

account of the high level at which the purulent collection is located and the difficulty in dealing with it through an incision in the anterior abdominal wall. This operation is generally called the "transpleural" or the "transthoracic" operation. It may, like the abdominal procedure, be carried out in either one stage or in two. If it is necessary to go through the pleural cavity on account of the parietal and visceral layers of the right pleural sac not having become adherent owing to the formation of inflammatory adhesions, the result of extension of inflammation from the liver, it may be advisable to allow two or three days to elapse between the exposure of the affected portion of the liver and the incision into its substance and evacuation of the pus. In the majority of patients, however, it will be found either that the base of the right pleura is the seat of a localised empyema or the cavity has been obliterated by adhesion of the two layers. The operation is performed thus: after the patient has been anæsthetised and turned somewhat on the left side in order to give free exposure of the part to be operated upon a site is selected on that part of the thoracic wall which overlies the most prominent portion of the hepatic swelling, and an incision from three to four inches long at first, but which may be lengthened if requisite, is made along the long axis of a rib. The soft tissues are divided and the external surface of the rib exposed and separated from its attachments with a periosteal elevator. A portion, usually about three inches, is then excised. The underlying costal pleura is cut through in the line of the first incision and through the middle of the space from which a part of the rib has been removed. If care be exercised in making this incision the intercostal arteries will not be injured. If the layers of the pleura have not become adherent air will rush in as the pleural cavity is opened and the lung will collapse. The diaphragm is now sought for in the bottom of the wound; usually it will at once protrude owing to the fact that it has been pushed upwards and outwards by the enlargement of the liver. The layer of pleura which covers the upper aspect of the diaphragm is now incised in the line of the original incision and dissected up for a short distance. The length of this incision should be about two inches. The margins of the wounds in the costal and diaphragmatic layers of the pleural sac are now brought together and fixed in apposition by a series of fine silk sutures inserted at very short intervals. In some cases a continuous suture can be inserted more quickly and will serve the same purpose. If the diaphragmatic pleura is very tightly stretched on account of the hepatic enlargement the abscess can be partially emptied by the needle of an aspirator. When the pleural cavity has been shut off in this manner an incision is made through the diaphragm as it is exposed at the bottom of the wound, the margins of this incision are dissected up for a short distance and then closely and securely fixed to the margins of the thoracic incision by the insertion of a series of silk sutures. Each suture passes through the diaphragm and the muscular and cutaneous layers of the thoracic wall. When all these sutures have been inserted and tied the pleural cavity ought to be completely shut off from any communication with the exterior of the region of the hepatic swelling. When it is considered advisable to perform this operation in two stages the wound is now packed with tampons of aseptic gauze and dressings applied. After from two to four days the next stage of the operation is carried out. When the two layers of the pleura are adherent or there is in addition an empyema of the basal portion of the right pleural sac or the abscess is an acute one the operation should always be completed in one sitting. When the surface of the liver has been exposed thus the needle of an aspirator is pushed through the hepatic substance until the abscess cavity is reached. The liver tissue is then divided with a knife along the needle and a free opening made into the abscess cavity, after which the cavity is packed with tampons of aseptic gauze and absorbent dressings are then applied and fixed in position by a bandage.

Operation through the lumbar region.—When the lower and posterior portion of the right lobe of the liver is the seat of the abscess and enlargement of the organ has taken place in a downward and backward direction it is usually advisable to evacuate the purulent collection through a lumbar incision. An incision three inches long is made along the lower border of the last rib commencing a short distance outside the outer border of the erector spinæ muscle. The various strata of the abdominal wall are divided until the swelling caused by the hepatic enlargement

is exposed. The incision in these cases should be slightly more in front and higher than the ordinary incision for lumbar nephrectomy; the liver should be exposed above and slightly external to the right kidney. The kidney is usually pushed downwards by the hepatic enlargement. The peritoneum is not opened in this operation. When the enlargement of the liver has been laid bare an incision is made through the hepatic tissue until the purulent collection is reached. The further treatment is similar to that recommended in the abdominal and thoracic forms of operation.

