CASE V, aged 35, married; sterile. She had been invalid and bedridden for many years, and had dysmenorrhœa. Ovarian pains were unceasing. The right ovary was very tender on pressure. Coccygodynia was present. The right ovary was removed (May 1875) by the vaginal incision. The pedicle was ligated. Recovery from the operation was rapid. Improvement was slight. The pain recurred in the left ovary, which was removed by a subsequent operation. The result was unsatisfactory; not improved.

CASE VI, aged 30, married; four children, the youngest six years old. She had been invalid ever since her last confinement. She had ovarian dysmenorrhœa and constant ovarian pains for six years, and was the subject of morphinism. The mind was unbalanced, threatening insanity. Both ovaries were removed (1875) by the vaginal incision; the pedicles were ligated, and the ligatures brought out by the vagina. All went on well till the ninth day, when she was taken suddenly with pain in the abdomen, and she died of peritonitis in twenty-four hours afterwards. *Post mortem* examination discovered an abscess round the stump of the right ligament (and ligature), which, bursting into the peritoneal cavity, produced the peritonitis.

CASE VII, aged 25, single, had severe dysmenorrhœa from her first menstruation at the age of 14. She had had ovarian pains all the time. She had been bedridden for four months. Her nervous system was completely shattered. She took morphia daily in large quantities, also sixty grains of chloral every night. Both ovaries were removed (1875) by the vaginal incision. The pedicles were treated by the *écraseur*. Convalescence was rapid. The cure was complete and permanent.

CASE VIII, aged 28, married; one child eleven years old. She had been invalid eleven years, ever since the birth of her child. She had metritis, pelvic cellulitis, and pelvic abscesses. The uterus was irritable, hypertrophied, fixed in the pelvis by effused organised lymph. She had continued ovarian pains. The left ovary was enlarged and very tender on pressure. Both ovaries were removed (1875) by the vaginal incision. A small hæmatocele in Douglas's *cul-de-sac* was opened and cut through. The ovaries were found to be bound down by adhesions, and were removed with great difficulty. The *écraseur* was used. The ovaries were not removed in their entirety. The operation was unsatisfactory. Convalescence was very slow, and was accompanied with pelvic inflammation and pelvic abscesses. The result was no improvement whatever.

CASE IX, aged 35, married; sterile. This is the same already described as Case V, in which the right ovary was removed by vaginal incision three or four months previously, without improvement. The left was now removed by vaginal incision. The previous operation was followed by pelvic inflammation. The ovary was bound down by adhesions that did not exist at the previous operation. It was broken down by the finger and removed piecemeal. The operation was unsatisfactory. She recovered rapidly from it; but the result was no improvement. Dr. Richardson subsequently performed Nott's operation of exsection of the coccyx for the coccygodynia, which was not at all relieved by the removal of the ovaries.

CASE X, aged 29, single. She had been invalid for many years from functional heart-trouble. She had ovarian dysmenorrhœa. Ovarian pains were persistent. Her mind was impaired by long suffering. Both ovaries were removed by the vaginal incision (1876). The *écraseur* was used. Peritonitis followed, and death occurred on the third day. No *post mortem* examination was made.

CASE XI, aged 34, married; one child, still-born, fourteen years ago. The labour was tedious; the forceps was applied. Sloughing followed, then total atresia of the vagina. She never menstruated since delivery, and had been invalid ever since. She had several operations for atresia, all of which failed. Her general health was completely broken down. She had dreadful suffering every month, with unrelieved menstrual molimen and its attendant symptoms. The operation was performed by abdominal incision, because atresia vaginæ prevented the vaginal. Both ovaries were bound down by adhesions, but were liberated and removed entire. The *écraseur* was used. Both ovaries were of normal size; the left showed a Graafian vesicle recently ruptured. Recovery from the effects of the operation was rapid. She was cured completely and permanently.

CASE XII, aged 22, married four years; sterile. She had had bad health for six or eight years; dysmenorrhœa, pelvic and ovarian pains, worse in the left ovary, and epileptic convulsions. Operation was done by vaginal incision (1877). Both ovaries were bound down by adhesions; the right was partially removed, the left wholly. The *écraseur* was used. The operation was unsatisfactory. She was not improved. Dr. Battey thinks of repeating the operation by abdominal section to remove the remaining portion of the right ovary.

[To be continued.]

