whom costs three times as much as a normal child to educate? I do not infer that they must be left without any endeavour being made to develop such aptitudes as they possess. They have neither initiative nor creative ability; they do not possess the imitative faculty necessary for storing up in memory words and numbers, much less of utilizing them for various processes of abstract thought and reason. Now the association of the eye and hand appears before speech in the developing infant and in the process of evolution, therefore simple manual operations can be more easily taught by imitation than can book knowledge. It is reasonable to suppose that a certain degree of skill can be acquired in handicraft by imitation, whereas abstract symbolic thought and reason by means of words and numbers, except in the most simple way, cannot be acquired by the mentally deficient, owing to arrest of development of neural structures and function of the latest highest evolutionary level of the brain. The most successful colonies for mental defectives are those where manual occupational education and treatment are best carried out. Manual occupation has an uplifting effect on these poor children, for it affords a certain satisfaction to them to know that they are not so inferior to normal children as book learning, of which they are incapable, makes them feel. Successful occupation, emulation, and reward, moreover, engender self-respect and a sense of well-being. Rhythmic movements, singing and dancing, also are easily acquired by imitation for similar reasons, and produce a sense of well-being and a joy in life. Especially is it desirable to place mental defectives in colonies at an early age before the sex instinct matures, for owing to the mental deficiency there is a lack of control of the animal passions; they are unable to sublimate the vital urge along healthy lines.

The high-grade imbecile and the moral imbecile are found in all grades of society, and it may be difficult to find sufficient grounds for compulsory segregation till adolescence or until repeated delinquencies lead to a proper inquiry into his or her mentality. With the idiot and low-grade imbecile there is not this difficulty, and they are either infertile or are cut off in early life by disease or neglect, if not placed under care in an institution; whereas the higher grade imbecile, especially of the female sex, is fertile, and very liable to be the mother of a large illegitimate family of children, many or most of whom are weak-minded. In large cities and towns immoral imbecile women sooner or later, however, suffer with venereal disease, and this leads to sterilization and abortion or to the birth of dead children.

In rural districts the migration to the cities and large towns for higher wages has led to a steady and progressive deterioration of the mentality of the population. This is shown by the fact that although there is less drink consumed in rural populations than in industrial and maritime, yet there is, *pro rata*, a higher percentage of registered mental deficiency and insanity. This is a strong argument in favour of encouraging legislation which will lead to an increasing number of a better type of men and women being able to remain on the land and obtain a decent living. A policy which brought this about could not fail to be an important factor in the betterment of the race. Moreover, such a policy would be of great national economic value, inasmuch as the more land that was under prosperous cultivation the less would the nation expend in imports of food. The time has come when the nation must recognize the necessity of regaining a mentally and physically capable rural population with a higher standard of living and a higher birth rate of children potentially sound in mind and body. The Bible says that men do not gather grapes of thorns or figs of thistles. Neither can we expect to have a mentally efficient rural population under present conditions.

The dominions take elaborate measures to prevent mentally deficient emigrants arriving and settling in their country. They prefer to have those that are able to work on the land, so that this is another reason why, unless something is done to improve the conditions of our workers on the land, a steady further deterioration of the race must ensue.

A Post-Graduate Lecture ON HAEMORRHAGE ABOUT AND AFTER THE MENOPAUSE.

DELIVERED AT THE MANCHESTER ROYAL INFIRMARY ON
MARCH 16TH, 1926,

BY

WILLIAM FLETCHER SHAW, M.D.,
PROFESSOR OF OBSTETRICS AND GYNAECOLOGY, VICTORIA UNIVERSITY;
GYNAECOLOGICAL SURGEON, ROYAL INFIRMARY; AND SURGEON
FOR WOMEN, ST. MARY'S HOSPITALS, MANCHESTER.

EXCESSIVE or irregular haemorrhage about the menopause and haemorrhage after the menopause are among the commonest symptoms which make women seek medical advice. The symptoms are produced by many different pathological conditions, but this must never allow us to treat the condition lightly, or forget in any case that malignant disease of the uterus is one of the most frequent and by far the most important cause of this symptom.

