

p. 728. 30. Römer Die Pathogenese der Cataracta Senilis vom Standpunkte der Serumforschung, Archiv für Augenheilkunde, Ergänzungsheft, 1907. 31. Kraus and Levaditi: Loc. cit., p. 731. 32. Schmidt: Chemische und Biologische Untersuchungen von ägyptischem Mumienmaterial, &c., Zeitschrift für Allgemeine Physiologie, 1907, Band vii., Hefte 2 and 3.

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OBSERVATIONS ON CONJUNCTIVITIS.¹

BY ROBERT W. DOYNE, M.A. OXON., F.R.C.S. ENG.

READER IN OPHTHALMOLOGY, UNIVERSITY OF OXFORD.

ON looking through the answers to the questions I set of the various forms of conjunctivitis I was struck with the enormous number of varieties that from the text-book standard might be enumerated. I wondered whether we were not adopting a sort of ready reckoner style, and whether the simple facts of conjunctivitis might not be lost sight of in the morass of nomenclature. There would be less to complain of if the names were consistently selected, either from the appearance or from the cause, or from the character of symptoms, but no such method is adopted. Some forms are described by names that are a survival of an older nomenclature, such as blennorrhœal, catarrhal; often names are chosen from the appearance of the discharge, mucopurulent, membranous, or from different characteristics, as nyctalopic, angular, follicular; others again from the exciting cause, pneumococcal, diplobacillary, gonococcal, so that without much difficulty one can place exactly the same condition in two or more categories. Instead, therefore, of accurate differentiation, confusion is rendered worse confounded.

I pray that we may be delivered from what used to be the deadly sin of dermatologists, among whom each man was a law unto himself as regards nomenclature, and few realised what his *confrères* were talking about. Let us not forget that conjunctivitis should mean no more and no less than inflammation of the conjunctiva. If, on the one hand, more should arise it is a sequela; on the other hand, for instance, a hyperplasia of the normal lymphoid tissue of the conjunctiva constituting follicles is not conjunctivitis until the follicles become inflamed.

The conjunctiva is that structure that extends from the margin of the skin of the lids to the limbus corneæ, beyond which it is represented by the corneal epithelium, thus constituting a sac. The epithelium at the lid margins is stratified and this form extends for a short distance. It soon becomes of cylindrical type comprising two layers, the deeper rather flattened, the superficial cylindrical. As it approaches the cornea it becomes again stratified, and this form covers the cornea. Goblet cells also form apparently from the deeper layer which discharge their contents, but do not regenerate and are themselves cast off. The sub-epithelial structure has been divided into two, both fibrous, the more superficial containing a large amount of adenoid tissue, while in the deeper, thicker, and much more densely fibrous connective-tissue corpuscles a large number of lymphocytes are normally present. True papillæ only form near the limbus corneæ. Arteries, nerves, and lymphatics run chiefly in the deeper fibrous layer.

When this structure becomes inflamed it follows the usual course of inflammation from whatever cause arising, the difference being only of degree. The vessels dilate, the capillaries become crammed with leucocytes and red blood cells; in the veins the leucocytes collect along the vessel walls, and there is a general stasis. Then the leucocytes and the blood plasma transude; the lymphocytes normally present in the tissue enormously increase; the former wander through the tissues and show their characteristics of polymorphonuclear cells and reaching the surface are cast off as pus. Mast cells and plasma cells increase the effusion which produces the swelling known as chemosis. The goblet cells secreting mucus greatly increase as the inflammation proceeds, and these constituents go to form the "discharge." Sometimes the vessels become plugged or the fibrine-forming factors of the blood plasma that has transuded form a membrane on the surface of the conjunctiva involving the epithelial layer, or in more aggravated cases the coagulation

takes place in the structure of the lid, and the tissue becomes solid like wood.

Now this is briefly what occurs in varying degrees when the conjunctiva is inflamed. As a rule, the causes are so readily disseminated that the attack is general, but from some causes it may be more or less localised, and in a few it is strictly so.

