

creased the percentage of recoveries, and the habit of using them for this purpose has undoubtedly done much harm and very little good.

Probably the drug most extensively used for lowering fevers during the last thirty years—notwithstanding the free prescribing of the coal-tar preparations—is aconite; yet to this hour I am ignorant of any proof whatever that this drug can lower the temperature of fever, except by injuriously lowering the vitality of the patient. It may slow the heat and lessen nervous perturbation; but that is quite another thing.

We often find ourselves considering in the most serious manner as a grave thing the direct effect of a temperature of, say 102 F., and lasting for a few hours or for a day. And we have connived at the belief by the lay people that such a fever is dangerous. If placebos are needful for the *morale* of the patient, there is no objection to giving some innocuous thing ostensibly for the fever, but for doctors to regard it as necessary on other grounds is unscientific and poor practice. A free catharsis at the beginning of sudden fever often gives a sense of relief, probably by removing ptomaines and other effete matter from the intestines, and in this or some other way removing congestion—or a sense of it—from the head. But except by removing ptomaines there is small proof that it lowers the temperature; and evidence of this latter even is not of the best.

It is, of course, always in order to attempt to remove or destroy the causes of fever. Some of the more tangible ones, especially those of a surgical character, we may deal with effectively. We may evacuate effete matter from the alimentary canal and increase the toxicity of the urine, which it seems clear is one of the eliminative effects of the Brand treatment of typhoid, although many forms of treatment may help the system to free itself from the toxic influence.

The service of this sort which we can render is very sharply limited, and may be roughly indicated as follows:

1. Pus-pockets, suppurating surfaces, and cysts leaking into the connective tissue, and so reaching the general circulation, may sometimes be evacuated or removed.
2. Inflammation may be assuaged, cured, or waited for.

3. Ptomaines in the alimentary canal may be evacuated by a cathartic if they do not directly bring on a remedial diarrhea.

4. Malarial plasmodia may be effectively dealt with; and we have, fortunately, one drug proved to have a positive action against these parasites.

5. The causes of the essential fevers, that obviously consist of specific microbes which run their course in definite periods, are usually destroyed by the conservative havoc wrought by the products of the microbes themselves. No drug is capable of destroying them, and, on the basis of present knowledge, it is idle to medicate by such means. But we are beginning to know that the destruction of these poisons is possible by artificial means acting like the physiologic forces. The success already attained in a few diseases, most notably diphtheria, is crucial proof of the possibilities in this direction, and is reason for the faith that we shall soon be able to deal with many diseases in the same way. This is the direction the efforts of every clinician ought to take, and we await the beck of the votaries of bacteriology and pathology.

It is hard to keep the practising part of the medical profession plumb, as it is the lay world. We easily drop into habits of prescribing for insignificant things, to the

neglect of the few indications that make for the patient's better comfort and greater prospect of recovery—the two objects that alone justify the existence of doctors. We give aconite or other drugs for slight fever and to bring down the pulse; digitalis, because the pulse is weak at the wrist—even when the weakness is apparent and not real, but due to the muscular and nerve fibers of the vessel-walls; we give calomel to clean off the tongue; prescribe for dry and rough skin and for cold, clammy skin; and for temporary dark coloration of the urine—and all as though such things were consequential and not the necessary, harmless accompaniments of many sicknesses of all shades of severity. Worse, we often prescribe thus to the injury rather than the benefit of the patient, and by pursuing such methods hide from our own eyes the manner of reasoning that means growth and the measures that, beside being scientific, are genuinely useful for the health and longevity of the sick.

SURGERY OF THE TEAR-PASSAGES.*

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What the physician of to-day wants more than anything else is a practical knowledge of the science and art of medicine as it is practiced by the leading men in the various departments into which the work is ordinarily divided. Theorists there always have been and always will be, and they undoubtedly serve a very useful purpose; but to the ordinary physician he is an unknown quantity. His logic and theoretical deductions may be interesting, even fascinating, but directly they are of extremely limited practical benefit, to either the physician or the patient.

With the exception of a very few, the members of this society are all general practitioners; or let me put it a little differently—they are general specialists, i. e., specialists in everything. In your every-day practice you are called upon to examine into and treat every form of sickness or accident that our bodies are heir to. Isolated as some of you are, you do not always have the time or opportunity of calling in the assistance and counsel of men who by special study and large experience have become experts in the different specialties. Allow me, therefore, to speak to you this afternoon about a group of diseases that every one of you must often have met, and without theorizing as to the how and why or whence, give a brief summary concerning their general diagnosis, care and treatment, together with a few hints as to the dangers to be avoided.

