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Hæmoptysis treated by Intrapulmonary Injections.—*The Lancet*, June 13th, 1925, p. 1238.

Intestinal Hæmorrhage.—*The Lancet*, October 31st, 1925, p. 918.

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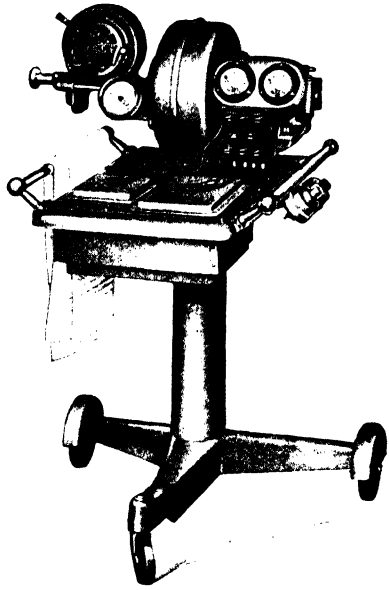
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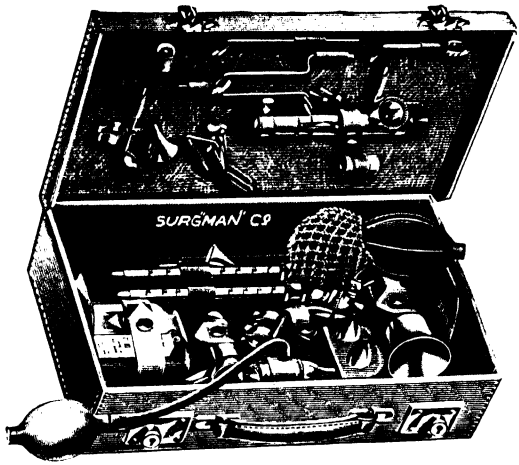
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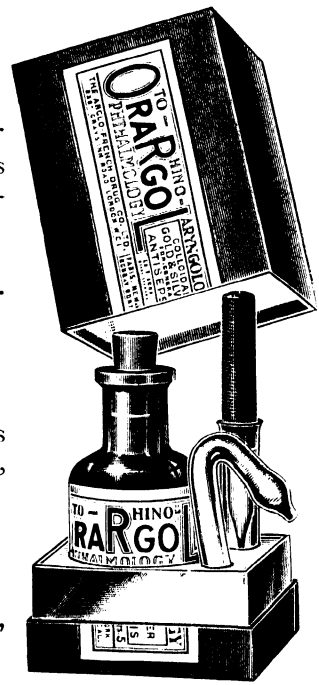
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EDITOR OF "THE LANCET."

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The Subjects treated in Volume I. are :

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MODERN TECHNIQUE IN TREATMENT

I

TREATMENT OF CONJUNCTIVITIS

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With regard to the treatment of conjunctivitis in general, the following points should be noted. (1) The infectivity of the different forms varies, but the patient should always be advised in bathing the eyes to use small pieces of lint which can be burnt after use, and periodically to boil droppers, eye-cups, etc. (2) The eye should not be covered, as by doing this the secretions are retained and the conjunctival sac is converted into an efficient incubator. (3) Cocaine should not be used to abolish the pain, as the effect is only transient, and prolonged use of this drug has a deleterious effect on the cornea. Adrenalin may at times be useful to produce temporary blanching of the conjunctiva, but it should be employed only on special occasions for cosmetic reasons. I have known of cases of chronic catarrhal conjunctivitis perpetuated by the use of this drug, the inflammation ceasing when a simple boric lotion was substituted for the adrenalin. (4) In all cases of ophthalmia neonatorum it is advisable to have a bacteriological examination of a swab from the conjunctiva, and in other cases this should be done when possible before treatment is instituted.

Monocular Conjunctivitis

Treatment of monocular conjunctivitis with lotion and ointments is usually of little avail, and much valuable time may be lost if a simple examination is not made at the outset. This examination should exclude: (1) Dacryocystitis, by pressing over the lacrymal sac and seeing whether any regurgitation of pus occurs from the lacrymal puncta; (2) the presence of a foreign body, by everting the lids and inspection of the conjunctival sac, and by examining the cornea with a corneal "loupe"; (3) the

presence of ingrowing lashes by a careful inspection of the lid margin.

Catarrhal Conjunctivitis, Acute and Chronic

The *acute* form is usually due to the Koch-Weeks bacillus and epidemic in character, but is sometimes caused by other organisms. Frequent cleansing of the conjunctival sac is essential. This is best effected by warm boric lotion or, if this produces irritation, by warm normal saline. Since the infection is a surface one, it is advisable to hasten the removal of the superficial epithelial cells of the conjunctiva by means of silver nitrate, which is used in a strength of 5 or 10 gr. to the ounce of distilled water, according to the severity of the case. It should never be dropped into the eye for fear of injuring the cornea, but should be painted on the everted palpebral conjunctiva by a wisp of cotton-wool wrapped round a glass rod. Some ophthalmologists neutralise the silver nitrate by subsequent painting with saline; in practice, however, the amount of sodium chloride in the lacrymal fluid seems sufficient to produce this effect. The applications should not be repeated for 24 hours in order that the conjunctiva may rid itself of the necrosed superficial cells and regenerate the new epithelium. A little bland, unirritating ointment, such as boric vaseline, should be smeared at night along the edges of the lids to prevent their adhesion and allow the muco-purulent discharge to escape. Should the patient be unable to attend daily for silver nitrate, applications of a 10 per cent. solution of argyrol or other organic silver preparation may be ordered for use three or four times daily after the lotion. It is milder than silver nitrate, but since it causes some superficial degeneration, the patient should wash out the argyrol with lotion after it has been in the eyes for three minutes, otherwise small rouleaux of desquamated cells form in the conjunctival sac and may cause considerable discomfort. This washing, moreover, diminishes the liability to argyrosis—i.e. staining of the conjunctiva by the silver. Since this condition if it arises is usually permanent, it is advisable, even with the precaution mentioned above, not to use any silver preparation for longer than three weeks.

Chronic catarrhal conjunctivitis is always a troublesome condition to treat. In the first place, any misplaced eyelashes, lacrymal obstruction, and errors of refraction must be treated. A slightly everted lower lid when the inferior punctum does not drain the lacus lacrymalis may perpetuate the symptoms: it is usually advisable to slit up the duct and remove a small triangular piece of its posterior (conjunctival) wall to avoid the constant epiphora. A plastic operation on the lid may be necessary in some cases. It should be ascertained whether the patient is exposed to irritant vapours, travels often in smoke-laden railway carriages, etc. A careful examination of the upper

part of the cornea should be made, in order to exclude pannus, and of the under surface of the upper lid to exclude the presence of a horizontal scar in the subtarsal sulcus. Either of these conditions indicates old trachoma and necessitates a change in treatment. Among local applications, a lotion containing zinc sulphate gr. i, acid boric gr. x ad ℥i, is frequently of service. The zinc sulphate may be found more effective if used separately in the form of drops (gr. i ad ℥i) and the boric acid combined with some astringent such as liq. hamamelidis dest. ℥xxx ad ℥i. The conjunctiva may become accustomed to the use of any particular drug, and it is well to have some alternative to the zinc sulphate, such as alum gr. ii ad ℥i, or glycerin. acid. tannic. ℥viii ad ℥i.

Angular conjunctivitis is a variety of chronic catarrhal conjunctivitis due to the presence of a specific diplobacillus and exhibiting characteristic signs. It yields readily to the use of zinc sulphate drops, gr. ii ad ℥i, instilled four times daily, and an ointment such as the following: Ichthyol gr. ii, zinc oxide gr. iii, lanoline ℥i, vaselin. flav. ad ℥ii, applied to the lids at bed-time. It is very important, however, to correct any errors of refraction, and as relapses are frequent the treatment should continue for a fortnight after all the symptoms have abated.

Purulent Conjunctivitis

The course of this is modified by the age of the patient, and it is customary to describe that occurring in the new-born child as ophthalmia neonatorum. It is worthy of note that only 60 per cent. of the latter class are gonococcal in origin, the remaining 40 per cent. being pneumococcal, streptococcal, etc.; the last-named types may have just as serious effect on vision as the former. The principal indication in ophthalmia neonatorum is to prevent infection of the cornea and the formation of ulcers. It is not sufficiently well known that St. Margaret's Hospital, Leighton Road, Kentish Town, London, is a special M.A.B. hospital for the treatment of this disease; mothers and babies are taken in together when possible, as children usually do better if breast-feeding is continued. In a bad case the conjunctiva is thoroughly washed out every hour with cold eusol 1 : 7, and a drop of a solution of acriflavine in castor oil 1 : 1500 instilled afterwards. If treatment can be instituted before the cornea is ulcerated, it is possible to avoid this complication altogether. When the patient is at home a daily application of silver nitrate 2 per cent. should be made. Secretion should be frequently wiped away from the lid margins with swabs soaked in lot. hyd. perchlor. 1 : 8000, and the conjunctival sacs washed out from an undine with a similar lotion. A skilled nurse will be able to evert the lids for this purpose, and an effort should be made to have this done every two hours while the discharge is profuse. A daily inspection of the cornea must be made in

case any ulcers should form. It is well on first seeing the case to use lid retractors for this purpose, for undue pressure on the eyeball may cause perforation of a deep ulcer. In adults the course of the disease is more severe than in infants. If only one eye is involved, every effort should be made to save the other by keeping the patient in bed—in a well-ventilated room—making him lie on the affected side, and by covering the second eye with a Buller's shield. A daily prophylactic instillation of some organic silver preparation in the unaffected eye is advisable. The diet should be liberal and the patient's general health considered. In the first stage the pain may be relieved by leeches to the temple, the application of cold compresses, and the frequent use of a cold boric lotion. Sedatives, opium, aspirin, etc., should not be withheld. If the lids are very tense the external canthus should be freely divided with scissors. When the stage of suppuration occurs, treatment with silver nitrate and frequent bathing with warm boric lotion are indicated. The attendants should wear gloves and goggles when carrying out the treatment.

Phlyctenular Conjunctivitis

Phlyctenular conjunctivitis occurs almost exclusively among hospital patients whose general health and surroundings are poor. Should the disease extend far on to the cornea, it may entail serious consequences. The treatment must be constitutional as well as local. The best thing is to get the child into the country and order a tonic such as syr. ferri phos., good and regular food, forbidding sweets in any form. The tonsils and adenoids frequently require removal. Local treatment consists in bathing the eyes with boric lotion, followed by the application of hyd. ox. flav. gr. iii, liq. calcis ℥x, vaselin. flav. ad ʒi, or some other form of yellow oxide ointment, three times daily. It is again important to correct any error of refraction.

Trachoma

Trachoma may commence as an acute catarrhal conjunctivitis; more usually, however, the onset is insidious. When the granulations are numerous the eye is thoroughly cocainised, or the patient given a general anæsthetic, the everted tarsus gripped between the blades of suitable expression forceps—e.g. Grady's, Tyrrell's, etc.—and the contents of the follicles forcibly expressed. The forceps should be pushed as far into the fornices as possible. After expression the everted lids are brushed with a solution of perchloride of mercury in glycerine (1 : 100) and the sacs are then washed out with boric lotion, boric vaseline being put between the lids. When the follicles are on the tarsal conjunctiva they are often too hard to be expressed with forceps. They may then either be touched with carbon-dioxide snow for 20 seconds (taking care that the frozen area thaws before it is

allowed to come into contact with the cornea), or they may be scarified with a Beer's knife, the contents being scraped out with a small Meibomian curette.

There is usually much reaction after these procedures, and iced compresses will be required, also frequent bathing with cold lotion. The subsequent treatment is the same as in milder cases—namely, daily application of copper sulphate stick to the conjunctiva of the lids and fornices. This should be kept up for six weeks or so, when the frequency may be diminished to twice a week, and later even to once a week. It is frequently advisable to change from copper sulphate to 2 per cent. silver nitrate, and occasionally to drop all caustic treatment for a week or two, using only a mild astringent lotion such as boric acid and zinc sulphate. The disease is of long duration, and the average time for cure at the M.A.B. trachoma school, Swanley, Kent, where treatment is carried out under the most favourable circumstances, is 18 months.

II

TREATMENT OF THE COMMONER AFFECTIONS OF THE SCALP

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Scurfiness

It is not proposed here to say anything about localised patches of scurfiness due to specific conditions such as ringworm, psoriasis, etc., but to deal only with those conditions which are usually included under the term pityriasis of the scalp. Two forms are recognised: a dry form (pityriasis simplex), and a moist or greasy form (pityriasis steatoides). In the former there is a simple hyperkeratosis of the scalp with desquamation, while in the latter some inflammatory exudate of serum has taken place among the scales, thus altering their character. There is, however, no hard-and-fast dividing line between the two conditions.

Pityriasis Simplex.—Pityriasis simplex may occur in children, not infrequently in infants, in whom it often first makes its appearance in the form of rings. It is, however, chiefly seen in adults, particularly in men. It is generally due to bacterial infection, the infecting agent being probably the bottle bacillus, but in some cases it is due simply to a deficiency in the normal oil secreted by the skin glands, as, for example, in xerodermia. A differentiation between the two types is not always easy, but the general dryness of the rest of the skin and hair should favour a diagnosis of the latter type. Microscopic examination of the scales is helpful but not conclusive, as the bottle bacillus is a normal saprophyte of the scalp.

Treatment will vary in the two conditions. It is obvious that if the skin is too dry repeated washings are not likely to help, whereas if bacterial infection is present these may be of considerable value. In the former case, therefore, in boys and men, it is best to confine washing of the scalp to once a week, and to give some slightly oily preparation to replace the missing oil of the skin. In women, washing the head once a fortnight will usually suffice. In mild cases it is better to give a lotion containing a small amount of oil, such as will be described presently,

while in the more severe cases it will be advisable to use an ointment. In women the lotion should always be used.

In the bacterial cases washing should be more frequent, twice to three times a week in men, and once a week in women. Ext. quillaiæ liq. (B.P.C.) is an excellent shampoo lotion, but any good soap may be used for the purpose. Medicated soaps have no special value and the stronger spirit soaps are better avoided. Mild antiseptic lotions should be applied daily: resorcin is one of the best, but should not be used in people with white or fair hair, as it stains a greenish colour. A usual formula is: ℞ Resorcini ʒi, sp. coloniensis ʒi, ol. ricin. ʒii, aquam ad ʒviii. Hydrarg. perchlor. gr. ii, or chloral hydrate ʒi, may be substituted for the resorcin or combined with it if desired. These lotions should be massaged into the scalp once daily, and always after washing the scalp. In more severe cases it may be necessary to prescribe an ointment. The best basis for this is the combination of soft paraffin and cocoanut oil suggested by Whitfield, which is not messy and is easily washed out of the scalp; it has the disadvantage of getting very liquid in hot weather, and though this does not limit its efficacy it makes it difficult of transport. The best antiseptics to use are sulphur and salicylic acid, and a useful formula is: ℞ Ac. salicyl. gr. xv, sulphur. sublim. gr. xv, ol. lavand. ℥iv, paraff. moll. ʒii, ol. cocois nucifer. ad ʒi. Crocker's formula of resorcin, sulphur, and thymol, prescribed as ℞ Ung. thymol. co. dilutum (B.P.C.), is also very useful, but has a lanoline basis which is disagreeable to some people. In this condition, too, it is rarely necessary to use ointments in women.

Pityriasis Steatoides.—Pityriasis steatoides is merely an exaggerated form of the bacterial type of pityriasis simplex with some exudation. The scales are greasy and more profuse, but there is no associated redness of the underlying scalp. Sabouraud considers that in this condition the infection is due to the bottle bacillus acting in symbiosis with the *Coccus cutis communis*. The treatment is the same as for the last-named condition, but caution is required to prevent irritation of the scalp or an acute seborrhœic dermatitis may be precipitated. In addition to the drugs already mentioned, tar is of considerable value: it may be used alone or in combination with other antiseptics. A good formula is ℞ Anthrasol gr. xx, ac. salicyl. gr. v, paraff. moll. ʒii, ol. cocois nucifer. ad ʒi.

Acute Seborrhœic Dermatitis of the Scalp.—In this condition redness of the scalp occurs, associated in the milder cases with greasy scales and in the more severe cases with weeping and crusting. The condition is usually only a more acute type of pityriasis steatoides. It is well to cut the hair as short as possible, though in less severe cases in women this can usually be avoided. Soaps should not be used, but scales and crusts should be removed by bathing in warm water or warm alkaline solution made by adding a teaspoonful of washing soda to a

wash-hand basin of water. If the crusts are very thick, starch poultices are called for. In the more acute cases ℞ Hydrarg. perchlor. gr. i, linimentum calcis ad ℥viii, is a useful application, or if mercury is not well tolerated sulphur. præcip. ℥i, or acid. salicyl. gr. xxx, may be used instead. In the milder cases tar ointment may be used. As the inflammation subsides the treatment recommended for pityriasis steatoides may be employed.

Seborrhœa Capitis

This is a state of excessive oiliness of the scalp, and varies from a slight greasiness of the hair to a condition in which the hair follicles are filled with greasy plugs, and the scalp is covered with a fatty exudate. The condition is due to over-activity of the sebaceous glands, and may occur alone or in conjunction with pityriasis steatoides. It usually begins about puberty, being most severe in early adult life and diminishes thereafter as age advances. Certain metabolic disturbances may be partly responsible for the condition, though racial and familial influences also play a part, and it is therefore necessary to rectify, if possible, any general metabolic disturbance, particularly by regulating the diet. Local treatment consists of frequent washing of the scalp, as described above, and the application of astringent and antiseptic preparations. The most suitable are alcoholic lotions. Greasy preparations should obviously be avoided. Useful formulæ are: ℞ Resorcin. ℥i, acid. acetic. ℥ss, sp. vin. rect. ℥ii, aq. rosæ ad ℥viii; or hydrarg. perchlor. gr. ii, sp. coloniensis ℥i, sp. vin. rect. ℥iii, aquam ad ℥viii; or liq. calcis sulphuratæ (B.P.C.) ℥i, glycerin. ℥i, aquam ad ℥viii.

Loss of Hair

Apart from general alopecia of the scalp, due to some acute illness, from alopecia areata, or from localised baldness due to inflammatory conditions of the scalp, loss of hair can roughly be divided into two groups: (1) calvities, which is only seen in the male, and consists of a progressive loss of hair, commencing on the crown of the head and the frontal region and going on to complete baldness of the top of the head; and (2) a general thinning of the hair, often most marked on the vertex, which is most commonly seen in women from the age of 30 onwards. The first-named condition is most frequently seen in middle-aged and old men, but in the premature form complete baldness of the crown may have taken place in the early twenties. This condition is thought by Sabouraud to be mainly due to seborrhœa capitis; many other factors have been invoked, of which heredity is the chief, but it is quite clear that no theory is completely satisfactory. A great deal can be done by preventive treatment, but this, to be of any value, must be commenced at an early age. In fact, general attention to the hygiene of the scalp from

childhood is the best preventive of premature alopecia. This should consist of regular weekly washing of the scalp. The hair should be kept fairly short, and undue dryness or greasiness dealt with on the lines suggested above. Each individual should use only his own brush and comb, which should be washed frequently. The brush should not be too hard. People should be encouraged to patronise only those hairdressers who sterilise their instruments between each customer, and who provide a freshly sterilised brush for each individual. All violent treatment of the scalp, as by the machine-brush, should be condemned. The use of hair lotions, etc., of unknown composition should be avoided. When any evidence of excessive hair loss appears, gentle massage of the scalp may be practised and rubefacient lotions used, a favourite one being: ℞ Aceti cantharidis ℥ii, sp. coloniensis ℥ss, sp. vin. rect. ℥iss, aquam ad ℥viii. Pilocarpine is claimed to have a specific action, and may be used as follows: ℞ Pilocarpin. nitr. gr. xx, sp. rosmarin. ℥ss, alcohol (60 per cent.) ad ℥viii. There is little evidence that any of the many vaunted remedies for this type of baldness—vibro-massage, high frequency, etc.—have any definite action; the first-named may occasionally set up an acute seborrhœic dermatitis. Ultra-violet light, by producing hyperæmia of the scalp, may have a slight action in stimulating hair growth, but it requires to be handled with very great care. There is no reliable evidence forthcoming of the value of internal remedies in this condition.

While this type of alopecia does not appear to be associated with any derangement of the general health, the general thinning of the hair seen commonly in women is often associated with some general disturbance. Disturbances of function of the nervous system, the genital organs, the gastro-intestinal tract, or the thyroid may be associated with hair loss. Apart from correcting these errors, the scalp should be kept in a healthy condition on the lines already indicated. Doubtless in a few years' time it will be unnecessary to differentiate between the sexes, but at the present time for those girls who wish to let their hair grow long, careful brushing night and morning will help to keep the hair in good condition.

III

THE TREATMENT OF CEREBRAL VASCULAR LESIONS

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The term "apoplexy," if used in its classical sense, denotes a state of unconsciousness with complete paralysis, except of the vital functions, developing more or less suddenly as the result of blockage or rupture of a cerebral artery. Its onset is sometimes instantaneous, but is usually preceded by premonitory symptoms, such as headache, giddiness, abnormal sensations in or weakness of a limb, or disturbance of speech, which may last for a few minutes or days. Consciousness may be lost slowly or rapidly. The patient lies in a state of coma, breathing stertorously, with a pale or cyanosed face and flaccid limbs. He may never recover consciousness, death occurring quickly or within two or three days. Recovery when it occurs is gradual and is marked by a stage of irritability in which the patient resents interference of any kind. Ultimately he is left with some gross disturbance of function, most commonly hemiplegia.

The apoplectic attack may, however, be less severe and consist of little more than momentary loss of consciousness or giddiness, associated with hemiparesis or aphasia which may disappear in a few weeks.

Sometimes coma supervenes after paralysis has appeared, and frequently a stroke consists solely of a slowly developing hemiplegia that may become complete without any disturbance of consciousness. To an attack such as the latter the term "apoplectic" should not strictly be applied, but the original meaning of the word is now rarely adhered to. The majority of apoplectic seizures occur in patients over 40 who are suffering from arterio-sclerosis with or without arterial hypertension, cardiac hypertrophy, and renal disease. Hæmorrhage or thrombosis is the immediate cause, and one of the branches of the middle cerebral is most commonly affected. A stroke occurring in a young adult is very frequently due to syphilitic arteritis, and sometimes to embolic occlusion or rupture of a basal aneurysm.

Theoretically, it would seem to be important for the proper

treatment of vascular lesion of the brain to differentiate cases of hæmorrhage from those of occlusion, especially by thrombosis. And the matter might not appear to present any difficulty when the state of the heart and blood pressure can be used as an index. But pathological experience teaches that in many cases, perhaps the majority, it is impossible at the bedside to be certain of the nature of the lesion. In general, embolism is usually the cause in young people with simple or infective endocarditis; between the ages of 20 and 40 thrombosis from syphilitic arteritis is most common, and after 40 either thrombosis or rupture may occur. With embolism or hæmorrhage the onset is usually sudden in a patient with high blood pressure, hypertrophied heart, or renal disease, whereas thrombosis often develops slowly with premonitory symptoms lasting perhaps for hours and frequently occurs in the night. But the lesion may be thrombotic when the left ventricle is hypertrophied, the pulse is full and bounding, and the blood pressure is raised; on the other hand, it may be hæmorrhagic when these signs are absent. Nor is the mode of onset a sure guide, for with thrombosis, while the development of the seizure is usually slow, it may be apoplectiform, and with a small rupture the opposite may occur. The broad rules of treatment should therefore have a general application whatever the immediate cause of the vascular lesion may be.

General Management

For a patient who is in an apoplectic seizure, or who has the slightest warnings of one, absolute rest is the first essential. He should be put to bed with as little disturbance as possible, his room kept quiet, and the light dim. His head and shoulders should be slightly raised on a pillow, care being taken that the large veins of his neck are not being pressed upon.

If the patient is conscious, visitors should be prohibited, and he must be protected from worries and physical exertion. He ought to be fed, and must not be allowed to alter his position in bed by his own exertions. A bedpan and urinal must be employed. If the patient is unconscious he should lie on his side, preferably on a water-bed, and the nurse must see that his head does not drop forward. He may be incontinent, but if urine is retained catheterisation will be necessary and should be carried out with minimal disturbance of the patient. His skin must be cleansed with soap and water night and morning to prevent the development of bedsores, and for this purpose the nurse should use the palm of her hand. After carefully drying his skin with a rough towel, she should gently rub his back, shoulders, and buttocks with methylated spirit, and finally dust them over with boric powder. If the patient is in a restless, semi-conscious state sedatives are necessary, and, provided that he can swallow, bromides or chloral, or both combined, are preferable. As a draught the following is satisfactory: Pot. brom., 20 gr.;

chloral hydrate 12 gr. ; aq. menth. pip. ad 1 oz. Morphia is a depressant of the respiratory centre, but in the circumstances under which it would be called for this is no deterrent to its use in moderate doses. For restlessness is not usually associated with deep coma or other signs of increased intracranial pressure sufficient to impede medullary function.

Feeding.—Whether the stroke is severe or slight it is safe and probably wise to starve the patient for the first 24 hours. If he is conscious and thirsty he should be allowed sips of water but not large quantities of fluid. If he is unconscious, care must be taken to keep his mouth clean by swabbing it out with a mild antiseptic or alkaline lotion. After the first day semi-fluid diet can be given if necessary in the form of nutrient enemata. If the patient is feeble and his heart's action is poor, alcohol and digitalis are often beneficial. Even in mild cases the diet for a few days should be light and then gradually increased. When it is clear that the cause of the stroke is rupture of a vessel it is generally considered to be good practice to promote free action of the bowels by calomel or croton oil ℥i, followed by an enema. If the vascular lesion is clearly thrombotic, and especially if the heart's action is weak, purgatives should be avoided, but enemata and mild laxatives can be used.

Where there is good reason to believe that syphilis is the cause of the arterial disease, anti-syphilitic treatment should be early instituted. Since it is important to disturb the patient as little as possible, it is necessary carefully to choose the drug to be employed and the method of its administration. Mercury by intramuscular injection is perhaps preferable, although arsenical compounds such as glucarsenol or sulpharsenol can be given in small doses into the buttock at weekly intervals under strict aseptic conditions. As soon as the patient is able to swallow, pot. iod. gr. x to gr. xx, thrice daily, should be given.

Are Surgical Measures Justifiable?—Many of the clinical phenomena resulting from cerebral vascular lesions are due to raised intracranial pressure from hæmorrhage and œdema or œdema alone. When coma is deep or increasing the question therefore arises whether or not active measures ought to be adopted to relieve the cerebral compression that otherwise may kill the patient. It is a question by no means easy to answer. If, in addition to profound coma, there is clear evidence of disturbance of medullary function, such as rising blood pressure associated with Cheyne-Stokes respiration and cyanosis, relief of intracranial pressure is certainly necessary, for otherwise the patient is likely to die. As to the best method to adopt, bleeding by phlebotomy at one time played a prominent part in the routine treatment of apoplexy, and if sufficiently heroic it will certainly lower the intracranial pressure. But nowadays it is rarely employed. This is not to be wondered at, for it has only a limited usefulness and under certain circumstances may be positively dangerous. Thus when the circulation through the

medulla is already enfeebled from either cardiac weakness or compression it is likely quickly to lead to a fatal result. Even in cases of cerebral hæmorrhage in which the heart is acting forcibly, the blood pressure is high, and respiration is not embarrassed, although withdrawal of blood is unlikely to be harmful, it is doubtful whether any real benefit will result from it. Venesection on the whole has little to commend it.

Withdrawal of spinal fluid by lumbar puncture is sometimes employed, but where the pressure within the skull is sufficiently great to affect the medulla it is not a safe procedure. The danger, of course, lies in the risk of herniation of the bulb through the foramen magnum. In less severe cases, however, in which signs of bulbar compression are absent, careful drainage of spinal fluid by lumbar puncture is relatively safe and often leads to rapid relief of the general cerebral symptoms.

A third available method of dealing with raised intracranial pressure is by cerebral decompression. It has been strongly advocated by Cushing for apoplexy from hæmorrhage, thrombosis, or embolism, not only as a means of saving life, but also, in less serious cases, to restrict the amount of residual disability by diminishing local destruction of tissue from pressure due to œdema or blood-clot. Our knowledge of the results of this method is insufficient for judging whether or not it should be employed to the extent that Cushing advises. But it would seem to be clearly indicated when the blood pressure is rising and Cheyne-Stokes respiration is present; in other words, when the patient's life is endangered from impairment of medullary function.

Period of Rest in Bed.—The question as to how long a patient who has had a stroke should be kept in bed can be answered only in general terms and in regard to cases uncomplicated by bronchitis, heart failure, etc. In all severe cases the patient should be kept in bed for at least a month after consciousness has been recovered and other acute symptoms have passed off. Even when the stroke has been slight rest in bed for from 10 to 14 days is advisable.