[Mr. Waring then discussed the complications of hepatic abscess and the consequences of spontaneous rupture. He concluded his address as follows:]

Prognosis.—Of the 22 cases which have occurred in St. Bartholomew's Hospital during the years 1887-1897 16 were operated upon and 6 were not. Of those who were not submitted to operation all died. Of those operated upon 4 were aspirated, 5 were treated by thoracic operation, 5 by an abdominal operation, 1 by both abdominal and thoracic methods, and 1 by a lumbar operation. In 2 of the cases in which a thoracic operation was performed the patients recovered and in 3 death ensued; of those treated by an abdominal operation 4 recovered and 1 died; the 1 lumbar operation was successful; and the patient upon whom both abdominal and thoracic operations were performed died. From a consideration of these cases and also the various tables of results by other writers it appears to be conclusively shown that a greater percentage of patients recover among those who have been submitted to an abdominal or lumbar operation than among those who have been operated upon by the thoracic method.

Remarks

ON

6657 ADMINISTRATIONS OF ANÆSTHETICS CONDUCTED AT THE LONDON HOSPITAL DURING THE YEAR 1897.

In three Clinical Lectures delivered at the Hospital,

By FREDERIC W. HEWITT, M.A.,
M.D. CANTAB.,

ANÆSTHETIST TO THE LONDON HOSPITAL, CHARING-CROSS HOSPITAL,
AND THE DENTAL HOSPITAL OF LONDON.

LECTURE II.¹

Delivered on Feb. 11th, 1898.

GENTLEMEN,—I wish to place before you to-day all the cases in which threatening symptoms, partly or wholly referable to the anæsthetic, were recorded. You will see by referring to the table before you that there were thirteen in all. In some of these the symptoms of danger arose during the administration, in others they occurred afterwards. It is always difficult, and sometimes impossible, to be absolutely certain what share the anæsthetic has had in the production of dangerous symptoms; but I have gone carefully through all the notes of the 6657 administrations and the table represents my conclusions.

In all of the cases tabulated there is, I think, no doubt that the anæsthetic had some influence in bringing about the symptoms to which I shall presently direct your attention; and in order to give you an idea of what I consider that influence to have been I have arranged the cases in different columns according to the factors which I believe to have been present. When any dangerous symptoms arise during or after the use of an anæsthetic for a surgical operation one or more of four factors may be responsible—viz., (1) the anæsthetic itself, (2) the state of the patient, (3) the posture of the patient, or (4) the surgical operation.

Let us first of all turn our attention to the cases of anxiety under ether. The first of these is of interest because the remedy of venesection was adopted, and quite successfully. The patient was a female, seventy

¹ Lecture I. was published in THE LANCET of Feb. 19th, 1898.

years of age, and ether was given for the removal of the eye-ball. During the administration, which was conducted by means of a Clover's apparatus, and before the operation had commenced the patient's breathing became impaired. This is not uncommon just as patients are passing into profound insensibility; indeed, we may regard embarrassed breathing as more likely to arise during light than during deep anæsthesia. In this case the breathing stopped before the patient was thoroughly anæsthetised. Many might apply the expression "holding the breath" to the condition under consideration; but such an expression always seems to me to imply voluntary action, which in the case before us had been abolished. As the breathing did not recommence and as the patient was very

Cases in which Serious Symptoms, partly or wholly referable to the Anæsthetic, were recorded.

| Anæsthetic. | Factors. | | | | | |
|--|-------------------------------|--|---------------------------------|---|-------------------------------|------------------------------|
| | A, During the administration. | | | | | B, After the administration. |
| | Anæsthetic. | 1. State of patient. 2. Anæsthetic. | 1. Operation. 2. Anæsthetic. | 1. State of patient. 2. Operation. 3. Anæsthetic. | 1. Posture. 2. Anæsthetic. | |
| Ether (2910 cases)... | 2 | 1 | — | 2 | — | 2 |
| Nitrous oxide (1362 cases) | 1 | — | — | — | — | — |
| Chloroform (677 cases) | 1 | 1 | — | — | — | — |
| Ether, then chloroform (293 cases)... | — | — | 1 | — | — | — |
| Nitrous oxide, then ether (220 cases)... | — | 1 | — | — | — | — |
| A.C.E., then chloroform (31 cases) ... | — | — | — | — | 1 | — |
| Totals | 4 | 3 | 1 | 2 | 1 | 2 |

cyanosed and the veins were greatly distended, the house surgeon performed venesection. About ten ounces of blood were withdrawn, and breathing immediately recommenced. No other restorative measure was used and no further difficulty arose. In the next case, which occurred in the out-patient department, the operation was for an anal abscess, and the report simply states that "the patient stopped breathing when just under the anæsthetic." Cyanosis was marked. Artificial respiration was performed and the breathing recommenced. The operation was then finished. This is similar to the first case under ether, except that artificial respiration was performed instead of venesection.

