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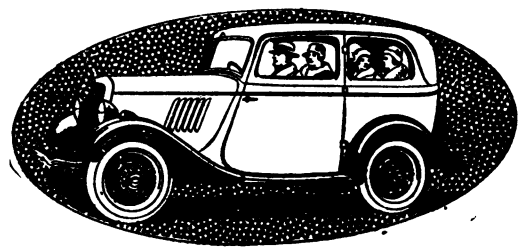

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and not only is it of value to the pregnant woman, but its study by recently qualified medical men would be of great advantage in the conduct of the minor maladies and incidents of childbirth, which unfortunately do not receive the attention they deserve in most medical schools.

—W. S. C.

AN INTRODUCTION TO PRACTICAL BACTERIOLOGY. By T. J. Mackie, M.D., D.P.H., and J. E. McCartney, M.D., D.Sc. 1934. Edinburgh: E. & S. Livingstone. pp. 504. Price 12s. 6d.

THE first edition of this book appeared in 1925. That the present volume is the fourth edition may be taken as a gauge of its usefulness and of the determination of its authors to keep it up to date. Unlike many other scientific volumes, it can with truth be described as a handbook. The matter contained in it is divided into three parts.

Part I is introductory. It deals with the general biology of bacteria and with immunity in relation to practical bacteriology. Here the essential information is given briefly, clearly, and concisely. It affords the student a bird's-eye view of the subject, making it easier for him presently to tackle immunology in fuller detail.

Part II consists of the methods of bacteriological technique, and its contents are of value both to the laboratory worker and the advanced student. A surprising amount of information is available which would otherwise have to be obtained from various and probably obscure sources. The recipes for media-making are comprehensive and varied, and the methods well arranged. They include, among others, Wilson and Blair's medium for the isolation of the bacillus typhosus and McLeod's medium for the isolation of diphtheria. The staining methods given are also up to date, as is shown by the presence of Castaneda's stain for rickettsia and for inclusion bodies in virus infections.

Part III deals systematically with the pathogenic and commensal micro-organisms as well as the bacterial diagnosis of the various infections. It includes a chapter on the filterable viruses, which has been enlarged and rewritten. This now forms a useful summary of the knowledge concerning these infective agents and the diseases caused by them.

The book can be specially recommended to any student or other person beginning work in a bacteriological laboratory.

—E. O. B.

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THE Managing Committee of the Royal Medical Benevolent Fund Society of Ireland acknowledge with thanks the receipt of £250, a legacy bequeathed by the late Sir William Whitla of Belfast. The terms of the bequest are, that this sum be invested and the income of same applied to medical men in Belfast, or their wives and orphans in Northern Ireland. The late Sir William Whitla was a keen supporter of medical charities, and this legacy is a typical example of his generosity.

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The subscription to the Society is one guinea for Fellows and Members living in the country; two guineas for Fellows living in Belfast; and one guinea for Members living in Belfast who are not qualified more than seven years. The payment of a sum of twenty guineas entitles one to election to Life Membership.

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THE
ULSTER MEDICAL JOURNAL

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VOL. III 1st JULY, 1934 No. 3

ANDREW FULLERTON

C.B., C.M.G., M.D., M.CH., F.R.C.S.I., F.A.C.S.

Emeritus Professor of Surgery, Queen's University, Belfast; Consulting Surgeon to the Royal Victoria Hospital, Belfast, and to the Belfast Hospital for Sick Children

ANDREW FULLERTON died on 22nd May, aged 66 years. After his retirement, last year, he had a serious operation, but recovered sufficiently to resume his private practice. Soon afterwards fresh symptoms developed, but it was hoped that he would improve with rest. Unfortunately this hope was not realized, and an operation became imperative. It was then apparent that there was little hope of recovery, and despite all his colleagues could do for him he succumbed.

In this Journal it would be no tribute to his memory to recount in full the numerous distinctions conferred on him, not only in his own Province, but in the Irish Free State, England, and America, nor to enumerate the contributions he made to medical literature, and in particular to the advancement of surgery of the urinary tract.

Although these distinctions included C.B., C.M.G., in recognition of his war service, perhaps none gave him greater pleasure than the Presidency of the Royal College of Surgeons in Ireland, which he held for two years, and later the Presidency of the Association of Surgeons of Great Britain and Ireland.

He published in all some seventy-seven papers, a remarkably large output for a man in the active practice of surgery. A survey of the honours he received, and the writings emanating from his pen, makes it apparent that he was a surgeon with an international reputation in his own branch. Many of us who knew the work he had done, often felt that in London, America, and the Continent of Europe his surgical achievements were appreciated to a greater extent than in his own Province.

It is quite certain that he enhanced the reputation of the Belfast Medical School over a wide area by his personal contacts and the esteem in which he was held.

He attained his position neither by good luck nor by influence, but by hard work, enthusiasm, and determination. He had an indomitable spirit which enabled him to surmount the obstacles of discouragement in his early career, and indifferent health throughout his life.

Perhaps his most brilliant work was in the field of prostatic surgery, in which he achieved amazing proficiency. He was never content until he had utilized or devised an improved technique which would bring his results nearer to perfection. Shortly before his retirement he had mastered the newest method of resection by diathermy, and displayed the same keen enthusiasm in this as in everything he attempted.

He was among the pioneers of cystoscopy, and his patience and perseverance in the examination of difficult cases had to be seen to be appreciated. Difficulties and failures only incited him to fresh efforts to overcome them.

He was always the first to proclaim his mistakes, that others might profit by them.

As a clinical teacher he spared no effort to communicate to his students his own knowledge and every new discovery in surgery. His own example in the matter of note-taking was a valuable lesson to every doctor.

When he became Professor of Surgery at Queen's University he utilized every device to illustrate his lectures, and brought distinguished surgeons from various centres to lecture on their own special subjects. The desire that this school should be in the front rank was always uppermost in his mind.

His love for his work left him little time to devote to outside interests, but as a Mason he had attained high rank and was a Past Master of Queen's Lodge; he was also an enthusiastic golfer, and had just completed a tenure of office as captain of the Royal County Down Club, an honour of which he was very proud.

His retirement from active work at the Royal Victoria Hospital and the University involved a severance from his deepest interests, and one feels that he died as he would have wished, before age or prolonged ill-health had enforced idleness upon him.

To his colleagues, the profession at large, and his patients, and above all to his wife and family, his death has brought deep sorrow, mitigated by the fact that his life was one of great achievement that brought much honour to himself and his profession.

C. J. A. W.

The Treatment of the Anæmias

By S. B. Boyd Campbell, M.D., F.R.C.P. (Edin.)
from the Royal Victoria Hospital, Belfast

Looking back to my resident days, the advance in recent years, both in the diagnosis of the various types of anæmia and in their treatment, is remarkable. In pre-war days our stand-by for pernicious anæmia was arsenic, and the only difference of opinion among the experts was the form in which it should be administered, some advocating liq. arsenicalis, some salvarsan, while the controversy about the value of cacodylates was at times acute. One clinician lauded its value, only to be criticized by the then Professor of Materia Medica, who declared it was inert, in spite of the fact that this so-called inertness had caused blindness in one patient.

At that time the anæmias were divided into a primary group, which included pernicious anæmia and chlorosis, and the secondary anæmias, including a large group where the blood-deficiency was due to one or more of various causes such as hæmorrhages, toxæmias,—either organic or inorganic. Recently new, but not necessarily more simple, classifications are being devised, the main feature of the classification being to divide them into two main groups :

1. Hyperchromic.
2. Hypochromic.

I still prefer the old classification of primary and secondary, and if we look on the primary as a group including all those due to some functional deficiency, i.e., including pernicious anæmia, chlorosis, microcytic achlorhydric anæmia, and the secondary anæmias those in which some definite cause can be discovered.

Wilkinson[1] divides the anæmias into four main groups :—

1. Acute or chronic blood-loss.
2. Excessive blood-destruction, as in acute or chronic hæmolytic anæmia and achloruric jaundice.
3. Destruction and complete inhibition of the blood-forming organs (aplastic anæmia).
4. Defective functional activity of the blood-forming system.

This latter group appears to be of the nature of a deficiency anæmia, being associated with a deficiency in either (*a*) the supply, formation, or absorption of the anti-anæmic principle, as in liver, or (*b*) the supply, absorption, and utilization of iron.

The first essential in the treatment of any anæmia is to make an accurate diagnosis of the type, and, if a secondary anæmia, of its cause. The omission of a preliminary diagnosis before starting treatment has been one of the reasons why many patients have had such a chronic illness where reasonable hope of a complete restoration to health might have been expected. Of the various anæmias, the two that have been most in the public eye are pernicious and microcytic achlorhydric anæmia.

It is hard to realize that it was only in 1926 that Murphy and Minot[2] published the results of their treatment of pernicious anæmia with liver, and that liver extracts were being investigated by the different medical centres early in 1928. Since then liver in some form or other has been our mainstay in the treatment of this disease.

The diagnosis, as a rule, is easy, and is based on a high-colour index with a megalocytosis and megaloblasts, with an achlorhydria, and in untreated cases an indirect Van den Bergh.

Castle[3] and his co-workers, in discussing the changes which are responsible for the onset of pernicious anæmia, suggest that there are two main factors :—

1. A constituent of the normal gastric contents—the intrinsic factor—which is secreted by the gastric mucosa and is absent in normal saliva, in duodenal contents free from gastric juice, and in any portion of the gastro-intestinal tract in a patient suffering from pernicious anæmia.
2. Protein or extrinsic factor which, when acted on by the intrinsic factor, produces an anti-anæmic substance. This latter is absorbed and is chiefly stored in the liver.

Janet Vaughan[4] considers there are two factors in liver :—

1. The specific anti-anæmic factor produced from protein as the result of gastric digestion, and which is necessary for the normal maturation of megaloblasts; and
2. Some material effective in clinical and experimental secondary anæmias.

There are three possible mechanisms by which pernicious anæmia can be produced :—

1. Lack of the intrinsic factor of the stomach.
2. Lack of the extrinsic factor.
3. Failure of the absorption or utilization of the products of interaction of these two factors.

Much work has been done on the treatment of pernicious anæmia by vitamin B. Davidson[5] thinks that a close relationship exists between the anti-anæmic factor contained in liver and vitamin B. His first experiments with Marmite produced little effect, but Goodall[6] has reported cases which responded to large doses of vitamin B (half ounce Marmite taken three times daily).

Strauss and Castle[7] record a failure with vitamin B, using autolysed yeast product. When the product was incubated with normal gastric juice, and then fed to patients suffering from pernicious anæmia, a response was invariably obtained.

Morris and Schiff[8] suggest that there exists in normal gastric juice a substance of the nature of a hormone which acts directly on the bone-marrow. They injected 4 c.c. of a fraction obtained from three litres of swine's gastric juice, and found an immediate and marked reticulocytosis.

Fresh liver extract has been found effective, while massive doses of liver extract introduced by a tube have produced immediate results. The drawback to this massive dosage is that it frequently produces vomiting.

Wilkinson[9] has proved the value of stomach in the treatment of pernicious anæmia, and many active desiccated preparations such as pepsac, extomac, and ventriculin are available.

The achlorhydria is an important clinical finding in the diagnosis of a case of pernicious anæmia, and though cases have been described with free acid present in the gastric contents, Stanley Davidson and others are now of the opinion—an opinion which is generally held—that if a trace of free HCl. is found, the diagnosis of pernicious anæmia is doubtful. Acute and chronic cases are found, the former being generally associated with a temperature.

The treatment resolves itself into:—

1. *Rest.*—For years Sir Thomas Houston has insisted on the necessity of absolute rest in all cases with a hæmoglobin of forty to fifty per cent. or under. Some cases with a low hæmoglobin may improve on ambulatory treatment, but generally one finds that unless they are in bed there is not an adequate response to treatment. The rest is generally from two to three weeks, in which time a case responding to medical treatment shows a hæmoglobin of sixty per cent. or more.

2. *Liver.*—In severe cases one generally prescribes either intravenous or intramuscular injections. Many firms make these preparations, but the one used in my wards is hepatex (P.A.F.), 5 c.c., or the intramuscular form hepatex (I.M.), 2 c.c. dose. Injections are given daily, and in some cases only two to three injections are necessary. In others five to ten are needed before the patient is put on to hepatex by mouth in dr. 1 doses taken three times daily. Campolon, intramuscular injections of 2 c.c. doses, or other preparations, may be used.

Several firms have a dry extract of liver, and most of these preparations have a proved potency. Once a patient's blood has reached normal proportions, the amount of liver is greatly reduced, but they must continue to take liver or stomach in small doses for an indefinite period. The liver may be given by injecting 2 c.c. every two to six weeks, or by giving hepatex dr. 1 daily, or fresh liver once or twice a week. The chief drawback to the use of fresh liver is the large amount necessary to be taken daily, half a pound being the minimum dose. The best results are in cases where it is taken raw. The liver is cut into cubes, squeezed out, and the juice flavoured with orange juice or some of the condiments, and the rest of the liver is mixed with the food.

In all cases the response to liver treatment should be controlled by frequent estimations of the reticulocyte count. One generally finds a rapid rise to fifteen per cent., or even to forty per cent. or more, and after a few days this gradually subsides. The highest count I have ever seen was seventy-five per cent.

Stomach or stomach extract is given in cases which do not respond to liver, or have some intolerance to it, and to those cases showing evidence of subacute combined degeneration of the cord. Fresh uncooked stomach may be given in four-ounce doses daily, but as this is not palatable, some form of desiccated

stomach is generally given. Wilkinson recommends pepsac, initial dose of 1 oz. (two tablespoonfuls), and this is maintained until the blood is normal. Then the dose is reduced and smaller amounts given daily.

Extomac is a similar preparation made by Bengers, and is one of the cheapest. Both of these can be given in water flavoured with condiments, in soup, cold beef extract, or mixed with butter, potted meat, sardines, etc.

Parke, Davis & Co. have a very useful preparation called ventriculin, the only drawback being the price—1s. 5d. per day.

The preparations of stomach extract have enormous variations in the price, from 8d. to 4s. 10d. per ounce dose daily.

Pepsac . . . . . 8½d. per oz., or 28 gms.
Ventriculin . . . . . 1s. 5d. per 10 gms.
Extomac . . . . . 5s. per 7ozs., or 4¾d. per dose.
Gastrexo . . . . . 2s. per 20 gms.
Hepatex I.M. . . . . 6s. 6d. per 6 ampoules.
Hepatex P.A.F. . . . . 6s. per ampoule.
Hepatex . . . . . 13s. 6d. per 4 ozs., or 1s. 4d. per day.
Fresh liver . . . . . from 8d. to 1s. 10d. per day.

If gastric symptoms are present, or if the patient has difficulty in taking liver, it is usual to give HCl. dil. dr. ½ to dr. 1, or an acid-pepsin mixture.

Since liver extracts are of no use in treating nerve lesions, one relies on fresh liver and the stomach preparations, with, in addition, fresh vegetables such as carrots and cabbages. Mellamby recommended the use of carrotin.

The auxiliary use of insulin, twenty to thirty units twice daily half an hour before meals, has been found to help the anorexic type of patient.

Complications of liver treatment—gout, acute nephritis, mania, albuminuria, and femoral thrombosis, have been described, but one rarely finds any complication in cases treated with suitable doses.