Preventive Measures

The physician's duties do not end when the patient has recovered from the acute effects of the vascular lesion. Apart from the treatment of residual disabilities, such as hemiplegia, he ought to review his patient's mode of living in order to ascertain whether anything can be done to avoid a recurrence. Thrombosis and hæmorrhage are probably always associated with arterial disease which cannot be eradicated. But it is often possible to diminish his liability to vascular accidents. Thus when syphilis is the essential cause adequate treatment ought to be persistently carried out. Patients with arterial hypertension should avoid excesses in food and alcohol as well

as in mental and physical exertion. Worry is the common lot, but such patients should, as far as possible, avoid situations that are likely to be disturbing. Their diet should be light. Meat soups, strong coffee, and heavy meals should be avoided, and a regular morning saline is beneficial.

Lastly, although any reasonable abstinence ought to be insisted upon, it should be remembered that it is easy by excessive zeal for rules and regulations to foster a spirit of hopelessness in patients with vascular disease and to make their lives more miserable than need be. In consequence their activities should not be restricted within too narrow limits.

IV

TREATMENT OF MYOPIA IN YOUNG CHILDREN

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It is astonishing how deep-rooted are the prejudices and old fallacies about myopia in the public mind, and often, unfortunately, in the minds of many practitioners as well. The commonest of these is that short-sighted people get better as they get older, and that therefore myopic eyes are very "strong." Both these fallacies arise from the fact that it is generally considered a sign of weakness to be compelled to wear glasses, and since the presbyopic correction after 45 counteracts to a certain extent the myopic correction, myopes at and after this age usually find that they are able to read without glasses. Such reasoning seems entirely to ignore the fact that the distant vision remains exactly the same as it was before and depends for its perfection on the use of distance glasses, by which alone the degree of myopia can be measured. These fallacies tend to encourage parents to be careless in bringing their children for advice, or in carrying out the treatment, while it leads the practitioner to hesitate in expressing his opinion and sticking to it. It is therefore vitally important to bear in mind the many causes which contribute towards the development of myopia.

Causation

There are various factors in the causation of myopia, but the commonest, at any rate in children, is what is known as axial myopia or abnormal length of the eyeball. This is sometimes congenital, but more often develops during the earlier years of child life, and is liable to increase up to the age of about 22. This lengthening of the eyeball takes place at the posterior pole of the eye, and if this distension occurs either quickly or gradually there comes a point when the choroid and retina, which should normally be closely adherent to the posterior part of the sclera, become thinned, split, and finally rent to such an extent that gaps are formed in these structures and so-called atrophic patches are found at the macula; the stretching round the optic nerve gives rise to the myopic crescent and staphyloma, often a useful

guide to the degree of progression. Thus the vision is seriously affected. Also in after life the vitreous is liable to become fluid, the change being due either to inherent changes in its structure or to some interference with the character of the fluid secreted by the ciliary body; this may lead to shrinkage, and thus detachment of the retina is liable to occur following any excessive muscular effort, and occasionally the lens becomes opaque and cataract develops. In my experience it is not common for such serious pathological changes to happen in young life, but the progression takes place at this stage and the pathological changes may develop later. The very fact that the eyeball bulges posteriorly is evidence of weakness of the scleral envelope, which is probably due to defective nutrition for reasons connected with the health, but the determining factors which contribute to this distension are the subject of some difference of opinion. Although many arguments can be advanced against it, the generally accepted view is that close application to near work for a length of time is largely responsible; owing to the fact that the extra-ocular muscles are attached to the globe they are liable to press on the eye when put into action. No movement of the eyes is a simple one, and in order to maintain the eyes in one position for any length of time many of the muscles jointly take part in the action and a sustained pressure is thus induced. Reading at near range results in such combined action, and the muscular tension, being imparted to the eye in the presence of a weak sclera, encourages the posterior pole, which is unsupported, to give way. It is doubtful whether accommodation has much to do with the production of myopia, but the irregular accommodation required in astigmatism may have some influence. Progressive myopia may occur without the patient being aware of it unless he wears glasses regularly.

The possibility of the occurrence of all these changes and possible influences must be present in the practitioner's mind when he approaches a case of myopia in a child, however remote the changes may be, or however unlikely they appear to be at the time of the examination.

Symptoms.—There are very few symptoms associated with myopia. There is hardly ever any asthenopia unless the short sight is associated with some muscle-balance defect, and practically the only complaint that patients make is that they are unable to see properly in the distance. This is by no means always the case, as many myopes will express themselves perfectly satisfied with their distant vision, and often object to wearing glasses on this account.

Management of a Case

In children the refractive error should be carefully measured under a mydriatic, and the glasses ordered should be the lowest strength with which the patient can see 6/6 binocularly. It will

be found that this represents a strength slightly lower than is accepted monocularly. In no case should a myope be over-corrected; this is a serious error. On the other hand, the old prejudice against ordering full correction in cases of myopia of any degree is entirely unjustifiable. This fallacy is founded on the assumption that full correction glasses necessitates a full amount of accommodation for near work and that this conduces to progression. But it is doubtful whether accommodation plays any part in the causation of myopia, and in many myopes the accommodation is certainly as strong as in emmetropes, though in several cases of high degree it has been proved to be atrophic. Many people are perfectly happy in full correcting glasses, while others describe various discomforts from wearing them which they seem unable to ignore or get accustomed to. Each case must be judged on its merits. I always encourage patients to begin with full correction; the strength can always be reduced later if necessary.

Glasses should be worn constantly by myopic children, as by this means their visual acuity is maintained at full normal (if 6/6 vision has been obtained); they quickly become aware of any departures from this standard and thus become conscious of the first signs of progression; whereas the changes in visual acuity at near range are not so noticeable, as the necessity for reading at a slightly shorter range than has been customary does not make any impression. Full correcting glasses also enable children to read at the most suitable distance (viz., 12 to 18 in.), which they otherwise might not be able to do, and this is much less straining for the eyes. No reading glasses should ever be ordered in young people unless it is proved on examination that they are unable to read J. with their glasses and yet can see 6/6. This indicates that the accommodation is weak, and under these circumstances reading glasses may be ordered temporarily; when the power of accommodation improves they can be discarded.

Very high myopes almost always prefer not to have full correction, and often are not comfortable except with three or four dioptres less, but even in such cases a trial with full correction should be made, and some patients are anxious to wear such glasses. The only objection is the heavy weight of the glass in the spectacle frame. Parents are often very averse to their children wearing glasses, and myopes themselves are particularly disinclined to use them, even though they realise that their visual acuity will be improved thereby. Under such circumstances the practitioner must remain firm in his opinion, especially in the case of children.

The general advice given to myopic patients is directed towards preventing the constant application of any kind of near work for any length of time. A proper form of desk for writing purposes should be advocated, so that the patient is compelled to sit up and keep at a reasonable distance; a good light is

essential, so as to avoid the alternative of putting books and work close to the eyes in order to secure a larger image, and no small print or fine needlework is permissible for the same reason. Reading in bed is not bad in itself, but only because the position of the light is usually utterly unsuitable for comfortable reading; lying on the side only causes the eyes to be maintained in an abnormal position and necessitates the unnatural muscular action which is so bad for myopes. It is an important matter to discourage continuous application in reading and sewing, but to arrange for definite periods of rest alternating with periods of work.

In cases of definite progression, such as one or two dioptres in six months, the question of discontinuing all reading and school work has to be decided, and this becomes a serious matter in children who have reached an important stage in their education, but before taking this serious step all pleasure reading can be forbidden as a preliminary measure. Near work need not be curtailed merely because a patient has high myopia; it is the signs of progression that matter. It is of the greatest importance in all cases of myopia in children to pay particular attention to the general health, since the weakness of the sclera must not be lost sight of as one of the predisposing causes. When high myopia has become stationary reading may be permitted but physical over-exertion must be avoided, as in this way detachment of the retina is encouraged.

V

ACUTE ANTERIOR POLIOMYELITIS

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In the treatment of a disease an accurate conception of its pathology is an essential. The pathology of acute anterior poliomyelitis divides itself, when looked at from a therapeutic standpoint, into three stages. These may be labelled for convenience the stage of onset, the stage of destruction, and the stage of repair.

Stage of Onset

The stage of onset is not always evident. When it occurs its symptoms are often vague. Fever, malaise, sore-throat, perhaps some slight gastro-intestinal disturbance are all accompaniments of the onset of many other commoner diseases. Not until the second stage, that accompanied by the development of a sudden paralysis, does the enemy reveal himself, and then at a time when his damage is already half done. But it is in the first stage of the illness that treatment may be really effective and when diagnosis should ideally be made; *in the presence of an epidemic* there are two phenomena that may lead to a correct diagnosis before the onset of paralysis. Pain in the limbs and spine, sometimes so severe (in the former case) as to suggest acute rheumatism and in the latter meningitis, may precede the paralysis by 24 hours. A lymphocytosis in the cerebro-spinal fluid is found almost invariably during the first stage. Two therapeutic measures are of value at this period, serum given intrathecally and intravenously and absolute and complete rest.

Serum Treatment.—The serum should be that of patients some weeks convalescent from the disease, but as the immunity conferred by attacks of filter-passing organisms is both great and prolonged it is probably that serum is still of protective value up to a period of five years. The blood (200 c.cm.) should be collected in a flask previously rinsed out with sterile normal saline solution. After the clot has separated firmly the serum (about 100 c.cm.) is drawn off and kept in a cool place. It is

administered both intrathecally and intravenously on two successive days, about 25 c.cm. being given by both routes on each day. Malaria and syphilis must, of course, be excluded in the donor. S. Flexner and P. A. Lewis showed that, whereas intracerebral inoculation of the virus into monkeys invariably produced the disease, yet if human serum derived from convalescent children were given to the animals intrathecally paralysis in some cases was delayed and in others completely prevented. In the case of an epidemic such convalescent serum may well be procurable, but otherwise horse serum can be given. There is some evidence that this also contains antibodies against the virus. Whichever is used the administration is of greatest value in the first or pre-paralytic stage, but *is probably still of some value for the first two or three days after paralysis has appeared.* If horse serum is used it may be necessary to desensitise the child against the occurrence of anaphylaxis by successive half-hourly doses of ℥ i, ½ c.cm., 5 c.cm., before giving the full intravenous and intrathecal doses.

Urotropin.—S. Flexner and Clark appeared to show that if large doses of the urotropin are administered to monkeys an appreciable amount is soon to be detected in the cerebro-spinal fluid; and, furthermore, that if the monkeys are during this time inoculated with the virus of acute poliomyelitis paralysis can be delayed and even in some cases prevented. There is no doubt that to obtain a therapeutic effect large doses should be given, the drug being pushed boldly for a short period. G. F. Still quotes the case of a child, 21 months old, to whom 10 gr. were given every two hours for 24 doses. These heavy doses are the more allowable in that the period during which active damage to the central nervous system occurs is a short one, and it is during that time, amounting to three or four days in all, that the action of the urotropin in the theca is desired. The organ most likely to be damaged in any way by the urotropin is the kidney, and careful daily urinary examinations for albumin and blood should be made as a routine. More recent work casts doubt upon Simon and Clark's findings, it being denied that urotropin can be exhibited in the thecal canal by oral administration.

Stage of Destruction

This stage lasts probably for five or six days. During that time the damage to the nerve tissues is done. This damage is to be divided into two categories, permanent and temporary. Some of the anterior horn cells are so severely hit that recovery can never occur, others are only partially poisoned or mechanically interfered with by their proximity to the areas of attack and the resulting local inflammatory changes. Furthermore, it must be remembered that hyperæmia is found post mortem in parts of the central nervous system far from the paralysed areas.

It is with a view to resting these insulted rather than wounded tissues that treatment is designed at this period. The patient is kept at rest in a quiet, airy room, bright light is excluded, and visitors are not allowed for the first week. Bromides and even chloral can reasonably be given to shield the nervous system from all excessive stimuli. As mentioned above, serum and urotropin should be given for the first 48 hours of paralysis.

Stage of Repair

The stage of repair may last for two years, and it thus comprises the large majority of cases of infantile paralysis met with in practice. Its successful treatment is a lengthy, often a tedious, business. But this conception—one of almost invisibly slow but steady progress—is one to be held by the medical attendant and to be explained carefully to the parents of the patient. Treatment of the disease is thus a campaign rather than a battle, and for its success considerable attention to detail is necessary. Since the essential pathological lesion involves the anterior horn cells it is obvious that the peripheral manifestations will be motor and trophic. The trophic lesion results in peripheral vasodilation and loss of heat, and must be compensated for, in the case of the legs, by the wearing of long woollen stockings. If these are insufficient, further coverings, possibly quilted, must be made and worn; paralysed arms are similarly treated.

It is, however, the damage to the motor mechanism that demands the greatest assiduity and care in treatment. The treatment consists of (*a*) immobilisation, (*b*) massage, (*c*) passive and active movements, (*d*) repair operations. As soon as the diagnosis is sure an exact investigation must be made as to which muscles are paralysed. This can be done by stimulating their movements and by carefully watching, or more accurately by noting their electrical reactions. The limb should then be immobilised without delay in such a position that the paralysed muscles are relaxed and their antagonists slightly on stretch. There is nothing so fatal to the complete recovery of a paralysed muscle as tension. On the other hand, tension of the sound muscles causes a reflex relaxation on the part of the antagonistic unsound muscles. The exact form of immobilisation does not greatly matter, but two points should be kept in mind; the support should be light and should be easily removable to permit of daily massage. The best material is celluloid.

Massage.—The most valuable ally in the campaign waged for the recovery of the limb from paralysis is the mother. She should understand that the task will last for two years, and she should, if a trained nurse is not permanently available, be taught to massage her child. During the first month or two she should watch the process and should learn how to carry it out

herself. Ultimately there is no reason why she should not shoulder the whole burden herself. The instructions given her should be specific. Those in use at the Hospital for Sick Children, Great Ormond Street, are comprehensive and valuable; they are as follows:

Rubbing.—This must be done for a quarter of an hour twice a day. Lay the child on a bed.

1. Rub the paralysed leg from the foot right up to the top of the thigh. Rub upwards only. Put the broad part of your hand on the back of the child's leg. In rubbing the thigh put your hand first on the back of the thigh and afterwards on the front, but always rub upwards and be sure to go as high as the loins. Whilst rubbing with your right hand hold the foot with your left. Use for rubbing any kind of oil.

2. Take hold of the child's leg with your two hands just above the ankle. Rub round the leg with your two hands in opposite directions, as though you were ringing out sheets. Work up the leg and thigh from the foot up to the top of the thigh in the above manner.

3. Take the child's calf with your two hands. Put your fingers to the back part of the leg and your thumbs to the front. Squeeze the soft parts out between your finger and thumbs so as to flatten the leg out and make it as wide as possible. Work right up the leg and thigh in this manner.

4. Put your right hand over the front of the knee and your left under the foot. Push up the foot and, holding your right hand in front of the knee, you will prevent yourself doing any harm. You want, if possible, by pushing the foot to make the child push against your left hand with all its might. This is the most important of all exercises.

5. Flip every part of the leg and thigh with your fingers so as to make the whole of the limb quite red and warm.

6. Gently rub up and down all over. This will take away the stinging which was left by the last movement.

Passive Movements.—At the end of the day's massage the joints of the affected limb should be moved passively in all their normal directions, especially in the direction towards which they would be drawn by the paralysed muscles.

Active Movements.—The child should be encouraged to try to move the paralysed limb and the slightest twitch of an affected muscle should be drawn attention to and praised. It will sometimes be found that such movements will first be noticed in a warm bath, and this fact should be remembered and impressed upon the mother.

Repair Operations.—The advances made in orthopædic surgery make it probable in the majority of cases that further functional

improvement can be obtained after all active repair has ceased, either by tendon transplantation or by joint fixation or by some other mechanical shift. Since, however, repair may progress for two years it is wise to postpone operative treatment until it is certain to what extent such a measure is necessary.

VI

THE TREATMENT OF DYSENTERY

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I.—Bacillary Dysentery

(A) *Acute Bacillary Dysentery*

A patient suffering from an acute attack of bacillary dysentery should be put to bed and not allowed to get up for any purpose. The treatment may be conveniently discussed under three headings: (1) diet, (2) the administration of salines, (3) serum treatment.

The *diet* should be fluid, consisting of albumin water, whey, beef-tea, chicken-tea, raw beef-juice, or meat jelly, given in small quantities every two hours. Milk is unsuitable in the acute stage of dysentery, and should be excluded from the dietary. During the first few days the supply of an abundant amount of fluid is of great importance, and the patient should be encouraged to drink as much water, barley-water, or lemonade (only slightly sweetened) as he may desire.

The *administration of salines* is invaluable during this stage. Their action, in no sense specific, depends on a gentle lavage of the intestinal mucous membrane by the copious watery secretions, whereby inflammatory products containing bacilli and toxins are washed away in place of being absorbed. The sulphate of magnesium or sodium, or sodium phosphate may be given, a drachm every two hours during the daytime only, between the hours of 8 a.m. and 6 p.m. Diurnal irrigation of this kind may be safely combined with sedative treatment at night time—e.g., a dose of laudanum or a hypodermic injection of morphia, often needed for the relief of pain and tenesmus, and to promote sleep. After two or three days the quantity of sulphate may be reduced by one half; but the treatment in modified form should be continued until convalescence is established, as it is important that the motions should be prevented from becoming hard and constipated during this period.

Serum Treatment.—Antidysenteric serum is of the greatest value, and should be given in all but mild cases. Two conditions are essential to success: (*a*) the serum should be administered

at the earliest moment; (*b*) it should be given in sufficient quantity. The earlier the stage of the disease, the more effective is the treatment. Its value rapidly lessens with lapse of time, and there is probably little to be gained by initiating serum treatment at a later period than the sixth day. 60, 80, or 100 c.cm. may be injected subcutaneously into the loose tissues of the lateral abdominal wall or elsewhere; the effects of smaller doses are in proportion far less striking. In many instances a single dose is all that is necessary; but if the symptoms are not clearing satisfactorily a second dose may be given after an interval of two days. In urgent cases with fulminating symptoms of choleraic type the serum should be injected intravenously and combined with hypertonic saline solution. The most favourable results may be expected if a serum is used containing exclusively Shiga or Flexner antibodies, according to the type of infection; but in practice no time should be lost by waiting for the laboratory report; the more acute the symptoms, the more likely is the case to be one of Shiga infection, and the best course is to use a polyvalent serum which is known to be rich in Shiga elements. If a second dose is needed, it may consist of pure anti-Shiga or anti-Flexner serum, according to the pathological diagnosis.

The drawbacks to serum treatment are for the most part unimportant. Anaphylaxis is a very rare complication, but its manifestations may be so formidable that it is a wise practice to put the following preliminary questions to the patient: (*a*) Has he had diphtheria? (*b*) Was he on active service during the war? If so, (*c*) Was he wounded; or (*d*) did he suffer from dysentery? In the case of an affirmative answer to any of these queries, the administration of the full dose of serum should be preceded by a tentative injection of 1 c.cm., which will have the effect of unmasking and, at the same time, of removing any hyper-sensitiveness that may exist. Serum fever, arising about the fifth day after the injection, with an urticarial or erythematous type of rash, is of no serious consequence. Joint pains, with or without swelling, may occur at the same time or a few days later, and have to be distinguished from true dysenteric arthritis, which, however, is a much more definite and severe form of arthritis, and is comparatively late in its onset.

Convalescence.—The most important consideration in guiding the patient through the stage of convalescence is the management of the diet. This should be increased, as in typhoid fever, by slow degrees, the effect of each addition being carefully watched before any further advance is permitted. Nutritious jellies, egg beaten up in milk, custard, junket, soft bread and milk made without crusts, and milk thickened with farinaceous foods may successively be added. When convalescence is fully established, as shown by a clean tongue and the disappearance of abdominal symptoms, a rapid advance to a normal dietary may with confidence be made; even in cases where the initial

symptoms were severe, the progress to recovery may, in the absence of complications, often be surprisingly rapid.

Complications.— Profuse hæmorrhage and perforation are both rare events in the course of the acute stage of dysentery. Hæmorrhage calls for absolute rest, the complete withholding of nourishment by the mouth, and the administration of morphia hypodermically. In severe cases the subcutaneous injection of normal saline, or an isotonic mixture of glucose solution with saline is indicated. In the event of small recurring hæmorrhages rectal injections of copper sulphate, 1 in 1000, may be useful, the mucous membrane having been cleansed by preliminary irrigation with warm water or saline solution. In the unlikely event of perforation during the acute stage an immediate laparotomy affords the only chance of saving the patient's life. In cases of fulminating dysentery with diarrhœa of choleraic type it is important to exclude cholera, which may be done by a microscopic examination of the watery stools and noting the absence of vibrios; the treatment consists of the immediate injection intravenously of a full dose of serum, repeated if necessary, and combined with hypertonic saline solution. Arthritis occurs more often in sequel to a Shiga infection than in cases of Flexner dysentery. It arises usually in the course of the third week, and is accompanied by considerable enlargement and tenderness of the joints, with effusion of fluid. Complete rest of the affected joints is necessary, and much relief may be obtained in suitable cases by tapping and the removal of the fluid. A dose or two of serum may be followed by rapid subsidence of the joint symptoms; but this remedy should be used with caution if serum has been administered during the acute stage, owing to the risk of anaphylaxis. It is a mistake to keep the joints at rest too long; after the subsidence of the acute symptoms, massage and carefully regulated passive movements should be employed, and radiant heat is useful.

(B) *Chronic Bacillary Dysentery*

Chronic bacillary dysentery is more likely to follow in the course of a comparatively mild Flexner infection than the severer types of Shiga dysentery, and may lead to a clinical condition that calls for the utmost skill and resourcefulness on the part of the physician. As the symptoms of a chronic bacillary infection may closely resemble those of amœbic dysentery, it is necessary as a preliminary measure to make a careful examination of the stools. In not a few cases it will be found that both a bacillary and an amœbic infection exist side by side, and in such an event a course of treatment with emetine is of primary importance. Wasting is often a marked feature of chronic dysentery, and may be so extreme that the nourishment of the patient becomes the paramount consideration. Under these circumstances better results may be hoped for if the patient is

placed on a fairly generous dietary, composed of soft semi-solid articles of food, from which everything of an irritating nature is rigidly excluded, than on a strictly fluid régime. In the management of the bowels constipation may call for the use of sulphates, or in some cases repeated small doses of calomel (gr. $\frac{1}{4}$ four times in the day) may be remarkably beneficial. In other cases profuse and exhausting diarrhœa is a prominent feature, and may be met by β-naphthol (gr. 5 in cachet four times a day), or bismuth salicylate (gr. 20 four times a day). Lavage of the intestine is more often useful than in acute dysentery; a long soft tube should be employed, and the fluid allowed to flow in gently through a funnel by gravitation. Dilute solutions of antiseptics, such as eusol, or of astringents, such as silver nitrate or copper sulphate (1 in 1000), may be used, but it may be regarded as doubtful whether these have any real advantage over cleansing injections of warm boric or weak permanganate solutions, or even of warm saline. A considerable number of cases ultimately prove refractory to all forms of medical treatment, and in these the question of securing a more efficient degree of lavage by appendicostomy should be considered, or complete rest for the lower bowel may be temporarily provided by arranging for the evacuation of the faeces through an opening in the caecum. Vaccine treatment has been employed with a certain measure of success. Perforation is a more likely complication of chronic than of acute dysentery; owing to adhesions the resulting peritonitis is often localised, and ultimately a large circumscribed abscess may be formed. On account of the chronic nature of the process the clinical picture is often quite indefinite, and the condition may exist for some time before it is recognised; the treatment is surgical.

VII

THE TREATMENT OF DYSENTERY (*continued*)

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II.—Amœbic Dysentery

An amœbic infection of the intestinal tract gives rise to a great variety of manifestations, and the clinical picture is accordingly considerably less definite than that of bacillary dysentery. Though occurring in both acute and chronic forms, amœbic dysentery is in the majority of cases characterised by a slow and insidious onset and chronic course, with a tendency to occasional exacerbations, during which the patient is acutely ill. The condition often bears a considerable resemblance to that of chronic bacillary dysentery, and a definite diagnosis may be impossible until the presence or absence of amœbæ or their cysts has been determined by the microscopic examination of the stools—an examination which, in the event of negative findings, must be repeated several times before an amœbic infection can be regarded as definitely excluded. Unlike the chronic bacillary form, there may be in amœbic dysentery long intervals, during which all symptoms may disappear, and a state of fair health seems to be established—a circumstance which needs to be borne in mind in assessing the value of any special line of treatment. The occurrence of hepatic abscess or acute hepatitis in the course of chronic dysentery amounts to practical proof of an amœbic infection.

The general management of a case of amœbic dysentery must be regulated by the severity of the symptoms. During the acute phases, characterised by diarrhœa with frequent loose stools containing mucus and blood, the patient should be kept in bed and placed on a strictly fluid diet. There is not the same objection to milk as in acute bacillary dysentery, and it may be given freely. In the absence of acute symptoms it is seldom necessary to confine the patient to bed, though every form of active exertion should be forbidden; nor is it desirable to restrict the diet to fluids, provided that articles of food which are likely to pass through the intestine in undigested form and cause irritation of the lower bowel are avoided. Constipation is often present, and is best corrected by the use of salines.

The pathological diagnosis of an amœbic infection should be at once followed by one or more courses of treatment with emetine, which is a specific remedy for amœbic dysentery in a similar sense to that in which quinine is a specific remedy for malaria. The chief value of emetine lies in its remarkable controlling influence over the more acute manifestations of the disease; as a means of cure in the sense of the complete eradication of the parasites its efficacy is less striking, and failure is not uncommon. Nevertheless, we possess no remedy more potent for the control of amœbiasis, and the pathological diagnosis of an amœbic infection should be followed as a matter of routine by one or more full courses of treatment. A course consists of 12 days' treatment, during which either (*a*) emetine hydrochloride gr. $\frac{2}{3}$ are given hypodermically twice daily; or (*b*) gr. 1 is given by mouth, supplemented by gr. $\frac{1}{2}$ hypodermically each day; or (*c*) bismuth-emetine-iodide gr. 3 are given daily by mouth in salol-coated capsules. The result of the treatment must be checked, not only by observing its clinical effects, which in acute cases are often very striking, but by repeated examinations of the stools for amœbæ and cysts. A single course seldom effects a cure; when more than one course is required there are advantages in varying the method of administration, and the order given above may conveniently be followed, reserving bismuth-emetine-iodide for the more chronic and intractable cases. It is desirable that, during treatment with emetine, the patient be kept in bed, however slight his symptoms may be, as in these large doses the drug has a definitely depressing action on the heart, which should therefore be spared as far as possible. While taking emetine by the mouth, the patient is given a simple semi-fluid diet, and should be kept strictly at rest for some time both before and after the daily dose, which may conveniently be given an hour after the last meal. Vomiting seldom gives trouble under conditions of absolute repose; if necessary a draught containing 10 minims of tincture of opium may be given half an hour before the dose of emetine. Slight nausea is not unwelcome as a proof that the drug is being absorbed. In a large number of cases it will prove impossible to bring about the complete disappearance of cysts, even by repeated courses of emetine, so long as the patient remains in a hot climate, under more temperate climatic conditions treatment can be resumed with more hopes of permanent success.

In dealing with specially resistant forms a trial may be given to the method of combined administration of emetine with neosalvarsan or novarsenobillon; the dose of the arsenical preparation is 0·3 g. or 0·4 g. given intravenously once a week. This method has been employed in a number of cases by Brug and others, and favourable results are reported.

Enemata of quinine, in increasing strength from 1 in 5000 to 1 in 1000, have been largely used in the treatment of chronic

relapsing cases, and are undoubtedly effective in destroying large numbers of the organisms which lie loose in the intestinal secretions or on the surface of the mucosa; it is, however, very unlikely that they are of any avail against cysts or amœbæ embedded in the substance of the mucous membrane; and though they may have their use as adjuvants, injections of quinine solution into the bowel must be regarded as ranking far below emetine in their parasite-destroying properties. In giving any kind of enema, it is of the greatest importance to bear in mind the necessity for the utmost gentleness in manipulation in order to avoid the risk of perforation.

Acute Hepatitis

The advent of acute hepatitis is indicated by pyrexia, with pain over the liver, which on examination is found to be enlarged and tender. A course of emetine in full doses should be inaugurated with the least possible delay, as there is reason for believing that by this means the condition may be brought under control and the formation of an abscess prevented. The onset of suppuration may be marked by no special symptoms; but more usually there are repeated rigors and a further rise of temperature, with a rapid deterioration in the general condition of the patient. The earliest local signs of hepatic abscess are often to be found at the right pulmonary base, and are due to the pressure effects of the abscess in an upward direction, causing partial collapse of the lung; with extension of the inflammatory process there may also be a pleural rub or signs of a pleural effusion. When there is reason for supposing that pus has formed, the diagnosis should be confirmed by an exploratory puncture and the pus then removed, either by an open operation or by aspiration. The contents of an amœbic abscess are usually completely free from pyogenic organisms, and hence, in the case of all but very large collections of pus, the method of aspiration is greatly to be preferred, on grounds both of simplicity and efficiency. A Potain's aspirator may conveniently be used, and after removal of the pus 4 or 5 gr. of emetine in solution should be injected into the abscess cavity.