It is very common just before anæsthesia is established for the breathing to become temporarily suspended. This is usually due, as an inspection of the neck will prove, to the anæsthetic vapour or the mucus which it produces setting up acts of swallowing, which are more tardily performed than when consciousness is intact. During normal deglutition the glottis closes momentarily; but during the passage into profound anæsthesia the act of deglutition is liable to be spread out, so to speak, over a considerable time during which no air enters or leaves the chest. In addition to this cause for the suspended breathing of light anæsthesia there is yet another—viz., general muscular spasm—which by reason of its affecting those muscles which are directly or indirectly concerned in maintaining respiration brings breathing to a standstill. In the vast majority of cases this impaired breathing, which comes on just before stertor, passes off spontaneously or, if it does not do so, it may be made to pass off by removing the inhaler, rubbing the lips briskly with a towel, and pushing the lower jaw forwards. In more obstinate cases in which the jaws are clenched and the neck muscles are rigidly contracted it may be necessary to separate the teeth and to pass the finger to the back of the pharynx, when breathing will recommence. It is important to bear in mind that unless such simple remedial measures are adopted for the relief of this form of arrested breathing, a very dangerous or even fatal degree of asphyxia will be liable to arise.

The next case is a very interesting and instructive one.

The patient was a man, thirty-seven years of age. He was of rather spare build, but muscular; and he had drunk heavily. There was nothing in his appearance to suggest that he was in a bad state of health. His chest was stethoscopically examined, and I understood the clerk to say that nothing abnormal was discovered. The operation to be performed was internal urethrotomy. Ether was accordingly given under my supervision by means of a Clover's inhaler. As you are aware it is advisable in administering ether to well-built men of alcoholic habits to limit the air-supply to a greater extent than in anæsthetising other types of patients, otherwise inconvenient struggling and excitement will arise. Ether was therefore administered to this patient with the minimum allowance of atmospheric air. In ordinary patients of this age and appearance this plan answers admirably, deep anæsthesia of a satisfactory type ensuing in about four or five minutes. But in this particular case there was an unsuspected element present which very greatly altered the usual course of events. The operation, which was a very short one, was on the point of completion when I noticed that the patient presented an appearance which is very unusual after a short administration of ether. His eyelids were only half closed, the eyeballs were slightly upturned so that rather more of the sclerotics than usual appeared, and the colour of the face was pale and dusky. On putting my finger to the radial artery I found that the pulse was very small, very rapid, and irregular. The respiration was, however, regular and deep. On placing my hand over the cardiac area I felt a rapid, irregular, and tumultuously heaving impulse which extended into the epigastrium and beyond the mid-sternal line. On applying my stethoscope I made out a murmur which, however, it was impossible to diagnose owing to the noisy breathing and embarrassed cardiac action. The conjunctival reflex was now returning. Gradually the ashy colour lessened and signs of returning consciousness began to appear. No remedial measures whatever were necessary, and the patient was sent back to the ward without displaying any further symptoms. It was quite clear that some grave cardiac lesion was present, and that the patient had passed through a critical condition under ether. Dr. Hadley, who very kindly examined the chest some few days after the operation, reported: "Dilated hypertrophied heart, irregular in action, with mitral regurgitation and aortic obstruction. Compensation fair, but a history of failure of compensation ten weeks ago (in dropsy). There is none now and the only sign of failure of compensation left is the irregularity."

You will remember that I have on many previous occasions pointed out to you the necessity of stethoscopically examining the chest before selecting your anæsthetic and the method of its administration. Although this was done in the above case the report given by the clerk was unfortunately misunderstood and the patient was anæsthetised by a wrong method as the subsequent symptoms testified. In cases of morbus cordis in which there is evidence of want of compensation all asphyxial methods should be carefully avoided. Nitrous oxide, nitrous oxide in conjunction with ether, and ether itself when administered by a close inhaler, are equally unsuitable. Limitation of oxygen, which is necessarily incidental to the administration of ether by a Clover's inhaler, throws extra work upon the right side of the heart even in healthy persons, but in such subjects the extra work can easily be accomplished and no signs of cardiac embarrassment will arise. But in patients with mitral regurgitation or obstruction "close" methods of etherisation must be avoided; otherwise, as this case very forcibly shows, a dangerous strain may be thrown upon the right cavities of the heart. The best anæsthetic for such cases is the A.C.E. mixture, or if for any special reason ether seems preferable it should be given by means of a felt cone or a Rendle's mask, in order to avoid all undesirable exclusion of air.

