

**Diphtheritic ophthalmia : a paper prepared for the Annual Meeting of the British Medical Association at Cork, with additions / by Edward Nettleship.**

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## DIPHTHERITIC OPHTHALMIA.

A PAPER PREPARED FOR THE ANNUAL MEETING OF THE BRITISH  
MEDICAL ASSOCIATION AT CORK, WITH ADDITIONS.<sup>1</sup>

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By EDWARD NETTLESHIP.

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ALTHOUGH this disease has received a large share of attention, especially in Germany, where, in its worst forms, at any rate, it is much commoner than in other countries, there are several points upon which more information is needed, and for which we may look as much to general practitioners as to ophthalmic surgeons. The points upon which I particularly wish to invite discussion and the contribution of facts are the following four :

1. Is it desirable to retain the distinction, first drawn by Von Graefe,<sup>1</sup> between "diphtheritic" and "pseudo-membranous" or "croupous" ophthalmia? The "diphtheritic" ophthalmia of Von Graefe is characterised in its first stage by solid, pale infiltration, a bloodless condition of the conjunctiva, formation of very adherent membrane, extreme brawny swelling of lids, and scanty thin discharge. In the "pseudo-membranous" or "croupous" cases we find a coherent pellicle of discharge adhering but slightly to the conjunctiva, which is succulent and bleeds easily when touched; usually there is also purulent or muco-purulent discharge. It is admitted by Von Graefe, and all later writers, that cases intermediate between these two types

<sup>1</sup> A short abstract was published in the 'British Medical Journal,' 1879, vol. ii, p. 327.

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are seen, but they have for the most part been taken as exceptions rather than connecting links, and in the latest and most elaborate works the distinction is still maintained.<sup>2</sup>

I, of course, admit that there is the greatest possible difference in prognosis between the worst cases characterised as diphtheritic by Von Graefe, and the milder cases of "membranous" ophthalmia; in the former the eye is often totally lost with great rapidity, and the conjunctiva becomes scarred and atrophied; in the latter no permanent harm results.

But I believe that a more careful study of the characters of these so-called two diseases will show that they are essentially the same, and that the term diphtheritic is equally applicable to both. Thus, for example, we cannot distinguish between the two forms by the local severity of the morbid process, for there are mild and severe cases of each form. In one of the earliest cases on record (Bouisson<sup>3</sup>) the eye was lost, and the conjunctiva passed into the markedly atrophic state signalled by Von Graefe as characteristic of his true diphtheritic disease; yet the conjunctiva was never hard and dry, but was succulent, and puriform discharge was present with the membrane from the beginning. Hutchinson,<sup>4</sup> and Mason<sup>5</sup> of Bath, have recorded cases of violent membranous ophthalmia leading to loss of both eyes, but in which the conjunctiva was freely vascular, and never became hard and bloodless. Cases, more or less similar, could be quoted from other authors.<sup>6, 7, 9</sup> Several years before Von Graefe's masterly paper on the subject, Chassaignac<sup>8</sup> had called attention to the frequent occurrence of membrane in ophthalmia neonatorum, and to the gravity of the prognosis which its presence implied, and his observations, almost ignored by many later writers, have often received independent confirmation.—Again, both forms agree in the frequency with which they are associated with a previously unhealthy state of the conjunctiva. The proneness of chronic granular lids, catarrhal ophthalmia, and other morbid conditions, to take on what the Germans call true diphtheritic ophthalmia, has been observed by many writers.<sup>1, 7, 9, 13</sup> The occurrence of the membranous variety in eyes which have lately suffered from some other ophthalmia is also noted by many. Thus, in Bouisson's case the eye had been badly inflamed three months before; in a case by Guersant *filis*<sup>10</sup> the order of events was: mild ophthalmia

