

ART. V.—*On the Topical Treatment of Acute Inflammation of the Larynx and Trachea.* By EBEN WATSON, A. M., M. D., Fellow of the Faculty of Physicians and Surgeons of Glasgow, and Professor of the Institutes of Medicine in Anderson's University<sup>a</sup>.

It is the almost necessary fate of a new remedy or plan of treatment to be employed at first without due discrimination. Let but its value in one set of cases be established, or supposed to be established, and it will forthwith be employed in many others with the highest expectations, and too readily proclaimed appropriate and useful in the latter as well as in the former. But ere long an enlarged experience shows that such a mode of proceeding was unwarranted, that the remedy fails in some, perhaps in many, cases for which it had been declared an infallible cure, and thus too often it becomes despised and set aside, although in reality efficacious within a more limited range than its injudicious advocates had at first pretended.

Now I cannot help thinking that the "topical medication" of the larynx, as its vaunters delight to call it, runs a great chance of sharing some such fate as that to which I have just referred. Nay, I believe that many excellent physicians are deterred from giving even a trial to this kind of treatment in *any* case, by the apparently equal and always perfect success which seems to have followed its use by certain parties, in diseases the most dissimilar and varied, if only the larynx or the pharynx could be in any way supposed to be implicated therein. I am the more anxious, therefore, having for some years past practised the topical treatment of the larynx pretty extensively, and having found it highly efficacious in *certain kinds* of laryngeal disease, to contribute my mite of experience towards the establishment of its therapeutic value, as well as to defend it from the great danger of an indiscriminate laudation.

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In the first place, then, I shall begin by endeavouring to point out the *modus operandi* of a solution of the nitrate of silver when applied to an inflamed mucous membrane, and if I shall at all succeed in this part of my subject,—if I shall be able to demonstrate the therapeutic indications which such a solution is fitted to serve,—a due limitation of its applicability will follow as a necessary consequence, and a settled position will have been gained for the topical treatment of the larynx, among the remedial agents of a rational medicine. For although it would be rash in the present state of science to expunge from the *materia medica* that numerous class of medicines of whose action we can give no satisfactory explanation, and for the introduction of which we are solely indebted to empiricism,—that is, to an imperfect induction of isolated facts,—yet, undoubtedly, a much higher place in our confidence should be acceded to those remedies which can be shown to act according to some one of the ascertained laws of the animal economy, and which are, therefore, based on the sure foundation of physiological science.

There is a little experiment, simple, and easily repeated, which is familiar to all who have paid attention to the recent advances made in our knowledge of the inflammatory process, and which presents us with an excellent occasion for observing the action of the solution of nitrate of silver, in the different stages and degrees of that morbid state. I refer to the excitement of inflammation in the web of a frog's foot stretched out under the microscope. When, for example, a red-hot needle is passed through the web, the following are the phenomena observed:—A spot in the centre of the inflamed part is sphacelated, destroyed by the passage of the needle through it; a circle round the spot is usually found in a state of complete congestion, the vessels being dilated, and the corpuscles almost perfectly stationary within them, and in the part beyond this circle the vessels are not so much dilated, and the

stasis of their contents is not so complete. The stream is seen passing slowly away into the collateral circulation of the unaffected parts of the web.

Now these two circles represent two degrees of inflammation, which it is important to distinguish wherever they occur, and, perhaps, especially when the seat of morbid action is the mucous membrane of the larynx or trachea. That part of the web of the frog's foot in which the stasis was complete represents the most intense, or sthenic degree; the other, in which the stasis was not so complete, represents what is usually called the sub-acute, and perhaps chronic, varieties. And the effects of the solution of caustic on each of these parts is markedly and importantly different. In the part which is most intensely inflamed, the solution, in the direct ratio of its strength, increases the stasis of the blood within the vessels. The latter seem to be unable to dilate further, and are, therefore, little changed, but the nitrate of silver acts through the coats upon the blood which they contain by causing its partial coagulation, and, likewise, by withdrawing water from the serum for the crystals of the nitrate which begin partially to form if the solution is strong. In that part of the web, on the other hand, which had been less intensely inflamed, the stimulant solution causes a renewed and increased dilatation of the blood-vessels, and the retarded current moves on in them more freely than before; a cure being thus speedily effected if the exciting cause of the inflammation has ceased to act.

