kitchen. She came from Norfolk to London; there is no ague in the part of Norfolk from which she came.

(h) May 5th, 1857. A policeman, aged 25, on night duty, had tertian ague, the rigors occurring every other night. He was previously a carman at Maidstone, of most abstemious habits. He had no ague before he came to London, where he had been about eleven weeks before the attack occurred. He lived in Walbrook, in the City.

(i) June 16th, 1857. W. E., aged 11, born, and always living in Paddington, has had ague of quotidian type three months; none last fourteen days; but is without appetite, languid, and prostrate. The liver and spleen are considerably enlarged.

SUMMARY. The morbid phenomena described in the preceding series are all referrible to a lowering or derangement of the nervous force in one or more situations. The brain may suffer, or the spinal cord, or the cardiac nervous centres, or those of the stomach or other abdominal viscera, or the vaso-motor nerves of other parts, or any sensory or motor nerve. Paralysis of the sympathetic nervous system will afford a reasonable explanation of the febrile attacks that have been often alluded to. (*Vide* Virchow's and Parkes' writings.) The disorder of the nervous power sometimes has, at least for a time, more of the nature of irritation than of simple prostration.

The question that now suggests itself is, are we to consider these phenomena as produced by a malarious miasm, or by merely common causes? To aid in answering this question, I adduce the following considerations:

1. It cannot be affirmed that malaria *may* not be generated wherever a moist surface is undergoing the process of drying. There are many well-known facts in proof of this; I will only adduce the following, which was kindly communicated to me by Dr. J. Marston. The whole crew of a ship, laden with wet deals, became affected with intermittent fever during a voyage from Norway to Lowestoft, and recovered on being landed and treated with quinine. The case was not a solitary one. In another instance quinine was of no avail as long as the crew remained on board the ship.

2. The metropolis is within reach of malaria transported from the low ground along the banks of the Thames.

3. Some cases of ague do certainly occur which seem to have been really produced in London; and in various others a pre-disposition long dormant has been rendered active again during a London residence.

4. The action of malaria is by no means limited to the production of intermittent and remittent fever. Dysentery, neuralgia, and a multitude of other morbid states are unquestionably produced by it. It may require much acumen to distinguish the non-malarial from the malarial disorder, and perhaps is not always possible. Yet the coexistence of marked debility and depression, or of paroxysmal fever, the failure of other remedies, and the success of quinine and the like means, or of change of air, will often enable us to distinguish clearly. If we meet with such cases we have almost as much proof of the presence of malaria as if the disease were an ague. When, for instance, we meet with marked neuralgia, not dependent on gout or rheumatism, or any local irritating cause, prone to relapse, somewhat shifting in its locality, and benefited by quinine, iron, etc., and by a pure bracing air, I believe, in the great majority of cases, it is truly of malarial origin.

5. Several good observers are of opinion that there exists a real affinity between cholera and ague; that the former has much resemblance to the so-called pernicious fevers. This view I quite concur in, as well for other reasons as from having myself experienced, during the last cholera epidemic, an attack which appeared to those who witnessed it to be most like ague, but which was evidently the effect of choleraic poison. Again, other good authorities have remarked a connection between ague and influenza; *vide* some remarks of Dr. Headlam Greenhow, quoted in a previous paper on malaria, published in this JOURNAL. It ought, I think, to weigh with us in some measure that both cholera and influenza, though in somewhat milder forms, show a tendency to become naturalised among us. Cholera revisits us at short intervals, and every now and then we have catarrhal affections prevailing which we are obliged to call influenzal. Surely this shows that we live under the influence of some peculiar constitution, which favours the recurrence of these disorders. Of both cholera, aguish disease, and influenza, it may, I think, be stated that prostration of strength is one of their most marked features, distinguishing them from other affections more or less similar.

My own reply to the question proposed above is, That there does prevail in and about London, at the present time, a morbid influence, which affects the weakly and predisposed in such a

way as to produce disorders, whose main character is the prostration or derangement of nervous power in some part or other, and which exhibit, in not a few instances, a decided resemblance to the ordinary effects of marsh malaria. The exact origin of this influence I cannot pretend to determine; I incline to the view that it is partly of a general, partly of a local nature.