I have chosen this subject for the particular purpose of emphasizing this fact, and what I wish to be remembered of this lecture can be epitomized in one sentence: "Excessive or irregular haemorrhage about the menopause and any haemorrhage after the menopause should always make us suspicious of malignant disease of the uterus, and we are never justified, in any circumstances, in treating these symptoms without making a vaginal examination, and, in the case of haemorrhage after the menopause, where vaginal examination reveals no growth in the cervix, without curetting the uterus to eliminate the possibility of malignant disease of the body." We all know this, we were taught it as students, and in the majority of instances we act up to it; but there are odd cases which escape, and these are those the consulting gynaecologist so frequently sees.

I do not think anyone but a gynaecologist realizes how many cases come for advice when the disease is past all hope of cure. Of course, in the majority of instances the fault lies with the patient herself; there is an ineradicable belief among women that haemorrhage at that time is quite normal; little attention, therefore, is paid to it, and the difficulty is to make this knowledge general among women without unduly scaring them.

Although the majority of cases brought too late for any hope of cure are thus accounted for, there are nevertheless a very large number who are kept under medical supervision for long periods without an examination being made, and when finally this is carried out the time for useful intervention is past.

Of all the cases of carcinoma of the cervix who consult me in private or in hospital I find I am able to perform a complete Wertheim's hysterectomy in only about one-third, and yet if these cases come early very good results are obtained; taking all my cases together, the earliest with the least favourable, and not making any allowance for death from intercurrent disease or operation mortality, I find that of all I operated upon more than five years ago there are alive and well at the present time 33 per cent. If only we could get all these cases in the earlier stage the curability would be much greater.

Operative treatment of malignant disease of the body of the uterus gives much better results than in the same disease in the cervix, and, moreover, the disease does not so readily invade other structures; still, in this situation as in all others, the earlier the disease is recognized the better is the chance of its total eradication.

It is a simple and easy matter to suggest and carry out an examination upon a complete stranger, especially where she has consulted a gynaecologist for the special purpose, but quite another matter when the patient is a personal friend or acquaintance, as she so often is to the general practitioner; and so, when first consulted about this symptom, quite naturally the practitioner is inclined to temporize, and hope that the cause may be one of the many simple ones and not the one he fears. In this way much valuable time is frequently lost, and it is necessary in the

interests of the patient that this diffidence be put on one side at the first consultation, and a determination made not to treat this symptom until the possibility of malignant disease has been definitely eliminated.

MENORRHAGIA AND METRORRHAGIA ABOUT THE MENOPAUSE.

Carcinoma of the cervix is a very common disease about the menopause, though it may occur at almost any age, and I have seen it as early as 22 and 24 years of age respectively. It is much more common in parous uteri, and is especially liable to commence in lacerations of the cervix. Usually the diagnosis is easy, as a friable area is found on the cervix, and the examination is followed by free haemorrhage. This sign alone should make us very suspicious of malignant disease of the cervix, as should a history of haemorrhage after coitus. The only type which presents any difficulty in diagnosis is that where the growth commences in the cervical canal and exposes only a tiny area of friable surface at the external os. In any doubt the patient should be examined under anaesthesia and a piece of the cervix excised for microscopical examination; but this is rarely necessary.

Erosion of the cervix consists of a slightly raised velvety red area extending on to the vaginal surface of the cervix from the external os. Haemorrhage is readily produced by the examining finger, and so this condition is that most likely to be mistaken for carcinoma of the cervix; firm scraping on the area with the finger generally settles the diagnosis, as the erosion extends only a few cells deep and the subjacent tissue is firm and resilient, whereas in carcinoma of the cervix the friable tissue extends much deeper, and it is usually possible to dig out a fairly deep ulcer with the finger. In a case of doubt it is necessary to examine the patient under anaesthesia and curette the cervix, or even, rarely, to excise a piece of the cervix for microscopical examination. Erosion is not a primary pathological lesion, nor has it any symptoms, but is itself merely the result of some irritating discharge, usually from the interior of the uterus, and curettage of this organ usually cures the condition.

