made the discovery that corrosive sublimate is a powerful hepatic stimulant; for it seemed not unreasonable to suppose that the free hydrochloric acid of the gastric juice might, by converting a small quantity of calomel into mercuric chloride, render it a hepatic as well as intestinal stimulant. The results of a full investigation of this question were given at the close of the second series of experiments, and they prove that, when calomel is placed in the stomach of the dog, its action is the same as when placed in the duodenum. Having, therefore, established that, in the case of commonly used drugs, their action on the liver is similar, whether directly introduced into the stomach or into the duodenum, we are in a position to predict that, when the dog's liver is excited by a drug directly introduced into its duodenum, that drug will *probably* also be found to stimulate the human liver when taken into the stomach by the mouth.

CONCLUDING OBSERVATIONS.

In our introduction to our first series of experiments, we pointed out what had been ascertained regarding the actions of drugs on the secretion of bile by our predecessors. We showed that, for want of a proper method of experiment, the definite knowledge arrived at was very meagre and to some extent erroneous; and, if the statements in that introduction be compared with our summary of results (p. 177), some idea may be formed of the extent of our labour, which we have striven to render as complete and as free from error as possible. We claim that, by means of a novel and precise method of investigation, we have been the first to place the whole subject of the physiological actions of drugs on the liver upon a sound footing, and thus to lay a real foundation for the rational—that is, scientific—treatment of many diseased conditions of this important organ; and it is gratifying to know that, in consequence of this research, not a few physicians have been led to use the new remedies to which we have specially directed attention. We have, indeed, occasioned by our experiments a considerable amount of pain to a number of dogs; but, considering that our discoveries are calculated to relieve much suffering, not only of men, but also of dogs, for all time to come, we believe that we have spared infinitely more suffering in the future than we have occasioned in the present.

In conclusion, I have to tender my warm thanks to my former pupils M. Vignal and William J. Dodds, M.B., D.Sc., for their valuable assistance in the performance of the experiments, and for their agreeable company during the long and weary hours through which they daily extended. I have cordially to thank the Scientific Grants Committee of the British Medical Association for having entirely defrayed, from the funds of the Association, the very heavy expenses incurred for the materials of the research, and for their energetic and powerful support at a time when the clamour of blind ignorance and silly prejudice seriously menaced and almost arrested the progress of this research. Having personally devoted not less than fourteen hundred hours of severe labour to the accomplishment of this work, and having (as, of course, every medical man thinks himself bound to do for the alleviation of suffering) communicated to all every fact calculated eventually to cure affections so common as those of the liver, it is, to say the least, ungrateful, that a certain section of the public should have rewarded our unselfish efforts to cure their *biliousness* by a flood of scurrilous abuse, because, like most of our medical brethren, we refuse to believe that to be penny-wise and pound-foolish as regards pain is not a policy as shortsighted, as narrow-minded, and as reprehensible here as elsewhere. Though profuse with their ingratitude, I doubt not that one and all of them will be very ready and eager to profit by the results of our labour; for I believe them to be much too recreant and craven-hearted to allow themselves to refuse all medical aid, and thus to push their ill-conditioned logic to its practical issue. Desiring, as I think most of them do, to continue in receipt of all the medical assistance they can obtain, they naturally try to overcome their conscientious scruples by vainly attempting to show that *nothing worth knowing* in medicine has been learned from experiments on animals. It is not difficult, by misrepresentation and by a multiplicity of words, to deceive a public ignorant of the machinery of life and of the processes by which its movements are studied and remedies found for its disorders; but they cannot thus deceive any moderately well informed and right-minded medical practitioner. It would be a just return for their opposition to medical experiments on animals, were medical men to take them at their word, and deny them the benefit of advice that is directly and indirectly based on such experiments. Their not having been already placed in this predicament is entirely due to the long-suffering charity of the medical profession, whose members are slow to refuse to alleviate the sufferings and prolong the lives of even those who misrepresent their motives and throw obstacles in their way. But, if they really wish medical men to continue to minister to their wants, the sooner they

lapse into becoming silence the better. Meanwhile, heedless of their ignorance, so contemptible were it not so mischievous, their scurrilous abuse—usually anonymous—and their shameful misrepresentations, we steadily have recourse to those methods of research which every medical man worthy of the title approves, because he knows them to be essential for the advancement of medicine; and the conviction of earnestly doing our utmost to prosper the cause of rational therapeutics—that is, of a scientific practice of the healing art—is to all earnest votaries of medicine a sufficient recompense for labour as honestly unselfish as it is practically unremunerative. And when the dupes of the antiphysiological—that is, of the *antimedical*—apostles awake to a sense of the gross injustice of the present antivivisection agitation, I would suggest that they could not do better than liberally contribute to the endowment of the few—too few—physiological laboratories to be found in the country; for it is not reasonable that, while the public receive the benefit, the heavy expenses of a research such as the above should be defrayed by the practitioners of medicine throughout the country.

