

Diseases of the lachrymal apparatus : a paper read before the Maine Medical Association, June 13, 1882 / by E. Eugene Holt.

Contributors

Holt, E. E. 1849-1931.
Tweedy, John, 1849-1924
Royal College of Surgeons of England

Publication/Creation

Portland : Stephen Berry, printer, 1882.

Persistent URL

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A PAPER

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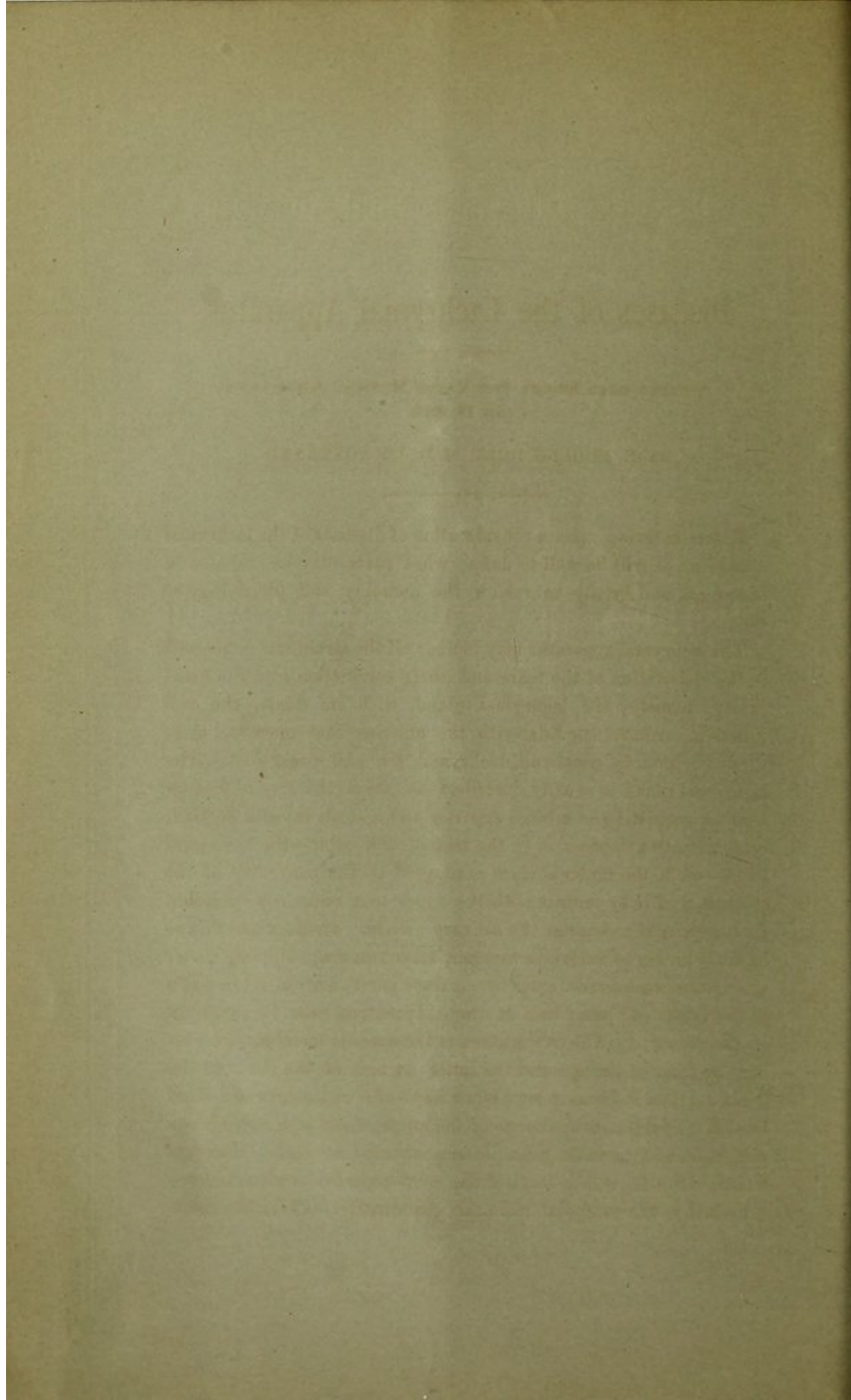
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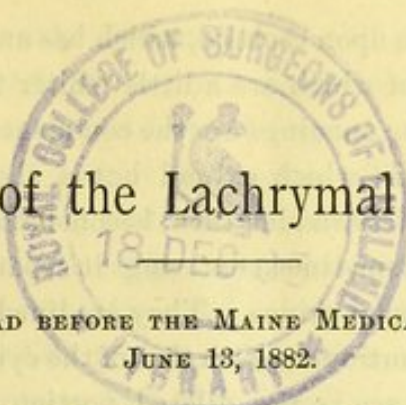
BY E. EUGENE HOLT, M.D.,
OF PORTLAND.