There are two other points worthy of note in this interesting case. The first is that the cyanosis, which had been well marked, as it usually is in alcoholic subjects during the initial stages of the administration, became replaced by a dusky pallor when the patient was thoroughly under the anæsthetic. The second is that the condition of the eyes gave early warning of approaching danger. Given that a patient's complexion is not abnormally pale before an anæsthetic is administered, limitation of air, such as that incidental to the use of nitrous oxide or ether by the customary method, produces what one might almost call healthy cyanosis; and so long as this cyanosis is not associated with pallor we may take it that the

heart is efficiently driving along the imperfectly oxygenated blood. If a patient is naturally very anæmic this healthy cyanosis, if I may use the expression, is not so obvious. Now, if during this cyanotic state the heart begins to fail, the features will lose their bluish or purple colour and become livid or ashy. Such an event, which must always be regarded as indicating danger, is more common under chloroform than under ether, because of the greater tendency under the former anæsthetic for cardiac dilatation to arise. But if the heart of the patient under ether be in a crippled condition it may behave like the healthy heart under chloroform and show signs of failure when any undue strain is imposed upon it. With regard to the other noteworthy point—viz, the warning given by the appearance of the eyes—I may say that whenever the lids are only partly closed and the globes are turned slightly upwards so that more of the sclerotic than usual is visible, attention should be directed to the patient's general condition. These ocular phenomena are liable to display themselves in surgical shock from hæmorrhage or other causes, in asphyxial states, and also when the anæsthetic has been freely, and perhaps too freely administered. Widely open lids with the globes fixed in their normal horizontal axes may be met with in the most satisfactory types of anæsthesia. But flaccid, nearly closed lids, displaying subjacent sclerotics, are usually, though not invariably, indicative of an unsatisfactory condition, and it has been my experience that it is best to give rather less of the anæsthetic under such circumstances; and if the ocular condition depends upon too deep an anæsthesia this treatment will cause the lids to regain their tone and to become approximated. Conjunctival reflex is usually if not invariably absent when the ocular phenomenon to which I have specially alluded is present, but it gradually returns after the lids have regained their tone.

In the next case the patient was a male, thirty-six years of age. He was anæmic and emaciated. The case is one of the two ether cases of the fourth column—that is to say, it was one in which the state of the patient was the primary factor, the operation the secondary, and the anæsthetic the tertiary. The operation was resection of the intestine and lasted forty-five minutes. This procedure is not infrequently attended by a good deal of shock. Ether was employed and it was administered by means of a Clover's inhaler. There were considerable pallor and feebleness of pulse during the operation, and just before it was over the patient's condition was rather critical and he ceased breathing for a short time. In this case, as in the preceding, the eyelids were only partly closed. Nothing was done to restore the breathing, as it soon recommenced spontaneously. But as the patient's condition from the circulatory side was unsatisfactory an injection of brandy was given by the bowel. His condition gradually improved and no further cause for anxiety presented itself.

In the next case, which is of a similar character, the patient was a male, thirteen or fourteen years of age, and the operation was exploration of the upper end of the femur. At the end of an hour he became collapsed. It is not an uncommon thing for children whose general condition is not very satisfactory to show signs of collapse during prolonged operations of this kind, and although one cannot wholly exclude the influence of the prolonged etherisation, this influence is of far less importance. It is in such cases as this and the preceding one that the use of hot brandy-and-water enemata, injections of strychnine, and the intravenous introduction of saline fluids will be found of great use.

The next case is an important one. It is one in which broncho-pneumonia followed the administration of ether. For several years it has been alleged that whilst ether does not kill upon the operating table it does so afterwards, whereas chloroform when it kills does so at the time of its administration; and it has been a very difficult matter indeed to say how far ether is open to objection in this respect. One of the objects which I had in instituting the system of note-taking at this hospital was to put this point at rest. We wish to decide whether the expressions "ether-bronchitis" and "ether-pneumonia" have any right to become current. It will, I fear, take several years before the matter can be finally settled; but I have during this, the first year of our inquiry, taken special pains to find out and follow up those cases in which any bronchial or pulmonary after-effects have arisen, and I hope as time goes on to collect more data. For the present we must not form too hasty a judgment, but