Now, the incidence of some attacks of conjunctivitis may be fairly regarded in the light of an attack on the vitality of the patient by a foreign army of infection choosing the conjunctiva as a battle-ground, while other attacks represent a mutiny on the part of those whose special function is to preserve order. The first simile refers to the action of the various pathogenic micro-organisms that have been isolated, the second to neuropathic conditions, such as herpes, pemphigus, and perhaps phlyctenules, and if in your mind you carry further the similes you will recognise how closely the fact of victory or defeat or guerrilla warfare corresponds with actual facts of the inflammation. Now, as to these micro-organisms, if you will allow me to change my metaphor to the more mundane one of a police court, some have been caught red-handed and are convicted, and these include streptococci, pneumococci, gonococci, diplobacilli, Koch-Weeks and tubercle, while grave suspicion attaches to staphylococci, and circumstantial evidence is dead against Klebs-Löffler bacilli in membranous conditions, while several others are under supervision.

The chief agent in producing what used to be called mucopurulent conjunctivitis, catarrhal conjunctivitis, and "pink eye" is the Koch-Weeks bacillus. Quickly as it loses its malignancy, difficult as it is to grow, yet it is responsible for very big outbreaks, especially in schools where numbers are associated together, and though it may exercise its morbid influence at any time, yet it selects the springtime most frequently, possibly because then the conjunctiva is rendered more susceptible by pollen and dust. But it must not be forgotten that the pneumococcus is associated with a condition very similar to that of the Koch-Weeks bacillus, not so acute, I think, as an attack that sometimes is produced by Koch-Weeks, but more prolonged and less inclined to yield and with more constitutional disturbance. The anxiety, too, lest the corneal epithelium should become eroded should be much greater with the pneumococcus.

Streptococcal infection is not common; these micro-organisms are found in membranous conjunctivitis, of the responsibility for which the Klebs-Löffler bacillus is suspected, though it is not always found. Plugging of the vessels is said to occur in connexion with this infection, and the only time I have myself ever detected distinct plugging of a conjunctival vessel was in my own case. I had removed from a baby's eye a piece of grass over three inches long that was doubled on itself and lay concealed at the top of the upper conjunctival cul-de-sac. From the history of the case the foreign body had lain there (I am speaking from memory) for five or six weeks, and there was a very free discharge of what appeared to be thick pus from the conjunctival sac. As I was engaged examining the child with its head between my knees in the usual way, a fly settled on my forehead and I raised my left hand to flick it away, when I touched my eye with my finger. I did not pay much attention to it, not thinking from the circumstances of the case that the pus was likely to be particularly malignant, but a few hours afterwards irritation began in the eye, and the next day it was severely inflamed and chemosed, suggesting the possibility of gonorrhœal infection. The following day a black line like a hair could be seen in the swollen conjunctiva of the lower lid, and when I first saw it in the looking-glass I thought it was a hair, as also did another ophthalmic surgeon who tried to wipe it away with a pledget of wool. I had a good deal of constitutional disturbance, swelling of the pre-auricular gland, and continual chemosis and ptosis. Cultivations were taken from the secretion, but not at once, and the result was practically negative, but this was not surprising, as I had been using regularly germicide lotions. It was some three months before my eye could be considered quite well. Now, on reflection I believe my case to have been one of what is called Parinaud's conjunctivitis, cases of which I believe I was the first to describe in this country, though I did not recognise them as such when I wrote the account. No English text-book at that time, so far as I know, had described the condition. No observation I have ever made has given me such satisfaction as this, and I hope

¹ Founded on a lecture delivered at Oxford to the candidates for the diploma in Ophthalmology.

you will allow me to quote the article in THE LANCET of Nov. 7th, 1903, describing what I then called septic conjunctivitis:—

From time to time among private patients of the better class one sees cases of acute inflammation of the conjunctiva with great thickening of that tissue and marked enlargement of the papillae of both upper and lower lids, resembling somewhat in this respect, only more so, a very acute follicular condition provoked by atropine; the inflammation is usually limited to the palpebral conjunctiva, but there is a tendency for it to pass round the fornices and to involve the ocular conjunctiva. There is free lachrymation and the discharge more serous than purulent. Ptosis, more or less marked, is present. There is generally tenderness or enlargement of the pre-auricular glands and a good deal of constitutional disturbance is present. The condition is generally limited to one eye. Ophthalmic surgeons of experience will, I think, at once recognise the affection I am attempting to describe, but those text-books that notice it are, as a rule, rather vague, and some, I believe, classify the condition under acute trachoma, with which disease, however, it has hardly anything in common. It yields slowly but with certainty to nitrate of silver, sulphate of copper, or, better still, to argyrol (20 per cent.) in the course of from three to eight weeks. It is only when treated by hot fomentations, cocaine, or tying the eye up (too often the case) that the affection becomes exaggerated and extends to the cornea, producing a "soppy" condition of that structure and sometimes small infiltrated ulcers towards its margin.