PORTLAND:
STEPHEN BERRY, PRINTER.

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Diseases of the Lachrymal Apparatus.

A PAPER READ BEFORE THE MAINE MEDICAL ASSOCIATION,
JUNE 13, 1882.

BY E. EUGENE HOLT, M. D., OF PORTLAND.

Before entering upon a consideration of diseases of the lachrymal apparatus, it will be well to define what parts may be included in that term, and briefly to review the anatomy and physiology of them.

The lachrymal apparatus may include all the structures concerned in the elaboration of the tears and their conduction into the nasal cavity; namely, the lachrymal gland, with its ducts, the conjunctiva, caruncle, the lids, with the muscles that open and close them, the puncta, canaliculi, lachrymal sac and nasal duct. The lachrymal gland is usually described as about the size of a small almond, consisting of a large superior and a small inferior portion, received into a depression in the roof of the orbit—the lachrymal fossa—while the under surface is adapted to the convexity of the eye-ball, and is in contact with the upper and outer recti muscles. In structure it resembles the salivary glands. Its ducts, as fine as hairs, from six to twelve in number, after running obliquely under the mucous membrane, open by separate mouths, arranged in a row at the upper and outer half of the conjunctiva, near its reflection on the sclerotic. The conjunctiva is the mucous membrane, covering the front of the eye and the inner surface of the lid. At the inner canthus it forms a semi-lunar fold—the rudiments of a third eye-lid. Further in the recess of the angle, there is a reddish elevation, named caruncle, from its resemblance to flesh. External to this caruncle, and in front of the semi-lunar fold—when the eye is turned to the temporal side for examination,—there is a some-

what conical elevation upon each lid, which has an opening called the punctum, the edges of which are a little whiter than the surrounding membrane. These openings are the commencement of two small canals—the canaliculi—which extend but a short distance, when they make a more or less sudden turn, become more horizontal, then converge to the sac, sometimes entering it separately, but perhaps more often by a common orifice. They are lined by a thin and pale mucous membrane, continuous with that of the eye and the lachrymal sac. The lachrymal sac is the dilated portion of the nasal duct, being situated in a groove of the nasal process of the superior maxillary and lachrymal bones. The nasal duct begins at the somewhat constricted portion of the passage, where the sac terminates and extends in an osseous canal, formed by the lachrymal, superior maxillary and lachrymal process of the inferior turbinated bone, in a direction * downwards, slightly backwards and outwards to the inferior meatus of the nose.

The nervous apparatus of the secretion of tears is not very definitely stated by authors. The lachrymal nerve, a branch of the ophthalmic—the first division of the fifth—is a nerve of sensation. This nerve is said to receive, not infrequently, a branch from the fourth—a nerve of motion, while the gland is supplied with branches from the sympathetic system of nerves. The tears, being pure water, containing essentially a small amount of salt and albumen, are secreted not only by the lachrymal gland, but by the conjunctiva also.

By closure of the lids, as in winking, they are distributed over the whole front part of the eye and serve to keep it moist and clear. The secretion of the meibomian glands serves to prevent them, when there is but little or no hypersecretion, from overflowing the lids, and they collect on the inner edge of the lid, in a little stream, which widens somewhat towards the caruncle, which further prevents them from overflowing, and they are taken up by the puncta and conveyed by the lachrymal passage to the inferior meatus of the nose. The secretion of the tears, although constant, is ever

* Differing, however, in almost every case, being sometimes more pronounced outwardly and sometimes posteriorly.—[*Stellwagg*.]

varying according to circumstances, and the actual amount, according to FLINT,* has never been estimated. The manner by which they are conveyed from the eye to the nose has been the subject of a good deal of discussion. The weight of authority would seem to indicate that the orbicularis is the motor power in conducting the tears into the nose, while it should be mentioned that some claim that they are carried off, principally, by the apparatus acting like an aspirator. Few authors speak of any further use of the tears than that pertaining to the eye, but Kuss † says it appears that the tears serve to lubricate the respiratory organs and counteract the drying effects caused by inhalation of dry air, ‡ and apparently assist in maintaining that state of moisture in the lungs which is so favorable to the exchange of gases.