Chlorosis, a disease of the young unmarried girl, has apparently become non-existent. Possibly an endocrine deficiency, and the disappearance is probably due to improved hygienic surroundings and a more varied diet.

SIMPLE ACHLORHYDRIC ANÆMIA.

A chronic anæmia of adults, chiefly women, and described fully by Witts of Guy's Hospital; first described by Faber in January, 1913. The pallor is like pernicious anæmia, but the blood picture excludes this disease. Dyspnœa is a more marked feature, and flatulent dyspepsia is usually complained of. On inquiring, one finds that they have suffered from indigestion for years, and have avoided meats and green vegetables. Loss of weight is a more prominent feature, while the tongue resembles the pernicious anæmia tongue with atrophy of mucosa and loss of papillæ. Colour-index is always low, and the cells are of the microcytic type. There is no bilirubin in the serum, and usually a leucopenia is found. Fractional test-meal shows an absence of free hydrochloric acid with excess of mucus and a rapid

emptying. There is a deficiency in pepsin in all and an absence in some. All these women are subjects of chronic dyspepsia, and have been taking a diet deficient in protein and mineral salts.

Experimental work has shown that the absorption of iron from the stomach depends on the presence of free hydrochloric acid; so reduced hæmoglobin in these cases is due partly to deficient intake of iron products and partly to absence of free hydrochloric acid.

Similar types of anæmia occur in some gastro-enterostomy cases, or after a large gastrectomy. Dr. Allison described some of these cases in a recent paper at the Ulster Medical Society.

The atrophy of the mucous membrane of the tongue may spread to the pharynx or œsophagus, and this syndrome has been named the Plummer-Vinson syndrome. Another characteristic of this type of anæmia is the change in the nails, which become dry, tender, brittle, and are flat and concave and often split—so-called oyster-shell nails. The source is probably nutritional defect. Liver in these cases does not produce a reticulocytosis, and therefore need not be persisted in. Large doses of iron are our stand-by, and generally produce a rapid rise in the hæmoglobin. The dose is :—

Iron : 30 to 60 grs. Blaud's Pills daily or ferri. et ammon. cit. drs. 2 to 3.

Hydrochloric acid alone does not help, though gastric lavage by removing excess of mucus may produce an improvement.

In many cases, preparations such as neobovinine and iodosan are helpful, while in severe or chronic cases a transfusion may be necessary, or injections of whole blood, 20 c.c. intramuscularly, may be given daily.

HÆMOLYTIC ANÆMIA OF PREGNANCY.

An anæmia progressing rapidly and causes marked dyspnœa, marked pallor, œdema, fainting attacks, temporary blindness or paralysis, hæmorrhages, vomiting and diarrhœa. Stomatitis and rise of temperatures are also usual, and this with the gastro-intestinal disturbances may resemble pernicious anæmia. There is not necessarily an absence of free hydrochloric acid. The cases generally occur towards the end of pregnancy, and become worse during labour and the puerperium. Recovery is characterized by a rapid regeneration of the blood with accumulation of nucleated and immature red cells. The anæmia is of the megalocytic type, with a marked deficiency in platelets. Colour-index is often low at onset, but rises. Liver is very beneficial, and transfusion is often necessary in severe cases. Iron, arsenic, and HCl. have been tried without benefit.

ANÆMIAS OF INFANCY.

Premature infants and twins often develop an anæmia, and it is assumed that this is due to the curtailment of the period allotted for the deposition of iron. Another form of anæmia occurs in young children fed too long on milk with inadequate supply of green vegetables or other iron-containing food. Some authorities trace the origin of this alimentary anæmia to the toxic or hæmolytic

effect produced by the digestion of milk-fats; others attribute the anæmia to a deficient iron depôt, and a functional inferiority of the hæmopoietic apparatus. In severe cases transfusion or intramuscular injections of blood may be required, but most cases respond to iron therapy. Ferrous carbonate grs. 30 to 60 daily is recommended. Syr. ferri. iodide is also helpful in some cases.

CHRONIC SECONDARY ANÆMIA.

1. Chronic blood loss :—Gastric ulcer, bleeding hæmorr-uterine lesions, cirrhosis of the liver.
2. Chronic nephritis, jaundice, tuberculosis, or cancer.
3. Intestinal parasites, such as hook-worm and tape-worm.
4. Chemical poisonings, such as lead and the coal-tar derivatives.
5. Pregnancy and the puerperium.
6. Infective diseases and septic foci, such as chronic arthritis, pyelitis, dental and nasal infections, cholecystitis, and salpingitis, etc.

The symptoms are usually those of the underlying condition, with those of anæmia, that is, breathlessness, loss of energy, slight puffiness of the ankles, and often a systolic murmur.

Treatment consists first of all in trying to get rid of or treating the underlying cause. For the anæmia we rely chiefly on iron in the form of Blaud's Pills, ferri. et ammon. cit., tinct. ferri. perchlor combined with liq. hydrarg. perchlor, but in certain cases arsenic with or without iron may be tried, while spleen and bone-marrow have been advocated, and in some cases have proved beneficial. Liver alone does not seem to help, but when combined with iron has a beneficial effect.

APLASTIC ANÆMIA.

There are two main types, an idiopathic and a condition following some poison or toxin such as benzol, trinitrotoluoul, severe infections, radium, and X-rays.

Idiopathic.—No recognized source of toxin. Generally an insidious onset; pallor, purpura hæmorrhagica, petechial hæmorrhages, diminished platelets. Sepsis, especially oral, may develop. Bone-marrow is destroyed, and blood-count shows no regeneration. The red cells are reduced to 1,000,000 or less, with colour-index only slightly reduced, as cells are filled with hæmoglobin. The cells often look normal. Polychromatophilia and nucleated cells are usually absent. White cells show a leukopenia with relative lymphocytosis, while the platelets are much decreased and often absent. There are also slight changes in fragility. The only treatment likely to benefit is transfusion, and cases have been reported where life has been prolonged for several years by frequent transfusions.

SPLENIC ANÆMIA.

In this disease there are three main stages :—

1. Where we find an enlargement of the spleen and a secondary anæmia.
2. Where the symptom of hæmatemesis is present; and
3. Where the cirrhosis of the liver has progressed and ascites has developed.

Apparently the only hope of a cure is in the first stage, when splenectomy may prevent the occurrence of cirrhotic changes from the liver. Apart from splenectomy, these cases are treated similarly to those of secondary anæmia.

TRANSFUSION.

Since the introduction of liver therapy, the number of transfusions in cases of pernicious anæmia has fallen very considerably, but in many other conditions it is one of our best therapeutic measures. Sir Thomas Houston was one of the first to recognize the importance of typing blood prior to a transfusion, and in this school we all owe him a deep debt of gratitude, not only for the technique of transfusion, but also for helping us to determine the type of case most likely to benefit.

There are various methods of giving transfusions, but the most commonly used are defibrinated blood and citrated blood. In the latter a 3.8 per cent. solution of sod. cit. is used to prevent the blood clotting.

Many cases are now surgical rather than medical emergencies, and one of the most difficult problems is to decide when to give a transfusion after a severe case of gastric or duodenal hæmorrhage. The possibility of a recurrence of the hæmorrhage is great, and usually one tries to get the surgeon to operate and tie the bleeding point immediately after the transfusion has been given. One case was given ten or twelve transfusions by Sir Thomas Houston before the surgeon could be persuaded to reopen the abdomen and suture the patent vessel. Even a delay of six weeks after an attack of hæmatemesis does not exclude the occurrence of fresh bleeding after a transfusion. I had a case in my wards where a man, aged 45, was given a transfusion many weeks after a hæmatemesis, and the following day his hæmoglobin had fallen by one-half owing to another attack of bleeding.

Another type of case where transfusion seems to be essential is that of the woman who has had a great loss at her confinement, and who was not in a position to have taken the necessary rest and treatment, and on admission to hospital is found to have severe secondary anæmia. Here other forms of treatment seem to have little effect, and introduction of fresh, healthy blood is sufficient to stimulate her own hæmopoietic function. Apart from the benefit to the patient, weeks of treatment in hospital are saved. The same applies to other cases of long-standing secondary anæmia.

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Mental Diseases in Relation to General Practice

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IN this paper I wish to refer to the relationship between the general practitioner and mental disease, and to try and impress on you the fact which has impressed me forcibly for some time, that mental diseases are not outside the province of general medicine, but that, in their early stages, they are the direct concern of the general practitioner. Judging from my own experience, the average medical student is inclined to look on this form of disease as being an entity by itself—something apart, with which he will rarely have anything to do, and his sole endeavour is to get his certificate of attendance at the lectures—his D.P., as we used to call it. Having obtained this, he closes his mind to further consideration of the subject, until he comes up against his first case in practice. He then naturally thinks of the handiest means of getting this troublesome person conveyed to the nearest asylum. But he will not be very long in practice before he finds that there are here and there dotted throughout his district many cases which are borderline cases—not bad enough yet to be sent away, but which, he is convinced, will sooner or later develop and qualify for the asylum. I shall do my best to clarify one's conception on broad lines of these not very mysterious diseases, and show that in a very large number of cases they are merely symptoms of general disease. And in so doing, I want to urge on you the importance of early treatment.

When the vast majority reach the mental hospital, treatment is rendered difficult by a lack of co-operation between the patient and the doctor. The patient has been lifted out of his home circle—often by the police—from surroundings which are familiar and to which he turns naturally when he is ill, to an atmosphere and surroundings which are strange to him. Any fears or suspicions he may be plagued by are exaggerated, and he is usually resentful of the change. Under these circumstances, it is not to be wondered at then that great tact, patience, and ingenuity must be exercised by the doctor before sufficient confidence is established between the patient and himself. Yet I would not have you believe that our hands are altogether tied by this want of co-operation. We have other means at our disposal—our own observation of objective signs, and the findings of the bacteriologist and pathologist. These findings frequently disclose the presence of long-standing disease which could have been diagnosed long before mental disturbance developed. As a few examples of cases in which the mental symptoms were of such a nature as to completely cloud the picture for the practitioner, I may say that within recent years I have had a case of acute lobar pneumonia, three cases of diabetes, one of sapræmia, two of pyelitis, one of cerebro-spinal fever sent in as mania, and many cases of uræmia sent in as confusional cases. I quite grant that these are exceptional, but they are examples of cases where the mental symptoms were obviously merely symptoms of a more general disease. Yet I hope to show you that there are many others, not so obviously, but none the less truly, where the mental symptoms are similarly merely symptoms.

I think a good working, though rough, classification of mental diseases may be arrived at by dividing them into three groups—

(*a*) Mental deficiency.

(*b*) The dementias—præcox-senile.

(*c*) Other varieties—confusional, manias, melancholias, delusional states, etc.

Now, with regard to mental deficiency, this can vary from total amentia to mild forms of imbecility. For these there is no cure—once an idiot or imbecile, always an idiot or imbecile. Prenatal treatment and care of the pregnant woman may help to reduce the number of these cases. An unhealthy and underfed woman can hardly be expected to supply all that is necessary to produce a healthy infant, and it is highly probably that a chronically infected woman may impart her toxins to the fœtus *in utero,* with the result that irreparable damage may be done before the infant is born, and the poor child starts life under a severe handicap. We have more than sufficient evidence to show that toxins are transmitted to the fœtus, toxins such as that of syphilis, infectious fevers, etc. Also we know how the newborn child of a recently vaccinated woman will not "take" if vaccination is attempted on it.

Again, in investigating the heredity of a long series of epileptics, it has been shown by Continental authorities that in a very large proportion of cases a history of alcoholism existed in one or both parents, and in a sufficient number of cases to attract attention it was elicited that either one or both parents were drunk at the moment of conception.

This brings me to the point where I think I may observe that I am of opinion that we are all given at conception a certain vital energy comparable to muzzle velocity in a rifle bullet. If this velocity is high, our mental faculties will remain unimpaired throughout life, be it long or short. If it be low, a breakdown is liable to occur at an age proportionate to the rate. A very low muzzle velocity will result in idiocy, a less low will favour the incidence of dementia præcox, menopausal disturbances, etc. Chronic sepsis in the mother, and other transmitted toxins, will damage this vital energy. It has been observed that mental instability in the mother is a much more potent factor in the causation of dementia præcox than in the father. If, as I hope to show, chronic focal sepsis can cause insanity in the mother, it is a sufficient explanation for this observation. It is in view of these observations that I should like to stress the importance of the care by the general practitioner of the prospective mother or pregnant woman, and of the importance of the doctor having a due appreciation of the dire effects of maternal sepsis in the fœtus. (The same infection which caused insanity or ill-health in the mother may in later years cause the same in her child.)

Now we come to senile dementia, which is, as you know, a loss of mind occurring in old age. I dare say a partial loss of mental activity is natural and inevitable in extreme old age, but one sees cases occurring at presenile ages—55, 60, 65, and in these there is usually a physical cause such as arterio-sclerosis, which causes a diminished cerebral blood-supply, with consequent degeneration of the brain-cells.

As arterio-sclerosis is now regarded to be a result of chronic infection, many, if not all, can be put down to chronic infection.

Before going further, I should like to make a few observations which may appear to be digressions, but which can be linked up later as my subject develops.

We know that harmful waste products are formed in the tissues by exertion. The more violent the exertion the greater the amount of waste products. A hare or stag which has been killed after a prolonged chase, if eaten by the hounds, causes a pathological weariness in the hounds. A frog's muscle, as we all saw in our experimental physiology class, when artificially stimulated, wearies after about one hundred and fifty contractions, and becomes unresponsive to stimulus after about two hundred and fifty contractions. If, however, the arteriole of the muscle is washed through with saline, the muscle recovers at once. If the washings are injected into a fresh muscle, fatigue is induced at once. Now, if this is true of the muscle, it is fair to assume that certain cerebral activities cause the formation of toxic waste products. We all know how flat and really ill we feel after any prolonged fright, worry, or anxiety. During the war I had charge for a time of the shell-shock centre of the Fifth Army in France, and I formed the opinion that the patients there were suffering from a definite pathological entity caused by this, what I may call, "worry toxin." Of course we have to take into consideration the fact that worry or fright, if prolonged, causes a dysfunction of the endocrine glands, but how much this is a result of the worry toxin is difficult to say. The thyroid is stimulated to an excessive degree, and so acts as a toxic body. One has only to look at a case of exophthalmic goitre to see a typical picture of fear : the protruding eyeballs—"his eyes starting out of his head"—rapid pulse, dilated pupils, tremors, and moist skin. These tremors are small rapid muscle contractions which in themselves produce waste matter, and so add to the toxicity. But I am persuaded, and I think it fair to assume, that worry or anxiety, if prolonged, will by itself cause the formation of toxic matter which is capable of causing mental symptoms. If you have the added toxins of septic foci the burden will become too much, and the patient gets what we call a "nervous breakdown."

