detached from the periosteum or from the ends of the fractured bone, and excision of muscle at this site must always be minimal. It is perhaps advisable at this stage to emphasize again that no periosteum should be removed; and even if some doubtful bone fragments insecurely attached to periosteum are taken away, the small, even minute, fragments of periosteum should be retained.

The object of suturing skin edges to deep fascia is to prevent premature closing of the wound cavity with consequent pocketing. The skin edges are sutured to suitable deep fascia, or often to muscle, by means of two or three catgut sutures on each side of the wound cavity. The elastic pull of the skin then tends to retract the deep muscle layer and thus prevent occlusion of the cavity deep in the limb. This suturing should not be undertaken until the wound has been amply treated with sulphanilamide powder. It is essential to prevent any infection under the skin flaps, and this is also guarded against by the use of catgut, which will absorb rapidly and enable the skin edges to retract later. This usually occurs in 7 to 12 days, during which time the success of the operation is being decided. This procedure also seems to reduce the depth of the wound and the depression of the scar afterwards.

Conclusions

I have described the aims and technique of the operations undertaken for gunshot fracture of the femur at various times after occurrence of the injury and with varied degrees of infection. It has been shown that when operation is undertaken within a short time the procedure is strictly confined to the removal of foreign material and damaged or devitalized tissue. In such cases additional drainage is seldom required, but the wounds should not be sutured. In treatment undertaken at a later time after the injury the method of choice is wide excision of infected and necrotic tissue and great care in mechanical cleansing, followed by free drainage.

I have concluded that adequate excision of muscle, so as to produce a funnel-shaped aperture for drainage, is of great importance. Adverse criticism has been expressed of this point of view. It is stated that this unnecessarily wide excision would cause an increase not only in the extent of muscle contracture but in the loss of power in the limb as a whole, and that it would increase the devitalization of the bone fragments with the risk of non-union of the fracture. I have never suggested that the excision should be excessively wide, and have pointed out the dangers of the removal of muscles with arteries traversing them; in consequence I have advocated the lateral approach through the vastus lateralis. In 350 cases of such fractures with gross sepsis upon which I operated I have not had one single case of non-union of the fracture. In addition, owing to the use of incision through the vastus lateralis and the technique of suturing the skin to the deep tissue, we have not seen defective movement of the limb as an after-result which can be attributed to post-operative defect in muscles.

I would like to remind readers that the first task in modern warfare in the treatment of a wounded man is to prevent the loss of the man's life and limb by infection. We believe that this is mainly achieved in the case of gunshot injuries of the thigh by the operative procedures described, prolonged immobilization in plaster, and the use of local and oral sulphonamide preparations. We admit that the procedures described are often tedious and time-consuming, and we have been told that such treatment cannot be used when the number of patients is large. We believe, however, that the methods described are irreplaceable by any other method of therapy, and by their means 95% of our patients with these injuries have their lives and limbs saved. Other methods, and splinting, though useful for transport, are unsuitable for immobilization treatment over any length of time and cannot replace the use of plaster. Inadequate excision and temporary splintings could only be justified under conditions of great stress, to enable the patient to be transported from the front line to hospital; we do not think that any considerations of time should weigh when the patient's life and the ultimate fate of the limb are at stake.

In view of the criticism that these procedures are prohibitively time-consuming I would like, in conclusion, to give an average estimate of the times which the various procedures take under our conditions.

