has not been proved that the Contagiosa can adhere to the walls of a room which has been occupied by a tuberculous patient. But I see no difficulty in believing that the discharge might be left on the walls by depositing them with infected fingers — and then before they set dry up to the spores destroying them, they might be touched by others at times, the Contagiosa may spread.

In the same way articles like furniture, clothing, and linens, might become the means of transmission as they do.
But it is stated that in the Prussian Army (1873 to 1878) that non-commissioned Officers who slept in the same room as trachoma patients were only very exceptionally infected, because they did not use the same utensils as the privates. Therefore, it is probable that infection is not conveyed by the atmosphere in a room.

Recent experiments have shown that the virus is slow in its action and that it is soon destroyed by heat, but that it thrives in moisture. So it can be communicated by contact direct or indirect, and it can thrive under any favourable condition. It can live for a long time in wet books, moist linen and damp air—so trachoma is most frequently found in low lying parts by coasts, rivers and marshes.

In all probability, broken epithelium of the conjunctiva offers an opportunity for a speedy establishment of the trouble.

No doubt, family relations help to spread the calamity. Married people are most likely to infect each other. Mating often gives rise to the children and vice versa. Whatever interferes with personal cleanliness, whatever thrusts people into close together under unsanitary conditions whatever
lovers people's vitality tends to help the spread of the contagion. But we are often beset with exceptions which make one think, and hesitate to come to any premature conclusions.

I have seen wives suffering from melancholy while the husbands were free from it. Mothers had dreadful eyes, but their infants in arms escaped the scourge. In fact, I have seen the eye of a patient showing the symptoms of lachrymation for several years while the man was perfectly normal.

No one has that a certain immunity is possible under certain conditions. I believe that there is more or less individual predisposition. The susceptibility of the conjunctival secretion varies in some cases, save the irritation. Healthy smooth conjunctiva might not offer scope for the lodgment of the virus, whereas, rougher, irritated, bleeding conjunctiva offers a suitable vessel for the grain. Thus smoke, dust, fume, misted in, whatever might have in retarding growth of the lid, or in some way help to keep up a chronic state of irritation, make it easy for the virus to pass.

But I am inclined to think that lymphatic diabetes is especially prone to lachrymation. The patients were generally anaemic. Whereas I examined them under various circumstances, it was found to be in a hyperaemic state.
Attention to the nasal condition, removal of adenoids, in case of children, containing the nasal mucous membrane in adults, hyperic improvement together with suitable drainage treatment helped me to combat the disease pretty successfully.

Von Hüls, von Michel, Rieselman et al. Scrofula in close to biological relationship to tuberculosis. It is also said that tuberculosis is very severe in hyperplastic- Scrofulous subjects that it is relatively benign in persons exempt from this predisposition.

Dr. feel is of opinion that the Scrofulous diseases of the eye are not caused by a simple type of bacterium. Again, for a Scrofulous person, tuberculosis may arise from all possible sources of contagion. We have contagious tuberculosis. Coming as after an infection of contagiousity. Even a superficial disulcious + Chronic inflammation in the eyes, there is a greater chance of infection. Influence of weather, like crowding, foul and dusty atmosphere edematous growth of glands, the local + general condition increases the chance of fulfilling the infection. Age seems to have no influence on the disease, though so far as my experience in India goes it is not so frequent in infants, young children + young people (Schell. Munich. med. Wochen-Schrift 1900. S. 256).
as it is amongst those who are below the altitude.

females are more prone to it, I believe,

since they are more enclosed than men at home,

exposed to smoke in winter conditions.

Some observers think that malignancy is in a way responsible for trachoma : Others, again,

that tuberculosis exerts itself in trachoma.

but I cannot have not seen any expert view

for their general acceptance. They might complex

trachoma (not like the other organisms, e.g. influenza,

pneumococci) but need not necessarily be its

cause.

Race confers no immunity nor does particular

one predispose for the disease. Some races were at

one time exposed to the agents from trachoma,

e.g. negroes in U.S.A., but in S. America negroes of the same

but there were other races were found to be subject

to the disease. Again the Jews were considered

the subject to trachoma less particularly; but

the cultured and well-to-do Jews of Hungary are

practically exempt from it.

It is not so much the race, but it is the conditions,

to which the race is subject, seem to influence

the susceptibility to acquire trachoma.

Trachoma may be regarded as a contagious
disease, caused perhaps by a micro-organism

which is not yet conclusively demonstrated.
Infection is carried by Conjunctival discharge directly or indirectly. 

It is only Conditionally contagious.

Individual susceptibility is an important factor.

This predisposition depends on:

(i) the peculiar structure of the palpebral
conjunctiva at the time when the discharge comes
in contact with it.

(ii) on the existence or on the tendency to the
formation of adenoid tissue which infectious
diseases seem to inhibit.

Other these conditions, the spread of the disease
is facilitated by (a) poverty

(b) ignorance

(c) filth & unsanitary conditions.

It is generally held that "Trachoma is a disease of the
proletarian." It is true in a way. It is mostly
found amongst the poor & the ignorant. But, on the
other hand I found it amongst all classes of people
in India. I have found it amongst the rich, who
could afford all the Comforts & Conveniences of life.
Again it is very common amongst the Brahmins
of India, who as a rule, are the most-scrupulously
clean. I have seen it amongst all classes, all castes,
and all ages & both sexes.

Poverty may help to spread, but could not produce trachoma.
Diagnosis of Trachoma.

At one time in my life I thought that it was the easiest thing in the world to diagnose trachoma. But I have learnt to consider it differently now.

A typical case of trachoma is easy enough to spot. But in practice typical cases do not always come within one's previous. We must call them so they true and decide whether they are trachoma.

I find it very helpful to make a thorough examination of the Conjunctiva. I open the upper lid, by pressing the fingers with the thumb, and then press the left hand on the lid and pressing down until a glass rod held in the other hand. After examining the lower half of the upper lid, I pull the lashes towards the brow, while the glass rod is gradually worked up, still continuing the pressure downward. Thus the whole lid, which is practically divided on the glass rod, comes under view of one's the front is exposed. I do this quickly without putting much pressure on the lid, for the local anaesthesia brought about by continued pressure, might give it the appearance of cicatrices. Again irrigation might cause hyperemia.

I search the frontal conjunctiva with a lens. I find localised illumination very helpful, but the best combined with focal illumination is invaluable at times.

I study all the symptoms to put them together, then arrive at my diagnosis.
Puritis - An important symptom.

1. N. E. Caused by the lining of trachea.

Also, as Dr. J. H. says, "the organic structures are directed, and those smooth muscle fibres the bladder the relaxed conjunctiva, these in the inflammation of the latter, & consequently become paralysed."

(Tooth Book of Ophthalm. Farn, pp. 570)

When a patient enters the room the can see, after a little experience whether he has phthisis or not. If a trachoma patient, phthisis of the wet type suggests the possibility of trachoma.

Hypertrrophy of Conjunctiva: This is one of the more important signs. Typical follicles and granules are characteristic of the disease.

Also, it has been hypertrrophy of conjunctiva in myopia.

Myopia + hypertrrophy, particularly in young subjects.

Also in anaemia, follicular coat &c.

Puraries: It is very pathognomonic of trachoma.

When it is very slight, oblique illumination reveals.

In rare cases, it resembles pneumonia resembling occasionally, obliquely, causing Clicia, keratitis, cornea, & producing superficial change resembling mild puraries. Also, again, healing vascular ulcer, marginal keratitis, & leprosy. Time line, produce a similar condition. Always through examination will help diagnoses. Areas render should be remembered.
The presence of keloids, lenticels, and erythematous evidences. The formation of lesions tested by fluorescein solution.

My first most decisive diagnostic help in the later stages is the existence of scars & cicatrices:

* Keloid Cicatrix

Suppurative pharon posterior

Conjunctival anaemia should not be mistaken for scars: There are also scars produced by Staphylococcus Pseudomonas. When two or more staphylococci appear together, I generally diagnose the disease as tuberculosis.

(Leads to atrophy of conjunctiva)

Scarring also occurs in simple chronic blepharo-conjunctivitis & ectropion. Here the scarring is confined to the margins of the lid, particularly the lower lid—hardly any follicles.

Tuberculosis should be differentiated from Tuberculosis Syphilis:

Tubercular Conjunctivitis (1) Limbal ulcer

2) Usual ulceration of conjunctiva

3) Hesitation of preauricular lymph nodes

4) Presence of P. B.

Syphilis:

1) History of the case

2) Evidence of treatment

3) Wassermann reacted
Gonorrhoeal Ophthalmia.

It looks very like trachoma

in the second stage—copious secretion, follicles

papillary hypertrophy + c.

It should be distinguished by

(1) History of the case.

(2) Rapid improvement under treatment (1-24: Ayg.)

(3) Presence of gonococci, &c.

Spring Colors: looks like trachoma into 3rd stage

(1) Here the milky white appearance is more distinctly

uniform.

(2) Cypripedium shows no scars in bands or points.

(3) No pannus.

(4) No entropion or ec.

(5) The elevations' of the bulbar conjunctiva have a

fractured surface—appearance of mosaic.

(6) History of recurring attacks in summer.

Seroserous Conjunctivitis: Conjunctival hypertrophy.

What it occurs only in children

(2) Cellulitis or other associated seroserous signs.