Among the most numerous and most important diseases that the oculist is called upon to treat are the diseases of the canal whose function it is to conduct the tears from the lachrymal lake into the nose. The epiphora which usually accompanies these diseases is so annoying and aggravating that persons suffering from it very soon seek medical advice. The tears, instead of finding their way through the passage ordained by Nature for them, are either prevented from entering the canal at all, or having entered, are hindered from passing through it. In either case it results in the tears flowing over the border of the lower lid on to the cheek. If this happens only occasionally, it will not seriously inconvenience the patient, but if it be continuous and, as is usual, aggravated by being out of doors, especially when it is windy, it will sooner or later result in consid-

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erable excoriation of the skin, besides the inconvenience of being obliged to constantly wipe away the tears. It must be remembered, however, that epiphora is not necessarily a symptom of obstructive disease of the tear-passages. It may be due to excessive irritability of certain endings of the trigeminus and occasionally it is found to precede Basedow's disease.

The canal being lined with mucous membrane, it may under certain conditions become subject to catarrhal inflammations. Sometimes this may be communicated to it from the nose; sometimes from a catarrhal conjunctivitis; sometimes it may be caused by the lodgment of a foreign body in the duct; but more often no definite cause can be assigned. Syphilis, a scrofulous diathesis, periostitis and erysipelas have all to be mentioned as possible causes. There is very little doubt that a certain per cent. of cases are the result of the extremely irritating qualities that tears occasionally possess. These changes, like those in the urine, are dependent upon the condition of the system as a whole, as it is influenced by this or that local trouble.

The characteristic results of a catarrhal inflammation—a swollen and congested mucous membrane, with an increase of the secretions, that readily decompose and become pyogenic—are sufficient to entirely close any part of the canal, and the formation of an abscess is only a question of time. Any suppuration, pus or infected sore anywhere near the organ of vision must always be considered as extremely dangerous. With the least abrasion of the cornea, and sometimes even without it, infection by this pus may produce abscesses and ulcers that often perforate and may ultimately terminate in panophthalmitis in the eye primarily affected, and possibly sympathetic ophthalmia in its fellow. Or the orbital tissue may become affected, causing an orbital cellulitis that may terminate fatally.

Since such disastrous results may manifest themselves before the disease is checked, we need not be surprised at the heroic measures sometimes advocated for their cure or to restrict as much as possible any evil consequences.

Beginning at the palpebral end of the canal we often meet with a considerable narrowing or contraction of the punctum. It may be limited to either the upper or lower one, or may affect both at the same time. The normal diameter of these openings is .25 mm. for the upper and about .33 mm. for the lower. They act as the sphincters of the canal. The punctum is funnel-shaped and in close apposition to the eyeball. Immediately beyond the funnel-shaped opening the canaliculi expand considerably, so that a kind of valve is formed, which, while it encourages the entrance of the tears, to a certain extent retards their exit in this direction. According to Gerlach, a few unstriated muscle-fibers have been found surrounding it. The cause of any constriction at this point may be a long-continued congestion or inflammation of the palpebral conjunctiva. Often it closes entirely, as a result of a burn, as from a flame, from molten metal or from chemicals.

Because it is easy of access, the treatment of this condition is comparatively simple. If it is entirely closed, it will be necessary to use a narrow, sharp-pointed knife, like a broad von Graefe cataract knife, to open it. Unless a person has had considerable experience in treating such cases, it is not always an easy matter to find the opening into the canaliculus, even after it has been opened by this method. Our only guide is an exact knowledge of the position and direction of the canal. Sometimes it happens that a large proportion of the

canal is closed. In this case it is necessary to make the opening a short distance beyond the punctum toward the median line, just within the upper or lower border of the lid, as the case may be, so that the opening in the lower lid may face upward and backward, and in the upper lid downward and backward. The tendency to heal and close again must be prevented by the daily use of a well-lubricated No. 6 probe, which must be introduced as far as the sac.

If there is simply a contraction without a complete closure of the punctum, dilatation, either rapid or slow, is usually sufficient. I prefer the rapid method. The upper as well as the lower punctum should be dilated, as the results of treating both are far more satisfactory than that of treating one alone. In fact, some cases absolutely demand it and would not get well without this form of treatment. The results, as a rule, are very gratifying and the patient is immediately relieved of a very annoying epiphora.

