

## **Acetate of lead in ocular therapeutics / David DeBeck.**

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By David DeBrock,  
Assistant to the Chair of Ophthalmology

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## ACETATE OF LEAD IN OCULAR THERAPEUTICS.

BY DAVID DEBECK, M.D.,

Assistant to the Chair of Ophthalmology.

During the past year three cases of corneal opacities resulting from the injudicious use of a collyrium containing a lead salt have presented themselves at the Clinic. One of these cases was so aggravated and the accompanying inflammatory symptoms so severe and persistent, that I am persuaded that these and some similar cases are not unworthy of being reported; and that the occasion is favorable for sounding anew and in sharper tone the old, time-worn note of warning.

Case 1, John H—, aet. 12. In the Clinic record of June 26th, 1884, as having phlyctenular trouble, two phlyctenulæ found at the sclero-corneal junction, nasal side, right eye. For this the usual treatment with the yellow oxide of mercury salve was instituted.

He was not seen again until July 11th, when he presented himself with the following history: on July 4th, while sitting at an open window, an ordinary fire-cracker which had been thrown through the window, exploded directly in front of the right eye. This accident occasioned intense pain and immense swelling and some ecchymoses of the lids. A neighboring physician was summoned after some hours, and prescribed an eye-lotion to be dropped into the conjunctival sac if possible, and

to be used to moisten compresses applied to the lids. This treatment had been continued during the intervening week.

The lids were still much swollen, and showed the discoloration of the ecchymoses undergoing resorption. Intense pain and photophobia and profuse lachrymation were present. Examination showed the cornea to be crossed by a broad band of opacity, leaving free only a minute area above, and a narrow band, about one quarter of the cornea below. This opacity was so peculiar and characteristic in appearance, milky in color, thick, rough and mottled, that the eye-lotion used was obtained for examination. Tested with a solution of the iodide of potassium it gave the yellow precipitate indicating the presence of a lead salt.

The boy was put on tonics; cold applications were ordered (this was alternated, at times, with warm fomentations); occasional small doses of morphine to allay pain and secure sleep; a 4 gr. soln. of eserine was instilled once daily (with three intermissions, when fearing a complicating iritis, atropine was used until full mydriasis was obtained); and the yellow oxide of mercury salve was used in conjunction applied once daily. Two months of this treatment produced no decided improvement. Early in September the symptoms showed an intermittent character, with evening exacerbations. Round doses of quinine were given; with excellent but only transient results. During September and October three applications of jequirity were made, at intervals of about two weeks. The jequirity ophthalmia was each time produced, and was followed by some amelioration, not marked or permanent however. Upon the reception of the new local anæsthetic, muriate of cocaine, this was employed. Three instillations of a 5 per cent soln. produced relief, but apparently not such perfect anæsthesia as is produced in a normal eye; probably owing to the diminished absorptive power of the cornea. The scarcity of the drug prevented giving the patient a solution for hourly or half-hourly instillations. Under this anæsthetic, early in November, the cornea was scraped. This resulted in a distinct gain, part of the improvement resulting therefrom seeming permanent. Under this same anæsthetic, in the latter part of November, an operation which may be termed "pricking" the cornea (Seely) was performed: the procedure of tattooing the cornea was carried out, only no India ink was applied. Following this is distinct and apparently permanent benefit; but at time of writing the patient is still visiting the Clinic daily.

Case 2, Annie M——, aet. 16. First came to the Clinic in May, 1884. Has trachoma of 4 years standing; corneal opacity and pannus; and in the right eye a leucoma adherens in the lower quadrant of the cornea. The corneal opacity is irregular and tolerably dense. Counted fingers at 4 ft. R. and 6 ft. L.

An infusion of jequirity was applied at this time to both eyes; during June it was applied twice; in August again it was applied for the fourth time in one eye, and early in September in the other. These applications were followed by the usual reaction. The result was excellent as regards the conjunctiva, with considerable improvement in clearing up the opacities of the cornea; but not so decided as was to be expected from the remedy. For after so complete a trial, when all the benefit that was to be obtained from jequirity had apparently been attained, there still remained a number of small plaques and dots of opacity. These are most apparent in the upper and outer parts of the left cornea; and in the upper part and about the leucoma in the right cornea.

Upon inquiring more searchingly into her history it was ascertained that two years after the trachoma had begun, and when a marked pannus had already been developed; and even some time after the perforation, with anterior synechia, had occurred, a physician had prescribed for her an "eye-lotion of sugar-of-lead." This she used irregularly for five or six months.

At present her condition remains about stationary; conjunctiva smoothing off; slight pannus; but  $V = \frac{20}{200}$  L, and she counts fingers at six ft. R.