(3) Rapid recovery under appropriate treatment.

Hair of plants vs. Caliberillars: How should symptoms, refractive

ax. Trachoma. Careful ophthalmic for hair. History will

reveal the value of the trouble.

In doubtful cases—wait, watch, and start the basis

that it may be trachoma. Till the real cause of trachoma

is found out, diagnosis cannot be absolutely certain.

In follicles also occur in keratitis, pseudo keratitis, glaucoma, stumps, the

case of the keratitis—abnormal, some others—abnormal when due to disease.
Prognosis of Tuberculosis:

It is a chronic disease, insidious in its progress, so that the trouble is fairly well established before the physician has the chance of discovering it.

The chronic form is persistent, and it takes a long time to be cured. Sometimes, (I have witnessed in India) people suffer for years with tuberculosis before they consult a doctor. So from the outset, it is an uphill work to attempt to cure.

I have heard of spontaneous cures only very occasionally. The cure was effected by the formation of fibrous tissue, or scar formation, which prevented the further development of tuberculosis.

There seems to be some relationship between lymphoid infiltration and blood.

The following are the factors which guide prognosis:

1. The condition of the tissues.
2. The condition of the blood.
3. Social conditions of the patient.
4. The condition of the disease.

When the follicles are situated superficially, if there is not much adjacent tissue, the disease generally runs a favorable course. On the other hand, when the follicles are deeply situated and lie in layers, an unfavorable course is offered.
Another help is the condition of the Cornea. So long the pupil is intact and clear, so far there is hope. But on the other hand, if there be a thick pannus, the prognosis will not be favourable. Sometimes I found it difficult to judge the prognosis strictly. I had to wait a week to watch the result of treatment. If the Intraocular pressure is treated rapidly, it does. In some cases, I gave a favourable prognosis.

The principal factors of treatment, e.g., tumescence, exudation, exudation, treated pannus, unfavourable — through with modern surgical methods much can be done to palliate the condition.

Narrowing of the palpebral fissure can be a favourable sign: here the microsymmetry. In fact, it is possible to lodge more easily against the reflex species of the lids is more severe. Continuous age — I found, the younger the patient, the more favourable the prognosis. Children seem to react to treatment rapidly. They often die, because their reproductive powers are not yet worn down, the tear formation was very fine. — not every — in some cases to move out with the naked eye.

(2) **Condition of the cornea**

In anaemia, scurvy, debilitating diseases, like melanin, diabetes, the prognosis was favourable: the more the abnormal tissue
actual or latent, the worse the prognosis.

A locality, robust constitution is a favourable indication.

(b) The Social Condition

The better the hygienic conditions available, the more hopeful the prospects.

Vandal, filth, overcrowding, insanitary conditions of life are unfavourable indications.

The capacity (financial) to afford treatment for a long time is a hopeful sign; also the possibility of obtaining better conditions of life, Change of occupation or place of residence, the ordinary ailments of comfort of life are favourable indications.

The cure may be permanent but relapses frequently occur. The patient have to undergo observation for a long time, after being declared cured.

Considerable abatement of symptoms is by no means a guarantee for a cure. The relapses at times are really re-infections.

The acute variety is rare but it is most amenable to treatment. Often after a few weeks, it changes into the chronic form.

I have not seen any cases of galloping consumption which seems to exist in Russia.

The earlier the treatment commenced the better the prognosis; but early treatment is no guarantee for ultimate cure.

In the whole tuberculosis seems to have become
Since the days of the Napoleonic Wars, one often hears of epidemics of trachoma at the present day. Yet the misery it has inflicted on humanity by this dreadful is truly vast indeed.

In India, trachoma is most responsible for blindness in an appalling degree, as much as, if not more than, small-pox, plague, and ophthalmia neonatorum put together.

We are still groping in the dark. Till this cause of trachoma is fully known, our progress must necessarily be fared.
Pathology.

Though trachoma is a specific infectious disease of the subepithelial tissue of the conjunctiva, no one has been able to prove, as yet, that any organism is alone solely responsible for it. Some observers thought it was a Coceus, thus a bacillus, while others believed an ultra-microscopic organism. But these supposed organisms subsequently proved to be merely fragments of cells formed by necrotic changes in the tissue.

Giemsa's stain had made it possible to discover some small round bodies, very much smaller than any known Coceus, in the epithelial cells. These bodies occur clustered together near the nucleus in the form of a cap—but there is a clear space between. It was also found that the area containing the granules and the whole cell enlarge rapidly, and discharge the granules by bursting. But nothing came out of this interesting fact, since these granules had not reproduced themselves—nor had it been possible to cultivate them. Perhaps they are only the products of degeneration of the cell—thickenings of the Chromatin filaments. Our doubts are confirmed by the fact that these granules have been found in the epithelial cells of normal conjunctiva and even in the urinary tract.
In the follicular trachoma, the form of transient, round swellings which look very like boiled bags or somewhat like frog spawn. These follicles become confluent, and when large, may rupture, discharging gelatinous material.

In the tarsal Conjunctiva trachoma shows itself in the form of small, circular, pale gray areas. This condition is no doubt due to follicles embedded in the fibrous tissue. Later these gray areas enlarge and form elevations on the surface, when they sometimes rupture.

As the follicles develop, the blood vessels become invariably hyperemic; there is also a varying degree of papillary formation. When the latter is very abundant, as it does in some cases, we have the Papillary form of trachoma, whereas in the follicular variety the follicular formation is the more striking feature.

The latter stage, which is frequently noticed in trachoma, is the Cicatricial stage, when irregular white streaks are also seen inside the lids. This is due to the formation of fibrous tissue which replaces the sub-epithelial lymphoid tissue. Often enough one notices Holt's streak, which is merely a band of fibrous tissue formed along the line of the subciliary ligaments. Entropion is frequently caused in trachoma by the contraction of this fibrous band.
Occasionally one meets with Stegway's tertiary, or late, Chronic Trachoma. In this condition the conjunctiva presents a waxy-like appearance, due probably to the hyaline degeneration of the infiltrate around the follicles.

Pannus

In chronic and severe forms of trachoma, pannus develops on the cornea. The latter first becomes translucent and then opaque, depending on the severity and chronicity of the irritation caused by trachoma. Besides, the cornea becomes very vascular. The upper half of the cornea is most frequently involved, though I have very rarely seen the lower half involved. I have also occasionally seen the whole cornea involved. Generally, a sharp line of demarcation separates the involved tissue from the unaffected part.

There are two varieties of pannus, the difference between them depending on the amount of vascularity present.

Pannus Tenius - In this condition the vascularism is slight, and where it is excessive, the condition is spoken of as pannus vascularis. The blood vessels in the cornea are derived from those of the conjunctiva and are mostly to be noticed in the superficial layer.

Very slight pannus is detected by the naked eye with oblique illumination with a lens.

Pannus Siccus. Sometimes pannus persists as a permanent opacity with a few vessels, after the trachoma is cured.
But usually it disappears with the trachoma, often when the latter becomes laboured in intensity under treatment.

I am inclined to believe that trachoma is merely an extension of the trachoma from the conjunctiva to the cornea.

Discharge: It is a variable gravity. It may be very slight in long standing chronic cases, and mucoid in character. Acute exacerbations are often followed by mucopurulent discharges. In the latter case there is the possibility of a mixed infection, since pyogenic organisms are invariably found in the discharges. Trachoma is essentially a chronic disease, and probably it reduces the vitality of the tissue and renders it liable to infection by organisms whose the follicles rupture.

Histology: Changes begin to appear in the epithelium only when discharge appears. It becomes infiltrated with polymorphonuclear variety of leukocytes and this abundance of cells suggests the presence of organisms. As the disease advances the epithelial cells undergo mucoid degeneration, and they become even destroyed on the surface of the follicles. The inflammation here gives rise to pseudo-palms in the crypts between the follicles and in the folds of the swollen sub-epithelial tissue.

In some long standing cases keratinisation of the epithelium.

My summary is based on Dr. H. S. Hayoi's Hygiene lecture 1905.
occurs associated with a decrease in lactic acid.

The secondary xerosis is specially noticeable when there is considerable formation of fibrous tissue in the
interstitial tissue of the glands.

Two main types of changes are noticeable in the
sub-epithelial tissue: (a) The formation of follicles.
They are usually found in the lymphoid layers, and
sometimes in deeper layers as well, their structure, hence,
varying with their age.

In the newly infected leishmaniasis, a follicle there is
externally a single layer of somewhat elongated
flattened cells, which appear to be of endothelial
origin; their continuity is often much broken up,
more so than in the follicles due to the forms of
Congenital. Within the external covering are other
cells supported by an ill-defined stroma.
The multinucleated cells in the follicles are chiefly darkly
staining lymphocytes. Toward the centre are a
number of slightly larger cells epitheliod in
character, probably derived from the reticules.
They stain slightly, suggesting that degenerative
changes have taken place in them due to the
action of the toxins. Scattered in this central
area there are also a few larger endothelial cells
chiefly of the phagocyte variety. Well formed
plasma cells are rarely found within a leishmaniasis.
folicles, probably because they tend to rapidly disintegrate in the presence of the toxin.

