	Clinical History.	Bacteriology.	
Broncho-pneumonia, lobular, patchy, disseminated	1. Gradual onset, tendency to relapse. Fever, hectic, markedly remittent, of long duration, with gradual fall. 2. Gradual onset, with sudden aggravation, in other respects the same as above. 3. Sudden onset, no tendency to relapse. Fever high, not markedly remittent, of short duration, with sudden fall.	Streptococcus chiefly, and others Streptococcus, etc., associated probably with pneumococcus	Secondary broncho-pneumonia after bronchitis, measles, whooping-cough, diphtheria, etc.
Croupous pneumonia, lobar, massive consolidation	Similar in all respects to the last	Pneumococcus Pneumococcus	Primary broncho-pneumonia. Croupous Pneumonia.

teriology, the case for the recognition of these two forms seems to be clearly made out.

The table here given represents in a diagrammatic form the views I have been expressing.

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THE USE OF CREOSOTED OIL FOR THE EXPULSION OF TRACHEAL FALSE MEMBRANES AFTER TRACHEOTOMY; AND OF INTRANASAL INJECTIONS OF OIL IN VARIOUS AFFECTIONS.*

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THE time-honoured treatment of croup by emetics, which aims at the removal of the membrane in the earliest stage, and is sometimes successful, deserves to be thought of in all cases seen at the beginning. For the later stages it has been superseded by modern methods of treatment. In all forms of diphtheria the injection of antitoxin should be our first care; and in the naso-pharyngeal cases it often succeeds almost without other aid. In tracheal diphtheria this fortunate result cannot be depended upon. Tracheotomy, which relieves that part of the dyspnoea which is due to superadded spasm, is powerless to clear the membrane away from the trachea and from the bronchial tubes. It is in these cases that the method suggested is of special value.

Tracheotomy itself was formerly too often delayed until the symptoms became urgent, indeed, sometimes to the verge of asphyxia, the disinclination to operate early being perhaps explained by the not infrequent failure of tracheotomy to save life. The author's opinion and practice have long been in favour of early tracheotomy. The scar which is left in the neck is after all a small matter compared with the risk to life involved in delay based upon a doubt as to the diagnosis. Our improved methods are arguments in favour of an early operation. Antitoxin accelerates the detachment of the membrane, and this will be the more readily expectorated if the child has not been exhausted by prolonged dyspnoea; whilst the method now advocated, which has for its chief object to promote the expectoration as well as the detachment of the membrane, cannot conveniently be applied except after a preliminary tracheotomy, but distinctly improves the prospects of that operation.

The present treatment, previously mentioned in a joint communication¹ by Mr. Hubert and the writer is applicable, after tracheotomy, in cases of simple tracheal diphtheria or in those in which the trachea is involved in addition to the pharynx. Its objects are: (1) To promote the expectoration of the membrane; (2) to assist its detachment; (3) to lessen its infectiveness *in situ*; and (4) to stimulate and soothe the ulcerated mucous surface.

The first two indications are the most urgent, and in so far as it has succeeded in fulfilling them, the method has contributed to the saving of life, since death when it occurs is

due to the direct obstruction set up by the membrane or to its unchecked extension into the small tubes.

In the following cases, as in that previously reported,² the diphtheria was limited to the trachea; and they resembled it also (1) in having been diagnosed at first as simple laryngitis, but when first seen by the writer as latent diphtheria necessitating tracheotomy; (2) in the circumstance that no membrane was seen, even at the time of the operation; and (3) in the fact that the relief afforded by the latter was only temporary and was followed by death from gradual asphyxia in the one case (in which the treatment was not applied and no antitoxin was injected), and in the other by asphyxia and apparent death through impaction of membranes, resuscitation being fortunately obtained by artificial respiration.

The first case illustrates the result of the non expulsion of the tracheal membrane, death occurring within thirty hours after the tracheotomy, and the necropsy showing a thick membrane extending down the trachea from the level of the tracheotomy wound. In this case an opportunity of prescribing the creosoted oil was unfortunately not afforded, and the child remaining without any effectual cough after the tracheotomy, no membrane was expectorated from first to last. Death was due to gradual asphyxia of mechanical origin, not to broncho-pneumonia.

