Dr. Landry's narrative is followed by remarks of Professor Gubler, which conclude by a statement to the effect that a paralysis similar to that which occurs as a sequel of diphtheria may supervene as a secondary result of numerous maladies very different from one another, but all producing exhaustion of the nervous system, impoverishment of the constitution, and a lowering of organic power—conditions favourable to the production of permanent disorder of the innervation. On the appearance of this case, Dr. Macario of Nice laid claim to priority in a communication published in the *Union Médicale* of Paris for Nov. 8th, 1859. He there gives the details of four cases of pneumonic paralysis. Dr. Macario's cases are given in his work on *Dynamic Paralysis*, which received a meed of honour from the Academy of Sciences of Montpellier, and was published in the *Bulletin Général de Thérapeutique* for December 1850. Many authors, writing before and since that date, have described cases of pneumonic paralysis. To priority in the publication of such cases, Professor Gubler lays no claim. The important claim to priority which he does put forth is thus expressed: "Le seul mérite que je puisse revendiquer est d'avoir le premier, je crois, élevé au rang de fait général la production des paralysies généralisées comme effet secondaire de toutes les affections de courte durée, vraiment dignes par leur intensité du titre de *maladies aiguës*." He explains that, under the term "acute diseases" (*maladies aiguës*), he includes only the diseases properly designated fevers and the inflammatory diseases accompanied by fever. Professor Gubler has, I think, succeeded in establishing his proposition that all the diseases embraced in his restricted category of "acute" may induce local or general paralytic affections during their evolution and after the cessation of their active manifestations.*

A similar opinion is expressed by Dr. E. Fritz in his valuable work on the different symptoms referable to the spinal marrow which frequently occur in the course of typhoid fever. He strongly dissents from a view put forth by Drs. Lombard and Fauconnet of Geneva, to the effect that typhoid fever, to the exclusion of other acute diseases, possesses a monopoly of spinal symptoms. He admits that, in various forms and degrees, they (including paralytic affections) occur in the course of, as well as during convalescence from, erysipelas, pneumonia, pleurisy, and bronchitis.†

[To be continued.]

ON PLEURITIC EFFUSION.

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[Concluded from p. 705 of last number.]

THE foregoing rules of treatment have been given for those cases in which urgent symptoms do not exist to demand a more speedy removal of the effusion, and when the slower process can safely be tried. But there are many examples of this complaint, when, from various reasons, other and more effective means cannot be delayed. I, therefore, now approach the consideration of that which is by far the most important remedial measure in pleuritic effusion, viz., *paracentesis thoracis*. It would be out of place here to enter into any lengthened detail of the history of this operation, as much information has been latterly given by others on this head, and *thoracentesis* has been supported by far more advocates than it formerly attracted. In passing, it may be briefly observed, that paracentesis has been practised from very remote ages, having, like many therapeutic agents, been at times almost abandoned, and then having been had recourse to again. We must go back to the school of Hippocrates for the chest having first been punctured; and it is strange that the great and manifest benefits which result from this, a comparatively simple operation, and really an operation attended with little or no danger, should have not been rendered more available. Hippocrates describes the symptoms which necessitate the perforation of the chest, but the father of our art had not the preciseness of diagnosis which discoveries and accumulated experience have given to the modern physician. The Hippocratic schoolmen knew not the difference between hæmorrhagic, purulent, and hydrothoracic effusions, nor yet between these and pneumohydrothorax. They relied upon succussion. The physical signs, which to us are exact exponents of the hidden state of things, were to them unknown. Galen merely followed Hippocrates. Celsus gives the operation no prominence. In fact, the Greeks, Romans, and Arabians, allowed it to fall into desuetude. In the sixteenth century, that epoch renowned for the revival of science, as it is renowned for the culmination of letters,