This is, I think, an opportune moment to consider nervous energy as a whole. Nervous energy can be likened to electric energy, and the central nervous system can be compared to an electric battery or accumulator. The battery gives out its energy, and eventually becomes exhausted and requires to be recharged. The central nervous system gives out its energy in mental and physical work, and it becomes recharged by means of rest, sleep, and nourishment. It possesses a contrivance which warns us when recharging is necessary, and we inhibit output by order of this warning signal. We feel sleepy, tired, and hungry : these are the warnings. The efficiency of these warnings depends on the state of charge of our batteries. When these are well charged our capacity for sleep and our appetite are at a maximum. Supposing for some reason, such as overwork, repeated late nights, the presence of the worry toxin, septic foci generating toxic matter, etc., we are unable to recharge our batteries, they become run down. This lowering of the state of charge also weakens the efficiency of the inhibition of output mechanism, and

we lose control of output. Our energy streams away and is dissipated in the form of inability to rest, nervous movements, irritability, apprehension, and fearsome thoughts. We lose the power to concentrate, to rest or to sleep, our appetites suffer, and we reach a condition of extreme nervous exhaustion. If continued and the stream of energy not arrested, the condition will develop into a state of acute mania or agitated melancholia. The treatment consists in recharging the batteries. Bring back the power to sleep—by drugs if necessary—reduce output to a minimum by absolute and prolonged rest in bed, and insist on the ingestion of the greatest amount of easily digested food possible. As the batteries become recharged, the control over output will be regained, natural sleep will return, and the patient will gradually build up a store of reserve energy. An early recognition of this condition and its appropriate treatment would, I believe, prevent many cases which eventually have to be admitted to the asylum.

I have already mentioned focal sepsis in relation to mental disease, and I should like now to discuss this more fully.

First of all, we are all familiar with the delirium which occurs in delirium tremens and in cases of typhoid fever, scarlet fever, pneumonia, septicæmia, and other febrile conditions, but in these the mental confusion is of secondary importance, and is looked on as a troublesome and often grave sign. In syphilis we have a toxin with a selective action on the central nervous system. There are probably two distinct spirochactes, one of which gives rise to the usual secondary and tertiary manifestations, and the other having a selective action on the central nervous system, and giving rise to a train of signs and symptoms, mental and physical, which follow a well-defined course. Also in tetanus we have an organism with a selective action on the central nervous system. In encephalitis lethargica, disseminated sclerosis, infantile paralysis, and diphtheria, to mention a few others, we have toxins which show a marked selective action on the central nervous system. But in all these we know and are familiar with the poison at work. In other cases the signs and symptoms—mental disturbances, fill the picture, and the toxin remains obscure. It is not too much to assume that those which I have mentioned above are not the only toxins with somewhat similar selective action, but whose results are exhibited as purely mental disturbances. There are, I am told, for instance, about sixteen different varieties of streptococci. Their characters are represented, not by their cultural features, but by the different effects they produce in the different tissues and systems of the body—in other words, by their selective action on the different systems. Many people consider that this question of focal sepsis in relation to disease is overdone, but one has only to consider certain conditions caused in this way to be convinced of its importance; and if the infection is caused by an organism having a selective action on the brain and nervous system, its toxins may well be the determining factor in the incidence of an attack of insanity. We know of cases of iritis, duodenal and gastric ulcer, pyelitis, arthritis, etc., caused by dental sepsis, and the opinion is held by some gynæcologists that cases of puerperal sepsis may be caused in this way. I know of cases of epilepsy where the fits ceased or were very markedly reduced in number by the extraction of septic and carious teeth.

The most frequent sites in which these foci exist are familiar to all—the teeth, buried stumps, unerrupted third molars, tonsils, accessory nasal sinuses, intestine, especially the large intestine, cervix uteri, etc. The local extent of the focus may be and usually is insignificant, and it may be giving rise to no pain or discomfort or other local symptoms, yet its removal is generally followed by an amelioration or cessation of mental symptoms. It may not always be the obvious source of infection that is the cause of the disease, so one should not be disappointed if no good follows the removal of what one feels sure is the offending material. If failure follows one attempt to find the real focus, try again and again. It is agreed that closed infections are more vicious and more widespread and more insidious in their effects than open, and, further, that those in bony tissues such as tooth sockets or sinuses have their virulence enhanced owing to being in connection with bone.

It may be objected that these septic processes are as common amongst the sane as the insane, and that they may therefore have nothing to do with the insanity. In the sane, though infected cases, the patient is putting up a successful resistance, and the organism may be of a benign character, whilst in these insane cases there is a failure of resistance and the organism is probably one with a selective action on the central nervous system, and one to which the patient has failed to form an antibody. This failure to form an antibody can be determined by a bacteriological test.

By reflex action, septic foci may give rise to many misleading sensations, which in time develop delusions or hallucinations. Septic teeth and stumps cause a metallic taste, which may make the patient believe he is being poisoned. Naso-pharyngeal sepsis may cause tinnitus and later auditory hallucinations. Sinusitis may cause visual hallucinations, terrifying dreams, headache, disturbances of smell. He may believe he is being gassed or chloroformed. Intestinal putrefaction can give rise to many vague abdominal sensations which later develop into distressing delusions. These symptoms are usually more pronounced in the female during the premenstrual period.

We who work in asylums only see the patient as a rule when he has well-marked symptoms of mental disease, but there is frequently a history that he has had months or years of indifferent health, that he has suffered from nerves for a long time, and that his condition had been diagnosed by his doctor as neurasthenia. Now, I feel that this term "neurasthenia" is one we should abolish. When we come up against a case which presents symptoms which are perhaps muddled and ill-defined, and which do not conform to any known disease, especially if the patient is introspective and appears to be unduly anxious about himself, we pull down our blind and label it "neurasthenia." We do so to cloak our ignorance. The diagnosis sounds well; it satisfies the patient, his relatives, and ourselves. My contention is that these are all potential mental patients. Simply because we cannot put our finger on the cause of their symptoms does not prove that no cause exists. They have probably got some insidious, hidden infection which is gradually poisoning the system and giving rise to queer feelings, and keeping the patient below par or in a state of semi-invalidism. It is here that teamwork in medicine could be seen at its

best. The patient should be overhauled by an ear, nose, and throat specialist. His sinuses and naso-pharynx should be put into a healthy state. A dentist should be made to remove all unhealthy or doubtful teeth, crowns, bridges, etc. Unerrupted third molars should always be removed. A gynæcologist should examine the female patient and treat any abnormality found, however trivial. In other words, at first sign of any obscure malaise, especially with any suggestion of mental symptoms, the patient should be examined and treated by every means at our disposal. No abnormality or sign of disease is too insignificant to ignore.

One frequently sees several members of the same family affected in the same way by naso-pharyngeal infection. A mother or a father may be affected and spread the infection to their children at an early age. I have a patient at present who is recovering from an acute confusional attack due to this cause. He is an only child. His father, he states, was always troubled with his nose and tonsils, and at one period he suffered from a nervous breakdown. I know a woman at present who obviously suffers from chronic naso-pharyngeal disease. I have her entire family, two sons and a daughter, as patients under my care—hopeless dements. I know of a family of three, two brothers and a sister. The latter suffered for years from strange headaches. She eventually became a patient in an asylum. One brother was always dull, melancholic, and solitary, until he had his nasal septum and tonsils attended to. He brightened up, got married, and is now a useful member of society. The other brother came to me with marked neurotic symptoms. He was seen by an ear, nose, and throat specialist, who discovered a chronically infected antrum. With the removal of this focus and of a few doubtful teeth, he is now infinitely better, and his symptoms are rapidly leaving him. And to quote just one more—a woman aged 38 became acutely delirious and later comatose. I attended her until the attack passed—a matter of several weeks. I then sent her to Dr. Killen, who found enlarged tonsils, a deflected septum, and poor drainage from one frontal sinus. He rectified the septum and removed the tonsils. I saw her recently. She says she has better health since the operation than she ever had. The severe headaches she formerly suffered from have quite gone, and she looks very well indeed.

Of course I fully recognize the difficulties which confront practitioners who are isolated from X-rays, bacteriological laboratories, and the various specialists, but the more one sees of asylum practice the more one longs for the time to come when early mental patients—neurotics, neurasthenics, and all others—can be sent to a hospital where all these investigations can be carried out and the diseased conditions removed. As it is, when they reach us they are usually not amenable to treatment or investigation, or else so much damage has already been done as to render recovery questionable.

Now I have finished. You may think that I have exaggerated the importance of this subject of local sepsis, but I want to emphasize my opening contention that early mental cases are undoubtedly your concern. If I have aroused your interest in the subject, and if I have caused any of you to determine to go back and renew your attack on your neurotic and neurasthenic patients, I shall be content.

The Investigation and Treatment of Chronic Diarrhœa

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UNDER the term 'chronic diarrhœa' it is proposed to consider not only those conditions in which diarrhœa is a really chronic symptom, but also in those conditions in which the diarrhœa lasts for some days or weeks to be followed by an interval of perfect health, at the end of which time diarrhœa makes its appearance again. As many of these conditions are due to extra-intestinal causes (e.g., Graves' disease) it is obvious that every case should receive a thorough general examination.

The methods employed in the investigation of the intestinal tract are : Consideration of the history, inspection and palpation of the abdomen, digital examination of the rectum, examination with the proctoscope and sigmoidoscope, examination of the stools, the Schmidt intestinal test diet, Schmidt's incubator test, and X-ray examination by means of the barium meal and the barium enema.

The following modification of the intestinal test diet introduced by Adolf Schmidt is used by us at the Mater Hospital :—

On admission to hospital the patient is given half an ounce of castor oil to remove all irritating or fermenting products that may be present in the intestine, and a twenty-four-hours fast is instituted immediately. During the fast, thirst may be allayed by allowing the patient to suck small pieces of ice at frequent intervals; or, in more serious cases, intravenous salines are administered. At the end of twenty-four hours the Schmidt diet begins :

Breakfast.—One pint of milk or tea or chocolate prepared with much milk; one buttered roll (approximately fifty grammes); one soft-boiled egg.

10 a.m.—One large plate of thick oatmeal soup, strained, cooked with milk and water, and flavoured with sugar or salt.

Dinner.—One large plate of thick potato soup; quarter pound chopped or scraped beef, slightly browned so that the inside is uncooked.

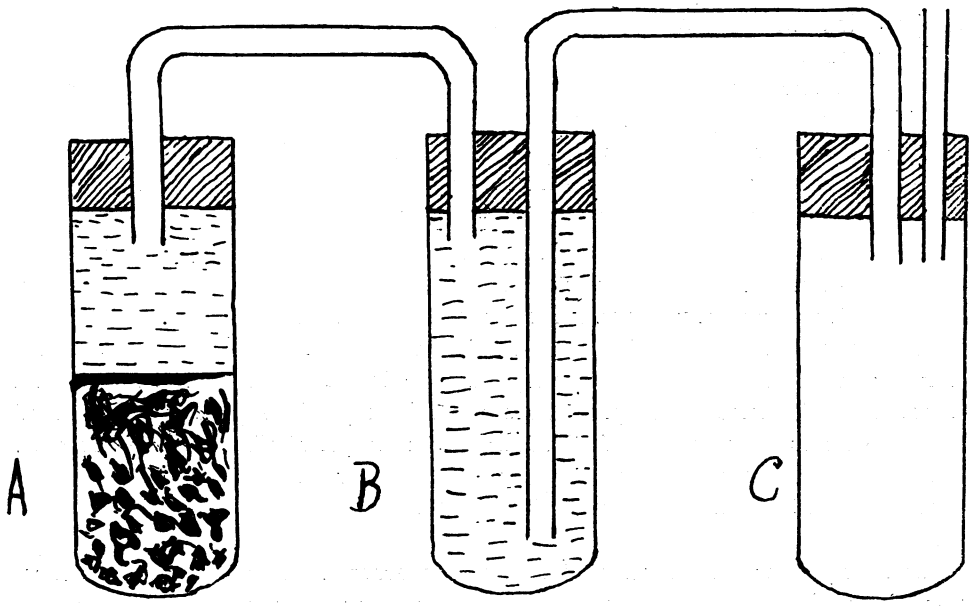
4 p.m.—As at breakfast, but without the egg.

Supper.—As at 10 a.m., with one or two buttered rolls, and one or two boiled or scrambled eggs.

This diet is maintained for three days, and on the morning of the fourth day the stool is examined with the naked eye and by the microscope for the presence of meat fibres, fat globules, or starch granules. The stool will have already been examined for the presence of blood, pus, mucus, or parasites. This diet is so well balanced as regards its composition in the principal basic foodstuffs, that the normal intestine digests these substances without the appearance of excessive residues in the fæces. The diet is not only of value in diagnosis : it is of marked therapeutic value as well. The diarrhœa frequently disappears entirely by the time the test is completed.

Schmidt's incubation test is carried out by means of three wide-mouthed test-tubes. The tubes are fitted with perforated rubber stoppers, and are connected up by means of glass tubing (see diagram). Tube A contains half fæces and half water,

tube B is filled with water, and tube C is empty. If the fæces putrify or ferment *in vitro*, the gas is collected in tube B and the water is forced into tube C.



SCHMIDT'S INCUBATION APPARATUS.

INTESTINAL AUTO-INFECTIONS.

The function of the bacterial flora of the intestine is to digest cellulose, but these bacteria will also attack protein and carbohydrates if these substances reach the large intestine in sufficient amount. Matzushita has counted forty-four species of micro-organisms in the normal adult intestine, and these have been grouped by Cawadias into two main groups: the proteolytes, which act on proteins; and the saccharolytes, which act on carbohydrates.

The principal proteolytes are :—Streptococcus coli gracilis and the various forms of B. proteus. The B. coli does not attack undigested protein, but it will act on peptones when there is little carbohydrate in the large bowel.

The principal saccharolytes are :—B. lactis ærogenes, B. acidophilus, B. bifidus, and B. acidi lacti longum.

In normal conditions the saccharolytes and proteolytes exist under a certain equilibrium, each checking the activity of the other, so that fermentation and putrefaction is slight. When this equilibrium is upset, one or more species belonging to the proteolytic or to the saccharolytic group increase in number and activity, and the intestine becomes infected with its own saphrophytes.

Increase in proteolytes occurs when there is excess of protein in the diet, excessive use of alcohol and tobacco, and in colonic stasis. It will also occur when susceptible individuals are exposed to heat or cold after operation or abdominal

injury. It occurs as a complication of intestinal cancer, or may follow an acute or complicate a chronic inflammatory lesion of the intestine.

Increase in saccharolytes is usually due to excess of carbohydrates in the diet, but (especially in children) it may also complicate an acute or chronic inflammation of the intestine.

In proteolytic auto-infection putrefactive diarrhœa occurs. The motions are liquid, dark in colour, alkaline in reaction, and of an offensive odour. They putrify *in vitro* with production of a small amount of gas. Indican is usually present in the urine. Pain is not constant and is seldom severe. There may be general symptoms of toxæmia such as headache, lassitude, and anæmia.

TREATMENT OF PUTREFACTIVE DIARRHŒA (modified from Schmidt and von Noorden).—For the first three days complete intestinal rest is enforced, and only water, weak tea with sugar, and glucose are allowed. After this period broth made from wheat or barley is added to the dietary. On the seventh day buttermilk, boiled milk, or milk fermented by B. acidophilus is allowed. Of the proprietary milk preparations, "Lacidac" has proved most satisfactory. Usually during the second week the fæces have lost the foul odour, and it is permissible to give potatoes, gruel, rice, arrowroot, and toasted white bread and butter. Other articles are now added cautiously until, at the end of about three weeks, the patient is having a normal diet.