The second case came under treatment on the fourth day, with considerable dyspnoea. Tracheotomy did not show the presence of any membrane, but only some suspicious stringy mucus; but membrane was coughed up on the same evening, and for twenty-one days subsequently, and its diphtheritic nature was shown by cultures both in the early stage and towards the end of the case. Fifteen drops of creosoted oil (1 in 20) were introduced immediately after tracheotomy, and 400 units antitoxin were injected at the same time, and again the next morning. The treatment by creosoted oil was continued throughout the case with an interval of four days, during which simple olive oil was substituted. The slight tingling of the sputum, which had been observed at intervals under the creosote, continued under the influence of the pure olive oil; and further proof that the hæmorrhage was not set up by the creosote was also obtained by raising the strength of the creosote for a while to 1 in 15, and even to 1 in 10: no undue irritation and no hæmoptysis were thereby induced. The original strength (1 in 20) was then resumed, and the treatment continued until membrane ceased to be discharged. Recovery was uninterrupted in spite of the unusually long membranous and pyrexial stage, the signs of broncho-pneumonia at the right base ultimately disappearing. After a rise due to two successive antitoxin rushes, the temperature finally fell, and the tube was removed on April 12th. No paralytic symptoms occurred in the case. The albuminuria, at first considerable, disappeared within the first fortnight. An abundant crop of pustular acne on both legs, which occurred soon after the antitoxin rash, is the only other point deserving notice.

Frequency and Mode of Administration.—Fifteen drops were at first introduced every two hours, but from the third day every four hours. The immediate effect of the creosoted oil was to set up cough, and its influence in aiding the detachment of the membrane was indicated by the ease with which, during the intervals, membrane was expectorated by spontaneous cough. In the cases hitherto treated an ordinary drop bottle has answered every purpose. The oil did not cause the slightest distress to the patients. Indeed, up to the present no practical objection to the method has been noticed; and its safety, which enables it to be carried out by any trained nurse, is a recommendation.

Addendum.—The practical aspects of the question as to early tracheotomy is illustrated by another case of latent diphtheria which was submitted to the same treatment shortly after this paper was read. The case, which appears from the result to have been one of mild laryngeal diphtheria with only slight extension down the trachea, might probably have done well, without operation, under antitoxin alone. But the risk had to be dealt with of the case being perhaps more severe than it appeared, and possibly invaginate with extension of the membrane into the lung. Again, the injection of oil after the tracheotomy and its systematic employment, although the breathing had become free, were part of a precautionary treatment for the tracheal diphtheria which could reasonably be suspected, and were prophylactic measures

* Delivered before the North Kent District of the South-Eastern Branch of the British Medical Association.

against the extension of the process to the bronchi and bronchioles.

The boy, aged 4 years and 8 months, was admitted on the sixth day after the first symptoms of sickness and headache. The croupy cough and voice had been noted two days before admission. The respiration was slightly noisy, the cough hoarse and brassy, but there was no expectoration. There was moderate inspiratory recession at the base of the thorax. No membrane could be seen, but there was some pharyngeal redness, and the tip of the epiglottis was red and slightly swollen. These symptoms had developed whilst the child had been kept in the house for two or three days, and were not therefore explained by laryngitis or exposure. Temperature 99.4°, pulse 108, respirations 28. On April 17th, the diagnosis of diphtheria having been made, immediate tracheotomy was prescribed, to be followed by the introduction of 15 drops of creosoted oil (1 in 20), and by an injection of 4,000 units of antitoxin. The operation was performed successfully and at leisure, there being no urgent dyspnoea, but no membrane was seen, and some opaque mucus only was expectorated on opening the trachea, and after the introduction of oil. A first examination of the sputum for bacilli was not successful, but a cultivation taken two days later showed them. The breathing was completely relieved, and only a few rhonchi were heard in the chest. The progress of the case was satisfactory and rapid. The expectoration, promoted by the oil, which was repeated every two hours at first, and subsequently, on the 19th, every four hours in my doses, consisted chiefly of opaque viscid mucus or muco-pus, which did not present a true membranous aspect until the third day after the tracheotomy, when a small piece of membrane was brought up. On the second day after the operation the epiglottis appeared much less red and not swollen, but when the plug was introduced into the tracheotomy tube there was still stridor. On the third day these symptoms were much less. The child presented no bad symptoms, and no continued pyrexia. There was a trace of albumen in the urine on the 19th, none afterwards, and no paralytic symptoms. The tube was removed on the tenth day after the operation.

This was an instance of early tracheotomy which may not have been absolutely indispensable, but at any rate was the source of complete and speedy relief to the patient, and of absence of all anxiety to the physician, and is therefore not to be regretted.