Complications other than those connected with the liver are rare. Perforation may occur, and is occasionally the earliest manifestation of an amœbic infection which, up to the moment of rupture of the intestine, has been completely latent. An immediate laparotomy is indicated. More often perforation is a late event, and considerable difficulty in diagnosis may arise owing to the existence of adhesions and the circumscribed nature of the resulting inflammatory changes. The appropriate surgical treatment must be undertaken at the earliest moment.

VIII

THE TREATMENT OF PSORIASIS

By R. Cranston Low, M.B., F.R.C.P.,

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Unfortunately the treatment of psoriasis is still in a very unsatisfactory position. Probably no great progress will be made till the cause of the disease is known. In many cases the eruption can be removed, if not permanently, at least for some years. In the bad cases, which relapse almost immediately after treatment is stopped, one can only hope to ameliorate the condition without curing it. The treatment may be either external or internal.

External Treatment

This varies according as the eruption is spreading or stationary. If the eruption is spreading rapidly, is itchy, and shows numerous small recent spots, rest in bed is almost essential. If the patient goes about, the rubbing of the clothes and alterations in temperature tend to increase the spread. Rest in bed slows down the circulation and keeps the skin at an even temperature. All strong applications should be avoided. There is a great temptation to apply some strong ointment to check the eruption; but this never succeeds and simply leads to a further spread. The only way is to soothe the skin till the eruption stops spreading, and not till then is the actual cure begun. An ordinary warm bath should be given daily, and the scales washed off with plain soap and water. If the case is not too acute sulphur baths (potassa sulphurata ℥ii or a packet of sulphaqua to each bath) are often very beneficial. Night and morning plain vaseline or an ointment of 5 parts of soft paraffin and 1 part of hard paraffin should be rubbed in. After a week or ten days the eruption ceases to spread. The baths should be continued, but in place of the vaseline the following ointment should be used: R sulph. præcip. and ac. salicyl. aa gr. iiss, lanolin and vaseline aa ℥ss. This is continued as long as there is an improvement. As soon as the improvement ceases the sulphur and salicylic acid are increased to gr. 5 to ℥i (i.e. 1 per cent.), and later to gr. 10 to ℥i (2 per cent.). Finally crude coal tar, painted on very thinly with a stiff brush, should be applied to one area, and allowed

to dry on and remain on for 24 hours. If no irritation is caused, the tar should be applied to all the other areas in rotation, doing the arms on the first day, the legs on the second, the front of the body on the third, and so on, taking about five days to paint all the spots. Each spot in this way gets tar for one day and the 2 per cent. sulphur salicylic ointment for the other four days. As the eruption becomes paler the tar should be painted on every fourth day, then every third day, every second day, and finally, when there are only a few spots left, every day. The patient should be kept in bed till the tar is found to be suiting the skin. In men, if the hair is cut short, the scalp can be tarred like the rest of the skin. The tar washes off easily if any grease such as the sulphur salicylic ointment is applied. Wood tars, such as ol. cadini, are not so efficacious as the crude coal tar, besides having the great disadvantage of the strong smell. Cases after treatment with crude coal tar, if thoroughly done, are much less liable to relapse than after any other form of local treatment. The course of treatment takes from eight to ten weeks to effect a cure.

In cases where the psoriasis is extensive but no longer spreading the same treatment should be applied, beginning with the 1 per cent. sulph. salicylic ointment and going on rapidly to the stronger ointment and tar. Chrysarobin ointment is only useful in stationary cases, and should never be used if the eruption is itchy or spreading. It is not suitable for ambulatory cases. When it is used, it should be continued till the spots, which at first turn white, are beginning to show a pink colour again. After the chrysarobin treatment the case should be treated with crude coal tar to prevent recurrences. In many stubborn cases X-rays will be found very useful. They should be applied once a fortnight in doses of one-half Sabouraud pastille at a distance of 15 cm. from the centre of the tube. With an ordinary gas tube the exposure is about seven to eight minutes. Usually two applications are sufficient to cause a marked improvement. The rays are especially useful when the eruption affects areas where it is difficult to get ointments into the lesions, such as on the palms and soles and the scalp. When applied to the scalp the dose is not sufficient to bring the hair out. It must be remembered, however, that the eruption does not stay away for any length of time after X-rays. The ordinary local treatment must be applied at the same time. Whatever form of local treatment is applied it must be thorough. The scalp must be specially attended to as the disease is frequently left incompletely cured in that area. Unless every spot of disease is removed one cannot hope to prevent a recurrence.

Internal Treatment

Drugs as a rule are rather unsatisfactory. Arsenic should be tried as Fowler's solution ℥5 t.i.d., but is only useful in stationary

cases. Larger doses than ℥5 are useless, because if the arsenic is pushed till the patient is ill from it the psoriasis will improve temporarily, just as it does if the patient takes any acute illness such as pneumonia. As soon as the patient recovers from the arsenic the eruption recurs. The same remarks apply to thyroid extract. If a result cannot be obtained with small doses no permanent effect will be produced by large doses. The newer arsenical preparations of the arsenobenzol group have been tried, but the results obtained were disappointing. In spreading cases and also in chronic cases salicin gr. 10 t.i.d. is much more likely to do good than arsenic. Alkalies such as pot. citras gr. 15, together with mag. carb. gr. 5 t.i.d., are also sometimes useful. The reason for giving alkalies is based on the theory that in psoriasis the skin is too acid. From analogy with seborrhœic conditions, which are somewhat allied to psoriasis, there is some evidence that the skin is more acid than normal. The acne bacillus, which many believe to be identical with the seborrhœa bacillus, will only grow outside the body in an acid medium. Assuming that the skin is more acid than normal in psoriasis, that would explain why some individuals get psoriasis, and others, with less acid skins, do not. It is possible that in psoriasis there is a bowel infection with fermentation and the production of acid. Dieting should be tried in all cases. Psoriasis is certainly not due to any particular food, but good results may sometimes be obtained by cutting out or cutting down certain groups of foods, such as sugars, starches, meats, fats, and acid fruits. Each group should be cut down to the minimum in rotation. If an improvement is going to take place it will show itself within ten days or so. If this form of dieting produces no results, sending the patient to one of the spas, such as Harrogate, to get the bowel thoroughly cleared out does good in some cases. Drinking the waters alone is not usually sufficient; the lower bowel should be washed out by the Plombières douche. Vaccines made from the bowel contents have also been tried, but the results are usually disappointing.

Non-specific Protein Therapy.—In cases where all the above methods fail to give relief non-specific protein therapy may be tried. For this purpose sera, peptone, and sterilised milk have been chiefly used. Of the three, sterilised milk is the one to be recommended. If a foreign serum is used, such as horse serum, there is always the risk, although perhaps not a very great one, of anaphylactic shock reactions, and if the patient's own serum is used there is the difficulty of the technique which is necessary to prepare the serum. It is difficult in practice to defibrinate the blood, centrifuge it, and keep it sterile. Intravenous injections of sterile peptone are more easily given, but I have never seen any benefit from their use in psoriasis. Intramuscular injections of sterilised milk are easily given and with ordinary care there is no risk. Ordinary fresh cow's milk is used. The milk should be as fresh as possible because, if kept for some

hours, the growth of organisms in it produces toxic substances, which cause a marked rise of temperature after the injection. The injections should be given in the forenoon, and that morning's milk should be used. About half a pint of milk, together with a teaspoon, is placed in a small jam-jar, which in turn is placed in a pan containing water. The water is boiled for 15 minutes. The jar is removed from the pan and the "scum" removed from the top of the milk with the teaspoon. Some of the milk is then drawn up into a sterilised Record syringe, and injected with a long needle deeply into the gluteal muscle in the same way as the insoluble salts of mercury are given in the treatment of syphilis. Injections should be given twice a week, and not at longer intervals, so as to prevent any risk of sensitising the patient to the milk. For an adult the first dose should be 2·5 c.cm., the second 5 c.cm., the third 7·5 c.cm., and the fourth 10 c.cm., followed by two more injections of the same dose. Children should have 1 c.cm., 2 c.cm., 3 c.cm., and 5 c.cm., successively. Six injections should give the desired result. There is no object in giving more. Each injection is followed in two to three hours by a marked leucocytosis of the blood, and in three to four hours there may be a rise of temperature, usually to 100°–101° F. The temperature only remains up a few hours, and is not essential for the production of results. The leucocytosis seems to be the essential factor. The fresher the milk the less likelihood is there of any marked rise of temperature. If the temperature reaction is very noticeable the dose of the next injection should not be increased. The only risk connected with the injections is the possibility of the milk being injected direct into a vein and fat emboli being produced. This can be avoided if the piston of the syringe is slightly withdrawn before injecting the milk. If no blood enters the syringe, then it is safe to give the injection. If blood does appear in the syringe it is best to withdraw the needle, empty the syringe, and refill it with milk, and inject in another place. Injections should be given into each buttock alternately.

The above method has only an indirect effect on the psoriasis, and should always be accompanied by local treatment as well. When local treatment is applied it is much more efficacious and rapid in its action than it would be had no injection been given. If chrysarobin ointment is used the same effect is produced in a few days as would have taken three to four weeks in the ordinary course. Similarly tar and other applications act very much more rapidly than usual.

Finally, there is another factor which should never be forgotten in the treatment of psoriasis. The taking of alcohol in any form, even in small quantities, such as in light beers, etc., nullifies the effect of any kind of treatment.

IX

THE TREATMENT OF MARASMUS IN INFANTS

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The basal metabolism of the infant has been found to fall outside the limits of the normal when the child has lost one-fifth of its body-weight. A child therefore can be considered as marasmic if its weight is less than four-fifths of the expected weight for its age. Marasmus may be primary, a "vice of nutrition" only; or secondary to some other disease. The patient may have recovered from the original disease; if not, then treatment must be directed to it as well as to the marasmus. Disorders of digestion are not infrequent, but many cases run their course without any digestive disturbance. In the treatment of marasmus breast-milk should be given whenever available, even if partial breast-feeding only is possible. In the absence of breast-feeding the best results are obtained by using modifications of cows' milk. Having started feeding with such a mixture, it is important to continue with this form of food for a considerable time, for frequent changes in the kind and composition of the food lead but to disappointment or disaster. Not infrequently the regularisation of the time of feeding and strict attention to detail will produce improvement in an atrophic child who has previously not improved on a diet with which no fault could reasonably be found. Marasmic children are very susceptible to cold, and many have a subnormal temperature; the supplying of artificial warmth is therefore very important.

The marasmic baby should be given more food than a normal baby of the same weight. It should be the rule to feed by the expected weight for its age rather than by actual weight, or if the calorie system is used, to give the child about 70 calories per pound per diem. The total calories of a milk mixture can easily be calculated if it be remembered that 1 oz. of milk (4 per cent. fat) has a caloric value of 20, and 1 oz. of sugar a caloric value of 120. When treatment is first instituted many babies will not take this amount of food, but after a time they will usually do so, and many will take even larger amounts. It is advisable to use one of the less fermentable sugars because of the tendency

towards carbohydrate indigestion. Therefore dextrimaltose (Mead's preparation is a useful one) should be used in preference to lactose or cane sugar. The caloric value of a feed may be increased by the addition of carbohydrate in this form, which, in the absence of diarrhœa, is well absorbed. The amount used can be 5 to 10 per cent. Additional cream may be used to bring up the caloric value of the food, but is unnecessary, because the amount of cream in an ordinary good milk is sufficient for the needs of the child. The marasmic child is able to digest that amount of fat as well as the normal child. The marked cases of fat indigestion described by German writers are rare in this country. If a dried milk be preferred to fresh milk, a half-cream variety should be used, since the fat absorption is better than with the full-cream variety.

Digestive Disturbances

Marasmus may be complicated by digestive disturbances, and although many of the varieties are not quite sharply defined, mixed forms occurring in many instances, and even one form supervening on another, yet they can be roughly classified thus: (1) Fat indigestion; (2) carbohydrate indigestion; (3) protein indigestion; (4) pylorospasm; and (5) diarrhœa and vomiting.

Fat Indigestion.—This occurs chiefly under two conditions—(*a*) if diarrhœa develops; (*b*) if high fat content dried milks are used. In the latter group the fat indigestion is recognised by the passage of large pale soap stools. Unless the soap stool is a bulky one fat indigestion does not occur. The form of fat indigestion described by German workers may be included in this group. In the cases showing diarrhœa, particularly if this is severe and of sudden onset, a preliminary period of starvation, during which the child is given water, tea, or albumin water freely, and lasting 6 to 12 hours, is advisable. In many cases, however, the child is too feeble to submit to this form of treatment. If the child is dehydrated, normal saline should be given by rectum or subcutaneously. The dietary should be a low fat one, and the carbohydrate given should be in the form of dextrimaltose. The low fat dietary can be obtained by giving skimmed milk in place of whole milk. The milk should be machine-skimmed, or one of the dried skimmed milks may be used. Horlick's malted milk, diluted 1 in 8, gives a mixture which is very useful in the treatment of diarrhœa, and containing a low fat percentage. Sweetened condensed milk in the same or greater dilutions also proves useful in some cases, for it also has a low fat and a high carbohydrate content; its use, however, is limited because in many cases the sugar increases the tendency to diarrhœa. One other form of feeding is sometimes useful as a temporary measure, i.e. the giving of protein milk. This method of feeding is described under carbohydrate indigestion.

The low fat mixture can be continued for a considerable period, but an attempt should be made to increase the amount of fat as soon as possible, because of the danger of vitamin A starvation and of abnormal calcium metabolism. The treatment of the second group of indigestion consists either in substituting for the dried milk a half-cream variety of the same brand or an ordinary milk mixture. It is rarely necessary to give the very low fat mixture described in the first group.

Carbohydrate Indigestion.—This is the most frequent form of indigestion. The stools are acid, loose, and green, and may show mucus and soap curds; vomiting and colic are frequent, and the child develops sore buttocks; diarrhœa is very liable to occur. These cases arise most frequently on artificial foods or where lactose or cane sugar are used as the sweetening agents. Most of these children improve when a normal milk mixture, sweetened with dextrimaltose, is used, but it may be necessary to omit all added sugar before the symptoms clear up completely. If diarrhœa occurs the methods outlined under fat indigestion should be used. It is in this form of diarrhœa (fermentative diarrhœa) that the best results are obtained from protein milk, and this form of feeding will frequently clear up cases that have resisted all other forms of treatment. Protein milk may be easily prepared by the addition of calcium caseinate, sold under the name of "Casec" by Mead Johnson and Co. For children over 3 months of age 20 gr. of this powder can be added to every ounce of milk. This method of feeding is, however, a temporary expedient, since many children after improving and gaining weight fail to show satisfactory progress and may even develop protein indigestion.

Protein Indigestion.—Fortunately this is the rarest form of indigestion, since it is necessary to give all artificially-fed babies a greater amount of protein than breast-fed babies, due probably to the different amino-acid contents between cows' milk and human milk. Protein indigestion only occurs where an excess of protein is present in the food over a long period. It is shown by the presence in the stool of large hard brownish curds, very different in consistence and appearance from the soft white smaller curds of neutral fat or soap, and which previously were regarded as evidence of protein indigestion. The treatment of protein indigestion is the giving of milk mixtures in the ordinary dilutions and without the addition of extra protein; the addition of 1, 2, or 3 gr. of sodium citrate to the ounce of milk is also helpful.

Pylorospasm.—This is a group of cases important to recognise, because treatment is often very successful. Vomiting is frequent, often severe; constipation or diarrhœa may be present, also anorexia and wasting. On examination gastric peristalsis may be seen, rarely marked in degree; a pyloric tumour is not palpable. Efficient X-ray examination will establish the diagnosis. The treatment most likely to be successful is daily

lavage of the stomach with 1 per cent. bicarbonate of soda solution, and the giving of an ordinary milk mixture. Citration of the latter is often very helpful. In certain cases the addition of ½ gr. of bicarbonate of soda to the ounce of milk initiates an improvement. If these methods are unsuccessful the effect of atropine may be tried. The solution of atropine sulphate should be made up freshly every two or three days, the strength of the solution being ½ gr. of atropine sulphate in 1 oz. of distilled water, i.e. each minim contains 1/960 gr. The initial dose is 1 minim given 15 minutes before each feed ; this can be increased to 2 or 3 minims if symptoms continue and if no sign of overdosage with atropine is observed. The signs of overdosage are flushing and intestinal distension.

Vitamins.—The vitamin content of the diet is of great importance both in the production of marasmus and in its treatment. Absence of fat in the food, e.g. the use of machine-skimmed condensed milk—will produce atrophy, and it is essential in treating marasmus to give an adequate supply of fat in the food to ensure the presence of vitamin A and of the calcium depositing (anti-rachitic) vitamin. Some dried humanised milks have a relatively poor calcium content and are not suitable for prolonged use in marasmus, even if the vitamin content is satisfactory. The amount of calcium in ordinary cows' milk, although variable, is sufficient for the needs of the child.

Fruit juice should be given daily to marasmic infants, since a certain number of cases fail to make satisfactory progress until this is done. The same remark is true of vitamin B, an adequate supply of which can be ensured by adding 1 drachm of marmite to the 24 hours' supply of milk.

Acid Milk

The use of " acid milk " has certain advantages in the treatment of marasmic infants over 3 months of age. The buffer value of cows' milk is high, i.e. it contains a considerable amount of substances capable of combining with acid without undergoing a change in reaction. Pepsin can only act at a certain degree of acidity, and to produce that acidity in cows' milk requires the addition of three to six times the amount of acid required to bring breast-milk to the same degree of acidity. Cows' milk, therefore, involves a greater task on the part of the child's stomach than breast-milk. The buffer can be neutralised in several ways—(1) by extreme dilution ; (2) by drying milk ; (3) by the addition of acid ; hydrochloric, citric, and lactic acids have been used. Hydrochloric acid milk is prepared by the addition of 2 drachms of decinormal hydrochloric acid and 2 drachms of water to every ounce of milk. The acid should be added to the milk, and not vice versa, or clotting will occur ;

clotting may also occur if the milk is not fresh or is made too hot. Citric acid milk is prepared by the addition of $\frac{1}{2}$ g. of citric acid to each ounce of milk, to this mixture is added an equal quantity of water. Milk prepared in this way has almost the same hydrogen-ion concentration as breast-milk.

X

TREATMENT OF ESTABLISHED TABES

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No account, however brief, of the treatment of tabes would be adequate without its preface. Within the central nervous system nerve fibres, once their continuity is interrupted by disease, are incapable of regeneration. Though it may be possible by suitable treatment to prevent further extension some irreparable damage will remain. Hence the overwhelming importance of *early* diagnosis. The diagnosis being made, treatment may be considered under the headings General Régime, Anti-Syphilitic Treatment, and Symptomatic Treatment.

General Régime

The general principle is to be inculcated that the damaged machinery should not be overloaded. Exertion, mental or physical, should never be pushed beyond the point of fatigue. Since in addition to those nerve fibres which have been already destroyed by the disease there are others whose function is barely maintained and whose continuity, as it were, hangs on a thread, substances which are known to have a deleterious action upon the nervous system should be used with strict moderation. Of these the most important are alcohol and tobacco. Exposure to cold and wet, even if it has no influence upon the course of the disease, may certainly provoke an exacerbation of lightning pains, and is therefore to be avoided. Finally, a special caution must be given against excessive sexual indulgence, which, in the experience of most clinicians, has at times been immediately followed by signs of increased damage to the cord.

Anti-Syphilitic Treatment

Tabes is a late result of a generalised infection by the *Spirochæta pallida*, which has been demonstrated post-mortem in the spinal cord and posterior nerve roots of cases of the disease. The symptoms of the illness are due to irritation and destruction of nerve fibres; the progress of the disease is caused by the continued action of the spirochætal poison. Adequate treatment

by means of spirochæticidal drugs may fairly be expected to arrest this progress. The tried remedies of this nature at our disposal are arsenic, mercury, and potassium iodide. Of these there is no doubt that arsenic is the most effective; the value of mercury is more doubtful. The late Sir William Gowers expressed the opinion that in cases of tabes energetic mercurial treatment such as was given at one time at Aix-la-Chapelle only did harm. Potassium iodide certainly has not the same favourable influence upon the course of tabes as it has upon meningeal and vascular syphilis. Nevertheless, since both mercury and potassium iodide appear to be effective in syphilis elsewhere in the body, and we are dealing with a generalised syphilitic infection, both these drugs may be given concurrently with arsenic, provided that the doses employed do not upset the patient in such a way as to interfere with the administration of full doses of the more important drug. In this as in other matters the tolerance of the individual patient must be studied. I have met with cases in which the combined course of treatment resulted in malaise and anorexia; yet when the mercury and iodides were withdrawn the patient tolerated full doses of arsenic without discomfort.

Of the three methods of injecting arsenic—intravenous, intramuscular, and subcutaneous—the intravenous route is to be preferred on practical as well as upon theoretical grounds, provided that the patient has veins suited to the purpose. The practical advantage of this method is its freedom from all pain save the immediate prick of the puncture. In theory it provides the most effective means of submitting the causal organisms of the disease to the immediate influence of maximal doses of the drug. Clinical experience supports this hypothesis, for in cases which eventually show good results from treatment, the first intravenous injections are commonly followed within 24 hours by an exacerbation of symptoms, such as lightning pains or visceral crises, probably indicating a focal reaction to the treatment. The fact that intravenous injections are more liable to produce symptoms of an immediate "toxic" reaction in the patient than subcutaneous or intramuscular doses is no objection to their use. Animal experiments have shown that the germicidal action of arsenobenzol compounds upon an infecting protozoon is roughly proportional to their toxic action upon the host, so that within the limits of safety [1] "toxic reaction" in the patient may be taken as evidence of efficient dosage.

Of the various preparations of arsenic suitable for intravenous injection that known as novarsenobillon best combines simplicity and efficacy, being readily soluble and easy to administer. A dose of 0·9 g. N.A.B. in 10 c.cm. of distilled water gives a perfectly clear solution. Experience has shown that

[1] Safe preparations are those which bear a label stating "The contents of this box have passed the tests of the Medical Research Council for toxicity and therapeutic activity."

certain unpleasant symptoms such as headache, fever, and shivering which occasionally follow within 24 hours of an injection may be due to the presence of dead bacteria in the water used for the solution. It is therefore advisable to use for this purpose ampoules of distilled water which has been sterilised and sealed immediately after distillation. Such ampoules containing 10 or 20 c.cm. are easily obtainable. The technique of intravenous therapy lies beyond the scope of this article, but in view of the fear of a " bad arm " after injection, which is sometimes a bar to efficient treatment, two points may be noted. First, the vein to be easily pierced must be adequately compressed, and this is most simply done by applying the pneumatic band of an ordinary sphygmomanometer and blowing it up to a point just insufficient to obliterate the arterial pulse. In the second place, the least sign of leakage into the tissues at the commencement of infection should be the signal for withdrawal of the needle and puncture of another vein. Upon the question of dosage no hard-and-fast rules can be laid down. Individual symptoms and individual tolerance have to be considered in each case. The following plan is suitable in the case of a male adult who tolerates the treatment well:

A mixture containing ʒi of the liquor hydrarg. perchlor. and 30 gr. of pot. iod. is given three times daily from the onset. The course of arsenical treatment begins with an injection of 0·45 g.; after a week's interval 0·6 g. is given, and subsequently doses of 0·9 g. at weekly intervals until approximately 5 g. have been given. An interval of six weeks is then allowed during which the mixture is continued, but no arsenic is given. In practice this has been found a safe period to allow for the prevention of cumulative arsenical poisoning. The injections of 0·9 g. are then continued at weekly intervals until a further 5 g. have been given. At the end of this course the patient is allowed six weeks' freedom from all drugs; the mixture and injections are then begun again until a further 5 g. of N.A.B. have been administered, and the patient continues with the mixture for a further six weeks.

Further treatment will depend upon the state of the disease. In the great majority of cases progress will have been arrested, and symptoms in some degree relieved; in this case the patient may be released with the advice to attend for further treatment if fresh symptoms develop, and *in any case* to attend annually for a short course as a preventive of further trouble. This course should consist of four weekly doses of 0·9 g. N.A.B. together with mercury and iodide by the mouth as before.

The results of anti-syphilitic treatment carried out upon these lines are encouraging. In the majority of cases the progress of the disease is brought to a standstill; the severity of lightning pains and visceral crises also is frequently mitigated. Some few

cases, however, in spite of treatment progress from bad to worse, so that no absolute assurance of relief can be given to a patient. In these cases anti-syphilitic treatment should be continued so long as the patient develops no symptoms of intolerance. Most tabetics bear well the dosage of N.A.B. described. A careful watch must be kept for individuals intolerant of arsenic; for since the poison has a cumulative effect, severe toxic symptoms may continue to develop for several weeks after the last injection has been given.

The W.R. in blood and spinal fluid is often valuable in confirming a diagnosis of early tabes. As a guide to progress and further treatment it is unreliable, since it is by no means rare to discover actively progressing tabes with a positive history of syphilitic infection despite a negative reaction in both blood and fluid. As to the intrathecal injection of salvarsanised serum, the theoretical basis for its use is insecure, it is a complicated, costly, and painful procedure, and there is no certain evidence to show that the clinical results achieved by it are better than those which may be expected from intravenous injections alone.

Symptomatic Treatment

The severity of lightning pains may be mitigated by means of the coal tar analgesics. Veramon in doses of 6 to 12 gr. is especially useful. Opium should be reserved for rare occasions, as when it may be essential for a special purpose that the patient should obtain complete relief for a few hours.

Gastric crises, if the patient is capable of taking drugs by the mouth, may be partially relieved by the administration of chloretone in 10 gr. cachets (two or three in 24 hours) or an attempt may be made to abort the attack by a single dose of 20 gr. Tr. belladonnæ in 10 ℥ doses also has a favourable effect in some cases. Failing these remedies morphia judiciously administered by a nurse at critical periods affords the only measure of relief. In a prolonged attack, warmth, rest in bed, and rectal glucose are essential to combat the prostration. In long-standing cases recourse may be had to operation. Posterior root section is seldom of permanent value; more favourable results have followed section of the pain tracts in the spinal cord, a more delicate but less severe operation than the other.

Bladder disturbances may be of two kinds. Spasmodic evacuation with imperfect control may be relieved by tr. belladonnæ in 5 ℥ doses thrice daily. Atony of the bladder wall with retention may be combated with a similar dose of liq. strychninæ. In either condition the patient should be instructed to attempt to pass water at regular (three hourly) intervals regardless of desire. Retention with overflow calls for regular catheterisation and a daily wash out with 1/2 per cent. acetic acid. The ataxia may be partially compensated by means of the exercises originally suggested by Frenkel. These may be

commenced in bed, and with their aid it is sometimes possible to obtain some power of locomotion even for patients long bed-ridden.

Perforating ulcers are more easily prevented than cured. The tabetic should be warned never to cut his corns. Charcot's joints in the acute stage should be treated by rest and immobilisation. In the latter stages celluloid splints may be of great value in preventing excessive mobility (especially at the knee-joint) without overburdening the limb.

XI

TREATMENT OF RHEUMATISM OF CHILDHOOD

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Modes of Onset

The recognition of rheumatism in childhood at its very earliest stage is of such paramount importance in influencing treatment that a word must be said about the modes of onset of this extremely common and destructive disease. These may conveniently be divided into three groups: (1) Onset with acute symptoms; (2) onset with chorea; (3) insidious onset.

1. *Acute onset* is that familiar to those working in the medical wards of general hospitals. It usually takes the form of an acute febrile polyarthritis, which yields rapidly to treatment, but which is often followed by a varying degree of carditis: in this case the child continues to occupy for some weeks a bed or cot much needed for fresh admissions, but when the cardiac condition seems relatively stabilised, she is necessarily discharged. It is this form of the disease which, under the name of "acute rheumatism," has fostered the erroneous idea of the arthritis being a disease in itself, whereas, indeed, it is only, like acute pleurisy in tuberculosis, an acute symptom of a grave underlying constitutional infection.

2. *Onset with chorea* is also common. These cases commonly develop endocarditis at an early stage. At any time during the course of the chorea a heart lesion may (but does not always) develop, so that a long period of uncertainty as to the future is inevitable even in the most favourable cases.

