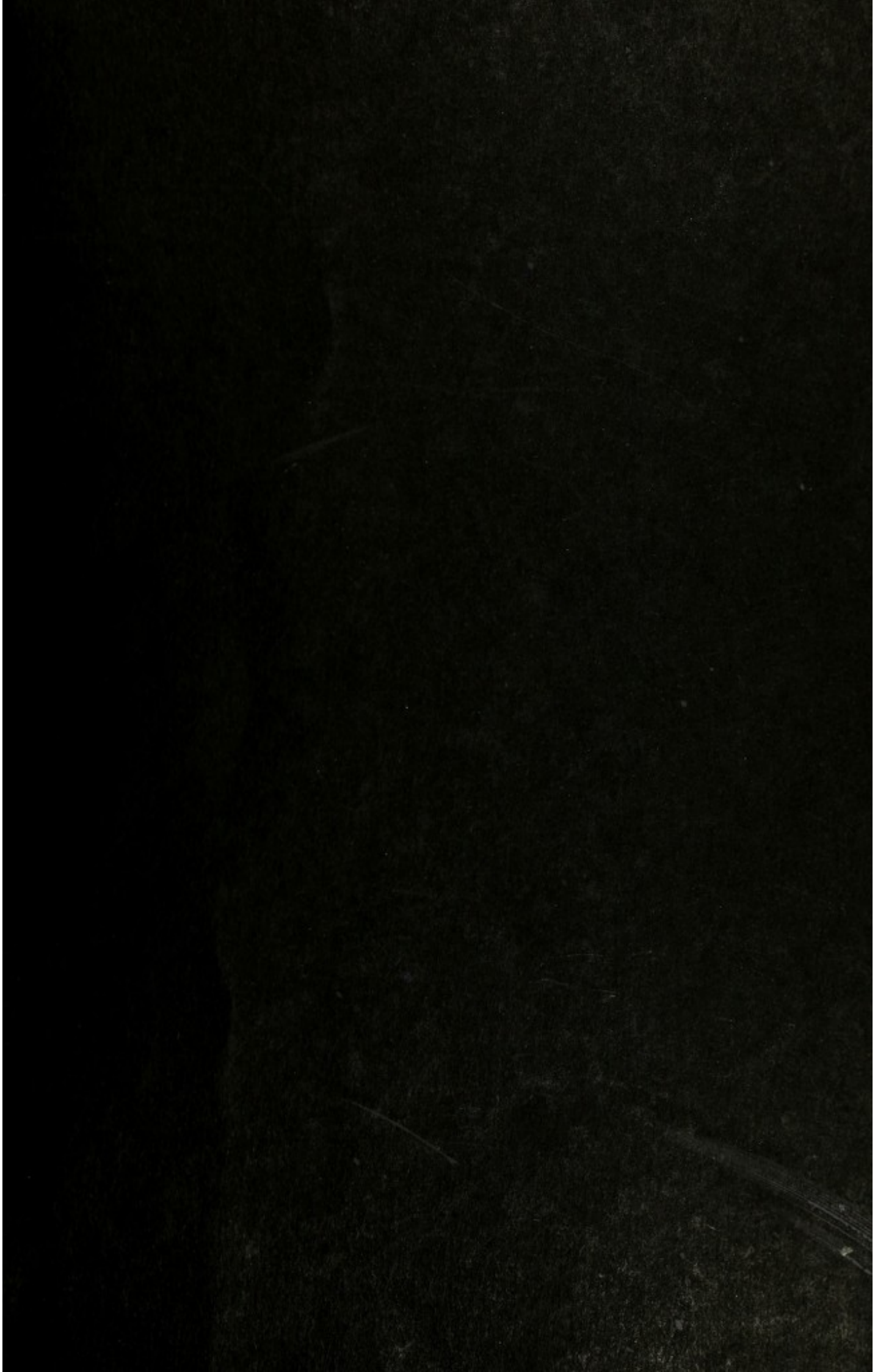
Infantile ophthalmia / by E. Treacher Collins.



INFANTILE OPHTHALMIA.

By E. TREACHER COLLINS, F.R.C.S.,

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I. PURULENT OPHTHALMIA OF INFANCY A PREVENTIBLE DISEASE.

In man the eyelids, which for a portion of fœtal life are united by their margins over the surface of the eye, become separated before birth. If, as in some of the canine species, this separation did not occur until some days after birth, the conjunctival sac would not be liable to become infected by secretion from the maternal passages, and one of the most potent causes of blindness would not exist.

Though the eyelids of a human fœtus are not united at the time of birth, in the passage of the head through the vagina the eyes are closed, so that infective material is only likely to gain access to the conjunctival sac at that time if they are separated by the examining finger of the accoucheur, or by instruments.

Vaginal secretion readily adheres to the eyelashes and margins of the lids, and may easily gain entrance to the eyes when first the child begins to open and shut them, or be conveyed in by insufficient care in the subsequent ablutions and wiping of the eyes. There can be now no doubt that in the majority of cases of ophthalmia neonatorum infection occurs in this way. In about two-thirds of the cases the gonococcus is found to be present in the discharge, and in about the same proportion of cases the history of a leucorrhœal vaginal discharge can be elicited from the mother.

In other cases, usually of a milder type, Week's bacillus, Morax's diplobacillus, or a diplococcus which is not the gonococcus, has been found to be the exciting cause.