REMARKS

ON

ANTISEPTIC MIDWIFERY.*

By J. MATTHEWS DUNCAN, M.D., LL.D., F.R.S.E.,
Physician-Accoucheur and Lecturer on Midwifery at St. Bartholomew's Hospital.

THERE is no subject which excites more the interested attention of the profession and of the public than puerperal deaths, yet, unfortunately, there is none regarding which there is more misunderstanding. There seems especially to be great difficulty in accepting the terrible fact of the great mortality of childbearing, a mortality as heavy in private practice as it is in well-managed maternity hospitals.† Puerperal deaths own various causes. Some are traumatic; some are from traumatism; some from simple inflammation; some from textural degeneration; many are from diseases which may be described as more or less accidentally complicating puerperality. But by far the most prevalent and important causes of puerperal deaths are septicaemia and pyaemia. Both these diseases involve or imply inflammatory processes, and both are essentially septic. It is against them that antiseptic midwifery wages war, and already it has achieved great successes. The object of this communication is to increase and diffuse knowledge of this subject, and to stimulate further inquiry into it, with a view to still further development of the beneficent antiseptic methods. Already, more pain is prevented and more life is saved by antiseptic methods than by all the recent combined improvements of midwifery, great though these are; and there is no prospect of preventing pain and saving life half so bright and encouraging as that from the extension and diffusion of them. Midwifery has been infected with its present zeal in this department of therapeutics by its sister surgery, and is proud to own the obligation. But, while the mere theory of antiseptics is the same for both surgery and midwifery, there is practically great divergence. Especially, that perfection of antiseptic treatment, which is called Listerian, has not been attained in midwifery. Ingenuity and skill have as yet failed to achieve this result. But there is no room for despair.

Ever since puerperal fever, or, in other words, puerperal septicaemia and pyaemia, were known, they have been accounted for, more or less distinctly and exclusively, by the uterine wound and a ferment or sepsis in the blood. A theory always, and naturally, brings a treatment in its train; and, accordingly, antiseptics have been in use in these diseases ever since the theory was started. In accordance with the modern developments of the antiseptic theory, attention is more and more exclusively directed to the local conditions, and especially the wounds of the uterus, and, in addition, those of the vagina and pudenda. But, formerly, the disease was opposed principally in the blood by treatment directed against the fermentation or sepsis there. This kind of treatment was almost purely hypothetical, and no evidence of any good results from it has ever been obtained. Even now, this department of therapeutics is

* Read to the Medical Society of London.

† Among other papers, see Winckel, *Berichte und Studien*, Band II; McClintock, *BRITISH MEDICAL JOURNAL*, August 10th, 1878, p. 215; Garrigues, *Gynaecological Transactions*, vol. ii, 1877, p. 592; Hecker, *Aesthetisches Intelligenzblatt*, v. Serie, No. 1, 1877; Matthews Duncan, *Mortality of Childbed and Maternity Hospitals*; Grünwaldt, *Volkmann's Sammlung*, No. 123; Lusk, *Transactions of International Medical Congress*, Philadelphia, September 1876; Stadfeldt, *Les Maternités, leur Organisation et Administration*; Feigneaux, *Centralblatt für Gynäkologie*, No. 13, 1878.

not neglected, and the treatment of Polli of Milan will be remembered by most. Of this department of antiseptic midwifery, I do not here attempt the discussion.

