the vagus; 5. Excessive exertion and consequent cardiac exhaustion; 6. Valvular insufficiency. This condition may pass on to permanent dilatation.

Mode of Repair.—The ordinary modes of repair of this condition are two: first, relief of the condition on which it depends, where practicable; and, second, hypertrophy, when it is due to increased difficulty in the flow forwards, or to valvular insufficiency, by that power of self-increase which is allowed to all muscular fibre, but with which organic muscular fibre is endowed *par excellence*. Restoration of the balance may take place in three modes, of higher and lower grades: 1. The highest, restoration of the cavity to normal size; 2. Hypertrophy, by increase in number of fibres (Forster) and thickening of existing fibres (Bamberger and Rokitsky)—a compromise; 3. Dilatation, a permanent distension—the lowest restoration of balance, and entailing diminished vital capacity to a point proportioned to the heart's lowered power.

The signs of this disturbance of balance, or partial asthenia, are three—palpitation, irregularity, intermittency.

1. *Palpitation.*—The first evidence of failure of power is palpitation. It is undistinguishable from increased action, except in deficiency of results. When there is excited action, as in exertion or excitement, it is perceptible in the bounding pulse, or, with the sphygmograph, in the increased apex-beat. Palpitation is not so accompanied; and though to auscultation and percussion the heart-stroke may appear identical, it is in the results the real difference lies. Palpitation is a laborious heart-stroke, but not a stronger one. It is the evidence of effort, not of capacity. It is barren in result—a laborious stroke in place of a normal one, but not of more effect, not always of so much. It is intimately associated and commonly mixed up with the next form—irregularity. Palpitation may be engrafted on symptoms of chronic insufficiency as a temporary condition; as, for instance, in the palpitation of Bright's disease, or of slight exertion in a dilated heart from valvular insufficiency. Palpitation is a violent effort of the heart-walls to overcome the action of the vagus, *plus* the obstructed flow.

2. *Irregularity.*—Irregularity of the bulk of blood transmitted into the arteries is one thing, and is due to auriculo-ventricular incompetence. Irregularity in time is another. The latter is under consideration here. Irregularity of rhythm is not due to disordered innervation, but to obvious debility. It is an arrest in the commencement of the peristaltic contraction or heart-stroke. The controlling action of the vagus arrests the contraction until such time as the layers of fibres acting early on the systole ought normally to have acted; and then a sharp, almost simultaneous contraction takes place, with an increased thud against the chest-walls. This action is homologous with the increased action of the muscular fibres, under the control of the cardiac ganglia, when the systole has been retarded by stimulation of the vagus. Sometimes it appears as if the action of these layers, acting early in the systole, had been lost; and there is a perceptible change of action in the heart, as if the contraction were commencing from a new layer or set of fibres. Richardson has compared this to a change in order of a number of strikers on an anvil. It always reminds the writer of a horse changing its feet when cantering. This is a more serious evidence of over-taxation of the heart, and is often found mixed up with palpitation. It is often the result of over-exertion, and affords strong suspicion of ventricular distension. Chronic irregularity may have engrafted upon it a passing palpitation from an intercurrent additional disturbance of balance. Nervous irregularity and palpitation will be considered in a future section.

3. *Intermittency.*—This is sometimes purely nervous, and is inexplicable. When persistent, it is usually associated with an impaired first sound, defective apex-beat, and other signs of degeneration. The occurrence of palpitation during this condition sometimes clouds the diagnosis, and makes it very difficult. Intermittency of ventricular contraction is not identical with intermittency of radial pulse, though related to it. In some cases of intermittency of the radial pulse, if the stethoscope be applied while the pulse is held, a ventricular contraction will be distinguished when there is no evidence in the pulse; but it is a feeble contraction. In other cases, the ventricle does not perceptibly contract. Whether there is a very abortive contraction, or not, is doubtful. Certain it is, that in some cases the ventricular contraction can be detected when too feeble to produce a pulse wave; in other cases, no ventricular contraction can be perceived. Intimately connected with this condition, is true angina pectoris, and, finally, cessation in diastole.

After this brief *resumé*, we can now consider the mode of action of digitalis, in what manner it acts; and from that, again, get an idea of its therapeutical value.