must wait till, by the comparison of recorded cases, we can come to some definite conclusions. In the case now under consideration there is no doubt that bronchitis came on immediately after the administration of ether, but whether the anæsthetic was wholly responsible or partly responsible, or whether the bronchitis was a simple coincidence dependent upon other causes, it is exceedingly difficult to say. The balance of evidence is strongly in favour of its having arisen as the immediate result of the administration of ether. The patient was a female, forty-one years of age. She came up from the country and her general condition was good. Her heart sounds were not abnormal and she had never suffered from cough. The operation was nephrectomy for calculous disease of the kidney and lasted forty-five minutes. Although the ether was preceded by nitrous oxide, the case is rightly considered with other ether cases because the preliminary anæsthetic could have had no influence whatever in the production of the after-effects. The ether was administered by an Ormsby's inhaler and the patient was not kept too profoundly anæsthetised. It was, in fact, found that a perfectly tranquil state, free from all rigidity, could be maintained with less than the usual quantity of ether. The conjunctival reflex was slightly present once or twice; there was no cough or straining throughout; and recovery took place in the ordinary way and rather more quickly than usual. The same evening it was noticed that the breathing was audibly moist, and in the course of a couple of days distinct bronchitis developed itself and ran on to broncho-pneumonia. I examined the patient three weeks after the operation and found that there were loud, large rhonchi and moist sounds over both chests, front and back, and distinct dulness at the left base with tubular breathing. The temperature had been irregularly febrile. She was soon transferred to the medical wards, where she eventually died, not from the broncho-pneumonia but from pyæmia apparently consequent upon the original calculous disease of the kidney. At the post-mortem examination the lungs were found to have undergone fibroid changes as the result of the broncho-pneumonia, but it was clear that the patient had died from other causes which do not of course concern us in our present inquiry. In thinking over the facts of the case the following question seems to present itself. Supposing that ether had been changed for chloroform in accordance with the principles to which I referred in the former lecture, would bronchitis have supervened? For the present we cannot, I think, venture to answer this question with any degree of certainty.

There is one other case which should be considered with the preceding one, inasmuch as the dangerous symptoms came on after the administration of ether. It was a case of some anxiety. The patient was a male and ether was administered for putting up a fracture of the femur. So far as the administration of the anæsthetic went, there was very little to note beyond that a great deal of mucus was secreted. When the anæsthetic was discontinued—the inhalation having lasted three-quarters of an hour—the patient seemed as though he were about to vomit. As you know, this is of very common occurrence; but in the case under consideration the patient's jaws became clenched and a good deal of cyanosis ensued owing to the obstructed breathing incidental to commencing vomiting. The jaws were opened with some difficulty, the tongue forceps applied, and the finger passed to the back of the throat. None of these procedures, however, started respiration. The house surgeon therefore very properly performed tracheotomy and directly this had been done a great deal of mucus escaped from the tube. In this case there is no doubt that the asphyxiated condition was connected with the recovery from the anæsthetic. When patients, and especially when certain types of patients are emerging from anæsthesia they may easily become self-asphyxiated. I have already referred to this liability during the induction of anæsthesia and the remarks which I have made are applicable to the stage of returning consciousness. In this particular case the secretion of a large amount of mucus doubtless contributed in no small measure to the obstructed breathing. You will find it an excellent plan in all cases in which such a course is possible to turn your patient well upon the side immediately the anæsthetic is discontinued. By this procedure mucus will tend to flow out of the mouth, the tongue will gravitate into the cheek, and stertor will cease. Patients recover from anæsthesia far better in this position than in any other. Under the circumstances here narrated this lateral posture was impracticable as the

patient had to be kept upon his back. The case, however, teaches us how very necessary it is to carefully watch patients whilst they are emerging from deep anæsthesia and also how important it is that tracheotomy instruments should always be at hand when an anæsthetic is being given.

We next come to the case in which threatening symptoms occurred under nitrous oxide gas. The patient was one year and three months old, and it was proposed to open an abscess of the neck under nitrous oxide, but under the influence of this gas breathing stopped, and the notes state that there was a good deal of laryngeal spasm. This is not uncommon in giving nitrous oxide gas to very young children, for such patients are very easily affected by the absence of oxygen, their muscular systems being thrown into a condition of spasm which may interfere with respiration. In the present instance the patient soon recovered, but I thought it well to mention the case because it shows that you should always be careful in administering gas to small children.