opening the chest was once more brought into notice. Fabricius advocated paracentesis, and observations made on penetrating wounds strengthened arguments in its favour. Bontius and Bartholin took up the question, and much was said relative to the introduction of air into the pleural cavity. In the seventeenth century, Gerome Goulu, Zacutus Lusitanus, Willis, and Lower, mention cases of paracentesis. About this time, Drouin used a trocar, and a hundred years later, Leirde advocated the use of the same instrument. The introduction of the trocar was, however, withheld, from a false fear of penetrating the lung. It could not be decided, as we can now decide, when the lung is in juxtaposition with, or when it is pushed away, from the chest-wall. The discovery of Laennec conferred a certitude in this as it conferred a certitude in many other points in thoracic pathology, and a sure and an enduring basis was laid for the more extended employment of thoracentesis; in fact, the stethoscope inaugurated a new era in the treatment of pleuritic effusion. At the beginning of the present century, the evacuation of liquid from the pleural cavity was rarely ever had recourse to. A few sparsely narrated cases may be found in medical literature, but the great usefulness of this expedient had no hold on the general professional mind. Not only, as I have already remarked, was there a dread of penetrating the pulmonary substance, but there was a dread of fatal syncope, and a dread of the admission of air into the sac. Hamilton Roe, in his excellent monograph, which did much good service in recalling attention to this question and to the re-establishment of the operation, remarks that Boyer, Dupuytren, Cooper, Laennec, Gendrin, and Stokes, were opposed to it. Such high names would doubtless weigh with many, and form no mean barrier to the progress of this potent remedial measure. To Roe, Davies, Trouseau, and Hughes, and, it may also be said, to Bowditch and Morill Wyman, is mainly due the credit for having brought into comparatively common practice the puncturing of the chest-wall, and thus the observance of a curative means which can hardly be over-highly estimated, as it is beyond all dispute that many lives are now saved which even twenty years ago would have been sacrificed to inertness and the let-alone treatment.

Paracentesis thoracis may be contemplated in reference to two objects being attained by its use; and these are, when a curative and when a palliative result is expected. We sometimes have recourse to it when recovery seems out of the question, and when there are such complications as to indicate an approaching fatality. It may then be the means of affording relief to urgent suffering, as when there is dyspnoea with threatening of orthopnoea, and also of extending life. In those instances in which we hope for a cure, it should always be held in mind that the success of the operation must greatly depend upon the condition of the system generally, upon the amount of strength, and the state of the visceral organs. Louis long ago pointed out this fact to be held in view. Impairment of the digestive and assimilative functions retards the well-doing of the patient; and, if there be renal disease and a lowered tone in the vital powers, the issue becomes very doubtful. It is beyond dispute that it is, like tracheotomy, far more successful when employed early than when employed late; as I have already remarked, before false membranes and fibrinous deposits bind down the lung and become organised. It is generally difficult to determine the precise time when operative interference should be tried. There is mostly a desire, not only on the part of the physician, but on the part of the patient, to give other and milder remedies a chance. If this waiting for the effects of medicines be protracted, much valuable time may have been lost. It is well that the inflammatory and more acute symptoms be first subdued. Hamilton Roe thought the fluid should not be left beyond the third week, as he believed that no real cure resulted if it were deferred until the fifth or sixth week; and Tuke of New York believes that re-expansion of the pulmonary substance may take place even at the end of between two and three months. There is, however, no occasion to wait such length of time when we see the patient from the setting in of the acute stage. But it often happens that cases go on for weeks before a decision is come to as to the operation. Absorption has been waited for, or, what not unfrequently occurs, the presence of the fluid has been overlooked. Sometimes it accumulates in an insidious manner, and I have known instances where effusion has long existed without any suspicion whatever of any collection in the pleural sac. I believe that no hard and fast rule can be laid down as to the period when the lung will re-expand; its expansion is dependent on many circumstances. When we know the fluid to be purulent, as may be ascertained by a grooved needle or the aspirator, there need be no hesitation in our resolve. It would be sheer folly to lose any time after such fact was demonstrable.

I have remarked that two fears have been entertained which have opposed the more general use of thoracentesis; and these have been the fear of syncope following the operation, and the fear of the admission of

* Gubler (Adolphe): Des Paralysies dans leurs rapports avec les maladies aiguës, et spécialement des paralysies asthéniques, diffuses, des convalescents. (*Archives Générales de Médecine*: 1860.)