The patient is put on the orthopaedic table, a spinal anaesthetic is given, the extension apparatus is applied, and the limbs are thoroughly washed. This work is mainly undertaken by orderlies, and the time required is approximately half an hour. The surgeon is helped by one assistant or an experienced sister, and there is a nurse attending to the instruments. If the knee-joint requires opening and the wound has to be dealt with as described, the whole procedure would take approximately 24 to 25 minutes. If the wound involves the femur above the great trochanter, and particularly into the hip-joint, the procedure will take from 40 to 45 minutes. If, however, the fracture is in any part of the diaphysis of the femur the work is easily completed in half an hour; thus the average length of this part of the operation is 30 minutes. The third part of the procedure—that is, the application of the plaster—is performed by trained nurses, usually two with a third preparing the bandages. The application of plaster, including a hip spica, takes 20 to 25 minutes, and 10 minutes is required for additional drying before the patient is moved. Thus three tables allow of a continuous flow of wounded. Each of these stages averages about 30 minutes, and each patient therefore requires one and a half hours; but one patient is dealt with each half-hour, and during a 16-hour working day, with one hour for dinner, it is possible to attend to some 25 to 35 wounded men. This is the maximum figure, but has been easily attainable under such a system. The team consists of 9 people, who work on three tables; there is only one skilled surgeon in the team, and usually three experienced nurses; the rest are orderlies. In order that the work shall proceed continuously it is necessary to have another experienced doctor available for the sorting of the wounded as they arrive, directing them for radiography or for other purposes as may be required, and also choosing the next patient for operation. This same doctor could administer the spinal anaesthetics. This team is sufficient to deal with a large influx of wounded men, since there are about 30 cases of femur fracture to 400 or 500 total wounded as a rule. Thus all the femur fractures among 1,500 wounded men could be treated in 3 days. Admittedly it is unwise to wait till the third day, but under conditions of stress this can be done successfully if the patient has been given sulphanilamide powder by mouth and locally. We have found that in these conditions the proportion of dangerous infection is not higher than 2%. Up to 2% of cases may show secondary haemorrhage, but in not more than 10% of such cases is the haemorrhage likely to be dangerous. We consider, therefore, that 90% at least can be evacuated in excellent condition, and the majority of these patients will have their wounds healed and the fracture consolidated before the first plaster needs renewal.

SOME THERAPEUTIC FALLACIES

BY

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A few years ago one of us had occasion to give a clinical lecture in a London hospital to a number of general practitioners. In it he happened to question the value of certain generally accepted forms of therapy, to be hotly attacked by a section of his hearers on the score that he was taking away their "treatment." It was in vain he protested that if this could be proved to be valueless it should be discarded. They were not to be pacified. Shortly afterwards he had a similar experience in the Provinces. This paper owes its origin to these two incidents. It is not to be expected that all our conclusions will be accepted by all our readers. If they succeed in evoking a critical spirit—now, alas! sadly lacking—in regard to present-day methods of treatment, we shall be content.

Essential Hypertension

The number of men and women in middle and late middle life who "suffer" from this condition is enormous. The number who are living full and vigorous lives in blissful ignorance of the fact that their blood pressures are abnormally high is immeasurably greater. Of those in the first category few would have any symptoms referable to the condition if they had not been informed by their doctors that they were its victims.

Uncomplicated high blood pressure gives rise to no symptoms of itself in the large majority of patients; few without knowledge of its presence complain of dizziness, a sense of fullness in the head, occipital headaches, and any others of the list of symptoms ascribed to it in textbooks of medicine. Such symptoms are nearly always due to an anxiety state largely dependent on knowledge of the height of their blood pressure.

Before criticizing the usual treatment of hypertension it is well to remember that its cause is quite unknown, even if innumerable theories regarding it have been advanced at one time or another. In spite of common medical belief to the contrary, infections, whether general or local, auto-intoxication derived from the bowel, prolonged physical strain, and a high protein diet have, so far as is known, nothing to do with it. Nervous strain may raise it temporarily; there is no evidence that it can produce it. Endocrine disturbances are easy to blame; they are harder to incriminate.

In view of these facts treatment must be unsatisfactory. It can be said at once that therapeutically we are powerless to reduce blood pressure save temporarily. Nevertheless, prolonged rest in bed, regular purgation, repeated venesections, diets of many descriptions, all manner of baths, scores of drugs and organic extracts, high-frequency currents, diathermy, and we know not what else are constantly being used by the over-active therapist. The public also likes "treatment" and is willing to pay for it. In the present state of our knowledge is it not more logical for us to approach the question of treatment as philosophers? A patient who has been told that he has a high blood pressure often lives in constant dread of a "stroke." Then why tell him when we discover it? If he has been told already, why not reassure him by telling him of people with blood pressure as high as or higher than his who are living full and active lives; that many of them will reach the allotted span; and that if we could bring down his blood pressure the chances are that he would feel the worse for it? In the case of the relatives, of course, the position is rather different, and they should be informed that the expectation of life is not so good as in an individual with normal or low blood pressure. So long as there are no complications the patient should not be allowed to consider himself an invalid; on the contrary, he should be urged to keep up his interests, though on general grounds he should be advised to avoid overstrain, both physical and mental. He should be encouraged to take moderate outdoor exercise: golf played in leisurely manner is—or, alas! was—the game *par excellence* for hypertensive patients. Often they sleep well. When there is insomnia sleep should be ensured by a nightly dose of a sedative, but no one should be initiated into the habit unnecessarily. He should be allowed an ordinary mixed diet, unless perchance he be obese, when his weight should, if possible, be brought down gradually to reasonable proportions by dieting. This last is a most important measure, as, for one thing, there seems to be some connexion between obesity and hypertension; for another, it seems illogical to allow an already overworked left ventricle to be subjected to a further strain which is avoidable; and, for yet another, the raised diaphragm and its small range of movement present in obese people can only increase the heart's handicap. A hypertensive patient who has brought himself to submit to the loss of superfluous flesh is greatly gratified, as a rule, by the results of his abstinence.