3. *Insidious onset* is too often recognised only in the past tense. The symptoms are, indeed, numerous enough—"growing pains," sore-throat, headache (too often attributed to eye-strain), pallor, wasting, and languor—but none of these may make a sufficient appeal to the hard-worked mother of a large family, and often the child is only taken to hospital for shortness of breath due to advanced cardiac disease. Into this third group of cases there is a steady drift of children from the first and second groups, who, as a result of recrudescences of infection, become the subjects of a chronic rheumatic carditis, which at

the worst destroys life in a few months or weeks and at the best is likely to lead to chronic cardiac insufficiency in later life. Occupying positions intermediate between these two extremes are thousands of cases, presenting all kinds of combined symptoms and signs of cardiac infection and insufficiency, the prognostic significance of which is the only key to proper treatment.

Treatment may conveniently be considered under the same three headings as have been used above, viz. treatment directed against (*a*) acute symptoms, (*b*) chorea, (*c*) chronic carditis—it being understood, however, that the third class of treatment applies to every case of rheumatism occurring in children.

Treatment of Acute Symptoms

The arthritis and pyrexia in an acute case rapidly yield in young subjects to treatment by salicylates. Rheumatism is rare below the age of 6 years. To a child of 8 or 10 years, 15 gr. of sod. sal. may be given with 30 gr. of sod. bicarb. every other hour for eight hours, and thereafter four-hourly until the temperature becomes normal. After this the medicine must be continued thrice daily for at least a fortnight. In the meantime the child is kept in bed between blankets, and any affected joint is supported by cotton-wool and a small many-tailed bandage. In the case of a persistently painful joint, linseed poultices applied over a single painting with tincture of iodine are useful. While any acute symptoms remain the diet should be strictly limited to milk and clear fluids, a milk diet being of great importance in the reduction and prevention of fever; meat extracts are not allowed. If tonsillitis is present the openings of the tonsillar crypts must be repeatedly cleared by sponging with cotton-wool swabs; the mouth must be kept clean and the bowels opened daily. In the absence of all complications, rest in bed should be, if possible, continued for six weeks in all.

Chorea.—The treatment of chorea involves rest in bed and emotional restraint in all but a very few cases in which the neurotic element is so marked as to make early re-education of the first importance. The children should be encouraged to occupy themselves with sewing, knitting, or jig-saw puzzles for an hour or two every day, and a careful and discriminating nurse will know how to steer them between the varying emotions, dependent upon fatigue on the one hand and boredom on the other. Arsenic is of much use, given as Fowler's solution raised by ℥i or ℥ii week by week from an initial dose of ℥iv t.d.s., until the choreic movements are in abeyance. The dose may then be continued unchanged for three weeks and then gradually lowered week by week until it is omitted altogether. Thereafter the child may start getting up, an added quarter of an hour every day being quite sufficient. During this stage, also, breathing exercises are most useful for the dissociated respiratory movements.

Prevention and Treatment of Rheumatic Carditis

In the prophylaxis and treatment of rheumatic carditis is involved one of the chief outstanding problems of public health. Rheumatic disease stands in relation to tuberculosis of childhood as regards frequency in about the relation of 2 to 3, but, in great contrast to tuberculosis, as yet no serious effort has been made to cope with what Dr. F. J. Poynton has rightly called a preventable disease, great destroyer of life though it is. Questions of importance in the general prevention of the disease include the improvement of housing conditions, the education of school authorities to recognise early symptoms, and the desirability of notification to enable cases to be followed up.

Management of the Individual Case

1. *Tonsillectomy.*—Whenever it can reasonably be assumed that the tonsils may be a seat of rheumatic infection, tonsillectomy should be carried out. A fortnight's administration of salicylate of sodium thrice daily while the temperature is normal should precede operation. The evidence in favour of tonsillectomy is not yet conclusive, especially when chorea has been present, but on the whole it appears useful, especially if carried out after the first attack and before the heart is involved.

2. *Fresh Air.*—After tonsillectomy (and, in acute cases, after the completion of the treatment already described for these) a child who has had any form of rheumatic disease should be sent away from the environment in which it was contracted for from six to eight months, especially when the home is in a large town or a damp climate. This long convalescence should be insisted on whether complications in the shape of heart disease and chorea are present or not. Such a procedure often appears unreasonable to the parents, since the child seems to them and professes personally to be absolutely well. Nevertheless, it appears likely that when the allotted term of fresh-air treatment is lowered beneath six to eight months, recrudescence is more than likely to occur, after the return home, in the rheumatic, just as in the tuberculous child.

3. *Rest.*—The ordinary convalescent homes, it is generally agreed, are not suited to deal with rheumatic cases. The life there is too active; rheumatic children should not be allowed to run about with those convalescent from such self-limiting diseases as pneumonia and whooping-cough. This means that accommodation should be found for them in some country home or ward where there is suitable nursing supervision. The number of available beds in this country is entirely inadequate for the thousands of children requiring them. Nevertheless, a few such places exist, of which the new heart home at Hartfield is the most recent.

As to the question of rest in bed, opinion is apparently still

divided, though such authorities as Sir James Mackenzie and Dr. R. Hutchison recommend as much as six months' rest in bed while there is still evidence of infection in the heart. After observation of a number of cases during some length of time, I have come to the conclusion that the choice between rest in bed and progressive infection of the heart is in many cases unavoidable, and I have certainly never seen a child the worse for a long period of rest in bed. The children must be kept warm and should be out in the fresh air as much as possible; they should sit up in bed, since in that position the respiratory muscles act at greater advantage. Under such conditions the patients remain very contented and happy, provided that disappointment is not caused by foolish suggestions that "perhaps the doctor will let you get up this week," etc. Such suggestions, and the type of visitor who makes them, should be rigorously discouraged, since any emotional upset is very bad for rheumatic children. Treatment by rest in bed should be continued until three conditions are fulfilled: (1) The disappearance of anæmia. (2) The return of the pulse to normal, and the disappearance of the excitability characteristic of the rheumatic heart. In this connexion the return of the normal respiratory variations of the pulse is a sign of great assistance. (3) Stabilisation of the physical signs given by the heart. At this stage the borders of the heart assume fixed positions and, a sign of the greatest importance in mitral disease, the apical diastolic bruit, caused by obstruction to the smooth flow of blood over the mitral valve, ceases to vary its position in the cardiac cycle. These conditions fulfilled, the patient may be allowed gradually to get up, an added quarter of an hour being allowed daily so long as the physical signs remain constant. At the end of a month the patient will then be having an eight-hour day out of bed; but a long rest is always to be given in the middle of the day. At this stage respiratory and other physical exercises, suitably graduated, are of importance. During all this time the heart and pulse must be watched carefully. I have never seen the heart-rate do anything but rise at the commencement of getting up, though the contrary has been reported.

4. *Drugs.*—Salicylates should be given a good trial in every case where there is a recrudescence of pain or pyrexia, and will be successful in reducing these symptoms in all cases except those of advanced infective carditis. Should they fail, arsenic should be tried. The action of digitalis is uncertain, but a certain number of cases of persistent tachycardia undoubtedly respond to full doses of the tincture. In others there is no effect. Possibly the electro-cardiograph may in the future differentiate more exactly the group of those cases among children who respond to digitalis from those who do not. Iron and hæmoglobin should be used during the long convalescent stage.

5. *After-care.*—The child having returned home at the end

of six or eight months, regular and prolonged after-care is still necessary. When the heart has been damaged a place should be secured for the child at a school of the type that is provided by the London County Council for physically debilitated children. As a result of a long series of investigations, Dr. W. St. Lawrence, of New York, has come to the arresting conclusion that not until a given case has remained free from recrudescences for three years can its recovery be regarded as fairly safe.

XII

TREATMENT OF EPIDEMIC ENCEPHALITIS (ENCEPHALITIS LETHARGICA)

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The early diagnosis of epidemic encephalitis is of importance, not because there is a specific treatment as in diphtheria, which must be given early to be effective, but because some of the conditions which simulate it, such as intracranial tumour or abscess, cerebro-spinal fever, cerebral syphilis, uræmia, and various drug poisons, call for quite other treatment, the delay or omission of which may be of serious import. Conversely also, some cases of encephalitis may easily be mistaken for other conditions. Painful abdominal myoclonus has been diagnosed as an acute emergency, and laparotomy performed in consequence; whilst the curious moral changes of behaviour, which so often occur in children as the result of this infection, have in some instances been dealt with as wilful naughtiness with most unhappy results. A definite diagnosis cannot, however, be made until characteristic nervous signs show themselves. Early or premonitory general symptoms may be present in some cases for days, in others for weeks, but there is nothing distinctive either in their character or in their grouping. Thus by the time that its presence is recognisable the poison has already reached the nervous system.

Disinfection.—It is believed that the primary site of infection is the mucous membrane of the mouth and naso-pharynx. Measures may therefore be taken to disinfect these regions from the first. Potassium permanganate solution (1/1000) was found by Levaditi to be particularly effective in destroying his virus under experimental conditions, and there is thus some justification for preferring it for this purpose.

Rest.—Rest in bed is clearly indicated in severe cases, and in them not difficult to enforce, but it is sometimes not easy to persuade a patient suffering from nothing but a slight diplopia to remain in bed for some days. However, the mildest case may at any moment develop into one of serious character. Many fatal cases have for varying periods seemed to be exceedingly mild. Whether any of these would have run a less serious course

had they been kept in bed from the first it is not possible to say, but it seems reasonable to insist that any person suffering from an acute infection of the central nervous system should be kept in bed at any rate until the acute stage may be assumed to be over, however slight that infection may appear to be.

Isolation.—The question of isolation is one of considerable difficulty, seeing that instances of direct infection are extremely rare. Theoretically no doubt it is desirable, but practically it is impossible to carry out a complete scheme of isolation based upon our scanty knowledge as to the conditions of transmission, or the period of infectivity. General measures as regards the hygiene of the sick-room should be adopted. At the Sheffield City Fever Hospital, where large numbers of cases have been under treatment during the recent outbreak, those kept out in the open all day appear to have been less excitable and to sleep better.

Diet.—Food should be light and palatable. In the acute restless cases the difficulty of feeding is often as great as in severe cases of chorea, and it is important to make sure that adequate quantities are taken. Some of these cases lose flesh rapidly. The same applies to the very lethargic patients, who will go for hours together without food unless made to take it. Dysphagia from bulbar lesions may add to the difficulties in some cases ; it is usually only temporary.

Management of a Case

Many lines of treatment of the infection itself have from time to time been suggested. Amongst these are the fixation abscess, " pure influenza " antigen, serum from convalescent cases, sodium salicylate intravenously (administered in 1/30 solution, 1 to 3 g. daily). Individual observers have praised these and other remedies, but none has received general support, whilst some have been definitely abandoned by those who previously advocated their use. At the present time various workers in Paris are testing the value of intra-thecal injections of a vaccine prepared from the central nervous system of rabbits infected by the virus which Levaditi obtained from the brain of a human case. The results are said to be encouraging, but they are still too few and uncertain to warrant undue optimism. In some of the cases so treated an undesirable meningeal reaction has occurred, and it seems doubtful whether repeated lumbar puncture in this disease may not itself be actually harmful. Some believe that it should be avoided if possible, and never performed in cases where the diagnosis is obvious ; others, however, consider it is of therapeutic value in the relief of lethargy and other symptoms. Probably the most generally used drug, on theoretical grounds, is hexamine, given in full doses (10 gr. t.d.s.) over considerable periods, during which the urine should be examined daily for signs of irritation of the kidneys.

In the acute restless cases, with choreiform movements,

careful nursing is essential. It is important to protect all parts liable to be chafed by the patient in his violent movements, since otherwise intractable sores may be produced on the elbows, knees, ankles, and elsewhere, even in a single night. Patients may at any time become extremely violent, and assistance should always be readily available. In some cases the use of a restraining sheet may be necessary. Sponging, ice-bags, or cold affusions to the head may be tried, the last-named being the most effective. (Tepid, cold, or even iced water is freely sponged over the head, face, and neck for about ten minutes every four hours. In males the hair should always be cut quite close; in females, only in very severe cases.) Sedatives in full doses are usually required. Bromides and chloral hydrate or chloretone, used alternately, have proved the most generally useful. If these fail, recourse must be had to an injection of hyoscine hydrobromide (gr. 1/200 to 1/100), which usually gives temporary relief. As a rule, this acute stage, if not fatal, diminishes in severity in a few days, sometimes with remarkable suddenness and independently of any particular treatment; this is a point to be borne in mind in assessing therapeutic values. In a few cases the maniacal symptoms may call for removal to a mental hospital in the interests of the patient.

Intense neuralgic pains in the head or elsewhere may occur at onset, and persist with extreme severity in spite of treatment. Drugs, such as antipyrin, phenacetin, aspirin, butyl chloral, gelsemium, bromides, etc., upon which reliance is usually placed in similar circumstances, often fail to produce any effect in these cases, and opium, in the form of Dover's powder, or morphine may be required from time to time. Myoclonic spasm may be extremely painful, and lead to great exhaustion and distress. Local pressure by pads and bandages, hot fomentations, and anodyne liniments are usually of little avail. Emplastrum sinapis applied to the epigastrium is occasionally useful. In severe cases morphine is required. The administration of an anæsthetic has at times been the only means of giving temporary relief. One or two observers claim success with injections of 10 c.cm. of the patient's own spinal fluid, but it must not be forgotten that the abdominal spasms which cause such acute pain when they first appear usually cease to be so painful after a few days, and that gradually the spasms may occur almost painlessly.

For the attacks of disordered breathing (polypnœa, dyspnœa, etc.), which often cause considerable alarm when they first occur, oxygen may be administered with good effect. In most cases a confident assurance to the patient and his friends that they are not dangerous and a simple sedative will suffice.

In the acute stage troublesome constipation often requires attention; frequent soap-and-water enemata may be useful. The tongue may remain foul and coated for longer than the general condition appears to warrant, when ordinary methods of local cleansing should be employed.

After-Treatment

After-treatment may demand great patience and endurance. When once the acute stage is over, say in two to four weeks, there does not seem to be any necessity for complete rest in bed. Many cases remain weak both mentally and physically for very long periods, and require a long rest before returning to work. A sea voyage, a holiday abroad, a quiet retreat in the country, at the sea, or even at home, whatever course is decided on must be designed as a real rest for the mind, and must therefore be congenial to the patient. In some cases motoring has proved effective.

The *Parkinsonian syndrome* as a sequela presents great difficulty in treatment. Massage, hydrotherapy, and passive movements have been advocated, and in some cases give a certain amount of relief. Electrical applications appear to give no benefit, and in some cases to do harm. Various drugs have been recommended, including arsenic, luminal, belladonna, and tincture of arnica. Scopolamine undoubtedly relieves the tremor and rigidity for a time, but has no permanent effect. Its use cannot be continued for long periods. After choreiform attacks recovery may be considerably hastened by the judicious employment of regulated exercises. For this purpose simple callisthenic arm exercises may be carried out, or, in small children, building with toy bricks. At the City Fever Hospital, Sheffield, Dr. Egerton Williams has obtained rapid improvement in older children by getting them to knit.

The most disturbing sequela is perhaps the peculiar nocturnal excitement and insomnia, which, though not limited to children, reaches its highest grade in them. In most cases much may be done by judicious control and "good mothering." Even then sedatives are often required as well. Of these, bromide and chloral hydrate, or chloretone, seem to be the most generally useful. The method of injecting small quantities of milk intramuscularly, which was first suggested by Lust of Karlsruhe, has proved effective in many of our cases; 2 c.cm. of boiled milk are thus given at bedtime, and the child usually goes to sleep in an hour or two, and sleeps soundly for six or seven hours or more. Nor is its action limited to children. In the case of a man who had not been able to sleep until 3 or 4 o'clock in the morning since his acute attack five months previously, intramuscular injections of milk given at 9 o'clock each night for a week produced sound sleep from 10 till 5 next morning. Preliminary injections of distilled water in similar quantity at the same hour had failed to have any effect. It does not always succeed, but should be tried in any obstinate case. In some cases a change to the seaside or country, with plenty of exercise in the fresh air, will give temporary relief, but a relapse on returning to home conditions is not uncommon.

Brief reference is made above to the use of belladonna in Parkinsonism. In addition to checking troublesome sialorrhœa, it has in some cases a striking effect in diminishing the slowness and immobility of these patients.

Cases who have been bedridden and unable to attend to themselves for long periods, may, on first coming under its influence, get up, wash and dress themselves, and become generally more alert, and brighter than seemed possible.[1]

In some the effect is produced even by small doses, such as 15 minims of tincture of belladonna daily; in others, it is necessary to push the drug up to 30 or 60 minims daily, or even more. In a certain proportion of cases, it seems to have no such effect, whatever the dose.

Large doses are usually well tolerated without troublesome symptoms. The most common complaint is of difficulty of accommodation.

Unfortunately, the effect seems gradually to pass off. After a few weeks or months they tend to get back to their previous condition.

In order to prolong its action Szyska,[2] who described similar successful results, using atropine in full doses, suggests giving the drug for periods of four to six days, then omitting for two days, and repeating.

Hohman [3] has recorded marked improvement from hyoscine hydrobromide in fairly large doses.

[1] Hall, Arthur J., "Post-encephalitic Parkinsonism," *Brit. Med. Journal*, 1926, i. 127.

[2] Szyska, *Münch. med. Woch.*, 1923, lxx. 47.

[3] Hohman, *Johns Hopkins Bull.*, 1924, xxxv. 355.

XIII

THE TREATMENT OF ANXIETY STATES

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Pathological anxiety occurs in many conditions, but the patients here to be considered are those where anxiety is shown as the chief characteristic—often associated with obsessional symptoms or hysteria—though this cardinal symptom is frequently masked by physical symptoms. Headache, insomnia, fainting spells, heart trouble, dysmenorrhœa, asthma, dyspepsia, mucous colitis, and the like, are found in anxiety states; the influence of emotion upon bodily functions accounts for the association, and when attention is directed to the mental state these physical manifestations can often be notably influenced.

The Avoidance of Physical Treatment

Physical treatment need not be considered in this article, since it is obvious that the general health of the patient must be attended to and any gross lesions treated; but it should be made clear at the outset that the doctor does not regard any physical trouble as the primary cause of the mischief. Recovery depends largely upon the patient's own handling of the situation, and any emphasis upon physical troubles, though acceptable to the patient as a means of escape from facing the situation, is for that very reason to be avoided. The search for something that can be treated by physical means, with neglect of the mental state, leads to chronic invalidism. We have to avoid the extremes of regarding the patient as suffering from a physical disorder or, on the other hand, of telling him there is nothing wrong with him. He may often be led to accept the proposition that physical disease is absent if we follow it by the remark that though his physical health is good, yet there is obviously *something* the matter or he would not come for treatment.

The sympathetic elucidation of mental symptoms is the first step in treatment, and it will be found that whilst the nervous patient talks interminably about his aches and pains, he is reticent and elusive concerning his fears and inhibitions, and

more obstinate still in concealing such causes for his trouble as he may be aware of. One cause for the reticence is that in the past doctors did not seek for these symptoms, and perhaps even, by dismissing them as trivial or imaginary, discouraged the patient from revealing them. Only when he realises that the mental symptoms are regarded as being in need of treatment will he talk about them ; it is now recognised that there is no danger of producing mental symptoms by " suggestion," though many nervous patients readily accept and cling to a diagnosis of physical disease.

If we waited for patients to complain spontaneously about a fear of being in closed rooms we should regard claustrophobia as a text-book curiosity, and the ready acceptance of faintness in a close atmosphere as a physically induced phenomenon easily prevents understanding. General complaints of loss of memory, inability to concentrate, of depression or nervousness, are met by a request for examples. " What sort of thing makes you nervous ? " will often bring out unsuspected fears and inhibitions, though it may be necessary to ask specifically about such trouble as fear of tube trains, of being in the dark, or of sitting alone in a restaurant. The feeling of being observed may be either little more serious than the shyness of adolescence, or a most distressing symptom, no less distressing because its irrational nature is fully realised by the patient. Obsessional symptoms, of which one of the commonest is the need to return several times to make sure that a door is fastened or that the gas is turned out, are themselves productive of anxiety and indicate a condition more deep-seated than the more simply handled pure anxiety state. Anxiety and obsessional symptoms are but meagrely described in our text-books, but those who realise that pathological anxiety arises from causes unknown to the patient and may remain floating loose—a fear of nothing in particular—or may attach itself irrationally to any conceivable object, soon learn from patients its manifold manifestations. Nervous breakdowns are often exacerbations of an anxiety state, and most of the cases of " neurasthenia "—even " traumatic neurasthenia " —are examples of pathological anxiety.

The Physician's Difficulties

The minor psychoses (and under this title are grouped hysteria and anxiety and obsessional states) are generally a reaction to current difficulties ; the type of psychosis is determined by the temperament of the individual and by previous troubles, and the causes—even the current ones—are not recognised as such by the patient. The commonly ascribed causes, such as overwork and stress and worry of various kinds, can only pull the trigger—they do not load the gun. The aim of treatment is to make the patient aware of his difficulties, and

according to circumstances (of which the temperament of the physician is an important one) the methods range from explanation and kindly insistence up to the full technique of psychoanalysis. In any case the more the patient is encouraged to talk out his own troubles the easier will it be for him to understand himself. The mere discussion of symptoms hitherto hidden from everybody will give some relief and help to establish that *rapport* necessary for therapy. Only when this *rapport* is established can the patient be expected to bring forth such emotional difficulties as may be present. Here the temperament of the physician becomes of importance, and it must be admitted that our own resistances play a great part in hindering the patient. For example, we have in the course of our training overcome a more or less artificial resistance against accepting as a matter of fact the discussion of the anatomical details of sex, but the mental aspect of it is still subject to the social taboo. The sensitive patient will note the slightest sign of antipathy on the part of the physician and will keep back what may be essential to the understanding of his case and himself. It is a good working rule to assume that in every anxiety case there is something kept out of consciousness and that it is kept out because it is repugnant to the patient. This suppressed material is heterogeneous, but is most commonly, for obvious reasons, connected with sex. It must be accepted as an empirical observation that the bringing of the material into full consciousness, and the necessary overcoming of resistance in the process, brings relief to the patient and lessens the amount of pathological anxiety. Hence, it is plain that the physician who possesses resistances identical with those of his patient can be of little help to him and will fail to understand what he is dealing with. If he has overcome his own resistances he soon finds that in adults a minor psychosis rarely exists when the sex life is running smoothly. He hears stories of frigid wives and impotent husbands, and discovers that when one spouse comes for treatment it is often the other partner who needs it; that unhappy marriages can induce a minor psychosis, and conversely that a minor psychosis leads to unhappiness in marriage. He recognises the perniciousness of the recommendation—still frequently given—of marriage as a cure for "nerves," for anxiety often arises from fear of sex or of sex desire, and marriage in such cases leads to disaster. He may find that the patient is faced with an insoluble problem. But even then the realisation that the anxiety has served as an escape from facing the problem may help the patient. In many cases, fortunately, relief is to be found in a discussion of the mental attitude of the individual, a discussion in which the physician may at times advantageously adopt the Socratic method after the patient has laid down his own point of view.

Revival of a Lost Memory

It is a matter of judgment how much the patient should be pressed with direct questions, but where time permits it is better to wait patiently rather than, by producing denials, make subsequent avowals difficult. An ever-recurring trouble is remorse at masturbation, past or present, and the physician must be courageous enough to recognise that the dreadful effects ascribed to it are imaginary, that the habit is so common as to be almost a typical phase in sex development, and that the greatest problem in regard to masturbation is the horror we profess towards it. If the physician is able to adopt this attitude he finds less difficulty in dealing with the associated remorse; but even then he may fail, and a slight acquaintance with psychotherapy enables him to recognise that he is dealing with an emotion arising from some deeper complex and secondarily attached to the masturbation. This displacement of emotion is characteristic of nervous symptoms and is of practical importance in treatment. A simple technique consists in placing the patient upon a couch, making him describe and, if possible, feel the emotion concerned—the feeling associated with a specific phobia, for example—and urging him to remember any occasion in the past on which the same emotion was felt. This method was successful in the war cases, and if the practitioner only once revives a lost memory by it he gains an insight into mental processes which reading does not give him. While a full analysis may not be practicable for the practitioner, he should be able to recognise those cases in which the severity of the symptoms demands it and the age, temperament, and circumstances of the patient render it possible.

The physician's influence must be used in supporting the patient and encouraging him to carry on the duties of life. Since a minor psychosis is, from one aspect, an attempt to escape from difficulties, the patient should be encouraged to persevere in spite of his symptoms. A practical point is that if a man wakes up fit in the morning, but soon tires and becomes "washed out" before the day is over, he needs a holiday; but if he wakes depressed and unrefreshed, to improve as the day goes on and become fit by the evening, he needs treatment for his anxiety and stimulation to stick to his work. The aims of the family practitioner should be to clear up those causes of anxiety which are accessible and to gain a personal influence by properly understanding the patient. The successful treatment of anxiety states must, like all treatment, depend upon experience. There is no lack of material. The real difficulty facing the practitioner is to find time properly to investigate it.

XIV

COMMON FRACTURES OF THE ELBOW-JOINT IN CHILDREN

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It is generally recognised that all fractures about the elbow, excepting fracture of the olecranon, should be treated with the elbow fully flexed and forearm supinated. In practice it is important to realise that good results will not be obtained unless the displacement of the fragments is first reduced. Swelling of the limb may tempt one to leave the elbow at a right angle, with the result often that further flexion cannot be obtained when the swelling has subsided. Hence it is important to judge the appropriate methods of treatment for each fracture so that good function is produced and complications are avoided.

Supracondylar Fracture

Supracondylar fracture (separated epiphysis of the lower end of the humerus) is a common accident in children, occurring usually between the ages of 5 and 10; it may occur before the age of 5 and in older children up to 15 or thereabouts. The injury is frequently called a separated epiphysis, but the line of fracture is on the diaphyseal (shaft) side of the epiphyseal line, so that the lower fragment consists of the epiphysis and some of the soft bone of the shaft adjacent to it. This fragment is displaced upwards and backwards, but, in addition, often laterally, either inwards or outwards. The radius and ulna move with the lower fragment. When the child is seen shortly after the accident the diagnosis causes little difficulty, but when swelling has commenced the bony points cannot be felt. X-ray examination is essential: (*a*) to confirm the diagnosis, (*b*) for comparison with another plate taken after correction, and (*c*) for medico-legal reasons. Both lateral and antero-posterior views are required.

(1) *Reduction.*—In order to get efficient reduction, which is essential for a good functional result, the child must be given a general anæsthetic. The limb is then washed, dried, and powdered. An assistant, who may be a nurse, holds the arm

firmly some inches above the elbow, and applies counter-traction at the appropriate time. The surgeon grasps the forearm in his right hand and holds it fully supinated. He places his left hand round the elbow, so that the thumb is against the front of the lower end of the shaft of the humerus and the fingers at the back of the joint over the lower fragment and olecranon. Traction is then applied to the forearm in the axis of the limb, allowing for the carrying angle at the elbow. This must be very strong and maintained during the subsequent manipulations. The elbow is then hyper-extended to free the lower fragment; next it is gradually flexed, during which manœuvre the left hand presses the humeral shaft backwards and the lower fragment and olecranon forwards. This will not be possible unless the strong traction is continued. After satisfactory reduction the

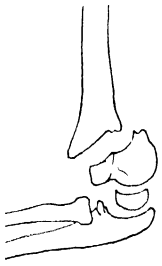


FIG. 1.

Diagram of supra-condylar fracture.

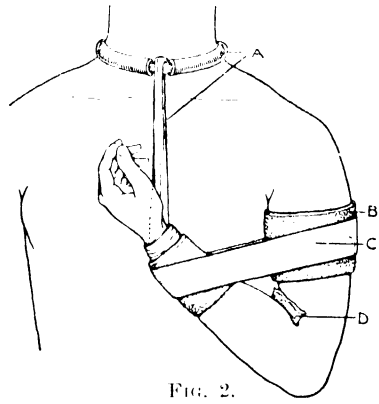


FIG. 2.

Method of fixation of arm. A, Collar and cuff halter. B, Felt. C, Adhesive strapping. D, Boric lint.

operator carries the elbow into full flexion with the forearm fully supinated. It is judicious for a radiogram to be taken to determine if reduction is complete.

(2) *Fixation.*—Powder is dusted into the fold of the elbow and a small piece of dry boric lint pushed into it. The wrist has then to be fixed to the upper part of the arm. A piece of felt or cotton-wool about three inches wide is wrapped round the lower end of the forearm above the wrist and round the upper part of the arm. A piece of adhesive strapping two inches wide is carried round the arm and forearm over the felt. The radial pulse and finger-nails should then be examined to make certain that no interference has been made with the circulation. If the child is under 6 the flexed arm is then kept across the chest by two turns of a six-inch flannel bandage round the body and arm. An older child should have the wrist slung in front of the chest by a "collar and cuff halter." This consists of a bandage or

webbing round the neck fixed to the wristlet of the bandage. It is more comfortable if the bandage round the neck is passed through a piece of rubber tubing, and the forearm can only be kept fully supinated if the connexion between the collar and cuff is made on the inner side of the wrist. The elbow itself is left uncovered.

