experienced in getting the slip from the masseter, and there are no compensating advantages. I have performed the temporal muscle graft without making use of a cheek incision, but I prefer the method described, and the additional scar, lying as it does in a natural skin fold, is almost imperceptible.

The cavity left in the temporal fossa after swinging down the slip is of considerable dimensions, and to obliterate it by approximation of the cut edges of the muscle is almost impossible. I intend in the next case to implant gluteal fat.

I have had good results before in paralytic ectropion by means of the ordinary Kuhnt-Dimmer operation; I think, however, that the sling of living muscle is more likely to ensure permanent improvement than the mere shortening of the lower lid.

I have not attempted to do anything for the expressionless brow; the patients I had were instructed to refrain from raising their eyebrows and frowning, and were very successful in abandoning this expression of emotion; in a deeply wrinkled forehead where the facial expression could not be adequately controlled I should feel inclined to excise strips of skin and fascia in the line of the frontal furrows. The immediate cosmetic result of the operation is good in repose. The drooping corner of the mouth is slung up into a natural appearance by the strap of inextensible fascia and living muscle, and the hollowness of the cheek is obliterated by the bulk of the graft. It is not to be hoped that the implantation of a graft from a mandibular muscle will restore the infinite variety of facial expression commanded by the complex sheet of muscle it replaces, but an appearance of tone and life is conferred that gratifies both patient and surgeon; and by practice before a glass the patients learn in some degree to associate the contraction of the temporal slips of muscle with that of the zygomatics and the risorius of the unaffected side.

Two years ago a writer in the *Annals of Surgery* contended that the neuro-muscular spindles of a graft multiplied and extended into the fibres of the paralysed muscle, and illustrated his article by microscopic sections that seemed to prove his point. I cannot feel optimistic about the likelihood of this occurrence, but if any such process took place the cosmetic gain would be further enhanced.

Much has been learned in military surgery that is destined to be of value in civil life; cases of facial palsy will be always with us, and I believe that where nerve repair is impossible, or has failed, the operation I have described will be the recognized method of treatment. The diagrams explain themselves.

OBSTETRICS: PAST, PRESENT AND FUTURE.*

BY

ALEXANDER STOOKES, F.R.C.S. EDIN.,

HONORARY SURGEON TO THE LIVERPOOL MATERNITY HOSPITAL AND TO THE LIVERPOOL SAMARITAN HOSPITAL FOR WOMEN.

In this paper on Obstetrics, the Cinderella of the Medical Faculty, I wish to present to the society the changes which have taken place, and more especially those which are now going on—changes not so much in technical points which are more suitable for presentation at a meeting of specialists, but changes affecting the community and our profession as a whole. Those of us who were concerned with the discussions and committee meetings before the National Insurance Act was passed will remember how difficult it was to get at what the medical profession wished or at any plan upon which we could agree. Since the Act came into force I have never met any one who was satisfied with its working. Even men with a panel of 5,000 are not pleased.

At present even greater changes are looming ahead, and in obstetrics have already taken place without the bulk of the profession realizing how we are drifting. In our archives we have a most interesting record of obstetric work done in Liverpool. Henry Park was a pupil of Percivall Pott at St. Bartholomew's, and studied in Rouen; he was surgeon to the infirmary, a partner with Alanson, and was the inventor of the operation for excision of

joints. His midwifery record, which we possess, extends from 1769 to 1830, and enumerates 3,900 cases extending over fifty-one years. The first 1,000 cases took fourteen years, the second thirteen, and the third twelve years. It was not until he had done 3,300 that he slackened in this work, and the last 100 cases extend over eight years. The record says nothing of mortality, but singularly few abnormal cases are noted. There were only two forceps cases, one a brow presentation; the difficulty in the other case is not recorded. There were five crotchet or craniotomy cases, four cases of placenta praevia, and only two cases of convulsions. Evidently child-bearing in those days in Liverpool was more simple than in these times.

A later record, of even more interest from the obstetric point of view, is the very detailed account left by Francis Ramsbotham of the Royal Maternity Charity from 1820 to 1850. From 1828 to 1850 in 48,996 deliveries there were 220 deaths (4.5 per 1,000), 162 were puerperal deaths, 58 non-puerperal; 66 of the former were from haemorrhage. There were only 43 cases of eclampsia (about 1 per 1,000); of these 27 were before delivery with one death, 16 after delivery with 3 deaths. Stillbirths came to 2,723, equal to 5.4 per cent.