I have for many years seen isolated cases of this form of conjunctivitis occurring, as far as my memory serves me, in the spring, summer, and autumn rather than in the winter. My reason for drawing attention to it now is the fact that this summer, at any rate in the Oxford district, there has been quite an epidemic of such cases. In two days recently I have seen three severe instances quite unconnected with each other. It would be interesting to know if this has been the experience of surgeons in other parts.

The bacteriology of this affection should be interesting; it cannot be very contagious, for with only ordinary precautions it is limited to one eye. The train of symptoms suggest a septic origin, and I have sometimes imagined I could trace a connexion with mangy dogs or cats, but this is little more than speculation. Perhaps others will be able to define a cause with more authority.

Curiously enough, referring again to my own conjunctival attack, I may mention that after I had attended to the baby I went to a friend's house who kept several dogs, and especially examined one that was mangy. Perhaps, after all, the baby was innocent!

As may be surmised from the foregoing remarks, Parinaud's conjunctivitis has been attributed to streptococci and in some cases they have been found in connexion with it.

The Morax-Axenfeld diplobacillus produces a more chronic form of conjunctivitis and is very definitely associated with the conditions that used to be described as angular conjunctivitis, so-called from the fact that the skin at the internal and external angles of the palpebral fissure was very generally affected. Before the discovery of the diplobacillus I had closely investigated such cases in order to discover, if possible, the cause of the remarkable peculiarity, and I then attributed it to the influence of the lashes of the upper lid, which at the inner and outer angles (especially the outer) came in close contact and rubbed against the skin. In the centre of the lid this is not so much the case, partly from the greater projection forward of the lashes and partly from the protection of the lashes of the lower lid which are more abundant at the centre than at the extremes of the lid, and I had a drawing made of a case which illustrated very markedly the point, where the appearance of "soreness" at the outer angle exactly corresponded with the part rubbed by the very long lashes of the upper lid. I am still inclined to think that the observation was a good one and that the micro-organisms are aided in their morbid work by the chafing of the lashes. The same sort of superficial erosion may occur at the periphery of the cornea. The whole effect produced by the micro-organism is that of "soppy eye."

The gonococcus is one of the most dangerous organisms that attack the eyes, and is responsible for more actual blindness than any other one cause. With modern ideas of cleanliness and treatment the percentage of eyes lost from this cause has become much less, but there are still plenty of opportunities for reducing the rate largely. I am alluding, of course, to the form known as ophthalmia neonatorum, though one has to recognise that all cases of this condition are not due to the gonococcus; and, indeed, in all cases of gonorrhoeal ophthalmia there is a mixed infection.

Gonorrhoeal ophthalmia is generally excited by direct infection, but it is also said to occur by metastasis, but of this I am not personally satisfied. So many sources of error come in that I do not think an absolutely confident diagnosis can be made of metastatic infection. That metastasis does occur, of course, is well known in the case of articular rheumatism and iritis, and I only express my doubt as regards the conjunctivitis due to this organism. One of the

chief peculiarities of this bun-shaped diplococcus is that it actually invades the epithelial cells, and may also be found inside polymorphonuclear cells. It is peculiar to man, and the cultures are difficult to grow and quickly perish. The tremendous chemosis and swelling of the lids produced by this inflammation are a source of very grave danger to the cornea, ulceration of which is a very common sequela. The early symptoms might be common to other conditions, but, as a rule, within 24 hours the condition of the parts makes the diagnosis certain. There are, however, exceptions and sometimes one sees a mild form affecting mainly the fornices and, with injection, extending on to the eyeball. This, however, when it occurs is seen in the later stages of the primary urethral attack and represents a condition that is sometimes said to be metastatic. For my own part, I believe this to be an infection at a time when the system has gained a certain stage of immunity, and this leads me on to point out that, in my experience, vaccines of this micro-organism have been of great value in bringing relief, and I should certainly advise you to use this form of treatment should occasion arise.