Physiologically, the lachrymal apparatus may be divided into a secreting and a conducting part, and, whenever there is an excess of tears present in the eye, one or both of these parts must be at fault. If the presence of tears, in excess, is due to over secretion, some authors would term it epiphora, and if due to an impediment to the flow of tears into the nasal cavity, they would term it stillicidium, or stillicidium lachrymarium. But as the hyper-secretion of tears cannot exist long without producing inflammation of the lids, obstruction or displacement of the puncta, thereby causing more or less impediment to the proper course of them into the nose, it does not seem necessary to make such a distinction, and in this paper the term epiphora will simply include every "watery eye," which use of it coincides with a majority of authors.

Epiphora is a common symptom of many affections of the eye. When it has become constant, and advice is sought for its relief, it may be dependent upon various causes, among which are the following:

* Physiology of Man, Vol. V., p. 144.

† Lectures on Physiology, edited by DUVAL and translated by Dr. AMORY.

‡ This probably accounts for the dryness in the nose, spoken of by some patients, when there is much obstruction to the flow of tears. It seems to be a point that has not received any attention from writers, and I am recording observations upon it.

in consultation, leaving only two of each sex whose result was unknown. The average length of time of treatment in twelve males was one month; in nineteen females, two months; while in the remainder of the cases it was not, owing to various circumstances, definitely recorded. Whenever occasion presented itself, a note was made of the condition of the patient subsequent to treatment, and it has been ascertained that the result has remained as given in the statistics in ten cases, on an average length of time of one and a half years, the longest time recorded after completion of treatment being five years, and the shortest three months. In regard to the etiology of these affections, the larger number were due to inflammation of the lachrymal sac and stricture along the lachrymo-nasal canal. As these diseases had existed a long time and under various circumstances, it was quite difficult to ascertain the primary cause. When dacryocystitis and stricture of the nasal duct existed together, it was often impossible to ascertain the primary cause, but in deciding whether the inflammation of the sac was the primary cause of the stricture, or the stricture was the cause of the dacryocystitis, we were governed somewhat by the condition of the naso-pharynx—a catarrh of the latter often acting as a pre-disposing cause to inflammation of the nasal duct, more or less diminishing its caliber, thereby inducing an inflammation of the sac by preventing a proper flow of tears into the nose. In summing up the causes as recorded, we find twenty-two cases of epiphora ascribed to inflammation of the lachrymal sac, with more or less closure of the canaliculus, and fifteen cases to stricture of the nasal duct, making thirty-seven cases due to inflammation and the results of inflammation of the lachrymo-nasal duct. Of the remaining fourteen cases, the cause was found among things which have been enumerated as likely to give rise to epiphora. We will not enter into details any further than to say that, in some half dozen cases, ametropia seemed to play the most prominent part in the production of the epiphora, since the annoying lachrymation was greatly or entirely relieved by fitting glasses to correct the optical defect.

Having briefly considered the anatomy and physiology of the lachrymal apparatus and the etiology of its diseases, we come now

to the most important part of the subject, namely, the diagnosis and treatment. When a case of epiphora presents itself for treatment, it is very important to ascertain the exact cause of it, that no unnecessary thing may be done; for we believe that, in the treatment of the conditions which give rise to epiphora, as in the treatment of other diseases whose etiology is imperfectly understood, much is done that is unnecessary and even harmful.

We should keep prominently before us the various causes of epiphora which have been enumerated under the ten heads. If it is due to granulations or foreign body on the lid or in the retro-tarsal fold, it will be unnecessary to direct special treatment to any other part. If it is due to displacement, obstructions or obliteration of the puncta, stricture of or foreign body in the canaliculi, it will be unnecessary to direct special treatment beyond these parts. Again, if it is due to any constitutional diathesis or unhygienic condition, to catarrh of, polypus or foreign body in, the nasal cavity, or to any defect in the eye as an organ of vision, these causes should receive our first attention. Excluding all cases of epiphora due to these various extrinsic causes, there still exists a wide difference in the treatment of the most common conditions which give rise to it, namely, inflammation of the sac, with more or less stricture in some part of the lachrymal passage. They differ so widely in their procedure that the one might be called the conservative and the other the radical method.

