but many now operated on by cutting operations would be dealt with equally well, if not better, so far as the removal of the growth is concerned, and with much greater safety and comfort to the patient, were diathermy used. It is often very difficult indeed to cut sufficiently wide of a growth involving the floor of the mouth or the posterior half of the tongue, but comparatively easy to coagulate. Growths of the fauces, soft palate or pharynx involve severe operations which can be done with much greater ease, safety, and rapidity by diathermy. Growths in the aryteno-epiglottidean region must also be included. In many cases coagulation and cutting can be combined. I removed half a tongue in this way with no haemorrhage, and more widely than if knife and scissors alone had been employed. The lingual artery was tied to minimize the risk of secondary haemorrhage, but even then, had cutting alone been employed, there would have been free bleeding.

Passing to the cases which are inoperable by cutting operations, they may be divided into: (1) Those which can be operated on by diathermy; (2) those which are inoperable. Of the former group, some are attacked with the hope that recurrence will not take place for a long time, and others to relieve symptoms. Many growths are so situated that they rapidly pass beyond the range of the knife, and many patients are not seen till this stage is reached: growths of the tongue in its posterior part, fauces and pharynx are examples. Sprays, etc., are used to keep the growth clean, morphine to ease the pain; but the patient goes downhill steadily, suffering great pain and discomfort, and death is a relief to him and his friends. There are now numbers of such cases recorded who have been operated on by diathermy and have lived in comfort for a considerable time without recurrence; when recurrences have taken place, they have been treated again and life prolonged. I have such a case to show this afternoon. He had an inoperable growth of soft palate, uvula and left fauces in April, was treated by diathermy on May 6th, 1920, and there is no sign of recurrence at present. There are other cases in which life has not been prolonged to any extent, but where symptoms have been greatly relieved, and they have died a much less painful death. One of the things which everybody who has used diathermy has noticed is the great relief from, or modification of, pain that often occurs, even in cases in which the whole growth cannot be removed. Massive ulcerating growths causing dysphagia and dyspnoea may be treated, giving the patient relief from these conditions.

Diathermy is no more a cure for malignant disease than any other treatment, but it can be used not only in cases which are operable in the ordinary way with greater safety and often with greater advantage, but also in cases which are beyond the scope of the knife. Post-cricoid growths—86 per cent. of which occur in women, and many in comparatively young women—have been dealt with, and life prolonged and much relief afforded, the pain and difficulty in swallowing being greatly relieved and in many cases temporarily cured. The operation is by no means without risk, but the condition is so desperate that the risk is justified. Cutting operations show a very high mortality, and can only be attempted in very early cases. Stuart Low has shown a number of cases in which large masses of malignant glands, which could not be removed, have been delayed in growth and diminished in size, and pain greatly modified, by plunging a diathermy point into them in many places. He dissects the cutaneous tissues off the growth first, and after the operation sutures them again, and in no cases has he had any ill effects follow.

It has been impossible owing to time to mention much of interest, and only a brief outline has been attempted; but I shall conclude by tabulating the advantages and disadvantages of diathermy.

Advantages.

Shock is practically nil, even after extensive operations. Pain after the operation is less than after operation by knife or cautery.

Temperature is only slightly if at all raised, rarely reaches 100°, and drops within forty-eight hours.

The dangers of metastasis are much less than with cutting operations, blood vessels and lymphatics being sealed.

Risk of septic absorption is less than in any other form of operation.

There is complete destruction of visible and palpable malignant disease, and probably many outlying cells are destroyed

which could not otherwise be reached. Malignant cells are of lower vitality than those of healthy tissue.

The operation is practically bloodless, is rapidly and easily performed, and can be easily repeated if necessary.

Tumours that are otherwise inoperable can be attacked.

Convalescence is rapid.

In many cases which are hopeless, relief can be given to the patient.

Disadvantages.

Healthy and diseased tissues are destroyed, but in cutting operations this also takes place.