Just a word about treatment. I believe the keynote is cleanliness and masterly inactivity. Once the tissue has become infected nothing, I believe, tends to cure it but self-immunisation. I have so often seen meddling interference bring about the very condition that one would wish to avoid. I taught myself a lesson many years ago in this respect. I devised a lid-elevator which really was a hollow tube with a row of holes at its free edge communicating with a tube down the handle, on which I could place an indiarubber tube and flush out the conjunctival sac. This I did regularly several times a day, gently placing the lid-elevator underneath the upper lid. Notwithstanding the care I took, the whole of the conjunctival epithelium was shed, corresponding to the shape of the lid-elevator. Opposite to this place on the cornea ulceration took place. One must remember that the epithelium of the conjunctiva is swollen and soft and deeply infected and the salvation of the cornea depends largely upon its integrity. I think one should be satisfied with gently flushing the palpebral fissures and eyelashes and wiping therefrom any adherent discharge. One cannot get rid of the infection by flushing out the sac, and any good one may do in that direction is far more than counterbalanced by the damage to the epithelium that is occasioned thereby. Instillation of a drop of argyrol at intervals may be of advantage. Than this and general cleanliness I would suggest nothing more. If the pressure of the swollen lids becomes very great, division of the external canthus might be of advantage.

Leprosy, rare in this country, may infect the conjunctiva, when the typical bacillus will be found. You will remember that it was not found possible to grow this organism on artificial media, but recently² Mr. Moses T. Clegg has discovered a method of doing so.

I want to say a word or two about the staphylococcus aureus. It has not been credited with setting up conjunctivitis, but in a paper I read before the Ophthalmological Society of the United Kingdom last December I pointed out the condition of staphylococcus aureus infection of the Meibomian glands as associated with severe conjunctivitis, the attack arising when from one cause or another the resistance is lowered. In the cases I have seen there has been no great amount of discharge, but a very great degree of hyperæmia, with accompanying sense of dryness and soreness of the eye, producing an extreme degree of discomfort. In one case in particular, where the infection of the glands was very marked, and where the opening of the ducts showed as yellow spots along the lid margin and from which thick yellow discharge could be readily expressed, pure cultures of staphylococcus aureus were obtained. After expressing the discharge by pressure along the lid margin and treating with a vaccine made from his own micro-organisms, the attacks at once ceased. When treatment had been discontinued about a year there was a recurrence of the appearance. This lasted for some time until he had an opportunity of again undergoing the treatment, when the symptoms again promptly disappeared. A fuller account of this trouble will be found in the Transactions of the Ophthalmological Society of the United Kingdom for this

² THE LANCET, June 11th, 1910, p. 1641.

year and it is a cause of conjunctival infection that should certainly not be overlooked and seems clearly to implicate the micro-organisms discovered growing freely in connexion with it.

Now let me pass on to the diphtheria or Klebs-Löffler bacillus. This is frequently found in conjunctivitis when a membrane forms, but not always, though in cases where it is not found its presence may be suspected. At the same time we must not forget that almost all other forms of micro-organisms to which I have alluded are also found. The membrane is due to coagulation of the fibrin and probably represents a condition in which there is a freer exudation of blood plasma and not necessarily that the Klebs-Löffler bacilli must be present. We get a coagulation, too, sometimes after the use of a strong caustic. I suggest this may be due to precipitation of mucin rather than fibrin, but I only suggest this from the clinical appearance and also because it is a plausible suggestion. It used to be said that in true diphtheria of the lid no false membrane was formed, but the tissue of the lid became like a block of wood, whereas when false membrane formed it was called croupous. In these cases the membrane is easily peeled off, leaving a bleeding surface, and is not a source of special danger to the cornea, as is the case when the whole lid becomes indurated. I myself have never seen a case of induration of the lid without false membrane. Cases of conjunctivitis with false membrane are, of course, fairly common; judging from clinical experience alone, I should not expect to find that they were all true cases of diphtheria. However, this is extremely disputed ground, and beyond drawing your attention to the subject I do not propose to discuss it further. An interesting question here arises as to the differentiation between the Klebs-Löffler and the xerosis bacillus. Now the xerosis bacillus is always, I think, to be found in the conjunctival sac, whereas the Klebs-Löffler bacillus is only associated with membranous exudation and brawny infiltration of the lid; but to state this, I think, to beg the question to which I wish to draw your attention. Is there any real difference between the Klebs-Löffler and the xerosis bacillus? They morphologically resemble each other and behave in the same way, only differing in a matter of degree, except in so far as their morbid influence is concerned, for whereas Klebs-Löffler bacillus has a most poisonous effect the xerosis bacillus is inert. But it is well known that malignant germs can be attenuated until they become innocent. How then can we say that the xerosis bacillus is not an attenuated form of the Klebs-Löffler? I do not think it is possible to make a judicial statement to this effect, though clinical symptoms support the view, which amounts to almost a certainty, that the two are distinct. The following case that occurred in my experience might lend support in either direction. Many years ago I was bicycling through Berkshire and stopped at a village inn for tea. The landlady drew my attention to a baby in a cradle with a bad eye. I looked at it and saw the typical condition which used to be described as croupous conjunctivitis. Nineteen years afterwards a young man came to the Oxford Eye Hospital having one eye blind with corneal leucoma and giving me the history that when he was a baby I had seen him at the village inn, and I at once recalled the incident. I suggested to my colleague, Mr. Adams, that he should tattoo the leucomatous cornea. The patient was taken into the hospital and he performed the necessary operation. There was a great deal of reaction and dense masses of false membrane formed on his eye for weeks, I am not sure it was not months, afterwards. When they were peeled off they were soon replaced, and this went on, as I have said, for a very long time; of course, it may have been a coincidence, but at any rate it was a very remarkable coincidence, and I suggest the possibility of the Klebs-Löffler bacillus having lain dormant in his conjunctival sac for 19 years ready to associate itself with the wounds in the cornea and conjunctiva, which was drawn over the cornea, resulting from the operation of tattooing.

