tions; but two or three yellow spots, the size of a pea, are scattered over its surface. She is recommended to keep quiet in bed, and continue the aperient medicine.

Dec. 1st. The old lady has been down stairs in her chair for some days; the ulcer having completely healed, and the evacuations proceeding quite naturally by the aid of gentle aperients; but she complains of pain in the upper regions of the abdomen, with much flatulence and sense of tightness, especially after food. The tumour is well supported by means of a handkerchief, and no topical application is used.

REMARKS. The history of this case appears pretty clear, viz., that an umbilical hernia has existed for at least fifteen years, increasing gradually, until at last it arrived at its present enormous size, gradually distending the abdominal parietes to suit its dimensions. The fall which she received a month before the date of the commencement of the case, in all probability would cause inflammation of the parts; and from such inflammation it is likely that adhesion may have been formed between the sac of peritoneum and the abdominal parietes, these structures at the same time thinning, until at last the rupture took place, and ulceration was established by the irritation of the acrid products which escaped through the opening in the bowel. But when I look at the case as it now stands, I feel incapable of accounting satisfactorily for the process by which the opening has been closed, and the natural course of the excretion established. I must therefore apply to it that ancient and useful term, *vis medicatrix nature*, for the want of a more scientific explanation of the subject; simply adding my conviction, that it has been effected by the edges of the ruptured intestine becoming adherent to the parietes of the abdomen, the continuity of the bowel being kept up by the granulations thrown out from the ulcer.

Although I cannot find an analogous case recorded by any author, either ancient or modern, yet I have received much instruction and gratification from perusing the work of Mr. Travers, entitled *An Inquiry into the Process of Nature in Repairing Injuries of the Intestines*, to which I would refer those who are desirous of prosecuting the study of such like complex points of our profession.

ORIGINAL COMMUNICATIONS.

PARACENTESIS THORACIS: WHEN IS IT JUSTIFIABLE?

By DANIEL H. TUKE, M.D., Visiting Medical Officer to the York Retreat, Physician to the York Dispensary.

[Read before the York Medical Society, Feb. 10th, 1855.]

[Concluded from page 1092.]

HAVING attempted to determine the period of effusion after which expansion of the lung is hopeless, by a reference to *post mortem* examinations, we ought next to inquire what information we can derive from an examination of the living subject suffering from effusion, at various periods of the disease: and here I may state, that it has been extremely difficult to find the records of many cases in which copious effusion had been present for some weeks or months, and in which the return of the lung to its natural size and condition is stated to have occurred.

Of the thirty-eight cases already referred to, reported in the *Medical Times and Gazette*, the great majority of those in which the lung re-expanded, were examples of recent, although very copious effusion. In one case, the lung appeared to have recovered itself after an effusion of three months; but, in the other examples of recovery of the lung, the period was much shorter.

In one case reported very carefully, there can be no doubt that the patient (12 years of age) had been suffering for many weeks from effusion before admission; and as he

was ten weeks under treatment, and there was some contraction of the chest even when first seen, which, however, subsequently disappeared (the lung re-expanding), it cannot be doubted that this is a fair example of a patient having one pleura nearly full of fluid for at least several months, and yet regaining the almost entire use of the affected lung.

In another case, of much shorter duration, under the care of Dr. Burrows, a woman had been ill with pleurisy about a month; and, on admission, the right pleura was found to be full of fluid up to the third rib, and there was even evidence of depression of the right half of the diaphragm. Three weeks afterwards, she was discharged, with the lower fourth of the pleura still full of fluid. Two months afterwards, she was examined, and the process of absorption was found to be complete, and the lung had quite recovered itself.

Dr. Hodgkin has favoured me with the following, in reply to an inquiry:—"In some cases," he says, "in which all the signs of pleuritic effusion had been present long and extensively, and even when marked contraction of the chest has followed, the return to the healthy state has been complete and satisfactory."

"In one of these cases which I now recollect, the patient, a gentleman of middle age, came to me from the country, when the affection was already of some months' duration. His convalescence was slow, his general health having much suffered. There was marked contraction, and little use of the affected side. After some years, I was referred to, in consequence of his desiring to effect an assurance on his life. My reply was such as would deter any office from accepting the proposal; for I believed the side to be so far from being in a condition to sustain life, that, if the other were to be attacked, there would be little probability of his living. The medical examiner of the office, however, found him in so satisfactory a state that, in spite of my report, he was inclined to recommend the life; and it was determined by the directors that I should see and examine my former patient. I did so with great pleasure and satisfaction. My doubts were quite removed, for the affected side had become resonant, and had acquired freedom of motion; the sound of respiration was good, and the full measurement almost restored."

