advanced cases improvement was obtained under sodium morrhuate, and he thinks that even more favourable results might be obtained under better climatic conditions. In pulmonary phthisis he summarizes his results thus:

(a) Rapid diminution in the amount of the sputum in lung cases. (b) Rapid putting on of flesh and weight. (c) Diminution in the fever in febrile cases. (d) Increase in weight and strength. (e) Diminution in the number of the tubercle bacilli in the sputum.

In gland cases he noted reactions in the form of fever and local swelling, followed by very marked and rapid improvement, matted glands becoming discrete, and later all but disappearing.

Captain Knowles has also had nearly a year's experience of the treatment, and records valuable detailed accounts of his cases. He concludes as follows:

I am not yet satisfied that the drug is a specific cure for tuberculosis. I am, however, certain that it is at present the best line of treatment for tuberculosis in general. Tuberculin in unskilled hands is about as dangerous as prussic acid.

He regards

The marked increase in weight as the outstanding feature of the series; along with this, very often, goes a persistently normal temperature. The general health of the patient often shows a marked improvement. For early cases the treatment is an admirable one.

His first case was a serious one, with fever, cavitation, night sweats, repeated haemoptysis, paroxysmal cough, and sputum loaded with tubercle bacilli. This patient improved rapidly, and his sputum is now free from tubercle bacilli, while he has done full work for six months past. Captain Knowles also reports several earlier cases with very favourable results, and apparent cure in some. He has used comparatively small doses every fourth or fifth day, and has aimed at avoiding anything in the way of a severe reaction. In two of the cases clearing up of physical signs in the lung was demonstrated by means of x-ray observations before and after the course of injections.

Major C. Brierley, I.M.S., civil surgeon of Peshawar, has also kindly reported to me the two following remarkable cases. The first was a man with advanced phthisis, who was treated with 2 c.cm. doses of a 3 per cent. solution of sodium morrhuate intramuscularly three times a week for two weeks, and 2 c.cm. sodium gynocardate intravenously once a week for the next fortnight owing to sodium morrhuate running short, after which sodium morrhuate was again used. During the first week he was worse with high fever and increased expectoration—a severe reaction, after which he rapidly improved, and at the end of a month had gained 8 lb. in weight. At the end of six weeks no expectoration could be obtained, and he had gained 12 lb. during the last three weeks.

The second case was a boy of 15 with apical phthisis, very extensive breaking down of glands in the neck with numerous sinuses, which had resisted repeated operations, and a greatly disorganized and suppurating wrist-joint indicating amputation. He was also treated with 2 c.cm. doses intramuscularly, and at the time of writing, six weeks later, the lung signs had disappeared, many of the sinuses in the neck had healed without any surgical treatment after more rapid breaking down of the glands in some of them, and the condition of the wrist had decidedly improved.

Such cases as these afford great hope of the new treatment proving to have a permanent value in tuberculosis.

CONCLUSION.

I fully realize the great responsibility of bringing forward a new treatment for such a serious and widespread disease as tuberculosis. A year's trial by several careful workers has, however, convinced me that it is harmless in the doses recommended, which is more than can be said of that double-edged weapon tuberculin, regarding which, after over a quarter of a century's world-wide trials, scarcely two experts are agreed, either on the doses or the particular preparation to use, although no one doubts the great harm it often does in inexperienced hands. At the same time, the fact that sodium morrhuate causes febrile and local reactions necessitates great caution in pushing the drug beyond the limits which have so far proved safe, and a warning is required regarding the possibility of harm being done by its injudicious use. With this caution I feel that the results already obtained justify

me in bringing sodium morrhuate to the notice of the medical profession, to allow of the prolonged trials by many skilled workers which will be necessary before its permanent value, if any, can be decided, and the indications and contraindications for its use worked out.

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THE TEACHING OF OBSTETRICS AND GYNAECOLOGY TO MEDICAL STUDENTS.

A GENERAL SURVEY OF THE SUBJECTS TO BE TAUGHT AND OF THE METHODS OF TEACHING THEM.*

BY

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THE importance of a thorough training in obstetrics for students of medicine, who with few exceptions will enter general practice, is generally accepted. My duty this evening is to introduce a discussion on this subject in order that we who have the great responsibility of teaching may consider our aims and methods, so as to ensure that our training shall be as perfect as possible and our students made capable of rendering the great service to the nation that the efficient care of mother and infant can afford.