That precisely similar degrees of inflammation occur in the mucous membrane of the larynx and trachea with those just described as artificially produced in the frog's foot, I need hardly attempt to prove, for it will be at once admitted that there are three kinds of acute laryngitis: one in which no false membrane is formed; a second, in which a false membrane is formed, but in which the pharynx, as well as the larynx, is affected, viz., the diphtherite of French writers; and, lastly,

that intense local inflammation of the larynx and trachea, accompanied by exudation, to which in this country we generally restrict the term "croup."

1. The first kind varies in its intensity from the most trivial catarrhal irritation to a severe inflammation of the whole thickness of the mucous membrane lining the windpipe. It very often commences about the fauces and passes downwards, causing cough more or less croupy in its character, difficulty of breathing, and hoarseness of voice. It is accompanied by fever of greater or less intensity, and its chief physical signs are, increased loudness of the respiratory sounds in the larynx and trachea, with occasionally a whistling sound, from the absence of the natural mucus of the part, and from partial spasm of the glottis. This kind of laryngitis is more frequently complicated with bronchial inflammation than with pneumonia, and as the patient sinks from non-aëration of the blood, the most prominent symptoms of the laryngeal affection gradually give way, and it is often difficult after death to detect more than a slight redness of the bronchial mucous membrane. The inflammation sometimes, however, terminates in œdema glottidis, and but rarely in the exudation of a false membrane.

I have mentioned the chief features of this kind of laryngitis, first, because it is very common in its slighter degree, and is by no means rare, even in its utmost severity; and, secondly, because it is not usually a very sthenic disease, or, to speak more correctly, it does not present so very high a type of inflammation as that which is characterized by lymphatic effusion, and is, therefore, an example of that degree of this morbid process, comparable to the outside circle in the inflamed portion of the frog's foot. The proof of this lies in the absence of exudation,—the usual complication being bronchitis, not pneumonia,—the longer duration of the disease, and its frequent termination in serous effusion into the glottis, or by passing into the chronic form of laryngitis.

It will be expected, then, that the solution of caustic

should act well in such cases, and so it does: but perhaps in none is a greater amount of discrimination necessary in the adaptation of the strength of the solution to the severity of the inflammation which may be present, as well as in the choice of the proper time for commencing the topical measures. For it must not be thought that I advocate restriction to any one remedy, local or general, in the treatment of this disease. In the severer forms of the affection especially, depletion of some kind will at first be necessary to check the violence of the inflammation, and an emetic will be useful in restoring the moisture of the mucous surface. It is after the use of both these remedies that the topical application is alone admissible, nor can it even then be employed to the exclusion of other means. In children it will be especially necessary to repeat the emetic several times during the progress of the case, and in very few will the judicious practitioner refrain from the use of counter-irritation to the outside of the throat while he is proceeding with the topical treatment internally. It is, however, with the latter that I have specially to do at present, and therefore to the management of it I shall, in a great measure, confine my remarks.

Contrary to what might, *a priori*, be expected, the result of those experiments I before alluded to is, that the more intense the degree of inflammation of the laryngeal lining, the weaker ought to be the solution of the nitrate of silver applied to it. In those cases in which the intensity of the inflammation has never been great, or in which, as is more likely to happen, the primary violence of the disease has been subdued by other treatment, a stronger solution may be used with advantage. Its first effect, when thus judiciously applied, will be to coagulate the albuminous film upon the surface of the membrane which had been stripped of its epithelium, and thus to cover and protect it. Another, and almost simultaneous effect, is to stimulate the basement membrane to form new epithelium, and to secrete new mucus, and thus the artificial film

of coagulated albumen is by-and-by replaced by a more natural covering, and the surface is lubricated by its appropriate moisture. If, then, a renewal of the morbid process could be prevented, a cure would already have been accomplished, but this is seldom or never the case. The good effects of the topical application wear off in a few hours, and the former abnormal phenomena may even in that time have re-appeared in nearly equal severity. The treatment must therefore be continued, —the touching of the larynx must be repeated frequently for some days, and indeed until all the symptoms of laryngitis have completely disappeared.