Hypotension

Of recent years there has been an increasing tendency to diagnose a condition known as "low blood pressure." In consequence a new sword of Damocles has been hung over the heads of numbers of healthy people. A doctor, unable to find any organic cause for a patient's complaints, discovers in the course of his examination that he has a systolic blood pressure of something in the neighbourhood of 100 mm. Hg. He immediately fastens on this, with the result that a new invalid is created, to become almost inevitably the victim of polyvalent therapy.

Except in a very small and limited group of conditions such as shock, severe haemorrhage, coronary thrombosis, Addison's disease, and a severe infection such as influenza, hypotension is of no clinical significance. Our practice is, when we find a middle-aged man with such a blood pressure as we have mentioned and for which there is no apparent cause, to con-

gratulate him upon the state of it. Apart from aught else, such a man is almost certainly immune to hypertension.

Arteriosclerosis

For this there is no known treatment. Yet how much honest endeavour is wasted in striving to stay its progress and restore its ravages! Why pretend to achieve the impossible? Surely it is better to accept the inevitable. No useful purpose, however, is served by telling a patient that he has arteriosclerosis. That much can be done to help him and his relatives by advice and by the treatment of various symptoms as they arise is certain. Nevertheless, the chances are that he will profit most by encouragement.

Angina Pectoris

The number of drugs used to reduce the frequency of attacks of angina pectoris should alone make one suspicious of the efficacy of any of them. Evans and Hoyle (1933, 1934) in a fine piece of work tested a host of them—sodium nitrite, mannitol hexanitrate, erythrol tetranitrate, potassium iodide, luminal, chloral, morphine, papaverine, phenacetin, diuretin, euphyllin, belladonna, digitalis, lacarnol, and harmol—to find that none of them acted better than the placebo they used as a control. And yet there must be few of the thousands of victims of angina pectoris in this country who are not taking at least one of them regularly on the advice of their doctors.

Nitrites, particularly in the form of freshly prepared glyceryl tetranitrate tablets, dissolved rapidly in the mouth before being swallowed, are of inestimable value not only in cutting short individual attacks but also in preventing them if they are taken immediately before exposure to such conditions as are known by experience to be likely to induce them. So transitory is their effect, however, that to give them, say, three times a day—as is often done—to prevent attacks is even less reasonable than to inject adrenaline three times a day to prevent attacks of asthma.

Cardiac Bruits: Simple Tachycardia

It would seem that to many practitioners the mere presence of a bruit is enough to warrant the administration of digitalis. The single indication for digitalis is heart failure in some degree, and this whether the bruit be or be not of organic origin.

Again, the mere presence of tachycardia seems still to many practitioners an indication for digitalis. It has no effect in simple tachycardia due to nervous, toxic (including thyrotoxic), and anaemic states. It is heart failure and not tachycardia which is the indication for digitalis.

Paroxysmal Tachycardia

An attack of paroxysmal tachycardia often arouses needless anxiety in patient and doctor alike, and recourse is straightaway had to a variety of drugs, including inevitably digitalis. The first thing is, naturally, to make an accurate diagnosis, for it is necessary to exclude an unusual degree of simple tachycardia, paroxysmal auricular fibrillation, and paroxysmal auricular flutter. An electrocardiogram taken during an attack is of great value, though not always essential. Paroxysms differ in origin and type and affect both healthy and diseased hearts. The treatment varies from type to type, and the prognosis from patient to patient, but there are a few valuable rules to keep in mind as regards both.