In other folicles consists of a follicle of connective tissue considerably infiltrated by inflammatory cells, especially if the disease is advancing. Numerous fixed cells are present. Numerous blood vessels are found in the periphery of the sheath of the follicle, they extend inward toward the center so the follicle becomes organized.

Plasma cells are usually absent from the follicle.

A trabecular follicle may finally become included in undergoes organization and absorption.

Examination of the follicle may occur
(1) as the result of operation,
(2) from contraction of surrounding fibrous tissue.

(1) In sections through follicle shortly after section the thickest fibers wall of the follicle enclose a space which communicates to. Surface of the conjunctiva. Here is considerable polymorphonuclear leukocytes, plasma cells, owing to the presence of septic or purulent. Blood-stained.

Plasma cells, mononuclear leukocytes are found within the follicle. Both fine bands of connective tissue fibers from one wall to the other. The original contents of the follicle are either thrown off or destroyed.

(2) The contents of the follicle are compressed or expelled by the contraction of the fibrous tissue around the follicle. Plasma cells - a thin layer - separate the follicle from the epithelium.
The epithelial lining by the friction of bits of dead epithelial tissue and the expulsion of the contents, the follicles also expel their contents partly extended. The remainder becomes septic and is removed by phagocytes or monocytes of the blood. Absorption of fibrin.

A large number of lymphocytes find their way into the blood stream via lymphatics. Vessels carrying near the follicles are filled with them. The polymorphs are found only in the walls of the follicles at the time of infection. But when its cells degenerate, the polymorphonecels, enter the follicles and result being phagocytes or monocytes of the contents.

"No doubt the therapeutic effect of copper sulphate, especially in an attack of most cases of tubercle, with the tubercle is due to the polymorphonuclear leucocytes attacking the disease both in the follicle but also in the infiltration." Collin Mayo. Pithology Aecinology. p. 432.

Here is then the formation of fibrous tissue

In long standing cases, tuberculosis the upper palpebral conjunctiva is sometimes converted into a pale fibrous, looking tissue - brawny sclema (Shaw). It is unusual to much the cornea represents only the final changes in the infiltration. The epithelial layer is keratinised. The epidermal surface of the affected area is smooth. The epithelial layer is mostly of infiltration, histiocytes and fibrous bands. Infiltration consists of a few mononuclear cells, numerous...
Plasma cells – this lymphoecytic is broken up and converted into lymphoid material. The latter at times goes on to secondary amyloid and calcaneous changes.

Changes at the limbus & the subepithelial perium are due to infection of lacrimal tissue. At first the cellular infiltration is superficial to Bowman's membrane, which in course of time becomes destroyed & the substantia propria involved. In the third layer, lacrimal follicles are formed. Polymuclear leukocytes are found if the ulcerus should be present.
Trachoma Bodies and Their Significance

M. Zade in the Graefes Archiv fur Ophthalmologie, Ed. LXXVII, Sept. 1, 1910.) gives the result of his findings in 25 cases of trachoma from the eye clinic of Jerusalem University. In 10 cases, trachoma bodies were found; in 5 the result was indefinite, and in 5 the result was negative. But others, however, found trachoma bodies in such large proportion.

Perhaps the chronicity of the disease makes the trachoma bodies to disappear. The treatment which the eye was subjected to might have something to do with it. All the cases, who were subjected to treatment did not show the bodies, while those who showed the bodies were known not to have been treated.

Kinder has again offered some pertinent suggestions on the question of the identity of the trachoma virus and of the inclusion bodies of the newborn infant's conjunctiva of male genital cells.

In his report on the History of the Location Neumorrhoea (Trachoma Virus) in Graefe's Archiv fur Ophthalmologie, Vol. XXXI, part 1., he records a number of experiments of inoculation upon the conjunctiva of the upper and lower apes. He found that the
vims of inclusion blennorrhoea of the newborn
conjunctiva and of adult genitalia generally excites
a typical inflammation as direct transforms to
the parenchymal conjunctiva. Under the microscope
chalmydorogon + five incisal bodies were often
found, in considerable numbers in the adult
type, whereas in the more chronic inflammation
they were very scanty. The more chronic type
resulted particularly from infectious with discharge
from adult genital.

Re-infection experiments have shown that
one attack of inclusion ophthalmia in patients
produces a definite immunity, though not a
lasting one.

But infection by the chronic virus was not so successful
on parrots, and it gave rise to a more chronic affection,
producing marked changes in the conjunctiva.
These differences were perhaps due to the comparatively
chronicity of the inclusion cases that came under observation.
The number of inclusion bodies formed in the discharge
were very much smaller than that formed in even the
mild inclusion blennorrhoea discharges.

It appears therefore that acute trachoma, whereas it is,
which is the more comparable with inclusion
ophthalmia.

Some of his experiments showed that the resistance of the
of the inclusion virus to be very low, just as Botalli has shown to be the case with fowl-plasmovirus.
Again one infection with trachoma virus seems to have conferred a certain local immunity against subsequent infection by inclusion blennorhoea.

Therefore as the evidence was available besides traces a close relationship between the two viruses. In his own mind he seems to entertain no doubt as to their identity!

Of course, Wolf used his produced trachoma with scarring by inoculating the adult human conjunctiva from inclusion blennorhoea. But the proof of identity is not established, because the infected eyes did not develop pustules.

But the report of the results of the numerous examinations of scrapings from the conjunctival epithelium in various conditions the following:
Inclusions have been arrived at by F. G. Rosales and Petroff M.D. of Tula.

(1) They doubt the specificity of the cell inclusion phenomena — in fact they doubt that they have any pathogenic properties.

(2) They found the inclusions in 62% of cases of recurrent and punctuated trachoma, but also in 68% of non-trachomatous chronic conjunctivitis; also 23% of cicatricial trachoma.

K. Binder of Vienna summed up the whole
question of trachoma in the Archives of Ophthalmology
July 1912.

In 1907 Halberstambl and Protogazek described
that they found in trachoma lesions stained with
Giemsa's method: there were dark blue or purple
inclusions in the protoplasm of the epithelial cells. At
first round or oval, they apparently fused, became less dark,
and then true red points appear in the masses. The red
points increase rapidly in number, while the blue ones
gradually disappear—they called the latter plastici,
because they thought them to be a reaction product
formed by the action of the virus upon the cells, which
was represented by the red points. Extra-cellular
red points also were found, though they were not
characteristic enough to be identified. Antitoxins
often showed similar findings when they were
incubated with trachoma.

Subsequent investigations also confirmed the idea
that Protogazek's inclusions are characteristic of
trachoma, although they are not so easy to find
usually. They are not found at all, even in fresh
cases sometimes. But there was universal
acceptance of their parasitic value.

In the meanwhile Shagardan and a little later
Schmeicher, each separately found the typical
inclusions in blennorhoea neonatorum not gonorrhea.
Heymans, soon after, claimed to have found the inclusions in
new cases of gonoblenorrhea neonatorum. As a result
of these investigations, one had to doubt more than ever
(1) the parasitic nature of these inclusions
(2) that they were typical of trachoma, since they might
be a reaction product of the epithelial cells against the
Gonococcus or against the agent of trachoma.
Again Neisser showed that in many cases
of ophthalmia neonatorum no Gonococcus was
be found. The idea of these cases was later than that
of the Gonococcal variety and of considerable rarity;
but accumulation of Conne had hardly ever occurred.
A small number of these cases were due to Koch's-
like, bacte:ill or to pneumococci—but in the great majority
of cases no pathogenic bacteria were found.
Hinder and Wolfden were able to show that in nearly all
cases of non-gonococcal Ophthalmia Neonatorum the
Cell inclusions are to be found, but they were not the
found when Gonococcus is the source of infection.
These forms of Ophthalmia were designated by Hinder
as "inclusion blennorrhoea."
As the result of further research, he came to the
conclusion that the described "plasma" is only a
particular stage or peroration of the virus, which is
so delicate that it becomes quite irregular and looks
brought out when the cells containing it are dried in linnen.
A series of scientific investigations proved that the inclusion blepharitis is similar to trachoma histologically as well as clinically. (1) follicles appear late in inclusion blepharitis. (2) Some of them break with scraping. (3) Rabbits are not susceptible to the organism, but the inclusion blepharitis can be introduced in them.

Hence, considering the great similarity of the conjunctiva to the genital passages, borders by the possibility of a genital trachoma has been chased for long. We are convinced also, while we cannot prove it yet, that the bole initial bodies of the neoplasms, called the elementary bodies, are really living organisms, and that the virus is a protozoa.

It may be that trachoma was originally a purely genital inoculity — but once transplanted to the ocular mucous membrane, it has, largely owing to its Chronic Course, been able to keep itself going as a purely ocular infection. For instance in Egypt, wherever Orientalism-like trachoma is widely carried from eye to eye. And under European influence the conditions tend to reduce adult ocular infection to a minimum, and to increase the spread of the genital or introitable complaint. But the propagation of trachoma is inclusion simple, affecting one into the same all the world over.
The inclusion that the following characteristics in well-fixed and stained sections—"blue, sharply outlined, round cocccin-like bodies are seen in the Cavities of the protoplasms of the epithelial cells. They multiply by special division, and later on are found only near the wall of the cavity at a time when red points appear in the Cavities." These "blue bodies" were found both within and without the cells, sometimes in large numbers. The circle cellular bodies are very characteristic and can be easily recognized.