It has now been definitely shown that if the simple precaution be taken of washing the eyelids free of any discharge with plain water as soon as the child's head is born, the number of cases of ophthalmia neonatorum may be materially reduced. As it can never be a matter of certainty that some discharge may not have gained access to the conjunctival sac, safety from subsequent

inflammation is still further increased by the introduction into the eye of some antiseptic solution.

This solution must be of sufficient strength to destroy the gonococci or other micro-organisms before they have had time to implant themselves on the tissues and grow in that excellent warm incubating chamber, the conjunctival sac.

The treatment of any vaginal discharge during pregnancy, and the use of an antispetic vaginal douche during delivery are also measures calculated to lessen the risks of ocular infection, but not such as can be definitely relied upon apart from any applications to the eyes.

Various antiseptic applications have been tried for the eyes, but that which has been most generally adopted is a 2 per cent. solution of nitrate of silver, as recommended by Credé.[1]

Having first tried and found unsatisfactory a solution of borax, he then took to cleansing the eyes with salicylic acid solution (2 per cent.), dropping into the conjunctival sacs nitrate of silver solution (2 per cent.), and laying compresses of salicylic acid solution (2 per cent.) on the eyes. After further experience he found he could simplify the procedure into mere cleansing the eyes with water and dropping in the nitrate of silver solution. This is what has come to be generally known as Credé's method.

Out of 2,266 cases before its employment he found 9.97 per cent. had ophthalmia neonatorum. After its employment, out of 1,160 cases, in only 0.086 per cent. were the eyes affected.

Kostling[2] has shown that out of 17,000 births tabulated by 13 observers before the introduction of Credé's treatment 9 per cent. developed ophthalmia neonatorum. After Credé's treatment, 24,000 births tabulated by 31 observers showed only 0.65 per cent.

He gives details showing the comparative results of use of different prophylactic measures, which have been arranged by Dr. Howe[3] as follows:—

Births.			*Per cent.*
24,724	...	2 % solution of silver nitrate	0·65
1,223	...	1 % ,, ,, ,, ...	2·4
1,623	...	Carbolic acid solutions	7·7
965	...	0·1 % solution of sublimate	0·6
1,396	...	Other sublimate solutions	0·4
6,155	..	Sterilised water	2·8
701	...	Iodide trichloride solution...	1·2

The above figures have been taken almost entirely from German sources.

By inquiry at the principal lying-in institutions in this country I have been able to obtain the following particulars as regards the prophylactic measures against ophthalmia neonatorum employed. I have to tender my most cordial thanks to the gentlemen named for so kindly supplying me with them.

Rotunda Hospital, Dublin.—Particulars furnished by Dr. G. W. Fitzgerald, Assistant Master. Total number of deliveries average about 1,500 for the past seven or eight years.

Eyes wiped with a soft rag as soon as child's head is born, and after first bath 2 or 3 drops of silver nitrate solution (grs.iv.to ʒ) is placed in each eye.

Percentage of ophthalmia after this treatment 0.5 each year.

In one or two cases transient conjunctivitis, which may be attributed to the silver nitrate, have been observed. This practice has been the custom for many years.

Queen Charlotte's Hospital, London.—Particulars furnished by Mr. Sydney Stephenson, Ophthalmic Surgeon to the Institution.

Until the end of 1900 a solution of silver nitrate (5 grains to the ounce) was dropped into the eye of each newly-born child, after careful cleansing of the eyelids, under the superintendence of the chief midwife. Since the date mentioned the strength of the solution has been increased to 8 grains to the ounce, except in babies who weigh less than 5 lb., when the first solution is still used. A certain degree of reaction, which soon passes away, is not uncommon; but nothing more has been observed.

	Births.	*Conjunctivitis.*	*Mild.*	*Gonorrhœal.*
1896 ...	1,144	53	38	15
1897 ...	1,075	20	15	5
1898 ...	1,142	22	20	2
1899 ...	1,106	26	24	2
1900 ...	1,039	8	7	1
1901 ...	1,197	15	14	1

NOTE.—There can be no doubt that many of the cases included under the head "Mild" were, in reality, of chemical nature due to the silver nitrate.

City of London Lying-in Hospital.—Particulars furnished by Dr. G. E. Yarrow, Surgeon Accoucheur to the hospital.

Until within the last year eyes of child as soon as born washed out with solution of perchloride of mercury (1 in 2,000). During

the past year solution of nitrate of silver used (grains v. to ʒj), diluted with ʒi of warm water. Six hundred and fifty births during that time, and only two cases of ophthalmia neonatorum.

In the outdoor department two midwives as a routine practice use Condy's fluid to wash infants' eyes with at birth.

British Lying-in Hospital.—Particulars furnished by Dr. G. D. Robinson, Assistant Physician.

The midwife is instructed to wipe the eyelids with cotton wool soaked in 1 to 2,000 solution of perchloride of mercury as soon as the child is born, before the eyes have been opened. The eyes are further bathed three times a day for the first three days of the lying-in period with 1 in 4,000 perchloride of mercury solution.

During the last four years, in which 1,420 patients have been delivered in the hospital, there has only been one case of ophthalmia. This was contracted on the eighth day after delivery.

The matron, Miss Knolt, informs me that they have never found any ill effects arise from the use of the perchloride as above described. In premature infants the eyelids have been noticed to become a little red after its application.