We who are teachers can help each other by comparing our methods; those who have profited more or less by our teaching can assist us even more by pointing out from their own experience of practice where our teaching methods have been deficient. We shall welcome candid criticism from any source, directed not to schools or individuals but to the methods which are more or less common to all.

Gynaecology is so intimately bound up with obstetrics that any attempt to teach these as separate subjects is futile, though there is much in each subject to be taught independently. It appears to me that our aims should be to give the student a good general knowledge of the special diseases of women in order that the practitioner may be able to deal adequately with the simpler cases, and to know when he ought to obtain more skilled assistance. Preventive gynaecology necessitates very thorough teaching—the prevention of infection, the prevention of the extension of infection, and the prevention and the early relief of various complications of pregnancy, labour, and the puerperium, such as lacerations and imperfect involution. While advanced and operative work is for the graduate who has the time and opportunity for further study, our aim should be to stimulate every student to take a keen interest and pride in the advancement made and to be made in our knowledge of these subjects, and so far as in him lies to do something towards the elucidation of the many problems which await solution.

I. SUBJECTS TO BE TAUGHT.

The obstetric anatomy of the pelvis must be taught by the obstetrician. The anatomy of the pelvic organs, not necessarily in minute detail, but the gross anatomy, must be taught with the greatest accuracy.

The Physiology of the Generative Organs.—Menstruation, puberty, and the climacteric: This subject, so fundamental to gynaecology, is generally neglected by the teachers of physiology, and must be taught by the obstetrician whose experience will enable him to give the student a view of its far-reaching importance in health and disease, mental and physical.

Pregnancy.—(1) The general structural changes in all parts of the body affected by pregnancy as well as the special organs and their functions, by which the symptoms and physical signs are recognizable in diagnosis. (2) The general development of the ovum into the mature fetus, placenta, and other parts. (Minute details of development are unnecessary in this course.) (3) Morning sickness. (4) Duration of pregnancy and the prediction of the probable day of confinement. (5) The various positions of the fetus and the means for recognizing them.

* An introduction to a discussion in the Section of Obstetrics and Gynaecology of the Royal Society of Medicine. Other parts of the discussion will be reported next week.

Labour.—(1) The general process and phenomena. (2) The doctor's and nurse's duties in preparation for and during labour. (3) Anaesthetics and substitutes. (4) Drugs—ergot and pituitrin.

The Puerperium.—The process in general and phenomena. Lactation, breast feeding, care of the breasts; doctors' and nurses' duties, doctors' and nurses' fees.

Pathology.—(1) The pathology of pregnancy, intra-uterine and extrauterine, with the diagnosis and treatment. (2) The pathology of labour: The treatment of many obstetrical complications should be taught, not only by methods applicable when skilled assistance, trained nurses and the most approved instruments are available, but in the circumstances when the attendant has to rely on himself and simpler resources. (3) The pathology of the puerperium. (4) The pathology of the young infant. (5) Artificial feeding of the infant.

II. METHODS OF TEACHING.

The means at our disposal comprise demonstration lectures; laboratory, museum and *post-mortem* work; clinical work, and teaching in wards and out-patient departments.

It appears to be obvious that all the subjects which involve diagnosis and treatment should be taught during the time that the student is engaged in his clinical work in obstetrics and gynaecology, and that instruction in obstetric anatomy, menstruation, normal pregnancy, and labour should immediately precede this course. Also, that as the practice of obstetrics and gynaecology is the practice of medicine and surgery applied to special organs and conditions, the student should have completed his course in those subjects, including pathology with bacteriology, before taking the special course.

I think we may take for granted that the long wearisome courses of lectures which were customary in the medical schools are not the best method of teaching any branch of medicine and surgery to students. I am equally sure that good lectures, well illustrated by personal experience, are of great value to advanced students who have already been grounded in the principles of the subject and have begun to obtain some experience of their own.