The next case occurred under chloroform and the anæsthetic was the chief if not the sole factor. The patient was a male infant aged five months, and circumcision was to be performed. During the administration of chloroform the pupils dilated and the breathing stopped. Inversion, artificial respiration, and flicking with a wet towel soon restored the patient. Small children are said to take chloroform particularly well, and this is no doubt true, but when once they have been brought under its influence they are very easily overdosed. It is often difficult to obtain anæsthesia because the vapour readily causes the sensitive glottis to close, so that some time elapses before sufficient chloroform enters the lungs; but when once that stage is passed the anæsthetic will be absorbed freely so that very small quantities are needed.

In the next case the symptoms were primarily due to the state of the patient and secondarily to the anæsthetic—chloroform. The patient was a female child and the operation was tracheotomy for œdema of the glottis. A few breaths of chloroform were given and the child ceased breathing and became asphyxiated, the heart beating violently all the time. When the tube was put in and artificial respiration was performed the breathing recommenced. It will be perfectly obvious to you that in giving anæsthetics to patients with obstructive dyspnoea the greatest caution is requisite. The greater the cyanosis the greater the need for caution. In some of these cases the breathing is only kept up by voluntary respiratory action, and natural sleep, save for brief intervals, is impossible. When such a state is present and anæsthesia is induced the patient has to fall back, so to speak, upon his ordinary muscles of respiration which will probably be quite inadequate for maintaining efficient breathing. If, for example, the patient has a large goitre pressing upon the trachea so that there is cyanosis, and more especially if general bronchitis is present, the use of any anæsthetic even in the smallest quantities may at once stop breathing, and it may be impossible, from the flattened state of the trachea, to get a tube into place. This is the kind of case that you may one day be called upon to anæsthetise; and you must under such circumstances seriously consider whether the risk should be run. If the obstruction is such that it would not interfere with the insertion of a tracheotomy tube, the case may be regarded from a totally different point of view, no matter how great the obstruction may be.

The next case is one in which ether was used in the first instance and chloroform subsequently. The patient was a male, aged twenty-two years, in a fair condition, and the operation was nephrotomy. Ether was given by a Clover's inhaler and subsequently chloroform was administered by a Skinner's mask. Under the ether coughing, struggling, and impaired breathing arose, so a change to chloroform was effected. When the operation commenced the pulse was very fair, but during traction and manipulation of the kidney the pulse became feeble and disappeared altogether at the wrist for two or three minutes. This case is very similar to one of those already referred to except that the shock was more marked and for the time very alarming. When the solar plexus is interfered with this reflex cardiac inhibition is by no means uncommon. I am not aware, however, that it has ever been proved to have been fatal. I have known the syncope to become so profound as to arrest breathing for some little while, but the patient recovered. In this particular case the breathing

was not interfered with to any extent but the pulse disappeared, as already stated, for two or three minutes. At the end of this time the patient vomited and the pulse gradually returned, but it remained irregular for some time after. In such cases as these, in which the operation must be regarded as primarily responsible, the anæsthetic has very little influence. It is at the present time quite uncertain whether this condition of surgical shock is more likely to occur under ether than under chloroform. I have seen it a good many times under both. It is always advisable in renal operations to be on the alert for such symptoms, to watch the patient very narrowly, and to see that his breathing is freely performed, and that an undesirable quantity of the anæsthetic is not given. I have found by experience that this reflex shock is just as likely to occur during a deep as during a comparatively light anæsthesia.

In the case of anxiety under nitrous oxide and ether the operation about to be performed was for post-nasal growths and enlarged tonsils, and under the influence of these mixed anæsthetics the patient became cyanosed and respiration ceased. Artificial respiration was performed and the operation was finished under the A.C.E. mixture. Whenever a patient has to be anæsthetised for the removal of enlarged tonsils and adenoid growths it is well to bear in mind that conditions are present which are liable to introduce an asphyxial element into the administration. In two at least of the nitrous oxide fatalities which have been recorded enlarged tonsils were present. When the enlargement is very considerable, so that the tonsils almost meet in the mid-line, and even natural breathing is difficult, nitrous oxide should not be given unless mixed with oxygen. In minor cases, however, there is no objection to this anæsthetic *per se*, or as a preliminary to ether, provided that care be taken not to push it too freely. It will be found that the patient will become more or less asphyxiated before he is really anæsthetised, and at this moment the inhaler must be removed, otherwise complete arrest of breathing may take place. The use of nitrous oxide followed by ether has many advantages, but the method requires considerable practice in such cases as I have just indicated.