General Lying-in Hospital, York Road, Lambeth.—Particulars furnished by Dr. Boxall, Visiting Physician to the Hospital.

The practice in use at this institution is embodied in the following rules:—

"The eyes require attention immediately the child is born. They must be washed with some antiseptic solution such as perchloride of mercury 1 in 3,000, dropped into the outer corner of each eye. This must be repeated when the child is first washed.

"Any weakness of the eyes should be at once noticed and reported. By early and careful treatment a bad attack of ophthalmia may be prevented, whereas, if the eyes are neglected, the eyesight may even be lost.

"The application of a little lanoline or vaseline to the margins of the lids, after they have been bathed with warm water which has been boiled, or with some antiseptic solution, prevents them from sticking together and causing further damage by the action of pent-up discharge. Boric ointment frequently applied to the margins of the lids affords both a soothing antiseptic remedy, and at the same time prevents the lids from adhering to each other. Special cleanliness is requisite also in these cases; all

lint, wool, etc. used must be immediately burnt; and the hands must be washed and disinfected after the eyes have been attended to."

Royal Maternity Charity for Delivering Married Women at their own Habitations, Finsbury Square, E.C.—Particulars furnished by Dr. Sutherland, Assistant Physician.

Cases are attended by midwives, who call in the local surgeon when necessary.

They are directed to cleanse the eyes immediately after birth. Some use boracic acid lotion, and some use Condy's fluid.

The foregoing statistics tend to show that purulent ophthalmia in new-born infants is more effectually prevented by the use of a 2 per cent. preparation of silver nitrate or a 1 in 2,000 of perchloride of mercury than by weaker solutions of those salts.

It becomes, then, necessary to inquire whether the use of solutions of these strengths are ever the cause of any ill effects.

Dr. Howe[3] discussed very thoroughly at the American Ophthalmological Society, in 1897, the possible objections to the use of Credé's method.

He mentioned how Cohn had sent a letter to the leading ophthalmologists of Germany asking, among other questions, if any unfavourable results of the use of Credé's method had come under their observation. He received 110 replies, "and among them all discovered only two cases in which there was even a question as to the disadvantages of the method. In both of these it was asserted that ulceration had followed the application of 'drops' immediately after birth, but in neither instance was it possible to ascertain the strength of these 'drops,' nor how often they had been used."

Dr. De Schweinitz and Dr. Pomeroy in America have each recorded a case in which bleeding from the conjunctiva followed the application of the nitrate of silver.

In De Schweinitz's case the application of a 2 per cent. solution was followed by one of a 4 per cent.

In Pomeroy's only one drop of a 2 per cent. solution was used.

Romiée[4] cites four cases in which the employment of Credé's method was followed by opacities in the lower half of the cornea which persisted for months.

In the reports which I have received from both the Rotunda

and the Queen Charlotte's Hospital it is stated that a certain mild amount of conjunctivitis appears sometimes to be excited by the nitrate of silver.

In Mr. Stephenson's report from the latter we have the advantage of the cases of conjunctivitis being divided up into mild and gonorrhœal. In the other reports it is probable the more severe cases have alone been taken account of.

At the Queen Charlotte's Hospital during the last year, when an 8 grains to the ounce solution was used, the number of both mild and gonorrhœal cases were fewer than in all but one of the previous five years, when a 5 grains to the ounce solution was being employed.

The above being the only disadvantages which I have been able to ascertain from the use of nitrate of silver, it is obvious that they are far outweighed by the advantages of its use in the strength recommended by Credé.

Protargol is a silver salt which lately has come largely into use for conjunctival affections, it having the advantage of giving rise to less pain or irritation than the nitrate of silver. Engelmann [5] has employed a 20 per cent. solution as a prophylactic for ophthalmia neonatorum with satisfactory results, and prefers it to the Credé procedure. Dr. Jardine and Mr. Ernest Thompson tell me that it is used in the Glasgow Maternity Hospital; but no satisfactory statistics are available. The 1 in 2,000 perchloride of mercury solution as used at the British Lying-in Hospital apparently causes no irritation.

In a case of ophthalmia neonatorum the symptoms usually begin to manifest themselves on the third day. Of 32 cases of which the writer kept notes the discharge was stated to have been first observed as follows:—

At birth	...	1 case.
1st day	...	3 cases.
2nd day	...	3 ,,
3rd day	...	15 ,,
4th day	...	3 ,,
5th day	...	2 ,,
7th day	...	2 ,,
9th day	...	1 case.
10th day	...	1 ,,
14th day	...	1 ,,

The second, third, or fourth day is the probable time at which symptoms begin when infection occurs from vaginal discharge

at or immediately after birth. Credé asserts that in children infected during labour the disease always begins before the fifth day. In the cases which occur later the infection must be brought about by contaminated water, towels, linen, flannels, or sponges.

II. PURULENT OPHTHALMIA OF INFANCY CURABLE WITHOUT AFFECTION OF SIGHT.

Gonorrhœal ophthalmia in an infant is much more amenable to treatment than in the adult.

In the latter, if a case comes under observation even in the earliest stage, before the cornea has become in any way involved, there is always considerable uncertainty whether or not the affection can be cured without some ulceration ensuing.

In an infant, on the other hand, if appropriate treatment be adopted while the cornea is still sound, it is exceedingly rare indeed for it to become implicated.