While I am fully aware that the mind may easily get so pre-occupied with one idea that it can take in no other; and while I have endeavoured to guard against this error, it yet does appear to me that such forms of disease as I have sketched above are those which prevail most at the present time, at least about the metropolis. I would only ask practitioners, in caring for perplexing cases, to allow the view I have suggested to enter into their consideration.

THE PHYSIOLOGY, PATHOLOGY, AND THERAPEUTICS OF THE MOTOR FUNCTIONS OF THE UTERUS.

By H. HANNOTTE VERNON, M.D., Physician to the Great Northern Hospital; formerly Resident-Accoucheur to St. Mary's Hospital.

[Continued from page 905.]

PART III.—THERAPEUTICS (*continued*.)

HAVING disposed of the various modes of diminishing the irritability of parts affected with hyperæsthesia, so as to lessen the reflex motor impulses derived from abnormal eccentric conditions of the nervous system, it now remains to describe the various

II. *Modes of Exciting or Exalting the Polarity of the Nervous Centres concerned in Parturition, and also of Allaying their too great Polarity.*

As a preliminary to the details of this paper, some principles must be laid down with respect to the use both of excitants and sedatives of the nervous centres. Some regard must always be paid to those correlations which I have insisted upon as obtaining between physiology, pathology, and therapeutics. In illustration of this, let us imagine a case of labour in which birth is delayed; it is not enough to say, "Here is ergot of rye, let us hasten labour." There must be a *natural* connexion between the cause of delay and the means used to obviate it, otherwise we shall be treading upon unsafe ground. These axioms may, I am convinced, be laid down as rules never to be reversed—as rules which tend, in the hands of competent persons, to increase the power of directing the uterus, and to procure the almost absolute safety of the patient, in so far as the matters upon which they touch are concerned.

1. Excitants of the nervous centres should be used only when delay arises from defective polarity of such centres—never in order to overcome a mechanical obstacle.

2. Hyperæsthesia, and the opposite condition of any given nervous centre, should, if possible, be treated by the exhibition of those agents which act upon the centre affected.

3. Mechanical obstacles, of whatever kind, should invariably be dealt with by mechanical means, or means which will remove the obstacle itself.

Thus, by rigidly keeping up the connexion of vital defects with vital helps, and mechanical obstacles with mechanical helps, we shall run no risk of ruptures, bruises, lacerations, or other disasters which will be spoken of presently as following the improper use of oxytocics, or the unnecessary use of instruments.

The conditions which declare the necessity for stimulants or sedatives of the nervous centres, in labour, should be very distinctly understood and remembered; and most particularly the mind should not be allowed to dwell upon the pernicious idea, that the broad fact of delay implies a necessity for some more or less potent oxytocic. It cannot be too forcibly urged, that the proper use of stimulants of the nervous centres is not as additional forces to overcome obstacles, but as means of supplying the natural impulse to act when it is wanting or deficient. I have seen frequently the evil consequences of dosing with ergot of rye in order to compel the uterus to force a large fetus through passages somewhat too narrow. The rapid and energetic contractions of an overstimulated uterus are far more likely to bruise and lacerate, than the careful introduction of forceps or lever by competent hands. The necessary want of moulding and adapting movements on the part of the fetus,

whether of rotation, flexion, or extension, which an excess in the propelling force causes, sufficiently explains why this statement is reasonable, not to mention that the soft structures of the pelvis resist a much stronger force of impulsion than of traction. An unwise fear of instruments has been the cause of many disasters; and the "meddlesome midwifery is bad midwifery" school of obstetricians have done more mischief by sins of omission, than every one else has done by sins of commission. The innocuous looking chocolate-coloured powder is a far more dangerous agent than the forceps, unless limited to a very definite and small class of cases—small, that is to say, in comparison with the numbers to whom it is actually given. Death of the fœtus, self-inflicted bruising of the uterus, ruptures of various kinds, incarceration of the placenta, and all degrees of metritis, are grave charges which may be brought against the ergot, unless skilfully used; and even then, when our arrow is discharged, we may find that we have "slain a woman to our wounding, and a young woman to our hurt." With the forceps, these dangers are unknown; for a man must be clumsy and ignorant if he does more damage than mark the face of a fœtus for a week or two. The fact is, if a case is fit for the forceps, and the operator is fit to use them, there ought not to be much more difficulty in applying them effectually than in taking an egg out of a saucepan with a spoon.