The sequence of nitrous oxide, ether, and chloroform, to which I more than once referred in the preceding lecture, is specially suitable for operations within and about the mouth, nose, and throat, especially in children and very nervous or hysterical persons. The first-named anæsthetic rapidly destroys consciousness and prevents crying, struggling, or inconvenient hysterical outbursts, all of which are liable to arise with other methods. The second (ether) is valuable, not only because it stimulates the circulation so that it is able to withstand any strain that may be thrown upon it by intercurrent asphyxial states, but because by its use it is possible to "charge up" the patient, so to speak, with sufficient anæsthetic to prevent him regaining semi-consciousness during the insertion of a gag or preliminary examination of the parts to be operated upon. The third anæsthetic (chloroform) is of service because of its convenience and because of the ease with which the comparatively light form of anæsthesia which is advisable in these cases can be maintained.

I should like here to say something about the use of chloroform during nose and throat operations in the sitting posture. Since I have adopted the plan of first placing patients well under the influence of ether I have given chloroform in the sitting posture for a very large number of nose and throat operations, and without ever having witnessed any evidences of circulatory failure. In many of the cases considerable hæmorrhage has occurred and yet the circulation has been well maintained. I am strongly of opinion that provided the patient has first been placed under ether, that every care is taken to avoid intercurrent asphyxia from faulty posture of the head or the accumulation of blood in the fauces, and that only a moderately deep anæsthesia is maintained, chloroform may be safely used in this posture. From the point of view of the operator the sitting posture is very convenient, for the patient assumes the position in which the surgeon is accustomed to examine him in his consulting-room, and the normal relations of the parts remain undisturbed. Moreover, it is such an extremely easy matter to tilt the patient's whole body forwards from time to time for the escape of blood should hæmorrhage be free. So far as the convenience of the anæsthetist is concerned there can be no doubt that for mouth, nose, and throat cases the lateral, or even the perfectly horizontal posture is preferable to the sitting posture; but given that the surgeon prefers the last

named there is no objection whatever to its being adopted and to chloroform being given provided that the points to which I have alluded are carefully borne in mind. The two worst postures for operations of this class are the semi-recumbent (the body sloping backwards at about an angle of 45°) and the dorsal with the head completely extended over the end of the table. Time, however, forbids me to enter more fully into this matter.

The last case I have to consider to-day is one in which posture was the primary cause of the serious symptoms. The patient was a child five years of age, and the operation was for a growth upon the scalp. The patient had to be placed in such a position that his chin pressed against the sternum. Under such circumstances breathing is likely to be interfered with because the tongue is forced back against the pharynx. It therefore happened that respiration ceased and artificial respiration had to be performed. The patient very quickly recovered. As a general rule one may say that the head should be kept as far as possible in a line with the body, no matter whether the patient be lying horizontally or upon his side or whether he be sitting in a chair. Rotation of the head to one or other side does not interfere with breathing provided that no flexion or extension take place; indeed, when patients are lying horizontally this rotation to one side should, whenever possible, be enforced; but flexion of the head upon the sternum or extension upon the spine is liable to bring about difficulties in the administration which may, as in the case before us, require the application of remedial measures.

ON THE HISTORY AND PREVALENCE OF LEPROSY IN AUSTRALIA.¹

By J. ASHBURTON THOMPSON, M.D. BRUX.,
D.P.H. CANTAB.,

CHIEF MEDICAL OFFICER OF THE GOVERNMENT, AND PRESIDENT OF
THE BOARD OF HEALTH, OF NEW SOUTH WALES; EXAMINER IN
HYGIENE AT THE UNIVERSITY OF SYDNEY; FELLOW OF
THE ROYAL INSTITUTE OF PUBLIC HEALTH;
HONORARY FELLOW OF THE INCORPORATED SOCIETY OF MEDICAL
OFFICERS OF HEALTH.

THE following paper contains a summary of the more important parts of "A Contribution to the History of Leprosy in Australia," which was written in 1894, and published by the National Leprosy Fund in the middle of 1897; to that work reference must be made for the detailed evidence on which the statements presently recapitulated rest.