[To be continued.]

CASES OF PLEURITIC EFFUSION MARKED BY VERY FŒTID EXPECTORATION.*

By JOHN C. THOROWGOOD, M.D.,

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WHEN we read the descriptions of pleurisy given in our medical textbooks, we cannot well help coming to the conclusion that few diseases ought to be more easy of recognition than pleuritic effusion; and that any one who overlooks an effusion of fluid in the thorax, or who is unable to speak decidedly as to the cause of dulness on percussing the chest, must be quite behind the age in his medical knowledge.

Be this as it may, I expect I do not relate a marvel of medical experience when I say that I have known a case where the treatment of more than one competent man has been energetically directed to the patient's brain for the purpose of arresting convulsions, when after death this organ was found in every respect healthy, while the left side of the thorax was the seat of a well-marked diaphragmatic pleurisy, with copious deposition of lymph and effusion of fluid. This case was related to me by one of the attendants, himself an eye-witness of all the events. Incessant vomiting, followed by convulsions, drew all attention to the brain, and the chest was, it appears, entirely forgotten.

I have, doubtless like many others, been asked to see a case of continued fever, when an examination of the thorax has disclosed the novel fact of one side being dull as a brick from top to bottom. No complaint of pain in the side or of cough had ever been made, hence it had not been deemed necessary to examine the thorax.

In hospital out-patient practice, and in other than hospital practice, too, it is not rare to meet with patients who describe their symptoms in such a way as to lead us not to wonder when they tell us they have been told "it is all stomach" or "all liver", and yet examination shows us a thorax containing more or less of fluid effusion.

These matters teach us the importance of carefully examining every patient who may come under notice, and of not forgetting the precept of the late Matthew Baillie, that the physician, in his examination, should seek to turn his patient inside out before him.

Though ordinary painstaking care will do much to guard us against serious errors in the diagnosis of pleurisy with effusion, still there are forms of pleuritic effusion that come on so gradually and so imperceptibly, presenting also—prominently often—symptoms that we are accustomed to connect with other known forms of chronic pulmonary disease, that the correct diagnosis becomes a matter of peculiar difficulty.

The three cases of pleuritic effusion that I have made the subject of this paper, presented other than the ordinary signs of pleuritis, and hence seem worthy of notice.

In all the cases, the most marked and prominent symptom was extreme fœtor in the expectoration. When the patient makes this his great cause of distress and complaint, the first thought of the physician may tend to old-standing bronchitis with dilated sacculated bronchial tubes, or to chronic phthisis with old cavities and more or less fibrosis, or fibrification, of the surrounding lung-tissue. In the following cases, none of these explanations could be assumed as correct.

CASE I.—Mrs. S., aged about 40, was seen with the late Dr. Cregeen of Rotherhithe on May 11th, 1867. She had been ill five weeks with pain in the right side and cough. Lately this cough had increased, and been attended with some rusty-coloured, very offensive, expectoration. The right side below was dull, and at some parts a distinct rubbing sound was heard; very little respiratory sound was heard. The pulse was 80; the skin was not hot; debility was great. Considering the duration of the illness, and the recent occurrence of the fœtid sanious expectoration, I thought that there must be a subpleural abscess; and I told Dr. Cregeen that we might have hæmoptysis, pneumothorax, or both, as possible events of the future. On May 19th, the patient seemed dying, in a state of collapse, with shivering, profuse sweating, and finally very copious purulent expectoration. On May 21st, I saw her for the second time. She was better; pulse 88. The right side was dull; there was an ægophonic twang in the voice; a friction-sound was audible; there was no blood in the sputa. She gradually recovered. On May 7th, 1868, I examined the chest, and all that I noted was some impaired resonance on the right side and bronchial breathing. The treatment consisted of bark, with sulphuric acid and free nourishment. Carbolic acid made her faint, and she would not continue it.

