been seen is small. Phayre described a case in which there was reason to believe that the lightning had entered the left side of the head; he found the left hemisphere to be wholly disorganized, an almost homogeneous liquid of deeply greyish colour, only a small part of the corpus striatum looking normal. Somewhat similar changes were noted by Johnston and by Dürck; Bauer found the brain very soft and anaemic in his case, and the cord had apparently deliquesced to a grey fluid substance. A doubtful case has also been recorded by Barnes; Dunscombe-Honeyball found the brain in parts almost diffident in one of his fatal instances of lightning-stroke.

Fracture of bones by lightning appears to be common in animals, and is not rare in man. Extensive fractures of the skull were noted in Knaggs's case, extending from the left parietal eminence across the right parietal bone, in which fine fissures radiated from the main crack and down to the base across the middle fossa, the orbital plate of the frontal bone (as in Heffernan's case), and the cribriform plate of the ethmoid. Dunscombe-Honeyball describes two cases in which extensive fractures of the skull were found. An excellent diagram of the elaborate fissures of the skull in a case he describes is given by Schottin; in this instance two ribs were also fractured, but without injury to the underlying tissues. Gem has recorded fracture of the humerus and the spinal column. Fractures of the tibia, or of both the tibia and fibula, by lightning-stroke have been recorded by Roy, Wilks, and Penfold; in the last case the victim was sitting down at the moment when he was struck, and there was no contusion at the seats of fracture, so that one seems able to exclude the possibility that the fracture was due to falling or to the application of external violence in any way. To illustrate the extensive fractures of bones sometimes exhibited by animals I may quote Free, who describes the case of a man who was struck by lightning and rendered unconscious, and then developed acute Bright's disease. A horse that was with the man was struck at the same time as the man and was killed. Free says that "the dead horse was as soft as a jelly, partly owing to the fact that every large bone in its body was comminuted." The exact mechanism by means of which lightning fractures bones is obscure. In cases where the heel is lacerated and the os calcis comminuted, one may perhaps imagine that an extra development of heat and steam has taken place here, with the result that the electric discharge has, so to speak, blown its way out of the body. The example described by Clark and Brigham proves that enough heat may be developed in so deeply situated a bone as the orbital plate of the frontal bone to char it, so that it is not unreasonable to suppose that small steam explosions may result if the lightning develops a less degree of heat in a moist tissue. But it is not quite easy to imagine how the tibia and fibula could be broken, without showing any external injury, as in Penfold's case, if the fractures were caused by small steam explosions taking place inside these bones. Yet there is no alternative explanation to offer. For I do not think it is imaginable that any known forces of electric attraction or repulsion³⁷ could exert enough violence to break bones. At any rate, the physicists appear to know nothing of electric forces of the magnitude that would be required here.

In a few well recorded instances which are extraordinary almost to the point of being incredible, strokes of lightning have effected amputations. Sycyanko quotes a case occurring in Russia, in which a boy of 12, who had had a flexed and ankylosed right knee for some years, was struck when riding on horseback. He was thrown to the ground and rendered insensible. At the same time the lightning amputated his right leg just below the knee-joint, leaving the patella and the cartilaginous upper end of the tibia intact. The boy made a good recovery; the amputated limb was afterwards found near the spot where he was struck. Vincent refers to a case in which an arm was amputated by lightning, but he did not see it himself. Dunscombe-Honeyball records the fact that he has known lightning to amputate a man's fingers. There seems no reason to doubt that such amputations might be the results of local developments of heat by the passage of the lightning through the tissues, with the sudden production of steam or other hot gases in sufficient quantity to blow the limb off. The alternative explanations that these

amputations are due to "electro-caustic action," or to violent electric repulsion, appear to me unsatisfactory.

Rapid putrefaction of the bodies of persons killed by lightning has occasionally been recorded, but is not of common occurrence. Rigor mortis, on the other hand, partial or of the whole body, may appear in a few minutes, and seminal emissions are not rare.