Narrowing or constriction of that part of the canal between the punctum and the sac is also quite common, especially at the junction of the upper and lower canaliculi and of the sac and the common duct. Its normal diameter is about .5 mm., and its length varies from 5 to 7 mm. It is surrounded by fibers of Horner's muscle, which assists the orbicularis palpebrarum in moving the lids, while at the same time it compresses the canaliculus and draws it toward the median line, thus shortening it with every effort toward closing the lids. The effect of this rhythmic compression and shortening is to force the contents of the canal into the sac. This results in a vacuum, which is immediately filled again by the tears from the lachrymal lake, entering through the funnel-shaped punctum. If any part of this canal is contracted it will prevent the tears from passing through it, and the regular compression and shortening of it will force the tears back again out of the punctum into the lachrymal lake. Thus the canaliculi are kept clean and washed out by the tears several times a minute, preventing stagnation, decomposition and abscess. For this reason it is exceedingly rare to meet with an abscess, or discharge of pus, whose origin is in the canaliculus. The only inconvenience that the patient complains of, therefore, is similar to that of closure or contraction of the punctum, viz., epiphora.

The treatment of this condition has been quite unsatisfactory in a large proportion of cases, and warrants us in trying to discover a better method. Dilatation is only of temporary benefit, and sooner or later the patient returns, no less to the disappointment of the physician than to himself. Often it seems as though the condition has been aggravated instead of relieved by it. Dr. Knapp, in writing on this subject in Norris and Oliver's "System of Ophthalmology," rather than subject the patient to the discomfort and uncertainty of dilatation, advises "patients with moderate epiphora to bear it without probing."

Slitting the canal and converting it into a groove is as unscientific and crude as its results are unsatisfactory and disappointing. Unless accompanied by such radical and forcible dilatation of the nasal canal as advocated by Theobald, it is a question in my mind whether it does not seriously increase the difficulty. By converting it into a groove we forever destroy the normal and proper function of the canaliculus, viz., that of forcing the tears into the lachrymal sac. The tears do not pass from the lid to the nose because of the effect of gravitation. In fact, the direction of the canaliculus is slightly uphill and the tears, like the contents of the bowel, are moved

along by the peristaltic action of the canal. Therefore, any method of treatment that interferes with this peristalsis or prevents it altogether should never be considered or advised so long as equally good results can be obtained by working in harmony with Nature. Theobald overcomes the bad effects of slitting the canaliculus by enlarging the entrance to the sac and the nasal canal to such an extent that a probe whose diameter is 4 mm. can easily be passed.

The objections to this are two-fold: 1. The amount of force required to pass such large probes is a "dangerous and reprehensible procedure" that not only severely lacerates the lining membrane, but, as its advocator himself acknowledges, often fractures the bony wall of the canal. I scarcely need do more than quote his own words: "Occasionally I have used the strength of both hands to pass these probes." 2. The other objection to it is still stronger, in that a large canal and a large opening in the lid allow the contents of the nose to be forced upward toward and on to the eye whenever the patient blows the nose, and thus constantly exposes the eye to all the dangers of infection from this source, which is little less than the danger of dacryocystitis, for which this operation is often performed.

In the treatment of strictures of the canaliculus two objects must be kept in view: 1. To obtain a canal of sufficiently large caliber to conduct the tears to the sac; 2, to preserve the normal function of the canal by not interfering with anything that would disturb the function of the organ and the forces that make this function possible. Simple dilatation of the constricted portion by means of ordinary probing alone is notoriously unsatisfactory, and the well-nigh universal opinion is that if a stricture, no matter where it be located, is to be permanently cured, it must be divided with the knife and its raw edges prevented from reuniting by repeated dilatation of the canal.

But how to cut without interfering with the physiologic function of the organ is the all-important question. After a careful study and considerable experience, I have adopted the following as my method of procedure: The punctum is dilated to such an extent that a knife made for this operation may be introduced with the least possible injury, for ordinarily it does not need to be cut. Having first ascertained the exact location of the stricture by means of probing, the knife is passed into the canal with the back of the blade firmly hugging the wall of the canaliculus toward the border of the lid, so as to injure the mucous membrane as little as possible. The sharp edge of the knife is directed downward in case of the lower, and upward in case of the upper, canaliculus, until it reaches the stricture, which is cut by a sawing movement. The knife is withdrawn just as carefully as it had previously been introduced. In the lower canaliculus the cut is made downward and in the upper it is made upward. In this way little or nothing is cut except the stricture, and the direction in which it is cut is such that it in nowise interferes with the proper physiologic function of the organ. It does not sever the fibers of Horner's muscle, which controls the peristaltic action of the canaliculus; neither is the canal converted into a groove, but it retains both the shape and the function of the organ.

