ing cells suffered from the effusion, their fibrous walls became softened and broken down; and here and there, this state of things could be observed.

The bronchi which suffered from the pressure of the tubercles, in contact with their outsides, presented nothing abnormal in their mucous coats. Neither fatty epithelium, casts, nor tubercle-cells were found in them. The epithelium of the ultimate bronchi of the affected air-cells was invariably broken down, and contained many free oil globules. No diseased blood-vessels were observed. The kidneys contained tubercles and cysts, and were very large and flabby.

REMARKS. The interesting features in this case were, the relation between the pathological condition of the lungs, and the physical signs during life; it being rare to find the first stage of phthisis free from complication. The great debility and nervous depression must be ascribed to the lowering effects of the tubercular cachexia; and the intolerance of cod oil and tonics is not without its value as a diagnostic. For, generally, those cases characterised by cough, debility, some alteration in the vesicular murmur and loss of flesh—the most common symptoms of the early stage of phthisis—and which do not progress unfavourably, are benefited by tonics and oils. Such is not the case with many other cases which run on to incurable phthisis: in these, sedatives are frequently the only remedies which relieve the cough and the distressing feelings of debility.

The immobility of the chest was produced by the universality of the pleuritic adhesion; and this pathological condition, in combination with the presence of so great a number of miliary tubercles visible to the eye, and so many microscopic tubercle deposits, accounted for the weakness of the inspiratory vesicular murmur.

In all probability the microscopic tubercles were deposited late in the case; and the consolidation of the majority of the miliary tubercles probably took place, instead of their softening, when the warm air of the ward, medicine, and milk diet, appeared to amend his general condition.

I feel inclined to believe that the change in the percussion sound, from simple dullness with resonance, to the dullness accompanied by a most unmistakable tympanitic sound, was produced by an access of fresh tubercular deposit; in fact, by the microscopic tubercles between the aggregated miliary granulations. For the production of this tympanitic sound is due to the presence of a certain amount of solid matter in a given air containing space: a thin layer of healthy lung placed over a surface of a body not containing air, will produce this sound; and perfect distension by air will not produce it in any body. Skoda may be consulted for the truth of these assertions; and anyone who will percuss the mid-sternum, from below the line of the fourth cartilages, will trace the dull sound of the heart merging into a tympanitic sound, as the edge of the right lung is covered by the pleximeter.

The wavy breathing had evidently a mechanical origin, and was not due to anything but the pressure of the adjacent tubercles upon the secondary and tertiary bronchi.

The absence of an increase of vocal fremitus or resonance was remarkable, and can only be accounted for, by there being insufficient connexion between the solid tubercles: on the consonance theory it is inexplicable. The microscopic preparations will be at the service of the Association Branch in its meetings in this neighbourhood.

ADDENBROOKE'S HOSPITAL, CAMBRIDGE.

CASES OF TRACHEOTOMY: IN LARYNGITIS; FOR FOREIGN BODY IN THE LARYNX; AND IN TETANUS.

By GEORGE MURRAY HUMPHRY, Esq., Surgeon to the Hospital.

CASE I. Frederick Townsend, aged 4 years, a moderately healthy child, had been observed to be hoarse for a few days previous to Dec. 22nd, 1855. On that day, it was supposed that he had caught cold, as he had some