Kinder has found these blue inclusions in Pruszkowski's cell inclusions in trachea, as well as in the non-smooth-tuberculous metastases.

E. E. H. in Ophthalmic Review of 1912 says—

"Khalleschow and V. Proskowiez thought the virus was similar, but not identical with the Causative Agent of Trachea, and succeeded in isolating it from the seminal excretion of a woman whose child had suffered from an inclusion tracheo-hora. Kinder, however, was convinced that the two were identical, and succeeded in incubating monkeys with the inclusion thrombosis. At a later date, succeeded in isolating the cell inclusions from the seminal of the patient who was suffering from a trachea, which was not due to the pneumonia."
Strangely enough they found both pus-cocci and inclusions together in *Ophtalmia nematoman* — in some cases, the eye of the patient showed both, while the other only the inclusions!

...with regards to polycular conjunctivitis — I do not think that it is invariably connected with trachoma. I am not a "veterian" in that to suppose that trachoma developed out of polycular conjunctivitis. And I admit that in some cases it is very difficult to make up one's mind whether a particular eye is trachoma or polycular conjunctivitis. I
Treatment of Trachoma.

It is unfortunate that no specific treatment has been discovered. All too well are we aware, after several centuries, attempts to cure have been made to grapple with this disease, but the success has not been very great. So long as we continue to strive in the dark with regard to the real root cause of trachoma, it is to be expected that the effective cure will evade our grasp.

Though a specific cure has not come to stay (though several have been proclaimed from time to time) it is of interest to note that modern treatment has done a great deal to ameliorate the condition, and effect cures in certain individual cases.

Lead acetate is said to be much in use amongst ancient Egyptians. According to Sellier, verdigris was in use over three thousand years ago. Hippocrates had recourse to rubbing or scraping off the pustules, with subsequent cauterization. He even went to the extent of sacrificing with the prickers of tyrants, wrapped around Milesian wool. Pumice stone, and fig leaves were used by Alexander of Tralles in 560 A.D. Paulus of Aegina is believed to have removed the pustules with a spoon-shaped aspiratory. In the middle ages, Bernardus of Naples attempted excision, while Pucellus attributes a kind of excision to the skill of Hippocrates himself.
Very little is known as to the nature of treatment during the period, long as it was, from the decline of ancient medicine to the beginning of last Century, when the attention of the world was again seriously drawn to the treatment of trachoma.

G. F. Behr (Wien 1813) almost calls trachoma an "Eye itch" recommending cleanliness as a necessary measure for preventing a cure, while prohibiting indigestible food, and insisting on the prescription of an aliment of turtle durettes into the affected parts of the skin at the back of the ear.

Dr. W. Boldo, in his first work on trachoma, says "Cold applications, leeches, incisions, venesection and artificiosities, even to loss of consciousness, played the chief rôle in all European Countries during the first twenty or thirty years of last Century and were often combined with balsam, incision, strong remedials & draughts, purges & diaphoretics, & confinement in a dark room.

The demands of hygiene gradually received recognition, and the Englishman Vetch, to use a word, believes in venesection, as early as 1820, pleaded for fresh air and life in the open. Among local measures, besides antiseptic cleansing of the eyes, innumerable nostrums were used, lead acetate, silver nitrate & copper salt, being largely in the fore. Removal of the granulation with the knife & scissors were emphatically by English (Vetch, Adams), Italian (Scarpa), & especially..."
German authors (Rust 1620; Philipp von Halsted, 1521; Walther, 1521; Läbe, Eble & Heyning) by
executive combined with hygienic measures, von
Walther succeeded in checking out a severe epidemic
in the warehouse at Frankweiler, in the lower Rhine,
in 1808—1809. He was so enamored of this treatment
that he advised it in almost all stages, even
discussed its performance in the lower lid as a prophy-
lactic measure. Over-enthusiasm & ridicule,
especially in England, soon brought the operation into
discredit.

Cauterizations, cautery - pencils were also in constant use, but
sometimes appalling results.

But - under modern scientific conditions, the treatment -
may be classified under the following groups:
1) Therapeutic (2) Mechanical (3) Surgical (4) Hygienic.

The most discouraging fact about treatment is that
the treatment takes a long, very long time, to effect
a cure. Months, even years, approximating a decade,
and more, to be spent in treatment before a case
can be said to be cured. Patients - & even their
medical attendants - get "fed-up" with the treatment,
and lose their early enthusiasm in continuing the
treatment. The prolonged period of treatment - makes
it very expensive to the poor, who are often the best
helpless victims of the disease. The situation is
...aggravated by the frequent interruption with their work which constant attendance at a hospital or a surgeon's office involves. Consequently patients give up the treatment all together in despair or have recourse only occasionally when exacerbations occur in the course of the disease. It has been my experience in India to frequently meet with patients who had neither the means nor the means to undergo an indefinitely prolonged treatment. In private practice, often enough, patients would turn round and ask me how quickly I could cure the disease. In my plight I generally avoided a direct answer and asked them to let me know how much they could afford to spend on the treatment or how long they would like to try the treatment. The prognosis I gave depended on the social position of the patient, his psychological disposition—whether he could persevere with the treatment or not, whether he was really determined to give it up—and on the actual condition of the eye. Three months was the shortest period I had ever suggested for the course of treatment—and I made it clear at the outset that the result might, in any particular case, drag into years! There was often considerable abatement in the symptoms of the disease, and patients thinking themselves cured, came against the better judgment of their doctor, gave up the treatment—only to return in two or three months hence with considerably affected symptoms.
Sometimes patients from the Country, Suffering perhaps for some years with Trachoma Came to the City to put in a full working week for Treatment, with the hope of getting Completely cured so they could return home during the week end. Some of them expect almost miracles from highly qualified medical men, especially from those who have been abroad, and thus lay claim to the conversant with the life-to-death methods of treatment. I have had to eat the humble pie on several occasions myself, and bend my head down in all humility unable to come up to the expectation of my Trachoma Patients, particularly with regards to the rapidity of achievement.

Our Village Physicians are ignorant of these methods. They may take months or years to effect a cure. But you, a well-trained man, preparing the specialist ought to be able to cure in a few days; they often remarked to me. To suggest to them a three months course of treatment is courageous enough, but to ask them to risk a year or two in the possible chance of a cure is madness itself. They would simply return home with eternal despair in their hearts. I had therefore to do what I could in the time at my disposal, and leave the rest to my patients and to the fates!

the rigorous way in which Trachoma develops serves as a blind to the patient, who does not become
Aware of it till perhaps an attack of Ophthalmia
Suppurativa. Thus much precious time for effective
treatment is lost of late, and the patient thinks of
Consulting an eye surgeon, when he realizes that his
Ophthalmia has not been Cured after several months
domestic treatment, while his neighbour's eye was
perhaps Cured within a week with the same remedies.
The patients do not easily see the difference there is
between Ophthalmia & Granules Ophthalmia.

Therefore hardly a Case Comes for treatment to the
Oculist before the disease gets thoroughly established
in the eye. So from the Very commencement on has
to work under Considerable difficulties.

Perhaps the lay mind will never sufficiently understand
what great efforts have been made in different parts
of the world to grapple with the problem of trachoma, and
the most patient research & the most perfect scientific
investigation have all up to now failed to stumble
either in the Cause of the disease or in its radical
cure. They can only judge us by our results, but not
by our efforts and heroic failures. We must hold on
in patience & faith. The goal will no doubt be reached
at no distant date. But, in the meanwhile we are yearly
making progress towards it; though we have not Cured
trachoma, we have Controled it — we have not been as yet
able to eliminate it, but we have broken its back.
The treatment of trachoma may be classified under the following heads: (1) Therapeutic (2) Mechanical (3) Surgical (4) Hygiene.

I have not found the treatment of trachoma by any means easy. I also soon discovered that there are no hard & fast rules to stick to in the treatment. Each case had to be treated in its own merit. Observation, discretion, patience and experience are most essential on the part of the practitioner to achieve any degree of success in the treatment of trachoma. No one method sufficed to effect a satisfactory cure. I have had to use, most frequently, all the four methods in individual cases - even in the result was in some cases, disheartening.

**Therapeutic Measures.**

The name of drugs suggested in the treatment of trachoma is legion. When I first started I armed my consulting rooms with every drug that I could get hold of. But in course of time I learnt to dispense with most of them, and stick to a few favourite ones, which my experience had justified. The following drugs I had came to depend on for my work.

(a) Silver Sulfate (b) Mercury Sulf. (c) Pilocarpine

(b) Copper Sulfate (c) Bromide (d) Hygiene.

Silver Sulfate - the best of them, so far as my experience goes, is Silver Nitrate (Aequinatum Nitricum).
Silver Nitrate — I found it invaluable in the treatment of trachoma. The chief objection to it was the pain of it, being very painful. No doubt it has its great drawback, but its utility cannot be denied. In fact, in India, the pain of it being a painful remedy enhanced its value for the elimination of my patients. The Caustic property which causes the pain, is in this opinion is destroying the "inertial thickening" in the eye. Moreover, the Coatings which the application of Silver Nitrate produces is formed in their hospital as "the drawing of bad fluid or serum from the eye." So patients were quite willing to submit to the painful treatment, and I had recourse to it frequently and courageously. I had Silver Nitrate made in solution of several strengths and ready for use. My stock solutions were: 1%: 2%: 3%: 4%: 6%: 12½%: 20%! (the latter I have not once used).