Saccharolytic or fermentative diarrhœa is characterized by marked flatulence, pain of a spasmodic type, and diarrhœa. Motions are yellow, soft, and frothy. The reaction is acid, and large quantities of gas are produced in Schmidt's incubator.

TREATMENT (modified from Cawadias and from Kantor).—The regimen is similar to that used in diabetes, but with the added restriction that even the carbohydrate-poor vegetables, such as greens, are also eliminated.

Breakfast.—Half pint of protein milk; two soft-boiled eggs.

10 a.m.—One cup of beef tea.

Dinner.—Boiled or roasted meat or boiled fish; cheese.

4 p.m.—Half pint of protein milk; one egg.

Supper.—Two scrambled eggs; one ounce of cheese.

(Protein milk is prepared by adding one teaspoonful of essence of rennet to one quart of milk. This is placed in a water-bath at 42°C. for half an hour. The coagulum is placed in cheesecloth and drained for one hour. The coagulum is then washed through a very fine sieve with one pint of water, and the process repeated until the coagulum is very finely divided. One pint of buttermilk is now added, and the resultant protein milk may be sterilized by boiling.)

A comparatively short carbohydrate rest is all that is required, and carbohydrate may be added to the diet after one week in the same manner as in diabetes. Cellulose and pulses (peas and beans) are badly tolerated for a long time.

Drugs play a small part in the treatment of auto-infections of the intestine. Morphine and opium are to a certain extent dangerous. Diarrhœa is, after all, a defensive mechanism, and when stopped by opium, toxic material may be absorbed through the injured intestinal epithelium. Belladonna is usually ineffective. Coating

and absorbent powders are very valuable. The most useful are calcium carbonate, bismuth carbonate, and kaolin. Of the vegetable astringents, rhatany and catechu are satisfactory, as they act only in the colon and do not exhaust their effects on the upper alimentary tract.

The site of the lesion in the alimentary tract can often be recognized by examination of the stool. When the small intestine is affected, motions are passed early in the morning, the impulse to stool waking the patient from sleep. This is known as the "alarm-clock diarrhœa" of Matignon. The stools are soft, and may be fluid, and they show the presence of undigested food (liporrhœa, creatorrhœa, amylorrhœa). They may be green owing to the failure of the intestinal bacteria to convert the biliverdin into stercobilin. Anæmia and wasting are prominent features of this form of diarrhœa.

In severe inflammations of the colon, the numerous stools are small in quantity, show very little fæcal matter, and contain a considerable proportion of water and mucus, with, perhaps, some pus or blood. Undigested food residues are rare in these stools.

When severe disease of the descending colon or rectum is present, the patient usually has one or two fæcal stools in the morning. These may be coated with blood or mucus. At various times during the rest of the day there are explosive motions, which consist mainly of mucus ("intestinal sputum"). Tenesmus is a frequent symptom. The anal sphincter is spasmodically contracted, causing "lead-pencil" shaped motions, and the skin of the anal region may show signs of irritation or eczema. Abdominal palpation shows that the colon is tender and contracted.

ETIOLOGICAL FORMS OF CHRONIC DIARRHŒA.

1. *Chronic toxic diarrhœa* is due to the excretion into the intestine of various drugs which have been taken in poisonous doses. The drugs most frequently at fault are mercury, arsenic, lead, silver, and iron. It is important to remember that the bowel furnishes the chief, if not the only effective, means of eliminating the poison. Such diarrhœa should not be checked, but encouraged by the use of a drug such as magnesium sulphate until it is certain that the poison has been eliminated. Secondary auto-infection may continue the diarrhœa and may be treated on the lines already described.

2. *Chronic uræmic colitis.*—This important variety of autotoxic diarrhœa is familiar to every practitioner. It may be treated by giving sixty grains of pulv. jalapæ co. in jam or jelly. The general treatment of uræmia must be carried out.

3. *Chronic tuberculous enterocolitis.*—The tubercle bacillus principally affects the terminal ileum and the cæcum, where it produces not only tuberculous lesions but also non-specific inflammatory lesions. The "Stierlin phenomenon" is a condition in which a nine-hour X-ray photograph shows barium in the terminal ileum and in the transverse, descending, and sigmoid colon, but absence of the meal in the cæcum and ascending colon. Its appearance in a film is very suggestive of intestinal tuberculosis, but it is not pathognomonic, as it may be present in cancer and it is not always present in intestinal tuberculosis. "Konig's syndrome" is

evidence of the stenosis which so frequently occurs in this disease. The patient complains of pain which is sharply localized at the site of the stenosing lesion. Visible peristalsis is seen above the stenosis, and the pain coincides with every intensification of these peristaltic movements. After a short time there is an abundant expulsion of gas or fluid stools, and the pain subsides.

The treatment of chronic tuberculous enterocolitis is that of tuberculosis in general. Intramuscular injections of 10 c.c. of a ten per cent. solution of calcium gluconate has a favourable effect on the diarrhœa. For the non-specific lesions, dilute acid nitro-hydrochlor (m.10 three times a day) is extremely useful.

4. *Sprue.*—This is a disease of unknown etiology which is characterized by an inability to absorb fat, glucose, and calcium. There is morning diarrhœa with bulky gaseous stools, which contain large amounts of neutral fat. The disease occurs, for the most part, in the Bombay Presidency, Ceylon, Malaya, Java, China, Cochin China, and Porto Rico.

Fairley's high protein, low fat, and low carbohydrate diet has now replaced the other dietetic treatments of this disease. Liver extract is very successful in the treatment of the anæmia which is a prominent feature of sprue.

5. *Chronic dysentery.*—This is really a chronic proteolytic autoinfection which follows on acute bacterial or amœbic dysentery.

6. *Gastrogenous diarrhœa* is common in the presence of achylia gastrica. It is usually of the proteolytic type. Dilute hydrochloric acid is effective in most of these cases.

7. *Chronic cryptogenetic diarrhœa.*—This is a large and important class of chronic diarrhœa. Owing to the vast number of micro-organisms in the stools it is impossible to isolate the causative organism. The infection may come from the food or from septic teeth. The type of diarrhœa will vary according to the part of the bowel most affected. The treatment is on the lines indicated for putrefactive or fermentative diarrhœa.

8. *Hepatogenous diarrhœa* is a common symptom of obstructive jaundice. It is due to the absence of the antiseptic action of the bile. The stools are foul-smelling, clay-coloured, and bulky. The treatment is that of the primary condition.

Linossier's diarrhœa is a post-prandial diarrhœa which is associated with disease of the gall-bladder.

9. *Pancreatogenous diarrhœa* is due to obstructive lesions of the pancreatic ducts. There is excess of meat proteins in the stools. The motions are bulky and extremely foul-smelling. Anæmia and wasting are marked. The commercial preparations of pancreas are often ineffective in the treatment, and it is advisable to obtain fresh pancreas tissue. This may be given in a sandwich (raw pancreas) or as a freshly-prepared gylcerin extract.

10. *Syphilis and actinomycosis* are rare causes of diarrhœa, and need not be described here.

11. *Ulcerative colitis* is a disease of unknown etiology. The condition is one of chronic diarrhœa with periodic acute exacerbations. The onset is insidious, and it is probable that the disease has been in existence for years before the onset of

diarrhœa. The stools are numerous and contain large amounts of blood. Pus and mucus are also present.

The treatment is still unsatisfactory. We have found Bargen's serum very disappointing. Appendicostomy and cæcostomy have now been abandoned, and ileostomy is being performed less and less frequently. At the Mayo Clinic ileostomy has been performed on eighty-two patients in ten years. Twenty-six died shortly after operation, and fifteen died later. The results of medical treatment are not quite so bad. Repeated blood-transfusion is still the most useful treatment for ulcerative colitis, but the majority of severe cases are forced to lead a life of invalidism.

13. *Cancer of the intestine.*—Diarrhœa is a negligible symptom in cancers situated above the sigmoid colon. But as seventy-one per cent. of intestinal cancers are situated in the rectum, the occurrence of chronic diarrhœa in a person over 40 should always raise the suspicion of malignant disease. Cancer of the rectum is characterized by vague pain at the umbilicus, anæmia, wasting, and numerous small stools which are covered with mucus. Blood in the stool is a comparatively late sign. It should be noted that the tumour may often be palpated on digital examination long before it is visible on proctoscopic or sigmoidoscopic examination.

The treatment is surgical, but, before operation, the patient should have one or more blood-transfusions and the diarrhœa should be arrested. This may be effected by giving a plain water enema daily and, if necessary, a morphine suppository.

FUNCTIONAL OR EXTRA-INTESTINAL DIARRHŒA.

1. *Chronic nervous diarrhœa.*—This is a disorder that occurs in emotional subjects. Except for a high percentage of water, eighty to ninety per cent. of the stools are normal. Motions usually take place on rising and after each meal. The patient becomes afraid to go any distance from a lavatory, and social and other duties are neglected. Ephredine hydrochloride, grain $\frac{1}{2}$ three times a day, is helpful. Ninety grains of calcium gluconate is also given each day. J. H. Anderson (quoted by Spriggs) remarks that in Gallipoli, which he describes as the greatest mass experiment of bowel disorder of which there is record, it was found that sick parades, which were mainly of dysenterics, fell almost to nothing before heavy fighting. If courage and duty could temporarily influence a true infective colitis, the same applies *a fortiori* to nervous diarrhœa.

2. *Heat and cold* may cause diarrhœa in certain persons. It is believed that, in these cases, histamine is generated in the skin by the action of heat or cold, and that the diarrhœa is caused by the stimulant action of histamine on the parasympathetic nerves to the intestine.

3. *Anaphylactic diarrhœa* is not infrequent, and it occurs in conjunction with other allergic manifestations. The diarrhœa is urgent and explosive in type, but the stools are normal. This is also an "alarm-clock diarrhœa." The treatment consists in giving adrenalin or ephedrine during the attack. Between the attacks desensitisation may be attempted. Schittenhelm's diarrhœa and the milk diarrhœa

of infants of Weill are other manifestations of anaphylactic diarrhœa. They appear to be rare in this country.

4. *Endocrine diarrhœa.*—In Graves' disease and in the late stages of Addison's disease, an intractable, watery diarrhœa often occurs. This diarrhœa is relieved by an enema containing twenty to thirty minims of liq. adrenalini hydrochlor (1 in 1,000) to two pints of water. As adrenalin is not absorbed from the intestine, the enema may be repeated as often as desired during the day; but one enema a day is usually sufficient to control this troublesome symptom.

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A Review of 122 Consecutive Hysterectomies

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Two writers, Davis and Cusick,[1] in reviewing the subject of hysterectomy, start their paper with the following paragraph, which is worthy of repetition:

"The scientific attitude in hospital work would be measurably improved if there were an obligatory requirement for a yearly, five-yearly, and ten-yearly group-study of at least five per cent. of the major standardized operations. Improved studies of cases would be a natural result, a more efficient system of record-making would follow, availability of the records would be improved, and a worth-while follow-up system would be supported. . . . The follow-up problem involves expense and painstaking effort which has no immediate tangible value in hospital financing. Its value must be credited to the patient and doctor."

This paper is a review of 122 consecutive hysterectomies operated upon by myself in the Ulster Hospital, Royal Victoria Hospital, and in private, excluding Wertheims hysterectomies and those done for obstetrical emergencies. It also includes a follow-up of 110 of these cases, the other cases having been operated upon too recently to be of value from this point of view.

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TABLE I—INDICATIONS FOR OPERATION.

Fibroid tumours	69
Fibroid and endometrioma	9
Fibroid and ovarian tumours	4
Fibroid and sarcomatous cervical polypus	1
Cancer of the uterine body	13
Fibrosis uteri	13
Tumours of the ovary	2
Endometrioma	4
Sarcoma of the uterus	1
Inflammatory pelvic disease	4
Suspicious cervix (microscopic)	1
Developmental abnormality	1
	122

Fibroid tumours, either alone or complicated by other tumours, were the indication in sixty-nine per cent. of the cases. Malignant tumours formed 11.4 per cent. of the cases. Endometrioma alone or complicated by fibroids occurred in 10.6 per cent.

TABLE II—MAIN SYMPTOM.

Abnormal bleeding	67.9%
Pain or discomfort	12.9%
Tumour	9.2%
Digestive symptoms	4.6%
Bleeding and pain	3.7%
Urinary symptoms	2.7%
Leucorrhœa	0.9%

This table simply proves what has been mentioned times without number, that any menstrual irregularity, especially in women over thirty, has usually a pathological basis which should be sought for and dealt with before treating the patient with ovarian extracts or ergot.

Abnormal bleeding was the main symptom of fibroids in a large percentage of cases, but some American authors do not agree that this is always so. Davis and Cusick,[1] for example, say that abdominal and pelvic pain, while not recognized as a symptom of fibromyomata by most textbooks, occurred much more frequently in their series than any other symptom. The frequency of this symptom in their series was sixty-five per cent.

In my series of cases, whether pain or bleeding was the main symptom, depended on the situation of the tumour. In those cases where pain was the main symptom, the tumour was either subserous, pedunculated, or had undergone degeneration. Where the tumour was encroaching on the endometrium, hæmorrhage was always the main symptom.

TABLE III—TYPE OF OPERATION.

	Number of Cases	*Percentage of Total*
Total hysterectomy	76	62.3%
Subtotal hysterectomy	46	37.7%

In cases requiring hysterectomy, I think the total operation is the better from every point of view, and where at all possible I should always prefer to do it. The above table includes many of my earlier cases, and the fact that thirty-seven per cent. of the operations done are of the subtotal type illustrates my early inexperience. Read and Bell,[2] in a recent paper on this subject, give inexperience in gynæcological surgery as one of the indications for the subtotal operation.

As one gains experience and judgment, the percentage of subtotal operations is bound to fall; for example, of the operations done in this series during the past year, over ninety per cent. have been of the total variety.

There are cases where the subtotal operation is unquestionably safer than the total, e.g., in cases with extensive involvement of the pelvis by endometriomatous tumours, where the rectum is densely adherent to the lower part of the uterus and cervix, in stout nulliparous patients, and in some benign cases, where the poor general condition of the patient indicates the shorter and easier operation.

In this series there has not been a case of cancer developing in the cervical stump following the subtotal operation, but it is too early to say that this disastrous complication may not occur. Since commencing this paper I have seen three such cases operated upon by other gynæcologists.

Spencer,[3] in commenting on this fact, states: "The truth is that the advocates of the subtotal operation cannot state the number of cases in which carcinoma occurs in the stump without an inquiry into the after-history of every one of their cases for a period of at least thirty years subsequent to the operation."

Fullerton and Faulkner,[4] in referring to the possibility of cancer developing in the cervical stump after subtotal hysterectomy, say that many of these cases occur very soon after the operation, suggesting the presence of cancer in the cervix at the time of operation.

Read and Bell,[2] in a recent paper discussing the sequelæ of the two operations, say, "Not only is subtotal hysterectomy more liable to remote complications, but also that the mortality-rate of the operation would be considerably raised if the deaths due to subsequent malignant disease of the cervix were included." The importance of this can be realized by figures from radiation centres for cases of cancer of the cervical stump attending for treatment. It has been found that from three to eight per cent. of the cases of cervical cancer attending for treatment have arisen in cervical stumps.