for a few days; severe membranous ophthalmia; scarlet fever setting in two or three days later, and rapidly fatal; *post mortem*,—soft grey pulp lining tonsils and nasal fossæ, and thick membrane all over inner surface of eyelids. A scrofulous affection of the eyes had occurred in a case, by Gibert,<sup>11</sup> of diphtheritic ophthalmia following measles; one of Magne's cases<sup>12</sup> began like catarrhal ophthalmia; slight ophthalmia a few days before the membranous ophthalmia, and granular lids preceding it, is noted in two others by Warlomont;<sup>6</sup> severe catarrhal ophthalmia a few months before by Jabez Hogg.<sup>14</sup>—Again, both forms may be caused by gonorrhœa<sup>9, 15</sup> and by gonorrhœal and purulent ophthalmia; each may occur in the course of ophthalmia neonatorum, and each may in turn give rise to purulent ophthalmia. Thus, Von Graefe stated that many cases of his diphtheritic ophthalmia in children of two or three years old were traceable to contagion from cases of ophthalmia neonatorum, and that the diphtheritic disease when transmitted to adults often reproduced mixed or purulent forms. Hirschberg<sup>9</sup> gives two cases of diphtheritic ophthalmia neonatorum. Streatfeild<sup>16</sup> records a case of mixed "membranous" and diphtheritic ophthalmia neonatorum. Lewinski<sup>7</sup> gives the following cases:—1. A boy, æt. 9, had "diphtheritic" ophthalmia of the right, and "purulent" of the left eye; a few days later three others in the family, æt. 16, 10, and 7, all had the "purulent" disease, and subsequently the mother and her new-born infant got "diphtheritic" ophthalmia. 2. A father, æt. 33, "purulent" of right, treated by nitrate of silver, and followed in three days by "diphtheritic" of left; his three children all suffering from "purulent" ophthalmia when his attack began.—In both forms the "diphtheritic" or the "membranous" stage is commonly followed by a stage of purulence, but the order of events may be reversed in both, and a few examples of each occur where no purulent stage ever comes on. Hans Adler<sup>17</sup> saw "diphtheritic" preceded by "acute purulent" ophthalmia in four cases. Keyser<sup>18</sup> records a mixed "membranous" and "diphtheritic" case in both eyes recovering without any purulent stage. Jacobson<sup>19</sup> saw three chronic cases of diphtheritic ophthalmia, affecting only one eye, in children from four to six years old, passing from the first to the third (or atrophic) stage without any suppurative (or

second) stage.—Either form may occur in one eye whilst purulent ophthalmia attacks the other; Lewinski has given in addition to the two already quoted several others of the same kind, *e.g.* F., æt. 26, “diphtheritic” of left, slight purulent of right. M., æt. 6, intense purulent of both, followed by “diphtheritic” (apparently mild) of right. F., æt. 2, catarrhal ophthalmia; a few days later intense typical “diphtheritic” of right, with “purulent” of left.

If we examine the cases in which some general disease has been accompanied by an ophthalmia entitled diphtheritic, we shall find that in some cases the eye disease had conformed strictly to Von Graefe’s definition, whilst in others it was clearly of the “membranous” or “croupous” type with vascular and freely bleeding conjunctiva. Indeed, in some of the very worst cases, occurring in connection with severe scarlet fever, measles, or other serious conditions, the ophthalmia has been of the “membranous” variety.—For cases of “typical diphtheritic” ophthalmia in the German sense, occurring in the course of *measles*, reference may be made to Gibert;<sup>11</sup> with primary *throat diphtheria* to Hirschberg<sup>9</sup> and Adler,<sup>17</sup> who have seen two cases in adults, aged fifty and sixty-four years respectively, and ending fatally. Adler also gives a double severe diphtheritic case following *scarlet fever* in a child, and ending fatally from renal disease. Cases in children who died of bronchitis or enteritis have been seen by several observers.<sup>9, 11</sup>

Of severe “membranous” cases in connection with general diseases many are on record, in the incubation stage of scarlet fever<sup>10, 4</sup>, with diphtheritic ulceration of throat after scarlet fever<sup>20</sup>, with primary diphtheria of throat<sup>21</sup>. Thus Magne<sup>12</sup> gives the following case:—A young child, with well-marked membranous disease with “gangrenous” patches on eyelids, but conjunctiva succulent; good recovery; a child had died of throat diphtheria in the same house two days before, following measles. Mason<sup>5</sup> records a case of severe membranous ophthalmia with ichorous discharge but freely-bleeding conjunctiva, during convalescence from measles, recovery followed in a month or less by severe relapse of same ophthalmia and loss of both eyes; scarlet fever and discharge from nose two weeks after onset of this relapse, quick recovery from scarlet fever, persistent refor-

mation of membrane firmly attached by broad peduncle to upper lid, the borders being free "like a lichen on a tree," for at least seven months.