In the conservative method, the case is not unfrequently treated by small probes and syringing, without having previously opened the canaliculus by the knife. Sometimes minor operations are substituted for that devised and first practiced by Mr. BOWMAN, of laying the canaliculus open. Small probes are invariably used, and by some (DONDEERS, LANDOLT) no probes are employed when a liquid can be readily syringed into the nose.

In the radical method, the first step is to slit up the canaliculus, then to pass as large a probe as possible without doing violence. (?) The nasal duct is further dilated and kept open by passing probes as large as can be introduced. All the cases of which the statistics have been given were treated upon the conservative plan, no probe larger than Bowman, No. 8, being used. As an illustration, I

might cite the case of Mrs. T., aged forty-eight, who consulted me December 14, 1877. The tears had overflowed in the right eye, more or less, for ten years. At times there would be redness and swelling at the inner corner of the eye and adjacent parts, accompanied with a good deal of pain, which seemed to radiate from this point all over the head. She was decidedly nervous, for she had consulted several medical men, who, on account of the character and amount of the pain and the condition of the eye, gave her to understand that she had some malignant disease. There was some muco-purulent secretion along the edges of the lids, which were everted; swelling and turgescence of the caruncle, with some swelling and a brawny appearance of the skin in the region of the lachrymal sac. She would not allow any "cutting operation" to be performed. With a small probe—in fact, a large silver wire—the canaliculi were entered. An attempt was made, with partial success, to clear the lachrymo-nasal canal by the smallest point of AGNEW's syringe. She was ordered an astringent, collyrium, and some constitutional remedy. At the next sitting, the inferior canaliculus was dilated by WEBER's probe, and a No. 1 Bowman was passed part of the way through the nasal duct. Some fluid could be syringed through, and, by the use of the air bag, as in inflating the ear, the meatus being closed by the obturator, to prevent any injurious effects on the membrana tympani, some air came up through the puncta. At the third sitting, the No. 1 probe was passed through the nasal duct to the floor of the nose.

In four months, with the use of small probes—No. 2 Bowman being the largest used—syringing with weak astringents and the inflation, she was entirely cured, having been seen twelve times, and for the last four years she has had no trouble whatever with the eye. Of course, citing one case does not prove anything, but when it is a typical one of bad cases that we have to deal with, even if the result is a little better than the average relief given in such cases, we are justified in putting it forth as an example of what is often accomplished by the conservative plan of treatment. In the treatment of some of the cases which have occurred in my second one thousand diseases of the eye, I have employed the radical method, to a certain extent.

Dr. THEOBALD, who is one of the most vigorous exponents of this plan, kindly had a set of pure silver probes made for me, as he advocates, running up to No. 16; the number of which, divided by four, gives the diameter of the probe in millimetres, No. 16 being 4 mm. in diameter. In a letter he says: "Don't let the size of No. 16 alarm you; you will find you can use it in most cases." I never have, however, found a patient in whom a probe larger than No. 12,—3 mm. in diameter—could be employed without using violence. It is well known that, in passing a sound through the urethra, in certain obstructions of that canal, a size within certain limits is more readily passed and is less likely to make a false passage than the smallest sound. This is the case with the lachrymal passage. A probe within certain limits may be passed as readily, and with less risk of injuring the canal, than in using the very smallest probe. It is believed, also, that bulbous probes are less likely to make a false passage, and I have often had occasion to be pleased with the action of the bulbous probes of Dr. H. W. WILLIAMS, of Boston, who kindly selected a set for me. Much force in passing a probe should be avoided, except, perhaps, in some very exceptional cases.