THE IMPORTANCE OF PRESERVING A VACUUM IN THE PLEURAL CAVITY AFTER PARACENTESIS OF THE THORAX AND THE INSERTION OF THE DRAINAGE-TUBE;

WITH DESCRIPTION OF A METHOD BY WHICH CONTINUOUS ASPIRATION MAY BE EFFECTED.*

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THERE is one important principle on which, it will be allowed, the successful treatment of empyema and hydrothorax depends in those cases which have required the insertion of the drainage-tube, or where any other plan for preserving an opening into the pleural cavity has been adopted. If we consider the effect of making an opening by which air is admitted into the pleural cavity, we perceive that the expansion of the lung is more or less diminished so long as this opening remains patent. We also perceive that, if the opening be of such dimensions that the air which passes into the pleural cavity is greater in volume than that which passes into the lung in inspiration, there is practically no expansion of the lung and its functions are destroyed. It is evident that, in order to obtain perfect expansion of the healthy lung, there must be no communication between the pleural cavity and the external atmosphere, for the effect produced even by a small opening is very considerable. If we wished to ascertain with accuracy the extent to which the expansion of the lung would be diminished by inserting a tube into the pleural cavity, we should have to consider two important points, in addition to those which would enter into the question if the pleural cavities were independent of one another, and the minute air-tubes were non-elastic. By admitting air into one pleural cavity, we disturb the equilibrium which exists between them when both are closed. We also liberate the force which the tissue of the lung possesses, in virtue of its elastic character, on the side from which atmospheric pressure is removed.

Supposing that the tube which is inserted be very small, in comparison with the aperture of the glottis, the elasticity of the lung will produce such diminution in its volume as to admit a certain quantity of air into the pleural cavity, which must remain, unaffected by the movements of respiration. The resistance offered by a very small tube would be such as to produce but little effect, compared with that which would be produced by a tube of such diameter as that usually employed in cases of paracentesis of the thorax.

When we observe that the tube used for laryngotomy is of sufficient diameter to admit the air necessary for ordinary respiration, it is evident that the drainage-tube will allow such an amount of air to pass through it as almost, if not quite, to annul the forces exerted on the lung by the various muscles of respiration. These considerations enable us to perceive how important it must be to bring the force of atmospheric pressure to bear upon the lung, when it has been compressed by pleural fluid; and we discover the objections which present themselves to the method of treatment of empyema by the insertion of the drainage-tube. We also perceive what may be urged against the method of treatment with the aspirator, the most important of which is the too brief duration of the force exerted upon the pulmonary tissue. We see what advantages belong to both methods of treatment, and some plan, combining a permanent opening for the escape of fluid with the power exerted by the aspirator, suggests itself as reasonable and consistent; and for such a plan I propose the term "continuous aspiration".

The apparatus constructed for this purpose consists of two parts, one of which is attached to the thorax, so as to cover the orifice of the drainage-tube; the second being connected with the first, and used for the purposes of exhaustion. The former may be made of ivory or India-rubber, in the form of a small hemispherical cup, with a broad grooved margin or phlange to obtain adhesion. The second part is a double-valved ball of caoutchouc, of considerable thickness and elasticity, by which the cup may be exhausted and fluid removed.

The amount of atmospheric pressure which may be brought to bear upon the condensed lung will depend upon the expansile power of the exhauster. In the earlier experiments which were made, one of the self-acting elastic cups used for cupping was employed. Subsequently, an exhausting syringe was attached to it; and finally, the arrangement constructed by Mr. Banks for Messrs. Maw, Son, and Thompson.

A suggestion of my friend Mr. Napier, to employ the respiratory movements of the lowest part of the thorax as an exhausting power, I

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hope will prove successful. In the apparatus which is exhibited by Messrs. Maw and Co. the ball-exhauster is intended to be worked by hand-pressure.

It is almost unnecessary to point out that the pathological condition of the lung must determine the amount of pressure which may be exerted. Practically it will be found that the exhaustion of the pleural cavity may be carried much further than would be supposed possible without producing any sense of tension or discomfort, and, provided that the surface of the thorax is unaffected by the pressure of the cup, the apparatus can be worn without difficulty or constraint.

There are other uses to which this apparatus may be applied, in conjunction with the single drainage-tube: such as large abscesses of the abdomen, etc. I have omitted any reference to the various pathological conditions which are met with in empyema, and have avoided any depreciatory remarks on the ordinary surgical treatment of the disease. A careful consideration of several *post mortem* examinations, and the satisfactory results obtained in the cases of children in which I have used this method of treatment, leads me to introduce it at a meeting of the Association when the subject of paracentesis is to be especially discussed.

ON THE NATURAL HISTORY AND TREATMENT OF PLEURITIC EFFUSION.*

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THE question of the treatment of pleuritic effusion is so wrapped up in that of the natural history of pleurisy, that no apology is needed for bringing forward some figures bearing upon that point. The time at my disposal will, therefore, be chiefly taken up in so doing. The material is derived from the clinical records of Guy's Hospital for the last ten years; from those of the Evelina Hospital for Children for the last eight years; and from notes of my own out-patients at the latter institution. A total number of cases of pleurisy has been thus collected, amounting to three hundred and fifty-two. This is a large number, though it will be subsequently seen that, in reference to the operation of paracentesis, towards which my observations will be chiefly directed, it is not sufficient by any means for the purpose of settling the question of the treatment of pleurisy. It will, however, form a contribution towards that end, valuable because it is derived from an examination of all the cases admitted into our medical wards as cases of uncomplicated pleurisy. It is often, it hardly needs remark, difficult to say whether pleurisy is dependent upon some primary lung-disease or not, and some cases are of necessity included which were due to such an old-standing disease; but, as far as possible, any cases in which the history gave a fair indication of its presence have been excluded.