It may be observed, finally, that both forms of ophthalmia are commonest in childhood, but that examples of each are not infrequent in adults, and that symmetry is by no means invariable in either. The only important difference as to age is the extreme rarity of what the Germans consider "true" diphtheritic ophthalmia in new-born infants; a few such cases, however, are on record by competent German observers.

It would therefore seem most natural and useful to abandon the distinction between "diphtheritic" and "membranous" ophthalmia, regarding these affections as varieties of the same morbid process; and to use the term "diphtheritic" as inclusive of all cases where false membrane is present, whether there be solid infiltration of the conjunctiva or not.

Graefe distinguished three varieties of his diphtheritic ophthalmia according as there was scanty exudation through the whole thickness and whole extent of the conjunctival tissues, dense infiltration of the whole extent, but limited to the superficial layers, or localised patches of disease which may even pass beyond the border of the lid on to the skin. We may add that the so-called membranous cases present corresponding varieties, for the membrane may be either general and uniform or present only in one or more patches. We may here note Von Graefe's speculation that the liability of the conjunctiva to take on diphtheritic action was connected with its exposure to the air. I have been told of several cases in which the membrane began to form at the free border of the lid, and I have myself noted the same occurrence.

A remarkable fact in some cases is the extreme chronicity of the disease. Chronic cases are referred to by Jacobson and recurrent cases by Graefe, but the subject appears not to have received its due share of attention. The following are the best marked cases of this kind that I have been able to find. In 1863, Hulme<sup>23</sup> published two cases:—(1.) A child in which ophthalmia with purulent discharge began at the age of seven weeks, and was treated by caustics two or three times a week for three months, without benefit; admitted under Mr. Hulme at fifteen months with membranous conjunctivitis,

and remained under care for eighteen months, with mild treatment (till about three years old); the membrane continuing to reform during the whole time, and being still present when the child was last seen; latterly it had become pedunculated, being attached only at the retro-tarsal fold, and had often dropped off and grown again. The cornea did not suffer. (2.) An infant showed purulent ophthalmia at one week old; admitted under Mr. Hulme, aged three weeks, with great swelling of lids and well-marked membrane adherent to upper, but not to lower lids. Membrane continued to reform for months, and the child remained under care for fifteen months. Cornea not permanently affected. Neither scarlet-fever nor syphilis; child fat, flabby, well-fed; mother feeble health. (3.) Mason (1871) recorded a case (briefly given above) in which a pedunculated membrane reformed on the upper lid for at least seven months. (4.) Businelli<sup>24</sup> (1872)—A girl, æt. 12, healthy; April, 1870, severe ophthalmia ineffectually treated for a short time before admission, when Businelli found great inflammatory swelling of lids of both eyes, thick adherent white membrane lining all the lids, but none on ocular conjunctiva; no liquid discharge; cornea rather hazy, conjunctiva bleeding freely when membrane detached, and its surface roughened by fungous-looking granulation masses near attached border of tarsus; no constitutional symptoms; nitrate of silver (gr. about xv to ʒj) and scarification. Treatment for one month diminished the thickness, density, and adhesiveness of the membranes, but they continued to reform in a few hours after every application; great tendency to fleshy vegetation from the retrotarsal fold. She went away for some months and returned in the original state; five weeks' treatment again gave considerable improvement, but she again insisted on going home. December, 1870.—Re-admitted worse than ever, lids swollen; dense, firmly adherent membrane; subjacent conjunctiva especially towards outer canthus, as before roughened by irregular, bleeding, fungous vegetations, divided by deep sulci, some being even globular or flat and lentil-sized, and attached by thin long peduncles (4—8 mm. long) to the tarsal conjunctiva, and actually protruding from the palpebral fissure when the lids were closed; these pedunculated bodies were also covered by membrane. Again treatment gave marked benefit, but was interrupted in January, 1871. The corneæ were hazy in

the later period of the case. February, 1872, Businelli saw her again (nearly two years after onset), and found all the symptoms as before, but the cornea less hazy. Constitutional treatment had no effect. Her father had acute catarrhal ophthalmia, and his sister some form of conjunctivitis, but without membrane. (5.) In one of Hutchinson's cases<sup>4</sup> dense membranes were still present two months after the attack began. (6.) Jabez Hogg<sup>14</sup> saw a boy, aged fourteen months, with severe ophthalmia with dense white membrane, which reformed repeatedly for more than three months; both corneæ lost.

2. What is the relation between diphtheritic ophthalmia and (a) primary diphtheria of the throat and air-passages, (b) secondary diphtheritic inflammations of the throat and other parts?