The old method of treatment was to open the sac from the outside and introduce a style or canula, which was to be worn for a long time. In many cases, wearing the style was as annoying as the epiphora; it made an objectionable disfigurement, especially in females, and, finally, it probably did not relieve more than fifty per cent. of the cases (ROOSA).^{*} This practice has long since been abandoned by ophthalmic surgeons. There are a few, however, who use the style introduced—through the slit-up canaliculus, but generally in very exceptional cases. The writer has had but very little experience with them. I have seen Dr. HILL, of Augusta, put them in, and the results he obtained seemed to be highly satisfactory. He kindly sent me several sizes of the kind he uses, and wrote a letter (worthy of publication), stating the cases and conditions in which he inserted them. The general practitioner is more often called upon for advice, in diseases of the lachrymal passages, when there

^{*} Lachrymal Catarrh.—[*Medical Record*, August 9, 1879.]

is chronic dacryocystitis, with acute recurrence—in other words, when there is lachrymal abscess, which, on account of the accompanying redness and swelling, often considerably involving the adjacent parts, is not infrequently mistaken by inexact observers for erysipelas of the face. There are cases in which doubts may arise as to the true nature of the disease, but in most cases the history, prodromal stage and present condition will point unmistakably to the true nature of the affection. If seen early enough, it can be relieved by the application of hot water, hot fomentations, steaming, leeching, etc.; but if the pain and swelling increase, or have reached a certain degree, the sac should be opened, either through the canaliculus or by AGNEW'S method,* which consists in entering the sac, by BEER'S or GRAEFÉ'S cataract knife, through the mucous membrane, at the angle behind the canaliculus, just in front of the caruncle. If this cannot be done it may be opened through the skin, but this should be a last resort, as in case of entering the bladder externally, to relieve that organ, distended with urine. The sac should always be entered through the canaliculus, if possible, for that operation is just so much gained towards relieving the condition which gave rise to the abscess, and which, if not removed, is likely to induce a repetition of it. In opening the canaliculus, the edge of the knife should be directed towards the eye, as has been pointed out by Dr. J. S. PROUT,† and not upwards, as directed in some of the books. The advantages are that the cut edges are directed towards the globe, as the punctum is in the normal condition; the tears enter the sac more readily, and the wound is entirely out of sight. When the knife is directed upward—unless the canaliculus can be rotated upon its axis 90° —the cut edges are often everted, and the tears do not enter the canal. This is sometimes the case when there is an hypertrophied, swollen condition of the lids. In the latter case, Mr. CRITCHETT'S operation may be performed. This consists‡ in “seizing a portion of the posterior wall of the canal and snipping it out with scissors,

* Clinical Lecture.—[*Medical Record*, Oct. 23, 1880.

† Lachrymal conjunctivitis and some of the other injurious effects of retention of the tears.—[*Transactions of Am. Oph. Soc.*, 1878.

‡ Quoted in Dr. PROUT'S article.

thus effecting the treble objects of drawing the canal more inward towards the caruncle, of forming a reservoir into which the tears may run, and of preventing any union of the parts."

There is a certain form of conjunctivitis, first accurately described by GALEZOWSKI, who designated it "lachrymal conjunctivitis," which is dependent upon catarrh of the lachrymo-nasal canal. The usual treatment for conjunctivitis does but little good, for the astringents do not enter the lachrymal passage in sufficient quantity to have any appreciable effect, and often there is more or less stricture at some point of the same. In such cases, if pressure over the lachrymal sac causes a muco-purulent secretion to exude, it is very evident that there is a lachrymal catarrh acting as a cause, which should first receive attention before the conjunctivitis can be cured. If this exudation does not occur when pressure is made over the sac, catarrh of the same cannot be excluded, for the patient might have emptied the contents of it just before the examination was made. Further search should be made to see if the conjunctiva is not slightly more congested towards the inner canthus, and the condition of the edges of the lids and puncta should be carefully noted. When there is mal-position of the punctum, often minor operations may be performed with success. These have been designated by Dr. PROUT as BOWMAN and CRITCHETT minor. The former consists in inserting one blade of a small pair of scissors into the punctum at right angle to the lid, and dividing the vertical part of the canal next to the eye. The first part of CRITCHETT operation is the same, and, in addition, a small circular piece is removed from the depth of the cut, thus further enlarging the entrance for the tears.

Although this paper has reached far beyond its intended limits, there are many things pertaining to this subject necessarily omitted, and the writer has endeavored to mention only some of the more important ones, and particularly to advocate the conservative method of treatment of these diseases. In conclusion, he would cite a few of the prominent men with whom he has conversed upon this subject, who are advocates of this method.