The local use of antiseptics, when there is clear nasal evidence of putrefaction in the genital passages, is the oldest application of such remedies, and still retains its indispensable place. Harvey* used, and in the last century Baudelocque described, this treatment just as the most modern author. The nasal evidence arising from examination of the discharges is generally abundantly sufficient for diagnostic purposes; but only generally. In some women, the healthy lochia have an odour so strong as to simulate that of putrefaction; and I know of no ready clinical method of settling the difficulty in such cases, except that of treating all that are uncertain as if there were putrefaction. All cases in which there is distinct putrefaction do not present constitutional disturbance, or, in other words, symptoms of septicæmic fever; and I cannot state the frequency of this fortunate deficiency. Neither can I explain its occurrence; only, while I know no difference in the anatomical conditions of the two sets of cases, I am disposed to fall back on the physical condition of negative abdominal pressure as the best theory of it, and for this, analogy is found in the results of intra-uterine injection of perchloride of iron solution.† In most cases, the fluid does not pass through the uterine sinuses into the veins in the broad ligament, and so onwards; but in some it does, and I believe the explanation of this occurrence is the same in both. The putrefying liquor flows steadily into the circulation in some cases; and in such we have the septicæmic fever. That it may also pass by the lymphatics is plain; but on this route of transmission we have as yet less information.

This poison of ordinary putrefaction produces septicæmia, but the term has only recently been applied to it; and it is necessary not to confuse the old and well-known septicæmia from putrefaction with the modern septicæmia of surgeons. Both may be justly called septicæmia, for in both the blood is poisoned by decomposing animal matter. But, while in one there is evident ordinary putrefaction, in the other the nature of the sepsis or decomposition is probably different, there being ordinarily no strikingly offensive odour. The clinical distinctions are also marked, and will be considered hereafter.

Midwifery experience is full of examples of the rapid transition from alarm and danger, on arrestment of putrefaction, to security and safety. The indication of treatment in all such cases, then, is plain. The putrefying matter is, if possible, to be removed. If this cannot be done, the putrefaction is to be, if possible, arrested; or, if it cannot be arrested, it may be diminished. Antiseptic measures here consist in the surgical removal from the vagina or uterus of the decomposing materials. If these be in the vagina, the object is easily attained by the use of the obstetrician's fingers, or of a dressing-forcps, or of a lotion. If they be in the uterus, the same means are resorted to, but the operation is more difficult. The object to be attained is, however, so important, that no pains are to be spared to effect it. If the putrefying substance be beyond easy reach, and if an intra-uterine antiseptic lotion thoroughly applied do not stop the putrescence, then an attempt should be made to introduce the carbolised hand to find and remove the offending structures, if this be possible. This particular department of antiseptic midwifery I have elsewhere‡ discussed, and shall not now enter upon it; only adding that much has to be done with a view to precisely determining the length of time after labour, and the other conditions under which this operative proceeding is feasible and advisable.

The familiar operation of washing out or irrigating the vagina is often done by a nurse; the washing out of the uterus is done by the accoucheur. Both operations, but especially the latter, require care. Especially is it important, considering the anatomical condition of the uterus at the placental site, that no air be forced into the uterus, and that no fluid of any kind be urged with more than the gentlest sufficient power. Neglect of these conditions may lead to baneful passage of matters into the general circulation through the uterine sinuses, and perhaps otherwise. To secure gentleness of pressure, it is not sufficient to have free exit for fluid through the cervix, which, for this purpose, is generally already amply expanded. An additional free exit may be obtained by using a double tube for injection. But, besides free exit, the pressure by the syringe should not be strong even for a moment. This is attained by care, or by the use of an irrigator—that is, the pressure by a head of injection-fluid. This latter expedient is valuable if the operation is to be done by an inexperienced or not thoroughly reliable person, who should at the same time be charged to observe the uninterrupted running

out of the lotion, and to stop the injection if the running off be arrested. It has been in several quarters recommended to leave the intra-uterine tube* *in utero*, to act as a drainage-tube, and to obviate the necessity of frequent reintroduction. But a tube so left, if antiseptically plugged, is no longer a drainage-tube, and, whether plugged or not, will almost certainly act as a source of sepsis instead of antiseptics. Circumstances are, however, conceivable in which a tube may, for a time at least, be left *in utero* with a view to frequent irrigation, and then the whole operation, with the safety of a short tube from the head of injection-water, or other security against its elevation to an undue height, may be committed to a good nurse to carry on. Many intra-uterine tubes have been invented and described, the most recent being those of Hayes and of Potter; but want of time will excuse my entering on the description or discussion of them. Neither shall I enter on the question of the particular antiseptic solution, recommending a warm carbolic lotion of the strength of about 1 in 50.