Having had considerable experience of the treatment of these cases the writer would say the stage in which a case of infantile ophthalmia is first seen should, as a general rule, be its worse stage; from the time at which applications of a 2 per cent. solution of nitrate of silver once every twenty-four hours to the inner surface of the everted lids are commenced, the condition should begin to improve.

Fuchs,[6] in his "Text-Book of Ophthalmology," expresses much the same opinion. He says: "If a case comes under treatment in season, that is, while the cornea is still intact, that latter can almost to a certainty be maintained in a healthy state." If every case of ophthalmia neonatorum could be seen in an early stage and have treatment efficiently applied there would be practically no blindness due to this disease.

We find, however, that a committee of the Ophthalmological Society of the United Kingdom in 1884, as the result of investigation at four institutions for the blind, estimated that about 30 per cent. of the persons concerned had lost their sight through ophthalmia neonatorum.

Mr. Snell,[8] in 1891, stated that the percentage of blindness from ophthalmia neonatorum in the Sheffield School for Blind since its opening was 39.6 (46 out of 116). Amongst the employés at the Institution for the Blind he found a lower percent-

age. He thinks that in fully one-third of every 100 blind the loss of sight is due to this affection.

Cohn,[9] in 1896, gave the percentage of blind from blenorrhœa in the institutions for the blind in Germany, Austria, and Switzerland as 20 per cent., and in Holland as 13 per cent.

To estimate fully the amount of damage which this affection causes, it must be remembered that besides those who become blind and enter institutions there are many more who get impaired sight or who lose one eye.

Mr. F. A. C. Tyrrell has kindly furnished me with the following figures, with regard to the cases of ophthalmia neonatorum, for the last two years at the Royal London Ophthalmic Hospital:—

	No. of Cases.	*Ulceration of Cornea.*		*Percentage with Injured Eyes.*
1900 ...	77 ...	one eye ... 14 both eyes ... 15	29	37·6
1901 ...	91 ...	one eye ... 12 both eyes ... 15	27	29·6
	168		56	33·3

In the majority of these the opacity cleared up, leaving only a small nebula.

Fuchs,[10] in 1885, published the following table:—

Author.	*No. of cases observed.*	*Affection of cornea.*	*Blindness of both eyes.*	*Percentage of injured eyes.*
Heyman	108 ...	43 ...	0 ...	39·8
Hirschberg	200 ...	55 ...	6 ...	27·5
Schöler	156 ...	43 ...	(?) ...	27·5
Heymann	139 ...	25 ...	(?) ...	18·0
Emrys Jones	420 ...	72 ...	16 ...	17·1

What has so far been stated is but a *résumé*, and accumulation of fresh evidence, of what has been known for some years. It will suffice to show that if a preventive treatment such as Credé's was universally adopted, purulent ophthalmia of infancy would become an exceedingly rare disease. If, moreover, in every case which did occur efficient treatment was at once had recourse to, not only would the amount of blindness in this country be diminished by one-third, but the number of people who have to pass through life with impaired sight would be largely decreased. I will now go on to show what has been done, so far, in this and some other countries to try and bring about this

ideal state of things, then proceed to discuss the effects which have resulted in this country from these measures, and what further ones seem practicable at the present time.

III. WHAT HAS BEEN DONE IN THIS COUNTRY.

In 1884 the Ophthalmological Society of the United Kingdom, in consequence of a communication made to them by Dr. David McKeown, of Belfast, appointed a committee to consider the subject of prevention of blindness from ophthalmia neonatorum. The suggestions of the committee, which were afterwards adopted by the Society, may be briefly stated as follows :—

That the Presidents of the Local Government Boards of England and Ireland, and of the Board of Supervision of Scotland, should be approached in order that a card, with the subjoined instructions on, might be distributed through the medium of the Poor Law and Birth Registration organisations of the United Kingdom.

"*Instructions regarding new-born infants.*—If the child's eyelids become red and swollen, or begin to run with matter within a few days after birth, it is to be taken without a day's delay to a doctor. The disease is very dangerous, and, if not at once treated, may destroy the sight of both eyes."

In England it was proposed that the Relieving Officer, and in Scotland the Inspector of the Poor, should in every case of labour under the Poor Law system, read to and leave with the person obtaining the order for medical aid, or the person obtaining the order for medical aid, or the person in charge of the patient, a copy of the card.

In Ireland the card should be attached to the order for medical aid in such cases, and the person who gives the order and card should, before doing so, read the card to the applicant.

It was also proposed that the Registrar of Births should read and hand to each person registering a birth a copy of the card.

Another resolution urged that the advocacy and aid of the medical press be solicited in drawing general attention, and especially that of the authors of text-books on midwifery, of the lecturers on the same subject for students and midwives, and of the various institutions which train, and charitable institutions which employ, midwives, to this important subject.

In response to this appeal the Local Government Board of

Ireland sent to the Medical Officer of each dispensary district, to each midwife, and to each Board of Guardians, a letter calling attention to the importance of seeing that each child's eyes are carefully washed immediately after birth, and the importance of early treatment should they show the slightest signs of inflammation.

A not very favourable reply being received from the Local Government Board of England, a deputation from the Society subsequently had an interview with Mr. George Russell, M.P., representing the Local Government Board and the Registrar General.[11]

The latter was unable to advise the carrying out of the suggestions of the Society, partly because it would increase the work of the registrars of births, for which they would require increased remuneration, and partly because the information would be too late to be of any good to the particular child registered, and could only benefit some possible child in the future.