Sometimes the tachycardia is ventricular in origin. Here the prognosis is usually grave, as in the large majority of patients serious myocardial disease is present; most cases, indeed, follow an attack of coronary thrombosis. It is then vital to stop the paroxysm as soon as possible. Digitalis, however given, is almost certainly ineffective and in large doses may be positively harmful, whereas quinidine sulphate, whether given by mouth or intravenously, may produce some of the most dramatically beneficial results in medicine. Far more commonly the tachycardia is supraventricular in origin, either auricular or nodal. Here the prognosis is usually excellent, as in the large majority of cases the myocardium is healthy—it is, indeed, practically only in cases of very diminished cardiac reserve, whatever the cause, that the prognosis is doubtful. Paul White (1937) goes so far as to say that the condition is "usually unimportant." Unless the life of the patient is crippled through the frequency or the length of attacks, or the reserve of the heart is known to be already small, active treatment is

unnecessary. It is generally advisable for the patient to rest during an attack; otherwise, little is needed save strong reassurance as to its innocence. Moreover, a small percentage of patients can themselves stop an attack by pressing on the carotid sinus in the neck, holding the breath, inducing retching, adopting a certain posture, and so on. If it is deemed advisable or necessary to stop an attack on account of its long continuance a subcutaneous injection of acetyl-beta-methylcholine chloride is the procedure most likely to be successful, though it is one never to be hastily adopted, since its effects in other ways may be alarming. Digitalis neither stops paroxysms nor diminishes their incidence. Quinidine sulphate is reputed to do both occasionally, although this is not our experience.

As a toxic goitre is sometimes responsible for the disorder it is always wise to exclude its presence, since a subtotal thyroidectomy in such a case may be the means of dispensing with all other kinds of treatment.

Paroxysmal Auricular Fibrillation

Marvellous as is the effect of digitalis in most cases of established auricular fibrillation, it will not stop individual attacks of paroxysmal auricular fibrillation, nor is there any satisfactory evidence that its regular administration prevents such attacks. In themselves these are—contrary to general belief—usually surprisingly harmless, and there is, as a rule, no urgency to endeavour to stop one, as it may easily and spontaneously cease after a short time. If, however, it persists hour after hour to the great discomfort of the patient, or if the cardiac reserve is known to be small, and in any case if signs of congestive failure appear, it can usually be stopped by the oral administration of quinidine sulphate at frequent intervals. As one of the most fruitful causes of paroxysmal auricular fibrillation is thyrotoxicosis, and a subtotal thyroidectomy generally results in a complete cessation of attacks, in every case a goitre should be diligently searched for—even if mitral stenosis is present.

Shock

This is a result of vasomotor and not cardiac failure. Drugs such as digitalis and strophanthin, which are often administered, have therefore no place in its treatment. It should be remembered, too, that with a reduced volume of blood reaching the heart it is necessary for it to beat rapidly to maintain the circulation.

Bleeding

Calcium is widely used in the treatment of purpura, menorrhagia, haemoptysis, epistaxis, post-operative haemorrhage, and haemophilia. It is also often given before operation as a prophylactic against haemorrhage. Yet, according to Hunter (1938), there is no pharmacological evidence that it either increases the coagulability of the blood or shortens the bleeding time. In his opinion there is no justification for its use in such conditions as we have mentioned; and, as regards its use before operation, it is only of value in cases of obstructive jaundice, in which probably part of the existing blood calcium has become bound to the bile pigment and is thus unavailable for the process of coagulation. Even in these cases administration of vitamin K is more important.

Chilblains

The use of calcium salts in the treatment of chilblains and allied conditions is practically universal. Yet there are no sure grounds for its use. In all these conditions the serum calcium is normal.

Anaemia

Tens of thousands of people are treated for anaemia who are not anaemic. A clinical diagnosis of anaemia is apt to be fallacious. In the examination of any patient in whom anaemia is suspected an estimation of the haemoglobin should never be omitted. If anaemia is found to be present every endeavour should be made to discover its cause. This may be revealed in the course of a thorough clinical examination. Often a full examination of the blood is not only advisable but necessary.

Most cases of anaemia with a low colour index are benefited by iron if effective preparations are used in adequate dosage. It is, however, often discarded as useless after trial in perfectly proper cases simply because the dosage has been inadequate. In this connexion we consider the recent fashionable craze for

giving iron by injection deplorable. According to Witts (1930-1) the majority of ampoules of iron on sale contain infinitesimal amounts of the metal and are ineffective; the potent preparations cause much pain and occasionally iron poisoning. Vaughan's (1932) dictum that intravenous, intramuscular, and all proprietary preparations of iron are as useless as they are expensive is practically true.

Again, liver is not a panacea for every type of anaemia. It is, with rare exceptions, only of value in the treatment of pernicious anaemia and other megalocytic anaemias. As regards the method of its administration, on all grounds—cost, comfort, convenience, and effectiveness—parenteral therapy is infinitely preferable to oral; indeed, the latter method should now be considered archaic save in a few cases. Much has been written on the necessity for giving dilute hydrochloric acid as well as liver. It seldom relieves any accompanying indigestion; it has no effect on the anaemia.