Case 3, Eva M——, aet. 21. Came to the Clinic in August, 1884. She presented central opacities of the cornea, left eye; with considerable pain, lachrymation and photophobia; the eye quite congested. The opacities presented the characteristic appearance for which Cases 1 and 2 had put me on the watch: rough, mottled and granular, and dull milky in color: the impression of lying more *on* the cornea, than *in* its tissues. Upon questioning it was found that the corneal trouble had commenced about three weeks before. The patient, living in the German quarter of the city, had consulted a neighboring old woman; part mid-wife, part nurse, and part amateur doctress in slight ailments. This hybrid had prescribed an "eye-wash." This was obtained for examination, and tested with the

solution of iodide of potassium, gave the characteristic yellow precipitate.

After six weeks' treatment with the yellow oxide of mercury-salve (gr. x— $\frac{3}{4}$  i); with an occasional instillation of eserin, she was discharged with all acute symptoms allayed. V=counts fingers at 8-10 ft., somewhat eccentric outwards.

A search through the Clinic records for the last seven years (1878-84), containing over 4,000 names, disclosed four additional cases of this same nature (in which this cause was distinctly mentioned) to be added to the above.

Case 4, John M——, aet. 62. Came to the Clinic in September, 1882. Had evidently had superficial keratitis. "Went to a drug store, and got an eye-water of sugar-of-lead." Left cornea shows a broad patch of minute dots of rough, pearly opacity, covering the central and outer portions.

No improvement under treatment. This patient still occasionally seen.

Case 5, Lizzie R——, aet. 23. Came to the Clinic in July, 1881. Opacity in lower part of cornea (probably from use of lead). No further record is given; but I was fortunate enough to find this patient at the address recorded. She had at that time suffered from what she called a "cold" in the eye. She consulted an irregular, who advertised as a specialist, and he prescribed an "eye-water." Under this the eye became almost well, and it was discontinued. Two or three weeks after the eye became worse and the medicine was resumed. In a week the eye became rapidly worse, and the "doctor" was again seen. She states that he informed her that the bad result was her own fault, in resuming the medicine without consulting him; and that he changed the eye-drops!

The opacity remains unchanged.

Case 6, John M——, aet. 35. Came to the Clinic January, 1881. Opacities, both corneæ (use of lead). No further record; but this case was also hunted up. He has central opacities, both eyes, faint, dull milky and granular. He is of German parentage; and states that when a boy of about fifteen years of age, he had "sore-eyes," and his mother used a "Bleilösung," (lead solution.)

The opacities are becoming fainter year by year; and vision correspondingly better.

Case 7, Katie B——, aet. 10. Came to the Clinic in September, 1879. Dense central opacity of right cornea. (The grandmother had used a lead-collyrium, obtained from a druggist.)

No further record, and no address being recorded, the case could not be sought after.

There is certainly no warrant for this deplorable list, a list taken from the records of a small Clinic, and a list which can probably be duplicated in every Clinic of any considerable size in the country. Above all, is there any possible excuse why two physicians should stand in this rank, shoulder to shoulder with an old woman and a quack? This is far more lamentable than that three persons should make fools of themselves, and injure themselves or their relatives through well-meaning ignorance. If there can be any extenuation for physicians and druggists in this matter, it may lie in the fact that caution on this point is not sufficiently emphasized in their manuals and by their teachers. We will glance through those leading text-books on Diseases of the Eye and on *Materia Medica* that are likely to be studied by English-reading students.

#### DISEASES OF THE EYE.

STELLWAG (Trans. by Roosa, Bull and Hackley. 4th Edit. N. Y., 1873), mentions at p. 104 the opacity caused by lead; p. 393 its use in ophthalmia neo-natorum, no warning; p. 411 mentions the Belgian treatment (Buys) of rubbing in the lead powder in trachoma, no warning.

WELLS (4th Amer. Edit., edited by Bull. Phil., 1883), p. 76 in œdema of the eyelids; p. 82 in herpes zoster frontalis; p. 135 in hyperæmia of conjunctiva; p. 152 in purulent conjunctivitis; p. 167-8 in follicular conjunctivitis; with these no warning given; p. 175-6 in chronic granulations; with these, caution as regards the cornea is enjoined; but he even recommends the use of the powder, with-

out giving warning; p. 183 in phlyctenular conjunctivitis, no warning; p. 244 cause of corneal opacities.