Important vessels and nerves cannot be seen.

There is danger of secondary haemorrhage when working near large blood vessels.

There is a tendency to the formation of keloid when skin surfaces are involved.

THE MATERNITY HOSPITAL, WITH ITS ANTE-NATAL AND NEO-NATAL DEPARTMENTS.

BY

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A NEO-NATAL ward and clinic, an ante-natal clinic, and a pre-maternity ward are all needed in order to complete a modern maternity hospital in its rounded fullness. Gynaecological and pathological departments may be added to the building or may be provided elsewhere, according to the requirements or the institutional resources of the city or town in which the maternity hospital is situated; but the neo-natal and ante-natal departments are essential to the entire fulfilment of its purpose.

The maternity hospital occupies a separate place among hospitals, for, whilst they are designed for the relief of the sick, it is for the reception of many to whom the words "absolutely healthy" may be fitly applied. It is a hostel rather than a hospital. When Sir Thomas Browne wrote, "For the world, I count it not an Inne, but an Hospital, and a place, not to live, but to die in," he was not thinking of the ideal maternity hospital of to-day and to-morrow, but of the very real general hospital of his time. When criticism asks ironically if living healthy mothers accompanied by living healthy babies always emerge from maternity hospitals, one has, of course, to admit sadly that they do not. With this admission, however, one is now justified in asserting that the things of which they die are preventable in the case of the mothers, and generally so in the case of their infants. The recognition of the preventability of maternal deaths in connexion with parturition has become wonderfully clear in recent years, and systematized efforts are now being made in many places and by ante-natal clinics and pre-maternity wards really to prevent such fatalities. On account of a less degree of familiarity with the causes of the diseases of the newborn infant it is not realized how possible their prevention also is; indeed, it is scarcely recognized how terribly fatal these maladies are, although the separate publication of the neo-natal death rate does not long leave this depressing conclusion in doubt. Their severity and their preventability are the incentive and the justification for the neo-natal department of the maternity hospitals of the future.

The Maternity Hospital of the Nineteenth Century.

Up to the close of the nineteenth century the maternity hospital was held to have discharged its legitimate functions when it made itself responsible for the care of women in labour, and of them and their babies in the puerperium. Within this limited sphere of service they achieved a measure of success, and their occasional but rather spectacular failures were in process of restriction towards the end of the century by the introduction of the practice of antiseptic and aseptic principles. Their too complete concentration upon the act of delivery and upon the days of recovery following it was, however, a heavy handicap to real progress in the rational understanding and in the practical solution of the problem of attaining safety in human reproduction. No amount of perfection in operative technique or in instrumental resource could cancel or annul the absence of supervision and care in the ante-natal months; one might, if one cared, speak of the brilliant performance of a craniotomy, but the executive

splendour of such an achievement was certainly not that of the sun, and it hardly attained to the lesser degree of the moon, for one felt instinctively that when there were two lives at stake there was little glory gained by saving the one at the expense of the other. Further, in too many places the maternity hospital had come to be almost wholly the refuge of the illegitimately pregnant mother carrying her unwanted baby; ethical considerations were unwarrantably dragged into purely obstetrical problems; and as a result the "unco guid" left no large benefactions for such institutions, and their annual meetings were sparsely attended in contrast with those of the palatial infirmary and the much admired sick children's hospital.

The Maternity Hospital of the Early Part of the Twentieth Century.