(3) *After-care.*—The limb is kept in this position for two weeks, during which period no movements should be allowed at the elbow, but finger and thumb movements should be encouraged from the commencement. Active or passive movements are dangerous and predispose to complications. Massage may be harmful if rough kneading is employed; it should be very gentle and applied where the elbow is swollen. At the end of two weeks the strapping is cut off, the child told to touch the shoulder with the fingers, and the forearm then let down a little every two days. It can be fixed with a flannel bandage round the arm and forearm in place of the strapping, or by the halter. Each time it is let down the child should be made to touch the shoulder, to show he has retained the full flexion. If he cannot do this, full flexion should be maintained for a few days longer. As a rule, in children the elbow can be at a right angle in three weeks after reduction. Shortly after this fixation can be discarded, but it may be wise for the child to wear a sling when out of doors. At this time he should be encouraged in active movements to regain the extension, such as pulling on a chair, but passive movements should be avoided as much as possible. If the elbow is greatly swollen, as will usually be the case if the patient is seen a day or two after the injury, treatment will have to be somewhat modified. Reduction should be carried out and the limb powdered, but full flexion cannot be obtained. Adhesive strapping should be avoided, as it may cut into the skin. Hence the forearm and arm should be bound together by two turns of a flannel bandage, in a position of as much flexion as can be obtained without causing undue pressure in front of the elbow. The wrist is then fixed in front of the chest by a collar and cuff halter. As the swelling subsides this can be drawn up every two days so as to increase the flexion and the bandage made more tight round the arm and forearm. The remainder of the treatment is as described above.

Difficulties and Complications

(1) *Failure of Reduction.*—Should reduction not be obtained, the best results follow open operation for reduction of the lower fragment.

(2) *Great Swelling* and blistering of the skin. The latter may be associated with the former. The region of the elbow should be painted with iodine and blisters pricked with a sterile needle and a dressing applied. The modification of the treatment necessary in this condition has already been described.

(3) *Ischæmic Contracture* (Volkmann's paralysis).—This condition is probably preventable by the avoidance of tight bandages round the elbow and by care in regulating the flexion, so that it is not so great as to cause compression of the brachial artery.

(4) *Myositis Ossificans* may follow this fracture if the reduction is performed roughly and if massage and movements are carried out injudiciously. It occurs more readily if the elbow is kept at a right angle. Its presence can be diagnosed sometimes as early as three weeks after the injury and straightway appropriate measures should be adopted to aid its disappearance. Absolute fixation of the elbow in as much flexion as is comfortable is indicated for some months. Massage and all movements are to be avoided, and operative treatment for removal of the bony mass should not be undertaken until after an interval of at least six months. The results of early operative treatment for this condition are disastrous, and late operation often fails to cure the condition owing to the tendency for the new bone to re-form.

(5) *Nerve Injuries.*—Either the musculo-spiral, ulnar, or (rarely) median nerve may be paralysed as a complication of this fracture. In the case of the former a small "cock-up" splint should be worn to prevent the wrist dropping as soon as the arm is put in a sling, and electrical treatment commenced for the paralysed muscles. If there is no sign of recovery in three months, operative interference becomes necessary. When ulnar paralysis is associated operation is indicated for reduction of the fracture and inspection of the nerve.

(6) *Deformity* may occur at the elbow after partial or incomplete reduction, or if the forearm is brought into wrong alignment with the arm. Late operation may be required for cubitus valgus or varus.

Other Fractures

Fracture of the external condyle in children consists of a separation of the capitellum and a small portion of the outer part of the lower end of the humerus from the humeral shaft. It is not very uncommon. The exact nature of the injury must be diagnosed by a skiagram to determine if there is serious displacement or not. If there is no displacement the elbow is fully flexed and the forearm supinated, as described above. Should displacement be present, reduction can be attempted under anæsthesia, but open operation may be required.

Fracture of the internal condyle is unusual before 10; in children similar treatment to that of fracture of the external condyle is applicable.

The *T- and Y-shaped fractures*, when there is a more or less transverse fracture of the lower end of the humerus with a line of fracture also into the elbow-joint, are uncommon in children. Treatment consists of open operation if there is gross displacement, but if the fragments are in good apposition the elbow

should be kept fully flexed and the case treated similarly to the supracondylar fracture.

The *coronoid process of the ulna* is very rarely fractured in children in association with a backward dislocation. Injury to the *upper radial epiphysis* (the head) is also rare in children. The elbow should be kept flexed in each case. In the former case the dislocation is reduced first.

Summary

In the treatment of fractures about the elbow-joint in children the following points are of importance: (1) efficient reduction; (2) position of acute flexion with supination; (3) avoidance of unskilled massage and early movements; (4) avoidance of lateral or side splints, which tend to deformity at the elbow, and right-angled anterior or posterior trough splints, which do not keep the fracture reduced and cause other untoward results; (5) operation is indicated when reduction is impossible or deformed union is present.

XV

THE TREATMENT OF POST-MENOPAUSAL HÆMORRHAGE

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Bleeding from the genital tract after the menopause is so often a symptom of carcinoma that every case met with should be considered malignant unless proved, on careful examination, to be innocent. A heavy responsibility is thus laid on the practitioner who is consulted about such a case, and an awkward situation may arise between him and his patient. It is unjustifiable to treat such cases symptomatically by the administration of ergot or similar drugs. On the one hand, it is unlikely that these drugs will have any beneficial effect; and on the other hand, valuable time may be lost during which a malignant growth may become inoperable.

The Need for a Complete Examination

When consulted about a case of this kind the practitioner should point out that a pelvic examination is desirable to find out exactly what is wrong; should the patient refuse, he should then state clearly that such bleeding is usually due to early cancer of the womb and that an examination is necessary to determine the point. If the refusal is persisted in, he has cleared himself from future blame and might be justified, in certain circumstances, in refusing to treat the case in ignorance of what is to be treated. The first essential then is a thorough examination to determine the cause of the bleeding.

On abdominal examination a pelvic tumour may be found, but more often is not detectable. In making a pelvic examination it is advisable first of all to examine the vulva in a good light. An unexpected epithelioma of the vulva may be seen, a urethral caruncle, or bleeding hæmorrhoids. Caruncle is not usually a cause of bleeding, but in a certain proportion of elderly patients it will be found associated with carcinoma of the cervix or corpus uteri. When examining the cervix it must be remembered that after the menopause the cervix is small and atrophic, and finally forms a depression rather than a prominence at the

vaginal vault. A prominent cervix at this period would be noteworthy, especially if hard and nodular. Another part to be carefully examined is the external os. This may be patulous, and a mucous polyp may be found inside or projecting through the aperture. In other cases the os may be widely dilated, embracing a partially extruded and often degenerating fibromyomatous polypus.

The corpus uteri must now be examined, and here again size and consistency are of the first importance. A post-menopausal uterus is small, and in later life very small, so as to feel almost like a uterus on which subtotal hysterectomy has been performed. Therefore, if the uterus be bulky like an endometritic uterus in early life, and especially if it be definitely hard, the probability of carcinoma of the body is great. If the uterus be enlarged to the size of a cocoanut or more and of a wooden or stony hardness, the chances are more in favour of a fibromyoma, probably undergoing degeneration, it may be malignant degeneration. The fornices must be examined, and any tumour of the appendages carefully noted. Finally, the condition of the heart, lungs, and peripheral vessels should be investigated, and the rectum and bladder examined, the latter by cystoscope if the bleeding appears to originate there.

Lesions which may be Found

The various lesions to be described collectively constitute the main causes of post-menopausal bleeding.

On the vulva a patch of epithelioma may be found ; pathological conditions of the vagina are rare, and epithelioma, usually extending along the anterior wall from the cervix, is the most common ; at the cervix carcinoma is the most common single cause of hæmorrhage, accounting for fully 80 per cent. of all cases. It may be ulcerating or fungating, but more often it is of the atrophic variety. Mucous or fibroid polypi may also be met with here, but such cases must be explored carefully by the curette or finger, as polypi of the cervix are often associated with carcinoma of the corpus uteri. In the corpus uteri, carcinoma or sarcoma are shown by bulkiness and hardness and usually also by a certain degree of fixation ; fibromyomata are usually shown by greater size and greater hardness ; fibrosis uteri is shown by hardness but little or no increase in size ; while in senile endometritis the uterus is only a little enlarged and soft. Carcinoma of a Fallopian tube may be associated with hæmorrhage, but it is a rare condition. Ovarian cysts which are associated with post-climacteric hæmorrhage are to be regarded with suspicion as being probably malignant. From the general point of view, cardiac lesions, chronic renal disease, and high blood pressure may be causative, but only in a very small proportion of cases. Again, in a certain number of cases the most

careful examination will detect no physical abnormality anywhere, but such cases are very few.

It cannot be too strongly emphasised that the most probable cause in any individual patient is carcinoma of the cervix or corpus uteri, and this lesion must be presumed until and unless shown to be absent. These considerations will suggest the principles of treatment, which in the great majority of cases is surgical.

Surgical Treatment

If epithelioma of the vulva or cervix, or carcinoma of the uterus be found, wide removal of the vulval condition, or total hysterectomy, as the case may be, is indicated if the condition be removable. This determination of operability is a most important point which, however, cannot be discussed here. Suffice it to say that while about 60 per cent. of cases of carcinoma of the body of the uterus, and about 30 per cent. of cases of epithelioma of the vulva are removable, it is usual for carcinoma of the cervix to be advanced beyond operation when first seen. This, which is the common experience of all gynæcologists, points the moral of making an early pelvic examination in every case complaining of post-climacteric hæmorrhage. In cases where the vulva, vagina, and cervix are normal the uterus is to be carefully explored by curette or finger. Mucous polypi of the cervix may be removed by forceps or a sharp spoon, but in such case the cervix should always be dilated and the interior of the uterus curetted. The curettings should be microscopically examined for signs of carcinoma. In cases of senile endometritis the curette removes a large amount of broken-down débris, often foul, and such cases usually clear up after this operation, which may require to be repeated. In carcinoma of the corpus uteri the cervix is easily—suspiciously easily—dilated, and the material removed by the curette is characteristic. It is of a greyish colour, profuse in amount, soft, cheesy, and often accompanied by bleeding. The curette is to be used gently in order to avoid perforation of the uterus.

In chronic metritis curettage is useful for purposes of diagnosis and exclusion. The amount removed from the uterus is very small or almost nil, and in some cases the hæmorrhage will cease after curettage, but usually it persists. In these cases and also in cases of inoperable carcinoma *radium* is of the greatest value.

Radiotherapy

In chronic metritis the dosage of radium should be small. A tube of 50 mg. of radium bromide sheathed in platinum is inserted into the cavity of the uterus and left there for eight hours. In about half the cases hæmorrhage ceases after one

such application. In the other cases it is either unaffected or improved, and another application should be given after a month's interval. By this treatment quite 75 per cent. of simple hæmorrhages from the uterus can be controlled. In the cases which do not react favourably, hysterectomy is the only choice left open. In inoperable carcinoma or sarcoma of the body of the uterus 100 to 120 mg. should be introduced into the uterine cavity for 24 hours. The effect of this is usually most beneficial and the hæmorrhage ceases, the discharge disappears, and the patient's general condition improves. Should the bleeding recur, the treatment can be repeated; again, the local conditions may so improve that a patient at first considered inoperable can later be operated on with safety. In inoperable carcinoma of the cervix it is a matter of personal opinion as to whether any fungating or ulcerating condition should be curetted before radium is applied. The cervix should be steadied with a volsellum, if it is possible to catch it without tearing, and two tubes of 50 mg. of radium each are introduced into the cervical canal. Several other smaller tubes are inserted into the peripheral parts of the growth, giving a dose of 170 mg. in all, which should be left in for 24 hours. The effect of this is usually most satisfactory, the bleeding and discharge ceasing within a week or two, and the local condition usually healing up almost beyond recognition. Such patients have to be watched from time to time, and it is well to repeat the application after four weeks. In vulval epithelioma the results of radium therapy are disappointing.

Fibromyomata of the uterus should be removed by appropriate means. This usually involves hysterectomy, but a pedunculated polyp may be removed per vaginam by avulsion or cutting with scissors or, if the condition be larger and degenerating, by morcellement. If sloughing and pedunculated, laparotomy is to be avoided if at all possible on account of the grave risk of peritonitis. In some cases vaginal hysterectomy is indicated, but the abdominal route is more often chosen to-day. Ovariotomy or salpingo-oöphorectomy is called for where an ovarian cyst or tubal disease is present, and in these cases it is better to remove the uterus at the same time. A urethral caruncle can be removed most easily by the actual cautery at a dull red heat and using a fine point. With the patient in the lithotomy position the caruncle is gently pulled on with forceps and the cautery point passed through the urethral mucosa at its base. If general anæsthesia be undesirable, local infiltration with novocain and adrenalin does very well.

Drugs do not require discussion, because in bleeding of the type under consideration ergot, pituitrin, adrenalin, and such preparations are generally found to be of no value, as would, indeed, be judged probable from a consideration of the causes of the bleeding. Almost always the bleeding has a local cause and requires local treatment.

Conclusion

It will be evident from what has been said that post-menopausal hæmorrhage as a rule indicates a serious, and it may be a fatal, condition. Treatment is usually operative and may involve a major operation, and it is on that account that a thorough pelvic examination should be made as soon as possible, in order that appropriate treatment may be instituted at a time when it may benefit the patient.

XVI

THE TREATMENT OF HÆMORRHAGE IN THE NEW-BORN INFANT

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The two main types of hæmorrhage which may be seen in the new-born—true birth hæmorrhage and spontaneous hæmorrhage—are as distinct in their treatment as in their ætiology. Like most affections peculiar to the early days of life these conditions have not received the attention which is their due, considering their frequency and the high death-rate which is associated with them. Without entering into details as to the somewhat obscure ætiology of certain varieties of hæmorrhage, one may mention, as a basis for rational treatment, the forms in which the bleeding may occur in the new-born infant, and their probable origin.

Birth Hæmorrhage

True birth hæmorrhage is by far the commonest type of bleeding in the new-born. It is now becoming recognised that the underlying cause is the congestion resulting from asphyxia during parturition. In all infants born with asphyxia livida this congestion is well marked, and in the majority some form of hæmorrhage is present. It may be only petechial or capillary, but it may be of a grosser character. Such congestion, with or without hæmorrhage, is often fatal. The treatment is largely prophylactic and consists in the prevention of undue asphyxiation of the fœtus by keeping the duration of labour within reasonable limits. A child which is born deeply asphyxiated, with its heart engorged with blood and all its veins and capillaries congested, can hardly fail to benefit from the withdrawal of some blood from the circulation. Hence good results may be obtained by allowing a few c.cm. of blood to escape from the cut end of the cord. Care should be taken to avoid violent manipulations which might lead to traumatic rupture of vessels in an asphyxiated and congested infant.

Traumatic hæmorrhage may occur either during labour or after delivery. Intracranial hæmorrhage from tearing of dural structures, such as the tentorium cerebelli, is of frequent occur-

rence, and is so often associated with a breech delivery that the correction of this malpresentation would appear to be the obvious method of lessening the incidence. Difficult forceps deliveries are also responsible for some cases of this form of hæmorrhage, but in others it is difficult to indicate any measure which might have been employed to prevent the occurrence. Gross hæmorrhage may occur into the body cavities from traumatic rupture of deeply congested organs. The best example of this is rupture of the liver or rather of the liver capsule—which is not infrequently attributable to the use of violent efforts to establish respiration. The Schultze method of artificial respiration is particularly apt to lead to this type of hæmorrhage. When gross hæmorrhage has given rise to increase in intracranial pressure much benefit may be derived from lumbar puncture, repeated from time to time as required. On account of the practical impossibility of localising the lesion with accuracy, surgical procedures are not advisable, though attempts have been made to deal with intracranial hæmorrhage in this way. Hæmorrhage into internal organs is also unsuitable for surgical treatment in the absence of localising signs.

Spontaneous Hæmorrhage

The terms spontaneous or idiopathic hæmorrhage have been used to describe a variety of conditions found in the new-born, all of which have bleeding as their most striking feature. They are not to be confused with the forms of hæmorrhage referred to above. In any case where doubt exists an estimation of the coagulation time and of the bleeding time will settle the matter, for in spontaneous hæmorrhage these are both definitely prolonged. Some cases of spontaneous hæmorrhage are associated with sepsis, others occur in congenital syphilis, while others again are of such obscure ætiology as to justify the retention of the term *idiopathic* in describing them. Rare forms exist such as Winckel's epidemic hæmoglobinuria, and it is held by some authorities that even true hæmophilia may lead to hæmorrhage in the new-born. The commonest manifestation of all these conditions is bleeding from the alimentary tract—melæna neonatorum and hæmatemesis. Bleeding also occurs into the skin, into the brain, into the abdominal and thoracic viscera, and from the umbilical stump. The chief loss of blood, however, is from the gastro-intestinal tract, and the amount lost is so great as to reduce the child to a state of extreme anæmia which soon proves fatal if the hæmorrhage is not checked.

In the treatment of such infants we have now a remedy which is practically specific. It consists in the subcutaneous or intravenous injection of *whole blood*. This leads to arrest of the hæmorrhage, and, if it has been applied in time, recovery is probable. The use of serum has been recommended by some writers, but the results appear to be much inferior to those

obtained from the injection of whole blood. In all cases where it is suspected that the "hæmorrhagic diathesis" exists the coagulation time and the bleeding time should be estimated.

To test the *coagulation time* all that is required is a sharp Hagedorn needle, a pair of watch-glasses, and a small lead shot. These should be carefully cleaned with soap and water followed by ether. A drop of blood is allowed to fall from a needle puncture in the heel into one watch-glass containing the shot, and the second watch-glass is inserted over it to prevent evaporation. Every half-minute the glasses are tilted so as to allow the shot to roll. The point at which it ceases to do so is taken to indicate the time of coagulation. Tested by this method the normal coagulation time in the new-born ranges between five and ten minutes. In cases of hæmorrhagic disease the period may be prolonged to half an hour or more.

In the normal child the *bleeding time* ranges between two and five minutes. It is tested simply by pricking the skin of the heel and removing the drops of blood with filter paper as they appear. If they continue to do so for more than five minutes there is an increase in the bleeding time. In many cases of hæmorrhagic disease the puncture goes on oozing for hours or even days.

Injection of Whole Blood

As soon as the diagnosis is confirmed in this way preparations should be made for the injection of blood.

Subcutaneous Injection.—The simplest method of doing this is with an ordinary serum syringe of about 20 c.cm. capacity. The syringe is sterilised and fitted with a fairly wide-bore needle such as is ordinarily used for intravenous therapy. The arm of the donor is constricted with a tourniquet, the skin is cleansed, and the needle of the syringe inserted in a vein. From 10 to 20 c.cm. of blood are taken into the syringe and the instrument is withdrawn after removal of the tourniquet. Without delay the needle is inserted through the sterilised skin of the infant in the mid-scapular line. The needle should point outwards towards the axilla. The blood is then injected deeply into the subcutaneous tissues. When the needle is withdrawn the puncture is sealed with collodion and the surrounding area is gently massaged for a minute or two. The results of this treatment—provided it is applied early enough—are very satisfactory, and the ease with which the operation can be performed makes it a method of real use to the practitioner.

Intravenous Transfusion.—It is claimed that even better results are obtained, however, by the intravenous transfusion of blood. For this purpose either a large serum syringe or one of the more elaborate forms of transfusion apparatus may be employed. If a syringe is used it should be one of 20 c.cm. capacity, and should contain 2 c.cm. of a 10 per cent. solution of sodium citrate. A cannula with a short rubber tube attached

is inserted into the donor's vein and clamped. A similar tube and clamp are attached to the needle inserted into the infant's vein, so that as many syringefuls of citrated blood may be given as the child may be thought to require. A severely exsanguinated infant can take as much as 15 c.cm. of blood per pound of body-weight (L. B. Robertson). With regard to the route chosen for intravenous injection in the new-born infant, it may be noted that the superior longitudinal sinus is the most satisfactory one. For any one who is in the habit of performing venipuncture it is a simple matter to enter this sinus through the anterior fontanelle. The child, wrapped firmly in a blanket, is placed on a table on its back, the needle is held at an angle of about 25° with the skin, and is inserted at the occipital angle of the fontanelle with its butt towards the frontal region. Another method is to use one of the veins of the scalp which are so prominent in young infants. Unfortunately they are less easily punctured when the child is exsanguinated. If this route is chosen the child is held firmly on the side with its head resting on a sandbag or hard pillow. Pressure with the thumb on the temporal region will bring the veins into prominence, and the needle can be inserted almost parallel to the skin with its butt pointing towards the crown of the head. The arm veins are not suitable for intravenous injection in the infant, but the internal saphenous vein and even the external jugular vein have been used with success.

Precautions in selecting a Donor.—A word may be said with regard to the choice of a donor. Ideally the blood of the donor should be tested to ensure that the Wassermann reaction is negative, and the blood of both the donor and of the infant should be "grouped." If there is no opportunity for testing the compatibility of the donor's blood, the safest procedure appears to be the injection of the mother's blood subcutaneously, as described above. A very simple method of carrying out the compatibility test is, however, available. A few drops of the infant's blood are allowed to clot in a capillary tube or Wright's capsule. The serum is then separated from it by swinging in a centrifuge. A *large* drop of the serum is transferred to a slide by means of a capillary pipette wet with citrate solution. To it is added a *small* drop of the donor's blood and a cover-slip is put on. If no agglutination of the corpuscles is seen under the microscope at the end of five minutes the bloods may be regarded as practically certain to be compatible.

In addition to the specific treatment described, every care must be taken to conserve the infant's strength by warmth and feeding. If possible, a quantity of fluid (either water or normal saline) should be given by the mouth. This is readily absorbed, and helps to restore the blood volume.

XVII

TREATMENT OF CHOREA

By H. E. A. Boldero, B.M., B.Ch.Oxf., M.R.C.P.Lond.,

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Chorea (χορεία, dancing) is a nosological label which has been attached to many clinical manifestations. The Chorea Sancti Viti of Paracelsus, dancing mania or chorea major of subsequent authors, belongs to the hysterical manifestations of disordered motion. The chronic choreas, or symptomatic choreas depending on degenerative changes of the motor cortex and its paths, for example, the syndrome described by Huntington in 1872, are also distinctive. Another group of cases sometimes referred to as "choreiform affections" or "pseudo-choreas", should be called "habit spasm" or "tic". Chorea minor, or Sydenham's chorea, alone is referred to in this article; it is an acute disease of children characterised by irregular purposeless involuntary movements, a varying amount of psychical disturbance, and the frequency with which it is associated with endocarditis and arthritis.

Prevention

The realisation of the predisposing factors in the life of a girl or boy can do much to ward off an attack of chorea. It is curious how rarely there is a history of chorea in the parents, whilst the protean manifestations of rheumatism are so common. Girls are affected two to three times as frequently as boys, the susceptible age being from 7 to 12 years. The girl in whom the disease is to be anticipated may be tall for her age, thin and anæmic. She is mentally bright, intelligent, and over-conscientious; if at school she may be at the top of her class and facing "special work" for a scholarship. In addition to this mental activity she is emotional and fidgety; in fact, chorea has been cryptically described as exaggerated fidgetiness. Rheumatism in some form is extremely common in the history of these children. The condition of the tonsils, therefore, requires consideration, for they are often enlarged and unhealthy, and may well be the portal of entry for the rheumatic virus. Fright, worry, and excessive study, though not causes, render the rheumatic child more liable to an attack of chorea; and the

avoidance of these factors lies within the field of preventive medicine.

Early treatment at the onset of symptoms will nearly always cut short an attack, or at least lessen its severity. The earliest symptoms fall into three groups :

1. *Change of Mentality.*—The child becomes headstrong, resentful of reproof, cries with little provocation, and loses power of concentration.

2. *Movements.*—She is much more fidgety, and is constantly changing position. Her facial muscles show little irregular jerky movements, and her hands are less controlled, as seen by her handwriting.

3. *Muscular Weakness.*—This is always present though commonly overshadowed by the movements.

General Treatment

There is no specific drug for chorea. The one essential of successful treatment in all cases is rest and quiet, for the movements cease during sleep. This is the opinion of most modern pediatricians, founded on close observation under hospital conditions of children who have been treated as out- and in-patients, with and without medicine. Chorea does not get well by itself, but it is clear that drugs alone will not achieve a cure, for cases drag on month after month as out-patients, rapidly to improve when admitted to hospital, though the same drugs are used. The child must be put to bed and kept there, exception being made only in those few cases where confinement to bed accentuates the nervous disturbances. In this case the child may be allowed up to lie on a sofa. If the movements are at all forcible, bed must be insisted on, care being taken to see that the child cannot injure itself by constant rubbing, for such sores heal tardily. In really violent cases the mattress should be on the floor, and the case constantly watched. No mechanical restraint is ever justified. The question of whether a trained nurse is necessary must be answered in each individual case. The discipline of a sympathetic, but firm, nurse is of great value, and advisable in severe cases where sleep is much disturbed, but milder cases may be better without the introduction of a stranger, provided the mother is sensible.

No special restrictions are called for in the diet, which should be liberal and appetising. Hydrotherapy is a most valuable aid in producing rest and sleep, e.g. shampooing the head twice a day for ten minutes is often successful. Hot or cold packs are excellent therapeutic measures, and are often more effective than soporifics. The hypodermic needle should never be used. When rest and quiet have been assured, two aspects of the disease must receive attention : (*a*) nervous disturbances, and (*b*) rheumatic manifestations.

(*a*) *The nervous disturbances* may call for sedatives, the aim

being to produce a certain amount of sleep rather than to abolish the movements. Chloral hydrate gr. vii, trional gr. v, or chloretone gr. v, are the best, and should be given three times a day. (Dosage for a child of 7 years.) Bromides may be usefully combined with the chloral, while chloretone is best given as an emulsion with liquid paraffin or cod-liver oil. These drugs should not be pressed, *for they are not curative*, and if chloretone is employed a watch must be kept for an erythematous rash and incontinence of urine.

(*b*) *Rheumatic manifestations* include pyrexia, a sore-throat, and less often vague pains in the limbs, and call for treatment with salicylates, which should be given with alkalis, so long as there is any rise in temperature. I do not think that a prolonged course of salicylates protects the heart, and it certainly has no beneficial effect on the chorea. A sore-throat or even enlarged tonsils should be painted twice a day with—

R	Salol	gr. xxx
	Glycerini	ʒii
	Alcohol 90 per cent. . . .	ad ʒi

When the active stage is subsiding, and before the child is allowed up, a short course of arsenic is valuable. It should be given well diluted, in tonic doses only. During convalescence, when the movements have almost ceased, iron should be given in all cases. Cod-liver oil and malt for 2-3 months should be ordered for those who have lost weight. Massage and exercises are beneficial provided they are not started too early. The exercises should stop short of fatigue, and at first should be crude and easy to perform; such as touching the tip of the nose with the finger of an outstretched arm, or pointing the toes while walking along a line or following the pattern of a carpet. Later, games requiring more skilled control may be employed, e.g. building castles with bricks or cards, knitting, exercises on the piano, and so on. Such exercises hasten the recovery of voluntary control of movement.

Treatment of Special Conditions

Heart.—We have no specific by which to protect the heart from infection, and must trust to early and thorough treatment of the chorea itself to reduce the incidence of cardiac lesions. When there is evidence of the myocardium being affected—namely, cardiac enlargement, increased pulse-rate, or a diastolic bruit at the apex—we must rely primarily on rest as a therapeutic measure. The rest in bed must be complete, and prolonged until there are no further signs of activity. This may even entail six months' rest.

Chorea Paralytica.—The so-called paralytic cases of chorea are those in which the movements are almost absent, and the muscular weakness so pronounced that the child is virtually

paralysed. Such cases call for very careful nursing, and ample light and nourishing diet. Stimulants will be required. Massage must be begun earlier so as to maintain the muscular tone and nutrition pending the return of voluntary movements.

Chorea Insaniens.—In those cases in which the movements are so violent and the mental disturbance so great that the patient is temporarily insane, feeding is difficult. The best forms in which to give nourishment are the semi-solids, such as jellies and custards. Artificial feeding may even be necessary. Sedatives may be pushed. The danger is exhaustion.

Hyperpyrexia, which is rare, must be treated by salicylates and hydrotherapy.

Chorea Gravidarum.—The usual onset is in the third month of the first pregnancy in very young women. The general treatment of chorea will be successful in the great majority of cases, and only very occasionally will it become necessary to terminate the pregnancy.

After Cure.—Whenever possible the patient should be sent into the country or to the sea coast for a prolonged convalescence, since the importance of chorea lies in its cardiac complications.