Evidence Derived from Deaths Produced by Sudden Electric Shocks.

It seems likely *a priori* that electrocution by the sudden and violent discharges of Leyden jars, condensers, and induction coils—that is to say, by discharges of high voltage and very brief duration—is more likely than electrocution by industrial electric currents to resemble death by lightning-stroke. The experiments on death by these sudden discharges have already been laid before you; it is not necessary to do more than summarize them here, and to say that such deaths may be due either to primary arrest of the respiration, or to primary arrest of the heart's action by ventricular fibrillation. These discharges seem to produce a profound degree of nervous shock.

(To be continued.)

THE NECESSITY OF RECOGNIZING MIDWIFERY AS A BRANCH OF SURGERY.*

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THE object of this paper is to urge the importance of definitely and finally recognizing midwifery as a branch of surgery.

Obstetrics and its offspring gynaecology have in the past been considered as appanages to medicine, and regarded as provinces of the physician.

The operative triumphs of the latter, however, have of late years become so insistent that its inclusion amongst the branches of recognized surgery is now nearly complete.

It is otherwise with obstetrics, whose status still remains indeterminate. I had the curiosity to look up the official titles of the staffs of the obstetric departments of the great general hospitals and of the chief lying-in hospitals of England and Scotland. In twenty-five of these the title is that of "physician"; in twelve an indifferently denomination, such as "accoucheur"; while in ten only is the style of "surgeon" used. I further noted that in the official list of the Council of the Obstetrical Section of the Royal Society of Medicine the medical qualifications, and not the surgical, are appended to every name.

Founded on the art of the female midwife, midwifery was, in fact, the first special department of our profession. But unlike the other special departments, it arose, not as an offshoot or branch, the result of the exuberant growth of medical knowledge, but as a more or less independent subject which has in process of time become grafted on to the main stem. That that process is not yet complete is shown by the fact that medical art is still commonly divided into three primary divisions—medicine, surgery, and midwifery—some examining bodies even granting a separate diploma in the last-named subject.

The isolated position of obstetrics is early brought to the notice of the medical student. His textbooks of physiology do not deal with the phenomena of normal labour; the diseases and disasters of childbearing find no mention in the lectures on general pathology; the curriculum is divorced from either medicine or surgery, as though the morbid processes with which it concerns itself were fundamentally of a different nature to the rest of disease. He finds a separate physiology, a separate pathology, a separate clinical teaching, a separate examination.

He sees in most institutions its exponents, though styled "physicians," practising their calling almost

* Read before the Harveian Society of London.

entirely by mechanical or operative means. In the theatre attached to the lying-in wards he witnesses labour conducted with all the circumstances of modern surgery, whilst in the extern department he finds the same procedures carried out under conditions which would make any of the operations of recognized surgery unjustifiable.

What wonder, then, if, in the face of all these anomalies and contradictions, the conception of obstetrics as a separate art to which the tenets of surgery only partially apply, grows up within the student, from him is passed on to the practitioner, and finally reaches the public.

As a result of the affiliation of midwifery to medicine in the past, the analogy between reproduction and other natural processes has been too much insisted on. Child-bearing is, of course, a physiological process, but it stands alone amongst such, in that while the rest of them are exercised for the good of the individual, reproduction is exercised for the benefit of the race at the cost of the individual. The toll reproduction exacts from womankind is very definite and is levied on civilized and aboriginal alike; animals, whether domesticated or wild, do not escape it. At no other time in the life of a healthy woman is ill health so imminent as during the periods of childbearing. Pregnancy is normally associated with altered metabolic processes, closely verging on auto-intoxication; labour is an example of Nature's rough surgery, puerperal a time of healing of self-inflicted wounds.

Midwifery is an almost purely surgical art. Therapeutic treatment finds less place in it than perhaps any other department of our profession. The means it employs are almost entirely mechanical. Its operations, as compared with those of other branches of surgery, are to the full as difficult, and require, from the circumstances under which they are usually carried out, a far greater average degree of care, skill, and fortitude. Further, the liability for infection to follow them is much greater, because asepsis of the operation area is much less under the control of the operator.