In some severe cases of this kind, especially in adults, there is great danger of a chronic thickening of the laryngeal mucous membrane being left behind, and of the voice being thus permanently impaired. It may, therefore, in such cases be a very good precaution to give a little mercury towards the end of the acute attack; but whenever the mouth begins to be affected, the topical application of solution of caustic must be stopped; for the laryngeal lining, especially at its upper part, is then far too vascular and irritable to bear the touching, and its only effect would be to cause still greater excitement of the part. It is for this reason chiefly, and because I put considerable faith in the topical remedy, that I should recommend the mercurialization to be postponed until the termination of the acute stage. After the mercury has had its required effect, it is often a good plan to repeat the topical treatment for a time, when its efficiency will be found very great in restoring the tone of the voice, and fitting the patient to bear a change of his apartment in the first place, and, ere long, removal to the country.

2. Regarding the second kind of laryngitis, viz., that which forms part of the diphtherite of Bretonneau, I have little to say, not having met with the affection in practice. It seems generally to be connected with an atonic state of the general system; the whole fauces, the gullet, and the stomach itself, are

often affected at the same time, and in the same way, as the lining of the air-tubes. The exudation, which in these cases occurs after a short stage of intense erysipelatous redness, consists almost entirely of albumen, and covers the whole of the parts affected, sometimes in considerable thickness. It is, therefore, in many respects different from the more local, firmly adhering, lymphatic exudation of true croup.

This seems to be a common affection on the Continent, especially in Paris, and also in New York according to Dr. Horace Green, who tells us that solution of caustic acts admirably as a topical application in such cases. It seldom, however, occurs in this country, at all events in this city, except as an occasional, and happily rare, form of epidemic.

3. True exudative croup is altogether a different disease. It appears in very sthenic conditions of the general system; the blood is invariably rich in fibrine and corpuscles, and the exudation which forms in the larynx and trachea always contains, and is sometimes chiefly composed of, fibrine. It is, moreover, a purely local affection, seizing at once on the larynx or trachea, and confining its chief violence to one or both of these organs. It is, besides, more frequently complicated with pneumonia than with bronchitis,—another proof that the degree of inflammation present is very intense, and to be compared with that which exists in the web of the frog's foot around the puncture of the red-hot needle. And my experience of the effects of the solution of caustic, in cases of croup, justifies this comparison, and confirms the important inference that such treatment is unsuitable for the degree of inflammation present in them; for I have always found the symptoms of congestion in the laryngeal lining, such as pain and difficulty of breathing, increased by the application of even a weak solution of nitrate of silver, and the very act of applying the solution is hurtful in these cases: the sponge generally brings away part of the false membrane upon it, and leaves the delicate and highly vascular tissue beneath exposed, and often bleeding.

Pain, anxiety, and, I fear, increased exudation, and sometimes ulceration, are thus produced, the original disease being thereby aggravated.

To show that I have not been too easily led to these conclusions, and to give force and point to what I believe to be a very important statement, I shall relate the two following cases, which I venture to think interesting in many points of view, and which I have, therefore, selected from my case-book. One of them illustrates the action of the topical application in an adult case, and the other in that of a child.

CASE I.—The subject of this case was a gentleman past the middle period of life, and, before the illness which I am going to describe, particularly strong and healthy.

One evening of the winter before last he was suddenly seized with difficult respiration, tightness in the throat, harsh, dry, whistling cough, and high fever. All the symptoms of croup, indeed, became very soon but too well marked; and, a few hours after the apparent commencement of the attack, the following were the physical signs which presented themselves:—The number of respirations in the minute was much increased, and yet the feeling of oppression on the chest remained unabated, so incomplete was the inflation of the lungs: indeed the respiratory murmur was but feebly heard in the upper parts of the chest, while the bronchial sounds were dry and snoring in their character. In the trachea the inspiration was long, and accompanied by the harsh sound of the air passing along the dry and narrowed tube. A little higher up, and chiefly at the commencement of inspiration, the glottis was heard vibrating so as to occasion a stridulous sound.

When the patient spoke he suffered great pain, and increased feeling of anxiety. His voice was feeble and broken, being at times deeper, and then suddenly much slighter, than his ordinary tone.