Diphtheritic ophthalmia is rare in cases of primary diphtheria of the throat and air-passages. Trousseau,<sup>25</sup> it is true, states that he was meeting with cases of this kind in children every year, but adds that they occurred chiefly in the malignant form of the disease. Some of the epidemics of diphtheritic ophthalmia at Berlin and Königsberg occurred when diphtheria of the throat was prevalent, but this coincidence has been specially noted as wanting in other outbreaks of the ophthalmia. Individual cases of the coincidence here referred to are recorded by Warlomont<sup>6</sup> (M., 30, ophthalmia with membrane chiefly near free border of lids, and diphtheritic patches on lips, mouth, and soft palate; recovery). Hirschberg (F., 50, severe diphtheria of throat and death from hectic and dropsy; early in the case right eye superficial diphtheritic, left eye purulent ophthalmia; also a case of severe diphtheritic ophthalmia, with diphtheria of throat, in child of eighteen months, whose four brothers and sisters were all ill of throat diphtheria). Adler (M., æt. 64, slight diphtheria of throat, peracute and excessively severe diphtheritic ophthalmia, great increase in severity of general symptoms after ophthalmia set in, followed rapidly by death with very high temperature). Thompson<sup>21</sup> saw only one case in a very large epidemic of diphtheria. Dr. Gwyther (now of St. Mary Church) informs me that when house-surgeon to the Children's Hospital at Manchester about 1864, he saw two cases of diphtheritic ophthalmia in a large



series of remarkably severe cases of primary diphtheria. Cases in which a medical man is supposed to have caught ophthalmia of no great severity by inoculation with portions of membrane from the throat of a patient are given by Mr. Leonard and Dr. Morris<sup>26</sup> in their own persons, and quite recently by Hirschberg<sup>9</sup> (medical man, æt. 35; phlegm from patient with throat diphtheria coughed into face; next day acute ophthalmia of right, with shreddy discharge and moderate swelling; three days later left affected; some ulceration of cornea in right; recovery in about five days). Dr. Dickinson<sup>27</sup> has met with a case, in the practice of Mr. Evans, of purulent ophthalmia and inflammation about the navel in an infant a few days old, rapidly ending in death; at same time another child in the family died of diphtheria of the throat, and a third, aged two years, died with sore throat and dyspnœa after erysipelas of arm, which spread from slight sloughing ulceration between fingers. Three other children of family had diphtheria of throat at same time and recovered.

If, however, it is rare with primary diphtheria, it is common to find that the disease occurs during, or very soon after, an attack of some exanthem, or during an attack of broncho-pneumonia or severe diarrhœa in young children. The commonest of these precursors of diphtheritic ophthalmia is measles, the eye disease usually coming on towards the end of the disease, and apparently without any throat symptoms. Hirschberg has once seen the ophthalmia in the incubation stage of measles (F., æt. 2, diphtheritic ophthalmia, measles on eighth day; death from broncho-pneumonia on fourteenth day of ophthalmia, or sixth day of measles). Dr. Wilton, medical officer to the pauper school at Sutton, told me, in 1874, that after an outbreak of measles which had recently occurred in the schools, among a considerable series of cases of severe ophthalmia he had several well-marked diphtheritic cases.<sup>1</sup> A large number of the children in the Sutton school had granular lids at the time. Next to measles, scarlet fever is the commonest acute disease causing diphtheritic ophthalmia, the ophthalmia being often associated with post-scarlatinal diphtheria of the throat. Diphtheritic ophthalmia in the incubation stage, or forming the first symptom, of scarlet fever, has been observed by

<sup>1</sup> 'Med. Times and Gaz.,' 1875, ii, 329.

Guersant and Hutchinson. In Mason's remarkable case, already referred to (p. 24), the order of events was (1) measles; (2) diphtheritic ophthalmia; (3) relapse of same ophthalmia; (4) scarlet fever. Cases have also been seen in children suffering from whooping cough, variola,<sup>1</sup> and varicella.

In a certain number of cases the disease occurs in delicate children or infants suffering from acute pulmonary disease, or from severe diarrrhœa with febrile symptoms. Chassaignac<sup>8</sup> states that the subject of membranous ophthalmia neonatorum may die of diarrrhœa or pneumonia if the eye disease be not properly treated, and, in another publication, said that he believed he had succeeded in reducing the mortality among his ophthalmic new-born infants from 1 in 3 (?) to 1 in 8 by the adoption of measures which shortened the eye attack.