In this connexion I may speak of trachoma. Its association with a specific micro-organism has not been established, though claims have been put forward. The subject is a very big one and must be dealt with by itself. There is no doubt that it is contagious, though I do not believe it is so to anything like the extent that it has been generally supposed. It is interesting to note among the writers of the first half of the last century how all sorts of conditions have been

included under this heading. The interesting passage in Mackenzie's "Diseases of the Eye" (fourth edition, p. 437) describes an attack of trachoma in the slave-ship *Le Rodeur* in 1819. This epidemic was obviously gonorrhœal ophthalmia, and such is doubtless the case with several of the attacks described among armies, but in these later days trachoma is narrowed down to a very definite entity associated with an appearance that it is hardly necessary for me to describe to you. I will only point out now what I have suggested before, that its contagiousness is not nearly so active as is supposed. Other conditions must, I think, have a very large share in the incidence of the attack. My experience in hospital work places me in a peculiar position for forming a judgment. I have been for over twenty years surgeon to the Oxford Eye Hospital, a country district, and at the same time for over ten years to the Royal Eye Hospital, Southwark. A case of so-called follicular conjunctivitis seen in London I would know would resolve itself, almost as a certainty, into trachoma. The same sort of case seen in the country I would be equally certain would recover completely without further symptoms. As a further illustration of this I may mention that in the workhouse at Abingdon, sleeping in a dormitory with a large number of other children, was a case of severe trachoma accompanied by pannus and free secretion. The case from its history had obviously been going on for a year, and yet not one of the other children was affected. Such a thing could not have gone on in a London workhouse school without general infection taking place. However, I will satisfy myself with throwing down this apple of discord in the presence of Mr. Stephenson, who probably knows more than anybody else in this country about trachoma.

I will pass on to conjunctivitis associated with follicles. Lymphoid follicles might almost be considered as a normal condition of the lid and are seen more often as even rows of translucent elevations near the fornix of the lower lid. They are sometimes enormously increased in number in conditions of lowered health like anæmia and cases of hypermetropia, perhaps arising from congestion due to the straining of the ciliary muscle, for marginal blepharitis often arises from the same cause. They are often associated with the local effect of atropine, eserine, or cocaine, but, when due to the irritation of these drugs, they are generally inflamed and constitute conjunctivitis. But they are frequently seen without any appearance of inflammation whatever and are, as I have suggested before, merely a hyperplasia of the normal tissue. When from any cause conjunctivitis does arise in cases where these are present, it presents especially severe symptoms, but by the inflammatory process the disappearance of the follicles is brought about in the process of recovery.

