the dissemination of the germs of specific contagious diseases. Liquid animal matter oozing from putrefying corpses in a churchyard may possibly be so purified by the oxidising power of a few feet of earth as to be bright, clear, and inoffensive to any of our senses; but water which is neither cloudy nor stinking, but rather enticing and popular, like the water of the Broad Street pump in 1874, has carried cholera to those who drank it. How often typhoid fever has been caused in the same manner, who can tell?

But I must not detain you longer. Here is the address to the Home Secretary, and I hope it may be signed by many who are convinced that the present custom of burying the dead is associated with evils which ought to be remedied.

"We, the undersigned members of the British Medical Association assembled at Cambridge, disapprove the present custom of burying the dead; and desire to substitute some mode which shall rapidly resolve the body into its component elements by a process which cannot offend the living, and may render the remains absolutely innocuous. Until some better mode is devised, we desire to promote that usually known as cremation. As this process can now be carried out without anything approaching to nuisance, and as it is not illegal, we trust the Government will not oppose the practice when convinced that proper regulations are observed, and that ampler guarantees of death having occurred from natural causes are obtained than are now required for burial."

In conclusion, let me ask you to think on the following propositions. Decomposing human remains so pollute earth, air, and water, as to diminish the general health and average duration of the life of our people.

Existing churchyards and cemeteries are not well fitted as safe, secure, permanent, innocuous places of repose for the remains of our dead.

The expense of funerals and interment in graves presses unduly upon the means of the middle and labouring classes.

The present system of registration of death is so imperfect that common causes of preventable disease are not detected; and life is also rendered insecure by the omission of efficient arrangements for the due verification of the fact and causes of death.

These evils might be mitigated or prevented — (1) if national cemeteries were provided and maintained, under the direction of duly qualified officers of public health, and not left, as now, to be sources of private gain to commercial companies; (2) if no interment were allowed without a certificate of the fact and the cause of death by an officer of public health.

All this should be urged by those who are content to improve on our present mode of burial. Those who would go further, who will assist in the attempt to arrest the evils inseparable from even the very best mode of burial, who would add to our reverence for the remains of the dead, ensure an impressive religious service, and at a reduced expenditure provide for permanent monuments in beautiful open public spaces, may assert and prove the influence which our Association can exert, and ought to exert, upon the health and morals of the nation.

ON THE CAUSE OF THE BAD ODOUR SOMETIMES ASSOCIATED WITH EXCESSIVE SWEATING OF THE FEET, WITH DIRECTIONS FOR TREATMENT.

By GEORGE THIN, M.D.

THERE are few persons of experience, medical or lay, who have not had the misfortune to discover that certain individuals smell so offensively, that it is almost impossible to approach them. In many instances, the evil smell is connected with the feet, although there is reason to believe that this source is only suspected for the most part by those who have learned to recognise the odour, and who know that it is associated with perspiring feet. In some cases, the smell is so strong and penetrating, that it pervades a room long after the person from whom it emanates (and who may have remained in it only a few minutes) has left it. The entry of such an individual into the compartment of a railway carriage or an omnibus immediately fills it with a sickening effluvia, which, to the initiated, is unmistakable. These unhappy persons, if they belong to the wealthier classes, become exiled to a great extent from society; if they belong to the poorer classes, they may find it difficult to follow the calling by which they earn their living. Female domestic servants, from a cause to be presently explained, frequently suffer from this evil, and cannot in consequence find a household in which their presence is long tolerated.

It is difficult to describe a smell, and I will not attempt to describe

this one, but it is of interest to remark that there is something in it suggestive of putrefying cheese. Some friends of mine found a country farmhouse which they had taken for a short period, almost uninhabitable, on account of a peculiar disagreeable odour which pervaded every part of it. The odour was at first attributed to a supposed want of cleanliness in the dairy, or to the presence of new cheeses which were being dried in one of the rooms of the house; but it was soon found that the smell proceeded from a young woman who had been engaged to do temporary service.