† Fritz (E.): *Etude Clinique sur Divers Symptômes Spinaux observés dans la Fièvre Typhoïde*, 8vo, pp. 186. Paris: 1864.

air into the pleuritic cavity. I have never known any danger attending the operation. Paul speaks of the perfect harmlessness of thoracentesis (*Bull. Gén. de Thérap.*, lxxxi, 83). Dr. Evans, in an elaborate article in vol. ii of *St. Thomas's Hospital Reports*, asserts that, out of eight hundred and twenty cases which he had collected, in two only did death follow the operation. Another writer declares there is no more risk in thoracentesis than in bloodletting. Anstie says, with modern instruments, there is no danger of wounding the viscera, and thus producing syncope, as it has been dreaded, by hæmorrhage.

The evil consequences of the admission of air into this serous sac have been very unduly dwelt upon; nor do I believe that a moderate amount of air passing into the chest is followed by those deleterious effects which some have imagined. In the patient whom I saw in August last year, with Dr. Farrington of Penhurst, and in whom the purulent collection forced a spontaneous outlet through the bronchial tubes, air must necessarily have passed at once freely into the thorax, as pyopneumothorax supervened; but the patient improved immediately after the exit of the fluid. In other cases that I have known in which the same event occurred, the admission of air into the cavity seemed to do no harm. Numbers of cases of pneumothorax do well. Dr. Fuller (*St. George's Hospital Reports*, vol. v) says the admission of air into the pleural cavity is a fallacious dread. Again, he declares that all mechanical contrivances to exclude air are worthless; and he maintains that the admission of air is of no importance. Anstie asserts the almost impossibility of excluding air when the fluid is instrumentally drawn off. Trousseau quotes the opinion of M. Reybaud on this subject. The latter thus speaks on the point in question: "The introduction of air into the pleural cavity is an almost inevitable occurrence, and one, moreover, regarding which no anxiety need be entertained." We know that, in pyopneumothorax, the patients recover when constant and large quantities are admitted. Davies never saw the admission of air set up inflammation. Dr. F. Bird stated that, on the twenty occasions on which he had operated, air had been admitted; and that he had never noticed even uneasiness caused by it. Bergeret and Sutton contribute the same kind of testimony, and say air may be admitted without any evil effects. Though I fully coincide in the opinions of these authorities, yet, as it is so easy a thing to exclude air by placing the free end of a piece of gutta-percha tubing used with the trocar under water, I have generally done so. If air be not demonstrably harmful, there can be no advantage in letting it in when it can with such facility be in a great measure kept out.

It has been held in dispute, whether the chest ought or ought not to be emptied at the first tapping. So far as my own experience warrants the expression of an opinion, I believe it is well to take away as much fluid as possible at the first operation; nor have I ever observed any ill effects from so doing. Roe and others say the pleura may be emptied without danger. The fear of syncope being produced by the prop formed, as it were, by the effusion, being suddenly taken from the heart, is, I believe, more imaginary than real. In twenty-four cases operated upon by the last named physician, and in some of which pints of liquid were drawn off at one time, no tendency to syncope was observed. In cases in which the heart has been displaced beneath or to the right of the sternum, or when it has been pushed down towards the left hypochondrium, or it may be inwards and backwards, such dislocation, as I have already observed, cannot be effected without more or less twisting of the great vessels, and interference with free systolic and diastolic action; and fatal syncope is more to be dreaded when this vital organ is persistently pressed upon, than when it is assuming, or has quickly assumed, its normal position. I know of no instance in which sudden death followed tapping from such causes. Walshe says that, when thoracentesis is employed merely as a palliative in phthisis, the fluid may be drawn off by degrees. I cannot, however, see the advantage of this recommendation, as it is always desirable to discommode and harass the patient as little as possible. I have advocated the letting out of as much fluid as can be conveniently removed; but there is no need to be solicitous for the evacuation of the last drop, as such would in some instances give rise to a good deal of fatigue and distress. Again, there is always a certain quantity left in the cavity, which, when the case does well, is readily absorbed. It often happens, even when a moderate amount of liquid is removed, that the mechanical disturbance is very manifestly relieved, and that the absorbents then take on such activity of action as to accomplish the entire disappearance of the effusion. As Sir Thomas Watson remarks, it is very probable, when the serous membrane is stretched by its contents, that its natural absorbing power is much lessened. With the diminution of pleural tension, as Hughes and Cock long ago maintained, other remedies are rendered more operative. When the organism is relieved of an incubus of this kind; there seems to be a compensating energy instituted in functional action, just as we see, after paracentesis abdominis, and even after free punc-

turing of the legs in anasarca, how remedies will become effective, as, for instance, how efficiently diuretics will then act, after they have been long and fruitlessly tried.