Physiological Atrophy of Muscle.—As a uterus approaches the menopause the blood supply diminishes and the muscle atrophies; normally these changes run concurrently, so that the diminishing muscular tissue is able to exercise the same control over the diminishing blood supply as it did in full vigorous life. If, however, the atrophy of the muscle outstrips the diminution of the blood supply the same control cannot be exercised and menorrhagia occurs. It is the knowledge that this physiological change may explain the onset of haemorrhage which lulls our suspicion, and examination of the patient is often deferred in the hope that this will prove the cause of the symptoms. The only treatment is the administration of pituitrin, ergot, or hydrastis—drugs which will stimulate the weakening muscle to greater effort—but it is necessary again to emphasize the fact that these drugs must never be administered without a vaginal examination being made to eliminate any possibility of carcinoma of the cervix being the cause of the trouble.

Subinvolution.—If involution does not progress normally during the puerperium the uterus is left enlarged and hard, but regular in outline and mobile, and usually gives rise to menorrhagia during all subsequent menstrual periods, but frequently menstruation is quite normal for some years, and then, as the patient approaches the menopause, menorrhagia commences and becomes worse and worse until she is compelled to seek medical advice. At first sight it seems curious that haemorrhage at the menopause should be caused by a lesion produced during a puerperium, possibly many years previously, and that menstruation during the interval should have been quite normal. The explanation is simple. During involution two main changes take place: the excessive muscular tissue is absorbed, and the large blood vessels are replaced by small ones. This change in the blood vessels is one of the most interesting processes in the human body. Instead of the old vessel merely shrinking in size, new vessels are formed within the old one, and at the same time the elastic and fibrous tissues in the old vessel walls swell up, soften, and lose their staining

properties. In normal involution the old vessel wall is absorbed completely, leaving the new vessel to function in the involuted uterus. If involution is not complete portions of the old vessel wall remain, and the internal elastic layer of the vessel will remain permanently surrounding the new vessel; the less complete the involution the larger the amount of elastic tissue surrounding the new vessels. The increased bulk of a subinvolved uterus is due to want of absorption of the muscle fibres, and so this uterus can exert a greater muscular control over the vessels, but to counteract this the vessels are surrounded by varying amounts of elastic tissue. If the elastic tissue is in preponderance the patient will have menorrhagia from the confinement; if the elastic tissue only equals the extra contractile power of the uterine muscle menstruation will be normal until the menopause is approached; then the muscle atrophies, and even though the blood supply diminishes in normal amount the relationship between the two is upset, as the weakening muscle has to exert its effect on the vessels through the mass of inert elastic tissue, and so menorrhagia commences. The only cure of subinvolution is another pregnancy with a normal puerperium; but in these cases with late onset of the symptoms this is usually impossible. Pituitrin, ergot, or hydrastis will frequently diminish the amount of haemorrhage by stimulating the weakening muscle to fresh exertions; if this fails, curettage followed by these drugs is usually successful. If this also fails, it is necessary, in a few cases, to stop the haemorrhage by x rays, radium, or hysterectomy; the latter is more generally useful, as there are frequently other complications—matted appendages, prolapse, etc.—which can be cured at the same time.

Chronic Metritis.—This term is frequently used clinically to include subinvolution or any bleeding uterus which is enlarged, hard, and regular in shape; but in a strict pathological sense it means a uterus in which much of the muscular tissue has been destroyed by inflammation and replaced by fibrous tissue; this condition, by weakening the action of the muscular tissue, allows haemorrhage to occur, especially as the uterus approaches the menopause. Chronic metritis and subinvolution often occur in the same uterus. The only treatment is to administer pituitrin, ergot, or hydrastis, curette, and finally, if these fail, hysterectomy or radium.

Polypus.—Either mucous or fibroid polypi frequently produce haemorrhage at this time. The diagnosis is easy, as the polypus can usually be felt by the examining finger. Occasionally a fibroid polypus is entirely within the cavity of the uterus, and we can then do little more than suspect its presence from the fact that the uterus is a little enlarged and possibly the cervical canal somewhat dilated. Examination under anaesthesia and dilatation of the cervical canal allows a definite diagnosis to be made and at the same time the polypus to be removed.