"A similar case is that of a young lady, in whom chronic pleurisy was followed by great retraction. After some years, the recovery was equally satisfactory; and the opposite side having been attacked almost as severely as the first, the recovered lung had its powers put to a severe, but satisfactory test. This lady is still delicate, as she was previously; but both sides of the chest are performing their functions, after the lapse of about twelve years from the first attack."

An essay by the late Dr. Hope contains the record of a large number of cases in which mercury is stated to have effected the removal of the fluid; but there is great doubt as to the nature of many of these cases, how far pneumonic or pleuritic; and, from the contraction of the chest, and the drooping of the shoulder which followed the so-called recovery of many cases, it is clear that in these the lung did not re-expand. The views of Dr. Hope, as expressed in this essay, are characterised by the *British and Foreign Med. Review* as "one-sided and imperfectly established."

Of those cases recorded in the *Medical Times and Gazette* in which paracentesis was performed, the longest period which elapsed between the first attack of pleurisy and the operation, and in which the lung recovered itself, was four months; although here there is no sufficient evidence to prove the precise date of effusion. The patient's age was 18; and, five weeks after the operation, resonance and healthy respiratory murmur were found to have returned.

Of the 24 cases which occurred under the observation of Dr. Roe, the longest period which elapsed between the attack and operation was three months eight days; the pa-

* This was not his own patient. He has already been quoted as mentioning five or six weeks as the longest period he has known compression from effusion, and recovery, in his own practice.

tient's age was 5½ years: 43 oz. of pus were in the first instance drawn off, and 38 oz. subsequently. Respiration gradually returned over the whole of the affected side; at the end of three weeks, the heart had regained its natural position, and the boy appeared perfectly well.

In four cases, one month and twelve days elapsed between the attack and operation; in three of these, nearly perfect recovery of the lung followed; in the fourth, contraction of the chest followed, and little or no respiration could be heard on the affected side. In these four cases the effusion was serous in character. In the other cases of recovered lung, the date of effusion was one month and under.

Of the whole cases operated upon, then, to which I have referred, I am unable to find one in which, with an effusion of more than four months duration, the lung re-expanded; and in the case in which four months are stated to have elapsed between the attack and operation, the assertion only rests on the patient's account of his own symptoms. On the other hand, in cases of longer duration, either death is stated to have resulted, or recovery of health with the deformity of a contracted chest.

In some of these cases the effusion was serous, in others purulent; the latter occurred in the two examples of the longest duration; but we may suppose that a lung would be much more likely to recover itself in those cases where the effusion remains serous; and, whatever may be the general rule, no doubt the experience of most practitioners will furnish them with examples of perfect, or nearly perfect recovery of the lung, after a copious effusion of longer duration than those I have recorded; but still such an event must, I think, be regarded as exceptional.

Closely connected with this part of the subject, is the question, When does serum usually become converted into pus? A question of great importance, because it is frequently impossible to diagnose from the symptoms the character of the effused fluid, and because our hope of the recovery of the lung would be materially influenced by our knowledge of what is the general rule in this particular.

We have not, however, time to enter fully into this subject. The diathesis of the patient and the condition of his health must very frequently determine the time at which serum becomes converted into pus, and hence it would probably be impossible to arrive at any general rule. The longest period I have been able to meet with at which serum, the result of inflammation, retained its serous character, is seven months.* On the other hand, a large number of cases have occurred in which pus was found at a very early period of the disease.

Dr. Townsend† relates a case in which a young woman, after experiencing for twelve days before her death the symptoms of most violent inflammation of the pleura, was found, on dissection, to have nine pints of thick inodorous pus in the right pleural sac. Andral‡ relates a case fatal on the eleventh day, in which the right side was found so filled up with pus that the lung was completely condensed and flattened against the spine. Piso§ mentions several cases of patients dying on the fifteenth, and some even on the ninth day, with their sides full of pus. But these must be regarded rather as interesting examples of acute empyema of very unusual occurrence than as examples of the ordinary conversion of serum into pus.

There is another collateral question of importance as bearing upon the general subject. Is an empyema often absorbed? But it is one difficult of solution, from our having no very certain proofs of the nature of the fluid effused when it does not make its way through the parietes of the chest, or the bronchial tubes.

Many writers have denied the possibility of such absorption. Laennec states that the disease has seldom any natural tendency towards resolution; and this statement, observes Dr. Townsend, has been so confirmed by the experience of modern physicians, that doubts are now very

generally entertained whether the fluid is ever removed by absorption in cases of genuine empyema. It is difficult, however, to see why pus should not be absorbed from the pleura when it is now generally admitted it can be absorbed from other parts of the body.