Those conditions which may be regarded as the morbid states, and the positive and negative signs demanding the operation, may thus be concisely summarised.

1. In all cases in which inspection and the physical signs give evidence of a large quantity of fluid: when there are symptoms of compression of the lung, and there is manifest cardiac displacement.
  2. When there are urgent dyspnoea, an irregular pulse, and threatening of orthopnoea.
  3. When the affected side is smooth and rounded, and the intercostal spaces are effaced or protrude; when measurement proves bulging; when the dulness in the chest is complete, or demarcated, and absolute; when there is abolition of tactile fremitus; when there are bronchophonic voice, tubular breathing, and absence of breath-sound; when the patient can only lie on one side, or in diagonal position; and when there is the Hippocratic sign of succussion.
  4. When the exploratory needle proves the fluid to be purulent.
  5. If the heart be pushed from its normal situation, and the apex-beat be substernal or beyond the right sternal edge, or if it be thrust towards the left hypochondrium, or if it be lost; when it becomes presumptive that the organ has been driven inwards and backwards; and when on the one side the liver depends abnormally into the abdomen, and when on the other side the relaxed and down-pressed diaphragm so displaces the spleen that its free edge can be felt.
  6. When half the thoracic cavity is filled, and a month or so shows no proof of absorption, the longer the delay the less are the chances of expansion.
  7. In those exceptional cases of double pleurisy when both cavities become half filled with effusion, and dyspnoea shows the lung-space to be dangerously encroached upon.
  8. In pulmonary phthisis, when the accumulation of serous or seropurulent secretion causes distress, and when the other lung assumes the symptoms of bronchitis or pneumonia, the operation should at once be performed.
  9. In mechanical hydrothorax, it may be had recourse to, though with no object to cure, but with merely a view for a time to prolong life and to aid the action of medicinal remedies.
  10. In children, whose chest-walls are thin, and in whom the white tissues are more developed and confer greater resiliency to the thoracic parietes, and whenever there are certain evidences of fluid, it should without delay be evacuated.
  11. In hydropneumothorax, it may be generally with safety and benefit employed.
  12. Pointing externally should never be waited for.
  13. Under certain circumstances, repeated tapings are required.
- Much has been said and written relative to the place and mode of operation. There was an ancient practice of perforating a rib, as revived by Reybaud, and also of producing an eschar by the potential or the actual cautery. It is never advisable to injure the rib, because caries or necrosis may follow. Indeed, in old standing empyema, when tubes have repeatedly been inserted, and the periosteal covering has been continually pressed upon, caries is not an uncommon result, despite of all the care which has been observed. The modern place of election is always at a costal interspace. In passing, it may be mentioned that the grave mistake has been made of puncturing the sound side, when air of course instantly rushed into the cavity, compressed the lung, and caused sudden death. Sheer carelessness, or utter ignorance of the physical signs, could alone give rise to such a catastrophe. It would be well never to depend on inspection and the obvious increase of size in one side, because, in empyema and in long standing effusion, there may be costal approximation and thrusting down of the diaphragm on the side of the disease, rendering the thorax smaller; and the unaffected cavity may have become distended by the increased volume of the compensating lung, as I have before pointed out. Percussion and auscultation will always rightly solve the question. At some parts, there may be adhesion of the pulmonary tissue. That part should be avoided; and, as Dr. Williams very justly remarks, the spot for the introduction of the trocar should be determined by reference to physical signs, and any place should be avoided where there is not characteristic and absolute dulness on percussion. Laennec, Townsend, Stokes, and others, prefer the fifth or sixth interspace in front of the digitations of the serratus magnus. If there should be pointing, such ought to be the place of opening if it be low down, but not otherwise. Some have said the puncture should be at the most depending part of the antero-lateral aspect of the chest. When in this line the instrument is thrust in below the sixth interspace, there is some chance of wounding the diaphragm; and when too low, the abdominal viscera may be pierced.