cough and difficulty of breathing. The latter was thought to depend upon an obstruction in the throat; it increased in spite of medicines and treatment directed by a surgeon; and, on the evening of the 28th, I was requested to see him. I found him lying with his eyes half closed, breathing heavily and noisily; the noise proceeding, evidently, from the larynx. When he was roused up, the struggle for breath was greater, and the sides of the chest were drawn in by the violent action of the diaphragm. The eyes were staring, the expression anxious, and the colour of the lips livid. I was told that he had frequently very severe fits of choking, in which they thought he would die. These were very bad on the preceding night, had diminished a little during the day, but were again increasing in severity, so as to make his parents fear to encounter another night. During these strugglings for breath, the air passed through the larynx with a loud noise. The laryngeal sounds obscured all others in the chest, and rendered auscultation useless. The child often cried for water, and swallowed it without difficulty. The pulse was irregular. There was nothing wrong to be seen in the throat. The disease was evidently in the larynx, and was gaining ground. The condition of the child was critical; his strength giving way, and would probably not hold out much longer. Accordingly I recommended that tracheotomy should be resorted to without further loss of time; and, the parents assenting, the child was wrapped up in a blanket, and conveyed to the hospital. Chloroform was administered by Mr. Carver. During the inhalation, a sharp attack of dyspnoea came on, and excited some alarm; however, it gradually passed off as the child fell more under the influence of the vapour. A large vein, along the anterior edge of the right masseter muscle, approached the median line at the lower part of the neck, and rendered it necessary to keep the incisions rather higher than usual. One or two veins bled freely, so that I waited a minute or two for the hæmorrhage to subside before opening the trachea. It had not quite subsided when the longitudinal incision into the trachea was made with the scalpel; but the entrance of much blood was prevented by the quick insertion of the silver tube. After the struggling and coughing which immediately followed the introduction of the tube, the child was very pale and faint, with drooping eyelids; and the inspirations followed one another at long and very irregular intervals. However, the pulse remained good; and, by the aid of ammonia and compression of the chest when the intervals between the inspirations were unusually long, the child soon revived, and breathed freely through the tube.

The tube used was a double canula, so made that the inner tube, which was the longer, could be easily removed, cleaned, and reintroduced, without disturbing the wound, and without pain to the child. This was required to be done several times during the night, in consequence of its becoming clogged with mucus. He drank some milk, had sleep, and next morning was very comfortable, breathing easily through the tube. On Jan. 7th, I removed the tube, and, as he breathed well through the larynx, I left it out. The wound closed very quickly. On the 10th, he left the hospital quite well.

CASE II. Mr. —, aged about 35 years, rather stout, and of florid complexion, had, for nearly a month previous to my seeing him on Jan. 21st, 1855, suffered under the symptoms of some affection of the larynx, indicated by cough, difficulty of speaking, and difficulty of breathing. These increased in spite of the treatment employed, and had been accompanied lately with such severe fits of choking at night as to cause great alarm, and to induce the surgeon in attendance to suggest that an operation would probably be necessary. When I saw him, the breathing was noisy, as though the air were driven through a narrow tube; and difficult, more particularly when he exerted himself. The obstruction appeared to be in the larynx. He could speak only in a whisper, and was troubled with a dry, harsh, husky cough. There had been very little expectoration; no pain nor tenderness. He pointed to the larynx as the seat of the obstruction, and

said he was sure he should be choked at night. He could not bear to lie down. Being unwilling to resort to operative proceedings at once, as the symptoms were not very urgent, and thinking it right to watch the case a little while, and endeavour quickly to establish a mercurial influence, I directed mercurial ointment to be rubbed well into both thighs; and a pill, containing three grains of calomel, with a quarter of a grain of opium, to be taken every three hours. He got through that night pretty well. On the night of the 22nd, he again had an attack of difficulty of breathing, so severe that his family thought he was dying. I was sent for; but, when I reached him, the attack had passed off, and there was no immediate urgency; so I determined to wait till the morning, and then run no further risk by delay. Accordingly, on the 23rd, I opened the trachea, and inserted a tube, through which he breathed very well. During the operation, several vessels bled, but ceased before I plunged the scalpel into the trachea. On one occasion, immediately after an incision, I heard a short hissing noise, which convinced me that air had been drawn into a vein. It ceased almost in an instant, probably before my finger covered the spot. Soon after, he complained of a sensation of tightness across the chest, and was inclined to faint. However, the pulse was not much affected, and he soon recovered himself. From the time of the operation, the case went on well; the only trouble we had was from the tube becoming blocked up with mucus, which dried in it, in spite of our attempts to keep it clear; and rendered its occasional removal necessary. On Feb. 13th, I found that he could breathe and speak very well without the tube; so I took it out, and the wound healed up, the patient continuing quite well.