HAEMORRHAGE AFTER THE MENOPAUSE.

Carcinoma of the cervix is one of the commonest causes of haemorrhage after the menopause. The diagnosis and treatment is the same as before the menopause.

Carcinoma of the body of the uterus is not nearly so common as carcinoma of the cervix, and does not occur before the menopause, although in some cases the period of amenorrhoea is only very short. There are no physical signs of this disease except a slight enlargement of the body of the uterus, and a definite diagnosis can only be made with the curette, when the material removed is usually so characteristic that a definite diagnosis can be made without waiting for a microscopical examination, and so hysterectomy can be completed under the one anaesthetic. Fortunately, simple panhysterectomy gives as good results as the extensive Wertheim's hysterectomy, and the mortality is much less. If examination of the cervix in haemorrhage after the menopause does not reveal any growth, curettage must always be undertaken to complete the diagnosis.

Senile endometritis is, fortunately, a very common condition. The atrophic endometrium is readily attacked by organisms from the vagina, becomes inflamed, and produces haemorrhage. Curettage completes the diagnosis, as the endometrium is always thin, quite unlike the thick

cheesy material in carcinoma of the body, and at the same time the curettage cures the condition. Senile endometritis is a definite inflammation, and the microscope reveals much small-celled infiltration.

Mucous Polypi.—An atrophic tissue like the endometrium after the menopause would not be expected to produce polypi, but it does so not at all infrequently, especially in the cervix, and I have seen at least half a dozen cases in the last six months. The polypi can usually be detected protruding from the external os, and curettage usually reveals no others in the body of the uterus. Curettage cures the condition.

CONCLUSION.

These are the commonest causes of haemorrhage about and after the menopause, though a number of others, like carcinoma of the vagina, do occasionally occur, but so rarely that we need not keep them constantly in our minds.

The one point we must constantly keep before us is the frequency of malignant disease as a cause of haemorrhage, and the fact that haemorrhage is usually the only early symptom of this disease, and so we must always consider any of these cases as likely to be malignant until we have proved the haemorrhage to be due to some other cause. If we will only do this these malignant cases will be detected much earlier and a far larger number cured of this dread disease.

COMPRESSION OF NERVE FIBRES.

BY

JOHN S. B. STOPFORD, M.D.,

PROFESSOR OF ANATOMY AND DEAN OF THE MEDICAL SCHOOL,
THE UNIVERSITY OF MANCHESTER.

COMPRESSION OF PERIPHERAL NERVES.

DURING a study of the lesions of peripheral nerves caused by missiles of war observations were made which indicated the possibility in certain circumstances of being able to diagnose compression of a peripheral nerve. The earlier investigations¹ led me to the conclusion that in a case of progressive compression of a nerve, uncomplicated by division of any fibres or serious intraneural changes, three stages could often be recognized.

1. The earliest sign generally found was increasing weakness of the muscles innervated by the affected nerve, demonstrating a loss of conduction in the efferent fibres, which was commonly associated with pain of a neuralgic character radiating along the course of the nerve and induced by movement or stretching of the nerve trunk.

2. The appearance of objective sensory disturbances which exhibited a characteristic type of dissociation. In uncomplicated examples of compression, hypalgesia and thermo-hypaesthesia progressing to analgesia and thermo-anaesthesia have been found to occur almost constantly before any definite tactile anaesthesia, even to the lightest possible tactile stimulus, could be recognized. During the appearance of analgesia the neuralgia frequently diminishes and not uncommonly completely disappears with the development of analgesia in the full area of distribution of the nerve. By this time complete paralysis of all the muscles supplied by the nerve distal to the site of compression is to be expected.

3. The development of tactile anaesthesia, which remains less in extent than the analgesia and thermo-anaesthesia, unless the compression proceeds to complete physiological division and causes an absolute obstruction to the transmission of all impulses.