Attendance on the puerperium resolves itself into the care and treatment of wounds of the genital canal—wounds naturally produced, indeed, but of the character of lacerations or abrasions, often associated with much bruising, and situated, as regards the placental site, in a position unfavourable for drainage, and as regards perineal tears in one impossible to render aseptic.

It follows, therefore, that the obstetrician stands more in need of modern surgical surroundings, accessories, and assistance than any other class of surgeon if he is to carry out his work in keeping with the present-day standards of aseptic surgery.

These statements are truisms, I venture to think, to all who give to the subject any degree of thought, yet the layman has a very imperfect understanding of them.

The unqualified reiteration of the "naturalness" of childbirth, the false conception derived from the profession itself, that midwifery is dissociated from the rest of medical science, has led the public to belittle the medical importance of labour, which, in the lower orders at least, tends to be regarded as analogous on a larger scale to defaecation or micturition. Hence has arisen, and is maintained by custom, a want of comprehension of the necessity for making proper provision and prearrangement against the time of labour, and a disinclination to expend on the event the amount of money commensurate with its importance.

It is a fact to ponder upon that amongst the working classes much more money is outlaid on a funeral than on a birth. The Jewish community, I believe, spend more on weddings than on burials; herein the members of that remarkable race show a better appreciation of the relative importance of the events, because the significance of marriage lies in the procreation which it legitimizes. But Christian and Jew alike fail to recognize that it is the ceremony of birth which should have first claim on the pocket of the community. Would that we could see some of the money now devoted to funeral and child-death insurance diverted to childbirth insurance. The Insurance Act in this respect has made a step in the right direction, but the amount paid is meagre in comparison with what the ideal conduct of labour demands.

There are in all great cities numbers of houses unfit for

the habitation of human beings; thousands of tenements stinking and verminous. The patient is filthy, the bed-clothes are filthy, the supply of water limited to one small kettle, the utensils to a single bowl or basin, the room choked with lumber, dusty furniture, and frowsy garments. In such surroundings it is the custom, against which no vigorous voice is raised, to perform difficult surgical operations peculiarly fraught, under any circumstances, with the risk of post-operative sepsis.

Who is not familiar with the general surgeon who relates with pride that he successfully operated for, say, a strangulated hernia, in a dirty cottage by the light of a single candle and the assistance of only one other medical man and a nurse. But what of the obstetric surgeon who, alone and unaided, amidst similar surroundings, acts the part of anæsthetist, operator, and nurse in his single person?

The absence of the conception of the "surgicalness" of midwifery, however, is not limited to the lower classes.

Consider the average lying-in room in the average middle-class house. A double bed is the first object that strikes the eye, unwieldy and inconvenient. In one corner is the baby's cradle and a pile of baby clothes; in another the washhand stand, and on it toothbrushes, bottles of hand and hair lotion, the husband's shaving materials, and various other objects. The dressing-table absorbs much of the floor of the room and most of the light from the window. It is littered with the implements of the toilet—brushes, combs, hair-pins, trays, boxes, vases, photograph frames, and other rubbish. In another corner stands the cast-clothes basket. A large wardrobe obtrudes itself on the already limited space, and a chest of drawers, piled with books, knick-knacks and various odds and ends, takes up much of the remainder. Add to these several chairs and a commode, and the picture is complete.

In this room lies a woman threatened with the possibility of surgical intervention. Were its nature any other than obstetrical, the room would not be left in that state. It would be cleared and converted, as far as possible, into an impromptu operating theatre.

From time to time articles appear in the medical press dealing with the causes of mortality and morbidity in childbirth. One such, by Dr. Haig Ferguson,¹ I have lately read. It formed the presidential address to the Edinburgh Obstetrical Society and was well worthy of the occasion. In it he gives the following striking figures:

In England and Wales puerperal fever and the accidents of pregnancy and childbirth caused the death, during the ten years 1897–1906, of 1 mother to every 228 births.