It follows, then, that oxytocics are to be solely confined to cases of *pure inertia*. Through whatever nervous centres we desire to act, and with whatever agent we work, deficient uterine action is the *only* indication for oxytocics; and this rule is absolute.

Sedatives, on the other hand, have a wider range of action and applications. Both eccentric and centric irritations frequently require their exhibition. Excessive action of the uterus, transposed action of the various expulsive forces, pain, rigidity of the maternal passages, and some mental states, call for the administration of sedatives, narcotics, anodynes, or anæsthetics—agents all of the same general intention.

As all sedatives and all excitants of the uterus, acting mediately, do eventually, beginning at whatever nervous centre they may, affect all nervous centres more or less, it will not be convenient to consider this part of our subject in the same categorical relation to the antecedent pathological investigations, as has been done with regard to eccentric medication. Such a plan would involve endless repetitions; and, moreover, it is not easy enough to say whether particular sedatives or stimulants belong in every case to one set of centres or another; or, at any rate, to affirm that they excite this or that centre, and no other immediately; and even when a common action is established, it cannot be determined as to the exact share of influence felt either by one centre or another. For these reasons, I shall take up the various agents we possess *seriatim*, and assign them, as far as I can, their specific physiological and pathological relations; and endeavour, at the same time, to fix their therapeutical value. They will be taken up one by one, without any reference as to whether they are stimulants or sedatives, because some are both, under different circumstances.

Ergot of Rye has been in use for about eighty years. Desgranges wrote an essay on its virtues so long ago as that; but Dr. Stearns of New York appears to have fixed it in its present place in obstetrics, thirty years later. Some prejudice against its use seems to have arisen out of its misapplication on the continent; for it was condemned by the medical bodies of the day, and eventually it became illegal to employ it. An epidemic arose in Germany A.D. 1596, which appeared to be traceable to its presence in the rye-bread generally eaten; and, so far back as about the year 1100, there was an epidemic in Silesia, the symptoms of which closely resemble those of ergotic poisoning; so that this agent was nothing very new to physicians even when Dr. Stearns wrote, in the year 1807.

Ergot is undoubtedly a stimulant of some nervous centre or centres. The idea of a specific action on the muscular fibres of the uterus alone is repugnant to all our scientific conceptions, and contrary to the tendency of discoveries which are constantly showing the action of remedies to be referrible to conditions of the blood or nervous system, modified by the emunctories through which such agents discharge themselves from the body. It is desirable to settle the question as to whether ergot acts on the ganglionic centres, or on the spinal cord, at rest; but, although I am satisfied in my own mind upon the subject, it may perhaps not be so easy to imbue the minds of readers with a similar conviction. Dr. Tyler Smith has stated directly in his writings that ergot acts upon the spinal cord; but he adduces no reasons for the statement, be-

yond the general reference to reflex spinal action which pervades his treatment of the therapeutics of uterine motor actions. I feel, therefore, the less hesitation in advocating a different opinion; though, at the same time, the dictum of so accomplished an obstetrician requires respectful consideration. The spinal theory of the action of ergot appears to rest upon the excitation of the muscular activity of the uterus which it produces, and upon the convulsions which follow its protracted ingestion. Neither of these circumstances, however, are at all conclusive, because the influence ergot exerts upon the uterus is explicable equally either upon the assumption that it acts on the spinal cord or the ganglia of the uterus proper; the one hypothesis, as an hypothesis, is as good as the other. The convulsive phenomena, moreover, do not obtain until a grave form of blood-poisoning is produced, similar in character to that which results from the zymosis of the blood in sausage-poisoning; and, indeed, it appears that numerous forms of toxæmia end in convulsions; so that the mere fact of convulsive actions is declaratory of no specific action at all. Disorganisation of the kidneys, and the defective blood-depuration of final stages of scarlatina and other fevers not exanthematous, are familiar instances of morbid states which have a common issue in convulsions and subsultus; so that these phenomena are of no special value. If we turn to the ganglionic theory of the action of ergot, there is the prime fact of excitation of the uterine muscles to fall back upon, as well as in the spinal theory of its action. But there are other facts which to me have appeared conclusive. It has been, for instance, proven that ergot is useful in arresting hæmorrhages, such as hæmoptysis and epistaxis; and, as the agent is possessed of no styptic properties, in the ordinary acceptance of the term, we are driven to account for its action in such cases by reference to an influence upon the capillaries exerted through the medium of the sympathetic. Ergot of rye has, further than this, been found useful in cases of retention of urine from vesical paralysis; and such cases have been recorded by M. Allier, Dr. Jeffreys, and Dr. Ross, and in the *Medico-Chirurgical Review* for 1839. A crucial experiment has, moreover, been provided for us by the fact that the agent under consideration has restored the functions of the bladder when there has been paraplegia, and when, at the same time, no effect whatever has been produced upon the paralysed voluntary muscles. I cannot, for these reasons, resist the conclusion that ergot expends its influence in stimulating the ganglionic nervous centres, and more especially those of the uterus proper.