Hirschberg considers that diphtheritic ophthalmia may kill little children by gastro-enteritis and diarrrhœa, and by bronchopneumonia, and mentions that the conjunctival affection alone may give rise to a temperature of 102° F.<sup>2</sup> Cases fatal from intestinal or pulmonary complication are also given by Coup-land and others.

It must be added, however, that many cases of diphtheritic ophthalmia occur in apparently healthy patients, and in no ascertainable relation to any infectious diseases.

3. The conditions of the conjunctiva which favour diphtheritic inflammation are not without interest. A previously unhealthy state strongly predisposes to this disease. The especial liability of patients with granular lids is mentioned by all German writers (see also the note on Sutton school above), and the occurrence of some form of acute mild ophthalmia a few weeks or months before is noted by many writers; the conjunctivitis of measles, no doubt, accounts for the frequency of the malady after that exanthem. These facts

<sup>1</sup> Dr. Reuben Harvey, of Dublin, tells me that he has seen a bad case of diphtheritic ophthalmia in a young child suffering from semi-confluent smallpox, and previously in very bad health. The conjunctiva was vascular. Eye rapidly lost.

<sup>2</sup> Common catarrhal ophthalmia is very often accompanied by a rise of temperature; in one case I found it 103·0° F. "Contribution to the Natural History of Catarrhal Ophthalmia," 'British Medical Journal,' June 9th, 1877. (vol. i, p. 705).

are of great interest in connection with the commonly expressed opinion that an unsound condition of the mucous membrane of the throat predisposes to, or allows of,\* an attack of ordinary diphtheria.

4. Another important point is as to the relative frequency of diphtheritic ophthalmia in North Germany and its rarity in our own and other countries.

I cannot help thinking that this difference in geographical distribution, although, in the main perfectly true, has been over-rated, both from want of an uniform nomenclature and from the publication of slight cases in great numbers in Germany; whilst in other countries publication has generally been reserved for severe examples. Had a series like Lewinski's fifteen cases<sup>7</sup> occurred in England, many which he diagnosed as "diphtheritic" would, in all probability, have been called "purulent," since several of the cases showed mixed characters, or were purulent in one eye and diphtheritic in the other. Again, though English observers speak of the rarity of the disease at home, it is remarkable that Dr. Samelson, of Manchester, who translated Graefe's original paper into English, and had an opportunity of seeing some of Graefe's cases at Berlin, should have stated in 1872<sup>28</sup> that in and about Manchester the "true" Graefe's disease was very common. It would be really of much interest to know whether the other ophthalmic surgeons of Manchester use the same name for cases referred to by Dr. Samelson; for if, names apart, diphtheritic ophthalmia is much more frequent in that city than elsewhere in the kingdom, the fact should be made generally known. We may refer also to the important papers of Dr. Adler, of Vienna, in which he assures us that during the last few years the disease, formerly hardly known there, has become so common that, between October, 1872, and December, 1877, he collected seventy-four cases, of which no less than forty-six occurred in 1874. Dr. Adler attributes this prevalence partly to bad conditions of living amongst the poor from depression of trade, &c.<sup>1</sup>

<sup>1</sup> It is interesting to observe that the earliest account of diphtheritic ophthalmia was given by Dr. Jaeger, of Vienna ('Dissertatio de Conjunctivite Membranacea,' Vienna, 1835), and that cases were described by various other authors between 1842 and 1850 (Arlt, 'Krank. d. Auges,' 1851, vol. i, p. 85).

In regard to the relative severity of the cases published in North Germany and elsewhere, we may gain some idea by comparing the proportion of eyes lost and badly damaged in the series published in different countries. Thus, out of about 190 available cases recorded as diphtheritic ophthalmia by several observers in North Germany, 80 eyes were either lost or seriously damaged (40 per cent.); in 8 French cases, 6 eyes were lost or badly damaged (75 per cent); in about 20 English cases, 11 eyes (55 per cent.); in 5 Swiss cases (Gibert), 4 eyes (80 per cent.). Dr. Jacobson, of Königsberg, saw 40 cases of typical Graefe's ophthalmia without serious damage to a single eye; a statement which appears scarcely reconcilable with Graefe's own account of the malady. Even Adler, though less explicit than Jacobson, tells us that 57 of his 74 cases were for the most part slight, or of the partial or disseminated varieties.