These two records cannot be considered as typical of obstetric practice of the time, but show what could be done. Dr. Matthews Duncan, writing in 1866, took 31,277 cases occurring in the private practices of the best known obstetricians and found there were 272 deaths; he concludes that 8.2 per 1,000 might be considered the average mortality of childbirth. It was well known that hospital practice gave a much higher mortality in most instances. Duncan came to the conclusion from investigation of the returns of well managed hospitals, such as the Dublin Rotunda, that the mortality was about the same as in private cases. Florence Nightingale in 1871 said that childbirth in a hospital in London was four times more dangerous than in the towns of England, where the mortality was 5 per 1,000 births.

Death Rates in Hospitals in London, 1865-1875.

British Lying-in	...	...	19.4 per 1,000
City of London	...	...	14.3 " "
Queen Charlotte's	...	...	22.3 " "

Obstetrics has always been, as I said, the Cinderella of the Medical Faculty. It was considered a branch of the profession hardly respectable. The College of Physicians precluded practitioners of midwifery from their Fellowship; the College of Surgeons would not allow such a one to sit on its council until 1828. It was only in 1886 that an amendment of the Medical Acts required all registered practitioners to qualify in obstetrics as well as in medicine and surgery.

TABLE I.—Mortality of Mothers per 1,000 Births Registered (England and Wales).

Decennium.	All Causes.	Sepsis.	Accidents of Childbirth.
1851-1860	4.7	1.5	3.2
1861-1870	4.7	1.70	3.00
1871-1880	4.72	2.18	2.54
1881-1890	4.73	2.68	2.05
1891-1900	5.09	2.36	2.73
1901-1910	4.01	1.76	2.25
1911-1917	4.02	1.4	2.59

When we turn to the Registrar-General's statistics for the past fifty years we find there is little if any less risk for a woman in childbirth to-day than there was in 1851.

The fall in mortality from causes other than sepsis has extended through five decades, whereas that from sepsis dates only from 1881-1890. Over the whole period the fall from non-septic causes is greater than from sepsis.

In the decade 1851-1860 the mortality from all causes was 4.7 per 1,000 births—1.5 from sepsis, 3.2 from accidents; if we take 1911-1917 the total mortality is 1.4 from sepsis, 2.62 from accidents, a total of 4.02 per 1,000.

No one event has produced so much effect in midwifery as the passing of the Midwives Act, 1902, whereby it became compulsory for any woman who practises as a midwife habitually and for gain to be on the midwives'

* A paper read at the Liverpool Medical Institution, November 21st, 1919.

register. The terms of the licence to practise are much more stringent than those for medical practice; any one can practise medicine or surgery without being registered, and the case for dentistry is worse. The Midwives Act has been in force for nearly fifteen years, and has already produced far-reaching effects, and in the near future will produce more. In centres such as Liverpool the practice of midwifery is passing into the hands of midwives almost entirely. Dr. Hope, the medical officer of health, in his report for 1918, states that 83 per cent. of the births in Liverpool are attended by midwives and the Maternity Hospital, so that only 1,002 births, or 5.84 per cent. of the whole, were notified by medical men; the midwives' cases had a death rate from puerperal sepsis less by far than the rate for the country and much less than the Liverpool cases attended by medical men. Out of 17,133 births in Liverpool 28 cases of sepsis were notified and 17 deaths were registered; among the 28 cases notified 16 deaths took place—9 deaths in midwives' cases, a mortality of 0.63 per 1,000 births attended, and either 7 or 8 deaths in the 17 per cent. of cases attended by other than midwives, a death rate from sepsis of 2.4 per 1,000 births. It would be of much interest if Dr. Hope published the same details of doctors' cases as of midwives'. As the report reads at present it looks as if the doctors had four times as much sepsis in the women they attend as midwives. When speaking of midwives' cases Dr. Hope means cases where a midwife attended in the first instance, even if a doctor is called in after. It is not only in Liverpool that the advantage rests with midwives. In a paper read before the American Association of Obstetricians and Gynecologists at Newark, N.J., in 1917, the figures for midwives were much better than for the rest of the city, and the same explanation was given as I suggested in 1912—namely, the prevalence of operative interference in cases attended by doctors. Dr. Arnold Lea, in his monograph on puerperal sepsis, said:

There can be little doubt that the introduction of chloroform has been accompanied by a distinct increase in puerperal mortality. Before this time operations were undertaken rarely and with reluctance, but with the general introduction of anaesthesia they were performed with increasing frequency, and a distinct increase in mortality can be traced to this fact. Statistics show that in at least 40 per cent. of fatal cases of puerperal infection, some operative procedure has been carried out.