Mr. Russell said he had been impressed with the desirability of taking some such steps as those suggested, and there, for a time, the matter ended.

In 1897 the Local Government Board[12] thought it expedient to draw the attention of district medical officers and medical officers of workhouses and infirmaries to the question of the prevention and treatment of ophthalmia in new-born children, and issued the following memorandum:—

MEMORANDUM OF THE LOCAL GOVERNMENT BOARD RELATIVE TO OPHTHALMIA OF NEW-BORN CHILDREN.

The attention of the Local Government has been drawn to the fact that occasionally district medical officers and medical officers of workhouses and infirmaries have failed to record in their medical relief books the occurrence of ophthalmia of new-born children in cases under their care. The Board think it necessary, therefore, to point out that it is the duty of every medical officer to enter these cases in his medical relief book, all the particulars indicated in that book being recorded, and that the book should be presented to the Guardians at each of their ordinary meetings.

The Board deem it desirable at the same time to bring under the notice of medical officers the following extracts from the Report of the Royal Commission on the Blind, etc., 1889, on the subject of the disease referred to, viz.:—

Page IV.: "Another frequent cause (of blindness) is the inflammation of the eyes of new-born infants, which can be prevented, and, if taken in

time, cured. It has been found by the Ophthalmological Society that 30 per cent. of the inmates of asylums (*i.e.* schools for the blind) are blinded from purulent ophthalmia in early life; and about 7,000 persons in the United Kingdom have lost their sight from that cause."

"Mr. Brudenell Carter recommends: A weak solution of perchloride of mercury as the best preventive in such cases."

"Mr. Hulke prefers alum."

"Dr. Glascolt states that: It has been distinctly proved in the large maternity and foundling hospitals of the Continent that the percentage of cases of purulent ophthalmia in the new-born can be materially diminished by simply cleansing the eyes of all children with clean water as soon as they are born. More recently the number of sufferers has been further diminished by the use of antiseptics, such as weak solutions of boric or salicylic acid; a 2 per cent. solution of carbolic acid, however, gives the best results. As a further development of the preventive plan of treatment, the method of Credé has been introduced. It has the merit of being extremely simple and very efficient. It consists in washing the infant's eyes with pure water as soon as it is born, and then by mean of a drop-tube instilling a single drop of a 2 per cent. solution of nitrate of silver into the eyes. This simple method should be known to and carried out by every midwife in the country, and, what is more, parents should insist upon it being done."

The Board request that medical officers will furnish each midwife or nurse acting under their directions with such written instructions as they may deem necessary to give effect to these recommendations of the Royal Commission.

Private enterprise in Great Britain has also done much to diffuse knowledge generally about this malady, the importance of its early treatment, and the danger to sight with which it is attended.

The Society for the Prevention of Blindness have issued pamphlets entitled, "Advice to Mothers who do not wish their Children to be Blind," "Instructions to Midwives and Monthly Nurses concerning the Special Care to be bestowed on Newly-born Children in Cases of Eye Inflammation."

Mr. Snell,[8] of Sheffield, has a card such as that suggested by the Ophthalmological Society, presented at the Sheffield Infirmary to everyone bringing a case of ophthalmia neonatorum.

In Glasgow a copy of a pamphlet, drawn up by Dr. Russell, has for the last considerable number of years been handed to each couple registering the birth of a child. This pamphlet is printed at the expense of the Corporation, and is distributed without extra remuneration by the registrars at all but one of the district offices in Glasgow.

In Bradford Dr. Bell has secured the voluntary assistance of the registrars in distributing a slip with the directions suggested by the Ophthalmological Society attached to the birth certificates.

In 1885 Dr. McKeown read a paper on the prevention of ophthalmia neonatorum before the Obstetrical Society of London, as the outcome of which the Society agreed to recommend the addition of a paragraph to the rules published by them for the management of infants on the subject of ophthalmia neonatorum.

The same Society have inserted the following in the rules and regulations to be observed by midwives holding their certificates:—

DISINFECTION OF THE INFANT'S EYES.

As soon as the child's head is born, and, if possible, before the lids are opened, its eyelids should be carefully wiped with pledgets of absorbent wool soaked in corrosive sublimate solution (1 in 4,000), and as soon as practicable after birth a few drops of the above solution should be dropped into each eye.

IV. WHAT HAS BEEN DONE IN OTHER COUNTRIES.

Austria.[10]—Paragraph 7 of the Austrian regulations for midwives imposes a penalty on midwives for neglecting to call in a doctor to a case of ophthalmia neonatorum. In December, 1882, the Austrian Government issued an edict in which Credé's method was recommended to medical men. The Hungarian Government distributed to all midwives in the country a popularly-written treatise upon the blennorrhœa of new-born infants.

Switzerland.[10]—The same regulation with regard to midwives calling in a medical man has been in force as in Austria since 1865. According to Horner (writing in 1884), since 1865 not a single case of blindness from blennorrhœa occurred in the Zürich Blind Asylum.

Germany.[13]—In Saxony as throughout Germany:

1. Women who have passed through an obstetric school and have obtained the prescribed certificate of professional competency may be licensed to practise in the particular districts in which they have a permanent residence. The midwives so appointed are bound by oath to the conscientious discharge of their duties; they may not practise except in the district to which

they are assigned, or without specific appointment. Lists of the local midwives are kept by the official medical men of the districts.