I have several times met with extreme instances of this kind, and, until recently, have not been able to give the sufferers much permanent relief. Hebra's treatment, which consists in keeping the skin of the soles enveloped in diachylon ointment, and necessitates the recumbent posture for eight to twelve days, I have not tried. Professor Hebra writes confidently of its success, but there are evident practical objections to its use in many cases.

The odour regarding which I am writing is so distinctive, that I have long thought it probable that it was associated with a special ferment; and a well marked instance of it having recently come under my notice, I have taken advantage of means placed at my disposal by the Scientific Grants Committee of the British Medical Association to investigate its nature. Before giving an account of the case, and what I have learned from it, a few preliminary remarks will be useful.

Profuse sweating of the palms and soles is not uncommon, but, in order to produce the specific odour to which I refer, something more than mere profuse sweating is required. The excessive perspiration, when confined by stockings and boots, macerates the epidermis, and, if the person stand or walk much, the skin of the heels becomes tender. This tenderness is accompanied by redness, slight blistering, or more decided localised eczema. In damp, relaxing weather, perspiration is increased; and we have thus two causes of aggravation, each potent, but both together very powerful—moist warm weather and prolonged pressure by walking or standing.

It has been pointed out by Hebra that the evil smell is not in the sweat itself, but in the coverings of the feet; a fact which it is easy to verify.

The patient who has afforded me the opportunity of investigating the cause of the smell is a young woman, aged 22, who has suffered from evil-smelling feet, with soreness of the heels, for several years. Her hands are usually moist, or even wet, but are always odourless. The smell from the feet is not constant, disappearing in dry bracing weather, and reappearing when the weather is moist and depressing.

The first experiment I made was to subject the soles of the stockings and boots to the action of an antiseptic solution. The success was complete, the odour being entirely banished. The antiseptic precautions having been soon neglected, the smell returned, and I took the opportunity of investigating its cause more minutely.

The sole of the stocking, a few hours after it was put on, was found to be quite wet; and a stocking, if worn for a whole day, was so extremely offensive that, when held close to the nostrils, its overpowering fetor was comparable to that of putrid blood. The inside of the boot was equally wet and offensive; but, at the very time that the stocking and boot smelt so strongly, the heel itself, exuding moisture profusely, had no disagreeable odour. The sole of the heel was reddened and tender, and macerated around the edge, like a washerwoman's palm.

The reaction of the moisture in the stocking and in the sole of the boot was alkaline, that of the moisture exuding from the skin of the sole of the heel faintly alkaline, whilst that of the perspiration of other parts of the body was acid.

The fluid from the sole of the heel was thus shown to be not pure sweat, the faintly alkaline reaction being doubtless due to the serous discharge accompanying the eczema set up by the local hyperidrosis.

The fluid in the sole of the stocking was found to be teeming with bacteria forms, the nature and development of which I have carefully investigated. These investigations have produced results of some scientific interest, which I have communicated to the Royal Society.* The rapid development of bacteria in the fluid which exudes from the soles is doubtless favoured by the alkaline reaction produced by the mixture of serous exudation with the sweat.

The treatment instituted in this case is as simple as it has been effective. The stockings are changed twice daily, and the stocking-feet are placed for some hours in a jar containing a saturated solution of boracic acid. They are then dried, and are fit for wear again if it be desired. The boracic acid effectually destroys the smell. But to kill the bacteria in the stocking is not enough. The leather in the bottom of the boot is wet and sodden, and smells as vilely as the

* On *Bacterium fatidum*: an organism associated with profuse sweating from the soles of the feet. (*Proceedings of the Royal Society*, No. 205, 1880.)

stocking. This difficulty is got over by the use of cork soles. I directed my patient to get half a dozen, which she finds sufficient. A pair must only be worn one day unchanged; at night, they are placed in the boracic jar, and are put aside the next day to dry. If these directions be accurately carried out, the evil smell is perfectly destroyed.