There could, therefore, be no doubt that this was an instance of acute tracheal croup, accompanied by exudation. It



was treated as such, by emetics, purgatives, hot baths, bleeding, antimony, and calomel, with a blister on the trachea, and in the evening I commenced to apply a solution of twenty grains of nitrate of silver in an ounce of water to the interior of the affected organ; but each application gave great pain and uneasiness, and increased the sense of suffocation. The violent fits of coughing which were thus produced undoubtedly occasioned the separation of small portions of the false membrane, but that was no improvement, since the surface thus exposed was tender, unprotected, and often bleeding. I next followed Dr. Horace Green's example, and increased the strength of the solution twofold. This, however, only made matters worse, and indeed the patient himself began to dread the repetition of the proceeding. Still my faith in the remedy was not completely exhausted: I determined, before abandoning the topical treatment altogether, to use a weak solution of the nitrate of silver; I therefore diluted it to ten grains, and ultimately to five grains, in one ounce of water, and yet I was unsuccessful. It was, indeed, too apparent to me that the larynx was not in a state to bear either the stimulant solution, or the presence, for however short a time, of the sponge by which it was applied; I therefore gave up the topical treatment entirely at this time, and used more ordinary measures. The patient was still further depleted, and more decidedly mercurialized. He was likewise frequently blistered during the next month, by the end of which time he was much improved, but still had a good deal of hard, whistling cough, dyspnœa when he moved about, and great pain when he spoke, referred to the glottidean region. The tone of voice was weak, but not unusually hoarse.

The most careful examination of the chest still showed that the lungs were free from disease. The respiratory sounds in the trachea were loud, harsh, and dry, and were accompanied by a pretty constant râle, as if there were one or more valvules of exudation matter still adhering to the walls of the trachea. The vibration of the glottis in breathing and cough-

ing was not so free as formerly, indicating a degree of œdema of the organ.

On opening the mouth, the fauces were seen to be red and swollen, and the epiglottis was felt by the finger covered with soft and doughy mucous membrane.

After careful consideration of all these circumstances, it was determined, in consultation with my father, that two caustic issues should be opened, one on each side of the thyroid cartilage; that the iodide of potassium should be administered in decoction of sarsaparilla; and that I should again apply the caustic solution to the interior of the larynx and trachea, now that the inflammation had passed the acute stage. Under this plan of treatment the patient made daily advances towards health, and was soon able to take exercise out of doors, wearing a respirator.

The effects of the topical treatment during this latter period were as manifestly beneficial as formerly they had been hurtful. The strength of the solution was at first only ten grains to the ounce of water, but was gradually increased to a scruple in the same quantity. After each application the patient found that in a short time his breathing was freer, his cough less frequent, and his voice stronger; but this improvement at first lasted only about forty-eight hours, at the end of which period the application was always renewed with the good effect of sustaining the improvement. By-and-by, however, the intervals were lengthened with impunity; the gentleman spent the summer at the coast, and is now perfectly well.

I think it worth mentioning, in conclusion, that I still see this gentleman occasionally for a feeling of dryness in the throat, which nothing but the stimulant application seems to relieve. This appears to be a very common state of matters after the caustic solution has been applied to the throat for any length of time. Hence I now and again see a number of my old laryngeal patients who have been cured of all their symptoms with the exception of this feeling of dryness, and it is

often both intense and annoying. I believe the most of them would disregard it were it not for the fear of a relapse into their former state, and I therefore encourage them to forget it if possible, and to use such means as rubefacient liniments externally, or some simple gargle. Still it must be confessed that no remedy for this disagreeable feeling is so effectual as the solution of caustic, and if it be not too strong, and if the intervals of its application be not injudiciously short, I do not think its continued use in the cautious manner just indicated will do any injury to the mucous membrane.

But to return from this digression;—the case which I have narrated proves, as clearly as any single case can prove, that the topical treatment is unsuitable during the acute stage of exudative croup: and, were it not for the inconvenient length to which it would protract my paper, I could relate many others, the subjects of which were children, and which all go to corroborate the above conclusion. I have in these cases invariably seen good reason to stop the topical treatment if I had begun to use it early in the disease, because I found that it retarded, if it did not prevent, their favourable progress. One of the most marked of the cases to which I allude was the following, and I relate its chief features here because it is the last case of acute exudative croup in which I have used, or intend to use, the solution of caustic.

CASE II.—The patient was a girl, four or five years old, attended by my friend, Dr. Peter Stewart of Eglinton-street.

This little patient was suddenly seized with symptoms of acute croup, about the middle of last winter. Dr. Stewart was immediately called in, and at once instituted the most judicious measures to check, if possible, the untoward progress of the malady. Among other things he applied a solution of caustic to the pharynx and upper part of the larynx.

Unfortunately, however, as sometimes will and must happen, under the best treatment, the patient's state rapidly became worse, and Dr. Stewart requested a consultation with

my father; and a doubt occurring to the former that possibly he might not have passed the probang fairly into the larynx, he likewise asked me to see his patient and apply the solution of caustic for him.