Reading American literature on the subject of hysterectomy, one is impressed with the fear that many authors have of doing the total operation, whereas in this country the total operation is strongly favoured.

The decision to do a subtotal hysterectomy should not be taken without being satisfied beyond a doubt about the condition of the cervix at the time of the

operation, or without doing a preliminary curettage to exclude the possibility of an unsuspected carcinoma of the body of the uterus.

MORTALITY.

There were two deaths in 122 cases, or 1.6 per cent. One case died from a pulmonary embolus following a subtotal hysterectomy for fibroids and an extensive endometrioma. This patient was difficult to anæsthetize, was cyanosed throughout the operation, and died a week later very suddenly. The second case died from shock. This patient was fifty-eight years of age, with a large ovarian cyst adherent to bowel, uterus, and bladder, probably due to an acute pelvic peritonitis. The appendix was also acutely inflamed. A subtotal hysterectomy, necessary on account of the fixity of the tumour to the uterus, was a very small part of the operation, and was not in itself responsible for the patient's death.

There were no deaths among seventy-six total hysterectomies. Mortality figures of other writers vary very much. Davis and Cusick,[1] in a series of 335 cases done by thirty-five different operators, show a mortality-rate of 4.5 per cent.

Burch and Burch,[5] reviewing two hundred cases, give a rate of 4.5 per cent. Spence,[3] in his series, which were all total hysterectomies, had a death-rate of 1.8 per cent., and in his paper quotes Lockyer as having a mortality of 1.45 per cent. Worrall,[6] in a series of 532 cases operated upon over a period of eighteen years, has a mortality-rate of 0.563 per cent. This is the best series so far published.

TABLE IV—MORTALITY.

Davis and Cusick - - - -	4.68%
Burch and Burch - - - -	4.50%
Spencer - - - - -	1.80%
Lockyer - - - - -	1.45%
Worrall - - - - -	0.56%
Macafee - - - - -	1.60%

Pulmonary embolism is still a dreaded complication of hysterectomy, and it seems to be more liable to occur after the subtotal than after the total operation.

Read and Bell,[2] investigating 2,344 cases operated upon in the Chelsea Hospital, found that this complication caused thirty-three per cent. of the deaths following the subtotal operation, while in the case of total hysterectomy it caused death in only ten per cent. of the fatal cases.

In my experience, the type of case likely to have post-operative complications, especially pulmonary embolus, is the patient who has a uterus containing several fibroids and fixed to the other pelvic organs by endometriomatous or inflammatory adhesions. The impaired mobility which results from these adhesions adds greatly to the operative difficulty, is liable to cause increased shock, and adds to the risk of injury to bowel and ureter.

In cases of endometrioma, there is the added risk of ileus as a result of extravasation of the retained menstrual fluid, which is very irritating to the peritoneum.

One of the most important things in preventing post-operative complications is

good anæsthesia, because the patient who is straining and cyanosed throughout the operation is the patient who is likely to develop a pulmonary embolus. Skilful anæsthesia has been a large factor in securing the smooth and rapid convalescence of the great majority of the patients in this series, and I am indebted to all the anæsthetists concerned.

COMPLICATIONS.

There were relatively few complications during the three weeks following the operation. Seven cases (including the two cases that died) showed departures from the usual type of convalescence, i.e., 5.7 per cent.

TABLE V—COMPLICATIONS.

	Total	*Subtotal*
Acute gastric dilatation	1	—
Secondary hæmorrhage from vaginal vault	1	—
Abscess in vaginal vault	1	—
Abscess in rectal sheath	—	1
Septic rash	—	1
Shock (death)	—	1
Pulmonary embolus (one death)	—	2 (one died)

Of the complications associated with the total operation, two are peculiar to the operation, and one is a risk of any abdominal section.

The case of gastric dilatation responded to gastric lavage; and the secondary hæmorrhage from the vaginal vault did not recur after securing the vessel with a suture. In one case a small abscess developed in the vault of the vagina, but apart from delaying the patient's discharge from the nursing-home, there was no other serious consequence. Of the complications associated with the subtotal operation, the abscess in the rectal sheath followed a hæmatoma, probably due to piercing a vessel with the "through and through" sutures. The patient who developed a generalized septic rash caused great anxiety. She had multiple fibroids and an unexplained temperature three weeks before operation. Operation was undertaken after this had subsided, and four days later she developed a rash on her buttocks, following enemata, which spread all over her body and was associated with a temperature of 103°F. and a pulse of 140. There was no evidence of peritonitis, and the abdominal wound was quite normal. Following the administration of anti-scarlatinal serum, the temperature gradually fell and there was general desquamation. There were two cases of pulmonary embolus, one of which died, and the case of shock which also died.

There were no cases of urinary fistula in the series. Two of the cases required blood-transfusion before operation.

From my own experience the mortality for an uncomplicated hysterectomy should be about one per cent. The two deaths in this series were in cases complicated by adhesions and additional tumours, which added to the operative difficulty or even overshadowed the actual hysterectomy. They were also difficult to anæsthetize.

AGE OF PATIENTS.

The average age for the whole series was 45½ years. The average age for patients operated upon in hospital was somewhat higher than that of the patients operated upon in private.

In a hysterectomy, either total or subtotal, one question always arises, Should an ovary or both ovaries be conserved? The problem in a large number of cases is settled for the operator on opening the abdomen, because both ovaries may be the seat of extensive cystic disease, or may be involved by endometriomatous tumours or by inflammatory adhesions. In such cases it is much wiser to remove both ovaries, especially in a patient at, or past, the menopause. One great advantage of removing the ovaries is that it makes the operation easier and the peritonizing of the pelvic floor more complete. There is also the advantage that one removes an organ in which tumours can develop in later life. All gynæcologists have had the unpleasant experience of having to remove ovaries which have been conserved, and it can be a very difficult operation, especially when it is the left ovary.

The ovary becomes matted over with adhesions, and the sigmoid flexure has a most unfortunate habit of wrapping itself round the organ. The difficulty experienced in removing conserved ovaries has perhaps something to do with the large number of cases in which the ovaries have been removed at the primary operation in the series.

In women who are in the early thirties, it is probably better to conserve one ovary, and for preference the right.

The supposed advantage (I say "supposed," in view of what I have to say later) of conserving both ovaries is that the menopausal symptoms associated with castration are not manifest immediately or are considerably alleviated. It has been observed by many surgeons that the menopause appears prematurely after hysterectomy, whether the ovaries have been conserved or not.

Murphy and Sessums,[7] investigating the surgical menopause in cases operated upon before the age of 36, with conservation of one or both ovaries, found that 43.9 per cent. experienced hot flushes before the age of 40. They state that this percentage was approximately eight times that occurring in a group of women of corresponding ages not operated upon. In another paper (8) they state that the flushes were more common, more severe, and appeared sooner after bilateral than after unilateral oophorectomy, but they think that the surgical menopause was shorter after associated bilateral oophorectomy than after hysterectomy with ovarian conservation.

Polak,[9] in a paper which deals with seventy-three cases which had to be re-operated upon for pathological conditions of conserved ovaries within five years of the primary operation, discusses the end-results of the conserved ovary. He says: "A conserved ovary, if unhealthy, will leave the patient in a worse state mentally, nervously, and physically than if total extirpation had been done." He thinks that when a patient has reached or passed the age at which the menopause should occur, a total ablation gives the best results. Polak agrees that theoretically "the loss of the ovaries means the loss of sex influence to the individual, with all the grave

disturbances in general metabolism which this loss signifies, and the earlier in life the greater the calamity, but practically the patient's well-being may be seriously impaired by routine conservation."

Of the six patients in my series, where one ovary was conserved, one patient operated upon four years ago was 41 at the time (but did not look it). This patient developed menopausal symptoms one year later which lasted for eighteen months, were mild in character, and since then she has been very well. Two patients were operated upon two years ago, and have not had any menopausal symptoms. Of the other three, two were operated upon eighteen months ago, and one is still under a year. None of these has had any menopausal symptoms. These six patients were the youngest in the series, the average age being thirty-three, and the ovaries conserved were not, to the naked eye, pathological. So far none of these patients has developed any pathological symptoms associated with the conserved ovary, and their menopausal symptoms have been absent or mild in degree. In the remaining 116 cases both ovaries were removed at the time of operation, but most of the patients were either at or past the menopause or had pathological ovaries.

TABLE VI—"FOLLOW-UP."
(110 Patients.)

Untraceable	4
Died since operation	5
Replied to questionnaire or interviewed	101

In following up these cases, four objects were in view: (*a*) To ascertain the character and where possible the duration of the surgical menopause, (*b*) the incapacity following the operation, (*c*) whether the cervical stump in cases of subtotal hysterectomy has caused any trouble, and (*d*) the condition of patients operated upon for carcinoma of the body of the uterus.

Of the 110 cases followed up, four were untraceable, leaving 101 who were either seen personally, communicated with by letter or through the patient's own doctor, and five who were found to be dead.

TABLE VII.

Operation for	*Cause of Death*	*Age of Patient at Death*	*Years after Operation*
Fibroid	"Hæmorrhagic enteritis"	44	4
"Fibrosis uteri"	Cardiac and renal disease	53	5
Sarcoma	Cerebral hæmorrhage	68	2½
"Fibrosis uteri"	Coronary thrombosis	56	4
Cancer of uterus	Recurrence	60(?)	1

MENOPAUSAL SYMPTOMS.

This investigation was started with the preconcieved idea that the removal of both ovaries, even in a patient at or about the menopause, led to menopausal symptoms more severe than those of the natural menopause.

Ninety-five of the patients "followed up" had both ovaries removed, and these

are divided into three classes. The menopausal symptom inquired for was "flushing," which is the commonest and most distressing symptom complained of. According to this symptom the cases have been divided into those who have had "severe," "mild," or no flushes.

A case was regarded as "severe" who had flushes of frequent occurrence and lasting over one year; a "mild" case was one where the flushes lasted only for a few months, and were infrequent. The following table gives the figure under these headings :—

TABLE VIII—MENOPAUSAL SYMPTOMS.

(95 cases with removal of both ovaries.)

Severe	*Mild*	*Absent*
33	28	34

It will be seen that sixty-four per cent. of cases had menopausal symptoms, but that in only about thirty-four per cent. were these regarded as being severe. Just under thirty-six per cent of the cases stated that they had no symptoms, i.e., flushes. The highest proportion of cases exhibiting no flushes occurred among a series of private cases. Among the hospital cases the type of patient in whom one would have expected to find most symptoms, i.e., nurses, had none. One patient operated upon at the age of 65 (menopause fifteen years previously) developed flushes, which are still present at the end of two and a half years. Another patient who had severe flushes and headaches before her operation is now completely relieved.

Martindale,[10] in a paper on the artificial menopause, found that 41.9 per cent. of cases where one or both ovaries were conserved at operation had no flushes, but her series where both ovaries were removed was too small to form a comparison.

Murphy and Sessums[7] found that hysterectomy before the age of 40, even when the ovaries were conserved, hastened the menopause. They showed that 53.2 per cent. of cases with conserved ovaries had menopausal symptoms before 40, and that the average time of onset after the operation was 15.7 months.

These figures given above made one rather curious to know what exactly were the figures for the normal menopause under the same headings. For this purpose, "An Investigation of the Menopause in One Thousand Women,"[11] conducted by the Council of the Medical Women's Federation, may be quoted. This investigation showed that the most frequent symptom associated with the menopause was flushing. It also showed that single women are more likely to pass through the menopause easily than married women.

The average number of women, married and single, who pass through the normal menopause without symptoms is 15.8 per cent., but the average for single women is 20.4 per cent. It is also pointed out that the duration of the flushing period is very variable; in the majority it lasted about two years, but some women in the seventies and eighties have never been free from flushing since the menopause.

From these figures and literature one might conclude that flushing, which is the most troublesome feature of the menopause, is less in the artificial than in the natural menopause. As against this conclusion, one has to remember that the

average age for this series was 45½ years, and that therefore some of the patients had already passed the menopause.

One might also find these figures some justification for removal of both ovaries at the time of operation, because even conservation of the ovaries may only delay the onset of symptoms for a period of fifteen months, according to the authorities quoted. The patient therefore has a menopause associated with the removal of the uterus, only to have a second menopause associated with the atrophy of the conserved ovaries, possibly in a relatively short time.

Of the patients operated upon in the past year, it has been found that those who have developed flushes did so within the first month after operation. It is too early to say definitely, but it has been my impression that those patients who have developed moderately severe flushes soon after operation are having a sudden short menopause. Many of these patients have said that at the end of five to six months their flushes were much more infrequent and less severe, and in some cases had disappeared.

INCAPACITY AS A RESULT OF OPERATION.

The incapacity resulting from the operation was estimated by the length of time before a patient was able to resume her usual duties. Taking the average for the 101 patients, this was just over five months. The shortest period was one month after operation (two nurses), and the longest was eighteen months.

This period of five months of incapacity does not, to my mind, really represent the amount of disturbance that occurs as the result of operation in those patients who develop severe menopausal symptoms. In these cases one feels that it is probably ten to twelve months before they really begin to feel quite well again.

TABLE IX—HEALTH FOLLOWING OPERATION.

Good	*Fair*	*Bad*
85	15	1

When inquiring about the general health of these 101 patients since operation, it was found that eighty-five were in excellent health, and it was a very usual thing to hear a patient say that she had not felt so well for years.

Fifteen patients are in "fair health," this being accounted for in the following ways :—

Seven patients can give no reason for not feeling quite well. Some of them have been operated upon under a year, and their ages vary from 44 to 57.

Two patients had previous operations some months before the hysterectomy, for inflammatory conditions, and would naturally have a prolonged convalescence after the second operation.

Two have developed ventral herniæ.

One patient has had two severe attacks of influenza since her operation fifteen months ago, and blames this for not feeling quite well.

One patient was very anæmic and emaciated, and before operation required a blood-transfusion.

One patient was operated upon six years ago for carcinoma of the uterine body, and is now seventy-one years of age. She feels in excellent health, but has got a recurrence in the vagina, which has responded to radium treatment.

One patient who had hyperpiesia before operation is still complaining of headaches.

The patient who complains of bad health was 69 when operated upon for a rapidly growing fibroid. The pathological report showed a fibroid with a low degree of malignancy (sarcoma?), but six months after operation she has a tumour in the lung, although the abdomen is free from metastases.

CERVICAL STUMP.

In forty-six cases of subtotal hysterectomy there were five patients who had some symptoms as the result of leaving the cervix. This was just over ten per cent. of the cases. All the cases complained of slight discharge or vulval irritation as the result of this. So far none of the cases have shown any signs of developing carcinoma of the cervix.

In my series, leaving the cervical stump does not seem to have given rise to any serious symptom, and in most cases the patients might have not referred to any discharge unless asked. There is no doubt, however, that there are serious potentialities associated with the subtotal operation.

CANCER OF THE UTERINE BODY.

There were thirteen cases of cancer of the uterine body and three cases of sarcoma.