Dr. C. E. FITZGERALD, Dublin, often succeeds in curing epiphora, when due to obstruction of the flow of tears into the nose,

without any cutting operation. Dilates canaliculus by WEBER's probe and uses BOWMAN's probes, seldom larger than No. 6.

Mr. H. R. SWANZEY, Dublin, uses small probes, BOWMAN's, never larger than No. 6. Thinks large probes, as well as large syles, produce an undue stretching of the nasal duct, injuring it, and, when the probing is stopped or the style is left out, contraction takes place, and a worse stricture than ever almost invariably comes on. Very much opposed to large probes, as unsound and irrational treatment. Frequently succeeds in curing epiphora without BOWMAN's operation, or any of the modifications of it.

Dr. LANDOLT, Paris, slits up the superior canaliculus ; seldom probes when a fluid can be passed through the nasal duct into the nose, and never uses a probe larger than about a No. 4 BOWMAN. When opening up the superior canaliculus does not cure the epiphora, he slits up the inferior one, uniting them to the sac, if necessary. He exhibited several cases of severe abscess and fistula of the lachrymal sac, which he had cured by slitting up the canaliculus and syringing with a weak solution of lead and borax.

Dr. DEWECKER, Paris, adheres to the practice set forth in his book, "Ocular Therapeutics," and is still very pronounced in favor of small probes—BOWMAN, Nos. 1 to 4—and avoiding cutting operations in all cases, where it is possible to do without them. His experience still teaches him that more cases can be alleviated or cured by these milder means than by the radical method of opening up the canaliculus and using as large a probe as possible.

Mr. HENRY POWERS, London, showed me a patient in his ophthalmic ward at St. Bartholomew's Hospital, in whom there had been a fistulous opening to the sac, occlusion of the nasal duct, etc., and he had made preparations to operate, but, upon having the heart examined, it was decided to be unsafe to give her an anæsthetic, and she would not have anything done without it. She was treated by the applications of mild astringents, etc., and had made a good recovery. He thought she was better off than though he had operated upon her that day and used large probes, as he intended to do. He was an advocate of the conservative method of treatment of lachrymal diseases, and almost invariably used small probes.

At the Royal London Ophthalmic Hospital, the large majority of the surgeons treated these diseases by the conservative method, Mr. COUPER being the only one pronounced in favor of large probes. It seemed to me, that those cases treated by the radical did not do as well as those treated by the conservative method, and this view of the result was confirmed by the junior members of the institution, who had the immediate charge of the cases treated by both methods.

Finally, we have, among the highest authority in the world, two with whom the writer has conversed, and who are in favor of the conservative method of treatment, namely, Mr. BOWMAN, of London, and Professor DONDEERS, of Utrecht. In making an appointment with Mr. BOWMAN, he took the pains to have a patient come at the same hour, on whom he showed his method of procedure in one of the worst of cases. The description given in books convey, generally, a correct idea of his method of operating upon the canaliculus, except that he is particular to have the edge of the knife close to the floor of the canaliculus and directed towards the eye, as has already been mentioned. He used a small rubber bulb syringe for syringing out the nasal duct. He had many instruments, which he kindly showed, for doing various operations in and about the conducting part of the lachrymal apparatus. He meets stricture at the juncture of the canaliculus and sac more often than in any other part, and often prefers to divide it at this point with his shielded knife, or to forcibly dilate it with his instrument for that purpose, rather than to perform his operation of laying open the canaliculus.

Mr. BOWMAN, by preference, operates upon the superior canaliculus, as this one is more in a direct line with the nasal duct, but he often operates upon the inferior canaliculus. In answer, as to whether he used large probes, he said there was some discrepancy in the numbering of them. He thought that the metric system ought to be adopted, to insure uniformity in measuring the size of them. He uses bulbous probes from less than one millimeter to one, sometimes of three and a quarter, millimeters in diameter at the largest part of the bulb, adding that every case must be studied by itself and often needs special treatment, so that no rule

could be laid down as to the line of procedure, in the management of the different cases as they present themselves.

DISCUSSION.

Dr. WEEKS said that the causes of inflammation of the lachrymal apparatus were both constitutional and local, of which the former were most important in their relations to treatment. Cases were most frequently met with in strumous or syphilitic children. Treatment must be directed to the constitutional taint as well as to the local disease. He was sure that he had seen cases that might properly be considered cured. He had relieved the stricture and then used constitutional remedies.