Bowditch says the best spot is between the ninth and tenth ribs, in a line let fall from the lower angle of the scapula. But this physician goes on to say that, in selecting the precise intercostal interspace at the back, he usually chooses one about an inch and a half higher than the line on a level with the lowest point at which the respiratory murmur can be heard in the healthy lung of the opposite pleural cavity; and he adds that he has even tapped in the axilla or in the breast. Sometimes cedema renders it difficult to fix on the spot for penetration. It is then desirable to carefully press with the pulps of the fingers until the ribs can be distinctly felt. Davies has given the opinion that in all cases an exploratory needle should first be passed. I have not, however, been in the habit of adhering to this precaution, because, in a nervous patient, the introduction of two sharp instruments might seem to give unnecessary pain. When there is not an absolute certainty of the presence of fluid, to first push in a grooved needle may be very desirable. I prefer the flattened trocar, to which is attached, at the free end, a piece of gutta-percha tubing which is to be carried under water. No instrumental contrivance is simpler and more effective. The fluid is thus generally drawn off quickly and completely. On four occasions, I have recommended the use of the aspirator, which is really but the return to an old practice of drawing off the fluid by a syringe; and it is as old as Scultetus. The objections which I have found to the aspirator are, the long time it takes to get away a large quantity of fluid, and the consequent fatigue which is given to the patient. In case No. 14, it was used by my colleague Mr. Marsack. The instrument became far less easily worked towards the end of the operation; and such was the fact which I noticed on two subsequent times of its employment. In No. 16, the withdrawal of the fluid took a long time, when Mr. Bishop operated; and the patient became a good deal fatigued. When he was a second time tapped, Mr. Bishop used the ordinary flattened cannula, when the result was far more satisfactory. I must confess I have not, like others, found its superiority over the simple trocar. When the trocar is used, Reybaud's plan, as recommended by Trouseau, may be adopted, by tying a piece of gold-beater's skin round the mouth of the cannula, so as to form a valve or curtain, which allows the fluid to pass out of, and prevents the air from passing into, the cavity. The skin should be firmly stretched by the index finger and thumb; and a longitudinal incision about six lines in length, coinciding with the intercostal space, should be first made. This facilitates the insertion of the trocar. Care should be taken that the stilette be sharp. A blunt instrument may push forward the pleura, thickened and rendered tough and tense by the union of false membrane, when the operator would be balked. It should be passed quickly, and as closely over the edge of the under rib as can conveniently be done without lacerating the periosteum; and the curve should be slightly upwards, when the opening becomes somewhat valvular. It should not be pushed in further than to fully clear the chest-wall; but, when the stilette is withdrawn, the cannula may be sent in deeper. A broad bandage should be applied round the lower part of the thorax, when the diaphragm would be pushed up to resume its normal position. The patient's trunk may be made to incline towards the operator, or sometimes the operation answers the best when the patient is placed in the recumbent position. The orifice should be at once closed by means of a piece of carbolic plaster. The operation may be repeated several times. Bowditch says he tapped one patient eight times, and a lady he tapped nine times in eight months. In empyema, even when absorption has gone on after the first operation, it is often well to tap again. When the fluid is purulent, the orifice may be kept open, and the injection of warm water may be had recourse to two or three times a week. I know one instance in which the chest was thus washed out for some time daily, and the patient made a full recovery. Radenbacher records the case of a boy who was tapped, and whose chest was twice daily washed out with warm water; and he made a full recovery (*Deutsche Archiv*, vol. ix, p. 240). The late Mr. Stanley of St. Bartholomew's told me he had, in these cases, seen the best effects from washing out the cavity with warm water. I cannot give any such experience of medicated injections as to speak with any authority. Weak solutions of iodine and Condy's fluid have been by some employed.

In children, paracentesis can, as the rule, be performed with much and immediate benefit. In these little patients, the diagnosis is easier; the lymphatic exudations less rapidly become organised, and absorption is more actively carried on, than in the adult. The flattened trocar, as before recommended, is the best instrument. In children, when the parietes are stretched with liquid, they are so thin as not to require the longitudinal incision through the skin. Again, in them it is most desirable to avoid unnecessary pain. Drainage-tubes, when had recourse to in children, sometimes set up a good deal of irritation. When the effusion is purulent, as it so frequently is in children, it is a good plan to employ a small silver tube like that used by Mr. Marsack in case No.