The child had been about forty hours ill when I saw her, and was evidently in a most dangerous condition. The exudation was very abundant in the trachea, as evinced by the sharpness of the inspiratory sound heard over it, and by the faintness of the vesicular murmur in the lungs; the glottis, however, vibrated during coughing and speaking; and was, therefore, free of œdematous swelling. The pulse was quick, but not feeble; the surface of the body was hot and moist; and the face was of a dingy hue, the lips being almost livid.

I introduced the probang, the sponge of which had been moistened with a solution of twenty grains of caustic in an ounce of water, so easily through the rima glottidis, that I feel quite convinced that Dr. Stewart, who is in the daily habit of using this plan of treatment in many other cases, especially in hooping-cough<sup>a</sup>, had likewise reached the seat of disease, and that there had been a fair trial of the topical treatment in this case from the commencement. I repeated the application thrice during my first visit, and Dr. Stewart renewed it again

<sup>a</sup> This mode of treating hooping-cough was originally proposed by myself in the Edinburgh Monthly Journal of Medical Science for 1849, and is slowly, but, I trust, surely, gaining confidence both with the profession and with the public. For the explanation of the theory of this mode of treating hooping-cough, I refer to my original paper; but I hope the following numerical results of the practice will not be uninteresting to the readers of the Dublin Quarterly. M. Joubert, of Cherion, has used the topical treatment in sixty-eight cases of hooping-cough, with the following results (see the Bulletin de Thérapentique for January, 1852; and also the Edinburgh Monthly Journal for May, 1852, page 257):—

A speedy cure resulted in . . . . .	40 Cases.
Great relief, and shortening of the disease, occurred in . . . . .	20 „
No change was effected in . . . . .	8 „
Total, . . . . .	68

The cases of this disease which I have myself treated, from beginning to end, in

in the evening. At my second visit, next morning, I used a stronger solution, viz., one of forty grains to the ounce of water. After each application the child seemed a little easier, perhaps from the passage being partially cleared by the sponge and by the child's own efforts, but she always became worse in a very short time; and although all the ordinary means had been carefully used during the whole progress of the case, besides the topical measure, still the child's state was evidently becoming very hopeless. The pulse was more rapid, but not as feeble, as might have been expected, and the colour of the skin was more dingy, indeed it was almost livid. The child died that evening, and I regret to add, that no inspection of the body was permitted.

In this case the failure of the topical treatment was far too marked to occur in any one's practice without exciting very serious reflections regarding its employment in the disease of which it was an example, and it led me to look back to my notes of other similar cases, as well as to institute some such experiments as that which I formerly narrated. The results of these observations and reflections have been to convince me of the total unsuitableness of the treatment in question to acute cases of exudative croup.

But I may here be met with the objection that if, in my

this way amount at present to 57, in all of which a more or less speedy cure was effected, as the following statement will show:—

38	Cases were cured in from 10 to 14 days.
19	,, ,, 3 to 4 weeks.
57	

Combining these two Tables, we have, in the first place, 125 cases of hooping-cough treated in this manner without one death. Only 8 out of the whole number resisted the treatment; of the rest, 78 were speedily cured, and 39 were greatly relieved and shortened. What better proof can be asked of the efficacy of the topical treatment of hooping-cough; and what now prevents its general adoption by the profession? Am I not warranted in believing that were it so adopted much suffering would be saved and many lives would be prolonged beyond the first, the most interesting, but perhaps also the most dangerous, epoch of human existence?

cases of croup, the topical method was unsuccessful, a very different result ensued in Dr. Horace Green's cases. This impression, however, will not, on examination, be found to be so correct as many may be inclined to think. Nor is it, in my opinion, detracting from Dr. Green's merit to hold that it consists in having effectually directed attention to the general subject of topical applications to the interior of the larynx rather than in recommending that treatment in cases of croup.