XVIII

THE TREATMENT OF PRURITUS ANI

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PRURITUS ani is the commonest form of localised itching of the skin. It is more frequent in men than in women, and may occur in children, though its incidence is greatest in middle-aged folk of sedentary occupations and in old age, when it is often associated with general atrophy of the skin. It is relatively commoner in private practice than in the hospital clinic. Pruritus ani is a subjective symptom of some general or local condition and is not a disease *sui generis*. It is therefore essential, before determining what treatment we should adopt in any given case, to discover first, if possible, its cause, and then to remove it or neutralise its action.

GENERAL CAUSES

Gout is, perhaps, the commonest general cause, for pruritus ani not infrequently alternates with acute attacks of gout. Rheumatism and diabetes, too, are at times responsible for its onset and should receive appropriate treatment. Disorders of the liver, constipation, and impaired digestion, due to over-indulgence in rich foods, may also be exciting factors. Constipation must be treated on general medical lines; aloes, in consequence of its irritant action on the rectum, should not be prescribed. A bland but nutritious diet is indicated. Condiments, pickles, rich sauces, and highly seasoned dishes should be forbidden. Strong coffee and alcohol, except in the strictest moderation, are contra-indicated. Certain other articles of diet, e.g. shell-fish and strawberries, appear at times to provoke attacks and are therefore tabooed. Excessive smoking should be prohibited. When the patient is in a low state of depression and the appetite poor, or there is evidence of neurosis, tonic treatment (quinine and nux vomica) is indicated, together with outdoor exercises—golf, riding, cycling, etc. If there is sleeplessness, bromides, sulphonal, or chloral hydrate may be administered cautiously. In the obviously neurotic case a straight talk may do much good, whilst in some hands hypnotic suggestion has met with marked success.

Local Causes

Local causes are more often responsible than general ones. The commonest are: catarrh of the rectum with consequent offensive discharge, best treated by injections of warm boric acid lotion; threadworms, the commonest cause of pruritus ani in children, occasionally persist in the adult and should be removed by enemata of strong solutions of common salt or of quassia, followed, if necessary, by 2–5 gr. of santonin and a purgative; hæmorrhoids, which should be operated on; polypi and ulcers. Fistulæ if present should be slit up, and any cracks and fissures touched with the caustic pencil or by painting with a 10 per cent. solution of silver nitrate in spt. æther. nit. Warty excrescences should be snipped off. Excessive sweating and tumours in the rectum and pelvis which obstruct the venous circulation are possible causes, and diseases of the genito-urinary apparatus may be either the direct or reflex cause of pruritus ani. Incomplete evacuation of the bowels, and especially want of cleanliness about the anus, should be looked for. *Cleanliness* of the parts after defæcation may be procured by the removal of fæcal matter or mucous discharge with pledgets of cotton-wool moistened with water. After drying a bland dusting powder should be applied. Morning and evening washings with hot water and coal-tar soap are to be commended. The application of a sponge wrung out in hot water sometimes has a very beneficial effect and may procure a night's repose.

Pruritus ani is often very resistant to treatment, but most cases are curable if taken in hand early and if the cause be located. The ailment is too often looked on as a trivial matter. If treatment is delayed until the skin has become indurated, excoriated, and sodden, then, even though the cause be removed, the itching will persist, since the nerves remain in an excitable state due to the pressure exerted on them by the fibrosed skin. It is imperative, therefore, that a careful general and local examination be made before any method of treatment is instituted. Not until after such an examination has been made are we justified in classifying a case as neurotic. The neurosis may be induced by the pruritus ani and the cause still be active though unrevealed. Each case must be dealt with in accordance with the findings and with the idiosyncrasy of the patient.

Persistent or Residual Itching

Having removed the apparent "cause" without relieving the symptoms, or having failed to find any general or local pathological condition, we are left with the further treatment of the patient. There are many vaunted remedies, but the most expert physician cannot invariably foretell which, if any, will benefit the case in hand. It is necessary to proceed with patience and caution. Whether ointments or lotions will afford the greater

relief is impossible to foretell; in spite of statements to the contrary, ointments are frequently of the utmost service.

Carbolic acid often acts like a charm. It may be used as a lotion (1 in 80) or as a liniment (1 in 20 of olive oil), and compresses soaked in these applications used as the symptoms demand. It may be combined with sodium hyposulphite in a lotion, or with cocaine or mercury in ointment or lotion form, e.g. Acid. carbol., gr. xv; cocainæ hydrochlor., gr. x; paraffin. moll. ad ℥i. Acid. carbol., gr. xii; cocainæ hydrochlor., gr. x; aq. laurocerasi, ℥iii; aq. rosæ ad ℥i. Acid. carbol., gr. xx; hyd. perchlor., gr. ii; ol. lini., ℥i; paraffin. moll. ad ℥i.

When the itching is intense or when it extends within the rectum, a half grain *cocaine suppository* affords untold relief, but such treatment should be cautiously adopted, especially in a neurotic patient. I have found the ung. gallæ cum opio equally efficient.

Cycloform ointment (5 per cent. with lanoline base) and 5 per cent. *anæsthesin* ointment are also helpful.

Tar has its advocates. The sapo carbonis detergens is desirable for washing the parts and the liq. carb. deterg. or the liq. picis carb. ℥ii–℥iv to the pint of water as a lotion. In an ointment combined with mercury and salicylic acid I have found it most useful, e.g. Acid. salicyl., gr. xv; liq. picis carb., ♏xx; hydrarg. ammon., gr. xv; paraffin. moll., adipis lanæ hydr., āā ℥ss.

Mercury is the most useful antiseptic, either in an ointment (calomel ℥ss. ad ℥i of vaseline or hydrarg. ammon., gr. xv ad ℥i of benzoated lard) or in the following lotion: Hydrarg. perchlor., gr. iii; glycerini, ℥v; aq. chloroformi, ad ℥x. After the morning toilet calomel in powder may be dusted on the parts or, better still, rubbed into the affected region by the patient. After the daily evacuation of the bowels the patient is instructed to clean and dry the parts and then to rub in 20 gr. of calomel. Such treatment, repeated for a few days, has in some instances produced most gratifying results.

Various means may be adopted for reducing the thickening of the peri-anal skin. *Salicylic acid* (6 per cent. in 50 per cent. alcohol) may be used as a paint. Twenty-second applications of *solid carbon dioxide*, with a simple protective ointment afterwards, may also be used. Carefully painting the parts with pure carbolic acid and applying Lassar's paste to the raw surface resulting from the subsequent exfoliation is an easy and convenient method. A more drastic means, necessitating a general anæsthetic, advocated by Mitchell Banks, is the use of the actual cautery to effect a superficial burn. The operation is followed by the use of the lotion of bicarbonate of soda (1 in 8) as a soothing medication and the application of zinc cream. These latter methods necessitate keeping the patient in bed till the parts are healed, and I seldom resort to them.

X-Rays

Radiation by means of the X-rays I now use as the routine method of treatment for pruritus ani. Not only have the rays a marked anti-pruritic action, but they also reduce induration of the skin. X-rays seem to have entirely superseded surgical division of the nerves, and not a few cases which have recurred after operation have remained permanently well after but a few exposures to the X-rays. The treatment should only be undertaken by a careful and competent radiotherapeutist, for over-exposure will produce a far greater evil and bring a valuable therapeutic agent into undeserved condemnation. Four unfiltered doses of a half pastille each are given at fortnightly intervals, and then after a month's rest two further exposures if necessary. The surrounding parts should, of course, be efficiently protected. An antiseptic ointment or lotion is prescribed when the circumstances demand.

The high-frequency *electrode* has proved efficient in some neurotic cases. Dr. J. M. H. MacLeod speaks well of *zinc ionisation* where superficial abrasions are present. The ionisation has definite astringent and anti-pruritic properties. MacLeod describes the procedure as follows: "A piece of lint the size of a penny is soaked in 2 per cent. sulphate of zinc solution and applied to the affected skin, the positive pole of the battery with a solid zinc electrode is pressed against the lint, while the negative electrode is held by the patient, and a current of a few milliampères is passed for ten minutes".

Vaccines

Some few years ago the late Dr. D. H. Murray, of Syracuse, N.Y., met with considerable success by the use of autogenous vaccines made from the *Streptococcus fæcalis*. His results have been confirmed by other American observers, but this treatment has not met with much approval in this country. Latterly, however, Dr. C. E. Jenkins, of Manchester, has adopted it with favourable results in a small series of patients. Dr. Jenkins gives seven injections at weekly intervals, using a residual vaccine. This method seems worthy of further trial in obstinate cases. It should not, however, be adopted before all other pathological conditions have been excluded.

XIX

TREATMENT OF ANGINA PECTORIS

By John Hay, D.L., M.D., F.R.C.P.Lond.,

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By angina pectoris I mean an arresting form of cardiac pain, substernal rather than submammary, in which the patient is conscious of a sense of oppression or constriction which may reach a high grade of intensity, up to intolerable anguish. This pain has well-recognised lines of radiation, and is often induced by effort or emotion. There are in addition characteristic associated symptoms not invariably present, notably the sense of impending death and of acute misery accompanied by varying vasomotor disorders such as cold sweats and deathly pallor. These attacks are the response of an inadequate heart to stress, due either to physical effort or emotion. Another potent factor is an exaltation or over-sensitiveness of the central nervous system consequent on prolonged worry, anxiety, or loss of sleep.

General Régime

The first essential in dealing with the patient is to explain the significance of the phenomenon, pointing out that the substernal discomfort going on to pain must be accepted by him as a peremptory order to halt and to wait until the distress has passed. More than that, it must be considered as a clear indication of the necessity for a careful readjustment of his mode of life. Except in some of the milder cases of angina minor, the wise course is to insist on complete rest in bed for a month, if this be possible. During that time there is full opportunity for careful and detailed examination. When there is a raised blood pressure the patient can be watched to see how far rest and freedom from worry will reduce the hypertension and at the same time the renal efficiency can be investigated, if this is considered necessary, and the important question as to how far the mode of life must be modified will come under consideration. Plans for the future must be made for his guidance both in regard to his mental and physical activities. They must deal especially with the pace at which he lives and works, his hours at business, and the amount of travelling done. Special attention should be paid to the manner in which the patient spends

his leisure, and any unnecessary expenditure of energy in politics or philanthropy viewed with disfavour. For anginal patients it is essential that the week-ends should be a time of rest, and all responsibilities which involve either mental or physical effort on the Sunday should be forthwith vetoed. When the time has come to attempt a return to a more normal life, the patient must be warned of the danger of exercise or effort immediately after a meal, more particularly if it entails exposure to a cold wind. An early retirement to bed is often helpful, and the patient who spends a quiet hour or two reading comfortably in bed before falling asleep is benefiting both his mind and his body. It is well to have the bed and bedroom warmed, otherwise an attack is likely to occur on retiring. Some patients are very sensitive to the chilly sensation experienced in getting into a cold bed.

The general treatment outlined above is an attempt to lower the level of physical effort in order to reduce the strain on a damaged and inadequate heart. As to medication, the recognition of the particular ætiological factor present may serve as an indication. When there is good reason to suspect syphilis, and more especially if the W.R. is positive, mercurial inunction is to be recommended, combined with iodide of potassium in doses of 10 to 15 gr. thrice daily; and a course of salvarsan or similar preparations should be given intravenously. In a large group of patients the blood pressure is unduly raised and persists at a high level in spite of rest and freedom from worry and nervous strain.

Diet and Exercise

The *diet* of these patients requires regulating. The total intake of food is usually too great. The food should be simple and small in amount; soups and gravies should be eliminated and little if any fluid taken with the meals. It is wise to diminish greatly the amount of meat, roast or grilled, and also any excess of starchy foods or vegetables liable to cause flatulence. A blue pill once a week or fractional doses of calomel given in short courses with a regular morning saline are to be recommended. Where there is any tendency to intestinal flatulence, dimol or kerol in capsules or sodium acid sulphate in gr. x to gr. xv doses are all useful. All patients liable to angina should be careful not to overload their stomachs; the meals should be small and a period of rest allowed subsequent to the meal before any effort is attempted.

Exercise.—The myocardium, like every other muscle, benefits by exercise, and it is important that the anginal patient should not be made more of an invalid than is necessary. In the amount of effort undertaken his own sensations must be his guide. He must be honest with himself and slow down or stop at the first indication of substernal discomfort. The more natural a life the patient can lead the better, and he should

make a point of getting some exercise daily in the open air. He should, however, be chary of walking against a stiff wind, more particularly if the air be keen. This difficulty in taking as much or as vigorous exercise as formerly tends to induce obesity with the consequent added stress on the heart. When this tendency is noted, vigorous efforts must be made to keep the weight within normal limits. Any gouty tendency should receive appropriate treatment, especially the windy distension of gouty dyspepsia.

In many patients the outstanding factor is mental, the result of prolonged overwork, domestic worries, or business activities. In them the nervous system is on edge. Massive doses of ammonium bromide are then of undoubted value, gr. xx thrice daily. This is especially useful in the first month or two of treatment, when the patient's habits and mode of life are being reorganised.

Drugs and Special Methods

The iodides have already been mentioned as of value in the syphilitic group. If they are tolerated well it is worth while giving them a fair trial in the presence of frank arterio-sclerosis. They are usefully combined with bromides, arsenic, and belladonna. Iodine may with advantage be prescribed in the collosol form—2 drachms thrice daily. Theobromine, either as a pure drug in 5 gr. doses given four times a day, or as diuretin in gr. x doses three or four times daily, appears to diminish the liability to pain. The diuretin is more pleasant when prescribed with the syrup of ginger. If there is any tendency to anæmia or general debility simple hæmatinics combined with arsenic are of undoubted benefit when taken over a long period, the object being to improve the condition of the myocardium by supplying it with good blood.

Diathermy is a method of treatment which is on its trial, but there can be no doubt that it frequently makes patients more comfortable; it appears to diminish both the frequency and the severity of the attacks of anginal pain, though the effect on the blood pressure in patients with hypertension is not very dramatic. It should be administered in a dose varying from 700 to 1500 milliampères, for 20 to 30 minutes twice or thrice a week, the electrodes being placed one on each arm, or one over the præcordium and the other between the shoulders.

On the first indication of substernal discomfort a tablet of trinitrin slowly chewed frequently aborts the attack, and it is advisable to anticipate and ward off a seizure by sucking a tablet before going out into the cold air.

Treatment during an Attack

In many instances the inhalation of amyl nitrite rapidly diminishes the severity of the pain and relieves the distress.

This is, however, not always the case, nor, even when the pain is mitigated, is the effect persistent. If the vaso-dilators fail and the pain persists then there is no drug comparable to morphia. It should be given in sufficiently large doses to bring relief and should be combined with gr. 1/50th atropine. It is essential that the pain should be eased. In persistent angina the action of the hypodermic should be sustained by opium *given as a draught*. Chloral, gr. x to xv, combined with this draught is also useful, or chloral may be taken twice a day instead of the opium for a few days at a time. If the pain is agonising and resistant to morphia, a general anæsthesia by the administration of chloroform is justifiable. In the earlier stages of the attack a rapid carminative is often most comforting. Brandy or whisky taken only slightly diluted will often be followed by the eructation of wind and consequent relief. A strong menthol draught is often more efficient. For example :

℞	Mentholis	gr. viii
	Spts. ammon. co. . . .	āā ℥i
	Spts. chloroformi . . .	
	Tr. zingiberis	

Two teaspoonfuls in water taken as strong as possible.

The tendency to nocturnal attacks is often obviated by a draught of nepenthe washed down with an ounce of whisky in water before retiring.

Conclusion

It is clear that in the management of this condition, except in the acute anginal seizures, the object of treatment is to prevent undue stress upon a depreciated myocardium. The pathological changes are incurable. The victim has to face his limitations and live within them. He has to learn to regulate his life and to live at a level of physical and mental effort compatible with his disability. But while recognising this, every means must be used to maintain the myocardium at the full power of which it is capable by a carefully regulated life and by medicinal and other measures.

XX

THE TREATMENT OF ACUTE OTITIS MEDIA

By H. Lawson Whale, M.D.Lond., F.R.C.S.Eng.,

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Acute otitis media, when attacked promptly and with particular care in the after-treatment, is comparatively easy to deal with, and a complete cure with perfect hearing, although it cannot be promised, is a reasonable probability. On the other hand, chronic suppurative otitis media is intractable, and the prospect of obtaining even a healed membrana tympani is doubtful; moreover, such healing, if obtained, rarely restores good hearing. Meanwhile, the patient suffers a continuous deterioration in general health, besides incurring a constant risk of dangerous complications. Obviously, no trouble is wasted if it may prevent the acute merging into the chronic condition.

Prophylaxis

The liability of every one at all times to an ascending Eustachian infection is greatly increased by sepsis in the nose or throat, or their annexa. And the timely correction of pyorrhœa, nasal turbinal hypertrophies, or nasal accessory sinusitis greatly reduces the actuarial probability of such infection. In children the most frequent predisposing cause is found in septic tonsils and adenoids, especially the latter, which, in suitable cases, may be removed without interference with the tonsils. In brief, prophylaxis comprises the toilet of the mouth, nose, and post-nasal space. But supposing that despite, or in the absence of, these precautions a patient arrives suffering from what seems to be acute otitis media, it is to be remembered that an intolerable boring pain, which has no respite, may be caused by other conditions than acute otitis media, of which it is so characteristic. I refer chiefly to meatal furunculosis and to old impacted wax which has suddenly swelled with moisture; either of these may coexist with an acute middle-ear infection. Again, with almost identical physical signs in both drum-heads, the pain on one side may be so great that no complaint at all is made of pain in the other ear; thus, in order to avoid a second and superfluous anæsthetic, both drums should be inspected.

Having decided that the condition is, in fact, an effusion into the middle ear, the further point at issue is whether this effusion is catarrhal or purulent ; that is, whether the drum calls for an immediate incision or not. In those cases where the physical signs indicate only a catarrhal condition, and pending arrangements for operation in the suppurative cases with which this article chiefly deals, an expectant attitude should be adopted.

Expectant Treatment.—Local analgesics give great comfort. It is usual to employ glyc. ac. carbol. 1 in 10 to 1 in 5 ; or "Ovoids" containing opium or cocaine, made by Messrs. Savory and Moore. A cholagogic purge is essential, preferably calomel.

Operation

Pus, once diagnosed—in a stereotyped case by a loss of landmarks in an opaque membrane, which, over a part or the whole of its extent, shows a bulge of which the colour varies from yellow, through salmon-pink, to an angry red—must be released. Myringotomy may be performed under a prolonged nitrous oxide anæsthesia, or gas and oxygen, or a light ether narcosis. The incision may reveal only a bead of pus, and this may be obscured by blood, although the hæmorrhage is insignificant. It is imperative to operate, because, first, the middle layer of the drum-head consists of radial and circular elastic fibres, and after a clean incision fewer of these (especially the radial) are severed than if the membrane be allowed to burst ; in the former case the opening is less ragged, so that rapid and complete healing is more probable. A second reason for early incision is that before rupture occurs the infection may spread not only to the mastoid, but to the meninges or brain. At the conclusion of the brief anæsthesia, and as soon as the ear has been covered up, the patient, if young, should be digitally examined for adenoids, if this examination has not been previously made. If any are found, their removal should be postponed, for the creation of a raw post-nasal area at this time might spread or maintain an infection, so that a unilateral case might become bilateral, and even in a case already bilateral healing would be invalidated.

After-treatment

Immediate After-treatment.—Meticulous care in this, including a strict antiseptic ritual for the first ten days, will be well repaid. From one of the various firms who cater for surgical equipment a tin containing six packets of aural dressings should be obtained ; also, if the patient be a restless child, a "mastoid cap," which is less liable to displacement than is an ordinary bandage. Circumferential hair should be cut sufficiently short to prevent any stray hair from wandering into the concha. At the close of the operation a wick, about five inches long, of plain sterilised

woven-edged ribbon gauze, not more than three-quarters of an inch wide, should be inserted into the meatus for half an inch; the surplus inches of gauze are loosely folded into the concha. Subsequently, the wick is changed every 24 hours; and each day before replacing the wick the meatus is gently wiped out with a piece of similar ribbon gauze made just moist with lot. ac. borac. 75 parts, spir. vin. rectif. 25 parts, and two or three drops to the ounce of tinct. iodi. After two or three days there is a tolerance to the warm sensation produced by the alcohol, which may be gradually strengthened up to 40 per cent. These manœuvres are facilitated by gently pulling the pinna backwards, thereby straightening out the curve in the cartilaginous meatus and rendering access more direct. Quite possibly no pus will ever be seen, even on the first dressing; the drum-head heals by first intention, and is intact in a fortnight or less. The friable healed area would be easily reopened by slight trauma or sepsis, and it is wise to keep a very light wick in the ear for another fortnight. After three months it may be difficult to find a scar. It is not desirable to syringe the ear at this stage.

Remote after-treatment differs according to the course of the case: whether (*a*) favourable (fortunately common) as heretofore outlined, or (*b*) unfavourable.

(*a*) *Favourable Cases.*—An alkaline nasal douche, in all patients old enough to use it, should be instituted as soon as acute symptoms cease, and continued twice daily for six weeks. In small or intolerant children a spray should be substituted. After two months the membrane is strongly healed, and then, but not sooner, if slight deafness or tinnitus remain, the mobility of the drum-head should be simultaneously examined and encouraged by using a Siegle's speculum, which provides a feeble form of air-massage. More vigorous movement may be required, as supplied by a pump attached to an electrical motor of the Pantostat type. And, to complete the cure, a few inflations with the Eustachian catheter may be most helpful of all. Any adenoids should be removed, and, if septic, the tonsils also by dissection, as a precaution against recurrence.

(*b*) *Unfavourable Cases.*—Suppose that during the first few days pus, instead of being absent, persists or even increases, and at the end of a week there is still otorrhœa, with slight irregular pyrexia and perhaps trivial aching discomfort, it is clear that healing by first intention has failed, and, as in the case of any other wound in like condition, dry dressings no longer meet the case. Recourse must now be had to syringing, twice or thrice daily, but at first with only the most bland unirritating fluids. Warm lot. ac. borac. is the best, to which, as in swabbing out the favourable cases, alcohol may be gradually added up to 25 per cent. As useful alternatives warm aqueous solution of resorcin, 4 per cent., or of chinosol, 1 in 1000, may be tried. Under this régime the membrane may heal in another two weeks. If not, if the suppuration still continues, and the pus instead of becoming

steadily thinner and more scanty remains yellow and so thick that its inspissation sometimes threatens to block its own egress, a stronger antiseptic is called for. An effective lotion is warm mercuric potassium iodide, 1 in 4000. There are various useful lotions and preparations for the treatment of obstinate otorrhœa, but their use, as also such methods as ionisation, belongs rather to the subject of chronic otitis media. If after using a lotion for three more weeks—that is six weeks from the onset of the infection—there is still no sign of healing, the possibility of chronicity must be faced. And here, as regards treatment, we are at the parting of the ways ; two courses are available.

The first possible course is to temporise by using a vigorous cleansing agent such as hydrogen peroxide. This, despite its valuable properties, carries about, by the mere mechanical movements of its bubbles, any and everything which they loosen—including infected débris containing micro-organisms which have escaped destruction. In the early days, therefore, the infection may be spread by its use. Later, when a barrier of granulation tissue has shut off surrounding areas, hydrogen peroxide is a good friend. From the point of view of obtaining healing and good function, its use is an admission of probable defeat, implying that the case is already on the border-line of chronic suppurative otitis media, and as such passes out of the province of these notes. In some cases it is necessary thus to temporise with hydrogen peroxide, but in others there is an alternative.

The second course is to face the issue and apply the ordinary surgical principle of counter-drainage. In obstinate cases of recent acute suppurative disease counter-drainage by a tube placed in the antrum after a simple mastoidotomy is often the best course. The antral cavity, of course, becomes obliterated by granulation tissue which gradually becomes fibrous, and there is no consequent functional disability. The usual outcome is that an acute condition which threatened to become chronic rapidly ceases, with perfect healing, and—after perhaps a few subsequent Eustachian inflations—excellent function results.

If this more active method is to be pursued, it must not be long delayed. It should be considered in any case which obstinately persists for three weeks, and undertaken before the lapse of eight weeks.

XXI

THE TREATMENT OF CLEFT PALATE

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Much has been written on the subject of cleft palates, and many variations of treatment advocated ; nevertheless the end-results of treatment—as seen in middle-age in a large proportion of cases, are far from satisfactory from the points of view of speech and appearance. It is evident that more attention has been paid to the actual surgical closure of the cleft in early childhood than to the prospects of functional ability in later years.

Movements of the Soft Palate during Speech.—The action of the muscles which enter into the formation of the soft palate is to raise or lower the palate to enable it to make or break contact with the posterior wall of the pharynx so as to close off the oral from the nasal pharynx, and the functional success of the treatment is almost entirely dependent upon the restoration of this action. However successfully the cleft in the hard palate may be closed, unless a soft palate is obtained which will reach the posterior wall of the pharynx when raised and so enable the patient to shut off the oral from the nasal pharynx during speech, the result must be regarded as a sugical success but a functional failure.

Langenbeck and Lane Operations.—The usual operations performed in this country are variations of the Langenbeck and Lane operations, which have the common factor of the closure of the cleft by soft tissues, with the result that a certain amount of scar-tissue is formed. In view of the great contracting tendency of scar-tissue little wonder that after these operations the parts concerned tend to be drawn towards the centre-point of contraction—i.e. the middle of the palate. The dental arch is contracted with resultant loss of occlusion of the teeth, the pre-maxilla (in cases of double cleft) is drawn backwards with resultant marked facial deformity, and the delicate tissues of the soft palate are drawn forward, thus causing it to lose ability to perform its function of closing off the oral from the nasal

pharynx, with resultant imperfect speech. Further evidence of this contraction may be obtained by X-rays, when it will be observed that the two bony parts of the maxilla have so approximated that the original cleft appears only as a narrow dark area. These deformities appear more marked when the operation has been performed at an early age, as the bone is then more easily moulded than in later life. Another contributing factor to these deformities is the apparent lack of growth of the maxilla as a whole after surgical interference, which accentuates the condition as the mandible develops. Orthodontic treatment is often resorted to to expand the arch after these operations, but is usually not attended with satisfactory results, and it is open to doubt whether the extensive movement of the teeth that is required does not lead to their premature loss.

Preliminary Measures, including Operation for Hare-Lip

The ideals to be aimed at in the successful treatment of these cases are : (1) The general health of the patient ; (2) good speech ; (3) proper mastication ; and (4) good appearance. The technique to enable us to reach these ideals as far as possible is as follows. To enable the infant to take its food it should be provided at birth with a small sucking plate, which is of simple construction and can be made in one day. It will not always enable the infant to feed at the breast, depending largely upon the amount of milk present, but it will certainly enable the infant to suck from a bottle and feed like any normal child. This plate is only worn whilst the child is feeding, and may be continued without alteration until between the second and third months, at which time a hare-lip operation should be performed if necessary. The reasons for operating at this age are : (*a*) The child having been naturally fed for this period is better fitted to undergo the operation ; (*b*) owing to the action of sucking, the two parts of the maxilla will have appreciably approximated, as may be demonstrated by a comparison of models of the mouth taken at birth and at this period ; and this fact, together with the increased supply of soft tissues, renders the operation easier ; (*c*) if the operation is postponed after the third month the child has a tendency to push its thumb into the cleft with resultant widening.

In cases of double cleft with a protruding pre-maxilla, it is essential for the future appearance of the child that the pre-maxilla should be replaced in its natural position between the two parts of the maxilla whilst the lip operation is being performed. After the hare-lip operation, the original sucking plate must be reconstructed or, preferably, a new one made, to conform with the altered conditions. This plate will carry the child on until the teeth begin to erupt, at which time the infant

accommodates itself to the condition and will be able to feed without its assistance.

From the third month to the third year no special treatment is required, beyond special attention to the conservative treatment of the teeth. The dental arch not having been interfered with, the temporary teeth will erupt in good occlusion with the lowers except those involved in the actual cleft, which may erupt somewhat irregularly but call for no drastic treatment. The child will be able to feed quite normally, although the usual difficulty when starting with solid food may be slightly prolonged. This, however, is an entirely temporary trouble which is soon overcome and calls for no anxiety.

Definite Measures Three Years after Birth or Later

When the child reaches the age of 3 years there are three courses of treatment open, viz. : (1) Surgical, (2) prosthetic, and (3) surgical and prosthetic.

1. *Surgical.*—If it is desired to treat the case by purely surgical means the Langenbeck operation may be performed, but the hard palate should be closed first and followed later by the closure of the soft palate, as this course helps to lessen the pulling forward of the soft palate alluded to above. In theory this operation should give good results, but it must be realised that the soft palate is such a delicate organ that when part of it is lost by surgical interference it cannot be replaced by any means yet known to plastic surgery. If the operation is not entirely successful at the first attempt the resultant condition is far more difficult to treat, either by surgical or prosthetic means, than if the operation had not been performed. It is this great risk and the deplorable results that so often follow that preclude recommendation of this treatment, and compel us to seek a safer and more efficient treatment in which the risk is entirely eliminated.