17. It need not be longer than to fairly clear the chest-wall, and care should be taken that the inner edge be perfectly smooth. The accident of its slipping in can be guarded against by the outer extremity ending in a button-like shield from six lines to an inch in diameter. Kussmaul recommends that, in these cases in a child, a small silver cannula should be kept in. He also advocates the injection of sulphate of soda and camomile-tea, to prevent the absorption of pus, which, he believes, gives rise to tubercle (*Deutsches Archiv für Klinische Medizin*, 4, 1868). Eyelet-holes for the introduction of a piece of tape should be made at two opposite edges of the shield. This little instrument can then be firmly fixed, and thus little or no irritation is transferred to the chest-wall. The orifice of the tube can be closed by means of a piece of lint and adhesive plaster. These being taken off, the chest can, by the child merely leaning towards the affected side, be relieved of the accumulated secretion every morning, as this practice was with such advantage adopted in Mr. Marsack's case. This fixed shield also admits of the chest being freely washed out with warm water. The water can be injected by an ordinary syringe, and it will run out again by merely inclining the trunk to the position which favours its exit. When the effusion is of recent formation, and serous, one operation will often suffice and, even if the whole of the fluid be not taken away, absorption will generally succeed with such activity as to be followed by speedy recovery.

A curious phenomenon, as the sequent of thoracentesis, was, during last year, much commented upon in France, and, indeed, it there led to some very animated discussions. In 1863, M. Pinault first pointed out the singular fact that not unfrequently *albuminous expectoration* quickly follows thoracentesis. MM. d'Espine, Woillez, Marrotte, Béhier, and Terrillon, have lately called attention to this question. The symptom, it is stated, may come on from ten minutes to an hour after the operation, and continue for several hours, or an entire day. There is said to be a correlation between the quantity expectorated and the mildness or gravity of the symptoms. In mild cases, the secretion is but in limited degree, but very abundant in the severe examples. The disturbance which it causes may be merely slight dyspnoea, or there may be distressing and acute dyspnoea, spasmodic cough, and fine subcrepitant rales; and, in fatal cases, the dyspnoea has been most urgent, the cough continuous and suffocating when asphyxia has supervened, and the accumulation of liquids has filled up the respiratory system. This albuminous product, it has been related, is yellowish, coagulates with nitric acid, while the expectoration is mere bronchorrhoea, and the microscope detects epithelial cells, and pus- and blood-corpuscles. The point of disputation is how and in what manner is this albuminous fluid produced. Perforation by the trocar, spontaneous perforation, reabsorption after the operation, and pulmonary congestion giving rise to transudation through the alveolar walls, have all been assigned as causes. In short, without citing arguments to rebut the first three theories, it may here be observed that the last named mode is held to be the most explanatory of the phenomenon. Cedema is the consequence of pulmonary congestion. When that condition has for a time continued, serous transudation then eventuates, in addition to bronchial mucus; when the lung has been for a long time compressed, and the liquid which has surrounded it and pressed upon it is suddenly removed, the atmospheric air by rushing into the vesicles irritates their mucous membrane and causes vascular excitement, and hence the sequents. Such is the explanation of certain of the disputants, and it would seem that such explanation is not wholly unfounded on physiological and pathological principles. Those who take this view maintain that the analogue is to be noticed in albuminous nephritis when the Malpighian capillary congestion becomes relieved by a serous transudation into the tubules. Dr. George Johnson, who last year referred to this subject in a clinical lecture, thinks another etiological explanation may be given of albuminous expectoration. He attributes the phenomena to absolute blood-stasis in the minute pulmonary vessels, especially in the pulmonary veins. I have before pointed out that coagula in the large pulmonary veins is a condition which takes place in a lung compressed by pleuritic effusion, more frequently than was formerly supposed. It is evident from the examples given, and the reasoning put forth by the French pathologists, that the irritant properties of the sudden ingress of atmospheric air is the most explicable cause of the congested capillaries, and the sequential event of the transudation of serosity. (*Mouvement Médical; Union Médical; M. Woillez's Treat. Respiratory Organs; Gazette des Hôpitaux; BRITISH MEDICAL JOURNAL*, October 1873.)