Dr. Horace Green illustrates his little work on Croup by thirteen cases. He may possibly refer to others throughout the work, but these are the only examples fully related, so that they can be judged of independently by the reader; hence they are carefully numbered so as to permit of easy reference. Of these thirteen cases, two are quoted from Mr. Ryland's work on the Larynx, chiefly for the sake of the account given by that author of the morbid appearances after death. In these, of course, the topical treatment was not used, so that the cases which illustrate this treatment given by Dr. Green are reduced to eleven. Nor am I convinced that these were all cases of true exudative croup; nay, I think it is certain they were not; for No. v. was a mere hoarseness, and No. VIII. was a spasmodic affection of the glottis which came and went without any symptom of croup at all. Nos. II., VII., and X., were apparently cases of acute œdema glottidis: leaving only six cases the symptoms of which resemble those of croup. Even some of these six have more the characters of diphtheritis than of croup, and in one of them (No. XIII.) the affection followed measles. In only four of the six cases was the disease fully developed, and of them one-half died. But, supposing that all the eleven cases related in this book were really cases of croup, more or less severe, I do not think that the mortality among them, viz., three deaths in eleven cases, was less than it generally is in the ordinary run of croupy cases occurring in the better ranks of life, and treated in the usual way; and therefore it follows that Dr. Green's experience, so far as we have it in his work on Croup,

does not show that his success in the treatment of cases of that disease was increased by his using the topical applications to the interior of the larynx; for he very properly used other measures as well, and the result has been a mortality not at all less than if he had neglected the topical treatment altogether. I consider it no small corroboration of my opinion, in regard of this point, that M. Trousseau states in the "Union Médicale" for 1851, No. 100, as one reason of his superior success of late years in the treatment of severe cases of croup, that he has discontinued the application of a strong solution of caustic to the larynx and trachea, which he used formerly to insist upon.

The termination of acute inflammation of the laryngeal mucous membrane, whether that inflammation had been of the simple or of the exudative type, in œdema of its loose subjacent tissue, is an event so remarkable and important that I have reserved until now the few remarks which I wish to make on its topical treatment. I believe that the occurrence of the lesion referred to is by no means infrequent, and that it is always attended with imminent danger to the patient's life. The rapidity with which the inflammatory stage sometimes terminates in this manner is sufficiently remarkable to have struck every one who has observed cases of the kind. In some of these it is the result of constitutional debility, however that may have been produced; while in others it seems referrible to a peculiarity in the nature of the morbid process itself. In the former class of cases it generally arises during the progress of some exhausting disease, such as typhus fever, or towards the end of exudative croup itself when it is always a formidable and often a fatal complication. And even when it occurs as a more primary disease, the inflammation of the mucous membrane appears to be reduced in intensity by the very occurrence of the serous effusion, although it had previously been even of the exudative type. From what has been formerly stated, then, regarding the action of a solution of caustic applied to a subacutely inflamed mucous membrane, it might, *a priori*, be expected to produce a bene-

ficial effect on the œdematous glottis; and this expectation has been remarkably fulfilled in my experience, as the following instance will sufficiently exemplify.

CASE III.—A young child, of eight months' old, had severe hemorrhage from the gums after division of them over the incisor teeth, and in the exhausted state which followed, he caught cold, and became affected with the ordinary symptoms of croup, which were chiefly combated by an emetic, counter-irritation over the throat and chest, and by repeated small doses of calomel. But very soon the chief, nay, only symptom became that of impeded respiration. The child's efforts during inspiration, the dry, whistling sound which accompanied it in the trachea, the nearly total absence of vesicular murmur in the lungs, and the short expiratory sounds, taken along with the previous state of the little patient, rendered it evident that œdema glottidis had occurred; and if to this it be added that the pulse was feeble, the patient pale and exhausted, and that he could hardly be made to receive nourishment,—his extreme danger will not be questioned.

I introduced the probang down to the glottis, but not through the rima, owing to the swelling of its margins. The strength of the solution used was thirty grains to the ounce of water, and it was applied three or four times at short intervals. The effect was soon apparent. Some coughing, and the expulsion of tough muco-albuminous matter first followed, and then the child became quiet, the breathing was freer, although, of course, there was still considerable obstruction at the glottis. In a few hours this obstruction seemed to be increasing, and the application of the caustic solution was again renewed in the same way, and with equally favourable results. The calomel was continued, and a warm water enema was administered, after the action of which the child took the breast, and slept for a short time. The future progress of the case was marked by a gradual but steady improvement. The calomel was soon



stopped, the bowels were duly regulated, and the topical applications were persevered in daily for two or three weeks, by the end of which time all obstruction to the breathing, as well as the cough, and even a degree of hoarseness which had latterly been observed, had completely disappeared, and the child's general health rapidly improved.