I would briefly refer also to a *post mortem* examination made by Dr. Kirkes, which appears to afford an example of absorbed empyema.* A girl, aged 10 years, died of fever two days after her admission into St. Bartholomew's Hospital. On examination, the left pleura was found to be thickened, and its two layers adherent by loose bands of lymph. In the most dependent part of the sac, and surrounded by a dense capsule of false membrane, was a quantity of concrete pus, amounting to about the size of a walnut. No form of tubercle, beyond a few miliary tubercles in the apex of the lung, was discovered in any organ.

Another very similar case is reported to have occurred at St. Thomas's Hospital, under Dr. Barker.

Dr. Peacock has been kind enough to furnish me with another example. "Some years ago," he writes, "I examined, after death, a man who had been an inmate of the Cheshire Asylum for several years, and was not known to have ever had anything the matter with him while there, in whom the left lung was found entirely compressed, and the pleura converted into a small sac lined with firm fibro-cartilaginous false membrane, and a small quantity of fluid in the centre, shewing that an old empyema—I might say, a very old empyema—had ultimately been absorbed."

But while these cases, and *à priori* reasoning, render it highly probable that an empyema may be absorbed, I think it will be admitted that this is the exception, and that one of two things much more frequently happens, viz., spontaneous escape of the purulent fluid through an opening in the chest, or through the bronchial tubes. "Laennec states, that the spontaneous evacuation of the matter of an empyema is more frequently effected by rupture into the bronchi than by ulceration through the walls of the chest; but, on comparing the records of those cases which have been published in this country as well as in France, it appears that their comparative frequency is pretty nearly equal."†

In the former event (escape of fluid by an external opening), the pleura, the lung, and often the ribs and cartilages, are subjected to injurious morbid changes in their structure: in the latter, pneumo-thorax is almost certainly established, and in both the constitution runs imminent risk of giving way; and uncured pleuritic effusions are, remarks Dr. Hughes, "very liable to terminate in phthisis."

The question naturally arises: "Ought we to anticipate these events by a resort to paracentesis, when we believe the effused fluid is purulent?" The operation has, however, been so generally resorted to in a very late stage of the disease, that experience hardly suffices to answer the inquiry. Thus much, however, we know, that when from the pressure of urgent dyspnoea the operation was resorted to early on in the disease, the cases did well, not only in regard to recovery of lung, but also restoration to health.

One word may here be said in regard to the danger attending the operation; for the opinion we entertain of this will materially influence our willingness to resort to it. In not one of the cases to which I have referred did alarming symptoms follow the operation. The immediate effects of paracentesis cannot, therefore, be urged against it. That instant death has followed from an error of diagnosis, I am well aware; but this circumstance can hardly happen now that auscultation enables us to decide with certainty upon the presence of fluid in the chest. The use of the grooved needle also is resorted to by most operators to lessen the consequence of any error of diagnosis. But although we cannot reasonably fear the direct consequences of the operation, it does not follow that the ultimate results are so innocuous. In some cases which I have examined, I find that at the first operation the fluid was serous, while at the second it was purulent; rendering it probable, though

* *Vide Medical Times and Gazette*, loc. cit.

† *Op. cit.*, p. 32.

‡ *Op. cit.*, p. 32.

§ *Op. cit.*, p. 32.

* Reported in *Medical Times and Gazette*, 1854.

† Dr. Townsend, in *Cyclop. of Pract. Med.*, vol. ii, p. 22.

not certain, that the conversion was due to the admission of air into the pleural cavity. It seems, however, possible to prevent by very simple means the admission of air; and certainly, whether in reference to this, or any other similar incidental source of danger, we are bound, in judging of the operation, to assume that it is performed skilfully, and with proper precautions.

Having thus very imperfectly considered some of the principal points connected with the subject before us, I may submit the following conclusions as deducible from an examination of the cases I have referred to:—

1. It is impossible to determine the precise period when the lung becomes irremediably damaged by effused fluid—as this must depend to some extent upon the individual case; but it can be proved to take place in a period of certainly not more than one month and nineteen days. On the other hand, the longest time a lung was subjected to the pressure of a large amount of fluid, and yet recovered itself, was four months; but in the great majority of cases, the lung lost its power of re-expansion long before.

2. That in regard to the danger of serum becoming converted into pus by delay, it can be shown that serum, the result of inflammation, may remain such for seven months; but that, on the other hand, the conversion may take place in a very early stage of the effusion.

3. That when the serous effusion has become purulent, we are not justified in expecting absorption, although such an event has occasionally occurred; but must expect the matter to make its escape either by ulceration of the walls of the chest, or of the pleura pulmonalis, producing pneumo-thorax and expectoration of pus.