	CANCER.—13.	
Died - - -	2	(One untraceable, regarded as dead.)
Alive - - -	11	
Over five years - -	2	(One very well; one with recurrence in vagina, aged 71.)
Over four years - -	2	(Very well.)
Over three years - -	3	(Very well.)
Two years and under	4	(Very well.)
	SARCOMA.—3.	
Dead - - -	1	($2\frac{1}{2}$ years after operation at 68.)
Alive - - -	2	(One with metastasis in lung.)

The two cases of carcinoma alive over five years after operation were both very advanced, but are both very well, although one has a recurrence in the vagina which has responded to radium, and illustrates the importance of keeping in touch with cancer cases after operation, and treating any recurrence immediately. One of the cases operated upon two years ago had a perforation at the fundus of the uterus, due to growth, to which small intestine was adherent; and one was very doubtful about the question of removing the uterus at all. She has never been so well, and last summer was assisting at the harvest!

One case died of cerebral hæmorrhage at 68, two and a half years after operation. Another is very well, one and a half years later, and the third is the case referred to with a metastasis in the lung.

In reading this paper I do not wish the members of this Society to think that I am an opponent of conservative surgery, but I feel on very safe ground in advocating total in preference to subtotal hysterectomy, unless in exceptional circumstances. As Spencer[3] says: "The subtotal hysterectomy is a nineteenth century operation. May there disappear that oppobrium to gynæcology, namely, cancer of the cervix left behind by the subtotal operation."

In suggesting the removal of both ovaries at the time of the hysterectomy, one does not feel on such safe ground, but I still think that it is the best thing to do in women at or past the menopause.

I would also make a plea for keeping in touch with all cases of cancer of the body of the uterus as well as cancer of the cervix. The case of cancer of the cervix is closely followed up, but the case of cancer of the body is liable to be neglected. In view of recent experience, I think that these cases should have more post-operative X-ray and radium than they have been given in the past.

In conclusion, I should like to thank all the doctors who have assisted me in inquiring about these patients, and Professor Lowry for facilities given me for operating in the Royal Victoria Hospital during the years I was on the auxiliary staff, and for permission to use these cases in this paper.

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Intravenous Anæsthesia with Evipan Sodium in Children

By J. C. C. Crawford, M.B., B.CH.
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This short account of evipan sodium anæsthesia is based on the study of fifty dental anæsthetics at the Belfast Hospital for Sick Children.

Evipan sodium is a barbiturate derivative of lengthy formula. The drug injected intravenously produces a general anæsthesia, which is of short duration owing to rapid detoxication by the liver, so lending itself to minor operations and short manipulations. The therapeutic index—the ratio between the minimum therapeutic dose and the minimum lethal dose—is 5, higher than that of any other barbiturate.[1] For example, the figure for veronal is 1.6 and that for nembutal 2.4.

Produced in Germany in 1932, and used there very extenisvely, it was last summer investigated by the Anæsthetics Committee of the Medical Research Council,[2] and reported on favourably. Since then it has attracted much attention, and recently Jarman and Abel[3] have published a report of one thousand cases.

TECHNIQUE.

Before the anæsthetic, a general examination of the patient should be made, and obvious disease of the liver, probably the only contra-indication, eliminated. Preparation of the patient does not demand any premedication or preliminary starvation. A light meal should be taken two or three hours before the anæsthetic. There is, of course, no need for admission to hospital, but it is very desirable that the patient should lie down for an hour after the anæsthetic, before going home.

Though evipan sodium is freely soluble in water, the solution is unstable, and should be used within an hour or two of preparation. The firm of Bayer, which has put the preparation on the market, supplies two ampoules of about 10 c.c. capacity, one containing 1 gm. of evipan sodium in powder form, the other 10.5 c.c. of sterile distilled water. The ampoules are opened, and 10 c.c. of distilled water are aspirated with a record syringe and injected into the ampoule containing evipan sodium; the latter is easily dissolved by aspirating and ejecting a few times, and is then ready for use. With children, at any rate, it is as well that they should see as little of needles and syringes as possible, so that before the patient enters the theatre the solution is prepared.

With the patient on the table and the arm held steady over a small sandbag, the skin of the antecubital fossa is sterilized and the vein made prominent. Here a nurse or other assistant, though probably not essential, is invaluable. With children especially, there devolves on the surgeon at this stage the duty of distracting the patient's attention while the injection is being given. Following the idea originally suggested by Lauber,[4] he persuades the child to count with face averted from the anæsthetist. It is recommended that 1 c.c. of evipan solution be given every fifteen

seconds, and this rate was adhered to in the series under consideration. The needle is introduced and a little bood withdrawn to verify the position of the needle in the lumen of the vein. The solution is then injected at the standard rate.

When the child's counting ceases, usually after 1½ to 2 c.c. have been given, half as much again is injected, if a short operation of, perhaps, two or three minutes is contemplated—or as much again if a longer period is desired. The needle is withdrawn, and a small pad and bandage are applied to prevent leakage if there is any restlessness at a later stage.

It might be pointed out that leakage of evipan sodium round the vein has no tendency to cause trouble. In one of our cases in which a little leakage occurred there was no pain, nor did any swelling or induration develop. In fact, one observer deliberately injected 5 c.c. intramuscularly and 5 c.c. subcutaneously without any ill effects.

During the whole anæsthetic the jaw must be under control and the airway maintained. As with all anæsthetics, coramine and carbon dioxide should be at hand in case of emergency. When the patient begins to come round he can be transferred to another room before going home.

THE SYMPTOMS OBSERVED.

As the evipan sodium was injected the children became drowsy, their counting became laboured and stopped, and they then fell asleep, sometimes with a yawn. During anæsthesia there was in many cases a varying degree of movement of the limbs, and muscular relaxation was rarely sufficient for an abdominal operation. The corneal and conjunctival reflexes disappeared, while the pupils remained active and moderately dilated. The blood-pressure was taken in four cases, and was found to fall on an average 20 mm. Hg. Twitchings and jacitations, in contrast to other reports, were rarely observed. When injection was completed the jaw had usually become quite lax, and it remained so. In no case among the fifty did the heart or respiration give rise to any anxiety, nor was there ever any obstruction of the airway or cyanosis. These should, nevertheless, always be carefully watched for. The children woke gradually and lay drowsily, perhaps crying a little, and were usually only fully awake after fifteen minutes or longer. Questioned afterwards, they could remember nothing after the prick of the needle. In one case only was there post-anæsthetic vomiting.

DOSAGE.

In children of six to twelve years the total dose was usually 2½ to 3 c.c., and for those aged four and five 2 c.c. But in all cases the rapidity with which counting stopped as the injection proceeded dictated the amount needed. At first the age of six was fixed on as the lower age limit in the investigation, since little has been published regarding evipan sodium in childhood. Later, children as young as four were anæsthetized, and with all of these the anæsthesia was

satisfactory and free of anxiety. Klages,[5] indeed, has used evipan sodium for children as young as 5½ months. The children under six comprised in our series twenty per cent. of all the cases.

In adults, doses are, of course, larger. An average dose of 6 or 7 c.c. usually gives fifteen minutes anæsthesia, while 10 c.c. should be exceeded with caution. The build of the patient should be taken into account, and, as with children, it is useful for the patient to count. The amount given when counting ceases is noted, and with adults as much again, or for the longer anæsthetics up to twice as much again, is given. Smaller doses are need for anæmic, pyrexial, and seriously ill patients and for the elderly and feeble. In the latter there is a tendency to weakened respiration, which must be watched.

CONCLUSIONS.

Evipan sodium is pre-eminently suited to minor surgical procedures which will not last more than twenty minutes, though there seems no reason why repeated injections cannot be used to prolong anæsthesia for as long as two hours.[3] In the gynæcological field, for simple curettage it is very satisfactory, and it seems to be very safe where short operations are necessary in the gravely ill, e.g., rib-resection for empyema, or in the presence of heart disease.

The children in this series were less disturbed than by the ordinary ethyl chloride method. The prick of the needle as it went in hardly upset one of them, and fully half did not even hesitate in their counting as the needle went through the skin. Very few cried at all. Compare with this the experience, terrifying for a child, of nitrous oxide or ethyl chloride inhalation. The prick of the needle was nearly always the last thing remembered. In only one case was there post-operative vomiting, and none gave the anæsthetist any anxious moments.

The only contra-indication seems to be disease of the liver, but evipan sodium is also unsuitable for abdominal work, since one cannot depend on full muscular relaxation. It should never be administered single-handed, nor should the patient be left alone to recover. Detoxication is so rapid that the effects of an overdose soon pass off if the respiration and circulation can be kept going for a few minutes.[6]

I must express my indebtedness to Mr. J. C. McNeill, honorary dental surgeon to the Belfast Hospital for Sick Children, for his help and co-operation in this investigation.

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Sodium Soneryl as a Pre-Anæsthetic Basal Narcotic

SOME OBSERVATIONS ON ONE HUNDRED AND NINE CASES

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Assistant Surgeon, Mater Infirmorum Hospital, Belfast

SODIUM soneryl, the sodium salt of butyl ethyl barbituric acid, is one of the least toxic of the barbiturates. In the series of cases under consideration, consisting of routine general surgical cases, it has, on the whole, given excellent results. Larger doses are tolerated than in the case of most of the other barbiturates, and the ratio between the medicinal and the lethal dose is high.

After a certain amount of experimental work with smaller doses on a number of cases, the results not being entirely satisfactory, it was decided to adopt the dosage recommended by Birdsell (*B.M.J.*, 26th May, 1933) for this series.

The routine adopted was as follows :—

The patient was given one capsule (.15 grm.) by mouth the night before operation. This ensured a good night's sleep.

One hour before the operation the drug was again administered by mouth in capsule form, the amount being proportionate to the body-weight.

Children received .3 grm. (two capsules), followed by .15 grm. (one capsule) if not asleep within half an hour.

Adults under ten stone received .6 grm. (four capsules).

Adults of ten to twelve stone received .75 grm. (five capsules).

Adults of over twelve stone received .9 grm. (six capsules).

A hypodermic injection of atropine sulphate was given in all cases twenty minutes before operation.

Anæsthesia was induced by chloroform and ether mixture, followed by open ether.

It was found that the age factor had an important bearing on the dosage of sodium soneryl. Elderly patients, and particularly elderly patients of frail physique, required a smaller dose than that indicated for their body-weight. One case in the series is an excellent illustration of this point. The patient was a man of 66 years about to have a cystostomy performed for a large urinary calculus. He was only given two capsules (.3 grm.) on the morning of the operation, but came to the theatre sound asleep. In the afternoon he felt perfectly comfortable, and inquired when his operation was to be performed. He was an ideal case with complete amnesia, no post-operative vomiting or restlessness, and obviously had received the correct dose.

In contra-distinction, another case is instructive.

A young girl of 18, with tuberculous adenitis of the neck, through an error of the nursing staff was given only .3 grm. (two capsules) on the morning of the operation, and she came to the table somewhat drowsy but aware of her surroundings. After the operation she had a clear recollection of events leading up to it, and had a moderate amount of vomiting. In general, it might be said that she presented

rather the picture of a case who had received no premedication. Her correct dose should have been .6 grm. (four capsules).

As regards anæsthesia, it was found that induction was a little slower than without premedication. This is presumably due to the depressant action of sodium soneryl on the respiratory centre. The actual amount of ether used during the operation was found to be less than the amount used on cases who had not received such premedication. The more experienced the anæsthetist the more obvious was the difference. It was also found that the pre-operative injection of atropine was most essential.

One of the greatest advantages of this premedication is that the patient, as a rule, arrives in the operating-theatre either asleep or drowsily content. All nervous apprehension has disappeared, and the boon that this must be to the average patient can probably only be appreciated by those who experienced the ordeal before the advent of premedication. Many of the patients of this series were partially awakened, some wholly so, when they were lifted from the trolley on to the operating-table, but they either dropped off to sleep again at once or remained awake, but sufficiently bemused to have no interest in their surroundings. All, with one exception, were entirely devoid of any feeling of apprehension. The solitary exception was a child of 10, who, in spite of .45 grm. (three capsules) on the morning of the operation, came to the theatre wide awake, frightened and struggling. Almost all the patients, with the exception of this child, when interrogated afterwards, had complete amnesia lasting from a short time after taking the capsules until they regained complete consciousness after the operation. A few seemed to have a vague recollection of some trivial incident, but even these patients (and, of course, all those whose amnesia was complete), did not experience any nervousness or fear.

Another very marked feature was the great reduction in cases of post-anæsthetic vomiting, which is such a distressing feature following many inhalation anæsthetics. Vomiting occured in eleven cases, but was very slight in all but four. In these four, there seemed to be evidence that one could assign the vomiting to a definite cause. The first was the case already mentioned, who had received an inadequate dose. The second case was interesting, in that she appears twice in this series. At her first operation (radical breast) she could have been cited as a perfect case from the premedication aspect. At her second operation (removal of tumour of scalp), through a misunderstanding she had no injection of atropine, and consequently secreted a great deal of saliva and mucus during anæsthesia, as a result of which she had vomiting after her operation, and did not feel nearly so comfortable as after her first operation, which had been more severe and more prolonged. The third case was one of cholecystectomy, who vomited for thirty-six hours following operation; this patient was probably not a very suitable case for sodium soneryl, owing to liver insufficiency. Other cases of cholecystectomy in this series had no post-operative vomiting. The fourth case was a girl who appeared to have an intolerance for ether, and finally had pure chloroform, the anæsthetic being an unsatisfactory one all through. The remaining seven cases had only very slight vomiting, generally a few mouthfuls of mucus.

Post-operative restlessness occurred in nine cases in the series. The patients

became noisy and, in extreme cases, violent during recovery from the anæsthetic. It was found that this could be adequately and easily controlled by an injection of one-sixth grain of morphia. This percentage appears to agree with the observations of others. The patient likely to exhibit these symptoms seemed to be the neurotic, highly-strung type, but this was not an infallible rule.

A fair proportion of emergency operations occurred during the period when these cases were being collected. When time permitted, the appropriate dose of sodium soneryl was given an hour beforehand, with an injection of atropine twenty minutes before operation. Most of these operations were for acute appendicitis and perforated peptic ulcers. The results in these cases, however, while not unsatisfactory, were not so good as in the ordinary operation cases, presumably owing to the patients' pain and great mental disturbance; accordingly, the procedure was abandoned in favour of the time-honoured morphia.

In eight cases of the series no inhalation anæsthetic was used. Three were cystoscopies in neurotic young women, and the appropriate dose of sodium soneryl was the only narcotic used. It proved very satisfactory in these cases, the patients exhibiting no embarrassment or nervousness, and having only a hazy remembrance of their experiences. In five cases the anæsthetic was local infiltration by novocaine or planocaine, and the results were excellent, the patients remaining asleep or drowsy during the operative procedure, so providing undisturbed access. The operations in these cases were two of skin-grafting for burns, by the Dickson-Wright method, in very young children; open drainage of a lung abscess; closed drainage of an acute empyema in a very nervous child of four years of age; and excision of a fibro-adenoma of the breast in a nervous, neurotic woman.