Forceps delivery, too often with an undilated cervix, or in cases of inertia, to save time or please the patient, is, in my experience, most frequently the cause of sepsis; manual removal of the placenta also is often a cause.

Whatever the explanation of the facts may be, it remains that, whereas previous to the enforcement of the Act the sepsis death rate had not much diminished, since the enforcement of the Act there has been a marked fall in the puerperal death rate, especially from sepsis, and most markedly in such places as Liverpool and Manchester, where there are many midwives well trained and supervised. The puerperal mortality in Liverpool has for years been below that of England and Wales and much below that of Lancashire.

Authorities seem to be conscious of the fact that all is not as it should be, and are making inquiries as to the training that medical students are getting in obstetrics and gynaecology. The General Medical Council in 1905 and 1907, and more recently, for London only, a committee appointed by the Royal Society of Medicine have been investigating the matter. The recommendations of the committee are not less than revolutionary, but, I fear, impossible. Every teaching hospital is to have accommodation for far more women than at present, new hospitals are to be built, and the medical student is to reside for four months in such a hospital, giving the whole of that time to the subjects of obstetrics, gynaecology, and infant welfare. Further, the clinical instruction is to be given by the senior officers on the staff, who, for periods of five to seven years, are to live on the premises but to carry on consulting practice. One does not see where the student is going to find the time. Every teacher in his curriculum claims that the student should devote more—much more—time to that teacher's particular subject. My experience with house-surgeons tells me that four months is none too much time to enable even a qualified man to become a reliable practical obstetrician and gynaecologist. The midwife's training is superior to the medical student's in that for

six months she lives in an obstetrical atmosphere and does nothing but midwifery; the weak point about her is in the class from which she is drawn, and her lack of general education. She will not improve until she can make a decent living wage by her practice; at present, with the small fees she obtains, usually 10s. 6d. or 15s., and the numbers of cases she can efficiently look after—say 150, the calling is not likely to attract a better class woman.

For the medical student there are many difficulties in the way of adequate clinical instruction, the lack of beds, of teachers, and, not least, the dislike all women have to being demonstrated, especially during parturition. When I think of the large number of medical men who never intend to practise midwifery, and the difficulties of adequate clinical instruction, I wonder if it is worth while to oblige all to qualify in obstetrics. The tendency, I am sure, is to hand over midwifery to midwives, with adequate hospital accommodation and adequate staffs of obstetricians and gynaecologists, men and women who are specializing in the subject. The days of the general practitioner as an obstetrician are, to my mind, numbered. In the past a young man starting in general practice, the London report points out, found his work chiefly to be the care of the minor ailments of women and children and midwifery—the very subjects to which he has paid least attention; he probably knew the most recent methods of doing a gastro-enterostomy, and might be a keen bacteriologist, but he felt rather astray when baby had colic or the woman could not pass water in the fourth month of pregnancy.

While ordinary normal midwifery is passing into the hands of the midwife, great changes have been taking place in the purely surgical or scientific aspect of practice. I can best put that by giving a very short account of the Liverpool Maternity Hospital and its work in the past and at the present. The present hospital in Brownlow Hill was built in 1884 and opened for patients in 1885; Drs. Armstrong, Wood, and Briggs were then appointed honorary medical officers. The charity or out-door department had originated in 1796 as a help to the wives of soldiers in the Peninsular war. I need not do more than allude to the amalgamation of the charity and lying-in hospital in 1870, and the unfortunate career and closure of the building in Myrtle Street in 1880, when the gynaecological part split off and became the Women's Hospital in Shaw Street.

TABLE II.—*The Liverpool Maternity Hospital, 1885-1918.*

	1885-1894.	1895-1901.	1905-1914.	1915-1918.
Admissions (average) per an.	147	201	523	680
Labours (average) per an.	147	201	489	572
Abnormalities (per cent.)...	9.3	14.4	30.9	37.0
Deaths (total)	17 = 11.5 per 1,000	45 = 22 per 1,000	100 = 18 per 1,000	51 = 21.1 per 1,000
Caesarean sections	1	10; 2 D.	144; 8 D.	112; 4 D.
Forceps	68	129	245	171
Version	11	18	137	117
Induction of premature labour	10	37	103	33
Eclampsia	7; 2 D.	38; 17 D.	99; 18 D.	66; 19 D.