SCHWEIGGER (Trans. by Farley. Phil., 1878), p. 214 in blepharitis from lachrymal trouble; p. 219 in blepharitis, as wash or as salve; p. 253 in hyperæmia of conjunctiva; p. 256-7 in catarrhal conjunctivitis; p. 263 early in purulent conjunctivitis; p. 267 in chronic purulent conjunctivitis; p. 274 in follicular conjunctivitis; p. 282 in trachoma; p. 295 in phlyctenular keratitis, lead-water dressings; p. 311-15 not given as cause of corneal opacities. With all these references throughout the book, not a single caution is enjoined, or warning given of any possible danger.

WECKER (Ocular Therapeutics. Trans. by Forbes. London, 1879), p. 11 in blepharitis; p. 50-1 in hyperæmia of the conjunctiva; p. 53 in catarrhal conjunctivitis; p. 81 in follicular conjunctivitis; p. 86-7 in trachoma; no warning given at any of these points; p. 144 speaks of metallic opacities and their treatment.

MACNAMARA (4th Edit. London, 1882), p. 169 mentions use of the powder in chronic granulations, without any warning; p. 173 in phlyctenular conjunctivitis, no warning; p. 220 as cause of opacities.

WALTON (3rd Edit. London 1875), p. 878 mentions, but discards the rubbing in of the powder in trachoma; p. 928 mentions lead opacities, and treatment; no warning.

JULER (N. Y., 1884), p. 21 in blepharitis; p. 110 as cause of corneal opacities; p. 448 among Formulæ; no warning.

MITTENDORF (N. Y., 1881), p. 21 in ecchymoses of the lids; p. 25 in hordeolum; p. 27 in blepharitis; p. 28 in chronic blepharitis; no warnings; p. 84 as salve in catarrhal conjunctivitis, here a warning.

SHELL (Phil., 1881), p. 24 in blepharitis; p. 49 in hyperæmia of conjunctiva; p. 52 in catarrhal conjunctivitis, here a warning.

SWANZY (N. Y., 1884), mentioned under "spring catarrh," acute granulations, chronic granulations (here a warning), and phlyctenular conjunctivitis.

ALT (St. Louis, 1884), p. 98 warns against use of lead-lotions; under "Drugs" (p. 228) not mentioned.

WOLFE (Phil., 1881), not consulted.

NOYES (N. Y., 1881), mentions under hyperæmia of conjunctiva, catarrhal conjunctivitis and acute trachoma, these two with warning; p. 191 lead opacities.

ROOSA and ELY (N. Y., 1876), under "Therapeutics," lead lotions should be avoided.

CARTER (Edit. by Green. Phil., 1876), mentions under lachrymal troubles, acute conjunctivitis and chronic granulations; p. 223, a sharp and distinct warning.

NETTLESHIP (Phil., 1883), among "Formulæ" a lead-lotion is given, but caution enjoined; p. 133 an excellent paragraph warns of the danger when the cornea is involved.

WILLIAMS (Boston, 1881), on p. 63-4 speaks out clearly and sharply, the acetate of lead should be discarded as valueless and dangerous.

#### MATERIA MEDICA, ETC.

WOOD and BACHE (U. S. Dispensatory. 15th Edit. Phil., 1884); p. 1130, used frequently as collyrium, no warning.

STILLE and MAISCH (National Dispensatory. 3rd Edit. Phil., 1884), p. 1189 in acute, chronic and granular conjunctivitis, no warning.

STILLE (2 vols., Phil., 1874). Vol. 1, p. 216-7 in acute, chronic, granular and purulent conjunctivitis, warning when cornea is involved.

WOOD, G. B. (2 vols., Phil., 1868). Vol. 1, p. 162 as eye-wash in "ophthalmia," no warning.

WOOD, H. C. (5th Edit. Phil., 1883); p. 41, used as eye-lotion, no warning.

GRIFFITH (Universal Formulary. Edit. by Maisch. Phil., 1874); p. 445, two collyria of lead, no warning.

NAPHEYS (Surgical Therapeutics. Phil., 1881), p. 415 in conjunctivitis; p. 422, in same, with warning; p. 439, "extensively employed as collyrium," no warning.

RINGER (N. Y., 1883); BIDDLE (Phil., 1883), and FARQUHARSON (Phil., 1882), mention its use, but warn us as regards cornea.

BARTHOLOW (N. Y., 1884), BINZ (N. Y., 1878), and PARRISH (Pharmacy, Phil., 1884), make no mention of its use in ocular therapeutics.