In a case of putrefaction manifest to the nose, with constitutional affection, the evil must be overcome by irrigation, however frequent; and it is for this purpose that a tube, left *in utero*, may be for a time required. But as yet I do not go the length of some obstetricians, who regard intra-uterine injection as a perfectly harmless operation,† the repetition of which needs no thought. Indeed, in cases where there is no manifest putrefaction, but where irrigation is considered expedient, it is difficult as yet to decide how often the antiseptic washing out should be done. It is desirable to avoid frequent daily injections. The uterine cavity should be washed till the fluid returns clean, and from half a pint to a pint is a moderate quantity to use.

The dangers of carbolic acid, or of other ordinarily used injections, whether antiseptic or not, attach themselves almost exclusively to those which are intra-uterine. They are too grave to be passed over without full and special consideration; and they are quite sufficient, in my opinion, in the meantime, to render it inexpedient to resort to intra-uterine lotion‡ without distinct indications; and it is well known that distinct indications imply distinct danger to life. Some authors, as Münster and Schülein, regard intra-uterine lotions as quite harmless, and as to be used in any, if not in every, case. With such views I cannot at present concur. But it appears to me that, when putrid discharge flows from the uterus and is producing septicæmic fever, or when there is septicæmic fever referable to absorption of uterine secretions that are not putrid, the danger to life is so great as to justify some risk in the therapeutical proceedings, if there be good hope of doing good or saving life by them. In the present instance, it is impossible to say exactly how well founded the hope of doing good is. But it appears to me beyond all doubt, first, that there is good hope; secondly, that in no other line of treatment is there nearly so good hope; and, thirdly, that no other line of treatment commands so highly the confidence of those best able to judge the matter. With reference to this treatment by intra-uterine injection, there are still outstanding important considerations; namely, the applicability, in some cases, of the alternative plan, and probably a safer one, of examining the interior of the uterus by the carbolised hand, and so removing offending matters; and the question of the frequency of infection by other routes than the uterine, rendering in such intra-uterine injections unnecessary.§

The danger of propelling the intra-uterine lotion through an open Fallopian tube has been much discussed. Cases demonstrate its possibility. But its extreme rarity renders it the least considerable.||

The great dangers are from poisoning in various ways, and I shall consider only the case of carbolic lotion. Such poisoning as goes only the length of producing for a time dark-coloured urine and other considerable symptoms is unimportant, and need not create alarm. But there is a chronic poisoning, said to be the result of lymphatic absorption,¶ which produces alarming symptoms. These are shivering and cyanosis, with quick and weak pulse. So far as I know, such poisoning has not proved fatal; and it is plain that, if the symptoms are suf-

* See Fritsch, *Volkmann's Sammlung*, No. 107, s. 800; Schede, *Berliner Klinische Wochenschrift*, No. 23, 1877; also Schucking, *Centralblatt für Gynäkologie*, No. 3, 1877; and *Berliner Klinische Wochenschrift*, No. 24, 1877; also Langenbuch, *Zeitschrift für Geb. u. Gyn.*, Band II, 1877, s. 86.

† See Münster, *loc. cit.*, s. 450; also Schülein, *Ibid.*, Band II, s. 116.

‡ Grünwaldt and Schülein (*loc. cit.*, s. 104) have used it in all cases; although they seem disposed to some restrictions.

§ Of Kehr's (see Fritsch, *Volkmann's Sammlung*, No. 107, s. 809) suggestion to leave retained matters *in utero* till wounds are covered by granulations, I do not comprehend the theory; for, if such matters are putrid and injurious, they should, if possible, be removed at once. Besides, long after granulations ensure a degree of safety by covering wounds, the uterine sinuses remain open on the interior of the organ (among other references, see Matthews Duncan, *Researches in Obstetrics*, p. 191); and there is other evidence of the permeability of some uterine ulcerated surfaces (*Edinburgh Medical Journal*, February 1879, p. 675).

|| On the necessity for gentleness in vaginal injections, see Späth and Kern, *Centralblatt für Gynäkologie*, No. 25, 1878.

¶ Fritsch, *Centralblatt für Gynäkologie*, No. 15, 1878.

* For reference to its older use by Albucasis and Levret, see Münster, *Zeitschrift für Geb. u. Gyn.*, Band I, 1877, s. 427.