Among local causes may be mentioned climate, age, exposure, changes of temperature, &c. As to local treatment, it was his practice to slit up the canaliculi, or, if the obstruction was slight, dilate with probes without cutting. In cutting, he thought it better to stop short of the sac, as he found that, by so doing, he was less likely to get secondary contraction at the termination of the slit.

In cases of suppuration of the sac, a free incision should be made through the skin. When the stricture was in the nasal duct, he used the style. In case of chronic inflammation of these passages, with thickening, it was not the best practice to slit up the canaliculi or use the probe. Repeated blisters, or other forms of counter irritation, applied below the canthus, gave better results. But it is to be remembered that constitutional treatment is of the utmost importance and must be long continued.

Dr. DWIGHT, of Massachusetts, asked why, in case of suppuration of the sac, the pus could not be drawn off by means of a hypodermic syringe.

Dr. WEEKS said there was the same objection that there was to the use of the aspirator in empyema—the pus would accumulate again.

Dr. DWIGHT asked if the pus could not be drawn off and an astringent thrown in.

Dr. WEEKS thought it could be done, but did not believe it was the best method of treatment.

Dr. HOLT said that, in the cases reported cured, five years was the longest time a case had been observed without recurrence. He thought there might be a wide difference of opinion as to what constitutes a cure. He was sure he had kept within a fair limit. He thought that when entire relief from lachrymation had been afforded for three months, it was fair to consider the case cured. There might be relapses, he admitted.

As to the method of slitting up the canaliculus, in his cases he most frequently found the obstruction at the junction of the canaliculus with the sac, and, if the incision was not carried the whole length, relief was not obtained. BOWMAN was in favor of dividing the stricture with a concealed knife.

Dr. J. A. SPALDING, of Portland, said that sixteen years of study and practice of diseases of the eye had convinced him of the obstinacy and general incurability of these cases. Relief could be obtained in many; absolute cure, that is to say, restoration to a normal condition, was the exception. Many of the "cured" cases were afterwards turning up in the hands of other physicians. The percentage of "relieved" cases could, however, be made so high that all patients thus affected should be urged to give the proper treatment a fair trial.

If the trouble lies at the punctum or in the canaliculi, or even at the upper portion of the sac, it can usually be cured, even if of long standing. But if it lies in the sac, or in the nasal duct, then the case will be obstinate and intractable. It is just because a majority of the cases which come into our charge for treatment belong to the latter class, that they give us, on the whole, so little flattering results.

The great tendency in modern specialties, is to go too deeply into minutiae. In a broad sense, the treatment of the diseases under discussion is generally the same in all cases; the canaliculus should be opened with a beak-pointed knife and probes passed. With very large probes, Dr. SPALDING had had no experience, although advantages are claimed for them over small probes. When the sac is inflamed and the muco-purulent discharge persists, astringents should be used, after passing the probes.

In neglected cases, the sac often swells enormously and sometimes opens spontaneously, giving rise to a fistula. It is not good surgery, then, to order poultices. It would be much better to advise the knife. But if the patients will not consent to the knife, yet the poultice should not be ordered. In the dilemma between refusal of the knife and resort to poultices, the physician should try heat and sedatives.

Two cases were then reported, in which poultices had been applied. The result was lachrymal fistula, with all its aggravating annoyances and disfigurement, persisting for years. A clean incision with the knife would have avoided all this. When the inflammation has abated, without causing a fistula, the sac should be opened and probes be used.

Considerable skill is requisite in all forms of these diseases. One great point is to open the canaliculus in such a way that the new opening shall rest against the eye-ball, when the lid lies in position. Some cases were reported, in which careless operators had opened the canaliculus with the blade turned outward, so that, when the patients bent over, as they had to do at their work, the tears were constantly dripping from the eyes. The pain in

passing the probes can be rendered easier by gently forcing them onward, without pushing them by jerks. Tact and skill were nearly equal elements in the successful treatment of diseases of the lachrymal apparatus. Still, chance played an important role, for if, as above suggested, the upper portion only of the lachrymal apparatus were affected, the physician, with a majority of such cases, would gain an easy reputation for rapid success, whilst, if the sac itself or the nasal duct were affected, the case would be more obstinate and the result would generally be less favorable for the physician's renown.