The main contra-indications to the use of this drug would appear to be liver impairment, renal insufficiency, extreme old age, very great debility, and pulmonary conditions such as bronchitis, emphysema, and congestion. Most cases coming under these headings were excluded from this series, with the exception of the gall-bladder case already mentioned, and a few cases of minor degrees of bronchitis. Speaking generally, it may be said that there are very few real contra-indications, and that the drug appears to be remarkably safe. There is, apparently, a wide gap between the effective medicinal dose and the lethal dose, as previously mentioned.

In conclusion, speaking from the point of view of the general surgeon whose daily task it is to point out the necessity for operation to patients, and to endeavour to allay their fears regarding such, it is obvious that when the public begin to realize how many of the horrors attendant on operations may be banished by premedication, this part, at least, of the surgeon's duty will become easier. In addition, it will be noted that his post-operative visits to patients are, as a rule, simplified, and made altogether much easier by having to deal with a contented patient who remembers little or nothing of the operation, and is not tortured with post-anæsthetic vomiting. Further, cases that have no prolonged post-operative vomiting make a quicker recovery, which from a hospital point of view means a saving of beds, and from a patient's point of view often a saving of money. Clearly also in certain border-line cases, where every detail counts, the difference between vomiting and not vomiting may mean the difference between life and death.

CASE REPORTS

THREE CASES OF HODGKIN'S DISEASE

By J. A. FISHER, M.B., B.Ch., *from the Royal Victoria Hospital, Belfast.*

THE following cases are reported, as they provide interesting examples of the varying manifestations of this disease.

CASE 1.

In 1930 the patient, a male aged 36 years, began to be troubled with itching of the skin. This was the first symptom of a departure from his normal good health. The itching affected both groins, axillæ, and sides of chest. It lasted until 1932, approximately eighteen months. The patient then began to be troubled with considerable sweating, especially at night, and with weakness and loss of weight.

In June, 1933, the patient was admitted to a hospital in Ontario, and while there some glands were found to be enlarged in the groin. A biopsy was performed, and the patient informed that he had Hodgkin's disease.

In January, 1934, he was admitted to ward 2, Royal Victoria Hospital. Clinically, there was a typical picture of Hodgkin's disease. The enlarged glands were present in both groins, axillæ, and supraclavicular fossæ. The spleen was enlarged. There was slight irregular pyrexia. On 31st January, 1934, patient complained of itching of his legs, and a blood examination showed an eosinophilia of ten per cent. A few weeks previous to this, a blood examination showed secondary anæmia, relative moderate lymphocytosis, but no eosinophilia.

In January, 1934, a biopsy was performed. Dr. Davis examined the excised gland, and confirmed the diagnosis of Hodgkin's disease by microscopy and by Gordon's biological test.

The interesting points about this case are :—

(1) The onset of itching of the skin for eighteen months before any other symptoms appeared.

(2) The areas affected by the itching were approximately the areas where the enlarged glands first showed themselves.

(3) During a recurrence of the itching, there was a blood eosinophilia of ten per cent.

Itching of the skin is not an uncommon first symptom in Hodgkin's disease. Ewing mentions that the itching bears considerable relation to the subsequent course of the lymph-node lesions.

CASE 2.

The patient, a female aged 30 years, showed the first signs of Hodgkin's disease in November, 1931, immediately after the birth of a child. Enlarged glands appeared as the first signs of the disease, and appeared first in the right axilla, then in the left side of the neck and left breast.

Soon after the onset, there developed a mass—about two inches by one inch—beneath the third and fourth left costal cartilages. At about this time, the patient complained of severe pains in both arms, around the waist, and in the chest. These pains lasted a few weeks.

In October, 1933, the patient began to have severe root pains, which suggested a lesion in the upper dorsal region. X-ray examination showed collapse of the body of the fourth dorsal vertebra and great enlargement of the mediastinal shadow. At this period there were no signs of a paraplegia; there was marked dyspnœa, and shortly afterwards many new glands appeared on the anterior chest wall. In December, 1933, a spastic paraplegia made its appearance and gradually increased. The patient died a few weeks later. The diagnosis of Hodgkin's disease was confirmed by a biopsy in June, 1932.

The post-mortem examination showed many masses of Hodgkin tissue throughout the body—superficial groups of lymph-glands, liver, spleen, kidneys. There was a very large mass of Hodgkin tissue in the mediastinum, which appeared to be infiltrating the upper dorsal vertebræ. Dr. Davis performed Gordon's biological test with post-mortem lymph-gland material, and obtained a positive result.

This case is of interest owing to the infiltration of the vertebræ by the Hodgkin tissue, resulting in a collapse of one of the vertebræ. The clinical course of the disease suggests a major involvement of the mediastinum from an early stage. In most cases where the chief lesion is in the form of mediastinal tumours, it is said that local invasive properties are pronounced.

CASE 3.

The patient was a female aged 26 years. The onset of the disease was in 1930, with breathlessness on moderate exertion, weakness, and loss of weight. There was a group of enlarged glands in the right side of the neck.

In 1933 the patient began to be troubled with weakness of the legs and retention. She was admitted to ward 1, Royal Victoria Hospital, in December, 1933. A typical picture of Hodgkin's disease was found. There were numerous groups of enlarged glands in the neck, axillæ, groins, and delto-pectoral regions. There was a spastic paraplegia, with a zone of hyperæsthesia along the second and third ribs and the adjoining interspaces, and there was incontinence. The spinal column appeared normal, both clinically and on X-ray examination. The diagnosis of Hodgkin's disease was confirmed by biopsy.

In this case, the Hodgkin tissue apparently involved the spinal cord to a degree sufficient to cause a complete spastic paraplegia without any clinical or X-ray signs of involvement of the vertebræ. It provides a contrast with case 2, in which there was involvement of the vertebræ to a degree sufficient to cause collapse of one of them before signs of a paraplegia appeared.

I should like to thank Professor W. W. D. Thomson for permission to publish these cases.

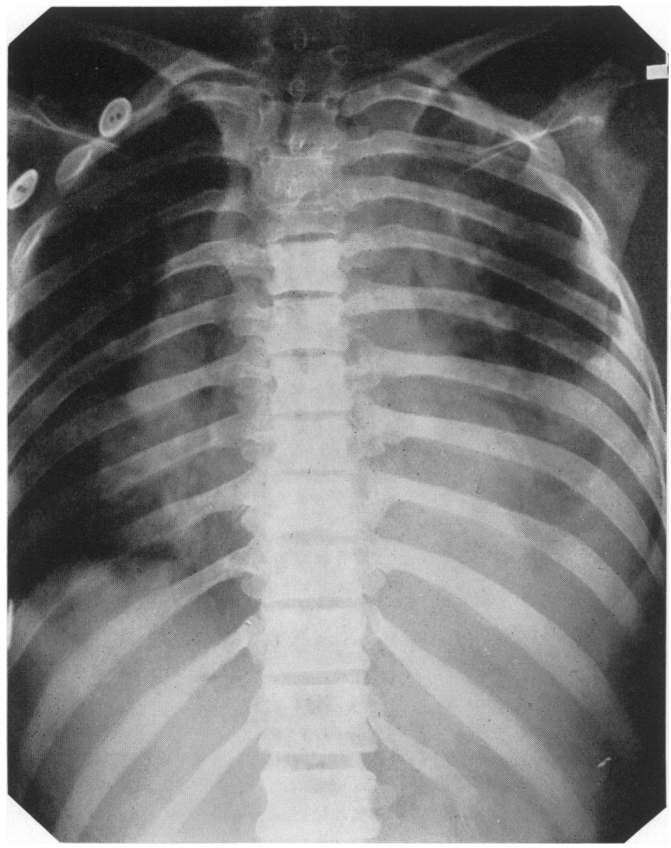

FIG. 1.

Radiogram of Case 2, showing collapse of fourth dorsal vertebra.

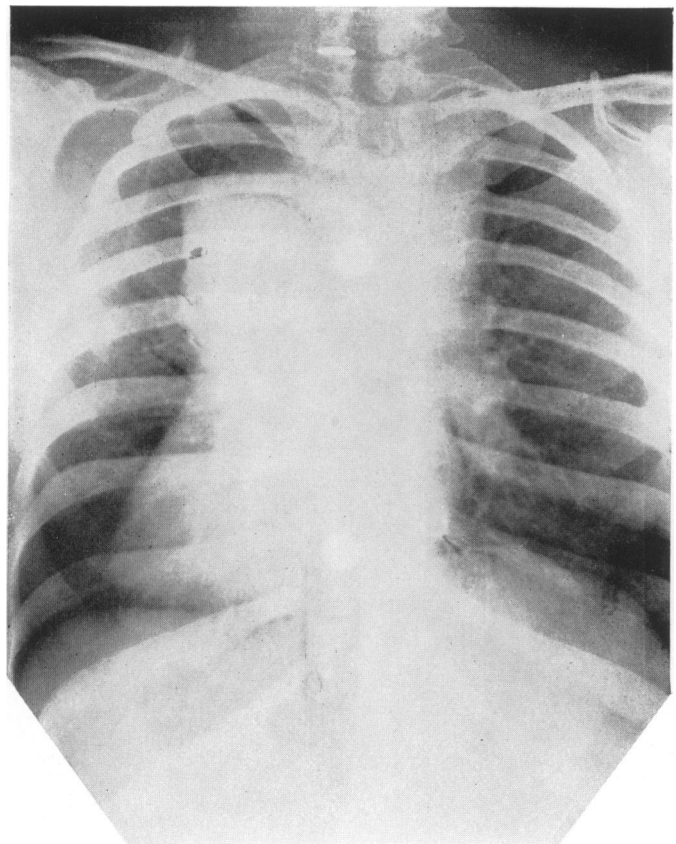

FIG. 2.

Radiogram of Case 2, showing greatly enlarged mediastinal shadow.

A CASE OF CAUSALGIA OF TWELVE YEARS' DURATION CURED BY A UNILATERAL CERVICO-THORACIC SYMPATHECTOMY

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ALTHOUGH papers on the surgery of the sympathetic system have appeared in astonishing numbers in the various journals recently, I offer no apology for reporting another case cured by sympathetic surgery, because I believe this case to be unique in the length of time the patient had been suffering from causalgia.

Sarah E., aged 30, was shot through the lower third of the forearm by a sniper's bullet during the disturbances in Belfast in 1921. She was admitted to the Mater Infirmorum Hospital on the same day (July, 1921). The bullet had entered obliquely, grazed the median nerve, fractured the radius, and come out on the dorsal surface of the forearm. The wound was excised, the fracture splinted, and the patient was detained in hospital for three weeks. She afterwards attended the out-patient department for dressing, her wounds being completely healed in a few weeks.

Some months later she returned, complaining that she could not use her hand owing to pain radiating down to the fingers and to great tenderness of the scar. She was ordered massage, radiant heat, and diathermy, but the pain and disability continued in spite of these measures.

In 1923 she was taken into hospital again. The scar on the anterior aspect of the forearm was excised, the median nerve was exposed, and a piece of fascia wrapped round it.

In 1925 a periarterial sympathectomy was performed. There was improvement for a few months following this operation, but eventually the pain and tenderness returned. She was again relegated to the massage department for radiant heat and diathermy.

She was then lost sight of for four years until September, 1933, when she again presented herself. The hand was now blue and cold, the skin atrophic and shiny. The scar was so sensitive that the merest touch caused her to shudder with pain. She was completely incapacitated, and begged that something be done to relieve her.

In November, 1933, a unilateral cervico-thoracic sympathectomy was performed by the Adson posterior approach. Entrance was made through the second rib, one inch of which and part of the transverse process of the second thoracic vertebra being resected. The stellate ganglion and its connections were resected. The operation was comparatively easy, the hand becoming warm, pink, and dry, all

pain and tenderness disappearing, and within a fortnight the skin had lost its atrophic appearance.

On examination in April, 1934, the healthy, comfortable condition was found to be maintained, and the patient could do her work.

I wish to thank Mr. J. J. Moriarty of the surgical staff of the Mater Infirmorum Hospital, who assisted me at the operation; also Dr. Dickson Boyd of the Anatomical Department of Queen's University, Belfast, for demonstrating to me the anatomical approach to the ganglion on the cadaver.

REFERENCE.

ADSON, A. W., "Cervico-thoracic Ganglionectomy, Trunk Resection, and Ramisectomy by the Posterior Intrathoracic Approach," *American Journal of Surgery*, 1931, February.

Megaloureter in the New-Born

By RICHARD H. HUNTER, M.D., M.CH., PH.D., M.R.I.A.

from the Department of Anatomy, Queen's University, Belfast

MEGALOURETER, or congenital enlargement of the ureter in the absence of any organic obstruction, is said to be an uncommon condition. Cockayne[1] described three cases of it, one in a child of two years, one in a child of seven years, and one in a girl of fifteen years; Caulk[2] described a case in a woman of thirty-two years of age; Bachrach[3] described a case in a woman of twenty-seven years, and Hurst and Gaymer-Jones[4] a case in a woman of thirty-three years. These few cases are the only ones I can find in the literature. Braagsch[5], in his monograph on "The Practice of Urology," makes no mention of it.

The condition would thus appear to be a most uncommon one, and three cases of it which I have found, post-mortem, in newborn infants appear to me worthy of report. One of these cases occurred in a female anencephalic infant of full term, one occurred in a female stillborn infant which had a spina bifida, and one case occurred in a female stillborn infant of full term in which I could find no anomaly of development apart from the megaloureters. In these three cases the condition was bilateral, and in each case the naked-eye, as well as the microscopic, appearances were closely similar. The following description is therefore based on a study of the ureters obtained from the apparently normal stillborn infant.

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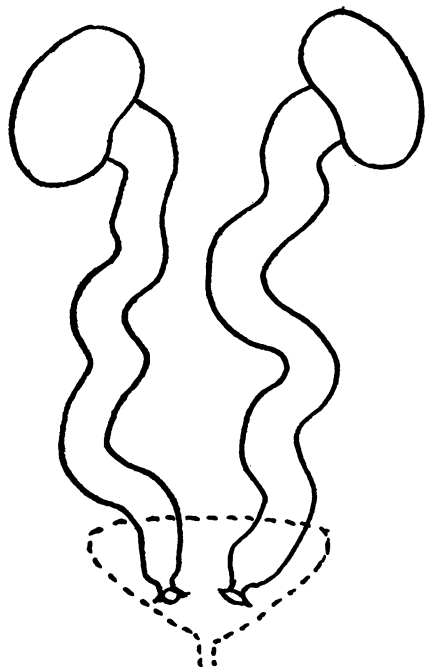

Megaloureters in a newborn infant of full term. The bladder is indicated by dotted lines.

Each ureter descended, from the renal pelvis over the psoas muscle and pelvic brim, in a markedly tortuous course to its termination in the bladder wall. Its transverse diameter gave an average measurement of 15 mm., which is more than four times that of the normal ureter of a newborn infant. At its termination, 5 mm. from the bladder wall, the dilated ureter converged suddenly to a narrow tube. This narrow portion, together with the adjacent part of the bladder, was embedded in paraffin wax, and cut serially in sections of ten microns thickness. A study of these sections, after staining, showed the lumen in this narrow part of the ureter to be patient throughout its course, and to communicate with the bladder cavity by a patulous uretral opening at the upper and outer angle of the trigone. No obstruction of any kind could be detected between the dilated part of the ureter and its opening, and there was no hypertrophy of the bladder wall.