† *Edinburgh Medical Journal*, February 1879, p. 675.

‡ *BRITISH MEDICAL JOURNAL*, October 27th, 1877, page 583. See also Braxton Hicks, *BRIT. MED. JOURNAL*, August 25th, 1877, p. 257; and Atthill, *Obstetrical Journal*, January 1879, p. 660; and Jones, *BRIT. MED. JOURNAL*, May 18th, 1878.

ficient to indicate the poisoning, then the lotion may be given up, or the extent of its use may be diminished. Acute poisoning by carbolic lotion is probably the result of the fluid flowing into the venous system and so onwards; and it is possible that the quality of the fluid may be only of secondary importance. The symptoms of this come on suddenly, even while the injection is proceeding. They are very alarming. Death has resulted, and immediate arrestment of injection may be too late. The symptoms somewhat resemble those of embolism, and indeed some amount of embolism may complicate the carbolic poisoning. The patient is described* as suffering from dyspnoea, frequent, small, or scarcely perceptible pulse, insensibility, and clonic spasms, especially of the face.

It is natural to suppose that the passage of fluid into the veins may be impeded by the uterine retraction induced by ergot; and this remedy should, in such cases, be employed for this as well as for other reasons.

The danger of forcing air into the uterine sinuses I do not consider, because it can be avoided by careful manipulation.

The danger of inducing parametritis or perimetritis is mentioned by Münster;† but he regards this as not a sufficient contraindication, and he quotes as holding similar views Grünewaldt, Radecki, and Hervieux.

In many cases, hæmorrhage has resulted from the injection, but has, so far as I know, never proved alarming, or compelled more than temporary arrestment of the proceeding. It is ascribed to displacement of clot-plugs by the rushing fluid; but I am rather disposed to attribute it to distension of the cavity of the uterus, too much pressure by the injected fluid being applied.

The great modern development of antiseptics in midwifery is in the prophylaxis of puerperal septicæmia and pyæmia; and, while much remains to be settled in this department, the successes and the expectations are certainly great. It is scarcely necessary to say that it is assumed that there is a virus which, being inoculated, induces the dangerous sepsis; and which may, perhaps, without inoculation from without, be produced in the puerperal woman's body. In accordance with this double source of the virus, the subject of prophylaxis is divided into protection from danger from without, and protection from danger from within. The subject is an extensive one in a literary point of view, and I shall not attempt to do justice to it in that respect; satisfying myself with naming pre-eminently Bischoff of Basle,‡ Fritsch, Fehling, R. J. Lee, Goodell, Lusk, H. P. C. Wilson,|| Schucking, Playfair,¶ Gervis,** Kehrer, Schede,†† Langenbuch, Chamberlain, Zweifel, Richter, Spiegelberg, Grünewaldt, Winckel, Hervieux.

Antiseptics in midwifery have been so used as to imply an attempt to realise Listerian results. No other account can be given of the conduct of confinements under the spray. But it is scarcely necessary to point out the vanity of such proceedings, as hitherto practised. Indeed, one cannot, meantime, imagine a Listerian method for confinements. Among other conditions, it would be necessary to have preliminary perfect disinfection of the vagina and cervix uteri. Then the whole confinement would require to be conducted under Listerian precautions, thoroughly carried out in spite of the proximity of the anus. Further, the whole after-treatment, including the care of vesical and rectal evacuations, would require Listerian management and precision. Meantime, this is impossible.

The operation of Cæsarean section is often spoken of as being done in the Listerian manner. But even here it is impossible to make sure of thorough or Listerian antiseptics; yet it is surely judicious to attempt it. Ovariectomy can be done thoroughly antiseptically, and from all quarters come testimonies to the success of the plan; but in Cæsarean section, besides the conditions of an ordinary labour, which are as yet, as already said, incapable of thorough antiseptic management, you have the wound of the abdominal wall, and especially of the uterine wall. It should surely be an object of the operator to keep these, so far as possible, under strict antiseptic conditions; and it is conceivable that success, so far as these wounds alone are concerned, may attend the procedure. Insecurity arises from the well-known easy propagation of sepsis from the vagina or uterus to the inside of the uterine wound. Then there is the danger of the septic matter passing through the wound from the well-known imperfection of the mutual adaptation of its two opposed surfaces; an adaptation which, however neatly executed by deep sutures, is liable to be disarranged by uterine contractions, espe-

cially as they affect different planes or bundles of the muscular structure of the part.