The boracic acid solution is an excellent application to the painful skin in these cases. When the tender skin of the soles is washed with it, a sensation of coolness succeeds the feeling of heat and tension which are the usual accompaniments of the eczematous condition associated with the smell, and the skin becomes harder and loses its abnormal redness.

The bacteric fluid would seem to act as a direct irritant to the skin. My patient assures me that, if she wears stockings which have been dried without being disinfected, irritation is speedily felt; and that the cork soles, if worn a second day without having been purified, act in a similar way.

TRACHEOTOMY IN CROUP.*

By W. J. TYSON, M.B., F.R.C.S.,
Medical Officer to the Folkestone Infirmary.

HAVING had the opportunity of performing tracheotomy three times in October and November of last year, and also of assisting my friend Dr. Thomas Eastes in two other cases about the same time, I thought that a short paper thereon, mentioning some of the difficulties that were met with, as well as other points connected with the operation, might be of interest, or at any rate give rise to some discussion. The following are notes of my three cases.

CASE 1. Catarrhal Croup: Tracheotomy: Recovery.—E. B., aged 5 years, a delicate child, was first seen on Thursday, October 2nd, of last year, suffering with a well-marked attack of measles, the rash being fully out. At seven the next evening the breathing became troublesome, and several convulsions took place. At half-past nine I saw him for the second time; the child was then in great distress, rolling from one side of the bed to the other, exhibiting great sinking of the chest-wall at each inspiration, lividity of lips, and making a loud croupy noise. Tracheotomy was done at half-past ten the same evening, Dr. Eastes kindly assisting me. The difficulties met with in the operation were the opening of the trachea before it was sufficiently bared, and the not hooking back of all veins as they appeared in the wound; consequently much hæmorrhage took place, but this was ultimately stopped by changing the tube for a larger one, and by applying external pressure. The child was left at 11.30, breathing comfortably at 44 respirations per minute, and with a pulse of 128. The next morning, October 4th, the patient was doing well; he had passed a quiet night. The urine contained no albumen. A piece of flannel, soaked in a warm weak carbolic acid lotion, was ordered to be placed over the mouth of the tube every quarter of an hour. The tube was taken out the next day at eight in the evening, forty-six hours after the operation. He now breathed partially through the mouth and nose, and partly through the tracheal wound; but the latter rapidly closed. I may say that, for ten hours previously to the withdrawal of the tube, some air was passing through the nostrils. On November 9th, he spoke audibly for the first time, and on November 25th the skin-wound was entirely healed. He is at this present time perfectly well.

CASE 2. Membranous Croup: Tracheotomy: Death.—R. K., aged 4½ years, a strong, healthy boy, was taken ill on Friday evening, October 24th; he continued so Saturday and Sunday, when I saw him for the first time, at 11 A.M. He had now all the symptoms of severe laryngeal obstruction. Four hours later, the symptoms not having abated, tracheotomy was done. Drs. Bowles and Eastes were present, and kindly assisted during the operation. Here, as in the former case, great hæmorrhage occurred, and before the tube was introduced the child was nearly moribund; but, with artificial respiration, the breathing became, compared with what it had been before the operation, natural. The bleeding was stopped by keeping up external manipulation; and the tracheotomy-tube was changed for one of a larger size. No membrane was seen before, but several pieces were coughed through the tube during the operation. The warm moist flannel was used here as before over the mouth of the tube. The child passed a good night. On the morning of the 27th, two little white patches, of the size of a pea, were seen on each tonsil. At noon the same day the child began to be restless, and from this time went rapidly downhill; at 10.30 P.M. some retraction of the chest-wall was noticed at each inspiration. He died the next morning at 4.30, 36 hours after the operation. The father

told me that the boy had passed a most struggling night, but he did not think it necessary to send for me! When I saw him, the inner tube was completely choked with the mucus, and the tape of the outer tube unfastened. Throughout the case, I was quite unable to make the parents realise the vital importance of constant attendance to the tracheotomy-tube. The *post mortem* inspection made in the afternoon of the same day, showed that the epiglottidean folds were edematous, and that pieces of false membrane extended from just above the true cords down the trachea into the smallest bronchi. There was considerable injection of the trachea where the extremity of the tube came in contact with its anterior walls. The lungs were not consolidated.