THE INTRANASAL USE OF MEDICATED OILS OR OILY FLUIDS.

In diphtheria the occasional occurrence of a prolonged period of infectiveness after apparent recovery has suggested an important precaution, that of keeping, throughout the attack and for some time after recovery, the nares protected by some antiseptic and healing application. For some years the writer has made this a rule of nursing in his cases, and carbolised oil (1 in 60) has been systematically introduced either by the swab or by the dropping method. A very small quantity of oil repeated twice a day will suffice. It is not improbable that, after the pharynx has cleared itself of membrane, some of the infection may linger in the large mucous tract above, especially in the absence of any cleansing treatment, and that in reported instances of late infectiveness the mischief may have really resided in the nasal fossæ. At any rate, it is believed that this precaution, if carried out methodically, might materially diminish the risk of a late transmission of diphtheria during convalescence.

In affections of the nostrils, naso-pharynx, and sinuses the local application of oil does not appear to have occupied the therapeutic position which some of its advantages seem to deserve. It is not referred to in current literature, and does not seem to have been practised with frequency, if at all. This circumstance may have been the result of the only drawback which the method presents, namely, that it is somewhat unpleasant to sensitive persons, and unless used with discretion, apt to nauseate. On the other hand, its simplicity and its efficacy in fulfilling the objects for which it is prescribed are recommendations. Its good results are manifest chiefly where it is locally applied to the mucous membrane affected; but it is also beneficial in those respiratory affections in which the trachea and the larger bronchial tubes suffer jointly with the nose and the naso-pharynx, and also in some cases of neurotic dyspnoea or asthma in which the nose is the seat of irritation. Its action in these cases would be one partly reflex, and therefore distinct from the results obtained by the strictly local method of intralaryngeal injections continued for long periods; moreover, it does not claim to cure the affections in question, but merely to alleviate their symptoms and to obviate the recurrence of the attacks.

The same mode of application is suitable to all cases. A small quantity of carbolised oil (1 in 60), flavoured with some essential oil such as that of almond or bergamot, is introduced into the nostrils whilst the patient is lying down with the head thrown back. A small glass syringe fitted with a spray nozzle is best, but failing this a common nozzle will answer; or the oil may be simply dropped into one or

both nostrils. The patient should be directed to turn the head from side to side to facilitate the spreading of the oil. Where the object is local treatment of the frontal sinuses it will be necessary to throw the head still further back, and to keep it in that position for a minute or two. If the quantity of oil should have been excessive, or if it should have been dropped instead of sprayed, it will trickle down the back of the throat, and this often excites some nausea. The quantity which has generally been used is about a saltspoonful or 15 drops, but even a less quantity may be found useful, and the objection stated may then not arise. The oil may be made the vehicle for various remedies. Recently, for instance, in a case of recurring epistaxis, in which the source of hæmorrhage was thought by the patient to be in the left frontal sinus, tannin was added to the oil, and the latter was felt by the patient to reach the spot in question. In many cases stimulation is wanted quite as much as, or even more, than mere protection. I have therefore availed myself of a well-known formula:

Menthol, thymol, 33 gr. i; ol. eucalypt., mv; ol. olive ad., 3jss;

and this has been preferred by some patients to the oil, and in others has been found efficacious where the latter did not relieve the symptoms. The stimulating solution is specially useful in neurotic cases.

The conditions in which the local use of medicated oil may be found of value are the following:

1. In continued pyrexia the drying and caking of secretion in the nasal cavities is a source of much discomfort; the mouth often has to be kept open in consequence, and the dry tongue of fever is the result. In these cases, as in the following, the quantity of oil required is very small provided it be thoroughly applied, and this can be done by introducing a thin swab of twisted cotton wool or of lint charged with the oil.

2. Nasal dryness and fætor are also apt to occur in all varieties of continued hurry of breath, but particularly in that which belongs to heart disease with broken compensation. Among valvular diseases, advanced mitral stenosis, with or without associated regurgitation, in which there is considerable pulmonary and venous congestion, is that most often accompanied by these symptoms. The ozæna-like odour was formerly supposed by the writer to be dependent upon some local lesion special to this disease; but it is probably explained simply as a result of permanent congestion and of the drying of a mucous membrane lined with secretion. The comfort to the patient and to the physician arising from this treatment is well worth the small trouble which it gives.