The value of such an agent in an obstetric point of view must be determined by three circumstances; first, by the proportion of cases in which it produces the desired effect, and upon the effects not desired which it produces at the same time; secondly, by the effects it produces upon the fœtus; and, thirdly, by its more remote effects upon the mother. With regard to the first of these tests, much discrepancy of opinion exists. Villeneuve rated the proportion of cases in which ergot produced contractions of the uterus at six-sevenths of all cases in which it was exhibited. I have kept no account of the results in my own hands; but the general impression on my mind is that it as often fails to produce any effect as not. It is perhaps not safe to trust to general impressions for a positive conclusion, but I can speak very positively as to its frequent inutility if I cannot formulate my experience into an exact numerical result. Failures on the part of ergot to set up uterine contractions may be accounted for by disease of the drug, or by a natural capriciousness of quality; but whatever explanation may be assigned, the practical fact remains, that it does frequently produce no discernible effects whatever; and here this part of the question must rest for the present. But, with respect to uncovenanted effects produced in the course of labour, it is possible to speak more certainly, and of the frequency of such effects it is not so necessary to have a numerical indication, because the mere fact that they do occur, and that there is always a risk of their occurrence, is enough. In the first place, then, the uterine contractions excited by ergot are usually dissimilar to the normal rhythmical actions, being either partial and irregular, or violent and continuous. In the first instance the effect produced is pain, out of proportion to the advance obtained in the progress of the labour; and, in the second instance, time is not given for the natural fetal moulding and movement of adaptation. The parts of the fœtus are crowded down, as it were, upon the aperture through which it has to pass with too great haste, and the result is either disruption of the maternal textures, or a difficulty which arises entirely from abolition of the normal mechanical conditions of

delivery. The power or the resistance may be destroyed; that is to say, the uterus may give way, or the perinaum may be ruptured; and, short of such extreme effects, there may be all grades of bruising and injurious compression. When birth of the fœtus is accomplished, there are still other mishaps in view; for the placenta may become incarcerated by the over-stimulated uterus, and its removal is not always a very easy matter under such circumstances. This delay and distress to the patient by unusual protraction of the final stage of labour is not at all unlikely to cost the medical attendant her confidence, especially if she happens to connect the exhibition of the ergot with her condition, not to mention the substantial evil of delay to the patient herself. If we bring ergot to the test of the effect produced upon the fœtus, we shall find, perhaps, a more cogent reason for extreme care in its use than even those adduced above. Dr. Samuel Hardy has placed it beyond doubt that in the majority of cases where ergot is given, the pulsations of the fetal heart become less frequent, sometimes irregular, and even quite intermitting for a time. Dr. Hardy even avers that, should the fetal pulsation be reduced below 110 per minute, and at the same time become intermittent, the child is generally lost, however soon after delivery may be effected. The *modus operandi* of the drug in destroying the fœtus would appear to be threefold; first, it is a powerful sedative of the heart's action; secondly, it exhausts the fœtus by violent and continuous pressure; and, thirdly, the utero-placental circulation is so far abrogated by occlusion of the venous sinuses and curling arteries, that death by asphyxia, or, more properly apnoea, occurs before birth. I have not personally verified all Dr. Hardy's statements; but the fact of reduction of the fetal pulse and the fact of still birth I have seen. The third test of the utility of ergot is to be found in its more remote effects upon the mother. It accords with my experience that very serious bruising of the uterus results, in many cases, from the use of ergot, and that a low form of metritis follows such injuries. The effect of this form of metritis, followed a little further, is subinvolution of the uterus, so considerably, that at the end of a month the organ is the size of two fists, besides being hard, very tender and irritable, and very low down in the pelvis. I have heard practitioners of some experience express a doubt as to whether some of the cases of fatal metritis after labour are not traceable to the use of ergot. Cases have been recorded in which there appeared to be no doubt that death from metritis followed the exhibition of this drug. There is an article in a number of the *Clinique de Montpellier* of the year 1847, translated from the Spanish of Señor Corral y Oña, in which two cases of excessive contraction of the uterus following the use of ergot are detailed. Both women died of metritis. In summing up the value of this drug, I cannot but remark that it has enjoyed a great reputation upon slender grounds; and that whenever we obtain the results from it we desire, we run a great risk of getting also a series of uncovenanted effects which detract very seriously from the value of those results which constitute its primary intention.