Table II presents a sketch of the main features of the work. In the first ten years, 1885-1894, there were 1,471 labours in hospital with 17 deaths (11.5 per 1,000); there was an average abnormality of 11 per cent. It was in 1894 that the first Caesarean section was performed by Dr. Briggs. The operative work otherwise was limited to an average of 6 forceps cases per annum with an occasional version and induction of premature labour. In the next ten years, 1895-1904, the average admissions came to 201 (14 per cent. abnormal) and a death rate of 22 per 1,000. There were about double the number of operative cases, including 10 Caesarean sections. In the third ten years, 1905-14, the average rate of admission was 528 (over 30 per cent. of abnormality). The death rate was 18 per 1,000, and the operative work five times as much as in the previous ten years—144 Caesarean sections, 245 forceps cases, 137 versions, 108 inductions, and 99 cases of eclampsia. Since

1914 the work has continued to increase, the average of admissions has been 680 a year, and admission has had to be refused almost daily for lack of beds. There has been an average abnormality of 37 per cent. The death rate has been 21 per 1,000, and the operative work is about double the amount of the previous ten years, and goes on increasing. A very large proportion of the cases of eclampsia that occur in Liverpool are treated in our hospital; in 1917 there were in Liverpool 6 deaths, 5 in hospital; in 1916 9 deaths, 6 in hospital; in 1915 7 deaths, 3 in hospital. I would draw attention to the figures connected with eclampsia in the first twenty years—42 per cent. were fatal. In the last fourteen years 22 per cent. died.

I think no one can avoid concluding that there is a rapidly increasing call for hospital treatment. Sepsis in cases dealt with entirely in hospital has almost disappeared. There can be no doubt that we are now saving many lives both of mothers and children by the increased possibilities of abdominal surgery; every year Caesarean section is increasingly resorted to, and its field extends. At the beginning of the period I review it was limited to cases which could not possibly be delivered any other way, and for some time only extreme deformity was considered to justify the operation. We have done it successfully for rupture of the uterus, for concealed accidental haemorrhage, for placenta praevia, and it has been done for eclampsia and for cases in which renal disease has caused oedema and threatened eclampsia. Our fatal cases have been mostly those in which attempts had previously been made to deliver, or in almost hopeless cases of ruptured uterus.

Another, and perhaps the greatest, advance in the past few years has been the systematic measuring, especially of primiparae, at the hospital and at the pre-maternity centres; many cases are found with unsuspected pelvic deformity of the minor degree in which a judicious induction about three weeks before full time results usually in a comparatively easy confinement and a live child. High forceps cases become less and less frequent.

What may we look for in the future? Is midwifery to leave the general practitioner altogether? I think most of them look upon midwifery as a nuisance, and in the advertising columns of the medical papers "no midwifery or very few" seems to enhance the chance of a sale. I think few in Liverpool will collect 3,900 cases like Dr. Park.

Is midwifery and infant welfare to become a branch of the public health service? The supervising authority is already in charge of 83 per cent. of the births in Liverpool. No specialist in obstetrics could make a living out of it alone, for the bulk of the operative work is among those who expect the State to provide, and those who can pay are limiting their families, so the two specialties must, for economic as well as other good reasons, be practised together.

From another point of view, the more one sees of confinements the less one likes the makeshift arrangements that are usually considered sufficient in private practice. There is no doubt that the training of the midwife has lessened the mortality from sepsis, but I should like to see all women attended under hospital conditions, and all labours conducted with all the care and preparation that are given to any serious operation in surgery. There can be no greater loss to the State than by carelessness in midwifery; no loss is so sad as the death of a young mother. Further, even short of death, the injuries and incapacities inflicted on women in childbirth and on the children themselves are a matter of most urgent consideration.

CONCLUSIONS.