I started the case with 1% solution. I always had common salt solution quite ready at hand. I never put the drops into the eyes. I simply paint the eyelids lids with a piece of cotton soaked held tight with a gauzein forefingers and dipped into the solution — then put a few drops of the salt solution into the eye in finally wash out.
the eye with cold water. If there be signs of Considerable
irritation at all, let it, I instil a drop of Cocaine (1%)
crude, put in a small quantity of Baltic Spirit, 5%.
The eye soon requires a solution for this solution, when
I go on to the 2%: after a week or two by the 3%,
then go on to the 4%. Generally the latter solution produce
Considerable reaction. The next day I go back to 1%.
then I go on to the 6%, as an intermedial measure.
I am very careful in neutralising the 5% with
the Salt Solution immediately and then wash out with
cold water. If the patient could stand this solution,
I wait for a few days, then I ease my patient
to try my Royal Remedy (12½% Solution).

For the application of this solution I have the patient
lying flat on the operation table. I have rubber gloves
on my left hand, the fingers of which hold the eyelid
in position. (The glove serves very well from the hands of
asepsis) An assistant is ready with a pipette filled with
weak salt solution. A jar of ice cold water stands close
by with a spray arrangement fitted on to it. The palpebral
Conjunctiva is anesthetised with 3 or 4% Cocaine Solution.
As I hold the upper eyelid, my assistant with a Specula presses on the
skin surface of the lid so that the whole lid practically
sits evident & comes into View right up to the fornix.
I rapidly paint the eyelid with the 12½% solution,
til the typical colour of the solution of the silver salt in the mucous membrane appears. I use a certain amount of pressure in passing the solution. I then instill, either a little bleaching is noticeable nor it's deprived of their epithelial covering. The whole process does not take more than a few seconds; and if there are any granules at the lower lid ends, I take a sweep or two round to it in, taking care that the lid does not touch the eye. At a sign from me the assistant squints in the salt solution, and the hand is turned to a side so that the solution/product into a basin placed by the head as purposed.

Then the spring of water is allowed to play on the eye freely for several minutes, so that the eye is thoroughly washed, cleaned & relieved. Then the other eye is treated similarly if needed be. I generally do one eye at a time before I finish off by introducing some soft ointment into the eye for soothing & lubricating it.

Pain generally subsides as the effect of cocaine sets off; the patients are advised to put on ice compress on the lid, and lie quietly for a few hours. Generally the pain subsides in two or three hours. But there is considerable reaction in the eye which lasts 3 or 4 or 5 hours. The next few days I content myself with putting in soothing & anti-septic ointments into the eye. If the lid needs still further treatment, I go back to 1% or 2% solution. I am a slave to no one method or solution - I use my discretion.
This may seem a drastic remedy, but it is justifiable when one considers what a desperate disease trachoma is! But—do not have recourse to it unless it becomes necessary to do so in any particular case. I do not remember I have adopted it more than half a dozen times in any one case: often two or three drastic paintings were all that were necessary. I believe the solution acts as an astringent, a mild caustic, & a local irritant. Hence its beneficial results— & at all events I have had very good results from it. The weaker solutions are sometimes too weak to cope with the virulence of trachoma. Matter may persist without any tangible result being obtained. But the application of this strong solution sometimes achieves wonders. A few years ago, a boy belonging to a rice merchant was brought to me suffering with trachoma. He had been for some time under treatment. Several ophthalmists tried him with weak solutions of agar, but it did not benefit him much. But I gave him 3% & 4% application of the 12½% solution of agar, at an interval of 2 to 3 weeks between, in two months time his condition improved, that is his recommendation to a girl, a relative of the boy who was suffering from trachoma & was sent—for all we way from Delhi to Madras, with the special request that the very principal remedy he tried in her also, as they had been satisfied with its efficacy.
There were hardly any cases of trachoma when they left me. I have never used silver nitrate sticks for trachoma, though I have used silver in solution frequently — persistently — I began with it, continued with it and ended with it. I never had a case of syphilis! In my experience the strong solution materially shortens the period of treatment and reduces the necessity for the constant application of blue salts or weaker solutions. Thus the chances of syphilis are reduced to a minimum.

Trypogol: Protargol:

They are painless when instilled into the eyes. They have everything to recommend them though they are comparatively expensive. I have used them freely — but they have not given me the satisfaction which Affog has given. Trypogol (3J 15 3J) and Protargol (3J 15 3J) I found useful in starting when the eyes were very inflamed. I would not tolerate Affog. I started with them and went on to Trypogol when the acute symptoms had subsided. Sometimes the eye became so set against the Affog it became tolerant of it. In such cases for a week or two I use Trypogol as a substitute to return to Affog again soon after, when the latter acts with perceptible rapidity. These are an aid in the application of Affog, salt to the palpebral conjunctiva — it is not easy for the doctor to require it, nor is it safe to trust them with it.
And hystadox is a safe drug. It is a drop. Can easily be instilled into the eye. So, when I discharge my patient, I usually order them an ounce of hystadox to be used by them in their home. In our village, even pre-antibacterial methode against the recurrence of trachoma.

I found hystadox invaluable in cases of phthiracmas where the diagnosis of trachoma was uncertain, and in follicular conjunctivitis. It acts as an anti-microbial, stimulant, and anti-septic. And it is too weak to grapple with the serious trachoma. It is, therefore, preferable, a splendid adjuvant to hystadox — a complementary drug — but neither of them can replace the nitrate of silver.

Copper Sulphate

Copper Sulphate has been held in great estimation by oculists, with regard to its potency in curing trachoma. It has stimulating and Corneal-irritating properties. I have used it on several occasions and found it useful in healing the follicles absorbed.

Here is also an antiseptic application of Copper Sulphate. Take a gram of hystadox. But it has one great disadvantage — its penetrating power is liable to readily penetrate into the eye. Its solutions, if it is not strong enough to act on the granules immediately, it is dangerous to leave the solution into the eye for any length of time. When blue stork is freely passed on the involved lid, the reaction is not sufficient to promote absorption. On the other hand, when a certain
degree of friction is used, small particles get
likely to stick to the cornea — and these particles are
not easy to be dislodged. We have not any soothing
solution (like the 1% for eyes) to neutralise the effect
immediately. So these particles continue to lodge and irritate
the eye. I have seen considerable irritation caused in an
ocular compressive — on a few occasions, even this
method of palpebral. So I have learnt to avoid it
as much as I can and use only very gently; take care
to wash all the lid and remove all the debris. If I rub
a piece of moist cotton wool before closing down the
 eyelid, eye lid.

With the Nitrate of Silver, or the Nikau, there is
much safety. It does not exhibit any penetrating
property. It acts immediately on tainting the
neural membrane — and it is easily & thoroughly
neutralised by the solution of Common salt. 1% - 2% to
make sure I actually used in the form of solution.

So I have not to hunt Nikau of Silver, and distinct
Copper Sulphate (it may be a fancy of mine!)
I use the latter where I feel that the lid has had
enough of the Silver salt and needed a change
badly. Also where I felt that the granules needed
a certain amount of stimuli (ision

Dr. S. Boldt, in his work in Treatise on p. 176,
says, "We recommend silver nitrate in 1/52.
"...per cent. solution only. This is especially indicated (Rachkow, loc. cit. 56) in soft, non-ulcerated conditions, with marked swelling and injection.

It is more efficacious when the conjunctiva is less oedematous, with prevalent or non-proofulent discharge — i.e. the more the condition approximates that of chronic blepharitis. The opposite condition, a rigid firm swelling, with pale yellowish red colour and mucous-sunts or scurvy secretion, & also the hyperplastic, granular condition, with palatums or fleshly appearance, indicate the use of Copper Stick.

I agree with this statement generally, but so far as my experience goes in India, I used Silver Nitrate in every conceivable case, without restricting the use of Cases 1 Copper Sulphate to others to Silver Nitrate — and I have had exceedingly good results. By using Silver Nitrate solely in very weak or very strong, one may get all the desired results. And when more mature experience is gained, I shall not press my point. Only this much I will say.

If I have to choose between Silver Nitrate & Copper Sulphate, I shall, of course, stick to the former, though I should like to have the latter also for any emergency.

Now, in India, a great many of the patients who come to me have already been treated by the Copper Stick by their village physicians — some of them remembering what they had done wrong and therefore adhering to the right. If it came in the hands of me, when they trusted implicitly, ...
Mercury.

Hydrosy. Acid. Flav. I use in the form of ointment mixed with Vaseline (5 grs: 16 grs: 32 grs: 64 grs: 128 grs: 256 grs: 512 grs: 1024 grs). It acts as an antiseptic, lubricant and a mild stimulant. At the commencement only the mildest ointment is used: later in the treatment, finally the strongest. It is not only put into the eye, but also used as a vehicle for massaging the lids on the cornea. After painting the lids with the water solution of working the solution with water, I give the patient a few moments rest, and then put in the yellow oxide ointment, and massage both eyes into the conjunctiva, to achieve both therapeutic and mechanical ends. Then I give the patients some yellow oxide ointment to take home and use it before retiring for the night. They also take some of it with them when they return to their country home, to put just into the eyes, especially as a precaution against a recurrence of trachoma.