3. Tachypnoea and Hysterical Tachypnoea.—A passing reference may be made to the word "tachypnoea," a convenient addition to a useful series of terms. "Dyspnoea" requires no explanation. The meaning of "tachypnoea" is analogous to that of tachycardia, and exclusively refers to the increase in rate. It enables us to restrict the use of the term "hyperpnoea" to its proper meaning, which should be equally exclusive—namely, that of increase in the depth of respiration. For instance, in the dyspnoea of over-exertion there is tachypnoea as well as hyperpnoea; the breathing is deep as well as rapid. The same association is sometimes present for many hours before death in cases of cardiac exhaustion, and in them a slackening in the speed and in the depth of the loud breathing is the immediate harbinger of death. On the other hand, in the air-hunger of diabetic coma the respirations are deep but they are not hurried. And lastly, in the panting of the obese—as in that so familiar in the lapdog roasting before a fire, hyperpnoea is conspicuously absent; there is respiratory hurry but the breathing is quite superficial. These are typical instances easily described, but in analysing other conditions which may be less obvious the distinction in terms is a help. No cases of hysterical tachypnoea have been under observation since this treatment was taken in hand, but it is not unlikely that some impression might be made upon inveterate cases by this method of local treatment or some modification of it. At any rate, it may be worth trying.

We now pass to the large group of the respiratory affections. The chief benefit is to be gained in those affections in which the mucous membrane of the upper air passages is immediately or indirectly concerned—namely, the obstructions and

catarrhs of the nose and throat and of the pharynx, and in spasms and cough set up by naso-pharyngeal irritation.

4. *Among the obstructive and naso-pharyngeal troubles permanent or progressive structural defects, such as narrowing of the passages, polypi, adenoid growths, etc., are curable only by surgical means.* But striking alleviation of any superadded congestion or catarrh may be brought about by the use of oil, which is particularly indicated for impacted foreign bodies. Much benefit may accrue in children suffering from large tonsils or adenoid growths, and from nocturnal restlessness and cough, if the mucous membrane can in this way be kept free from irritative congestion, swelling, and dryness, by protecting it from the results of open-mouth breathing. The same applies in the adult, where the nostrils are blocked by a polypus or by secretion and swelling.

5. *Dry naso-pharyngeal catarrh and granular pharyngitis* are both susceptible of much relief. The treatment is specially adapted to cases in which dense adhesive mucus forms scabs on the pharynx, and leads to the well-known distressing symptoms; and as a protecting agent it also may be of much service in granular pharyngitis. Acute catarrhal pharyngitis, if submitted to this local treatment sufficiently early, when the sore, raw feeling, or the stiffness and pain limited to one spot, with which the affection often begins, are first perceived, would probably be manifestly relieved, but there are no cases to report. This might be the means of checking the usual extension of the catarrh to the mucous membrane of the trachea and large bronchi.

6. *Bronchial catarrh* of the large tubes, or common chest cold, is frequently the sequel or the concomitant of naso-pharyngeal catarrh. This conjunction led the writer to try the treatment in his own case, and he was much impressed by the relief afforded, not only to the nasal catarrh, but to the chest symptoms, including retrosternal pain and rawness, painful cough and expectoration. He has since then observed equally satisfactory results in other cases.

Remarks on the Treatment of Tracheal and Bronchial Catarrh.—It is difficult to explain how a local application in the nose can relieve the chest, since it is doubtful whether the oil, although spreading so readily, can find its way downwards into the air passages. The influence is probably one partly brought about by associated nerve agencies. If, therefore, we regard the resulting relief as one merely reflected from the pharynx, we can hardly expect that the nasal method can be of much service in bronchitis of the smaller tubes. On the other hand, the direct application of oil might perhaps be of use, and one at least of the cases narrated is an instance of the success of this treatment in the broncho-pneumonia of diphtheria. The results noted from the indirect or intranasal method causes us to inquire again whether the more frequent use of intralaryngeal injections might not be of advantage. Hitherto they have been chiefly employed in chronic pulmonary affections; but if directed to the cure of the more acute catarrhs of the large tubes, their efficacy might be more manifest, and probably many a protracted chest affection might be avoided or considerably shortened in duration. It may be thought that this is too powerful an engine to apply to small work. But the intralaryngeal injections are really not troublesome to the patient if successfully performed, and their performance presents no difficulty to anyone familiar with the laryngoscope.

On the other hand, it would be premature, without previous trial, to recommend intralaryngeal injections in broncho-pneumonia, and their desirability in acute bronchitis must also remain an open question till further experience has been gained.