I am sure also of the value of demonstration lectures, well illustrated and with plenty of *viva voce* questioning, which helps to maintain the close attention of the students, and enables the lecturer to discover if they have learnt anything from his previous lectures. It is well to select men from the back rows for *viva voce*, men whose modesty or fear of the process lead them to take a back seat. One great advantage of lectures over the admirable textbooks of the present time is the opportunities which the lecturer has for emphasizing and repeating points of fundamental importance and for illustrating them from his own experiences. The subjects which can be well taught in this way are the obstetric anatomy of the pelvis and its contents, menstruation, the anatomy of pregnancy, of labour, of the puerperium, and the mechanism of labour, which should be taught with a fetus, not with the fetal skull only. I do not know of any doll which is sufficiently flexible. The whole of the remaining subjects, namely, the great bulk of them, should be taught by demonstration lectures accompanying clinical work in the wards and out-patient rooms.

With regard to gynaecology, the large out-patient departments of the hospitals, if properly organized for teaching, afford most valuable means of instruction, the students attending for three months and having charge of the cases allotted to them, preparing the notes and examining the patients individually with the physician. The chief difficulty I had personally during the thirty years that I assisted or was in charge of the out-patient department of St. Bartholomew's, was from the large number of patients who attended, and it was necessary for one of my clinical assistants to supervise the case-taking by the students and to prepare a list of cases so that I could select those I required for teaching. If the case-taking is done systematically, according to a scheme of which each student has a copy, and accurately (a very difficult thing for the beginner, the patient misunderstanding the question and the student her answer), he will gradually acquire the power of forming correct opinions about the nature of the ailment from the history alone—

a very valuable asset to the young practitioner, especially in gynaecological cases where the patient might hesitate to allow him to make a proper examination.

This personal responsibility for forming correct opinions for diagnosis, prognosis and treatment cannot be inculcated too soon; it is an unpleasant experience to have to begin to acquire it in practice. The amount of time that this kind of instruction takes is considerable, and much patience is needed, but the value not only to the individual student but to the whole class is well worth it, and it gives rise to much good humoured criticism, not only on the part of the other members of the class, but often by the patient herself.

Out-patient Obstetric Work.

This comprises two distinct departments: (1) The attendance by students on patients in their own homes; (2) the attendance of pregnant women in the out-patient department of the hospital.

The value of the former to the student, if he has had the necessary instruction as well as experience in the proper management of cases in the labour and lying-in wards, is very great. The responsibility he meets with compels him to find out his deficiencies on the one hand, and gives him confidence and self-reliance on the other. The results obtained bear witness to the care taken by students of their patients, and to the great freedom from the calamities of obstetric practice. This attendance of patients in their own homes is also of great value in bringing the student into direct touch with the domestic difficulties and social relations of the poor, and in developing that sympathetic feeling for their troubles and privations so characteristic of our profession, and which is so often accompanied by their practical advice and unostentatious assistance.

The value of the training to the student attending this department is also great if he is held to be personally responsible for the history and examination of the patients. He learns to diagnose pregnancy when advanced, not usually a very difficult procedure, but one in which most unexpected mistakes are not very uncommon even in the practice of men of experience. He learns to diagnose the position of the fetus and the presentation by abdominal and vaginal examination. He learns to measure the pelvis; if he also does this in the *post-mortem* room, where he can compare his results with the actual internal measurements, he will be in a better position to realize the uncertainties and errors of the method and its great value in certain circumstances. He will occasionally meet with breech and other abnormal presentations, and will learn the easy and advantageous operation of external version. He will occasionally meet with other complications and learn how to recognize and deal with them. He will examine the breasts, and learn what can be done to relieve conditions which may interfere with lactation. He will examine the urine, and in doubtful cases obtain a catheter specimen. He will examine the vulvo-vagina for evidence of infection, and learn to take the necessary steps for thorough disinfection and treatment. He may meet with cases of chorea or early mental trouble, but for the treatment of mental cases he must visit an asylum and learn the principles of treatment which, if properly carried out, are followed by such a high proportion of recoveries. Above all, he will learn the value of the systematic examination of all women advanced in pregnancy, and the advantage of being sure that all important details are normal before confinement, and be forewarned of difficulties and complications.

Gynaecology.