If we glance at the proportion of fatal cases we again find that North Germany shows a far lower percentage than any other country. North Germany in about 170 available cases, 10 deaths (6 per cent.); England about 20 cases, 3 deaths (15 per cent)<sup>1</sup>; France 9 cases, 1 death (11 per cent); Vienna 74 cases, 13 deaths (17 per cent.); Switzerland 5 cases, 4 deaths (80 per cent.); Spain 7 cases, 3 deaths (40 per cent). But notwithstanding *percentages* these *numbers* convince us that the disease is after all absolutely much commoner in North Germany and Vienna than elsewhere; ten deaths in the former, and thirteen in the one city of Vienna speak for themselves.

It is probable that the greater prevalence of granular lids in North Germany may, in some degree, explain the frequency of diphtheritic ophthalmia, and it is possible that other racial peculiarities of tissue (less recognisable than trachoma), or climatal conditions may have an influence.

In respect to granular disease, it would be useful to hear from practitioners in Ireland (where trachoma is so extremely common) whether cases presenting more or less diphtheritic characters are more frequent there than is generally supposed.

In reading some of the German accounts of the disease, especially the earlier ones, it is difficult to avoid the suspicion

<sup>1</sup> Not including the cases appended to this paper nor Mr. Tweedy's cases there referred to. These 15 cases with 1 death make the percentage about 12.

that facilities for contagion must have existed from which we in this country were at the same period comparatively free, and that probably not only diphtheritic, but also purulent ophthalmia was more abundant than here.<sup>1</sup> If this were so the frequency of diphtheritic ophthalmia in the same country would no longer be so remarkable. Thus Graefe tells us (1854) that many cases of diphtheritic ophthalmia in children of two or three years old were caused by contagion from ophthalmia neonatorum, and that adults infected by children with diphtheritic ophthalmia often showed a mixed or purulent form. Now, I believe I shall be correctly stating the experience of most British surgeons in saying that the transmission of ophthalmia neonatorum to other members of the household is, and for many years has been, with us a very rare event. It seems not improbable that to the prevalence of habits favorable to contagion, Graefe partly owed the abundant material at his disposal for studying and differentiating diphtheritic ophthalmia. Again, in Lewinski's series, already more than once referred to, we read of violent diphtheritic or purulent ophthalmia running through whole families and causing the loss of several eyes, of husband and wife losing all four eyes at a stroke, and similar occurrences.<sup>2</sup> The facts of Adler's epidemic of thirteen cases arising in a hospital for children after the introduction of a single case from without, although very possibly admitting of a satisfactory explanation on the ground of the disease being unusually contagious, nevertheless suggest the same train of ideas. His statement is to the effect that notwithstanding all ordinary preventive measures the disease continually spread from bed to bed seldom missing one out.

In conclusion, I may add that I have now seen a considerable number of cases both in the practice at Moorfields and amongst my own patients in which diphtheritic characters were present

<sup>1</sup> In making this suggestion I refer to children and adults living at home, not to schools, workhouses, foundling hospitals, &c., in many of which in our country purulent ophthalmia has from time to time been very prevalent.

<sup>2</sup> The figures which my friend Dr. Hirschberg has given ('Brit. Med. Journ.,' of October 4th, p. 535) in criticism of the abstract of this part of my paper ('Brit. Med. Jour.,' 1879, Aug. 30th, p. 327) are unanswerable, and although they apply only to his own practice, I am perfectly willing to believe that at the present time communication of purulent ophthalmia to other persons is as rare on the Continent as here.

in greater or less degree, always with membrane, and often with more or less infiltration of conjunctiva, and firm adhesion of the membranous discharge. Several of them have been ophthalmia neonatorum. Some of these cases are given below, and had all that I have seen been recorded they would have made the above proportions for England very different.

## APPENDIX OF UNPUBLISHED CASES.

CASE 1.—Summer, 1875. F., about 4; one eye only; soft, tough chemosis and swelling of palpebral conjunctiva, but very little discharge and no membrane; cornea universally hazy for some weeks. Case slowly recovered in about two months. (Case under Mr. Hutchinson at Moorfields.)

CASE 2.—March, 1876. M., 8 months, left, very slight case; grayish infiltration of conjunctiva and adhesion of its folds to each other, and slightly membranous discharge; eyes “weak” for some time before. Soon well. “Inflammation of chest” some time ago. No bronchitis. No contagion of any kind.