REMARKS. I relate these cases, not because they present any features of novelty or unusual interest, but because I think that the operation of tracheotomy requires to be continually presented to the attention of the profession, believing that many cases which are lost might be saved by a timely resort to it, and that no other operation is to an equal extent deprived of its legitimate opportunities of doing good. We are continually hearing of fatal results which there is much reason to believe might have been averted by it, or of cases in which it was resorted to only when the patient was past hope. It is not in itself a dangerous operation, provided it be done with care, and provided it be done before the patient's strength is so exhausted by the disease that he is unable to bear the slight shock of the operation, and to expel through the tube the fluids that collect in the air-passages. I grant it is often difficult to decide whether the affection has arrived at such a point that the operation is absolutely necessary. But what I feel is this: when, in laryngitis, or other disease of the upper part of the windpipe or throat, the breathing has become difficult, particularly if fits of dyspnoea are superadded at night, or when the patient lies down, far greater risk is incurred by omitting than by performing tracheotomy. Provided the patient has a fair amount of strength, the operation will in all probability be successful; and the disease, if it be of any ordinary kind, will subside spontaneously, requiring no further treatment. If, however, the operation be delayed till the patient's strength is exhausted by struggles for breath; till mucus has begun to collect in the air-tubes; till, in short, it is clear that he must die, unless some decided step be taken—then, indeed, tracheotomy may be called a desperate measure, which it may be the surgeon's duty to have recourse to, but which, if he considered only his own credit or the credit of the operation, he would gladly avoid.*

I do not see the necessity or the advantage of the trocars and other instruments which have been devised for making

the opening into the trachea. A scalpel answers the purpose sufficiently well. It will be found a very great convenience to maintain the opening by means of a double canula, one tube sliding within the other, so that it may be removed and cleared of mucus without disturbing the wound or distressing the patient. For want of this contrivance, the gentleman whose case has been just related suffered a good deal, both from the clogging of the tube and from the pain of removing and replacing it, as well as from the attempts to clear it whilst it remained *in situ*. In the following case, the fatal result may be attributed chiefly, if not entirely, to the same cause.

CASE III. One evening, I was summoned into the country to see a little girl, aged 3 years, the daughter of a medical man, whom I found struggling for breath, with blue lips and noisy inspiration; the noise proceeding apparently from some obstruction in the larynx. I learnt that, two months previously, soon after she had taken some broth, her father was attracted to the nursery by hearing her suffering under a seizure of dyspnoea, and felt convinced that there was some foreign body in the windpipe. Upon cross-questioning the servant who was present during the meal, he found that the child had suffered a slight fit of choking while swallowing the broth; but it had passed off, and no more had been thought of it. His suspicions were confirmed by an examination of the remains of the broth, which showed that it had been imperfectly strained, some pieces of bone being left in it. The attack of dyspnoea soon subsided; but ever since that time the child had not been quite right, not breathing or speaking with the same ease as formerly; and she was the subject of occasional attacks of dyspnoea, which, however, were not very severe. As she got no worse, the father began to hope that his apprehensions were unfounded. On the morning of the day on which I saw her, she had been out in the cold east wind. In the afternoon, the dyspnoea came on, and had increased up to the time of my arrival at 11 P.M. It was a question whether there was any foreign body in the trachea or larynx; but there was no question as to the extreme urgency of the symptoms, and the necessity of at once opening the trachea, which I accordingly did without loss of time. I divided several rings of the trachea; held them apart with forceps, to allow any foreign body to escape; and made search for it with a probe in vain. I was glad quickly to insert the tube, and finish the operation, for the child, who was beginning to be in a depressed state before I began, was now very faint and weak. However, the operation had given immediate relief to the breathing; the little girl soon rallied, fell asleep after getting rid of some mucus, and was breathing easily and looking well when I left early next morning. All went on well till about five o'clock in the afternoon, when, the breathing becoming impeded by the clogging of the tube with mucus, her father removed the tube. The difficulty of breathing was immediately increased, and the little child died before he was able to clear and reintroduce the tube. On examination, I found a rough fragment of bone, of considerable size, sticking in the larynx, and obstructing the passage of air.