The chief difficulty in ward teaching at the present time is due to the abundance of surgical material which interests and occupies the time of the gynaecologist to the exclusion of cases of great importance for teaching. Some experience of the major operations, though advantageous, is of small value to him, and he learns too little of the minor gynaecology which will come to him in general practice, and he is induced to take little interest in cases not needing operative treatment. What, for instance, does the student learn about the treatment of the ordinary common cases of dysmenorrhoea, of the methods for the relief of cases of inoperable carcinoma which he will have to attend to the end?

When we consider the clinical means for teaching obstetrics, that most important branch of practice for every general practitioner whose ignorance or want of care

may lead to great suffering and long illness, and may even involve the life of his patients and their babies, and, indeed, that of his own wife and child, we find ourselves face to face with great difficulties. Owing to the better systematizing of our small resources we are somewhat better off than in 1906, when I had the opportunity in Toronto of discussing this subject in my address at the meeting of the British Medical Association. How can any branch of medicine and surgery be properly taught in an out-patient department only—and the department scattered over an area of, say, a square mile, with no real and effective supervision, and without the aid of competent nursing? Hospital authorities have provided a few beds for special cases, but though these are of immense value what are they but a pittance?

I am not of the opinion that the value of a hospital for teaching purposes is necessarily improved in proportion to the large number of its beds; this depends on the number being adequate and on the ability of those in charge of it to make the best use of them. At Queen Charlotte's, where I worked regularly for twenty years, we had admirable opportunities for teaching. We had the great advantage of teaching at the bedside and in the labour wards mixed classes of students and post-graduates, together with midwives and monthly nurses, and it would be difficult to determine who gained most from the mixed classes—the students, who soon discovered how little they knew of the nurses' duties, or the nurses, who gradually began to realize their own ignorance and the difference between their superficial training and that of the doctors. This combined training, if general, would, in my opinion, also do much to place the relations of doctor and midwife on the friendly footing of mutual confidence and help that should exist for the benefit of the poorer women and their infants.

It is in the organization of maternity wards or hospitals in our great teaching centres, comparable to those devoted to medicine and surgery, that we must look for our next great improvement in the teaching of obstetrics, and without these we are severely handicapped in our endeavours. A three months' combined course in obstetrics and gynaecology, the whole time being given up to the subjects, would probably prove to be sufficient.

A CRITICISM OF SOME MODERN METHODS OF INFANT FEEDING.

BY
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I VENTURE to submit these few notes, on a subject of some importance, as the result of long and close observation of the progress of babies in general practice.

The following is approximately the method of artificial feeding adopted by some of the large London hospitals and institutions:

The baby is not fed for the first forty-eight hours after birth; he may be given a little sterile water. After this period the following mixture is used for the first week: milk (sterile) 1 part, water 3 parts, with sugar about 10 grains and cream 5 minims to an ounce of the mixture. This is given every four hours on the third day, and on the fourth day every three hours from 7 a.m. to 10 p.m. From 10 p.m. to 7 a.m. only one feed is given, making in the twenty-four hours a total of seven feeds. The quantity allowed at each feed is $1\frac{1}{2}$ ounces for the first week, sometimes 2 ounces. During the second week the mixture is strengthened to half milk and half water, and the quantity is increased to 2 ounces; the intervals are kept the same.

This method is apparently adopted in all cases irrespective of the size of the infant or his evident appetite. The principle of such feeding seems to me to be wrong, for I cannot see that it is a good imitation of the way in which a baby or any other young animal is naturally fed. The mixture is probably more or less correct, for it resembles the composition of the mother's milk; but, in my opinion, the quantity and the intervals between feeds are in many instances unsuitable, for the following reasons:

(a) *Quantity.*—A young healthy infant always sucks at the breast until he is satisfied; in doing this he very often empties it. The amount of milk which can be drawn from a woman's breast is usually about $2\frac{1}{2}$ or 3 ounces, though it may of course

be less. It seems to me unreasonable to give an infant less food than it would get from a healthy mother.

(b) *Intervals.*—In the course of a good many years of general practice I have asked nursing mothers how long intervals they gave between feeds. The answer is nearly always two to two and a quarter hours, perhaps two and a half hours, never longer, for at least the first month, except at night. When asked why they do not give longer intervals, some or all of the following reasons are invariably given: (1) If the interval is lengthened the baby cries a great deal; (2) the nights are bad because the baby does not sleep for many hours at a stretch; (3) the breasts get swollen and painful. These are very sound reasons for not giving long intervals.