Hydrosy. Perchloride.

Occasionally I use it as an eye wash in (1 in 400 solution), particularly where there is considerable post-paracentesis exudation present. Rarely I use it as an antiseptic and to irritate in rubbing the fragments with cotton wool soaked in it.

Cyaneide of Mercury.

I have used this salt.
for subconjunctival injections when trachoma was associated with pannus, with most gratifying results.

The injection is extremely painful; sometimes a hypodermic of morphia becomes necessary to reduce the sensibility to pain. On the other hand, the addition of a few drops of a solution of Atropine reduces considerably the pain of the injection.

I have found pannus of considerable thickness, which disappears under a couple of injections — the 2nd injection was repeated at the end of a week or so. The trachoma of the lid, which resists treatment with a spray, for instance, soon showed signs of yielding to treatment after an injection of hydrocyanide. Perhaps the severe reaction which the subconjunctival injection produces in the eye, flushing the blood vessels & the lymphatics, thus aiding a rapid absorption of the pannus. The palpebral conjunctiva being so lax as the ocular one, the similar result could not be produced.

The trachoma would have yielded to subconjunctival injections of hydrocyanide of mercury. I shall refer to this later when I come to discuss the question of treating pannus later.

**Zinc Sulphate**

A solution of 2 grs to the ounce I give my patients to drop into their eyes frequently when they are at home, preferably before retiring for the night.


A lotion of 2 grs to 1 oz. of water is used.
as eye drops alternating with zinc sulphate. An
ointment of boric acid (gns. &c.) (white vaseline) I use
to prevent the adhesion of raw surfaces and also reduce
irritability in the eye.

Atropine sulphate

I hardly ever use it in trachoma,
except when there is an ulcer in the cornea. Because, as a
rule trachoma patients continually wear the light of the
trachoma lamp and— and the dilatation of the pupil
produced by the instillation of atropine drops into the eye
prevents the sensitivity to light—hence they confine
themselves in closed or dark rooms—which seriously
interferes with the hygienic ideals of treatment. On the contrary
I prescribe for my trachoma patients smoke glasses and insist
upon their getting out into the open air as much as possible.

Diamine sulphate

Most useful in the treatment of corneal
complications of trachoma, e.g., ulcers, pannus, inflammation.
A drop or two instilled into the eye, producing a moist
reaction in these cases. But it soon fails. The tolerated by the eye.
Instillation of diamine drops, followed by a massage with the
ointment of the yellow oxide of mercury, diamine causes rapid
absorption of the ulcer & pannus.

To occlude ulcers:

Only in the form of solution . . . (3 ml. per ml.)
most effective after strong applications of. After obstetric, or other serious
mechanical or surgical interference.
The Mechanical Method.

Massage is a bloodless method. It is able to cause absorption of the deleterious products through its action on the lymphatic streams, besides being very simple. Various forms of massage have been recommended by various authorities. In 1889, L. J. Tschernig practised direct massage with the finger, bromide acid poultice being spread on the conjunctiva of the eye. A glass rod or spatula has been used by others. More recently, I have rubbed the upper lid with a glass rod and to the enchant of the patient. I am a real believer in massage. I have my own method. I have not seen anybody doing it in my precise plan, nor have I read any literature about it. So, I may be excused for the liberty of calling the method my own.

I generally place on the inner surface of the lower lid and hydrate. I then place about the size of a pea, and if there be a few more, I work the lid, the upper or lower, whichever is nearer the affected part. Gradually, first, then briskly, and then I rub the two lids together in the following way: With the index finger of the right hand placed about the middle of the upper lid against the lower lid in such a way that it partially envelops and meets the lower lid, which is
in turn finished up by the left middle finger placed about its middle. Thus the two lateral Compressions of both the lids is opposed to each other, with a coating of the Yellow Oxide Ointment spread on them. With the aid of the thumb, one lid is placed at the inner border of it. With some practice the whole surface of lateral edge of the upper lid could be made to pulp a fragment of it. Now with this just manipulation without causing any serious discomfort to the patient. These hair-like follicles...

...through the general Stimulation of the Conjunctiva. Again armed with a weak Solution of Cocaine, with increased pressure, I could make the rubbing pretty brisk, so because some of the follicles demanded of their blood supply a drop of blood occasionally oozed out of the affected lid surface. This localized bleeding prevents the formation of fleshy knobs on a large scale, and helps the destruction of the follicles. The presence of the mercurochrome ointment helps to keep the Conjunctiva aseptic, and its germicidal property might help to some service in the destruction of the microorganisms. I found such a practice to the follicles within its power of penetration.

Again as a lubricant it prevents adhesions and aids resorption of the lumps formed.

I have found very useful in the treatment of follicles of not great density and since its adoption I have had very...
Generally choose my cases for the application of this friction
massage. I avoid it when the eye is highly inflamed or too
irritable; also when the follicles are very large or when they ooze.
Again when the secretion is very much thickened it is not
easy to employ friction massage. In acute blepharitis, wait
till all the signs of the incipient infection disappear.

From the professional point of view, the friction massage
is very useful, as I found it to be in dealing with normal subjects
who had the very slight irritation of surgical instruments near their eyes.

Here is also very little pain in this method. I have noticed
the effects produced by it — in fact it hastened the recovery
of these cases very materially.

Heigh's ointment (Potassium lodide, 10; Sodium
bicarbonate, 0.5; Petroleum, 100) has been recommended for
massage. I never tried it — I was content to use lubrication
where the lid is still hard & cannot easily be drawn
down or up. I found jet tool and made it briskly with Cotton
wicks drawn into a pledge — soaked in 2% solution of
1/9. Apply friction with it over follicles, so that they
practically bleed. This helps localized destruction of
membrane + formation of localized fibrin, thus aiding
perhaps the partial destruction + absorption of the follicles.
Hygienic Method

I have come to regard heat
hypoxia places as very important part in treatment
of tuberculosis. I invariably recommend open air:
change of place of residence if possible: clean and
healthy surroundings. Avoidance of smoke and dust which
cause and keep up irritation of the eyes. Plentiful supply
of clean water for washings and ablutions. Use of clean
separate buckets by the patient: also the use of an antiseptic
solution for the cleaning of hands when they come in contact
with the eyes.

Plentiful supply of easily digestible nutritious food is
most essential. Milk, butter, sour milk, and fruit I have
found invaluable, especially in limiting those who are
pure Vegetarians. Strict avoidance of indigestible
food, such as articles of chic, alcoholic beverages and
excessive use of廉价 Coffee & Tobacco either in the form
smoking or snuffing.

Since tuberculosis favors Scorbutus diathesis & anemic
Condition, I have found anti-scorbutus measure a great help
in overcoming the disease. Phlegemine sulphur in 2-3 grm. doses
three times a day I found to be helpful and to a true and
powerful stimulant. Phlegemine sulphur is very demeritible, particularly in those
who have a malonic taint in their blood. 2 or 3 grm. doses
three times daily may be continued till bringing in the case seems
cure, but the system cannot stand any more of it safely.
As nicotine I found as an invaluable drug. Its action on the red blood corpuscles stimulates it to an chain of the first rate blood resorber. Whether it has any paracidal effect on the microorganisms of tuberculosis (is B. tuberharum i. e.?) it is too premature to say at the present state of our knowledge. 

**ES.** Arsenic 2 - 3 hrs. three daily after food, along with quinin or with terecammon. Albus 3 - 5 hrs. is a wonderful pre-venereal apogee.

I could also recommend Diamine solution

15 nos. thrice daily, freely sterile in water.

**ES.** Of Calomel. Segundo 5 - 10 hrs. at bed time in 1/2 of water, I found very useful in regulating its blood.

Often lichenoma is associated with abnormalities in the nose-pharynx. A saline lotion to irrigate the nasal passages (Bor. Silic. Sulfur. Phosph. Chlom.) in 5 parts of 1 part of water) or medicated nose sprays are very useful. Attention to the nose-pharynx I found invaluable in the treatment of tuberculosis.

I remember treating a well-to-do fiction lady for lichenoma. After a few treatments I discharged her as cured. About she returned in 3 months, complaining of a relapse of lichenoma.

When I examined her nose-pharynx, I found that both the inferior turbinate turbinate bodies to be greatly hypertrophied on both sides & her tonsil slightly enlarged. So I cauterized her turbinates with galvomic cautery & removed her turbinals, with the result that when she met me a year afterwards the cancerous turbinates had not returned!
The Surgical Method

The chief strength of the modern treatment lies in the surgical methods that have come into vogue. But I need not enter fully into the various surgical methods or their relative merits, since they may not be of much interest from the purely medical point of view. So far as the purpose of this article goes, I shall content myself with indicating the methods that I have found useful in my own practice.

Expression with roller forceps:

Expression in this manner causes the epithelium over the follicles to rupture, with the result that the contents are expelled to the follicles, excepted without pain or injury to the Conjunctiva, rapidly. Dr. J. Bödtt believes that roller forceps is specially indicated when moderately large follicles occur without previous inflammation or after the inflammation and discharge have subsided. Roethman, also into a host of others, advises expression when the follicles are "ripe" or softened.