No example could, I think, better illustrate the efficiency of the topical treatment in cases of œdema glottidis, even when occurring with the most serious concomitants. In the preceding instance the œdema happened during the progress of pretty severe laryngeal inflammation, and in a very debilitated state of the system from loss of blood. Yet the application of a caustic solution had always a marked and beneficial effect on the state of the diseased organ, and mainly contributed to the successful issue of the case. Nor can it be wondered at that two or three weeks elapsed before all the laryngeal symptoms had completely disappeared, for the child required that time to make up the blood he had lost, so as to enable the larynx to resume its healthy tone. But in those cases in which œdema glottidis is a more primary and uncomplicated disease, the good effects of the topical treatment are very much more speedily seen and felt. Indeed, as it is then a purely local affection, the means employed for its cure may, in many cases, be purely local too; for instance, as in the following example.

CASE IV.—About the middle of last winter I was suddenly summoned to visit an infant, only two months old, that had been ill with a rough cough for some days, but as the child's health was little affected, she was thought to be only labouring under a slight passing cold: however, on the morning of my visit, the child was found to have great difficulty in breathing, and when I saw her that symptom had become so very severe, that the patient's face was nearly livid, and she was tossing about on the nurse's knee almost convulsively.

The physical signs were those of swelling and nearly com-

plete closure of the glottis. The infant's cry was almost extinguished, being reduced to a faint whistling sound, and the respiratory murmur could scarcely be heard in the chest.

I immediately touched the glottis with a strong solution of caustic, with the instantaneous effect of assisting in the evacuation of a considerable quantity of ropy mucus, and in relieving the obstruction to the respiration. A purgative enema and a tepid bath were administered, and in a few hours the touching was repeated. The breathing was now much improved, and the patient passed a good night. Only four or five repetitions of the topical application were necessary in this case, and no other treatment was employed except regulation of the bowels and confinement to the house. The child was perfectly well in a few days.

On reviewing the whole subject, then, the following are the principal conclusions to which my observations, experimental and clinical, have conducted me:—

1st. The solution of the nitrate of silver, when applied to an inflamed mucous membrane, acts differently, according to the intensity of the inflammation that may be present; in the asthenic varieties it operates as a stimulant of the capillaries of the part, and likewise of its secreting apparatus, while in the sthenic variety it increases the congestion of the membrane, chiefly by diminishing the fluidity of the blood in its vessels.

2nd. In acute laryngitis in which there is no false membrane, and probably in diphtheritis in which there is an albuminous exudation, the local application of solution of caustic, varying in strength inversely in proportion to the intensity of the inflammation, may be employed with more or less speedy benefit.

3rd. During the violence of true exudative croup the stimulant application to the part affected is injurious, but when the disease begins to yield to antiphlogistic and other treatment, it may assist in the cure.

4th. Œdema glottidis, whether occurring as a primary dis-

ease, or as a complication of other morbid states, is always speedily relieved, and in some cases effectually cured, by the application of strong solutions of the nitrate of silver to the œdematous organ.

And 5th. It follows as a corollary, derived partly from the foregoing conclusions, and partly from the results of my experience of the topical treatment communicated to this Journal in November, 1850, that the solution of caustic acts beneficially in only one, viz., in the asthenic variety of laryngeal inflammation: for it matters not whether such has been the original character of the affection (acute but asthenic cases), or whether it has become so under the combined influence of time and general treatment (chronic cases).

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ART. VI.—*Observations on Hermaphroditism, illustrated by a remarkable Case.* By AWLY P. BANON, M. D., Fellow of the Royal College of Physicians, Edinburgh, and of the Royal College of Surgeons, Ireland; Physician to the Richmond and Grangegorman Government Prisons, and Acting Physician to the City of Dublin Prisons; Surgeon to Jervis-street Hospital, &c.

ALTHOUGH true hermaphroditism, or a condition presenting the characters of both sexes in the same individual, and each capable of separately discharging its functions, has not been met with in man, or even amongst the higher classes of animals, it is, nevertheless, of the deepest interest to consider those departures from a normal development of the generative organs, in some instances approaching the true hermaphroditic state, which are occasionally to be met with, and of which a very remarkable instance recently came under my notice.

The importance to individuals of this class of a thorough acquaintance with the subject on our part, especially in being capable of discriminating cases of what are termed “spurious hermaphroditism,” must be admitted, when we recollect the