1. The results of obstetric practice remain unsatisfactory; the death rate from childbirth, largely preventable, remains too high; too many injuries follow, too many children are lost and injured.
2. More adequate hospital accommodation is required.
3. Midwifery is passing into the hands of midwives and specialists.
4. Adequate and complete training in midwifery for all medical students is impossible even with increased hospital beds, and is not necessary for all, as many will never practise obstetrics. As to this last clause I hold no very fixed convictions.

D

EXPERIMENTS ON THE DESTRUCTION OF LICE AND NITS.

I.

THE SURVIVAL PERIOD OF LICE AND NITS (*Pediculus humanus*) WHEN SUBMERGED IN TAP WATER AND WATER CONTAINING 1 PER CENT. OF SALT AT VARIOUS TEMPERATURES.

BY

A. BACOT, F.E.S., AND GEORGE TALBOT, F.E.S.
Entomologist, Lister Institute
of Preventive Medicine.

THE series of experiments with which this paper deals were carried out in order to test the correctness of a claim made by an official of the London County Council that an effective method of dealing with verminous sheets was to soak them for twenty-four hours in water containing salt in the proportion of 1 lb. to 10 or 12 gallons of water; the temperature of the water was not stated.

METHOD.

The method adopted was to immerse nits on slips of army shirt flannel and active lice on similar material in tubes containing tap water or 1 per cent. salt solution kept at various temperatures. The number of nits available for the trials, owing to other calls, was somewhat restricted, and in consequence of the females crowding their eggs into small clusters, the numbers used for the different tests varied from 36 to 120, with an average of 72. In the case of eggs immersed at 30° F. and 46° F. the batches were divided, one-half being removed for incubation after 50 hours and the remainder at the end of a week. The number of active lice in each trial was 20 to 25. The plan adopted was to remove a few at a time, dry them on filter paper, and place in card boxes kept at 82° F. The period needed for revival of the apparently drowned lice was generally not more than an hour, but in several instances revivals took place after 3 hours, and in two cases after 5 hours (at 60° to 63° F.).

Active Lice.

At 91° F. no mortality resulted from four hours' immersion; after 7 hours 4 out of 5 removed from the salt solution recovered, but only one out of the same number taken from the tap water. None survived 24 hours in either tap or salt water. At 82° F. all were killed within 31 hours. At 60° to 63° F. all of the lice removed after 19 hours from both tap and salt water recovered; single lice removed after 46 hours revived, but all the remainder (over 50 per cent.) were dead when removed after 47 hours. At 46° F. no mortality occurred among samples of 6 lice removed from both salt and tap water after 19 hours, nor among further samples of 5 taken out after 47 hours, but after 67 hours 1 out of 3 had been killed by immersion in tap water, though all of a similar sample from the salt water revived. Samples removed after 96 hours from both tubes were dead, as were also the remainder taken out after 168 hours. At 30° F. 4 out of 7 revived when taken out of salt water after 67 hours, and 2 out of 3 removed from the tap water; of the remainder, after 168 hours' immersion, 1 out of 18 survived the effects of salt water, but all of the 17 in tap water were killed.

Nits.

Four per cent. hatched after 22 hours in salt water at 91° F., but none in tap water. At 82° F. 45 per cent. survived 26 hours in salt water and 53 per cent. in tap water. At 60° to 63° F. 68 per cent. hatched after 45 hours in salt water and 42 per cent. after a similar period in tap water. The figures at 46° F. were, in salt water 75 per cent. after 50 hours and 5 per cent. after 168 hours, while in tap water at this temperature 72 per cent. hatched after 50 hours but none after 168. At 30° F. 76 per cent. survived 50 hours in salt water, but all were dead after 168 hours; in tap water at 30° F. only 58 per cent. hatched after 50 hours, but 18 per cent. survived 168 hours' immersion.

It will be noted that for both lice and nits the survival period increased with the decrease of temperature, presumably owing to the slowing down of physiological action due to cold rendering their need for oxygen less acute. The nits showed a much longer survival period than the active lice. As regards the practical point at issue, no apparent advantage is gained by the addition of salt, plain tap water giving results just as good, and in some cases better. Temperature, however, proved to be a very important factor. It is quite within the bounds of possibility that the practice of immersing sheets in salt water gave successful results during hot summer weather, active lice being destroyed, and nits, if present, failing to hatch owing to the want of the continued heat necessary for their incubation; but the evidence obtained shows that no reliance can be placed on the simple soaking of verminous textiles in water even for so long a period as 24 hours unless the temperature of the water is above 90° F.