The after-treatment consists of irrigations with boric-acid solutions and the regular use of a No. 8 Bowman probe as follows: Daily for the first week; every second day for the second week; every third day for the third week, and once a week during the three following weeks. I need scarcely mention that neither probing

nor cutting should ever be attempted without first having taken the most perfect aseptic precautions possible.

Quite commonly stricture of the tear-passages is found at the junction of the lachrymal sac with the nasal canal. The canaliculus may be of normal shape and size and performing its functions perfectly, but the obstruction at the lower end of the sac prevents the tears from passing through into the nose. The retained secretions become stagnant, easily decompose, and on account of the well-nigh universal presence of bacteria and germs, readily become an infected and infectious mass. The irritating qualities of the fluid soon set up a congestion and inflammation of the lining membrane of the canaliculus, producing a swelling and consequent constriction of this narrow canal, which effectually prevents the exit of the infected fluid from the sac. The lining membrane of the sac becomes similarly affected, resulting in a purulent catarrh, which increases the contents of the sac, and a true abscess or dacryocystitis has developed. It manifests its presence by a fluctuating red tumor at the base of the root of the nose, with considerable edema and puffiness of the lids, so that frequently they can not be separated except by force. There will be epiphora, severe pain, headache, with perhaps slight chills and elevation of temperature. Its treatment is similar to abscess in any other part of the body. A large opening is made in the most dependent portion of the sac and the contents thoroughly evacuated, followed by flushing with boric-acid or bichlorid of mercury solutions. No attempt should be made at this time to open or dilate the strictures, as the swelling of the lining membrane is usually so great as to make this procedure impossible without the use of more force than is justifiable. The after-treatment is again similar to that of an abscess elsewhere, viz., thorough daily cleansing and dressing with antiseptic precautions until all discharge has ceased.

In addition to this, an attempt should be made to overcome the strictures and have the canal patent from end to end before allowing the opening to close entirely. If for any reason this is impossible, one of two methods may be followed: 1, the destruction of the lachrymal sac; and, 2, the establishment of a permanent fistula. Of these two, the former is to be preferred. It frequently happens that when the abscess has healed and the inflammation subsided, the stricture has also disappeared, proving that it consisted simply of a swollen mucous membrane.

On the third or fourth day after having opened the abscess, an attempt may be made to pass a small probe. If successful, it may be repeated every day by one of the next larger size. If unsuccessful, wait two or three days longer and try again, at which time there is usually no difficulty, unless complete closure of the canal has taken place. If a stricture exists it should not be cut or treated by any other method than simple dilatation until the abscess has completely healed and all danger of infection has passed.

If a complete stricture and an entire closing of the canal has taken place, we must first ascertain by means of a probe whether this obstruction is due to closure of the bony canal or whether it is simply the result of cicatricial contraction. If due to the first, the probe will encounter a firm, hard, irresistible barrier; if it is the result of the second, the contact of the probe with the obstruction will impart to the fingers a sensation not unlike that which would be conveyed to them if the probe were pressed against a piece of soft rubber. There is a certain amount of "give" and elasticity.

If after a careful examination it has been ascertained that the obstruction to the canal is of a bony nature, the treatment resolves itself into extirpation or complete destruction of the lachrymal sac, with or without excision of the lachrymal gland. Extirpation or destruction of the sac may be accomplished by one of three methods: either by a careful dissection, by means of the actual cautery, or by scraping and curettage. Preference should be given to these methods in the order in which they are mentioned, although the last is perhaps the easiest, and, if thoroughly done, is equally as successful as the others. The wound should be left open and allowed to fill in and heal by granulations, except when the first method is followed. In this, if the operation has been done under strict aseptic precautions, the wound may be closed immediately and healing by first intention is usually accomplished. The canaliculi should be slit and cauterized.

The operation for removal of the lachrymal glands seems to me to be gaining in popularity, and I can see no good reason why this gland should remain after destruction of the sac, since its presence is a source of considerable annoyance and inconvenience, and its absence is followed by no ill results. The secretions from the glands in the lid are sufficient to lubricate the cornea and keep the parts moist and comfortable.