In conclusion, a word may be said relative to the operation, and the attempts at the operation, in certain of the foregoing examples. In case No. 6, the failure was attributable to wide-spread adhesion of the lung to the chest-wall. If the fluid could have been reached, the patient would doubtless have been relieved for a time, notwithstanding

that the primary malady was tuberculation. The large amount of serosity caused death by mechanical pressure. The anasarca was mainly due to visceral displacement, and, though the heart was not of itself diseased, the pericardium being filled with fluid, great interference was necessarily given to the normal action of a vital organ. In the other fatal case, No. 7, the operation was easily performed, and the benefit was immediate and decided. As the patient lived some days, her death which resulted, in an emaciated frame, from asthenia, could hardly with good grounds be attributed to thoracentesis. In case No. 11, the fruitless efforts to draw off the liquid were doubtless from long standing and extensive adhesions. Two punctures were made, but to continue plunging in the instrument when there was no exact knowledge as to the position of the heart, or when there became a great probability of wounding the lung, would have been unwarrantable. In No. 14, I am quite of opinion that the trocar and tube would have been more effective in the withdrawal of the fluid than the aspirator. The large amount of serosity and the immediate comfort and easier breathing which followed, were most satisfactory results. The operation in this man showed most conclusively how advantageously thoracentesis may be used as a palliative in pulmonary phthisis with effusion. In such complaint, paracentesis presents itself to our notice as one of the most decisive and effectual of remedial measures. In the little boy, No. 15, the operation was expeditious and beneficial. Occurring as the effusion did, as the complication with or sequel of one of the exanthems, it was pretty evident that the fluid would be purulent. In No. 16, the good results of the operation were more speedy and decided than in any other example of my own experience. The youth was gravely ill, extremely emaciated, and unquestionably in great peril. The outcome of the fluid was at once followed by amendment, and his recovery was absolute. In the little boy, No. 17, I have already expatiated on the advantageous employment of the small silver shield-tube.

ON THE EMPLOYMENT OF THORACENTESIS IN ACUTE PLEURITIC EFFUSION.*

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It is proposed in the following paper, first, to relate a case of acute pleurisy with effusion, in which, ordinary treatment failing, recourse was had to thoracentesis (strictly thoracocentesis); secondly, to offer some remarks on the value of this practice in acute pleuritic effusion generally; and, thirdly, to further illustrate the subject with a case in which ordinary treatment was successful. I shall venture to give the cases a little in detail, the object in view seeming to require this; and would premise that primary, and not at all secondary, pleurisy is here under consideration.

1. A schoolgirl, aged 13, accustomed to good health, felt quite well in the forenoon of July 3rd, 1873, and walked with ease a distance of between two and three miles. About 1 P.M., she was seized with pain in the left side. This gradually became more severe, and, although it did not much disturb her at night, was attended the following morning (July 4th) with loss of appetite and general disorder, so that she was brought at once to hospital for advice. It being now observed that her temperature was 101 degs., her pulse 120, and the left side of her chest nearly motionless, she was directed to become an in-patient, and was admitted as such in the course of the day.

July 5th.—The report was, that she slept well; the pain in the left side was less. On examination, the lower half of her left chest, posteriorly, was found to be dull on percussion, and yielded little or no vocal fremitus; the breathing here was very feeble; the voice at the angle of the scapula was ægophonic; the heart's beat was to the inner side of the left nipple. Her temperature was 99.4 degs. (rising to 100.6 degs. in the evening); her pulse was 138; her respirations were 42; she had no cough; she was somewhat pale in the face; her tongue had a white coat with prominent red papillæ; her bowels were opened twice in the twenty-four hours; her urine was high coloured, acid, of specific gravity 1.030, and presented a slight cloudiness on boiling and the addition of nitric acid. She was ordered to take four grains of mercury with chalk three times a day, and one ounce of the solution of acetate of ammonia mixture every six hours; also to have a diet of milk and beef-tea.