2. *Prosthetic.*—The prosthetic line of treatment consists of the fitting of an obturator to restore the hard and soft palates. This treatment is commenced during the fourth year, and naturally the apparatus has to be renewed from time to time, depending largely upon the eruption of the teeth. The points in favour of this treatment are : (*a*) No operation having been performed upon the maxilla, except for the hare-lip, the dental arch develops like that of a normal child, with the result that the occlusion of the teeth is practically normal except in the immediate neighbourhood of the cleft in the alveolus ; (*b*) as the result of the normal development of the maxilla unhindered by operation, the usual cleft palate disfigurement is avoided and the appearance of the child is not affected ; (*c*) when the soft palate is not interfered with Nature endeavours to accommodate

it to the condition; the two separate halves hypertrophy, together with the muscles of the posterior wall of the pharynx, and so facilitate the fitting of a really functional obturator. It has often been stated that if children are not operated upon or some appliance fitted at an early age they will develop bad speech and that this habit is very difficult to cure. This is a fallacy. Experience of about 300 cases has proved to me that the quickest and some of the best results in speech are obtained when the patient comes for treatment between the ages of 12 and 18, without any previous surgical or prosthetic treatment. The prosthetic treatment fulfils all the ideals mentioned above, good speech especially being almost a certainty. The only disadvantage of this treatment is that the patient has to keep in touch with a dental surgeon experienced in the construction of obturators.

3. *Surgical and Prosthetic.*—This combined treatment has for its purpose the closing of the soft palate by surgical means and of the hard palate by a dental plate.[1] The primary importance in speech of a functional soft palate is the basis of the treatment, and this is secured by utilising all the available soft tissue in its construction, thus leaving the cleft in the hard palate to be closed by means of a dental plate. This plate is of simple construction, and is similar to the ordinary denture which in a large number of cases is necessary to replace the involved incisor teeth, these being often irregular and requiring extraction. The advantageous features of this treatment are: (*a*) A long soft palate which reaches the posterior wall of the pharynx when elevated, resulting in good speech. Any tendency of the palate to move forward is obviated by the dental plate, which is carried slightly into the cleft. (*b*) A normal dental arch which has not been distorted by surgical interference, eliminating facial disfigurement and giving good occlusion of the teeth with normal masticatory function.

The best results from this treatment accrue when the operation is not undertaken until the child is 6 to 8 years old, and this postponement calls for patience on the part of the parents. It is often advisable to insert a small obturator after the age of 4 years to accustom the child to the wearing of a plate, to aid speech, and to give the parents the necessary assurance. In performing the operation special attention must be paid to the insertion of a dental plate at the same time, otherwise the soft palate will tend to be drawn forward and the most important feature of the operation missed.

Conclusion

It must be borne in mind that if the early operation is not completely successful future treatment is far more difficult, and

[1] See Gillies and Fry, *Brit. Med. Jour.*, March 5th, 1921.

necessitates the use of more complicated appliances, than if the operation had not been performed in early infancy. It seems, therefore, desirable that the safer prosthetic, or the combined surgical and prosthetic courses, should be adopted.

XXII

THE TREATMENT OF CHRONIC BRONCHITIS AND EMPHYSEMA

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The lot of the middle-aged or elderly bronchitic patient is a hard one and the task of his medical attendant is difficult, since the choice of treatment often lies between recommendations which are impracticable on the ground of expense, or uneconomic because they would prevent the patient from earning his living. Treatment is thus often of necessity a compromise and unsatisfactory from the patient's and, it may be, from the practitioner's points of view. Yet much can be done, even in unpromising cases, by a judicious use to the best advantage of preventive measures and palliative or remedial treatment. The association of bronchitis and emphysema is a true example of a vicious circle. The conditions of life and work in most parts of this country, especially in the towns, are often such as to fix the circle firmly in its harmful progression.

Prevention

Climatic Treatment. Where possible, the patient should be moved from places where cold, damp, and fogs prevail to those with an equable, dry, and sunny climate, and where there are no prevailing cold winds. In this country, the health resorts on the south coast from Hastings to Falmouth or Penzance, including the Isle of Wight, and those on the Welsh coast—such as Colwyn Bay and Llandudno in the north or Tenby in the south—afford useful refuges for these patients; but even at such places they may be obliged to remain indoors for many days owing to unfavourable conditions of weather. Farther afield, for those whose means permit, many of the resorts on the French and Italian Riviera, such as Hyères, Cannes, Mentone, Nice, San Remo, and Alassio, are often recommended; but it should not be forgotten that at some of these places bitingly cold winds may occur, and that in crowded hotels catarrhal infections may be rife. Still farther, the Egyptian desert stations, Mena House, Helouan, and Assouan, the Atlantic

islands—Madeira, the Canaries, and the Azores, and places such as Jamaica, Cuba, and California all offer climatic conditions favourable to these patients during the months of the English winter. Patients endeavouring to escape catarrhal conditions in this country should leave before November and should not return till April at the earliest, and preferably May.

To many of the worst sufferers recommendations of this kind are impossible, from family, financial, and business reasons, and for such the conditions of life and work may require the most careful scrutiny. They may be advised to change their residence from a damp, foggy, low-lying or riverside locality to a healthy suburb or to another urban or rural district not too far away from the place of occupation. This is particularly the case where there is an asthmatic factor. It may sometimes be necessary for the patient to consider a change of occupation owing to the limitations imposed by the chronic and progressive nature of the malady. Dusty occupations are particularly to be avoided. In advanced cases where the patient is obliged to live in unsuitable places it may be necessary to keep him indoors for weeks at a time, or even for the greater part of the winter, only allowing a walk, drive, or other outing when the weather conditions are favourable.

Clothing.—Bronchitics nearly all have an almost morbid fear of "chill"—which is justified to the extent that it is generally admitted that marked chilling of the surface of the body may lead to congestion of the bronchial mucous membrane and to acute exacerbations of catarrhal processes. It becomes morbid when it leads the patient, as is so often the case, to put on extra vests, home-made or bought "chest protectors," or thick jackets of cotton-wool, medicated or otherwise. Once employed, these are difficult to discard, and, at each fresh sensation of cold, an extra layer is often applied till the patient is literally swathed in multiple wrappings. By promoting sweating, these measures render the patient uncomfortable, and favour, rather than prevent, chill. Warm underwear of loose cellular type, either wool or linen, should be worn, with warm wool-lined waistcoats or cardigans in the case of men, and Shetland or other woollen spencers in the case of women. Sometimes two light cellular vests are to be preferred to one heavy impervious woollen garment. For outdoor wear, warm rather than heavy clothing should be worn. Scarves or "mufflers" are not to be encouraged, but they may be permitted, provided they are worn so as not to cause sweating.

Vaccines.—Prophylactic inoculations may afford valuable aid in the prevention of acute catarrhal infections. Where it is known that one particular organism is concerned, an autogenous vaccine may be used, but as a rule one of the stock "mixed" vaccines seems to give satisfactory results. The stock vaccine has the merit of being simpler and cheaper than an autogenous vaccine. Not a few patients, especially those with some chronic

indurative process in the lungs, prove sensitive to these vaccines, and may develop acute symptoms after each dose. In such cases small doses should be used to start with in subsequent courses, and only slowly should the ordinary doses be reached. In some cases the prophylactic vaccination may have to be discarded.

Nose and Throat.—The nose and throat should be carefully examined, and any abnormal condition, such as nasal obstruction, chronic diseases of the accessory sinuses or polypi, dealt with.

Diet

Since not a few patients suffer from arterio-sclerosis, heart weakness, or asthma, a light diet—poor in nitrogenous constituents—is advisable, and it is often wise to take the chief meal at midday rather than in the evening. Flatulence may promote useless cough, embarrass the heart, and increase the asthmatic or paroxysmal character of the dyspnœa. Alcohol should only be permitted in strict moderation. It is then more likely to be helpful in emergency. Smoking should be cut down or prohibited in severe cases, especially the inhaling of smoke.

Drugs

The medicinal treatment varies with the type and degree of the condition. The classification of the cases which is usually adopted is based on that of Laennec. There is (1) the *ordinary winter cough or chronic tracheo-bronchitis*, the commonest variety. In such cases but little medicine may be necessary. A simple expectorant mixture of vin. ipecacuanhæ ℥x, syrup. scillæ ʒi, tinctur. camphoræ co. ℥x, aquam chloroformi ad ʒi, to take occasionally may be all that is necessary. Where cough is frequent, irritative, and ineffective, a dose of the well-known Brompton Hospital "mist. sodæ cum æther. chloric." taken in hot water may be helpful. It consists of sodium bicarbonate gr. x, sodium chloride gr. iii, spiritus chloroformi ℥v, aquam anisi ad ʒi. In cases with marked tracheitis, small doses of apomorphine (1/36–1/20 gr.) and of morphine in the form of tincturæ chloroformi et morphinæ, '85 B.P. (℥v–x) are often very useful. Various demulcent or sedative lozenges, such as the black currant, the glycerine, the liquorice, the ipecacuanha, or ipecacuanha and morphine lozenge, or one with a small dose of heroin, are all of value in certain cases.

(2) *In more severe cases* with asthmatic dyspnœa or with copious nummulated muco-purulent sputum, iodides, ammonium salts (the chlorides or carbonates), and antispasmodic drugs, such as belladonna, stramonium, hyoscyamus or grindelia, may be useful. A valuable mixture in such cases is pot. iodid. gr. iii, pot. bicarb. gr. x, ammon. carb. gr. iii, tinct. stramonii ℥v–x, syrup. tolut. ʒi, aq. chlorof. ad ʒi.

(3) *Bronchorrhœa*—the "*pituitous catarrh*" *of older writers.* This uncommon condition is a distressing one, owing to the very large quantity of sputum which is brought up. It may reach as much as 4 to 5 pints in 24 hours. It is thin, watery, frothy, and non-albuminous. Treatment seems to exert but little influence on it, but atropine, belladonna, acids, and vaccines may all be tried.

(4) *Dry catarrh*—in which little or no sputum is expectorated, but there is a chronic, distressing, and painful cough. In this type of case saline expectorants, such as the Brompton Hospital mixture above mentioned, with iodides give the best results.

Other drugs which have been employed in cases of chronic bronchitis are ammoniacum, terebene, creosote, garlic, the balsams, and the benzoates. Some of these are worth trial in cases which prove refractory. Cod-liver oil, with or without malt, is often helpful, especially in patients of thin, spare habit.

Local and Special Measures

Counter-irritation to the chest in the form of liniments often proves helpful and comforting to these patients, especially when there is retro-sternal soreness or muscular pain from violent or prolonged coughing. One of the best of these is the acetic turpentine liniment, but other stronger liniments or iodine ointments are often useful.

Dry cupping of the bases of the lungs may be useful during acute attacks, especially in older people, or those confined to bed and tending to develop hypostatic basic congestion. Poultices may also be used in similar conditions.

In cases with marked emphysema, various special contrivances have been designed to promote ventilation of the lungs—of these Kuhn's mask and the compressed air bath have proved the most helpful. The latter may help certain cases with dyspnœa and expectoration, but it is difficult to secure the treatment, and it is now not often used.

Vaccine Treatment.—This seems to be of less value in treatment than in prophylaxis. It may, however, be tried cautiously in cases in which other methods fail. In this case an autogenous vaccine is to be preferred, in small doses at first.

Complications

The chief complications for consideration are: (*a*) Attacks of acute bronchitis progressing to broncho-pneumonia; (*b*) progressive emphysema; (*c*) cardiac failure; and (*d*) pulmonary tuberculosis.

(*a*) *Acute bronchitis* should be treated on ordinary lines. The patient should at once be put to bed, no matter how mild the attack may appear at the outset; saline expectorants,

diaphoretics, and stimulants being given if necessary, and the physical signs watched.

(*b*) *Advancing emphysema* with increasing cyanosis demands a careful review of the patient's mode of life, occupation, and habits. In some such cases the compressed air bath proves of great value.

(*c*) *Cardiac failure*, which is more especially right-sided in these cases, requires most careful treatment. Rest, the relief of the engorged right side by venesection, leeching or purging, and the employment of cardiac tonics are the chief means at our disposal. Venesection should not be employed in old, enfeebled, or cachectic cases.

(*d*) *Pulmonary tuberculosis.*—This should be suspected in cases in which the summer intermission suddenly ceases. It is wise in all cases to have the sputum examined, as it is now becoming more generally recognised that tuberculosis in the elderly often masquerades as senile bronchitis, or is masked by emphysema till it is advanced.

XXIII

THE TREATMENT OF VERTIGO

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Vertigo or giddiness is a peculiar disturbance of equilibrium in which the patient experiences a feeling of movement either in himself or in surrounding objects. In severe cases there may be staggering or reeling, or the patient may even fall to the ground.

Equilibrium is maintained by the properly adjusted tonic contractions of certain muscles. It is controlled by a centre situated in the cerebellum. From the skin, muscles, joints, eyes, and labyrinth afferent impulses pass to the cerebellum and are there transformed into efferent impulses which travel through the superior cerebellar peduncles to the red nuclei. From the red nuclei impulses pass to the lower motor neurones, so that the contractions necessary to maintain equilibrium are ensured. Although afferent impulses then are sent from many parts, the most important are those from the labyrinth, and thus it is that vertigo is so frequently associated with aural disease. For this reason it is convenient to classify cases of vertigo into (1) those associated with aural disease, (2) those in which no aural disease is discoverable.

Vertigo Associated with Aural Disease

This group comprises a large number of cases. In all the vertigo is due to disturbance in the labyrinth; in many it is the result of an irritative lesion in the external or middle ear—for example, wax in the external auditory canal, or suppuration in the middle ear. In others, usually the more severe, it is the result of an actual non-suppurative destructive lesion in the internal ear, the exact nature of which is not usually ascertainable. Very severe vertigo is also caused by sudden extension of a suppurative process from the middle to the internal ear, the treatment of which calls for immediate surgical interference. It is therefore necessary, in all cases of vertigo associated with deafness, to obtain the opinion of an aural surgeon that the precise condition of the ear may be determined. In a number of cases the vertigo is paroxysmal and is associated with vomiting

in addition to deafness ; this triad of symptoms—namely, vertigo, deafness with tinnitus, and vomiting—constitutes Ménière's syndrome. In these cases the vertigo may be so sudden and so severe as to cause the patient to fall as if felled, though in Ménière's syndrome there is never any loss of consciousness, an important distinction from petit mal and fainting.

Where the vertigo is associated with a lesion in the external ear, such as a plug of wax in the external auditory canal or a severe inflammatory lesion or with suppuration in the middle ear, the treatment is directed to the local condition.

The treatment of vertigo, the result of a non-suppurative lesion in the labyrinth, demands attention : (*a*) during an attack, (*b*) between the attack as a preventive measure. During the attack the patient is put to bed with the head slightly raised, hot-water bottles are put to the feet, and calomel, gr. v, administered. As a preventive measure between the attacks the patient should be warned to avoid sudden turning movements of the head, undue exertion, and the watching of quickly passing objects, as experienced by looking out of the window whilst travelling in an express train. Sometimes even gazing at moving pictures may incite an attack. Constipation should be prevented, and tobacco and alcohol used only in moderation. The most efficacious drugs are iodides, bromides, strychnine, and quinine. In any particular case it is difficult to say which of these is likely to be most successful, though in those with a neurotic temperament I think bromides are indicated, whilst strychnine is perhaps the most beneficial in debilitated individuals. On the whole, however, I believe that quinine in small doses with or without bromides will be found to be the most valuable drug in warding off attacks of vertigo of this class. A useful prescription is :

℞	Quininæ sulph.	gr. ½
	Ac. hydrobrom. dil.	℥xv
	Tinct. aurantii	℥xx
	Aq. ad	℥ss

℥ss night and morning.

Vertigo Unassociated with Aural Disease

Vertigo in these cases may be the result of disturbance of afferent impulses from sources other than the labyrinth. This is probably the explanation of vertigo occurring when a person walks from a hard on to a soft surface, resulting in a disturbance of afferent impulses received by the cerebellum from the deep structures—e.g. joints. Again, vertigo may be due to ocular disturbances, generally the result of paralyses of external eye muscles associated with diplopia, but in a few cases in which there is no paralysis and in which dizziness with headache occurs after prolonged use of the eyes, it would appear that the dizziness is due to some error of refraction, for cases occur where

examination of the eyes has revealed some error of refraction, and the wearing of suitable glasses has benefited the condition. Neurotic vertigo is fairly common, such, for example, as vertigo occurring in certain individuals when they get into a crowd or into a large open space, or when they find themselves in a confined place, such as a theatre. Fear, no doubt, plays an important part in these cases. Patients with neurotic vertigo rarely fall. This type is best treated on the general lines laid down for the treatment of neurasthenia aided by some sedative drug, such as bromide of potassium or sodium and valerian. Vertigo occurring with epilepsy and migraine calls for no special treatment outside that employed for the relief of the nervous condition with which it is associated. In migraine the eyes must be carefully examined for some error of refraction, and any error found corrected with suitable glasses. In many cases no other treatment is necessary. In others considerable benefit may be derived by taking pil. quininæ, gr. i, twice a day, combined with a diet restricted in animal food and strict instructions to the patient to eat sparingly. Where the attacks of migraine occur at fairly regular intervals I believe that, in addition to the above treatment, luminal, gr. ii, each night for a few nights before an attack is expected is beneficial.

Vertigo is also associated with certain organic diseases of the central nervous system, but I know of no special treatment which affords relief in these cases. It occurs notably in cerebellar disease, when it may be central in origin or due, as in cases of cerebral tumour, to a general increase in the intracranial pressure. It may also be met with in disseminated sclerosis and in general paralysis of the insane. Giddiness is a symptom commonly complained of in all forms of anæmia, and does not call for any treatment other than that employed for the relief of the anæmia. Another common cause of vertigo is some gastro-intestinal disturbance, such as dyspepsia and constipation. It is probably due to the sudden discharge into the blood-stream of poisons manufactured in the alimentary tract, and is relieved by giving calomel, gr. v, followed by a saline purge. Toxic vertigo due to alcohol and tobacco is well recognised and is relieved by removing the cause.

Disturbance of Intracranial Circulation

Perhaps the commonest cause of vertigo is some disturbance in the intracranial circulation resulting in either hyperæmia or anæmia of the brain. Cerebral hyperæmia is probably the explanation of the giddiness which occurs associated with hot flushes at the menopause, though in most instances where vertigo is due to disturbances in the cerebral circulation it is the result of anæmia of the brain consequent upon sclerosis of the cerebral arteries. Associated with the vertigo in these cases there is usually a high blood pressure, but in a few cases, owing to

myocardial degeneration, the blood pressure is below normal. In either case, when the vertigo is severe it is a grave omen. In the one type it is often the forerunner of a stroke and in the other of sudden cardiac failure. The treatment is somewhat different in the two types of cases.

(*a*) *Where the blood pressure is high* the patient should avoid all strenuous mental and physical effort; if possible he should retire from active business. He should be warned against stooping or sudden alterations in position, but gentle exercise should be allowed. The diet should be restricted as regards meat, and two or three days a week should be meatless. Any meat that he takes is better grilled or cut from a joint rather than stewed. Beef tea, gravies, and meat extracts should be forbidden. The bowels should be kept relaxed but not purged. Suitable aperients are phenolphthalein, 2–4 gr., phenolax, 1 or 2 wafers; in certain cases a small dose of a saline aperient taken each morning is most beneficial. The object should be to produce two relaxed evacuations daily rather than an occasional purging. Alcohol and tobacco must be used only in moderation. Iodide, either as potassium iodide or in the form of iodalbin, iodicin, or collosol iodine, is, I believe, the most useful drug in this type of case. It should be given in moderate doses over a long period. In some severe cases I have seen benefit derived from taking iodalbin, gr. v, three times a day and erythrol tetranitrate, gr. $\frac{1}{2}$, night and morning.

(*b*) *Where the blood pressure is low* exercise must be more curtailed, but the same rigid precautions are not necessary as regards the diet; in fact, it is better to allow meat to be taken daily. These cases are more difficult to relieve than are those with a high blood pressure. Medicinal measures are disappointing, though some patients are benefited by giving iodide in some form in moderate doses three times a day and a digitalin granule, 1/600 gr. (Nativelle), night and morning; others obtain considerable relief by taking a Gélineau's dragée night and morning.

XXIV

TREATMENT OF TUBERCULOUS PERITONITIS

By H. W. Carson, F.R.C.S.Eng.,

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Treatment in tuberculous peritonitis, as in other tuberculous lesions, tends to become more and more conservative. This follows the acceptance of the theory that in most cases of surgical tuberculosis the disease is a local manifestation of a general systemic infection. A. Rollier considers tuberculous peritonitis to be almost always consecutive to pulmonary, pleuro-pulmonary, or pleural lesions.[1] He is strongly opposed to operation in this disease, on the ground that it "may produce a locus minoris resistentiæ and a depression of general health which not infrequently results in renewed pulmonary activity." Unfortunately, the ideal is not always attainable: operations are performed from time to time either deliberately or accidentally —deliberately in order to evacuate fluid in the ascitic variety or to meet some emergency such as intestinal obstruction in the fibro-adhesive variety; accidentally, as the result of a mistaken diagnosis.

Tuberculous peritonitis requires a more exact classification. A wide distinction may be drawn between primary and secondary conditions. Among the primary can be included the miliary type with ascites and the fibrous adhesive type, which I look upon as a later stage of the ascitic following the absorption of the fluid, a stage of partial cure. These cases are systemic in origin. Among the secondary conditions peritonitis may follow tuberculous enteritis, or sometimes tuberculous salpingitis, ileo-cæcal tuberculosis (the entero-peritoneal type of Hartmann), and the large class of caseous tuberculosis which may be regarded as a late stage of mesenteric gland tuberculosis. It is doubtful whether these secondary infections are systemic at all; they may be looked on as local implantations of tubercle operating through the intestinal tract; especially is this probable in the case of mesenteric gland tuberculosis which is comparable with tuberculosis of the cervical glands. If this view is true it justifies operation in the secondary types, while limiting operation in the primary types to the relief of intestinal obstruction. It is

[1] *Heliotherapy*, Oxford Medical Publications, 1923.

true that cœliotomy has had many successes in the ascitic form, and it may still have its place where the modern conservative methods are not available.

Conservative Treatment of Uncomplicated Tuberculous Peritonitis

The preliminary examination of cases of uncomplicated tuberculous peritonitis is on the same lines as for all abdominal conditions. A thorough investigation is necessary to exclude sepsis in the nasal passages (rhinitis or sinusitis), in the pharynx and naso-pharynx (and this may necessitate the removal of adenoids or septic tonsils), and in the mouth (dental caries). The examination of the lungs is especially important and it is well to estimate the Wassermann reaction. The stools should be investigated for evidence of undigested food and occult blood.

When any septic foci have been removed or excluded, the patients are confined to bed, "simple recumbency" in Sir Henry Gauvain's phrase, or as Rollier suggests in the acute stages, "immobilisation in the dorsal position." The diet should be regulated to avoid all materials liable to irritate the intestine.

Graduated sun treatment as employed at Leysin is then used. This consists in a very gradual exposure to sunlight, the ultra-violet rays of which, while they have very little penetrative power, are strongly bactericidal and in addition appear to increase the power of the blood to destroy disease-producing organisms, at the same time increasing the calcium metabolism. Gauvain's instructions for this treatment are as follows:

1st day	Expose legs to knees for 5	minutes hourly for three successive hours.
2nd ,,	,, ,, ,, ,, 10	
3rd ,,	,, ,, groins ,, 10	
4th ,,	Expose legs and buttocks for 20	
5th ,,	In addition one aspect of the trunk for five minutes.	
8th ,,	Total exposure for 20 min. hourly for three successive hours.	

The exposure is regulated by the amount of pigmentation, it being understood that patients who will not pigment or only freckle, require much more care than those that pigment well. Eventually a total exposure of two to three hours a day may be obtained, the greatest care being taken to protect the head and to prevent blistering. The coincident exposure to cold air increases metabolism, which is still further increased if sea-bathing is added. The very young, and aged and infirm patients, require special care. Rollier says that the sun treatment produces its best results in the ascitic type, but in the caseous type a congestive reaction accompanied by vomiting and fever may result. Gauvain says that uncomplicated cases almost invariably do well, that the fibrous adhesive type often obtains rapid and

permanent benefit, and that such complications as intestinal obstruction are very rare at Alton.

X-ray exposures may be employed in the absence of sunlight. The abdomen is divided into quadrants, only one being irradiated at a sitting with an interval of five to six days. This treatment is valuable in the fibrous adhesive type, but is of little benefit in acute forms.

Alternatively the *mercury-vapour lamp* may be employed, it being remembered that at a distance of one metre its ultra-violet intensity is over three times that of the sun. This is increased in a hot room and diminished in cold, and erythema is easily produced.

Tuberculin.—Opinions are divided as to the value of tuberculin. Rollier has almost abandoned it, but others use it, though not in acute cases. It is usual to start with a minimal dose, 1/10,000,000 mg., progressively doubled at five-day intervals, till 1 mg. is reached. This dose is then given at fortnightly intervals for a year. If there is no pyrexia the initial dose may be 1/10,000 mg., but it is important to take regular readings of the temperature in the rectum.

Operative Treatment

Operative treatment of tuberculous peritonitis concerns itself mainly in dealing with complications, of which the most common is intestinal obstruction. From time to time one is called upon to treat the ascitic type, and surgical measures generally meet with immediate success. Operation must be accepted, however, merely as one step in the treatment; the aim is to evacuate a fluid of low bactericidal power in the hope that it will be replaced by a temporary serous effusion of a higher bactericidal power. The operation consists of a cœliotomy, the evacuation of the fluid, the removal of any local primary cause—e.g. appendix or Fallopian tube, and closure without drainage. All ligatures and sutures must be of catgut. In a short series of 17 consecutive cases operated upon by me for tuberculous peritonitis which I have collected for the purpose of illustrating this article, I include two ascitic cases. There were three other cases where miliary tubercles were found during the course of operations done for various reasons, in only one of which free fluid was found. All these five cases were in females and all did well. As to the fibrous and caseous types there were nine cases of intestinal obstruction, of which seven resulted from adhesions and two from intestinal ulceration. Of the seven adhesion obstructions, five occurred in females and all recovered in spite of the fact that intestinal resection was necessary in one case and a lateral anastomosis in another; two occurred in males and both died, one shortly after operation, the other in three weeks, and in both cases obstruction had been present for a long period. The two intestinal-ulceration obstructions were treated

by resection, a male in whom obstruction had been present for six weeks dying, a female operated on for acute obstruction recovering. Operation in these fibrous or caseous cases, where obstruction is present, is very difficult. There is the risk of injuring adherent intestine in opening the abdomen, and the most gentle handling is needed in releasing adhesions in order to avoid tearing the gut, an accident which frequently leads to fistula and causes a high mortality. If, in addition, it is necessary to do a resection or a short circuit, the chance of a successful issue is still further reduced. They are operations of necessity and not of choice; they are not done in the hope of curing the peritonitis, but to relieve a complication, and their value must be judged from this standpoint.

There are two other conditions which may give rise to tuberculous peritonitis secondarily. The first is

Tuberculous Disease of the Mesenteric Glands

Three stages of development are recognised, a tuberculous enlargement, caseation, and calcification. It is in the stage of caseation that most of the complications arise, the serous covering becoming affected, leading to adhesions, and, if the gland burst, the abdomen may be flooded with caseous material, leading to localised abscesses, or diffuse peritonitis. This is the stage known as the caseous stage of tuberculous peritonitis, really a misnomer, for it is, I believe, a late stage in mesenteric gland tuberculosis, rather than a late stage in tuberculous peritonitis. These conditions are the despair of the surgeon who must, on occasion, operate for the relief of some urgent catastrophe, such as obstruction. Success lies in the early diagnosis of mesenteric gland tuberculosis and adequate treatment.

During the period covered by the series of 17 cases quoted above, I have operated upon 68 cases of mesenteric gland tuberculosis with a mortality of two, both late cases requiring resection. One of these died soon after the operation, the other a few weeks after of pulmonary phthisis. Three cases had intussusception and all did well. The operation consists of a laparotomy in the middle line below the umbilicus. The ileo-cæcal mesentery, a favourite site for these glands, is examined first and then the mesentery of the ileum, it being remembered that the most infected gland may be high up in the root of the mesentery. Attack is directed to the caseating glands, which are deliberately dissected out, the serous covering being preserved as far as possible. There is little, if any, risk of so damaging the mesentery that the viability of the intestinal coil is endangered, but the incision in the serosa must be sutured with the finest catgut after careful hæmostasis to prevent subsequent adhesions. The appendix is removed and the abdomen closed.

Ileo-cæcal Tuberculosis

Ileo-cæcal tuberculosis in its entero-peritoneal form may also lead to tuberculous peritonitis. This variety is not well suited to operative measures, except in its early stages, and results do not compare with those obtained in the hyperplastic form. In the series of 17 cases there were three successful cases of ileo-cæcal tuberculosis, but in none was the peritoneum much affected. The treatment is a block resection of the cæcum with the lower six inches of the ileum.