Finally, there is no evidence that arsenic is of any value in the treatment of either microcytic or megalocytic anaemia.

Toxic Goitre

The truth of Joll's (1932) statement that subtotal thyroidectomy is "the method which most rapidly, most certainly, and most safely restores the patient to a state of economic efficiency and involves least likelihood of danger of relapse" is now firmly established. Iodine does not cure. This truth cannot be stressed too strongly. In most cases, for reasons not yet understood, it ameliorates the signs and symptoms, but only temporarily. Its administration for a short period before and immediately after operation has contributed not a little towards the extraordinary safety which now attends subtotal thyroidectomy when conducted by a team of experts. In our opinion its use should be restricted to these periods. The common practice of giving it for months and even years on end in the belief that it cures is strongly to be condemned. Thereby operation is often postponed till cardiac complications, extreme emaciation, or a psychosis supervenes.

The Common Cold and Influenza

The clamant demand of the layman for a cure of these, the banes of his life, would appear to have had such an undesirable effect on our profession that we feel it our duty to insist on the uselessness of preventive inoculation. In spite of the many large-scale investigations that have been carried out, not one of which has shown that any benefit accrues from such treatment, uncritical impressions still hold the field, and numberless patients are subjected year after year to prophylactic courses of vaccines.

Another point: sulphonamide compounds have no action on filter-passing viruses. It is unwise, therefore, to give them to patients suffering from uncomplicated colds and influenza. Moreover, to quote Beaumont and Dodds (1941), "the prophylactic administration of small doses of sulphanilamide against various types of infection, such as sore throats or colds, is useless."

Bronchitis

A diagnosis of bronchitis, whether acute or chronic, means almost invariably the prescription of an expectorant. The number of gallons of expectorant mixtures used in this country alone in any one year is enormous. That their action is beneficial is taken for granted. Yet it is doubtful if they do not do more harm than good. It seems not only a clumsy but a harmful procedure to try to increase bronchial secretion by irritating the vagal nerve endings in the delicate mucous membrane of the stomach through the administration of sub-nauseating doses of emetics. Nevertheless, this is how such expectorants as ipecacuanha, ammonium carbonate, and squills act—if they do act effectively when used in pharmacopoeial doses, which is not certain. The chances are that they do little more than cause gastritis. It may be said that this accusation cannot be brought against the iodides. Their action, however, has been found to be very variable, and is probably dependent on the sensitiveness of the individual patient to iodine. What is urgently needed, of course, is a complete reconsideration of the whole subject of expectorants. Unfortunately, as Clark (1937) says, the pharmacology of cough has scarcely advanced at all in the last half-century. We, for our part, have practically

given up expectorants in the treatment of bronchitis. In acute bronchitis—a condition which tends to spontaneous cure—we rely chiefly on rest in bed, an abundance of hot drinks, steam inhalations, and sedatives to control an irritating cough; in chronic bronchitis, on general measures as they affect physical condition, climate, environment, occupation, etc., and, since chronic bronchitis of any standing inevitably connotes bronchiectasis, we advise such patients as seem capable of it to practise postural drainage every morning and at intervals during the day. This can be achieved very simply by a patient stretching himself across a bed or couch with the trunk hanging steeply over the side and coughing till no more sputum is produced.

Lobar Pneumonia: Bronchopneumonia

In spite of the amazing success of sulphapyridine (M & B 693) and allied preparations in this disease there is still need for the well-established non-specific methods of treatment: measures to achieve rest and sleep, good nursing, a sufficiency of fluids, and oxygen. Special attention has always been directed towards the heart. Most doctors seem to visualize a heart poisoned by infection gradually dilating as it becomes flabbier till in the end it fails. Yet seldom, even in fatal cases, are the classical signs of congestive heart failure seen. Moreover, in a radiological study of 119 hearts in pneumonia by Davies, Hodgson, and Whitby (1935) definite enlargement was witnessed in no more than three. It is not cardiac failure which is to be feared; it is peripheral circulatory failure. This is due to loss of contractility of the muscular coat of the peripheral arterioles, with consequent stasis of the blood in the capillaries.