July 7th.† She had now no pain; she seemed to be able to lie on either side. The dullness was increased over the left chest, and accompanied with bronchial breathing; only the apex-region was free; under

the clavicle, there was a distinct tubular percussion-note. Her temperature was 99.2 degs. (evening temperature 101.4 degs.); her pulse was 140, and her respirations 40; her tongue was cleaner; her bowels were inclined to be relaxed; her urine was scanty. She was ordered to omit the medicines, and to take the sixteenth of a grain of biniodide of mercury along with two grains of iodide of potassium and four minims of tincture of digitalis, in one ounce of infusion of cloves, every six hours; also to have her left back blistered with epispastic liquid and afterwards dressed with cotton-wool.

July 10th. Her urine was a little increased in quantity; her nostrils were inflated at each inspiration; the physical signs were much the same.

July 14th. She had not good sleep; she now lay continually on her left side. There was universal dullness, with absence of vocal fremitus over the left chest; a considerable amount, however, of bronchial breathing was audible; her heart was pushed over to the right side. Her temperature was 100.2 degs. (evening, 102.4 degs.); her pulse was 148, and her respirations 48.

July 15th. She had not much sleep again; her bowels were relaxed. Her left chest at the level of the nipple measured three-quarters of an inch more than her right, and was quite immobile; her heart's apex beat at the right nipple; the breathing of the right lung was much exaggerated. Her temperature was 100.2 degs.; her pulse was 144; her respirations were 48. It was now determined to resort to thoracentesis. Accordingly, at 1.30 P.M., the resident medical officer, Mr. Waller, introduced one of the fine trocars of a Dieulafoy's aspirator into the eighth intercostal space near the angle of the scapula, and, the syringe being attached, forty-five ounces of tolerably clear straw-coloured fluid were drawn off, which, in the course of half an hour, coagulated into a gelatinous mass. Resonance on percussion now reappeared at the upper part of the chest. The opening was instantly closed upon withdrawal of the cannula. The patient had a little troublesome cough during the process, but was calm and comfortable afterwards. At 9 P.M., she was lying on the right side; she had been sleeping on and off since the operation; had had more cough than before it was performed, but she did not expectorate; she was perspiring rather freely; her temperature was 103.8 degs.; her pulse 138; her respirations 54; her heart's beat was still on the right of sternum. She was ordered to continue the draught.

July 16th. She felt better; her cough was less; she had not expectorated; her temperature was 100.2 degs. (evening, 102 degs.); her pulse was 132, and her respirations were 36; her tongue was clean, and her appetite was returning. At the left apex, the stroke-sound was better, also the breath-sound; but in the infrascapular fossa, where, immediately after the tapping, fair pulmonary resonance had returned, there was more or less dullness; the heart's apex was about one inch and a half above and to the inner side of the right nipple. No friction-sound was detectable anywhere. She was ordered to continue the draught, and to take in addition, the same evening at bedtime, two grains of antimonial powder, with one and a half grains of sulphate of quinine, in the form of pill; and to have half-diet.

July 17th. She slept well, and seemed much better; she had no cough to speak of. There was tolerably good resonance over the uppermost region of the left chest, except in the axilla; the breathing was markedly bronchial about the level of the nipple, but was more open towards the apex; ægophony was present in the infrascapular fossa. Her temperature was 101.4 degs. (evening, 102.8 degs.); her pulse was 144, and her respirations 56.

July 18th. There was some amount of resonance on percussion as low as the angle of the scapula, and vocal fremitus was perceptible as far as the middle of that bone; but both were nearly absent in the axillary region. She was passing more urine, and otherwise progressing favourably.

July 20th. There was a decidedly better stroke-sound at the upper left chest, particularly behind, and the vocal fremitus extended to a lower level. Her temperature had averaged lately 100 degs. (evening, 102.2 degs.); her pulse was 140, and her respirations 48; her bowels were still disposed to be relaxed. She was ordered to continue the draught, but without the digitalis, and to take two grains of sulphate of quinine in pill night and morning, and one teaspoonful of cod-liver oil twice a day after meals.

July 22nd. Vocal fremitus was distinct now in the axilla, and generally in the upper half of the left chest; the dullness was not quite so intense at the base; the voice was ægophonic about the angle of the scapula. Her temperature had fallen to 99.8 degs. (evening, 101.2 degs.)

July 24th. There was increased area of vocal fremitus, and less extent of bronchial breathing; the heart was gradually returning to its normal situation.

* Read before the Bath and Bristol Branch.

† The writer's charge of the case commenced at this date.