From observation of many cases I am sure that bottle-fed babies do better, increase in weight and sleep well if the intervals are short. I have often been asked why the baby cries so much, and in nine cases out of ten I have told the mother to give the food more frequently and the baby ceases crying (provided it is allowed enough). Perhaps it is not realized how harmful it is to a mother to have her baby crying a great deal; she gets bad nights, feels worried, and becomes restless and nervous, and her recovery is very much retarded.

About twenty or twenty-five years ago a great deal was written and said about infant feeding, and it was pointed out that babies were grossly overfed; this was quite true in many instances, for they were given milk and very thick barley-water and much sugar and cream, and the food was more or less forced down their throats; but now we have gone to the other extreme and in consequence a great many infants are underfed and some nearly starved.

No hard and fast rule can be laid down as to the quantity of food an infant should be allowed irrespective of his size, weight, and natural appetite. It is obvious that a 10 lb. baby requires more food than one of $6\frac{1}{2}$ lb. I believe also that some babies digest their food more completely than others, exactly as in the case of adults, so that even with babies of the same weight one cannot be sure that they will do well on the same quantity of food.

The method I advocate is as follows:

(a) *Breast-fed Babies.*—The baby is put to the breast from twelve to sixteen hours after birth, and about every six hours after this until the milk comes. If he cries and seems thirsty he is given sterile water. After the milk has come the baby is put to the breast at least every two hours from about 8 a.m. until 10 p.m., leaving him there till he is satisfied, and, if necessary, waking him at the right times. A good supply of nourishment is thus obtained during the day so that much food is not needed during the night. After 10 p.m. the baby is allowed to sleep as long as he will; he usually has to be fed once or perhaps twice between 10 p.m. and 8 a.m.; after the first two or three weeks a baby will often sleep six or even eight hours at a stretch if he has had enough food during the daytime. In some cases, where the baby is small and weak and can only take a little food at a time, and wakes and cries within two hours, he is fed every hour and a half for the first seven days, or even longer. As the infant grows older the intervals of feeding can be gradually lengthened as a rule; about the third or fourth month, or sooner, the baby is often on three-hourly feeds, but this depends on the comfort of the mother and the appetite of the baby, and must not be a hard and fast rule.

(b) *Bottle Feeding.*—I endeavour to imitate nature as closely as possible; the times of feeding are practically the same as in breast-fed infants. The mixture is as follows, subject to variations: For the first two or three days 1 part milk, 3 parts water, cream $\frac{1}{2}$ drachm, sugar $\frac{1}{2}$ drachm to each feed. After this the mixture is gradually strengthened, till at the end of fourteen days it is 1 part milk, $1\frac{1}{2}$ parts water, 1 drachm cream, rather less than a drachm of sugar to each bottle; sodium citrate or sodium bicarbonate may be added. I do not want to emphasize the ingredients or strength of the mixture, or the variations which may be necessary, but to insist that enough must be given to satisfy the infant. The easiest way to make sure of this is to put enough of the mixture in the bottle, let the baby have it from twenty to thirty minutes (the hole of the teat being of a suitable size), and then take it away. If a baby finishes every bottle it is fairly certain that he is not having enough. A baby, like an adult, takes more at one meal than another, and it therefore follows that there should be something left in some of the bottles. I have found that the actual quantity varies very much, as one would expect—a 10 lb. baby takes more food than a $6\frac{1}{2}$ lb. baby, as a rule, though not always. Some babies are quite content on the stereotyped allowance of $1\frac{1}{2}$ oz. for the first week and 2 oz. for the second; others need much more. In the second week it is common for a baby to require quite 3 oz. in some of its feeds, notably in those following a long sleep. If a baby gets nine feeds in the twenty-four hours with an average of $2\frac{1}{2}$ oz. a feed he will get 22½ oz. in all. This is not an uncommon amount for an 8 lb. or 9 lb. baby to take, but some will require even more, others rather less.

Many doctors would object that by this method the baby would be grossly overfed, but I contend that it is difficult