2. Midwives are expressly prohibited from treating any derangement of the eyes or eyelids, however slight. On appearance of the first symptoms of eye disease the midwives are to represent to parents, or others, that medical assistance is urgently required, or, if necessary, they are to report to the local authorities and the district doctor. Neglect of these regulations makes them liable to punishment.

Bavaria.[14]—In Bavaria, in 1900, the following laws were passed:—

1. Among the effects which a midwife is obliged to carry to all cases of confinement there has been added a small blue bottle with a 2 per cent. solution of nitrate of silver.

2. Immediately after cutting the cord the margins of the lids and the surrounding parts are to be carefully cleansed with clean cotton and boiled clean water. In all cases in which the mother has suffered from a purulent vaginal discharge, immediately after cleansing the eyes a drop of the silver solution is to be instilled into each.

France.[15]—In September, 1880, the French Government caused a note to be inserted in the *Journal des Communes* calling general attention to the subject.

The Academy of Medicine, in July, 1901, at the instigation of M. Pinard, unanimously agreed to make the following recommendations to the Government:—

1. To have distributed in all the registry offices throughout France with the certificate of birth a short notice indicating the causes, the symptoms, and the dangers of ophthalmia neonatorum.

2. To take some measures for the immediate notification of all cases of ophthalmia neonatorum throughout France.

3. That an ophthalmic surgeon be attached to all the maternities for the treatment of ophthalmia neonatorum and the instruction of the medical pupils and midwives.

United States.—Through the exertions of Dr. Howe, the New York State passed an Act making it compulsory for midwives to notify any case of ophthalmia neonatorum arising in their practice. This law has now been adopted by thirteen states having a population of over 34,000,000.[3]

The following is the Act passed by the State of Ohio[16]:—

Section 1.—Should one or both eyes of an infant become inflamed or swollen, or show any unnatural discharge at any time within ten days

after its birth, it shall be the duty of the midwife, nurse, or relative having charge of such infant to report in writing within six days to the physician in attendance upon the family, or, in the absence of an attending physician, to the health officer of the city, village, or township in which the infant is living at the time, or, in case there is no such officer, to some practitioner of medicine legally qualified to practise in the State of Ohio, the fact that such inflammation, swelling, or unnatural discharge exists.

Section 2.—Any failure to comply with the provisions of this Act shall be punishable by a fine of not less than 10 dollars, nor more than 100 dollars, or imprisonment for not less than thirty days, nor more than six months, or both fine and imprisonment.

At the American Ophthalmological Society,[3] in 1897, Dr. Lucien Howe further advocated that the adoption of Credé's preventive method should be made compulsory in public institutions. The matter was referred to a sub-committee, and the resolutions suggested by the majority composing it were subsequently adopted by the Society the following year.[17] They were as follows:—

Whereas, purulent ophthalmia of infancy produces more blindness than any other disease, thus necessitating great and often unnecessary cost to the State, with lifelong misery to the individual; and

Whereas, a 2 per cent. solution of silver nitrate dropped into the eyes of children as soon as possible after birth is one of the most efficient means of preventing that disease; therefore,

Resolved, That we desire to call the attention of obstetricians to the fact that these cases are unfortunately common in our practice, and to urge the more frequent use of the silver nitrate solution in the manner described by Credé.

Resolved, That we approve of legislation which would result in the invariable use of this method in almshouses, or any other equally safe and efficient, whereby the loss of vision from this disease would be lessened.

V. RESULTS SO FAR ATTAINED.

That the measures adopted in this country so far have produced a decided effect seems clearly shown by the satisfactory decrease in the number of blind persons returned at each census. Thus, the number of blind per million in England during each ten years for the last half of the nineteenth century are as follows:—

1851	...	1,021
1861	...	964
1871	...	951
1881	...	809

The total population in the administrative County of London was

In 1891	...	4,228.317
In 1901	...	4,536,541
A net increase of		308,224

The number returned as blind were

In 1891	...	3,573
In 1901	...	3,556
A decrease of	...	17

So that while there has been a marked increase of population in London, there has been a decrease in the number of blind persons. There are, of course, several causes contributing to the diminution of blindness, but the decrease in the amount of ophthalmia neonatorum is probably the chief.

The proportion of blind persons to the population is greater in England than in Scotland. In 1881 it was 1 in 1,236 in England, or 809 per million, and 1 in 1,439 in Scotland, or 695 per million.

Dr. W. G. Sym[18] has pointed out that this is probably due to the greater frequency of ophthalmia neonatorum in England, because there is a distinct difference in the relative proportion in the two countries of those who have been returned as "born blind" in the census papers, the term necessarily including those who, though not strictly born blind, have lost their sight in early infancy. In England, of the 809 blind persons per million, 1 in every 6 was blind from birth. In Scotland, of the 695 blind persons per million, 1 in every 7.7 was blind from birth. Dr. Sym goes on to state that he thinks the cause of the greater prevalence of ophthalmia neonatorum in England is to be looked for in the larger proportion of births which are attended by midwives there than in Scotland. He takes it that rather more than one-half the births in England are attended by midwives, whilst in Scotland the proportion is not nearly so great.