If this be the case, the uselessness of so-called "heart tonics" is manifest, even if they can ever be proved to have any stimulating effect on the myocardium. Certainly alcohol, whatever its value as a food or a sedative, has no such action, nor have strychnine and camphor, while strychnine does not appear to exert any effect on the poisoned peripheral vessels. Digitalis—in popular medical opinion the most potent of all "heart tonics"—is, after all, a poison, and its beneficial effects must be very convincing to warrant the further poisoning of an already poisoned organ. As a matter of fact, its effect in lobar pneumonia has been carefully investigated by many workers, among whom Wyckoff, DuBois, and Woodruff (1930) concluded that its routine use was dangerous and in large doses increased the mortality; while Cohn and Lewis (1935) in an analysis of 1,456 cases found that it did not influence the course of events. Whatever be the value of expectorants under any circumstances, they should logically have little place in the treatment of lobar pneumonia unless there is an associated bronchitis, for most of the exudate is absorbed and not expectorated.

All we have said about the heart, the circulation, heart tonics, etc., in lobar pneumonia holds also in bronchopneumonia. The value of such preparations as sulphapyridine in the individual case is, however, much more a matter of trial and error. Success or failure probably depends on the extent to which the pneumococcus is responsible for the infection, and this is difficult to assess.

Constipation

Incredible quantities of purgatives are ordered daily by doctors, in most cases needlessly and in many harmfully. In the first place to treat roughly and ignorantly a marvellous piece of mechanism like the intestinal canal, with its delicate epithelium, its wonderful secretory and absorptive apparatus, and its beautifully balanced rhythmic movements, is little less than an outrage. There is an ingrained belief in doctors and patients alike that manifold evils will result if the bowels are not opened once at least every twenty-four hours. Yet, as Gee insisted many years ago, this is not a natural law, and many people feel in better health when the bowels act once in every two or three days. There is little or no evidence to support the widely held opinion that auto-intoxication results from simple constipation: faeces are, after all, meant to dry in the distal colon, and toxic absorption is far more likely to derive from fluid faeces than from dry scybala. To quote Witts (1937): "Apart from mechanical distension, a constipated stool exerts little more influence on the patient in the colon than in the bed-pan." Again, in many people who complain

of constipation the faeces arrive normally at the pelvic colon, but subsequent evacuation is not adequately performed owing to loss of the conditioned defaecation reflex, generally caused by continued neglect to respond at once to the call to stool. It is, however, in the constipation met with in acute infections that purgatives may be definitely dangerous. Here constipation is chiefly due to dehydration, and to dehydrate further an already dehydrated patient seems hardly logical. Once more, though there has been of late a change of mind on the part of most surgeons as regards the preparation of patients for operation, the practice of preliminary purgation in all cases still obtains in some quarters. To dehydrate deliberately before operation and to use all kinds of ingenious means to rehydrate immediately after would seem to be the acme of illogical thinking.

We ourselves have less and less recourse to purgatives with the years. Much can be done by stressing the harmlessness of constipation. "The ill effects of constipation are almost entirely psychogenic and due to worry over disturbance of habit" (Witts, 1937), and anxiety about the action of the bowels is probably in itself a fruitful cause of constipation. Much, again, can be done by insistence on the necessity for cultivating a regular habit, diet, exercise, the provision of a low lavatory seat or the adoption of a squatting posture for defaecation, and the lubricant, liquid paraffin. There is seldom any urgency to open the bowels in acute infections under four or five days, and then this should be done by enemata and not by purgation. Enemata are almost certainly not used enough in the treatment of chronic constipation; a regular habit can often be regained by their daily use in constantly decreasing amounts.

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OBSERVATIONS ON THE ACID HAEMATIN METHOD FOR THE ESTIMATION OF HAEMOGLOBIN

BY

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The acid haematin (Sahli) method is one which is widely used for the estimation of haemoglobin, and is recommended (M.R.C. Report, 1943) for use when the Haldane method cannot be employed. Though not ideal, it has several points in its favour—e.g., the reagents are simple and independent of a supply of CO, and the colour obtained with 20 c.mm. of blood is strong enough to read easily in the Haldane type of haemoglobinometer tube. While the conversion to alkaline haematin has many advantages (Clegg and King, 1942) the colour produced in similar concentrations is much weaker, and consequently comparison, particularly visual, is more difficult. A serious disadvantage of the acid haematin method, however, is that the fluid is a suspension and not a true solution (Barcroft, 1928). Considerable sedimentation has usually been observed in 24 hours at room temperature in several hundred samples investigated in this department. Moreover, occasional samples of blood give suspensions of such turbidity that they are impossible to read.