A knowledge of these three stages in the development of complete strangulation of a nerve, in conjunction with the study of a carefully elicited history, makes it possible to diagnose correctly a large proportion of examples of uncomplicated compression of some part of the peripheral nervous system. In my experience, such complications as partial division or the occurrence of intraneural fibrosis very commonly render diagnosis much more difficult and uncertain. The characteristic manifestations of compression are well illustrated by patients suffering from compression of the lower trunk of the brachial plexus by a cervical or first dorsal rib, and in a study of its production by the latter cause² it was found that in nine out of ten patients the objective sensory disturbance was

distinctive; further observations since the publication of that paper have confirmed this. The dissociated sensory loss is undoubtedly the most striking and the most helpful sign, and possesses the clinical advantages of being rapidly and easily demonstrated and not readily confused with any other neurological condition excepting possibly syringomyelia, an error which ought to be avoided without difficulty. It is important to mention that quite frequently patients are unaware of any sensory loss, and are surprised at the analgesia and thermo-anaesthesia which clinical examination reveals.

COMPRESSION OF THE SPINAL CORD.

During recent years my attention has been directed to the frequent appearance of a similar dissociation of sensation as a result of compression of the spinal cord by such lesions as extramedullary tumours, and this observation has proved on several occasions of considerable diagnostic value. The first occasion on which I noticed this was about eight years ago when investigating a patient suffering from fracture dislocation of the cervical spine and subsequent compression of the spinal cord. The man merely suffered from weakness of the muscles, altered reflexes, and hypalgesia and thermo-hypaesthesia below the level of the lesion, and after relief of the compression all these manifestations almost completely disappeared. Recently I was permitted to examine at the Manchester Royal Infirmary a patient who illustrated particularly well the manifestations of uncomplicated compression of the spinal cord, and exhibited undoubted resemblances to the observations made upon patients suffering from compression of a peripheral nerve. I am obliged to my colleague, Dr. E. Bosdin Leech, under whose care the patient was, not only for the opportunity of making several examinations, but also for permission to publish a brief report of the most significant features.

A man, aged 44, previously very robust and healthy, began to suffer from pain in the region of the shoulders about December, 1924. The pain often travelled down the trunk, especially on the right side, and after a time became very severe, attacks of exceedingly sharp pain occurring frequently and persisting for many hours at a time. He then suffered from stiffness of both legs and attacks of "pins and needles," extending from the level of the umbilicus down the front and back of both lower limbs. The stiffness was succeeded by progressive weakness of both legs until, at the time of his admission to hospital in November, 1925, he was unable to walk without assistance. Shortly before admission to hospital he also complained of difficulty in beginning the act of micturition, but he was able to pass urine normally once he had started the stream.

On examination there was no absolute paralysis of any of the muscle groups of the lower limbs, but very profound paresis and marked spasticity was obvious. The deep reflexes of both legs were greatly exaggerated, and there was an extensor plantar response and ankle clonus on both sides. On testing sensation it was found that there existed, as high as the level of the nipples, complete analgesia and almost complete thermal anaesthesia, although the patient was not aware of any objective sensory disturbance. No defect of any other form of sensation could be discovered, although carefully tested.

A provisional diagnosis of extramedullary spinal tumour at the level of the fifth dorsal segment was made and an injection of lipiodol made by Mr. H. H. Rayner, F.R.C.S., for confirmatory purposes. An x-ray examination after the injection demonstrated the presence of an absolute obstruction at the vertebral level suggested by the clinical investigation.

At the operation, performed by Mr. Rayner, it was found that the spinal cord was compressed by a tumour lying between the dura and bones. The tumour was exerting direct pressure upon the cord both posteriorly and laterally, but had not at any point penetrated the membranes. Microscopic examination of a piece of the tumour, made by Dr. G. E. Loveday, showed it to be an angioma.

A similar dissociated sensory disturbance has been seen in so many cases of spinal compression that I have come to regard it as a valuable aid to diagnosis, and it is primarily for this purpose that the report of this patient has been recorded, since it demonstrates unusually clearly the clinical manifestations of the progress of the compression, and bears rather a startling likeness to what has been found in similar circumstances in the peripheral nervous system. In a recent paper on extradural spinal tumours Stookey³ regards it as possible that the tracts in the white matter are more vulnerable to pressure gradually applied to the cord than the grey matter, and it is interesting to notice that in two of five cases of cervical extradural tumours he mentions that "early evidence of