Dr. Lucien Howe[17] has shown that in the United States the proportion of blind in the cities is less than in the country. On taking all the cities of over 50,000 inhabitants together, he found in them almost 33 per cent. fewer blind than the average of the entire county.

In Scotland Dr. Syme[19] has shown that there is a similar state of things. The proportion of blind is highest in Shetland,

Sutherland, and Caithness, Inverness, Ross, and Cromarty, and Argyll; lowest in Kincardine, Selkirk, Stirling, Linlithgow, and Berwick. The differences, he says, are not slight, for, reduced to one scale, blindness is 10.5 times as common in the highest county (Shetland) as it is in the lowest (Kincardine). The reason of the smaller amount of blindness in the large towns and their vicinity is no doubt to some extent due to the ease with which the best ophthalmic advice is there to be obtained. It is, however, probably also due, as strongly urged by Dr. Howe, to less attention being directed to the prophylactic measures against ophthalmia of infancy in the country than in the cities.

In 1885, when the writer was Junior House Surgeon at the Royal London Ophthalmic Hospital, he for several months kept a list of all the cases of ophthalmia neonatorum which attended. Estimating for the whole year the number of cases to be in the same proportion as for the months for which he kept the record, there would have been 133 in the course of the year, the total number of new out-patients in that year being 25,863, making one case of ophthalmia neonatorum to 194 patients.

The out-patient surgical officer, Mr. F. A. C. Tyrrell, to whose care all these cases are now handed over, has kindly furnished me with the following return of the number of cases attending during the last three years.

	No. of cases.	*New out-patients.*	
1899	65	37,832	1 in 582
1900	77	36,932	1 in 492
1901	91	31,258	1 in 343
For the three years..	233	106,022	1 in 455

These latter figures compare very favourably with those given by other writers.

Fuchs,[10] writing in 1885, quotes Hirschberg as having met with 1.46 per cent. of blenorrhœa neonatorum among 21,440 eye patients.

Cohn,[9] in 1896, states blenorrhœa was found 1,938 times among 302,971 patients, 1 in 156.

Dr. Jackson[17] writes:—

"The service of the Brooklyn Eye and Ear Hospital for twenty-five years, among 85,364 cases of eye disease, shows 414 cases of ophthalmia neonatorum, or 1 in 206. Combined statistics from the Massachusetts Charitable Eye and Ear Infirmary, and the Carney Hospital of Boston, the

New Amsterdam Eye and Ear Hospital, and the Ophthalmic and Aural Institute of New York, the Buffalo Eye and Ear Infirmary, and the Eye, Ear, Nose, and Throat Hospital of New Orleans, show among 93,744 cases of eye disease 441 of ophthalmia neonatorum, or 1 in 213, while in 193,633 cases of eye disease at Wills' Eye Hospital, Philadelphia, there were 683 cases of this form of ophthalmia, or 1 in 283. Combining all the above American statistics, we find in 382,741 cases of eye disease 1,538 of ophthalmia neonatorum, or 1 in 249."

Dr. Sym looked over the records of 6,000 out-patients at the Ophthalmic Department of the Royal Infirmary, Edinburgh, and found a percentage of only 0.37 of ophthalmia neonatorum, 1 in 270. At a dispensary at Leith, the social position of the patients attending which is on an average much lower, he found, in 3,000 cases, a percentage of 0.7, 1 in 142.

VI. WHAT FURTHER MIGHT BE DONE IN THIS COUNTRY.

The stamping out of ophthalmia in new-born children is essentially a matter for those engaged in the practice of obstetrics, but ophthalmic surgeons have generally been those who have pleaded most eloquently for the employment of prophylactic measures against it. A medical man who practises midwifery, if he attends those of a well-to-do class, may after considerable experience have only met with a few cases of this affection, and, perhaps none, or at any rate only one or two, in which any permanent defect of sight has resulted.

An ophthalmic surgeon, on the other hand, in the out-patient department of hospitals is frequently having cases of ophthalmia neonatorum brought to him, and unfortunately becomes only too familiar with those in which ulceration has done so much damage as to render his best endeavours futile. There are few more painful duties an ophthalmic surgeon has to perform than that of telling a young mother that her first-born, as so frequently it is, for whom she has expected and endured so much, has become hopelessly blind at the very threshold of life. When, further, he reflects that this unfortunate calamity might certainly have been prevented, either by the simple precaution of the insertion of one drop into each eye immediately after birth, or by the avoidance of a few days' delay in bringing the child to him for treatment, he necessarily feels stimulated to urge strongly and emphatically the desirability of greater attention being directed to these simple but important precautions.

This disease is so closely associated with obstetrics that for some time there was just cause of complaint that many writers of text books on that subject made no reference to it. In the more recent works, and in later editions, this omission has to a great extent been rectified.

The plea of the Ophthalmological Society for the aid of authors and lecturers on midwifery in drawing attention to the subject cannot be too strongly urged.

Sad to relate, cases in which delay in the application of appropriate treatment has resulted in permanent damage are met with where the mothers have been attended by a duly qualified medical man, and not by "an ignorant midwife." The inclusion of attendance on a course of instruction on ophthalmology as a necessary part of the medical curriculum should tend to do away with these altogether. The setting of a question on the subject in examination papers, as at the recent examination in surgery for the membership of the College of Surgeons, will still further guard the portals of the profession from any unacquainted with the proper methods for dealing with such cases.