Thus we see a wide difference in the views of various authors as regards this matter. At one extreme stands an eminent author making numerous references to the use of lead collyria, without at any point giving any intimation that any precautions are necessary, or that any injurious effects are possible; and in direct contrast, another author regarding them as both valueless and dangerous, and to be excluded from ocular therapeutics. These ref-

erences are probably more the result of routine book-making, than of any special thought over or consideration of this seeming minor and trivial detail. They are, most likely, usually made in much the same spirit as that in which Noyes refers to a lead lotion: "But old usage gives it currency, and it may be given sometimes without harm." (Diseases of the Eye, p. 162.)

While the majority of the references quoted above may be so designated; a severer term must be applied to a suggestion such as that made by Schweigger (Handbook of Ophthalmology, p. 295) recommending lead-water dressings to allay the irritability in phlyctenular keratitis! And how should we speak of those modern text-books (intended, by their very title pages, for students and medical practitioners) mentioning the old and abandoned Belgian (Buys) practice of rubbing the acetate of lead in the form of a fine powder into the granulations in cases of old, chronic trachoma!

There is certainly, no such sovereign efficacy in this mild astringent that, in view of these possible dangers, it should be retained in the ophthalmic pharmacopœia. Its only value is in mild forms of conjunctival and lid troubles, affections which would, as a rule, recover of themselves if let alone; and it does not seem rational to employ a remedy to assist a score of cases towards recovery, where in the next similar case the eye may be irretrievably damaged. It would be another question if lead were the only astringent at our command; but a whole row, devoid of any possible danger of this sort, stands ready at hand; remedies all equally or more effective than lead.

If the solution were only to be used by the surgeon himself, no damage would probably ensue in the hands of a careful man. He would not use it in trachoma with pannus, as in our Case 2; nor would he apply it in a case, as

our Case 1, where most likely the cornea could not be carefully examined to ascertain if it had been abraded; nor would he use it in clear cases of corneal affections, as were, most probably, our Cases 3, 4, 6, and 7.

The matter becomes infinitely worse when a lotion of this salt is put into the hands of the patient. In the first place, should the patient ascertain from the doctor or the druggist the composition of the lotion, it only gives professional sanction to the old popular medical superstition regarding "sugar-of-lead" as the sovereign remedy in "sore eyes."

Then we possess no certainty, after the patient leaves us, that a corneal complication may not arise at any time, and, the medicine being continued, the damage ensue. Case 5 is probably to be so explained.

It probably often occurs that the lotion is laid away and preserved for future use; or the prescription may be renewed from the druggist at some later date. In this way it may be used for a very different disease than that for which it was originally given, and these disastrous effects result. Or the lotion or prescription may, as is sometimes the case, pass to relatives or friends, and so from hand to hand. As Carter remarks: "It not unfrequently happens that this result is produced when the remains of a lead-lotion, carefully preserved by a patient whose conjunctivitis it has cured, are presented by him as a specific to some friend suffering from eye disease of a different kind" (*Diseases of the Eye*, p. 223).

The damage effected in these cases is to a great extent irreparable. Some authors recommend surgical interference; and where a dense thick film has been deposited in a corneal ulcer, this metallic plate, as it were, can be lifted away; but an opacity nevertheless is left. In other cases this film can only be scraped off imperfectly and with

great difficulty, as our Case 1 demonstrated. As Nettleship (*Diseases of the Eye*, p. 133) suggests, these opacities will in time wear away and be thrown off; and this view our Case 6 supports. But this same case proves that even twenty years after the deposition of such an opacity, enough will remain to seriously affect vision.

The study of such cases and of such facts can lead to only one conclusion, and that is: that a remedy, so dangerous in the hands of the laity, and requiring so much care and watchfulness even in professional hands, should be entirely and absolutely discarded from ophthalmic practice. Moreover, we should do all in our power to do away with this prevalent idea of the value of the acetate of lead as a popular household remedy. If we can not persuade people not to tamper with their eyes, any more than they would with their watches or legal papers, at any rate let them amuse and comfort themselves, and not harm themselves, with salt water, alum, borax, etc.

While with the laity in general we may make little impression; with one class, our friends the druggists, we may have some influence and effect some reformation. We may persuade them in this instance to confine themselves to their share of our common work, and not to so habitually recommend, and to so indiscriminately dispense, so dangerous a remedy. An expectorant for a slight bronchitis, or a gargle for a pharyngitis, or a liniment for a slight sprain, while probably not their business, still is quite a different thing from an "eye-wash" for a "sore eye," when that collyrium contains acetate of lead.

I can, in conclusion, agree most heartily with the advice given by Dr. H. W. Williams (*Diseases of the Eye*, pp. 63-4): "*Lead acetate should be absolutely excluded from use in ocular therapeutics. It is liable to be decomposed and deposited upon the cornea, as an indelible opacity, whenever an abrasion*