CASE 3.—September, 1877. M., 2 years. Mixed, membranous and purulent; tough membrane; profuse bleeding; cornea hazy and ulcerated, but recovered. Left only. Measles three weeks ago; eyes were bad in measles, got better and relapsed; no vaginal discharge. Two others in family had measles same time, but no ophthalmia.

CASE 4.—December, 1877. M., 14 months. (Norris.) Mixed, purulent and diphtheritic. One eye lost. Was attending at another eye hospital for some different disease when attack came on; mother attributed it to contagion from brush used at hospital.

CASE 5.—February, 1878. F., 3 years. Severe muco-purulent with membrane adherent to border of lid in left. No contagion.

CASE 6.—June, 1879. M., 30. (Ash.) Acute swelling with palish, not very hard chemosis, scanty discharge, thin adherent membrane, followed by well-marked purulent stage. Right only; cornea perforated. Was attending frequently for chronic granular lids when attack came on; ? contagion by brush. Good health.

CASE 7.—June, 1879. F., 20. Gonorrhœal ophthalmia with

membranous discharge and infiltration and ecchymoses; conjunctiva bleeding readily, but discharge never became profuse. Eye lost. Other not affected.

CASE 8.—(Under Dr. Dickinson's care at Hospital for Sick Children, October, 1878. Dr. Dickinson kindly allows me to publish it.)

Child, 1 year 9 months. Out-patient for some months with chronic pulmonary disease; ceased attending for two months, then right eye inflamed, and child became ill and was taken in. Great constitutional depression and irritability, some bronchitis; temperature higher than usual in diphtheria. No enlarged glands. I saw child on October 24th. Right eye typical membranous ophthalmia, with muco-purulent discharge; slight chemosis, but no infiltration; cornea normal. 26th. Health much better, temperature lower; still membrane on eye.

The ophthalmia soon got well, the left eye never suffered, and child's health much improved, but before leaving hospital caught a cold and died. *Post-mortem*.—Recent bronchitis, no old disease.

Another child in same family had ophthalmia with membrane, also limited to one eye, soon after the attack in the patient. No diphtheria in the house. They lived in an unhealthy part of Soho.

See also five cases, four of them membranous, reported from Mr. Hutchinson's practice, 'Med. Times and Gazette,' 1877, i, 337.

CASE 9. *Single patch of chronic, tough, adherent membrane on ocular conjunctiva three months.*—Eva W—, æt. 15, November 19th, 1878 (St. Thomas's). An oval patch, as large as a three-penny piece, of tough, very adherent, wash-leather-like membrane (or slough?) on conjunctiva of left eyeball, below cornea; zone of surrounding conjunctiva infiltrated; general congestion of eye; the patch so adherent that even its edge could be barely separated by picking with forceps. Began three months ago "as a small spot." After it began an aunt in the same house had "ulcerated sore throat." Patient has had no other symptoms, and no enlarged glands. No burn or injury. Two medical men who saw it at an earlier period considered it "extraordinary." After about a month's treatment with *lapis divinus*, and a weak sulphate of zinc lotion, the patch of mem-

brane disappeared, though the surrounding conjunctiva was still infiltrated. Four months after admission a scar had formed at the seat of the membrane, but there was still some thickening.