The chances of such a disaster were not to be again incurred. We had lately had a new set of tracheotomy tubes at the hospital. We sent them all back, and had double ones constructed. Dr. Trousseau observes, that the double canula is absolutely necessary; and he goes on to say, "Truly, when we see in what language Van Swieten insists upon the necessity of a double tube, we ask how this precept has been forgotten, and how, in spite of the recommendations of Dr. Bretonneau, we have ourselves remained several years without using it."

CASE IV. A stout, moderately healthy woman, aged 50 years, was brought to the hospital May 19th, 1855, with the ordinary symptoms of tetanus, of eight days duration. The only external cause to which it could be attributed was a chronic ulcer, of the size of a half-crown piece, just above the right outer malleolus. The spasms affected the neck and body to a certain extent, but were much more severe in the lips, fauces, and larynx. When they were at

* I must refer to an excellent lecture on "Tracheotomy in the Last Stage of Croup," by Dr. A. Trousseau, contained in the *Med. Times and Ga.* for Jan. 5th, 1856. It well deserves attentive perusal. It has always appeared to me probable that laryngitis and croup, though really distinct diseases, are, in the case of children, very often confounded, and classed together under the latter name; and that, consequently, tracheotomy, which must be less successful in croup, where the trachea and bronchi are apt to be blocked up with lymph, has fallen into unmerited disuse in laryngitis also.

their height, she could not breathe, owing to the firm closure of those parts. She struggled hard, and turned blue in the face. They came on whenever she dropped asleep or lay down; also whenever she attempted to expectorate the mucus which collected in the air-passages, and gave great trouble. As she was decidedly getting worse, in spite of the various means adopted to relieve her, I determined to try the effect of opening the trachea, which would at any rate remove the apprehension of choking, and might afford a more easy outlet for the accumulating mucus. This was done on the 21st, while she was under the influence of chloroform. Rather a severe spasm came on when she was recovering from the anæsthetic state. After this, there was no return for four hours. Previously to the operation, the intervals between the spasms had not exceeded a quarter of an hour. When they returned, they were less frequent, less severe, and unattended with difficulty of breathing. A good deal of mucus was voided through the tube. On the whole, she was more comfortable, had some sleep, and took a pint of beef-tea, besides wine and arrow-root.

Soon the spasms returned with their former frequency; the progressive loss of strength continued; and the crepitations in the trachea, bronchi, and smaller air-tubes, with shortness of breath, indicated that disease was going on in the lungs. To meet these symptoms, acetum canth. and blisters were applied, to no purpose. She died on the 23rd. We found general congestion of the lungs, with circumscribed spots of solidification and interstitial suppuration. In one place was a collection of dirty turbid pus. There was also yellowish dry lymph upon the surface of the pleura on one side. No appreciable disease of the nervous centres was present.

REMARKS. The operation did about as much as was to be expected in this case, by divesting the spasms of their most distressing feature—the stoppage of the breath; and had it been resorted to earlier, its good effects might have been more decided. There is no doubt that in tetanus and other allied affections the immediate cause of death is sometimes the suspension of respiration, by the spasmodic closure of the larynx. I have seen a tetanic patient die in this way. An opening in the trachea may, for a while, avert this result in some cases, may render swallowing less difficult, and afford a little longer time for the trial of other remedies. But no more than this is to be expected; and it must be a question whether for this it is worth while to subject the patient to the operation, even under chloroform. If we had surer means of combating the complaint, there would be some encouragement to adopt this proceeding, with the view of endeavouring to extend the patient's life, and give them a better chance of acting.

In this case I observed a circumstance, which is noticed in the lecture by Dr. Trousseau, above referred to,—viz., that the liquids which the patient took into the mouth passed through the glottis and escaped at the opening in the trachea, through and beside the canula. I then thought it depended upon some peculiarity in the patient or the nature of her malady; but that physician and Dr. Archambault have noticed it in several cases, and believe that it has often been the cause of death after tracheotomy. They attribute it to the patient's having, in consequence of breathing through the canula, lost the habit of freely using those muscles which serve for the occlusion of the larynx, and those which push the food into the œsophagus. To meet the difficulty they forbid liquid food, giving thick soup, etc., and suggest the momentary closing of the canula with the finger whilst the patient swallows.