With the dawn of the twentieth century came the development of the idea of the hospitalization of pregnant women and the concomitant conception of the prevention of obstetric disasters thereby. The "ambulant patients" of the past were more generously recognized as the "expectant mothers" of the present day, and the kindlier breezes of the spring-time began to play around the maternity hospitals and their inmates in place of the coldness of the winter's blasts. By and by, and, as it would seem, by a special providence, maternity as an outlier or sort of Cinderella sister of child welfare came with a rush into the full sunshine of national recognition, approbation, and encouragement, and this has been accompanied by a small trickle of pecuniary support, perhaps the herald of the refreshing and much-needed shower. In the bringing about of this welcome change many forces were doubtless at work. The falling birth rate played its part; the havoc of the war was the voice of the prompter; the great principle of modern medicine—that "prevention is better than cure"—was the prevailing motif; interest in the wonders of pregnancy as a symbiosis and in embryology as the fairyland of science took its place in the scenario; and the uprush of public opinion on the rights of womanhood to a full fruition supplied the insistent chorus. These all were there; but the concrete fact so far as the maternity hospital was concerned was the opening of pre-maternity wards and the starting of ante-natal clinics.

The Ante-natal Department.

The development of an ante-natal department began in different ways in different places. In the Edinburgh hospital, which the writer believes to have led the van in this forward movement, the beginning was the founding of a bed for the diseases of pregnancy in 1901. The bed was soon increased to a ward with four beds, and the name "pre-maternity," which the writer had given to the former, was soon extended to the latter. Other events followed. Pregnant patients at all ages of gestation began to be cordially welcomed at the hospital and urged to return for supervision; nurses with special knowledge of pregnancy and its maladies began to go amongst the expectant mothers, and persuade them to come to the hospital for advice regarding the inconveniences as well as the danger signals of pregnancy; such "pre-natal nurses" were furnished with schedules by the writer setting forth the chief danger signals and were encouraged to fill them up; then separate hours and days were set apart for the seeing and advising of pregnant women, and these came to be called mother-consultations or ante-natal clinics. Next, the system within the hospital was conjoined with the town scheme of maternity and child welfare, the hospital itself formed the head centre of the mother-welfare part of the scheme, and health visitors began to act as an auxiliary staff outside the hospital; then the scattered activities in the hospital were gathered together in an annexe of the building and called the ante-natal department; and, lately, the care of the expectant mothers suffering from the venereal diseases has been added to the other duties of this new department. In the building up of this elaborate edifice smaller stones had to be hewn and fitted in, but the portions mentioned above were outstanding, and the pre-maternity ward was the great corner stone. In a series of some thirty articles published at various times in various places the writer has described the stages of the progress of the idea and the details.

The hospitals in the large towns in England, in contrast to Edinburgh, seem to have started their ante-natal departments with the ante-natal clinic as a foundation,

and thereon to have built up towards the pre-maternity ward; but all do not seem to have reached that culminating institution. In the case of towns without a maternity hospital the ante-natal clinic allowed a beginning to be made to which a maternity hospital could be added later; but it can never be too often insisted that the ante-natal system without a pre-maternity ward or beds is dangerously incomplete, for whilst it ensures the detection of dangerous maladies in pregnancy it gives no destined place for their treatment. For pure prevention it may suffice (and that is much), but for curative success it is insufficient. In Glasgow, as may be learnt from the recently published report by Dr. Chalmers, the medical officer of health, ante-natal dispensaries and an ante-natal ward in the Glasgow Royal Maternity Hospital were opened between 1916 and 1918. In America the "pre-natal nurses" of Boston seem to have led the way in the development of ante-natal work, which later was affiliated with maternity hospitals and medical institutions; throughout it has been pre-eminently a movement in the full gaze of the public. During the war America to a large extent carried her ideas on mother and child welfare into France.

There have been differences also in nomenclature. Ante-natal clinics have also borne the names of pregnancy clinics, *ante-partum* consultations, free consultations for expectant mothers, and the like. The pre-maternity ward has been called the ante-natal or the pregnancy ward. One may speak of an ante-natal department or of a pre-maternity system; and of course the words ante-natal and pre-natal are synonymous. The writer's predilection is for pre-maternity ward and ante-natal clinic, but he has no strong preference. In 1891 or thereabout he was looking for a word which should express and include all the scattered subjects known as teratology, fetal diseases, germinal infections, monstrosities, morbid heredity, and the like, and he decided upon ante-natal pathology; but he was not strongly set upon it, and a mere turn of the die might have led him to *pre-natal* pathology, with the advantage of a syllable less to pronounce every time. Towards pre-maternity he had a much more decided leaning, and thought it more expressive.