CASE II.—The notes of this case are fragmentary. The patient was a man in the Victoria Park Hospital, with much cough and expectora-

* An abstract of this paper was read before the Medical Society of London; and, in compliance with the expressed wish of the President, I here publish the paper in a more ample form.—J. C. T.

tion of very offensive sputa, rusty-brown in colour. The left side of the chest was dull, but some limited cavernous breathing was heard at parts. The heart beat in its usual position. This man had been long ill, and the case seemed one of cavities in the left lung, containing purulent offensive matter. On Sunday this man was in a state of great collapse and prostration, with copious foetid expectoration. On Monday he was better. On Wednesday he had rigors, clammy sweats, and very feeble pulse. On Thursday he died. The *post mortem* examination showed the left pleura quite full of stinking purulent matter, the lung being pressed back against the spine. There were some adhesions, and these were so arranged as to fix the pericardium and heart *in situ*. Had the adhesion been absent, the heart might have been pushed over to the right side and the diagnosis less obscure.

CASE III.—A respectable man engaged in a shop in Regent Street, aged 44, when seen by me at my house on August 1st, 1870, looked very sallow, but in no way emaciated; indeed, he said that he had been becoming rather corpulent of late. It seemed he had been ill about one month, and he believed he was suffering from stomach and liver derangement. He had a cough, and had been at the sea-side without deriving any benefit. My own faith in the restorative powers of pure sea-air in all complaints of mere exhaustion and debility is such that, when a patient returns from a month by the sea no better, or even worse, I suspect some seated disease in the system. The great complaint made by this man about his cough was, that for the whole month past he had, at times, coughed up sputum so offensive as to render the room in which he was quite unbearable. He had shortness of breathing; the pulse was 104; the tongue foul. An examination of the chest disclosed dullness at the right base up to the line of the nipple, and extending downwards a little below the ordinary limit of hepatic dullness. The respiration at the base of the right lung behind was bronchial, with some crepitation. In the left lung there was strong loud breathing. I advised him to inhale the fumes of carbolic acid from a vaporiser, and gave him quinine with dilute hydrochloric acid. A few days later, crepitation was marked at the right base, and a few crepitant rhonchi were heard at the left base also. Beneath the clavicle the respiration was weak. He went daily to his business. On August 12th, he called on me in great alarm on account of free hæmoptysis. An examination of the chest showed the breathing harsh and strong at both bases, and much less crepitant rhonchus. I told him to keep quiet at home, gave him opium at night, and creasote with acetic acid during the day. The fœtor of the expectoration had almost totally subsided since he had used the inhalation of the vapour of carbolic acid from one of Savory and Moore's carbolic acid vaporisers. On August 22nd he was taking iron and quinine; the pulse was 84. There was less dullness over the right base, but some pain at times on the right side; and he said he did not think I need see him again. A few days later, I left town for three weeks. I heard no more of him till October 1870, when he called in consequence of a sudden attack of hæmoptysis, after taking a long walk and eating raw apples. His pulse was 88. There was dullness still at the lower right third of the chest; the breathing was very weak now, where before it was bronchial. At the left base there was strong full respiration; the sputa were not foetid. This was on November 19th. I next saw him in bed, in consultation with Dr. Brown, his regular attendant, on Sunday, January 22nd of this year. He said that on the previous Thursday, as he left the omnibus to walk to his house at Camden Town, he felt sudden severe pain in the chest; and when I saw him I found him lying in bed on his back, with no severe dyspnoea, respiration 40, pulse 132. The right back was perfectly dull; and when I moved him and listened afterwards, a distinct metallic tinkle was heard. I considered that a subpleural abscess must have burst into the pleura, causing a false empyema. The dyspnoea being by no means urgent, I prescribed some ordinary remedies, and suggested that it might be well for me to see him again should his difficulty of breathing increase; my intention under these circumstances being to propose paracentesis of the right chest. A week later (Saturday evening), a message was left at my house that the patient was dead. I called on the following afternoon, prepared with instruments for a *post mortem* examination. Dr. Brown soon came, and we together made the examination. When Dr. Brown cut through the cartilages on the right side of the thorax, at once a puff of very foetid gas escaped; and on opening the chest the right side was full of stinking grumous purulent fluid, which I ladled out to the extent of a chamber-pot quite full. The right lung was then seen as a mere thin skin pressed against the spine, leathery, airless, covered with creamy pus, and on spreading it in a plate we could trace a cavity, or rather sac, in its lower lobe. The left lung was voluminous and congested. Nothing like a tubercle was seen in either lung. The liver was large, but not unhealthy. I was interested in this point, for the very basic character of the disease in the first instance, the fact of the right side being affected, the sallow, but by no means emaciated, look