But Knoebel (Zeitschrift für Augenheilkunde, Bd. 15, 1892, S. 360) drew attention to the fact that in chronic gelatinous trachoma roller forceps cause serious injury, especially laceration of fragile follicles, with much scarring. Whatever is the merit of roller forceps expression, I found it very painful, in cases of certain constitution — and women, patients could not stand the treatment. I am inclined to try...
with Col. F. Smith of Hamilton's Staff (The intenmen
of the Galen: Capillary wall oedema of Glazeant) that
in future expansion by roller presses etc, could be avoided
a risk of ancient tamper in ophthalmic surgery

The same object is realised without making the
patient or becoming the risk of causing laceration by
holding the follicles by the point of a needle, only
are & compelling the cul-de-sac. I have found this method
very useful & not unpopular with patients. Thus
exorcise in the dehiscence Canlein Conjunction.

Kubert used his "modified expeller" no of
the places of which is solid, as the periphery.
He also punctures the thickened tarsus deeply with
a special "puncher", particularly the Corneal
border when the tarsus is infiltrated.

Galois-Caulery is also recommended to
pick out individual follicles. I have rarely used
it when the follicles were large enough to
justify its destruction but the Conjunction. The
risk here is going too deep into the tissue.

Excision—

Excision of the fornixes and of a part
of the tarsus was introduced by Heisrath of Königsberg,
a pupil of Jacobson, in 1889, through the other
authors had noted the predilection of lacrimal and
fornices. (Heisrath, berl. Klin. Wochenschr. 1889, No23-10)
"This procedure" says J. Boldt "heralded an unlooked-for advance in the treatment of trachoma. It has proved of invaluable service, particularly in the struggle with the disease in endemic areas."

Even Jacobson, who did not believe in excision at the outset, became a convert to the new rational method. Kubert in his 'Chemische Beiträge zur Pathologie des Auges,' commenting on the use of excision, says: "fewer weeks suffice to cure bad cases than was necessary in as many years by the old methods — mere uninterupted use of lotion — to leave them blind or unfit for work."

Excision needs skill and judgment and experience to be a success — else irreparable complications might arise. Kubert claims to effect cure in six weeks, and also is of opinion that there is very little chance of reinfection after excision. The permanent cure is claimed to be as high as 50–60% by Kubert and 34% by Hopper. While the percentage of cases claiming for expression was about 20%,

Kubert has greatly introduced his invaluable method of excision of tumors, in cases of infiltration and thickening — which can be used in the stage of squamous cell and healed Conjunctiva.

In no time, Core should be either not to excise Conjunctivitis but to the rotation of the eye, and be in the fullest degree
In principle, when ulceration is involved, one should have recourse to expression + treatment with drugs.

In Children, excision should not be practiced, since healing more easily yields to the antiforms of treatment than in adults.

Excision is the best method of treatment, we have in some cases, though, personally, I would have recourse to it, when the minor simpler methods have been tried & found to be non-remedial. I have had good results from it, but I do not recommend it as a routine treatment.

But since I resided in India, with resident hospital experience, have recently advocated its routine use even among the hospital patients. I doubt the possibility of its becoming popular among private patients, in India. The better class of patients do not submit to operative treatment, and all the minor methods have been tried & proved ineffective.

In this vocabulary, surgery means indiscriminate cutting into the human body by Western butchers who are given as a rule of the efficiency of the drug treatment. I have often heard patients say to me: "We have come to you to be treated by the application of medicines, truth it would cost us something. Wash we wished to be cut into (dissected?) we would have gone to the hospital!"
Igles:

When ulcers occur in the cornea, I put in a
drop of atropine, very gently massage the cornea with
yellow ochre ointment and bandage the eye.
If the ulcer is situated on the corneal edge or
it is deeply situated with the danger of prolapse of
the iris into it, I put in cocaine to keep the iris,
iritis, + pupil contracted.
I have found glycerine very helpful in promoting
the rapid healing of ulcers.

Staphycoma — Once & Cornea losing its lucidity +
increased internal pressure. In mild case
pressure should be all that is necessary. In more
serious cases — Atropine, Cicatricine + pressure
bandage + rest + correct posture.

Trichiasis — If not very troublesome, fuse I feel but
the barriers if not in pressure by means of a strip of
adhesive plaster.

When it is associated with Entropium — Surgical method

Removal of the skin + portion of the lashes: Shifting the
borders along the edge of the cornea lashes.

Dacryocystitis — Caused by the collection of teardrops into a
lacrimal sac. I have not seen many cases of dacryocystitis.

Starting secondary to dacryocystitis. By not properly care
does not do much good. Palpitation of the face,
and sometimes Contusion of the surrounding bone forms.
It is only safe + reliable course. The is an operation.
Treatment of Trachoma Pannus by Means of Injection

W. Goldzieher — Wiener Klinische Wochenschrift 1907:52.

According to Goldzieher, pannus is an invading the Conjunctiva, an attack upon the Conjunctiva by the trachomatous process which has already invaded and partially destroyed the Conjunctiva: it is therefore right to permit when this invasion occurs to attack it directly. He destroys the new formed blood vessels, when there is an excessive formation of them.

(a) by Caustic
(b) by perforating, destroying Conjunctival vessels first as they enter the anterior segment of the globe.

But he rejects the influence of the febrility. He states that this method of treatment is too risky for mild cases or too frequently a complete failure in the really severe. He recommends the method of injecting treatment by injecting the pannus with Secrelin-panthomkin.

He seemed to have tried it in six cases, where all other methods had failed, and his efforts resulted in surprising cases. (Before him von Jünger, Chief Medical officer of the Austrian Army, recommended it in the most unfavorable terms, in certain suitable cases.)

For circulation pus should be taken from an Ophthalmia neonatorum, but never from gonorrhoeal breton or from the Conjunctiva of an adult affected with gonorrhoeal conjunctivitis.
A little of the infected material is to be picked up, not too
a mere bit rather by drawing the sterilized glass rod along to
wetted lower lid so as to infect the eye to be treated better
with backspoon secretion containing organisms than into
actual pus. A severe inflammation is created associated
with a alarming gray infiltration of the panama cornea,
which he considers, an indispensably preliminary to
clearing up. The healing has been without scar formation
if there had been a great deal of tracksmas,
infiltration of conjunctiva. This encourages to intently
the idea that trachoma need not necessarily be
followed by scarring.

This might be considered a bold a risky method,
since some remote consequences might be produced by
the introduction of gonorrhoeal infection into the eye.
If I had to choose between gonorrhoeal infection and
trachoma, I should unhesitatingly choose the former, because
it is more under control, through the methods of modern
treatment.

It should be said to the credit of Goldzieher that thus
he had been treating trachoma for 30 yrs. or longer, he had
ventured to treat only six cases with gonorrhoeal infection,
which shows that he is not rash in pushing his treatment
but very cautiously select his cases.

I must confess that I have not had any experience in the
treatment of trachoma paresis by the method of gonorrhoeal infection.
But I had a peculiar case, which throws some light on the question we are considering. It occurred a few years ago in India— I cannot vouch for its accuracy— I merely state it here, so that it may be taken for what it is worth.

A patient was under very treatment for trachoma, and he had to return home for family reasons before I could make up my mind to discharge him. A few minutes later he came back to me, expressing a desire to place himself under very treatment again, promising to stay with me till I could discharge him as cured. I finally agreed to take him back—but he had to wait a few days before I started him with the treatment. Of course he had a pannus in one of his eyes. On the 4th or 5th day since he saw me, he came to me with both of his in a violent state of inflammation, which he could not account for. I was able to draw out of him that he had suffered from fleet that he happened to rub his eyes, instantly after washing his hands.

I wanted to keep him under observation. He felt exhausted of himself, and in the present of an unexpected business went home, intending to return after the acute symptoms subsided. But he never turned up. Later I found from his friends that the trachoma had practically disappeared from his eyes. Since that acute exudation had subsided.
The Complications of Trachoma

Perfunctory is the chief

of them. If it is thick, it interferes with vision very constantly.

As the Trachoma subsides under treatment, Perfunctory gradually

clears off.

I found massaging of the perfunctory with a little yellow

oxide of mercury ointment, by rubbing the lid and

frequently helps to clear up these perfunctories.

When it does not yield so readily to massage I

insert a drop or two of Dineine solution

and finish off with the massage. It is wonderful

how soon Dineine helps the perfunctories to clear up.

The still resistant forms I treat with the

Sub-Conjunctival injection of Cyanide of Mercury,

in 1:4000. I cocaineise the eye first, then

inject about 10 minims of the solution of Cyanide

into the Sub-Conjunctival space, lying near the upper

fornix. I do it then, because gravity helps

the fluid to spread round the Cornea—

which would not be possible by injecting near

the lower fornix. I make the patient lie down as much

as he can and then insert the needle. The Conjunctiva being

so lax near the upper fornix, the slight fibrinous tissue found

at the spot of the puncture does not materially disturb

the eye. The eye will be in a Visial state of Inflammation.

Conjunctiva is thickened — a hazy, Semi-transparent

exudate like bread in which the Cornea lies, patiently

waiting to be cured.
The inflammation receded in a week, when the pannus generally disappears, and the trouble is beginning to lose much of its severity.