Antiseptic prophylaxis, in ordinary confinements, against danger from without, has now been extensively carried on, and with results which excite the enthusiastic admiration of all who have fairly tried them, whether in hospital or in private practice. The details of the method vary, some practitioners using more, some fewer, precautions. They are the same for hospital as for private practice. Similar care is now extensively taken against infection in surgical hospital-wards. It may be described as a transcendental disinfecting cleanliness; and its results in surgical hospitals, when Listerian methods are not adopted, have been extremely satisfactory; so much so, indeed, as to lead some to doubt the necessity for Listerian exactness. This great success is probably best illustrated in the healthiness now prevailing in many of the great continental hospitals, such as those of Copenhagen and Munich; and in these are to be seen, not only the generally good results of antiseptic cleanliness, but also those special surgical cures which, without the Listerian method, would neither be attempted nor produced.

[To be continued.]

ABSTRACT OF A CLINICAL LECTURE

ON

TALIPES EQUINUS AND CALCANEUS:

WITH CASES ILLUSTRATING NEW METHODS OF TREATMENT.

(Delivered May 24th, 1878.)

By RICHARD DAVY, M.B., F.R.C.S.,
Surgeon to the Westminster Hospital.

GENTLEMEN,—Before entering upon our special subject this day, I wish to draw your attention to two cases in Mark Ward, of talipes varus, which have been most successfully operated on in the way described by myself in the BRITISH MEDICAL JOURNAL of December 15th, 1877: cases in which common-sense rules of cleanliness have been carried out, but without any dressings, or any special antiseptic precautions. Both were young lads; both had been most patient submitters to the usual orthopædic practice; both had gradually got worse; and both were unable to gain an honest livelihood by reason of the deformity. The right foot was affected in each case. Their recovery also was equally uniform. Each boy left his bed five weeks after the operation; and both can now walk well without apparent deformity.

You must remember that, in these cases of confirmed talipes, the bones are structurally altered; and this fact (amongst others) directed my attention to bone-operation, in contradistinction to tendon or fascia cutting. Take the case of a deformed knee-joint with angularity of ten years' duration, no amount of division of hamstrings will restore the limb to a straight line; but an accurate removal of a wedge-shaped piece of bone effects restoration immediately; or, supposing the mast of a vessel to be permanently distorted, cutting away portions of the rigging is useless; the mast itself must be subjected to the carpenter's skill before permanent straightness and symmetry can be regained.

I here exhibit before you the facts which induced me to resort to the removal of an accurate wedge from the tarsus. On this dead man's foot I have opened freely from the outside the transverse tarsal joint, and I have inserted a wedge of wood into the gap. You now see how exactly the deformity of talipes varus is produced, and how that nothing short of the ablation of this wedge will restore symmetry. I am not aware that this demonstration has ever been previously made; but it is an excellent one, and makes the *rationale* of the operation at once intelligible to any observer.

Talipes Equinus.—This deformity may be most simple or severe; illustrative cases may be found from simple elevation of the heel, phalangeal progression, digital tip hobbling, up to positive treading on the dorsum of the foot. In the more severe cases, nothing short of amputation answers; and I leave it to your discretion in individual application as to which operation may be selected (Pirogoff, Syme, or Chopart). In the simple variety, divisions of the tendo Achillis and plantaris suffice.

The preparation and casts that I now show you are taken from Gladhill's case of talipes equinus (nineteen years' duration), in which I removed a wedge-shaped key-stone of the tarsal arch. The man died, two weeks after the operation, from septicæmia.

This cast (fig. 1) is a typical illustration of talipes equinus, the heel itself not being so much at fault as the phalangeal end of the foot; so

* See Küstner, *Centralblatt für Gynäkologie*, No. 14, 1878; see also Herdegen, *Ibid.*, No. 16, 1878.

† *Loc. cit.*, s. 486.

‡ *Correspondenzblatt für Schweiz. Aerzte*, Nos. 22 and 23, 1875.

§ *Volkmann's Sammlung*, No. 107.

|| *Gynaecological Transactions*, 1878.

¶ *Science and Practice of Midwifery*, 2nd edit., vol. ii.

** *Obstetrical Transactions*, vol. xviii.

†† *Berliner Klinische Wochenschrift*, No. 23, 1877.