4. That the mortality per cent. in the cases operated upon (a large number of them apparently desperate cases) was 30.4, and only 26 per cent. in the cases of genuine empyema; that with regard to the non-fatal cases, some would doubtless not survive long; but that a fair proportion completely recovered, and that the most successful results were obtained when the operation was resorted to in an early stage. In some cases, immediate and permanent relief was obtained when death seemed imminent from suffocation. In none did the operation cause fatal results—facts which are much more encouraging than might have been expected from the experience of some other operators. Boyer performed the operation several times, but never saved a patient. Dupuytren saw only two successful cases in fifty. Sir A. Cooper saw only one successful case. Gendrin had not one successful case out of twenty in which he operated.*

5. In regard to the main question of the essay—it appears to be incumbent to resort to paracentesis when the dyspnoea is so urgent as to threaten death, whether it be in an early or a late stage of the effusion, and whether that effusion be serous or purulent.

Cases of mechanical hydro-thorax, or cases in which the effusion is complicated with phthisis, malignant disease, etc., in which the symptoms of asphyxia are urgent, and in which an operation can afford only temporary relief, may perhaps be regarded as analogous to cases of phthisis, in which, from the larynx becoming involved, suffocation is imminent, and tracheotomy alone can prolong, though it cannot save life.

It likewise appears to be reasonable to employ it when we feel satisfied that the effusion is purulent, and the patient is obviously losing ground. "It is," says Mr. Cock, Surgeon to Guy's Hospital; "it is from an early application of the trocar that a successful result must be anticipated, and it is the delay until the pressure of the fluid becomes indicated by external physical signs which has so often led to disappointment in the issue of the case."

How far, however, when a patient is in moderate health, and has a large collection of fluid in his pleura, uninfluenced by absorbent and other remedies pursued for many weeks; how far, I say, we are justified in endeavouring to anticipate the time when the lung will be irremediably

compressed and bound down, by tapping the chest, is a much more difficult question; but, on the whole, I think that, unless we have strong grounds for believing the fluid has been converted into pus (judging of this more by the condition of the patient than the period of the effusion, important as this circumstance would be as an auxiliary), it would be rash to resort to paracentesis, especially when we know that occasionally large effusions are unexpectedly absorbed when remedial treatment has been regarded as hopeless. Dr. Hughes, however, says, "My own experience and consideration induce me to believe that it is preferable to tap the chest as soon as all hope of the future beneficial operation of remedies has disappeared; and, if possible, before the effusion has been converted from serum into pus."

To conclude, in reviewing the whole subject, and comparing more recent results with those formerly obtained, and admitting to the full the danger of too hastily resorting to operative interference, the expectations of Laennec have, I would submit, to a great degree been realised, when he said, "that the operation (of paracentesis) would become more common and more frequently useful in proportion as the employment of auscultation is extended."

TRACHEOTOMY IN QUINSY, AND RAPID RECOVERY.

By W. H. BORHAM, Esq., Senior Surgeon to the Paddington Dispensary.

DR. PRIOR, of Bedford, in the JOURNAL for November 16th, page 1034, says, that he had a patient "with enormously enlarged tonsils; when scarlet fever supervened, symptoms of asphyxia began to show themselves, and whilst in the act of applying leeches to the throat the patient was seized with convulsions, and expired. Had there been time, the operation of tracheotomy would have been justified; nor would its execution have exercised an unfavourable influence upon the primary disease." I quite agree with him, and think the following case will strengthen his prognosis. The above remarks of Dr. Prior also lead me to open the case with a few preliminary observations which have occurred to my mind since reading them.

In all cases of surgery requiring the important operation of tracheotomy, the great and most desirable point to be displayed by the surgeon is, judgment as to the precise time of executing the operation. The nature of the disease or accident, the rapidity of their course, the tone of the system, and the probable results of the operation, are to be weighed, and carefully balanced by the surgeon, and ought to receive prior claims of consideration to the mere mechanism of the operation itself.

Frequently we see the very worst operators turn out the most successful cases; and I am inclined to believe that the case is studied more than the operation: and it is thus that it becomes so successful, from a sound opinion being formed. Expert and beautiful operators are often induced to sink their judgment in their dexterity for the *éclat* or applause of a wondering class. On the other hand, many combine the judgment of a good surgeon with the skill of a calm and expert operator; and this ought to be the climax of ambition to the young surgeon.

In cases that require the operation of tracheotomy for disease, how is the surgeon to form an opinion as to the exact moment at which the operation is to be resorted to? We have seen many cases of croup, where we have momentarily expected death, recover; we have seen cases of quinsy, so severe as to threaten instant suffocation, recover; we have seen the severest forms of scarlatina anginosa threatening asphyxia recover; and we have seen recovery where the tongue so enlarged as to threaten the blocking up of the natural apertures of respiration: and, on the other hand, we have seen cases similarly attacked die. Are we to allow our patients to die, that we may gain experience as to the most desirable time to select for operating? On the other

* Dr. Bennett: vide Lancet, Dec. 30th, 1843.