In accordance with the principle laid down at first, the exhibition of ergot should be confined to cases of pure inertia uteri. It matters not how little an obstacle may be in the way, there is no justification in the use of ergot, or any other oxytocic, to overcome it, if the contractions of the uterus at all approach the natural standard of frequency and power. But in addition to the restriction as regards the quality of cases dealt with, another caution is requisite, arising out of the effect of the drug on the fœtus. Not only ought every case in which ergot is given to be a case of pure inertia, but the process of dilatation ought to be so far advanced, and the fœtus so far down in the maternal passages, that there is a reasonable prospect of delivery resulting from two or three sharp pains. Many a labour may be hastened by the use of ergot without attention to these rules; but many a still-birth, many a metritis, and many an incarceration of the placenta, will be the price of an expedition which only benefits the medical attendant—and him only at the cost of a moral defalcation. So strongly impressed have I been with the necessity of extreme caution in the use of ergot, that in the last four hundred cases I have attended I am sure I have not used it a dozen times. I have even thought it better to do nothing than to resort to its use; but fortunately there are other means of acting upon a case of inertia uteri; and we may well forego the temptation to give ergot when we reflect upon the numerous other ways of promoting uterine contraction which suggest themselves to the modern obstetrician.

It remains to speak of the dose of ergot, and the mode of

exhibition. My own plan has been to give a drachm of the powder in some warm gin and water. The ordinary dose of a scruple, repeated at intervals, is insufficient, and adds to the risk of poisoning the fœtus. It is better to give a full dose at once, so as to diminish the chance of absorption by the fœtus; and if the case be properly selected, the effect, if produced at all, will obtain in the course of from ten to fifteen minutes. The vehicle is not a trivial matter; for the cerebro-spinal stimulus of a glass of gin-and-water will materially assist the ganglionic stimulus. The ætherial tincture, according to my observation is often rejected; and I am not at all sure that æther takes up all the active principles. According to the late Dr. Wright, of Birmingham, no single constituent of ergot is capable of producing the effect of the powder; and for this reason, as well as on account of the teachings of my own experience, I prefer the crude drug. It has occurred to me first to exhaust the drug with hot water, then with proof spirit, and finally with ether, and to mix the several fluids; but even with this method, which ensures the presence of all the constituents of ergot, I see no advantage over the powder possessed by pharmaceutical preparations.

Digitalis is a drug which may fairly be considered as an appropriate oxytocic in some few cases. That it should ever come into use as an excitant of the uterus during labour at the full time with a living fœtus, is neither probable nor desirable; but in cases of abortion it deserves consideration on account of the twofold manner in which it produces hæmostasis. As an emmenagogue, *digitalis* has been long known, and also as an oxytocic; and this last application of the remedy has been recently revived in a manner by the experiments of Mr. Howship Dickinson. The agent in question would appear to have an extensive range of actions upon the genito-urinary system in both sexes. Priapism, emissions, and violent sexual excitement have been known to follow its administration in considerable doses; and such cases are recorded by medical jurists. The fact that *digitalis* is a diuretic, a stimulant of the kidney (an associate organ to the uterus), is perhaps, in some measure, a clue to its oxytocic powers; certainly it would appear that many diuretics stimulate the uterus. Juniper and safin act upon both organs. Cantharides excite diuresis as well as "fire the lazy blood"; and, indeed, there is presumptive evidence that any diuretic will stimulate the uterus.