It is hardly necessary in these days to write of the advantages to the maternity hospital of its ante-natal department. During recent months medical journals, and especially those devoted to maternity and child welfare, have published many appreciations; they have sometimes, too, added statistics, although the profitable time for discussing results has not yet come. The present danger, perhaps, is undue optimism, for there are parts of the subject which are still unknown, and the interrelations between mother and child are subtly complex. On the other hand, a maternity hospital which has added to itself an ante-natal department will not easily let it (with its illuminating "reports in advance") go again. It would be easy to enumerate some of the most obvious advantages it gives, such as an exact knowledge beforehand of the relation of the head of the fetus to the brim of the mother's pelvis, the correction of malpresentations and the rectification of malpositions, the prevention or cure of many of the smaller annoyances of pregnancy such as the pressure effects, the fully-informed treatment of many of the really severe danger signals of gestation such as those of toxæmia, the more accurate foretelling of the date of delivery, the estimation of fetal health or disease, and particularly the opportunity it gives for systematic treatment of the venereal diseases; but here it must suffice to emphasize more generally its outstanding value. That, in a word, is *prevision*.

The ante-natal department of a maternity hospital is like the air service of an army. Only a very incompetent commander would dare to attack without scouting, without a reconnaissance, and without his aviators who carry out both. Ante-natal supervision from the early months gives a bird's-eye view of the whole field of operations, and prepares the obstetrician for the attack he has to make upon the foe, that "auld enemy" death and disease, at the time of the confinement. He may find no signs of enemy presence; so much the better for his patient and so much the easier for him. On the other hand, he may discover the carefully camouflaged battery or the deadly cross-roads, with the most immediately happy results in the adoption of an advance in another

and a safer direction. Without such foresight and foreknowledge he is blinded like the general whose aeroplanes cannot rise or have been sent down crashing by the enemy. In both cases fog is a trouble. In obstetrics it often takes the form of hydramnios or of some other abnormal intrauterine condition which hides the underlying facts. Further, the two services are alike in the risk which they run when communication is interfered with; when by reason of a fault in the "wireless" the aviators are not getting their messages through there is danger; so when, through a lack of hearty co-operation between the ante-natal department and the delivery part of the maternity hospital, the labour ward is not getting its reports, there is grave risk. The ante-natal clinicians are the air force of obstetrics, and indispensable.

The Maternity Hospital of the Near Future.

It may be safely predicted that when the maternity hospital has its ante-natal department in thorough working order—that is to say, when patients begin to come at early dates in their expectancy and when all that can be discovered about them is learnt with accuracy at each visit—there will follow an immense gain to the practice of the institution in certainty of diagnosis, in early prevision of danger and consequent rational choice of treatment, and in lessening of maternal, of fetal, and of infantile mortality and morbidity. Only of one disadvantage has the writer heard—the ante-natal department may spoil the operative work of the place! It may, of course, replace a craniotomy by a Caesarean section now and again, not altogether a disadvantage, one thinks; it may actually diminish the number of operative interferences, not without bringing some sort of relief to the expectant mothers.

Even the best of ante-natal departments, however, do not entirely solve the maternity hospital's difficulties. The infants have to be cared for after birth as well as before it. To some extent—nay, to a large extent—ante-natal care, by lessening the risks of premature labours and in other ways, makes it more likely that babies will be born alive and will go on living; but it is insufficient in itself to do all that is needed by the delicate infants, by those who are diseased or deformed, and by those who add prematurity to the other impediments in their way to life and health. For them there must be something more; that something more may be called the neo-natal department.

The Neo-natal Department.