In 1907	...	1 mother to every 261 births.
In 1908	...	1 mother to every 280 births.
In 1909	...	1 mother in every 270 births.

Puerperal sepsis alone caused the death of:

In 1907	...	1 mother to every 602 births.
In 1908	...	1 mother to every 684 births.
In 1909	...	1 mother to every 609 births.*

The morbidity-rates due to this cause, could they be estimated, would obviously be very much greater.

All papers dealing with puerperal morbidity and mortality deplore the continued prevalence of puerperal fever after home-conducted labour, and variously indicate where the fault lies. Thus the doctor is blamed for not carrying out Listerian principles, or the midwife is arraigned for carelessness and uncleanness.

But not one of them that I have read goes to the root of the matter—namely the utter want of surgical environment under which labour ordinarily takes place, a custom, I maintain due to the fact that the "surgical idea" as applied to midwifery is only partially recognized by the profession and not at all by the public. So long as these unsatisfactory conditions remain, the mortality and morbidity of childbirth will continue unduly high. The transgression against the canons of modern surgical asepsis is too great to be washed away with a bowl of antiseptic lotion however diligently used.

If we consider the results of surgical operations other than obstetrical, when carried out in hospitals and private houses respectively, it will be found that those performed in private are, on the whole, the most successful. Compare this with the results of obstetric work carried out in

* Modified from Dr. Haig Ferguson's paper.

hospitals and private houses respectively. The contrast is striking. In lying-in hospitals puerperal sepsis in its graver forms is almost abolished; in private houses it is responsible for the wastage of life and health to which Haig Ferguson and others have so forcibly directed attention.

It may be objected that the comparison is not fair, because the operations of surgery other than obstetrical are not customarily carried out in private houses unless the means of the patient permit of the surgical environment being created in the house.

But that is just the point I want to push home. In all other surgical work the medical man postulates surgical circumstances and surroundings as a necessity for the successful performance of his duties, and without them, except under great emergency, he refuses to undertake the case. Further, the public, educated as regards recognized surgery, supplies his requirements without demur, or, being unable to do so, appreciates at once the necessity of having the patient transferred to a hospital or home.

But in obstetrics a vicious circle obtains. The imperfect conception of the position of the art by the profession results in the public underrating its importance and belittling the gravity of labour. Hence has been established a custom by which childbirth takes place under conditions that outrage all the requirements of modern aseptic technique, yet in no other branch of our profession does success obtain so little praise or failure so much obloquy.

This attitude of the public in turn reacts on the medical man. He finds, when he enters practice, that it is customary to conduct labour under the faulty conditions to which I have drawn attention, and in the face of long usage he hesitates to deal with labour as with any other surgical problem. The conversion of the lying-in room into some semblance of an operating theatre, relatively aseptic surroundings, efficient assistance, and an independent anaesthetist, are looked upon as academic ideals not to be pressed for in everyday work.

The carrying out of an operation without sufficient assistance is as disadvantageous to its performance in midwifery as it is in any other branch of surgery. The thought of a surgeon curetting the uterus or ligaturing piles without an anaesthetic brings a smile to the lips, yet in obstetric work the practitioner is frequently diffident of asking for such assistance, because, by general conception, custom, and habit of thought, the public expects him to combine the offices of surgeon and anaesthetist.

The slight demands made by the obstetrician on behalf of his art results in the public habitually underpaying him. I have made inquiries amongst a number of my friends engaged in general practice for the purpose of comparing the relative amounts of the fees paid for a confinement with those received for the performance of such operations as they themselves frequently carry out.

Thus I learn that, assuming the patient's position to be such that a fee of 5 guineas is charged for the labour, then the charges for the following operations would roughly be:

For removal of tonsils and adenoids ...	3 to 5 guineas and anaesthetist's fee.
For curetting... ..	7 to 10 guineas and anaesthetist's fee.
For ligation of haemorrhoids ...	7 to 10 guineas and anaesthetist's fee.