Mr. Dickinson's experiments were made at the time he was Resident Obstetric Officer at St. George's Hospital; and they consisted chiefly of the exhibition of the drug in cases of menorrhagia and hæmorrhage from organic diseases of the uterus; it was, moreover, given to pregnant women, in whom it set up uterine contractions. The result as regards the cases of hæmorrhage was that the bleeding was effectually controlled under certain circumstances. There were, of course, three possible explanations of the action of *digitalis* in suppressing the hæmorrhage; first, the diminished *vis à tergo* of a more slowly pulsating heart might permit the establishment of natural hæmostasis; or, secondly, the drug might be a styptic, properly so-called, when absorbed into the blood; or it might be that the uterine muscle was stimulated to contraction, and that stanching of the hæmorrhage arose in the first instance from compression of the bleeding points. The question was set at rest by a very ingenious *experimentum crucis*, which was made in this way. *Digitalis* was given in cases where the bleeding points were external to the uterine cavity; and again in cases where they were internal. In the first set of cases no check upon the bleeding was effected; but in the second the bleeding was controlled. There could be no reasonable doubt, from these experiments, that the hæmostasis was due to the compression of the contracting uterus.

As to the action of *digitalis*, I apprehend there cannot be much doubt. It is a stimulant of the organic nervous centres, in the first instance. The diminution in cardiac force, and frequency of pulsation, effected by *digitalis*, has been shown to be subsequent to stimulation; and it would appear that the rapidity with which its sedative effects follow its effects of stimulation is peculiar to its action on the ganglia of the heart.

As regards its use in obstetric practice, I should be inclined to restrict it to cases of abortion in which the hæmorrhage is considerable, or the ovum only partially detached, but so far adherent, and so much out of reach, as to render much manual interference imprudent. I have met with two cases of albuminuria of pregnancy, in which *digitalis* was given as a diuretic; and in both cases the fœtus died *in utero* during the exhibition of the drug, and premature labour occurred. It must therefore be regarded as a dangerous remedy in such cases. There

are similar cases mentioned by the late Dr. Campbell in his *Introduction to the Study of Midwifery*. There is some influence, I should imagine, to be attributed to retardation of the heart's action in the hæmostasis effected by digitalis. This consideration, and the clearly established fact that this agent does really excite uterine contractions, appears to me to mark it out as a valuable means of controlling the hæmorrhage which occurs in cases of fibrous tumour of the uterus. This application is not strictly obstetric; but is so nearly so, that it appears fairly worthy suggestion here.

[To be continued.]

CASE OF BULLET IMPACTED IN THE CHEST FOR FORTY-TWO YEARS.

By ROBERT HOWARTH LEACH, Esq., Shaw, near Oldham.

ON November 18th, I forwarded to Edward Stanley, Esq., F.R.S., for presentation to the Royal College of Surgeons, a preparation which I have had made of a part of the lung, cyst, and ball, which I recently removed from the body of the late Henry Barrott, of Fullwood, near Oldham.

The following is a short history of the case, and may be most implicitly relied on.

Henry Barrott was aged about 27 years at the time of receiving his wounds. His statement is as follows:—"I was in the First Regiment of Life Guards. We were fighting in close column, on the afternoon of June 18th, 1815, at Waterloo, when I received my wounds. The ball passed through the muscles of my left upper arm, and entered the left side of my chest, fracturing two of my ribs. It could not be extracted. I was in the hospital at Brussels from the above date to March 1816, when I was discharged, with a pension of ninepence a day. I had an incision made into my side, while I was in the hospital at Brussels, to evacuate a large quantity of matter that had collected in my chest."

For a number of years after Barrott returned home, he suffered much, as he stated to me, from attacks of pneumonia; and after I began to attend him, he was subject to inflammatory attacks in the chest, with copious expectoration, which, latterly, was of a muco-purulent character. He sank exhausted on October 13th, 1857, forty-two years and one hundred and seventeen days after he received his wounds. I examined the body, and removed a portion of the left lung, with the cyst and ball, forty-two hours after death. The ball weighs 5 drachms and 34 grains, or nearly three-quarters of an ounce (apothecaries' weight).