It is quite unnecessary to argue on behalf of the need for some means other than what is now in our possession for the care of the neonate during the month which follows birth. It is sufficient to state again the well known fact that more lives are lost in the first month of the life after birth than in any other. The neo-natal death rate, which is for one month, is about 40 per 1,000 *live* births, whilst the infantile death rate, which is for twelve months, is about 100 per 1,000 *live* births. If the stillbirths are added to the neo-natal death rate, as they may very properly be, the result may be as much as 80 per 1,000 births. The present neo-natal death rate is a powerful and a sufficient argument for the provision of a neo-natal department, or at any rate of greater neo-natal supervision and care. What is needed is realization that many of the neo-natal deaths are preventable, along with the concentration of medical and especially of obstetric attention upon them.

The causes of the high neo-natal rate are not difficult to find. Some neo-natal disasters are, so to say, postponed deaths. But for the favourable circumstances of ante-natal life the unborn infant would have died before its expulsion from the womb, for it had the potentialities of death in it. Instances of this are found in grave malformations and marked tissue changes due to disease. Other disasters are due to an actual absence of knowledge regarding the causation of many of the peculiarly neo-natal maladies, regarding their diagnosis, and regarding an effective treatment of them. Instances are supplied by nearly all the diseases (such as icterus, haemoglobinuria, melaena, sclerema, and oedema) which appear with the word *neonatorum* after them. Yet others are due to the prematurity of the infant, and another group contains cases in which the fatal issue is the result of the traumatism of birth or of infections received during it. But there is yet another maleficent influence at work: neo-natal life lies, so to say, on the "divide" between two great departments of medi-

cine, between obstetrics on the one hand and pediatrics on the other, and it runs the risk of receiving insufficient attention from both. It is situated where obstetrics and pediatrics meet; and, so far as hospitals are concerned, its home is the interspace between the maternity and the sick children's hospital. In general practice the medical practitioner and the midwife are supposed to be in charge of the neonate as well as of his mother for a month; but it has to be admitted that too often the vigilance of both attendants flags long before the dangerous four weeks are over. It is to the honour of the doctor and the monthly nurse that brilliant triumphs have been recorded in the saving of weakly premature infants; but they are none of them achieved easily and they are sadly too few. A scrutiny of the complete returns of any maternity hospital (including the follow-up statistics of the babies who leave the institution about the twelfth or thirteenth day of life) will convince any who may be sceptical about the number of deaths which may be easily prevented at this age.

An attack upon the neo-natal mortality may, of course, be made by other means than the establishment of a neo-natal department in maternity hospitals. It may be made by handing the infants over to a sick children's hospital the moment they are born; but there are obvious disadvantages in this way of dealing with them, including their removal to a distance from their mothers and away from the attendants who have knowledge of the characters of the labour and the records of the ante-natal conditions. It may be done by the erection of special hospitals which may be named infants' hospitals or babies' institutes or "prematurities," and which would be under the care of doctors and nurses who would be, so to say, specialists in the management of delicate neonates; in these institutes also there might be well equipped laboratories for the investigation of the various problems of the causes of neo-natal deaths and for the preparation of the necessarily modified food. The great objection to such institutions is that it is unwise to increase the number of hospitals, especially in these days of financial strain, if their function can be performed by additions to existing hospitals. A neo-natal department in a maternity hospital may in the meantime meet the want.