of the patient, made me think more than once of the case of a man admitted to Victoria Park Hospital many years ago with profuse purulent expectoration, where a *post mortem* examination showed that an hepatic abscess had ruptured through the diaphragm and been discharged by the bronchial tubes. Against such a probability in the present instance I set the rarity of hepatic abscess, the rarity of its opening through the diaphragm, and the fact of the dullness increasing rather upwards towards the axilla than downwards towards the abdomen. With respect to remedial treatment, the inhalation of the carbolic acid vapour I may describe as strikingly beneficial against the fœtor, and the power of opium and also of digitalis over the attacks of hæmoptysis was unmistakably marked.

Inquiry into the early history of case III elicited nothing more definite than the statement that he had for a long time had cough and much expectoration every morning. Ulceration of the air-tubes must have taken place, soon after which event probably it was that the sputa became not only foetid, but mixed freely at times with blood. More than once during my attendance I mentioned this sequence of events as my opinion; and, in answer to inquiry, I decidedly negated the idea of tubercle of the lung. During the last week of the patient's life, as well as for several weeks previously, there had been no return of the fœtor in the sputum, which was tough, and greenish at times. The large amount of fluid found in the right pleura seemed to have increased rapidly during the last week of life, and must have been caused by the lung-mischief extending from within outwards.

The prospects of paracentesis in these forms of pleuritic effusion and false empyema are not promising: the question, however, is one on which more practical experience is wanted. My own opinion would be favourable to the operation, as one that would rid the patient of a dangerous and pernicious matter within the chest, and would thus afford him, at any rate, a chance of recovery which he would hardly have while he was carrying about, pent within his chest, an accumulation of offensive fluid.

In conclusion, I may observe that the events which I mentioned as probable, or rather possible, in Case I—viz., hæmoptysis and pneumothorax, actually did occur in Case III. The prominent symptom of the foetid expectoration is the one to which I would especially draw attention in reference to its relation to these forms of pleuritis.

EXFOLIATION OF THE BLADDER,

By T. SPENCER WELLS, F.R.C.S.,

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DR. WARDELL's interesting case reported in the JOURNAL of June 10th, with his paper and that of Dr. Phillips in succeeding numbers, have induced me to send to the museum of the College of Surgeons two specimens, which I have asked Mr. Flower to place where they may be conveniently inspected by any of the Fellows who may attend the College election next Thursday, and who may be interested in the subject. Another specimen (No. 1993 Pathological Specimen) in the museum referred to by Dr. Wardell, from the bladder of a man, which Mr. Liston opened by incision above the pubes, may be seen at the same time.

In one of my specimens, the uterus and bladder are seen, as well as the detached cast of the bladder, covered with a gritty deposit of urates and phosphates. The walls of the bladder are thick and contracted, the muscular fibres being distinctly visible. The detached mass which was lying loose in the bladder I described at the time as "degenerate epithelium holding together saline deposit. On boiling a piece of it in twenty parts of water to one part of acetic acid, much of the saline matter is dissolved, and some of the tissue becomes clear, looking like smooth muscular tissue which has begun to degenerate by the deposit of fatty or albuminous particles in its substance." (*Obstetrical Transactions*, vol. iii, p. 354).

The patient was twenty-two years of age. After a natural labour with her first child, the bladder was not emptied for sixty-two hours. Five pints of turbid bloody urine were then drawn off. Cystitis followed, incontinence of urine, and a train of distressing cerebral symptoms, ending in death two months after delivery.

The second specimen I exhibited at the Obstetrical Society on the evening of the day when it was voided by the patient, six weeks after a severe instrumental labour. The report may be seen in the third volume of the *Obstetrical Transactions*; and in the fourth volume there is an elaborate report on the specimen by Dr. Harley.

From the time of her labour the patient suffered from severe cystitis with nephritis. Three weeks after labour, the urine contained albumen, blood-corpuscles, pus-cells, chylous matter, and renal tube-casts.