If the obstruction is the result of a deposit of fibrous or cicatricial tissue, it is best treated by the same method as that used for stricture of the canaliculus, viz., cutting and dilatation with a No. 8 Bowman probe. Having passed the probe, it should remain *in situ* for about 20 or 30 minutes before it is withdrawn again.

The normal diameter of the nasal canal is about 3 mm.; but when we take into consideration that all the tears passing through this part of the canal must first pass through the canaliculi, whose normal diameter is only about .5 mm. each, then we must reach the conclusion that a canal whose narrowest part is not less than 1 mm. in diameter is plenty large to carry off all the tears that come to it. Any mode of treatment, therefore, which attempts to increase the diameter of the canal very much above this, especially if this is done at the risk of lacerating the tissues and fracturing the bones through which it passes, must seem absurd, to use no stronger term. Bowman's probe No. 8 is about 2 mm. in diameter, and any canal large enough to admit of the easy passage of this instrument from end to end is large enough to permit the tears to pass freely without producing epiphora.

Occasionally we meet with cases in which the formation and discharge of pus will continue even after the canal has been properly opened. In such cases I have had the best success by injecting a 2 to 5 per cent. solution of nitrate of silver, preceded and followed by a douche of a saturated solution of boric acid. When I say a "douche," I do not mean the injection of three or four syringefuls of the solution, but inserting a canula both into the upper and into the lower punctum, allow a pint of the fluid to flow through uninterruptedly by means of a fountain syringe or a siphon from a bottle. In desperate cases I order a use of the douche three times a day and the nitrate of silver every two to four days. Rarely is it necessary to use it every day. Thorough antiseptic irrigation for not less than half an hour at a time is of the greatest importance here as well as elsewhere.

It has never yet been my bad fortune to meet a case in which it was necessary to destroy or extirpate the sac in order to stop a discharge of pus. I do not deny that such cases are occasionally met with, and therefore the

operation is a justifiable one, but it certainly should not be attempted except as a last resort and after every other method of treatment has been faithfully tried without success. "In resorting to such radical and heroic measures we must ever consider it as an evidence of our limited knowledge and inability to deal more properly with this sometimes so-complicated a condition," were the words of a noted surgeon in speaking of amputations, and they apply with equal force here.

Lastly, allow me to call attention to the necessity of being certain that no stricture exists at the nasal extremity of the canal. In many cases in which no stricture or narrowing of any part of the canal can be detected by the ordinary Bowman probe, there may nevertheless be a stricture at the inferior or nasal extremity which is not always reached by these probes. For this purpose it is necessary to have an extra long probe, which I believe was first suggested by Noyes. It is introduced just like a Bowman probe until it passes down about as far as these probes will go, when it is twisted around about a quarter of a circle, so that the point of it is directed toward the median line and pushed down about half an inch farther. In this way the entire canal is thoroughly dilated from end to end.

Having treated the tear-passages after the most approved fashion, we shall nevertheless be doomed to disappointment in a certain number of cases, unless the same careful attention and treatment are directed to the nasal mucous membrane. Time will not permit me to do more than simply call your attention to this important point.

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THE DIFFERENTIATION OF CHOREA AND THE DISORDERS SIMULATING IT.*

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In some of its aspects true chorea, the chorea of Sydenham, presents the features of an acute infectious disease. Among the phenomena suggestive of such an etiologic relationship are the mode of invasion, the seasonal prevalence, the self-limitation, the endocardial and articular complications, the liability to recurrence, and the post-mortem findings in some cases. Further, optic neuritis has occasionally been observed.

The actual causation of chorea yet awaits final solution, but the belief is growing that the disease is dependent on irritative disturbance of the motor cells of the cerebral cortex, of either infectious or toxic origin. In the etiology, heredity, sometimes direct, at other times indirect, is a not unimportant factor. It is not uncommon to obtain a history of the disease in the parents or in other members of the family. Chorea occurs almost invariably in neurotic stock, so that, as with infectious diseases, the predisposition or the susceptibility, viz.: the fundamental condition of the nervous system, is an important etiologic influence. The competitions, the strains, the overwork, the anxiety, the successes, perhaps not less than the failures of school life, the profound changes that take place at puberty, and the emotional and other disturbances of pregnancy appear to be important contributing factors, lowering physiologic resistance. Fright seems to be a less common provocative

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