Mr. Lund, lecturer on anatomy at the Royal School of Medicine, Manchester, having seen the parts before they were put up, wished to be informed whether Barrott had coughed up blood, or been bled, while in the hospital at Brussels. On my putting these questions to the widow, she informed me, in reply to them, that she had heard her husband often say—"that he did cough up blood from his chest, and that he was bled in the arm twice in one day."

I find, on examining Barrott's papers, that he was discharged on March 6th, 1816; and the cause assigned is a "wounded thorax and abscess in the lung". His papers give him "nine years and a half servitude".

EXAMINATION OF THE BODY forty-two hours after death. The circular cicatrices caused by the ball in the left upper arm and left side of the chest were still very visible. On raising the sternum, we found the left lung diminished in size, very much solidified, and firmly bound down to the ribs by strong adhesions, which resisted the knife like so much cartilage. On separating the adhesions, we opened a large abscess in the lung, which contained about a pint of foetid pus; and in detaching the lung from its posterior wall, we accidentally opened the cyst which contained the ball, and the latter escaped for the moment into the cavity of the chest. This circumstance I very much regret, but the occurrence was unavoidable, owing to the abscess having been opened in our endeavours to separate the lung from the ribs.

REMARKS. I have, as shortly as possible, given the history of the case, and will now venture to offer an opinion upon it. My own impression is, that the ball, having entered the chest and being nearly spent, instead of passing at once into the substance of the lung, glided down posteriorly between the lung and ribs, and, slightly wounding the lung, became fixed in its situation by adhesive inflammation being set up in the pleura pulmonalis and pleura costalis. That the lung was

wounded, the hæmoptysis proves; and that violent inflammation followed, the bleedings spoken of by the widow, go far to prove.

The preparation is in the Museum of the Royal College of Surgeons, where it may be seen on application to Mr. Quekett.

THE VACCINE SCARIFICATOR AND GUARD.

By WALTER GARSTANG, Esq., Blackburn.

AN unusually successful method of operating in vaccination consists in employing a little instrument, which I have designated as above, and constructed in the following way:—Having procured a common metallic pen-holder, with reversible end, and clipped off that portion of it which was intended for the insertion of the pen, and accordingly rendered duplex by compression, I had then left two small tubes, one of which, the larger, admitted of the other sliding into it. I next took the pointed extremities of six well-tempered medium-sized sewing needles, secured them together by ligature, and separated their points evenly placed in relation, by a turn of the thread passed between each; these I placed inside the in-going or lesser tube, just so low down as to allow their points to project outwards to one-tenth of an inch (see fig.), retaining them in position by means of softened gutta percha. So prepared, the lesser tube, elongated for facility of employment by its adaptability to the other, constitutes the vaccine scarificator, of which a full drawing is given (fig. 1).

The guard is an oblong disc of ivory (fig. 2), fashioned like

Fig. 1.

Fig. 2.

a pleximeter, and having in the median line two holes, half an inch apart, of such a size as will allow the scarificator to be moved in a limited degree to and fro in every direction within their area.

In proceeding with the operation, the vaccinator first places the guard in contact with the infant's skin; and, for an obvious reason, he is led to prefer a spot which is anterior to the insertion of the deltoid muscle. He then takes up the scarificator between his finger and thumb, and abrades, in the manner before mentioned, the cuticle and basement-membrane only, corresponding in extent to the size of a pock of variola discreta in its vesicular stage. By this procedure, an areola of derma is exposed, full of active lymphatic absorbents, and peculiarly susceptible of the influence of the vaccine virus, which is thereupon to be immediately applied, either with a lancet or clean ivory point, first clearing away any serous exudation by the touch of a napkin. If, however, the lymph be employed in the dry state on points (and it is by no means infrequently so employed), the serum serves the useful purpose of liquifying or dissolving it, and so promoting its absorption.

Any lymph, short of what may actually have become inert through long keeping, will by this method generally be found to be successful in its result—a circumstance of some importance, in the history of vaccination, to gentlemen in small practice or in remote parts; and the union surgeon, whose cases in this department are oftentimes numerous, will find his