Now the outfit, skill, and care required of the obstetrician are at least as great as those demanded for the performance of these operations—they may, indeed, be much greater—while the time, trouble, and general wear and tear that attendance on a confinement involves is out of all proportion greater. Many men, indeed, have told me that midwifery does not pay, except in so far as it acts as an introduction to other forms of practice—a wrong principle, for underpaid work can never be the best work.

This low rate of remuneration is an expression on the part of the public of the small regard in which they hold obstetric art as compared with recognized surgery. In fact, obstetricians are taken at their own valuation, for they have up to now made no claim to be considered surgeons—nay, more, they have strengthened the popular belief in the trivialness of their calling by legalizing attendance on labour by a less educated class of practitioner—the midwife.

That the trained product of a maternity school is an enormous advance on the foul beldam who used to preside over childbirth goes without saying. Since the passing of the Midwives Act a marked fall has taken place in the annual number of cases of puerperal fever. Thus I find, on referring to the report of the Registrar-General for 1910, that the death-rate from this cause has decreased to 1 to every 727 births in that year.

But in so far as the Act tends to the employment of midwives *instead* of doctors, I believe it to be a step in the wrong direction. The aim should be not to cheapen the cost of labour, but to increase it; to make the public understand the importance of the event, and to teach that its proper conduct requires the environment of surgery, for the provision of which the layman must co-operate with the obstetric surgeon by prearrangement and adequate payment.

That great difficulties lie in the way of attainment to the ideal is obvious. Many of them will require years of education and social reform to overcome. Insurance against childbirth on a much extended scale, the establishment of municipal lying-in institutions where women could be attended by their own medical men under circumstances of true surgical asepsis—these are shadows cast on present thought by, let us hope, events coming somewhere in the future. But we must begin by setting our own house in order and definitely and finally recognizing midwifery as a special branch of surgery.

REFERENCE.

¹ Some Twentieth Century Problems in relation to Marriage and Childbirth, *Journal of Obstetrics and Gynaecology of the British Empire*, December, 1912.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

INJURY TO THE ELBOW INVOLVING THE
ANTERIOR INTEROSSEUS NERVE.

A GIRL, aged 7 years, fell and struck the inner side of the right elbow. She was treated by a "bone-setter" until it was found that the elbow could not be flexed beyond a right angle.

She was brought to me six weeks after the accident, when extension at the elbow, pronation, and supination were complete, but flexion could be obtained only to a right angle. There was fullness about the lower end of the humerus, just above the joint, especially about the internal condyle, and some wasting of the flexor muscles covering the forearm and of the pronator quadratus. Flexion of the distal phalanx of the thumb and of the index finger was very deficient, but not entirely absent, while flexion of the distal phalanx of the middle finger was good. A skiagram did not reveal the exact nature of the injury.

From these signs it would appear that the anterior interosseous nerve was injured by the accident or involved in the callus produced after fracture at the lower end of the humerus. In the latter case the origin of the nerve from the median must have been higher than usual. The escape of the deep flexor of the middle finger, which in normal cases receives its nerve supply from the anterior interosseous, is also peculiar.

The case is perhaps sufficiently rare to warrant its being recorded.

H. M. JOSEPH, M.A., M.B.Cantab.,
B Sc.Lond., etc.

Guernsey, August 6th.

TREATMENT OF MORTON'S METATARSALGIA
BY FORCIBLE MOVEMENTS.

THOSE of us who have the opportunity of seeing a fair number of cases of Morton's disease during the year know not only the misery which this condition entails, but also the unsatisfactory results of treatment, and therefore I make no excuse for publishing a method which I have adopted lately in a few cases with uniform success.

The method consists of grasping the foot with both hands, one on either side, and forcibly moving the metatarsal bones upon each other, and also forcibly flexing and