Now, a few words on localised conditions. There is the primary syphilitic chancre with its indurated margin which, when once well developed, is easily recognised, but which, in the earlier stages, is a matter of some difficulty, perhaps mainly because it is unsuspected. Tubercle shows itself as polypoid outgrowths of a granulation tissue, as small nodules, and as ulcers which tend to coalesce. The palpebral conjunctiva is usually affected, though not solely. Tubercle bacillus may be found, but often is not. It is well in cases where tubercle is suspected to observe von Pirquet's vaccine reaction. You will remember the other day I showed you a boy whose conjunctiva showed what seemed to be typical of one form of tubercular conjunctivitis. Yet the von Pirquet reaction was negative. This was to me of especial interest for, from the clinical appearance of the case, I had no doubt that it was a case of tubercle, but in the face of the negative reaction I cannot feel so certain. Yet I cannot suggest any cause that seems to me a probable one other than tubercle.

In connexion with tubercle it is well to draw your attention to the form of conjunctivitis that might suggest it as the cause, but is really excited by the hairs of certain caterpillars. The disastrous consequences that occur not only to the conjunctiva but to the deeper structures of the eye must be borne in mind.

Spring catarrh, a very rare condition in this country, is occasionally seen. Its etiology is very doubtful. The appearance, however, is typical. The conjunctiva within the lid margins shows new growth of the appearance of paving stones, or, as one of you suggested to me the other day, the mud at the bottom of a dry pond cracked by the heat of the sun. I think that is a more typical appearance than paving stones.

Another form of this trouble is when the bulbar conjunctiva is affected with a sort of brown, brawny infiltration surrounding the cornea near the limbus. Lately, Mackenzie Davidson has claimed to be able to cure such cases fairly rapidly with the aid of radium. The conjunctivitis associated with phlyctenules, herpes, and pemphigus is, no doubt, neuropathic in origin. The phlyctenular type presents marked injection of the bulbar conjunctiva, without or with very little conjunctival discharge. Sometimes there may be no phlyctenules, and the characteristic I have mentioned will suggest the condition. Herpetic vesicles on the conjunctiva are not very common, but they do occur, and give rise to a great deal of trouble. In connexion with herpetic vesicles on the cornea or conjunctiva or skin, it is interesting to note that you always, I think, find enlargement of the auricular glands, suggesting from that symptom alone that the cause might have been micro-organisms; but this is only an instance of how wrong conclusions may readily be drawn, and are so often drawn, from our insufficient knowledge of this new branch of medical research. It is obvious, I think, in this case, that the necrotic tissue formed at the seat of the vesicle has been an effective nidus for the growth of organisms which have in this way affected the lymphatic system. Phlyctenular conjunctivitis, though not due to tubercle, as has been very clearly shown by Mr. Stephenson, is frequently associated with it. The *causa causans* of pemphigus is more or less wrapped in mystery. Radcliffe Crocker suggests that it is due to the action of toxins on the nerve-centres. Be this as it may, the condition described as essential shrinking of the conjunctiva is doubtless a later stage of it. The condition of xerosis is often produced and xerosis bacillus found in it, but it is not at all probable that the trouble is originated by its presence.

I should mention the attacks of irritative conjunctivitis that occur in those who are liable to be irritated by the pollen of flowers, the intolerable "itching," and the desire to "tear the eyes out," the only real cure being to get away from the cause by going to the sea where the wind is not off the land. I have noticed that those who suffer from hay fever are often, though certainly not always, of the neurotic type, the same sort of people who get erythropsia after cataract extraction, and I have noted, too, that "hay fever" subjects are at other times particularly free from mucous secretion—people who do not soil their handkerchiefs much—and I have wondered whether the incidence of hay fever may not have something to do with insufficiency of the secretion of mucus. I throw this out as a suggestion but not as an established observation. One word in connexion with this subject upon a rare form of individual intolerance of certain flowers, not due probably to their pollen, I think, but to other characteristics. The two flowers that I have associated with patients are primulas and dahlias. It is an interesting type of inflammation which affects also the skin of the face something like erysipelas and the fact is well worth remembering.

I will just mention a conjunctivitis, a condition in which, however, the salient symptoms depend more on the corneal coaffection: it is that due to exposure to a naked arc light. The patient goes to bed apparently unaffected and after a few hours wakes up in intolerable pain from the shedding of the corneal and conjunctival epithelium.