The neo-natal, like the ante-natal, department must be a part of the maternity hospital; preferably it ought to be an annexe. It should consist of two parts—a pathological and a clinical. The former, which might be called the neo-natal pathological laboratory, should be devoted to research into the causes of early neo-natal deaths and of stillbirths, and would be under the care of an expert in ante-natal and neo-natal pathology. Already some hospitals have such a laboratory. In Edinburgh and Glasgow, for instance, for more than a year now the stillbirths and early neo-natal deaths have all been examined in searching necroscopies by Dr. F. J. Browne and Dr. A. M. Kennedy respectively, the latter working in a portion of the hospital, and the former in the neighbouring *post-mortem* department of the Edinburgh Royal Infirmary. The publication of these researches—which are being carried out under the Medical Research Council's Child Life Investigation Committee—ought to do much to advance the knowledge of neo-natal pathology. The clinical part of the neo-natal department should consist of a ward (or wards), not far removed but distinct from the ordinary puerperal patients' ward. The neo-natal ward will be furnished with electrical incubators and all other life-preserving means, will be under the management of physicians and sisters skilled in the treatment and nursing of newborn infants, and especially of premature and weakly ones, and will be most carefully guarded against infection. In some respects—for instance, in its temperature—its hygiene will be peculiar to itself, for it is really intended to serve as the real nursery, almost as the hothouse of the hospital. It must never be forgotten that a prematurely born infant is really a fetus struggling against the rigours of an environment for which he is not yet prepared; he is truly the tender exotic plant requiring the moist warmth of the conservatory until such time as his acclimatization is complete. There will be means for frequent weighing of the infants and apparatus for preparing milk according to chemical formulae carefully adapted to each child's requirements. In a word, there will be concentrated into this part of the maternity hospital all the devices of science and all the care of the obstetrical and nursing staff for that campaign

of neo-natal life saving which has here its special *terrain*. There will, of course, be special difficulties, such as the maintenance of touch between the babies and their mothers, but these are all capable of being overcome. When well enough the mothers will be welcomed in the ward and taught the nursing of delicate babies. The inmates will be all the babies born in the hospital or brought in from outside who call for special care because of injuries in labour, of delicacy of constitution, of the presence of disease, or, and most particularly, of prematurity of birth. A special place and differentiated handling will be afforded for the syphilitic babies and for those suffering from ophthalmia neonatorum. The age of the babies dealt with in the neo-natal ward will correspond with the name of the department; but here it is necessary to add a word of explanation. The ordinary neonate remains such for, roughly, a month after birth; but the fetus born at the seventh month of ante-natal life does not conclude his neo-natal existence till three months after his birth. If this obvious fact had been more generally recognized and acted upon there would not now have been so many neo-natal deaths recorded; such deaths were really ante-natal and not neo-natal in time, although they fell accidentally after the act of birth.

New Responsibilities.

The addition of ante-natal departments to maternity hospitals and their reinforcement with neo-natal departments has had and will have the effect of increasing the responsibilities of these institutions as well as of widening the range of their usefulness; but it will do more. It will increase—indeed it already has—the responsibilities of the hospital as a teaching centre. Both for medical students and nurses in training as midwives it is necessary to supply clinical instruction in the ante-natal and neo-natal departments. It is more than time that the exclusive or at least preponderating attention paid to teaching on the parturient and puerperal patient tacitly enjoined by the present regulations of the General Medical Council be extended and that tuition in ante-natal clinics and in the ante-natal and neo-natal wards be at least recommended in addition to the more usual and compulsory part of the training. It is, of course, essential that future practitioners should know about the handling of labours and the management of the puerperium, but it is most desirable that they shall be made familiar also with the examination of pregnant patients at all stages and with the hygiene and maladies of newborn, and especially of prematurely born, infants. Further, these additions will give a scope and a status to clinical obstetrics such as it does not now enjoy. It will then be a more complete presentation of the subject and will be less meagre in its content in comparison with clinical medicine and clinical surgery than it is at present.

The teaching of theoretical obstetrics will in turn be similarly affected. The lecturer will be led to give and pay more time and attention to ante-natal diagnosis and pathology and to neo-natal hygiene and disease than he commonly does now; and, again, as with the clinical aspects of the subject, a greater fullness will be introduced. The term "midwifery" is more truly descriptive of the teaching given to women in training for the examinations of the Central Midwives Board; something which both in nature and in extent surpasses this is what should be offered to the medical men and women of the future. The lectureship or chair might have been given the eminently and correctly descriptive name of genetics, but that term has been appropriated. Apparently we must fall back upon the term obstetrics, using that word in its widest sense.