Sections of the dilated part of the ureter from one side were cut in a transverse plane, and from the other side they were cut in a longitudinal direction, and alternate sections were stained with hæmatoxylin, and with Mallory's triple connective tissue stain. These sections showed that a mild degree of hypertrophy of the muscle wall of the ureter was present with a great increase in the amount of connective tissue. But whether the increase of connective tissue was a primary condition or a secondary change from hypertrophied muscle, of an analogous nature

to that which occurs in hypertrophied cardiac muscle and in blood-vessels, is a question which cannot be satisfactorily answered. In the sections there is nothing which could be interpreted as offering support to either possibility. There was also a flattening of the epithelial lining of the ureter, with absence of its usual folding, and there was a rich supply of markedly congested blood-vessels. No changes suggestive of inflammatory reaction were detected. Careful search was made for nerve-cells between the muscle layers, and between the muscle and epithelial layers, but no trace of such cells could be found.

Discussion.—The condition of megaloureter would appear to be an analogous one to that of megalocolon, and other congenital enlargements of the intestinal tube, e.g., megaloduodenum, megalojejunum, etc.[6] But unfortunately little is known of the factors involved in these conditions, and what is known is of little help in the study of megaloureter. It has been suggested that the megalocolon is a primary unconditioned dilatation of the gut, developed in response to an attempt to overcome an obstruction to the free passage of the intestinal contents. But in the cases of megaloureter just described, this explanation is not acceptable, as no obstruction of any kind was found that could have prevented the free flow of urine along the ureter in any part of its course, or to its flow from the ureter to the bladder, or from bladder to the exterior.

Another suggestion is that in megalocolon there may be an inco-ordination between the sympathetic and the para-sympathetic nerves passing to the part. This suggestion has been advanced as the etiological factor in such cases by Illingworth and Dick.[7] It is true that dilatation of the colon has been produced experimentally by Adamson and Aird,[8] after section of the sympathetic nerves passing to the large intestine, but as far as I am aware, the condition of megaloureter has never been produced by similar experimental means. It should be remembered, however, that these experiments of Adamson and Aird were performed on *adult* cats, and the conditions were therefore quite different from those which obtain during the differentiation and development of specific structures during embryonic life, and there is no proof that nervous impulses, either of sympathetic or para-sympathetic origin, are necessary for normal development and growth. On the other hand, the experiments performed by Abel[9] seem to make it clear that the development of muscle progresses normally in the absence of nervous impulses. And it has recently been shown by Tower[10] that the influence of the sympathetic nervous system is not an essential factor for the growth of muscle in kittens.

Another suggestion is that megalocolon is the result of some congenital defect of the neuro-muscular mechanism of a similar nature to that said by Hurst[4] to exist in cases of achalasia of the cardiac sphincter with dilatation of the œsophagus. So many facts have been assembled in opposition to this view, that it can hardly be seriously considered as a causative factor in the cases of megaloureter here described. And in addition, all three cases showed a wide patulous uretral opening into the bladder. The possibility of a "sphincter which has failed to relax" is thus ruled out from the limits of probability.

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4. HURST., A. F., and GAYMER-JONES, J., 1931, *Brit. Jour. of Urology*, Vol. 2, p. 43.
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9. ABEL, W., 1912, *Jour. of Anat.*, Vol. 47, p. 47.
10. TOWER, S. S., Annual Report of the Director of the Department of Embryology, Carnegie Institute of Washington, 1932, p. 16.

ULSTER MEDICAL SOCIETY

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The annual general meeting of the Society was held on Thursday, 24th May, at 5.30 p.m. After routine business, the following office-bearers were elected for the session 1934-5 :—

President, S. R. Hunter, M.D.; vice-presidents, Rowland Hill, B.A., M.D., M.R.C.P.Lond., F.R.C.S.Edin., and John McCloy, M.D., D.P.H.; hon. treasurer, C. A. Calvert, M.B., F.R.C.S.I.; hon. secretary, F. P. Montgomery, M.B., D.M.R.E.Cantab.; hon. librarian, T. A. Kean, M.D.; hon. editorial secretary, H. H. Stewart, M.D., M.R.C.P.Lond.; hon. editor of Journal, R. H. Hunter, M.D., M.Ch., Ph.D., M.R.I.A.

Hon. Editorial Board: P. T. Crymble, M.B., F.R.C.S.Eng.; R. J. Johnstone, M.P., B.A., M.B., F.R.C.S.Eng.; H. J. Ritchie, M.B., L.A.H.Dub.; W. W. D. Thomson, B.A., B.Sc., M.D., D.P.H., M.R.C.P.Lond.

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University Square, Belfast.

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J. A. SMYTH, *Hon. Secretary.*

University Square, Belfast.

BRITISH MEDICAL ASSOCIATION
BELFAST DIVISION

THE fifth meeting of the session was held on 22nd March. As a change from the reading of a paper, two medical cinematograph films were shown, entitled "Typical Gaits" and "Treatment of Chronic Ulcers of the Leg." The latter film showed excellently the technique of varicose vein injection and of elastoplastic bandage application, while another section depicted methods of skin-grafting large ulcers.

On 10th May the annual meeting of the Division was held. Dr. S. J. Killen was elected chairman, and Dr. S. B. Boyd Campbell vice-president. The hon. secretary and hon. treasurer and representatives and deputy-representatives to the annual representative meeting were re-elected, as were the remaining members of the committee. In addition, Dr. James Boyd and Dr. F. M. B. Allen were elected to the committee.

The divisional model rules of organization, with the additions suggested, were adapted by the meeting; and a proposal introduced by Dr. Armstrong, that the Association be asked to hold an annual meeting in Belfast at an early date, received the approval and support of the meeting.

J. C. C. CRAWFORD, *Hon. Secretary.*

360 Lisburn Road, Belfast.

BRITISH MEDICAL ASSOCIATION
TYRONE DIVISION

THE annual meeting of the Tyrone Division of the British Medical Association was held in the Tyrone County Hospital, Omagh, on Thursday, 3rd May, 1934, at 4.30 p.m. Those present were Doctors McAllister (chairman), Eaton, Lyle (W.), Lagan, Leary, Murnaghan, McVicker, Warnock, Lyle (L. A.), and Martin (secretary).

The above members were entertained to tea by the matron of the hospital, and after tea, the election of office-bearers for the year 1934-5 resulted as follows :—

Hon. secretary, Dr. Martin; hon. treasurer, Dr. Gillespie; chairman, Dr. Leary; vice-chairman, Dr. Lagan; representative on Branch Council, Dr. W. Lyle; representative on Representative Body, Dr. W. Lyle; executive committee, Dr. McAllister, Dr. Murnaghan, Dr. Spence, Dr. Warnock, together with the chairman, vice-chairman, hon. treasurer, hon. secretary, and representative on the Branch Council.

Dr. W. Lyle proposed a vote of condolence with Mrs. Stevenson, Strabane, on the death of her husband, and also with Miss Hamilton of Dromore, on the death

of her brother. Both these doctors were very valued members of the Tyrone Division in the past, and it required no words from him to emphasize the great loss sustained by the medical profession in the deaths of Doctors Stevenson and Hamilton. This was seconded by Dr. Warnock, and passed in silence, the secretary being instructed to write to Mrs. Stevenson and Miss Hamilton.

Dr. Lagan proposed—That we, the members of the Tyrone Division of the British Medical Association, desire that the Branch make representation to the Government of Northern Ireland with a view to the restoration of the ten per cent. cut, or failing that, should keep in step with the Imperial Government in restoring half the cut.

This was seconded by Dr. Gillespie, and passed unanimously, and the secretary was instructed to forward same to the Branch, and also send a copy to the Belfast Division, urging them to have this matter discussed at their next meeting.

JOHN R. MARTIN, *Hon. Secretary.*

Holmedene, Clougher, Co. Tyrone.

BRITISH MEDICAL ASSOCIATION
NORTH-EAST ULSTER DIVISION

THE Division met in The Café, Coleraine, on Friday, 30th April. The chairman, Dr. Evans, presided over a good attendance of members. After routine business, Mr. H. C. Lowry, F.R.C.S., read a paper on "Sedatives in Labour." At the end of his paper Mr. Lowry answered several questions, and the best thanks of the meeting were expressed to him for his most interesting and practical paper. Dr. Huey kindly provided tea before the meeting.

The third annual dinner of the Division was held at the Causeway Hotel on 22nd March. Over seventy members and guests were present. After the toast of The King, Sir Dawson Bates proposed the health of the British Medical Association, and Dr. Huey responded. Dr. Bateman proposed the toast of The Guests, to which Alderman D. Hall Christie, M.P., and Mr. S. Wray replied. The chairman's health was proposed by Dr. Sloan Bolton, and Dr. Evans replied.

During the evening songs were given by Mr. Hugh Carson, Mr. A. Belford, B.L., and Doctors Allison and T. Adams. Mr. A. J. W. Christie delighted the company with solos on the ocarina. After the dinner the chairman presented to the honorary secretary, Dr. J. M. Hunter, on behalf of the members, a beautiful silver salver engraved with the signatures of all the active members, and a cigarette case.

The Division met in the Café, Coleraine, on Friday, 11th May. The chairman, Dr. W. F. Evans, presided, and there was a good attendance. It was decided to hold the annual golf meeting at Portrush on Thursday, 21st June.

Dr. F. F. Kane, Purdysburn Fever Hospital, read a paper on "The Diagnosis and Treatment of Common Infectious Fevers." The paper was greatly appreciated, and many members took part in the subsequent discussion. A hearty vote of thanks was passed to Dr. Kane for his very useful paper.

Dr. C. O. S. Blyth Brooke kindly provided tea.

J. M. HUNTER, *Hon. Secretary.*

36 Eglinton Terrace, Portrush.

LISBURN AND DISTRICT MEDICAL GUILD

THE March meeting was held at Dr. W. R. Hunter's of Crumlin. In the absence of the president, Dr. Hunter occupied the chair. Dr. F. P. Montgomery gave an address on "Common Bone Diseases in Relation to X-ray Photography." He said that the two main features of bone diseases are destruction, and formation of new bone. He showed a beautiful collection of X-ray pictures to illustrate his remarks. He discussed osteomyelitis, and the almost as common condition of tuberculosis of bone. These two conditions, he said, were difficult to distinguish radiologically. He also discussed sacro-iliac lesions, Charco's elbow and knee. Tumours were then considered from their radiological aspects, and then achondroplasia and delayed ossification. He stated in the course of his remarks that slipped epiphyses are difficult to differentiate from tuberculous joints, but that osteo-arthritis and rheumatoid arthritis could be distinguished by the fact that in the latter there is decalcification present.

During the discussion which followed it was mentioned that in cases of breast carcinoma the bones and lungs should be screened, as secondaries are very common after breast tumours. Also that sarcomata of the humerus, with or without pathological fracture, are becoming commoner in children under twelve years of age.

Dr. W. R. Hunter and Dr. West then expressed the thanks of the meeting to Dr. Montgomery for his interesting and valuable address.

J. W. PEATT, *Hon. Secretary.*

14 Railway Street, Lisburn.

BOOK REVIEWS

BLOOD DISEASES IN GENERAL PRACTICE. By A. Piney, M.D., M.R.C.P. London: John Bale, Sons & Danielsson, Ltd. 1934. pp. 92. Price 2s. 6d. net.

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The book can be thoroughly recommended to the busy practitioner who can only afford the minimum time to refresh his memory of blood diseases.

—H. H. S.

VITAL CARDIOLOGY. By Bruce Williamson, M.D. Edinburgh: E. & S. Livingstone. 1934. pp. 337. Price 15s. net.

THIS attractively produced book presents a study of the heart and circulation from a different aspect from that from which one is accustomed to see the subject approached. The author applies physiological and mechanized principles to his study of heart failure and its prevention. He has come to the conclusion that there is need for a new outlook on cardiology which deals primarily with the two essentials of rate and force.

Part one of the book deals with the broad principles of this rate and force theory, and any statements made are usually followed up by a logical argument. One, however, is not impressed by such statements as "The heart has no intelligence." Surely there must be a more scientific explanation of the tachycardia of heart failure than this!

Part two of the book deals with the individual conditions met with in heart cases. Tachycardia is discussed, and several original and useful tests for its significance are suggested. In the other chapters a good deal of controversial matter appears; for example, few would admit that resting the rheumatic heart favours the production of mitral stenosis on the principle that fibrosis follows in any part of the body immobilized; or again, there are few who would take the author's advice and encourage exercise in a child stricken with a rheumatic heart, even though it was quiescent, in the hope that the myocardium would hypertrophy and prevent mitral stenosis.

The last two parts in this volume are devoted to "Symptoms" and "Treatment" respectively, and they show the author to be a keen and accurate clinical observer.

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and not only is it of value to the pregnant woman, but its study by recently qualified medical men would be of great advantage in the conduct of the minor maladies and incidents of childbirth, which unfortunately do not receive the attention they deserve in most medical schools.

—W. S. C.

AN INTRODUCTION TO PRACTICAL BACTERIOLOGY. By T. J. Mackie, M.D., D.P.H., and J. E. McCartney, M.D., D.Sc. 1934. Edinburgh: E. & S. Livingstone. pp. 504. Price 12s. 6d.

THE first edition of this book appeared in 1925. That the present volume is the fourth edition may be taken as a gauge of its usefulness and of the determination of its authors to keep it up to date. Unlike many other scientific volumes, it can with truth be described as a handbook. The matter contained in it is divided into three parts.

Part I is introductory. It deals with the general biology of bacteria and with immunity in relation to practical bacteriology. Here the essential information is given briefly, clearly, and concisely. It affords the student a bird's-eye view of the subject, making it easier for him presently to tackle immunology in fuller detail.

Part II consists of the methods of bacteriological technique, and its contents are of value both to the laboratory worker and the advanced student. A surprising amount of information is available which would otherwise have to be obtained from various and probably obscure sources. The recipes for media-making are comprehensive and varied, and the methods well arranged. They include, among others, Wilson and Blair's medium for the isolation of the bacillus typhosus and McLeod's medium for the isolation of diphtheria. The staining methods given are also up to date, as is shown by the presence of Castaneda's stain for rickettsia and for inclusion bodies in virus infections.

Part III deals systematically with the pathogenic and commensal micro-organisms as well as the bacterial diagnosis of the various infections. It includes a chapter on the filterable viruses, which has been enlarged and rewritten. This now forms a useful summary of the knowledge concerning these infective agents and the diseases caused by them.

The book can be specially recommended to any student or other person beginning work in a bacteriological laboratory.

—E. O. B.

ROYAL MEDICAL BENEVOLENT FUND SOCIETY OF IRELAND

THE Managing Committee of the Royal Medical Benevolent Fund Society of Ireland acknowledge with thanks the receipt of £250, a legacy bequeathed by the late Sir William Whitla of Belfast. The terms of the bequest are, that this sum be invested and the income of same applied to medical men in Belfast, or their wives and orphans in Northern Ireland. The late Sir William Whitla was a keen supporter of medical charities, and this legacy is a typical example of his generosity.

and not only is it of value to the pregnant woman, but its study by recently qualified medical men would be of great advantage in the conduct of the minor maladies and incidents of childbirth, which unfortunately do not receive the attention they deserve in most medical schools.

—W. S. C.

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