7. *Asthma.*—It is well known that in a proportion of cases of asthma the affection is connected with some nasal trouble, usually a congestive hypertrophy of the mucous membrane; and the opinion has been held that asthma itself is a congestion and swelling of the bronchial mucous membrane. The late Sir Andrew Clark took that view. Only a proportion of these cases yield to local nasal treatment by the galvanocautery or to local medication such as that by perchloride of mercury, carbolic acid and quinine, formerly recommended by Sir Andrew Clark. Among the local methods which might still be resorted to in the unrelieved cases the present one suggests itself for trial. But in the probably larger catarrhal group the indication is a double one, and it is to this group that the following cases belong.

The first case was the most successful, that of a man aged 58, of gouty parentage and the bearer of Heberden's nodules, suffering from severe catarrhal asthma and emphysema, which no form of treatment seemed to relieve. His chest symptoms dated back to influenza six years previously, and his dyspnoea had unfitted him for work for fifteen months. His present severe attack had lasted almost unabated for six weeks, when a trial of this method was suggested to the writer by the relief he had personally obtained from it. The treatment by carbolic oil gave immediate results. The nose which had been blocked, became pervious, and the dyspnoea, as well as the catarrh, was greatly relieved. In this case the relief was kept up, and the patient never complained of the treatment, but ascribed his improvement to it. After a while the parolein solution of menthol, thymol, and eucalyptus oil was substituted for the oil, and this also gave much relief, and was preferred to the other application; but the symptoms had no longer presented any severity when it was first tried.

The second case was also striking in the immediate relief given by the application of the oil during a protracted attack of asthma which the inhalation of the datura cure and Himrod's cure, the former usually a sovereign remedy in this case, had been tried ineffectually for several hours. The patient was orthopneic, and inhaling Himrod at the time the treatment was applied. Under its influence the spasm relaxed, and the patient was soon able to lie down. This attack had originated in the hospital after an attack of articular gout, for which the patient had been admitted. He had been liable to occasional asthma for sixteen years. In spite of this conspicuous relief to the asthma, the patient did not care to submit to the treatment for the remaining catarrh, which was dealt with in the ordinary way.

In another case of inveterate catarrhal asthma recurring in the winter months since the age of 10, for which the datura inhalation was usually an immediate cure, but which on this occasion failed to be relieved by it owing to the severity of the catarrh, the introduction of carbolic oil into the nose did not control the symptoms, and other treatment was applied, the symptoms yielding gradually. At a later date the carbolic oil was again used for the catarrh, with good, though not striking, results, and the parolein solution was substituted after a while.

The conclusion to be drawn from these experiences is that the method is well worth trying, but cannot be relied upon to benefit every case of asthma, though its trial will probably not be detrimental in any of them.

In reviewing the whole subject it should be understood that these are suggestions rather than dogmatic statements as to the absolute value of the method; whilst its failures may sometimes have more to do with questions of detail than of principle. Much will depend, for instance, upon the kind and the strength of the ingredients added to the oil; and idiosyncrasies have to be borne in mind. Again, the mode of application and the amount injected at one time may have to be varied according to the case; but in all cases the application in the form of spray will probably be more efficacious as well as more acceptable than either the simple injection or the dropping method.

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ONE HUNDRED CASES OF PULMONARY TUBERCULOSIS TREATED WITH LARGE DOSES OF BEECH-WOOD CREOSOTE.

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I AM indebted to the visiting physicians of this hospital for permission to record the results obtained by treating 100 cases of phthisis with large doses of creosote. Some twelve months ago I noticed that patients objected much less to a mixture of cod-liver oil and a few minims of creosote than to the oil without the antiseptic, and with the sanction of the physicians I determined to watch the effect of gradually increasing the dose of creosote, and was surprised to find that the toxic symptoms which are said to accrue from the administration of large doses of this drug were absent in practically every case; indeed, in the majority of cases this seemingly nauseous mixture was taken without the slightest complaint, whilst in no case did any bad effect result.

As I have been unable to find any detailed account of the best method to adopt in giving creosote in large doses by the mouth, and as attention to details appears to be of the greatest importance to ensure that more than 90 per cent. of consumptive patients will take these so-called poisonous doses without discomfort, as well as to know accurately the amount of creosote taken on any day throughout the treatment, it will perhaps be advisable to give a fairly full description of the method which has been found most efficacious at this