After writing the above, I received from a very intelligent surgeon in this neighbourhood a larynx with inflammation of the mucous membrane, and superficial ulceration, accompanied by the following history, which I give, with his permission, as it illustrates in a remarkable manner the danger of delay in such cases:—

"A man, fifty years of age, very active, healthy, and strictly temperate, attended his meeting three times on

Sunday last, ate his supper as usual, and went to bed in perfect health. He awoke in the night, was chilly, and afterwards slightly feverish, but complained very much of his throat, with difficulty of breathing. He again slept until four or five in the morning. At six he jumped suddenly out of bed, apparently nearly suffocated. I saw him in about twenty minutes in bed, breathing with difficulty; the fauces looked slightly inflamed; no cough; pulse perfectly quiet. In fact, he said he felt perfectly well, with the exception of tightness over and below the thyroid cartilage. I should say the breathing was stridulous or croupy, and some degree of hoarseness. I looked upon it as a case of laryngitis, gave tartar emetic, which emptied the stomach, applied spirit of turpentine to the front of the throat, and ordered two grains of calomel to be taken every hour; at ten I saw him again, found him much the same, or perhaps a little better; an abundance of viscid sputa about the fauces; at twelve, after talking with his friends, he was again seized with an attack similar to the one at six, called out for air, and died in a few minutes—about a quarter of an hour before I could get to the house, or I would have opened the larynx. Ought I not to have done so earlier?"

CITY DISPENSARY.

CASES ILLUSTRATING THE PHYSICAL SIGNS OF INSUFFICIENCY OF THE AORTIC VALVES.

By JOHN COCKLE, A.M., M.D., F.R.A.S., Member of the Royal College of Physicians, Physician to the Dispensary, etc.

STRUCTURAL alterations of the valvular apparatus of the heart vary both with respect to the amount of implication of the muscular tissue of the organ and the existing symptoms, as they occur at different periods of life, and under the influence of exciting causes of greater or less intensity. Thus, for example, up to the completion of the first half of life there probably exists a greater proclivity to active inflammatory excitement of the pericardial and endocardial structures; and the chambers of the heart become ordinarily increased in bulk and capacity, one or both, as a consequence of the irritation and subsequent paralysis of the contractile fibre induced by such inflammation spreading over a large surface, and very frequently persisting in a subacute form. During the second period of existence, on the other hand, the pathological changes are usually simply those of perverted nutrition, consisting of thickening of the endocardium, or are limited to the induration or calcification of a single valve or its neighbourhood, and characterised, unless such change be extreme, rather by an absence of subjective phenomena than by any active signs of cardiac irritation or hypertrophy. This activity or latency of the symptoms of valvular disease, as occurring at different phases of life, was well pointed out by Bichat (*Anatomie Générale*, tome ii, p. 55).

The following cases are offered as illustrations of the distinction adverted to, with respect to the aortic valves, as also of the direction of the murmur which revealed the change in question.

CASE I. *Insufficiency of the Aortic and Mitral Valves: Dilated Hypertrophy of the Heart: Emphysema of the Right Lung.* Charles Pipe, aged 29 years, admitted Dec. 6th, 1855. He had rheumatic fever two years ago. Since which attack, he has suffered from palpitation of the heart and occasional dyspnoea. At the present time, in addition to these symptoms, he complains of pain over the upper sternal region and in the left shoulder, attended with a frequently recurring sensation, as of cold water trickling down the back, constant sense of dyspnoea, and dry cough. His ankles are swollen; urine clear and copious; his appetite is good, and he sleeps well.

Inspection. Face anxious and somewhat pale; nares rather dilated; conjunctivæ injected; slight distension of jugular veins; no abnormal pulsation of any of the super-