In conclusion, I will say a few words about treatment. The main point in treatment is a "masterly inactivity." The infective condition gets well by a power of self-immunisation, not because you have irrigated the eyes with astringents. I kept statistics of a large number of cases treated with astringents, with boric lotion, and with plain water. The astringents came last, the boric lotion and water were about equal in time of recovery. The one exception to these general remarks is the diplobacillary infection which is promptly destroyed by sulphate of zinc. Sometimes the conditions relapse or may become chronic, immunity not being completely gained, and then stimulation seems to answer, more blood is brought to the part, old cells are cast off, and the micro-organism is more effectually dealt with by the leucocytes. Phlyctenular conjunctivitis only requires fresh air under all conditions and in all weathers; it rapidly gets well, but it seems impossible to secure this in the patient's own home, and talk as you will to the parents and do what you will to the child the cases go on for weeks. They just will not carry out instructions. I remember the case of a child in a good social position who for weeks and weeks

suffered from all the usual train of symptoms, intolerance of light, &c., for whom I gave the usual instructions, regular healthy diet and to get out of doors twice a day for long periods. Eventually the family medical attendant took part against me and I, perhaps rather rashly, said, "Let me have the child in the hospital and I will undertake to cure her in three days." The child, however, went home practically well on the fourth day, and I had done nothing more than I had previously suggested.

Other local conditions will more or less suggest the line of treatment that should be adopted, and for particulars of the details of treatment I will refer you to the standard textbooks.

Cavendish-square, W.

INFLUENZAL MENINGITIS.¹

By FREDERICK E. BATTEN, M.A., M.D. CANTAB.,
F.R.C.P. LOND.,

PHYSICIAN TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON, W.C.

Introduction.—Influenzal meningitis is probably a rare infection, but its rarity in the past is very likely due to the difficulty in recognition of the organism, and even at the present time it is by no means certain that the organism described in some cases as the influenzal bacillus is identical with that described by Pfeiffer. Until November, 1908, no known case of influenzal meningitis had occurred in the Hospital for Sick Children, Great Ormond-street. Since that date 5 cases of influenzal meningitis have been admitted into the hospital—1 in November, 1908; 1 in December, 1909; and 3 in the earlier months of 1910. Of these cases 4 patients have died and 1 has recovered.

CASE 1.—On March 11th, 1910, a female child aged 1 year and 2 months was admitted to the hospital under my care. She was the second of two healthy children, the mother and father being quite healthy. There had been no miscarriage. The child had been quite well till Feb. 23rd, when the mother noticed that she was feverish and that the head was retracted. She had been under the care of a medical man for 14 days before being brought to the hospital, and at times had seemed better and at other times worse. She had never been unconscious, nor had she had convulsions. She had taken her food well, she had not vomited, and the bowels had acted regularly. On admission the child was quite conscious, well nourished, lay quite still if undisturbed, and apparently saw well. No change was noted in the fundus. The head was somewhat retracted, and the neck muscles were rigid, but there was no arching of the back and the limbs were not spastic. The fontanelle was prominent. The temperature during the first five days varied from 101° to 103° F. The knee-jerks were active, the plantars gave an extensor response, and the abdominal reflexes were not obtained. Kernig's sign was not present. Lumbar puncture yielded a very turbid fluid which flowed out under considerable pressure. It contained a considerable amount of albumin, and on cytological examination the cell deposit was composed almost entirely of polymorphonuclear cells, among which both extra- and intra-cellular organisms were found. On culture a very scanty growth of diplococci resembling meningococci was found. The child was then treated with injections of 10 cubic centimetres of antimeningococcal serum of the Lister Institute, repeated every day for six days, but without effect. On March 12th Dr. J. Graham Forbes reported that the organism present in many respects resembled the bacillus influenzae. A subculture was planted, and on the 14th he presented the following report:—

The cerebro-spinal fluid is turbid, yellow in colour, and yields, of course, granular clot. There is a heavy deposit of albumin, and dextrose is absent. There is a dense cell deposit, composed chiefly of polymorphonuclear cells. Scattered groups of bacilli are present, some in diplococcal form, intracellular, and Gram-negative. There is no visible growth on serum, but films taken from the surface of the serum show numerous bacilli of variable length, some in diplococcal form, and all Gram-negative. Subcultures on blood agar show an abundant growth of bacillus influenzae.

The growth and cerebro-spinal fluid were now submitted to Dr. J. A. Arkwright at the Lister Institute, who reported that 5 cubic centimetres of the cerebro-spinal fluid injected intravenously into a rabbit produced no effect. The growth of one

¹ Notes of a lecture delivered at the Hospital for Sick Children, Great Ormond-street, on May 19th, 1910.