Of the whole number of cases,

Those in which there was evidence of lymph only amounted to	73
Those in which there was evidence of fluid	265
Cases of double and diaphragmatic inflammation	14

352

The 73 cases of plastic pleurisy need not detain us long: 39 were on the right side, 34 on the left; and the course of the disease appears to have been much the same on either side. The sex, and longest, shortest, and average duration of illness on the two sides are shown in the following table:

	Right.	Left.
Sex { Males	25	25
Females	14	9
Longest period of illness	13½ weeks.	13 weeks.†
Shortest	8 days.	8 days.
Average duration	6 weeks.	6½ weeks.

It may not at first sight be apparent what these details of dry pleurisy have to do with pleuritic effusion. They are given to show—a point that will come out better presently—how far the duration of illness, calculated from the onset of the disease to the discharge from the hospital, is lengthened by the absence or presence of effusion, slight, moderate, or extreme in amount. They also show that neither side has much advantage over the other in the duration of pleurisy, and probably not much in fatality.

The ages of attack, represented in decades, stand thus:

	Right.	Left.	Total.
Under 10	3	4	7
10 to 20	3	5	21
20 to 30	11	10	14
30 to 40	8	6	12
40 to 50	7	5	3
50 to 60	2	1	4
60 to 70	2	2	0
70 to 80	1	0	1
Not stated	2	—	—
	39	34	73

The thirty-nine cases on the *right* side show one death, a female child aged 2½, from extensive pericarditis with the pleurisy. One case, lasting thirteen weeks and a half, left with some falling in of the apex of the thorax—a point of very little significance in the prognosis in children, but perhaps of more serious import at the time of life at which it occurred in this instance, viz., nineteen years; and a man aged 28 was subsequently admitted with phthisis. On the *left* side, one of the patients was readmitted after eight months, for pain in the side and impaired respiration.

According to these figures, males appear to be attacked more than twice as often as females.

The temperatures recorded do not often show any high elevation. Many of them were normal: those not so, averaged 101 to 102 deg.; two rose to 104 and 105 deg.

In the remaining 265 cases, fluid formed; of these I shall speak in two groups, as serous and purulent. Serous effusion was present in the chest in 188 cases; 99 times on the right side, 89 on the left. Tabulated, they stand as follows:

	Right.	Left.
Sex { Male	82	62
Female	17	27
Longest period of illness	32 weeks.	61 weeks.
Shortest	3 weeks.	2 weeks.
Average, with slight effusion	9 weeks.	17 days.*
" moderate effusion	11 weeks.	8½ weeks.
" considerable or extreme effusion.	11½ weeks.	11½ weeks.

This contrasted with the former table of cases in which there was no effusion, this shows that the duration of the illness is somewhat in proportion to the amount of fluid present: when none was present, the average duration was six weeks; when a slight amount, nine weeks; when a moderate amount, eight and a half to eleven weeks; when much was present, eleven weeks and a half. Again, there is a great preponderance of males affected:

Age.	Right.	Left.	Total.
Under 10	20	23	43
10 to 20	22	14	36
20 to 30	20	26	46
30 to 40	13	14	27
40 to 50	16	5	21
50 to 60	3	5	8
60 to 70	2	0	2
Not stated	3	2	5
	99	89	188

As to the treatment of these cases and the results which followed, I have to say that paracentesis was performed on seventeen patients. The others were all treated either by counterirritation, the internal administration of iodide of potassium and diuretics, or by the restriction of fluid diet.

Taking the results as a whole first of all, and leaving the special consideration of those cases which were tapped till afterwards, we find that death occurred eleven times; a bad result thirty times. Forty-four disappeared from view in an ameliorated condition, but by no means well. The remainder, 103 cases, left well. Of those which are classed as relieved, it is but fair to state that the majority were far advanced towards recovery, but they left the hospital with some fluid still present.

Contrasting the affection on the two sides of the chest, we find—

	Right.	Left.
Deaths	6	5
Bad results	16	14
Relief	24	20
Well	53	50

This is in favour of disease on the left side. Paracentesis was performed eight times on the right side, nine times on the left.

It will now be necessary to go a little more into detail concerning those that died, those that did badly, and those that were tapped.

Of those that died, the following additional facts may be recorded.

1. A female child, a year and a half old, died after the incision of an empyema, which formed after twice removing serum from the chest by the aspirator. No other disease was found *post mortem*.

* Only two cases.

* Read in the Section of Medicine at the Annual Meeting of the British Medical Association in Manchester, August 1877.

† This excludes one case lasting thirty-four weeks—a time much out of proportion to all the other cases, and due to a previous cough, which could not be distinctly separated in time from the pleuritic attack.