CASE 3. Chronic Laryngitis: Tracheotomy: Death.—C. B., aged 4 years, was stated by his mother to have had a cough for some months; at times his breathing had been very short. A fortnight previous to my seeing him, he caught measles. On Sunday evening, November 23rd, I was sent for, and then found him with severe laryngeal obstructive symptoms. The next morning I saw him at 9.15 A.M. His countenance was now of a dull leaden hue, he was cold and semi-conscious, his pulse was 160, and the laryngeal symptoms had become intensified since the previous evening. Tracheotomy was done an hour later. The trachea was not cut until quite cleared; and the veins, which were most turgid, were carefully held aside by small hair-pin retractors. Practically no blood was lost, and the operation, compared with the previous two, was most agreeably easy. The child soon regained its natural colour. The urine contained albumen. The next morning, the 25th, pulse was 150; respirations 40. No membrane could be seen through the throat; the tonsils were enlarged. At 10.45 the same evening I was suddenly called down, but before my arrival the boy was dead. The nurse, on account of the restlessness of the child, had taken out the inner tube, and in so doing must have slipped the outer one from the trachea, for I found it lying outside and upon the trachea. The tape was not unfastened. The *post mortem* examination was made the next day at noon. No false membrane was seen anywhere. The rima glottidis was closed, and its edges were much thickened. At the posterior aspect of the upper lobe of the right lung there was consolidation of liver consistence and colour. The bronchial tubes were red and contained a frothy reddish fluid.

REMARKS.—The first case, I think, was doubtless one of catarrhal croup, associated with a considerable amount of spasm, for the symptoms developed most rapidly and as quickly disappeared. No membrane was seen at any stage of the case. The second was a typical case of membranous croup of the asthenic type; and the third was probably of a chronic nature, in which an acute attack had supervened. The immediate cause of death must be considered to have been the accident of the outer tube being expelled, either during a severe fit of coughing or whilst the inner tube was being changed. Too much "play" had been allowed to the tube. There are two points in this last case to which I wish to draw attention, for they are of some practical import. It is generally believed that, at the end of twenty-four hours, the parts external to the trachea, and the lips of the tracheal wound, are so glued together that there is no difficulty in getting in a tube at any time after this date. I believe this not to be universally true; for, on examining carefully the condition of the trachea soon after death in this last case, I found the edges of the wound in the trachea almost in contact, and an ordinary round tube could only be introduced with some amount of difficulty. There is another fact which is more important than this, viz., the swelling which takes place in the tissues between the windpipe and the skin, thus augmenting considerably the distance of the trachea from the surface. This swelling is partly due to inflammatory material thrown out, as well as to emphysema. The practical outcome of this is that, although one may allow a fair amount of play to the tube immediately after the operation, very soon the tube becomes more or less tight, and, unless the shield of the tube is kept in close contact with the skin-wound, the risk is run either during a severe coughing fit, or in the careless changing of the inner tube, of permitting the outer tube to escape from its proper seat. This fact applies with still greater force to the infrathyroid operation. In the case referred to, the tracheal wound was quite an inch and a half from the surface, and when the shield of the tube was pressed firmly against the wound, the inferior extremity of the tube only just entered the windpipe. As regards any subsequent introduction of the tube, Hilton's pilot overcomes both these difficulties, for the extremity of it is more or less conical; and, as it also possesses a handle, there is no need of virtually shortening the tube, as one really does when introducing an ordinary Fuller bivalve tube by applying two fingers to the shield end in order to render the inferior extremity small for introduction. As regards the operation itself, one reads continually that it should be done slowly and carefully, and the trachea not be opened until its rings are clearly visible. Yet this is not usually done. I have seen the operation performed several times, certainly by young operators, and in the large

* Read before a meeting of the East and West Kent Districts of the South Eastern Branch of the British Medical Association.