Australia had been often sighted by navigators before Captain Cook landed and took possession on behalf of the English Government in 1770; but the first foreign settlement in the country was effected by an expedition which numbered about 1030 souls at Botany Bay, near Sydney, in 1788. The whole continent had, it is believed, been free from intrusion in every part down to that date with the following possible exceptions: in 1837-39 Sir George Grey, Governor of South Australia, discovered some rock-drawings which were judged to be of other than aboriginal execution at a point near the north-western coast line; and on the north coast, Flinders, issuing from the Gulf of Carpentaria, encountered a fleet of Malay prahus engaged in tripang fishing and was told by its leader that he was the first Malay to reach that coast about twenty years before, or about 1783-84. For many years at all events the aborigines at this part remained at enmity with their Malay visitors, who returned year by year, and, according to the available accounts, did not penetrate further than the beaches, where they usually had to fight for the wood and water they went to secure. At discovery by the whites the country was found parcelled out among many different small tribes and it is considered that the state of the people must have been what it was found to be in 1788 for several hundred years before. No information as to the absolute numbers of the nomad autochthonous population at any part of the country is available for older years and no trustworthy information is available for later times. Sydney was the original seat of

Government for the continent and for many years was consequently the repository for all archives touching Australia and Tasmania, Tasmania being usually reckoned a part of Australia, from which it began to be separated by the rather narrow Bass Strait only during tertiary times. The collection of books touching this country in the public library at Sydney numbers about 5000. Gentlemen officially concerned in tabulating and preparing the old official archives for the press are of opinion that there is no mention of leprosy down to the year 1836 at all events or of any disease under which leprosy might be supposed to lie hid; on the other hand, information as to all diseases down to that date and for long afterwards is extremely meagre. The works of several explorers of note which deal with wide tracts of country on different parts of the continent, and which were written from about 1830 onwards, contain no reference to anything resembling leprosy among the autochthons with a single exception; and in that case there is nothing to show that the word "leprosy" was not used in its banal sense, the writer, who was not a medical man, probably intending merely to emphasise the disgusting character of some skin disease. Several explorers of note have informed me that they have never met with any disease among the aborigines which they supposed might be leprosy; nor, after looking at many photographs of lepers, did they hesitate to adhere to that statement. Among these gentlemen was the late Baron Sir Ferdinand von Mueller, K.C.M.G., M.D., F.R.S., &c., who spoke chiefly of the south-western part of the continent about the year 1847 and of a part of the Northern Territory about 1855. It may be taken, in my opinion, that there is no record of leprosy among the primæval autochthons in any part of the continent.

Comprehension of the progress of white settlement will be facilitated if it be remembered that Australia has an area of just three million square miles, that the earliest Government at Sydney was the Government of Australia, that distant parts were settled by sea as became possible and were gradually erected into separate Crown Colonies, and that all these Crown Colonies, always including Tasmania, were at different dates granted the right of self-government and thereby became autonomous States. The net result has been that Australia is divided into the following territories, which became self-governing at the dates mentioned: Tasmania, 1854; Western Australia, 1890; South Australia (with which is the Northern Territory), 1856; Victoria, 1851; New South Wales, 1851; and Queensland, 1859. For the first sixty to sixty-five years the population was practically entirely English. In 1851 the discovery of gold led to the immediate influx of large numbers of people who came from almost every country and from almost every recognised leprosy area in the world to New South Wales and Victoria. These natives of recognised leprosy areas were in small proportion to the rest of the population, if the Chinese (of whom further mention will be made below) be excepted, and the occurrence of leprosy among them has been recorded. The total population of Australia at the dates at which the various territories were granted responsible government was not so much as half a million; at the present day it is about four millions. The conditions of life in this country are extremely favourable to health. The earliest settlers no doubt endured similar hardships to those necessarily suffered by explorers in later years, for they were themselves in the position of explorers; but without going into detail it is indisputable that the condition of the population as a whole and in every territory has been and still is one of ease. Food, which continued to be of precisely the same kinds as they had been accustomed to in England, was always wholesome and sufficient even when it was not plentiful. There is no malaria in any of those parts of Australia which thus far have become populous, the exception being the very sparsely inhabited north. Lastly, the climate, speaking generally, is as good as can be imagined, and while the temperature necessarily varies greatly between parallels of S. latitude so widely separated as are the 44th and the 11th, it is in every inhabited part such as encourages outdoor habits of life. Nothing at all is traceable in the circumstances of life in Australia such as possibly might have importance in relation to occurrences of leprosy. In 1851 this healthy, small, and widely-scattered population was composed in the main of Europeans and chiefly of English. The aborigines retired before them and died apparently almost in proportion to the degree in which they were forced

¹ Abstract of a paper presented to the Leprosy Conference, Berlin, 1897.