Some years ago, a girl came to my door begging, being blind—led by another girl. I examined her eyes, and found one of them was totally blind, with a huge pannus, Secca, filling all the cornea. The other eye to had a pannus—trivial, vascular, with pretty severe trachoma. She could scarcely count the fingers. I asked for treatment, the treatment of that eye to which she gladly agreed. I put her on a course of silver nitrate treatment and massage with the yellow oxide treatment. She was a very ignorant and hysterical girl. The morning I applied the 12th Solution of Ferro—she shrieked and yelled—but the next day she went home. She did not turn up for a week, but then she returned. She came by herself, with no excuse toleck her. So she was able to see just enough to walk on the streets. I fixed her for her presumptuous disappearances, and made her promise to come in twice regularly. The pannus by this time diminished to such an extent that she could faintly see my face. One morning I put her in my operating table, and with the aid of an assistant, injected some Cymricide Solution into her conjunctiva. I scarcely injected 5 minims, the girl retraced worldly, pulled out the needle.
and would not let me finish it off. So I bandaged the
eye & sent her home. The next day she came in where
the bandage remained — but never came the again.
I thought that her treatment was started on her, and
that since it was given gratuitously, it was not preach-
Several weeks after our long fall, it happened to
pass a group of women who were attending the
repair of a road. One of them walked up to him & saluted him & asked whether he
recognized her? It was my blind girl.
She told them than that the pain had frighten
her — and she feared that I would injure the
epuodr again into her eyes — that was why she
did not come back to me. But, the interesting
point was that she could see perfectly well.
Afler the injection. She was in fact able to set some
work, and help the women by fetching water. To
repair the road. She could walk freely, recognize parts
without any difficulty. She kept the work for some
months. I do not know what became of her. I later

Parsus Secen: Nothing can be done to cure it.
I sincerely take to both my arm for optical purposes
and then if the vision is interfered with, I perform an
injection — preferably in the inner, inferior quadrant
of the cornea.
Some Specific Forms of Treatment.

Radium: It has been declared to cure tissue most effectively. Thiersch of Algiers claims to have employed radium extensively in the treatment of tuberculosis, with gratifying results. But in curing the disease and in clearing the forms where paralysis was present, radium raised first hopes but it has disappointed a great many who gave it a trial.

Dr. Etheridge Collings, Senior Surgeon to the Royal Ophthalmic Hospital, Summarizes his experiences thus:

"About six cases have been treated with radium. A tube of radium bromide has been held over the affected lids for five or seven minutes daily. This has had to be continued for from three to four weeks before any reaction was produced. If the exposure to the radium could be made for half an hour at a time, treatment with it would probably prove more efficient. It would, however, be tedious to both patient and nurse to hold the tube over the affected lids for being a fine. Radium has also been given a trial in the U.S.A. But the reports have been conflicting: at any rate the majority are not encouraged of its efficacy. Under such conditions, I could not recommend my patients to undergo the radium treatment. Of course it was too expensive for me to attempt to experiment with it."
Radium Treatment in the U.S.A.

In the Ophthalmology, July 1912, Dr. C.H. May of New York, under the heading of "The Treatment of Trachoma with Radium: The Use of Radium Coated Plates for this Purpose," came to the following Conclusions after extensively using Radium in the treatment of Trachoma:

1) In most cases the treatment had to be continued not less than 3 months.

2) In no case was the result of treatment with Radium as good as obtained with Copper Sulfate.

3) Used in the form of Radium coated colloidal platinum plates, the results obtained in the treatment of Trachoma did not warrant the adoption of this remedy in place of other means which are more satisfactory.

4) The Praehematoxys Conjunctiva was doubtless very readily to Medicine, but the benefit was only temporary—new follicles developed after the Radium Treatment was discontinued.

5) The Cost is prohibitive, while the Radium is not always obtainable.

Quarzitis—Light Treatment for Trachoma

Holtz & Baumum have treated Trachoma with the Mercury Vapor Lamp, by means of a special modification. Only recent Trachoma yielded to this Treatment, which completely failed to reach the Chronic type.
The X-ray Treatment:

Mr. Stephen Haywood was the first in this country to suggest and practice it. From his point of view the following are its advantages.
(1) X is free from pain (2) There is considerably less deformity of the limbs afterwards (3) The process clears more thoroughly (4) The period of treatment is shortened.

This has been employed at the White Hill School, Swansley, in 40 cases, where were subjected to no other treatment. The results obtained were seen to justify the claims made for it by Mr. Haywood. The rapidity with which a reaction has come on & its amount seem to have varied considerably in different cases.

"As a rule, after the exposures have been made daily for five days, they have been employed alternate days for the following week, and after that discontinued for a time until the amount & character of the resulting reaction became manifest. After a decided reaction has once been produced and has subsided, a fresh reaction is very easily reproduced. Caustics applied after the reaction excited by X-rays, tend to produce a greater reaction than they would under other circumstances would do."

"If a case has been treated for some time with Copper sulphite & is then exposed to X-rays, reaction is more readily excited than where no Caustic applications have been previously applied."

[Note: The text contains various typographical errors and variations in handwriting style, typical of handwritten notes or drafts.]
Some of the best results have been effected when the lymphoid follicles have been first expressed into forceps and exposure to X-rays commenced a week later. It is claimed that in several cases marked and rapid improvement in the symptoms had been produced by the X-rays, the blood vessels disappearing, the tumour healing in a most satisfactory way. But much care and discretion are needed to employ this treatment to get satisfactory results.

Gmelin, in his "Feinphototherapie bei Trachoma," summarising his treatment of trachoma with a fine blue light admits that the most rapid improvement was obtained by using the light a week after a previous expression of the exudation. Considerable reaction follows, lasting 2 or 3 weeks, leaving a smooth pale surface with healing more superficial than that produced by copper sulphate. As a rule an application sufficed, but in many cases treatment was repeated in a month. But recurrences occasionally occurred. In several cases, cornual complications occurred, or when present were aggravated. He believes that fine blue light has a special power of destroying the Trachoma virus - and in this respect that it is superior to Co. light. But unfortunately the apparatus used is elaborate and expensive, and its efficient management requires specially trained assistants.
Indian Treatment

It may be of interest to note here some of the methods that are in vogue of treatment of Trachoma in India at the present day, quite apart from the Western Medical Science.

A friend of mine, an eminent Sanskrit Scholar, and who practices very successfully at Madras, the Ayurvedic System of Medicine (Ancient Hindu Medicine—the Science of Life) assured me sometime ago that Trachoma had been mentioned in ancient Sanskrit works. It was styled as “shocking pruritus in the kids.”

I regret that I am at present unable to write the book or translate from them as I have not any one of them. In the treatment various pastes are used in which Copper, Silver, and Mercury form the chief ingredients.

It is of interest to know that even in villages, the ordinary village physician, scrape the trachoma a specimen with rough leaves. The red oxide of Mercury is used in the form of ointment, mixed with Ghee (Clarified Butter) or Castor oil. Copper Sulphate is used in some pastes. The stick is also used occasionally to touch the follicles with. Scyping is done with the fine point of a probe or wire. I have heard of the thermo-lancing being used very rarely, when parents become resistant to ordinary treatment. Silver and Copper Coins are frequently wrapped in the treated conjunctiva. Castor oil is boiled in a Stove and the hot oil is instilled into the eyes to allay the inflammation and prevent the adhesion of the lids together. In some cases
human milk is sometimes used to the eye, right from the woman's breast, for the sake of its cooling and its supposed antiseptic properties. When there is considerable pain in the parts of sandal wood & opium is painted over the lid or brow. Hot fomentations are employed. Cold fomentations are made use of. Instillations of rose water into the eye is supposed to allay the inflammation. Patches of the fresh petals of some scented flowers are being used overnight to keep the eye cool & comfortable.

New Venicia, Arzunic, occasionally combines the salts or per chlorides of mercury are given internally as general tonics. Salts of pekota & chrisoba are administered internally for their diuretic and cutting properties.

A liberal allowance of cow's milk, buttermilk is given. Fruit, especially of the Citrus variety is permitted. Milk acid & purgative substances are withheld.

Alcoholic drinks are forbidden. Tobacco is tabooed.

Indigestible food is temporarily withheld from the patient. They are also forbidden sexual indulgence. Apparatus to heat & cold, & physical mental fatigue are discouraged. The bowels are regulated. Patients are advised to abstain from calling which will expose them to dust.通风ke, hogs & barley porridge are recommended, while rice water is advised as a cooling drink. Seals in the sea & rivers are forbidden.
I am inclined to think that trachoma is specific. Endemic, chronic, long-lasting, and when left to itself capable of causing serious and permanent impairment of vision. The possibility of micro-organismal origin of trachoma is very great at the present day. I do hope the organism will soon be found.

If some day we know the organism, we will have also its method of coping with it.

If we continue on the basis of organism, we cannot do better than treat it as we do with other micro-organisms, with local applications of medicines, especially arsenic white and potassium permanganate. If we are not able to treat the people at the present day and we have to approach the organism in all the ways open to us.

I believe that I have said very little about Trachoma in my thesis. Till the micro-organism is discovered, nothing can be said in this subject. It is a world-wide subject. Some of my views might seem rather anomalous to the microscopists of my examination.

I have only expressed my views, based on the experience of my examination in India. I have seen several thousands of trachoma.
In my own blundering ways I have tried to do what I could. I am conscious of this imperfection.
I am bethinking the Fals to continue the study of
beacons in the Seamounts &c. If I obtain any further results I hope to be able
to submit them to the consideration of my Alma Mater.