## AUTHORS REFERRED TO.

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2. Saemisch, in Graefe & Saemisch's Handbuch, 1875; Wecker, in Wecker & Landolt's Traité, 1879.
3. Bouisson, Ann. d'Oculist, XVII, 100, 1846.
4. Hutchinson, Oph. Hosp. Reps., II, 130 (1859), and VI, 220; and Med. Times and Gaz., 1877, i, 337.
5. Mason, Oph. Hosp. Rep., VII, 164, 1871.
6. Warlomont, Ann. d'Oculist, XLIV, 115, 1860.
7. Lewinski, Inaug. Thesis (Trans. Ann. d'Oculist, 1861).
8. Chassaignac, Gaz. d. Hôp., 1854, No. 127; Ibid., 1855, Nos. 5, 9, 31; Ann. d'Oculist, XXXIV, 39, XXXV, 34.
9. Hirschberg, Berl. Klin. Wochschr., 1869, 27; Ibid., 1871, 40; Arch. Oph. & Otol., IV, 2, 223, 1874; Nagel's Jahresb. for 1875, 217; Beitr. f. Aug., 1876, 7; Centrbl. Aug., 1878, 172.
10. Guersant  *fils*, Gaz. d. Hôp., 1845, 162.
11. Gibert, Arch. Gen. d. Med., 1857., Sept.
12. Magne, Gaz. d. Hôp., 1858, No. 78.
13. Argyll Robertson, Edin. Jour., XV., 781, 1870.
14. Jabez Hogg, Lancet, 1873, March 1.
15. Jacques, Nagel's Jahresb. for 1876, 249.
16. Streatfeild, Lancet, 1873, II, 10.
17. Hans Adler, Wien. Med. Wochschr., 1875, No. 36; Ibid., 1878, No. 15.
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19. Jacobson, Arch. f. Oph., VI, 2 (Trans. by Samuelson, Lond. Med. Rev., 1861, 45).
20. Pritchard, Brit. Med. Jour., 1857, November.
21. Thompson, Brit. Med. Jour., 1858, June 5.
22. Coupland, Med. Times & Gaz., 1876, II, 622.
23. Hulme, Med. Times, 1863, II, 452.
24. Businelli, Gaz. Med. p. le prov. Venete, 1872, No. 16.
25. Trousseau, Clin. Lects. (N. Syd. Soc. Trans., Vol. II, 502).
26. Second Rep. of Med. Off. to Privy Council, pp. 209 & 211, 1860.
27. Dickinson, Rep. of Committee on Membranous Croup and Diphtheria; Med. Chir. Trans., 1879, 117. (Dr. Dickinson has kindly furnished me with some particulars in addition to those given in the reference.)
28. Samuelson, Rep. of 4th Internat. Oph. Congress (London), p. 125 (1872).

Since this paper was completed, an able contribution on the treatment of diphtheritic ophthalmia by the local use of



quinine lotion has been published by Mr. Tweedy.<sup>1</sup> Mr. Tweedy wishes to maintain the classical distinction between diphtheritic and membranous ophthalmia. In 1873 he saw a case of "unmistakable primary diphtheritic ophthalmia," and in 1876 another case, but of gonorrhœal origin. (1) In February, 1879, a third case, in a puny infant, æt. four months, of which full notes are given; severe typical Graefe's ophthalmia in the course of mild purulent while under treatment by silver; diffuse corneal opacity; complete recovery under local use of quinine lotion (three grains of sulphate to the ounce of water, with a minimum of sulphuric acid).

Several other cases treated at Moorfields, *at about the same time*, are briefly referred to.<sup>2</sup> (2) Child, eight months; lids very brawny; corneæ opaque; membrane began to form at free border of lids; complete recovery of eyes under the quinine lotion, but death from throat diphtheria two weeks after dismissal from hospital. (3) Boy, five years, pale and weak; right eye only; muco-purulent or purulent, complicated (after several weeks) with adherent membrane on lower lid, and opacity of corresponding part of cornea; recovery under same treatment. (4) Child, twelve months (Mr. Adams), both eyes, much swelling; membrane adherent at upper margin; right followed, and was worse than left; cornea not affected; same treatment; recovery with numerous small scars. Woman had died of throat diphtheria in neighbouring house. (5) Child, six week. Both eyes; membrane began to form at free border of lids and firmly adherent; corneæ hazy; same treatment; recovery with marked scarring. Diphtheria reported prevalent in neighbourhood. (6) Child, three months; membrane partly adherent; localised opacity of cornea; same treatment, recovery. Besides the evidence of association with throat diphtheria in Cases 2 and 4, all the cases occurred within a short time, and were from a district in London where diphtheria was very prevalent.

<sup>1</sup> 'Lancet,' 1880, i, pp. 125 and 282.

<sup>2</sup> Mr. Burnham, the house-surgeon at Moorfields, has given me some additional details.

Dr. Brailey kindly informs me that  
a case of severe diphtheritic  
ophthalmia of one eye with desquama-  
tion (? diphtheritic) Keratitis of the  
other, has lately been under his  
care at the Evelina Hospital for  
children. - The child, aged 3 1/2 yrs  
died with albuminuria 1 mo. after  
the onset of scarlet fever during  
which the affection of the eyes  
came on. There were also  
diphtheritic patches of ulceration  
on the scalp. - No post-mortem.  
The case will be published. Oct/80