The bearing on gynaecology of these ante-natal and neo-natal additions to the equipment of a maternity hospital is not necessarily direct. In Edinburgh the gynaecological department is in the Royal Infirmary, but in many places it is conjoined with the practice of the maternity hospital. In some respects this is admirable, for one large part of a gynaecologist's work is devoted to the repair of injuries and their results which are directly or indirectly due to faulty midwifery, and there is a distinct advantage in their being carried out in the same building. Thus the gynaecological department of a maternity hospital would serve the same purpose for the wounded puerperal woman which the neo-natal department discharges for the delicate infant. But it must not be forgotten that another large

part of gynaecology is concerned with the treatment of morbid states, such as malignant and myomatous tumours of the uterus, cystomata of the ovaries, and malformations, which have no obvious or common connexion with child-bearing. These are best dealt with in a surgical hospital, for they are really nowadays a part of surgery. It looks almost as if gynaecology were on the point of breaking up into two parts—one containing conditions due to or militating against childbirth, and the other dealing with diseases and tumours common to surgery and gynaecology, and special only in respect of the sex of the individual suffering from them. For the management of the first subdivision of gynaecological cases a department in the maternity hospital would be perfectly suitable; for that of the second subdivision the gynaecological ward of the general hospital would seem to be appropriate. The progress of the art and practice of obstetrics, as reinforced and aided by the work of the ante-natal department, will be in the direction of limiting more and more the occurrences calling for reparative gynaecological operations, and happily, in time, of abolishing them altogether.

THE TREATMENT OF UTERINE HAEMORRHAGE NOT ASSOCIATED WITH PREGNANCY.*

BY

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IN normal menstruation, when the superficial layers of the endometrium are cast off and blood is extruded from the abraded surface, clotting takes place very rapidly with abundant fibrin formation. Whitehouse¹ says: "The high thrombo-kinetic [blood-clotting] power of the endometrium is a provision of nature to facilitate clotting and prevent excessive haemorrhage. Even in well-marked cases of haemophilia profuse haemorrhage very rarely occurs during menstruation . . . Clinically . . . it is well known how rapidly, during the operation of curetting, the blood clots when mixed with the curetted endometrium, and special precautions are necessary to obtain tissue for microscopical purposes unmixed with clot." If, however, normal menstrual blood is examined after it has reached the vagina, it will be found to be almost completely fluid. Blood collected from the uterine cavity in a test tube is found to clot rapidly, but after some hours it becomes liquefied again. In other words, there is not only a blood-clotting substance present, but also a clot-dissolving substance, which normally produces liquefaction of the blood in the vagina, and so facilitates the evacuation of the menstrual discharges. There is evidence which suggests that the stroma cells of the endometrium secrete the clotting substance and the uterine glands the liquefying substance.

That ovarian secretion also exercises a profound control over menstruation is certain, and most probably the hormones of other endocrine glands are also potent, but little is known of how these act. Mechanical factors no doubt come in—for example, uterine muscular contractions may reduce menstrual loss by limiting the supply of blood to the endometrium. But the broad fact remains that the amount of menstrual bleeding is determined by the balanced action of various internal secretions about the mechanism of which we are at present without the knowledge which would enable us to control or regulate it. In practice we find that excessive menstrual loss usually occurs about the age of puberty or when the menopause is approaching. Excessive uterine haemorrhage during the child-bearing period is almost always associated with organic disease of the uterus or with some blood disease. The most frequent cause is, of course, fibroid tumours, and when a fibroid is accompanied by severe bleeding it will almost always be discovered either to be involving the endometrium, and thus likely to modify its secretory action, or it has itself undergone some degenerative change—necrobiosis, mucoid degeneration, red degeneration or malignant transformation—with consequent considerable chemical changes.

Until our knowledge has so improved that we are able to control the delicate balance of internal secretions, on

* Read at a meeting of the Bradford Medico-Chirurgical Society.