The larger number of cases of ophthalmia neonatorum occur in the poorer classes, that is, in those who most frequently employ midwives, and as it would be impossible to do away with midwives, they must be entrusted and instructed to use prophylactic measures against this disease. These measures should be made for them as simple as possible, such as efficient cleansing of the eyelids, and the insertion of a drop of fluid into the eye.

In Bavaria, as already mentioned, all midwives are required to carry with them a small blue bottle with a 2 per cent. solution of nitrate of silver. In this country much good might result if instrument makers could be induced to have all midwifery bags fitted with a special compartment containing a coloured bottle and dropper labelled nitrate of silver drops for the eyes, and if all institutions employing midwives would insist on this as a part of their necessary outfit.

When symptoms of ophthalmia make their appearance the treatment of the case obviously passes beyond the range of a midwife's capabilities, and it becomes her duty to immediately advise that the assistance of a medical man is urgently required.

The list of measures adopted in other countries which has been given is by no means complete. It includes only those to

which the writer has been able to find reference; it suffices to show, however, that in many countries a law or regulation has been adopted to enforce the notification to a medical man by a midwife, of any case of ophthalmia neonatorum occurring in her practice, neglect to do so being punishable by fine or imprisonment.

No endeavour to make such a law or regulation has so far been attempted in this country. Its enforcement could not fail to prove of the greatest assistance in securing the early treatment which is so essential in these cases.

It is stated that in those parts of the United States where such a law is in force there have been very few convictions, or even prosecutions for its violation; but the value of a law cannot be estimated by the number of those who are found guilty of infringing it. The mere existence of such a law would tend to direct the attention of midwives to the importance of the matter. As, further, it is generally understood that midwives rather object to having to seek the assistance of a medical man, it would stimulate them to use prophylactic measures which would render it unnecessary for them to do so.

At the present time there is before Parliament a Bill to secure the better training of midwives and to regulate their practice, which has been read a second time and referred to the Committee on Law. Lord Cecil Manners, in moving its second reading, pointed out the large number of cases in blind asylums which were attributable to want of care at birth.

One of the clauses of the Bill provides for the formation of a central Midwives' Board with powers to frame rules for midwives, subject to the approval of the Privy Council, after consultation with the General Medical Council.

In the event of this Bill becoming law it is to be hoped that one of the first rules which this Board draws up will be to the effect that any midwife who, during the time she is in attendance on a case, finds one or both the infant's eyes becoming red and begin to show any unnatural discharge shall, within six hours, notify the same to the medical officer of health of the district, or see that the advice of a duly qualified medical man is obtained, under penalty of a fine or suspension from practice.

The passing of such a regulation as this in connection with the Bill as it stands would not, however, be sufficient to ensure

the early treatment of all cases of ophthalmia neonatorum, for the present Bill, unlike that of 1900, does not prohibit unqualified practice. It would be the poorest people, those whose infants would be most likely to become affected, who would continue to employ unqualified assistance.

In the law from the state of Ohio, which has been quoted as an example of those in force in the United States, it will be observed that the duty of notification rests with the midwife, nurse, or relative having charge of the infant.

This, though it has the disadvantage of dividing the responsibility, serves to provide for all cases, by whomsoever attended.

It should be observed that compulsory notification of cases of ophthalmia neonatorum is by no means necessarily bound up with the registration of midwives, and might be adopted quite independently of the latter.

If the cases occurring early are to be regarded as due to neglect of the use of adequate prophylactic measures by the surgeon or midwife, those occurring after the fifth day are due to the want of proper aseptic cleanliness on the part of the monthly nurse or mother.

Anything, therefore, which tends to the improvement and training of monthly nurses will add its quota to the reduction of the number of cases with impaired or lost sight due to this malady. It must be added, however, that the improved training must not turn them into prescribing nurses. Quite recently the writer has had under his care a case which had been treated for a long time with boric acid lotion only, recommended by "a trained nurse."

As has been mentioned, the French Academy of Medicine has recommended that an ophthalmic surgeon should be attached to all maternities. The Queen Charlotte's Hospital, in London, had already taken this wise step, and appointed Mr. Sydney Stephenson on their staff.

It is true that in a well-conducted institution, if adequate prophylactic measures are adopted, the number of cases requiring an ophthalmic surgeon's aid would be very few indeed. At those institutions, however, where a number of patients are attended at their own homes by midwives in connection with it, his services would be more frequently required. For in these external cases, prophylaxis is generally less satisfactorily carried

out than in an institution itself, and it would be of the greatest advantage to have an ophthalmic surgeon whose advice could be obtained as soon as any symptoms of ophthalmia began to manifest themselves.

In conclusion, the measures which at the present time seem to the writer best calculated to reduce the amount of blindness may be briefly summarised as follow :—

1. Compulsory notification of cases of ophthalmia neonatorum by all persons attending women in labour other than medical men.

2. Instruction as to the importance of the universal adoption of prophylactic measures (preferably Credé's method, or the use of a sublimate solution, 1 in 2,000, or protargol 20 per cent.) by all lecturers and writers of text books on midwifery.

3. The appointment of ophthalmic surgeons to maternity institutions, more especially those which provide for attendance of women at their own homes.

4. The provision in all midwifery bags of a drop bottle labelled "drops for the eyes."

5. The better training of monthly nurses in the methods of aseptic cleanliness.

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