XXV

TREATMENT OF SORE NIPPLES IN THE LACTATING WOMAN

By Violet I. Russell, M.D.Lond.,

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Modern management of the nipples lies rather in forbidding the use of the old methods of "preparation of the nipple for nursing" than in inventing new treatment. Nature prepares them much better than does any artificial device. It is, moreover, necessary to give detailed constructive suggestions rather than to assure the patient and her nurse in general terms that all will be well if the nipples are kept clean, since otherwise tradition may prevail.

It is of great importance to avoid sore nipples, not only because any soreness causes extreme pain to the mother while nursing, but because of the risk of a mastitis and breast abscess supervening on any infection of the raw surface.

Management during Pregnancy

The practitioner should look at the nipples early in pregnancy, since if they are retracted the sooner appropriate treatment is commenced the better will be the result.

(*a*) *Normal Nipples.*—If the nipples are well formed very little treatment is necessary. The patient must be warned to avoid pressure on the nipple by her clothes, and her corsets must not extend above the waist. After the third month the nipples should be bathed night and morning with warm water to wash away any adherent dead epithelium and lacteal secretion, and should then be dried by gentle friction with a rough towel to render them less sensitive to touch. After drying, a little lanolin may be gently rubbed in. This is probably the most satisfactory method of preparing the nipples for lactation. There is reason to doubt the wisdom of bathing them with methylated spirit or eau-de-Cologne; any attempt to harden them in this way almost certainly predisposes them to crack and they may become rough and sore, whereas ointment keeps the mucous membrane supple. The prevention of cracked nipples is analogous to the prevention of cracked lips, and the use of an emollient in the latter situation is certainly more efficacious than would

be any application of alcohol. In the hospital class of patient cases are occasionally seen where a septic crust has formed over the nipple owing to lack of cleanliness and accumulated secretion. Such crusts must be softened with olive oil and removed, and the nipple then treated as described above. The matron of the Mothercraft Training Society at 29 Trebovir Road, S.W.5, recommends sponging the breasts with cold water during pregnancy and scrubbing the nipples with a soft nail-brush. This treatment is said to harden the nipples naturally and to prevent the discomfort, sometimes amounting to actual pain, often experienced by primigravidæ when nursing is commenced.

(*b*) *Retracted Nipples.*—If the nipples are retracted the patient must be shown how to encourage them to regain their normal position. This is not such a hopeless proposition as might be imagined, as the nipples are naturally erectile during pregnancy. The best way to encourage a retracted nipple to become erect is by gentle manipulation with the palmar surface of two fingers, one on either side of the nipple. The patient should be shown how to encourage the reflex erection of the nipple, and in most cases the nipple will respond by standing out normally. No force should be used in traction, and both hands and nipples should be clean. This manipulation should be carried out night and morning after bathing the nipples; when the nipple is erect it should be bathed again and lanolin rubbed in, care being paid especially to its apex, which may be fissured and sore. If any attempt is made to draw out the nipple by suction, a self-suction breast reliever (Fig. 1) should be used, never the old-fashioned breast pump (Fig. 2), since any mechanical form of suction exerts undue force upon the nipple. Patience and perseverance are needed in the treatment of retracted nipples—if they are pulled out too hurriedly they will become sore. The old gamps' slogan of "breaking the nipple-strings" both of mother and baby is happily passing into well-deserved oblivion.

Management during Lactation

The two points to aim at in the postnatal care of the nipples are (1) cleanliness, and (2) avoidance of mechanical injury as far as possible. Before nursing the nipples should be bathed with boric acid solution, and after each feed they must also be bathed to remove all milk, which might decompose on the nipple. They should be carefully dried. If there is any tendency to crack, a little lanolin should be rubbed in round the base of the nipple. The nipple should be protected from the clothing by a pad, about 4 inches square, of sterilised gauze or by a folded large soft handkerchief of silk or old linen; ironing with a hot iron is sufficient sterilisation for ordinary purposes. Squares of boric lint, although excellent in theory, are in practice rather liable to scratch the nipple. This protective covering must be changed frequently and not allowed to become very damp or

hard with dried milk. Overheating the breasts by pads of wool should be avoided.

The following points should receive attention from the nurse in order to prevent sore nipples: (1) The child must not be allowed to drop the nipple frequently and catch hold of it again while feeding; this predisposes to abrasions of the surface from the child's gums. The habit is nearly always due to the baby being held so awkwardly that its nose is pressing against the breast, which prevents it from breathing as it sucks. If it is due to the nipples being retracted the mother should draw out the nipple with a self-suction breast reliever before the child is put to the breast; if the baby is still unable to keep hold of the nipple a nipple shield must be used for feeding. (2) The child should not be put to the breasts too often before the milk comes; three or four times daily is sufficient for the first two days of the puerperium. If there is no milk in the breasts the

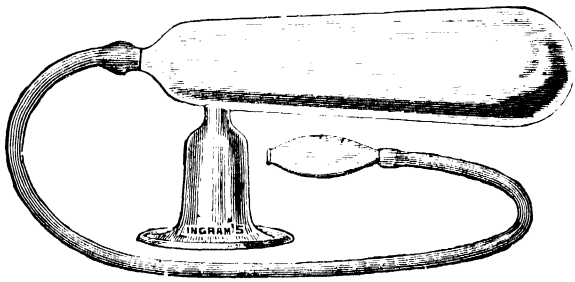


FIG. 1.
Self-suction breast reliever.

intense suction exerted by a vigorous child causes a sodden condition of the skin and may even raise a blister on the nipple. (3) Maceration and consequent erosion of the nipple is also caused by too prolonged or too frequent feeding or by allowing the infant to go to sleep with the nipple in its mouth.

CURATIVE MEASURES

When there is a loss of epithelium on the surface of the nipple all septic contact with the eroded surface must be avoided. The nipples must be bathed with boric lotion as usual before and after each feed and must be carefully dried with sterilised or scorched old linen. After drying, an excellent application is the time-honoured friar's balsam (tinct. benzoin. co.). A little should be dabbed on to the nipples and allowed to dry while exposed to the air. The nipples are then protected by the usual pad pinned inside the clothing. If preferred, lanolin or glycerine of borax may be applied in these cases; sometimes glycerine of tannic acid is efficacious. By using alternate breasts for suckling in the

ordinary way the nipple is allowed six or eight hours' rest; it is washed as usual for the next feed and the application subsequently renewed. If the erosion is a severe one and the nipple bleeds when the child sucks, a nipple-shield must first be tried, and if the bleeding continues with the shield the breast must not be used for 24 hours; the excess milk may be gently massaged out of the breast to relieve tension and discomfort, by gently but firmly stroking the breast from the periphery towards the nipple, using the flat of the hand and having previously anointed both hand and breast with olive oil.

Another variety of sore nipple shows itself as a crack or fissure usually situated at the base of the nipple, though occasionally seen at the apex. These cracks may be satisfactorily healed in the early stages before infection is present by the treatment described above. If the fissure becomes septic it is much more difficult to cure and is also acutely painful. Anti-

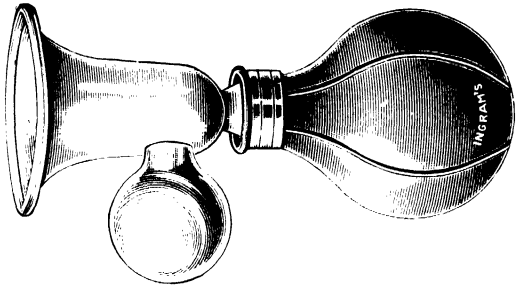


FIG. 2.
Breast pump.

septic dressings are indicated and one of the most popular is gauze soaked in perchloride of mercury 1 in 1000. This dressing must be kept damp and not allowed to dry on the nipple. Its poisonous character is a disadvantage, and it must be very carefully and completely washed off before the baby feeds. The same applies to carbolic lotion 1 in 80, which has the advantage of its slight anæsthetic property. Collosol iodine is a satisfactory antiseptic for sore nipples, being effective and non-irritating. Sometimes one or at most two hot fomentations on the nipple will improve a septic fissure, after which tinct. benzoin. co. may be painted into and over the crack and left to dry. The nipple should never be fomented for any length of time as the epithelium becomes sodden and macerated very easily. If fomentations are necessary for the breast on account of coincident mastitis, a hole must be cut for the nipple both in the lint and in the oiled silk and wool covering it. If the fissure is a deep one, applications of silver nitrate are useful in promoting healing. The disadvantage of touching a fissure with the solid silver stick is the pain caused by the method, but it may be worth while in the

case of a very deep and painful fissure, cocaine having been applied previously. 1 or 2 per cent. solutions of silver nitrate are not very painful and so in most cases are preferable; the silver solution must be applied with great care to the actual fissure, avoiding all contact with the surrounding skin. In all bad cracks of the nipple it is better to rest the nipple for 24 hours. Even feeding through a nipple-shield or the mother drawing off the milk herself through a self-suction breast reliever tends to open up the crack again.

XXVI

TREATMENT OF FREQUENCY OF MICTURITION IN WOMEN

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Frequency of micturition is a common complaint amongst women and may cause considerable distress. In itself it is only a symptom, and thus in a small class of cases only is treatment definitely directed towards it. In the majority of cases its treatment must be that of the lesion to which it is due. I do not propose here to deal with the many acute illnesses in which frequency plays a part, but rather with those in which frequency may, in certain instances, be the only or the predominating symptom.

The causes may be classified in five groups: (1) Organic disease of the bladder; (2) irritation of an otherwise healthy bladder, either by some abnormality in the urine or by some external cause; (3) incompatibility of size between bladder and contents—i.e. a bladder so small that it is unable to deal with the normal output from the kidneys, or a condition of polyuria; (4) organic disease of the central nervous system; and (5) functional nervous conditions.

Organic Disease of the Bladder

Cases of frequency arising from diseases of the bladder may be divided for our purpose into two groups—those which require purely surgical treatment, and those which require medical treatment.

(*a*) *Conditions needing Surgical Treatment.—Foreign bodies*, if of small size, may be removed through the urethra after this has been dilated; it must be remembered, however, that the female urethra, although very dilatable, has its limits, and consequently care is necessary. Cases have occurred in which free stretching, prior to the extraction of a foreign body, has resulted in permanent incontinence. It is better to do a suprapubic cystotomy than to risk this.

Malignant Growths.—Where there is any hope of being able to effect a complete removal, the bladder must be opened and the growth removed together with that part of the bladder wall from which it is growing, the viscus being re-formed from what is left. Should the growth be in itself inoperable, the patient's sufferings may be alleviated for a time by opening the bladder above the pubes and burning the growth down to its base with diathermy. The suprapubic fistula may remain, but it sometimes heals up, although a permanent cure is not effected; the distressing symptoms, however, are relieved temporarily. The usual method of dealing with *innocent growths*, unless these are very extensive, is to treat them by diathermy applied through an operating cystoscope. A papilloma, if very small, may be destroyed at one sitting; if larger, repeated treatments are required at intervals of two to three weeks. If a long sitting is expected, with much irrigation, a general anæsthetic may be given, or else sedatives, such as scopolamine and morphine, may be administered beforehand. In both cases the patient is able to return home 48 hours later, and a long convalescence is avoided.

Persistent calls to micturition in young women, particularly when these occur by night as well as by day, often indicate *tuberculosis of the bladder*, secondary to the same disease in one of the kidneys. Such cases demand patient and persistent investigation. When this diagnosis has been established the affected kidney should be removed, unless some definite contra-indication exists.

Diverticula are rare in women. When they occur they lead to frequent calls to empty the bladder, and, in this case, should be resected.

(*b*) *Conditions requiring Medical Treatment.*—Infection of the bladder with *B. coli* is common among women of all ages, and is highly resistant to treatment when once it has reached the chronic stage. Other organisms are also sometimes responsible. The bacillus may appear primarily in the bladder, or may make its way there via the kidney, and care must be taken to exclude an underlying lesion before proceeding to treatment. Where the infection appears to be confined to the bladder, the patient should avoid chills and over-fatigue, and restrict herself to a non-irritating diet; spiced foods, alcohol, and coffee must be prohibited. Constipation must be treated. It is advisable to give an intestinal antiseptic, such as salol and beta-naphthol āā gr. v, three times a day. The urine should be rendered non-irritating but copious, fluids being taken freely. If the reaction is acid a mixture of pot. cit. gr. xv, sod. bicarb. gr. x, tinct. hyoscyami ℥xx, inf. buchu ad oz. 1, will be found soothing; it may be necessary to increase the dose of alkalies. On the other hand, an alkaline reaction may usefully be acidified with benzoic acid gr. x three times daily. Cases untouched by either of these methods may respond to one of the essential oils, such as ol.

santali ℥|x, thrice daily. Urinary antiseptics—hexamine gr. xxx to xlv in the course of the day, or helmitol, should be exhibited. Local treatment of the bladder, if it can be tolerated, is often helpful. Daily lavage with a tepid solution of pot. perman. 1 in 5000, protargol 1 in 500, or oxycyanide of mercury 1 in 4000 may be followed by leaving in the bladder a few c.cm. of a 10 per cent. solution of gomenol in olive oil. If the infection is a descending one from the kidneys treatment on the above lines should be maintained for some time. Where this is not efficacious, good results may sometimes be obtained by irrigation of the renal pelvis with a 5 or 10 per cent. solution of collargol. Vaccine therapy may be tried, but the results are very variable. A troublesome variety of chronic cystitis is what might be called the *residual tuberculous bladder*—the irritable and often ulcerated bladder which remains after the removal of a tuberculous kidney. General hygienic principles must be adopted, and a diet and treatment prescribed as in chronic simple cystitis, the diet consisting mainly of eggs and milk, fruit, and fresh vegetables. A soothing mixture containing tinct. bellad. ℥|v, tinct. hyoscyami ℥|xx, inf. buchu ad oz. 1, may be tried. Even inf. buchu by itself, though generally prescribed for its diuretic properties only, has a markedly sedative effect on some bladders. Methylene-blue, gr. 1 in a pill three times a day, is sometimes efficacious, and daily instillations of gomenol without lavage give good results if they can be tolerated. If ulcers still persist after prolonged treatment, fulguration sometimes causes them to heal.

Irritation of the Bladder

(*a*) *External Irritation.*— Among the causes of frequency of micturition under review, external irritation of the bladder is perhaps the one that applies most particularly to women. The lesion may be either pelvic or perineal. In the case of the pelvis, uterine tumours and ovarian cysts cause trouble by preventing the bladder from filling to its normal capacity; the resultant discomfort is one of the indications for surgical intervention. Frequency in the early months of pregnancy calls for examination, as it may indicate a retroverted uterus needing replacement. Chronic inflammatory conditions in the uterine adnexa may cause frequency, although this is by no means an invariable result, but *chronic cervicitis* is a very potent cause of bladder irritability, the viscus being either healthy itself or the seat of a trigonitis with hypertrophic tags and fringes around the internal urethral meatus. These cases will not show any improvement until the cervical condition has been dealt with. The cervix should be treated by appropriate local measures; if a healthy state cannot be established by these means it should be amputated. *Urethral conditions* are very often responsible. The commonest are: a caruncle at the external meatus, best treated by cauterisation; urethrocele, in which satisfactory results are

obtained by a buttress operation; and urethral prolapse, which should be excised when giving trouble.

(*b*) *Internal Irritation.*—Irritation of the bladder by some abnormality in its contents, apart from disease of its wall, may be due to a *bacilluria*—usually, but not invariably, of invasion by *B. coli*. This is especially common in women. The treatment is broadly the same as that of the chronic cystitis mentioned above. In some patients the only discoverable peculiarity is a highly acid reaction; these can at once be relieved by the exhibition of large doses of alkalies. Finally, there may be a heavy excretion of oxalates or phosphates. To treat the former, all articles of diet rich in calcium and oxalic acid should be prohibited, and meat, fruit, potatoes, and bread recommended. Doses of dilute mineral acids should be given, and the urine kept acid by the administration of acid sodium phosphate in fairly large doses to dissolve the oxalate of lime. Heavy excretion of phosphates is frequently a manifestation of disordered digestion; this must be inquired into and treated. Rest should be enjoined, and the general condition built up. Care must be taken to keep the urine acid.

Incompatibility of Size between Bladder and its Contents

For the *sclerosed contracted bladder* very little can be done. If all lesions are healed, and we are only dealing with the sequelæ of old inflammation, attempts may be made to improve matters by graduated distension of the bladder, increasing amounts being injected at successive sittings. But marked success is not likely to be met with. *Polyuria* is itself a symptom, and most of the causes of this complaint—diabetes mellitus and insipidus, Bright's disease, etc.—require an elaborate scheme of treatment which is outside the scope of this paper.

Nervous Affections: Functional and Organic

Frequency due to disease of the central nervous system also comes into this category. It is often very difficult to combat frequency due to *hysterical and nervous polyuria*. Patients so suffering must be reassured, told that no serious lesion is present, and their confidence gained. A sedative mixture, such as pot. brom. gr. x, tinct. val. ammon. ℥xv, tinct. hyoscy. ℥xv, aq. chlorof. ad oz. ½, may be given, and general tonic treatment instituted. In this case also good results may be obtained by graduated fluid distension of the bladder, the patient being persuaded to retain the injection as long as she can hold it. Rest, prescribed in regular hours, also helps to calm the patient.

Conclusion

Finally, it must once more be emphasised that frequency of micturition is only a symptom. On no account should it be treated for itself alone. Such treatment is only permissible after the fullest investigations have been made, and the possibility of important lesions—such, for instance, as early renal tuberculosis—excluded.

XXVII

THE TREATMENT OF CARBUNCLES

By H. Ernest Griffiths, M.S.Lond., F.R.C.S.Eng.,

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A carbuncle is due to a molecular necrosis of the subcutaneous tissue, the result of infection with the *Staphylococcus aureus* or, in about 10 per cent. of cases, with the *Streptococcus pyogenes*. Little liquefaction of the necrosed tissue takes place and healing can only occur after the large central slough has been extruded. Carbuncles occur only in debilitated patients, and are a frequent complication of constitutional disease such as diabetes. The aims of treatment can be divided into two main classes—general and local. General treatment must be directed at (1) increasing the patient's resistance to the spread of infection, (2) elimination of toxins, (3) the production of sleep. Local treatment must secure (1) the relief of pain, (2) the removal of all necrotic tissue, (3) the arrest of infection in the surrounding parts, (4) epithelialisation of the raw surface after separation of the slough.

General Measures.—The patient's resistance to infection is increased in proportion to the degree of control of any constitutional disease from which he may be suffering; his general strength must be kept up by judicious feeding, the feeds being light, nourishing, and given at intervals of two hours. Eggs and milk should be the staple articles of diet. In cases where the patient's resistance is much lowered recourse should be had to blood transfusion as an initial step in treatment. Vaccine treatment in severe staphylococcal infections is disappointing, often resulting in a temporary depression of the patient's resistance; for this reason vaccine and serum therapy is not advised in the acute stage of the disease, although small doses of an autogenous vaccine sometimes produce benefit in the later and chronic stages. Elimination of toxins is accomplished by flushing out the kidneys and bowels and promoting gentle secretion from the skin. Treatment is started by a saline purge and the bowels must be kept open each day by an adequate dose of salts; where there is evidence of intestinal decomposition small doses of calomel, gr. $\frac{1}{4}$ hourly up to gr. 1, should be given for three days. Large quantities of fluid, lemonade, barley-water, or "imperial

drink," must be taken : a gallon a day is not too much. Finally, where the patient is well enough he must have a warm bath once or twice a day, or failing this a blanket bath. Sleep must be obtained at all costs. Where pain is the predominant factor in keeping the patient awake an adequate dose of morphia should be given.

Local treatment may be operative or non-operative, but in all cases immediate steps should be taken to give the patient as much relief as possible while other arrangements are being made. The affected part should be kept at rest, as every movement causes pain : where a limb is involved it should be placed on a splint. A wide area around the carbuncle should be shaved and cleansed thoroughly with soap and water or ether, and then large fomentations made by wringing out several layers of boric lint in boiling water should be applied to the inflamed area and covered with jaconet and a thick layer of cotton-wool. Fomentations should be changed at half-hourly intervals except when the carbuncle is situated in such a position as to necessitate moving the patient and causing him undue discomfort.

Operative Treatment

This should be looked upon as an emergency operation : a delay of 24 hours or more so that the patient may be " properly prepared " entails a great deal of unnecessary suffering and intoxication. The enema is the only stage of the routine preparation that need be taken. A general anæsthetic, not simple gas, should be given, so that the operator may have ample time to attend to the details of his task and may secure the dressings in position before the patient comes round. When the patient is anæsthetised any further shaving that may be necessary is done and the operation area thoroughly cleansed with ether. It is better to avoid the use of any coloured antiseptic such as iodine or picric acid at this stage as the extent of inflammation in the skin may be masked by the stain. There are two main operations practised for carbuncle : total excision of the diseased tissue by a circular cut, and incision. The latter is the method of choice in the majority of cases. An incision is made extending throughout the whole length and depth of the diseased tissue ; a second similar incision is made crossing the centre of the original incision at right angles to its course. Four triangular flaps are thus mapped out covering the whole extent of the carbuncle. Each flap is raised in turn and all necrotic tissue is removed with sharp scissors, so that a fresh bleeding surface is left on the inside of the flaps and on the base of the operation area. Oozing may be controlled by packing tightly for two minutes with gauze wrung out in hot saline. Where there is intractable bleeding it is best dealt with by touching the bleeding points with the actual cautery, and for this purpose there is no better instrument than an ordinary soldering iron.

When all hæmorrhage has been controlled the wound is packed with gauze soaked in a concentrated solution of magnesium sulphate; jaconet and then a thick layer of absorbent wool are applied and the patient returned to bed. The dressing must be changed at the end of 24 hours and after that will probably require renewing twice a day. The advantage of the magnesium sulphate dressing is that it promotes a free flow of serum which tends to wash out toxins from the wound and to limit the spread of infection. Healing appears to be more rapid with this than with any other method. Its great disadvantage is that it requires frequent changing.

An alternative to the magnesium sulphate dressing is bipp. A little bipp is taken on a piece of gauze and rubbed firmly into the walls of the wound, all excess of ointment is sponged away and the cavity packed lightly with gauze. This dressing may be left in position for two or three days and then renewed under gas.

A popular method of treating the wound after removal of the slough is by cauterisation with carbolic acid. Each of the four flaps is held back with a tissue forceps and then a tiny gauze mop is taken in a pair of pressure forceps and dipped in liquid carbolic acid. This is dabbed over the walls of the cavity, care being taken to avoid the skin edge. The cavity is then sponged dry and packed with gauze. It is claimed for this method that it arrests all hæmorrhage and kills off any organisms that may have been left behind after the excision of tissue. Also that carbolic acts as a local anæsthetic and the patient is spared much pain after the operation. The disadvantages of the carbolic treatment are that the new sloughs take a long time to separate and healing is correspondingly retarded. Again, if carbolic be applied over a large surface there is some risk of carbolism from absorption. As an alternative to carbolic acid, fuming nitric acid has been employed, but it has little to recommend it.

After-treatment

All first dressings should be performed under gas anæsthesia. The gauze dressing should be soaked before being removed and then the wound cleansed by irrigation with saline, eusol, or hydrogen peroxide (4 vols.). In replacing the packing care must be taken that the edges of the wound are packed well open and are not allowed to become undermined. The skin around the wound should be well cleaned at each dressing with ether; this minimises the risk of infection of the neighbouring hair follicles, with the formation of a crop of boils. Too much emphasis cannot be laid on the importance of keeping "the injured part at rest" whether by splinting or sand bags. Should it be found at any time that carbuncle formation is continuing in the edge of the wound, the diseased area must be completely excised at a second

operation. After excision of a carbuncle the wound ultimately heals by granulation, epithelialisation taking place from the edge. Where there is a large surface to be covered the process may be considerably hurried by the use of the Thiersch graft or by secondary suture.

Non-operative Treatment

The most successful method of treating carbuncles without operation is that devised by the late A. E. Morison and is dependent on the brisk flow of serum induced from the tissues around the carbuncle by the application of a paste of magnesium sulphate. The following was his method of preparing the paste: "With 1½ lb. of dried magnesium sulphate are mixed 11 oz. of glycerin. acid. carbolic. (1 to 10). The dried magnesium sulphate is in the form of a white powder which contains 12 per cent. less water than the ordinary commercial Epsom salts. The glycer. ac. carb. is put in a hot mortar and the sulphate added, the paste being slowly stirred and mixed with a warm pestle. The result is a thick white cream, so hydroscopic that if exposed to the air it rapidly absorbs moisture and becomes fluid. It must therefore be preserved in a covered jar." The area round the carbuncle is shaved, cleansed with ether, and carefully dried. A thick layer of the paste is spread on a piece of lint and this is applied directly to the carbuncle and surrounding skin. The lint is covered by a piece of jaconet and then by abundant cotton-wool. A profuse discharge of serum is induced and it is generally necessary to change the dressing twice in 24 hours. There is great relief of pain after the first or second dressing, and in the majority of cases the central slough separates in a few days. In the meantime, with the discharge of serum, toxic symptoms are considerably abated, the temperature falls, there is less headache, and the patient feels generally better.

After separation of the slough Morison recommended packing the cavity with strips of sterile lint wrung out in a saturated solution of magnesium sulphate to which glycerine had been added in the proportion of 5 oz. to the pint. The subsequent treatment is the same as that employed after operation. The one great advantage of this treatment is that an operation is avoided. Against this are the facts that it is slower and more uncertain than operative measures. It should be reserved for those patients who refuse operation or who are unsuitable subjects for a general anæsthetic.

"Malignant" Carbuncles

Carbuncles situated on the nose, or on the surrounding part of the face, so frequently prove fatal that the term "malignant" has been applied to them. Infection from them is prone to travel

through the angular vein and its connexions into the skull and cause cavernous sinus thrombosis. Radical operative measures should always be applied from the first in dealing with "malignant" carbuncle even if the plastic surgeon be required to complete the treatment.

XXVIII

TREATMENT OF CRETINISM

By A. E. Naish, M.B., B.Ch.Camb., F.R.C.P.Lond.,

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Cretinism, according to the classification in general use, is divided into two varieties—endemic, which is common in the Alps and Himalayas, and sporadic, which is scattered all over the world. A classification based on external factors such as geographical distribution must of necessity be unsatisfactory, but there is justification for the temporary use of this particular division, in that the sporadic variety usually presents the clinical picture which might be expected from simple loss or diminution of thyroid secretion in the individual himself, whereas the endemic form appears to be due to a multiplicity of factors (more or less hypothetical), such as hypo- and dys-thyroidism in the mother, hypo- and dys-thyroidism in the individual, and pathogenicity of one or other of the germ cells. Thus the endemic cretin shows a far greater diversity of symptoms. In some the brain is severely affected with a nearly normal bony skeleton: in others dwarfism is extreme with comparatively little mental defect; and the development of the sexual organs is very variable.

The causal distinction just made helps to remind us that it is only in sporadic cases that we can expect to get a striking result through treatment of the individual. In the endemic form efforts must be directed mainly towards prophylaxis by treatment of the parents and especially of the mother. Probably cases which, although occurring sporadically, resist treatment, are in their essential nature of the endemic variety.

Attempts have been made to distinguish between sporadic cretinism and infantile (or juvenile) myxœdema. The distinction is an artificial one. The age at first onset of the symptoms varies in different cases, but there is no break in the series to enable us to distinguish between those in which the thyroid is functionless at birth and those in which the function is lost at a later period. There is by no means always a history of acute illness preceding the onset of the cretinism in the latter case. The treatment is identical. It has been stated that, the child being protected by the maternal secretions, the cretinoid con-

dition is never patent at birth, symptoms being longer delayed in breast-fed infants. This statement is too strong. M. B. Gordon found that out of 113 cases in which the age of onset was noted symptoms were present at birth in 13, and my own experience agrees with this.

Cretins and Mongols.—In spite of the many excellent descriptions in text-books it is still necessary to stress the radical difference between cretinism and Mongolian imbecility, the more so that certain scientific workers have assumed that the latter *is partly at any rate due to lack of thyroid secretion.* The prognathous face of the cretin is just the opposite of the over-flattened face of the Mongol, and there is not a scrap of evidence in favour of there being any close relationship between the two diseases. The use of thyroid extract in the latter condition is a waste of time and raises false hopes in the minds of the parents.

Active Principle of the Thyroid.—It is not yet settled whether the secretion of the thyroid gland contains only one biologically active chemical substance or more than one. A number of substances which have been isolated from the gland have had their actions tested on animals. Of these, the chief are iodothyrine (E. Baumann), iodothyreoglobulin (A. Oswald), thyreoglandol (Hoffmann-La Roche), and thyroxine (E. C. Kendall). All these have physiological action, and it is interesting to note that one of the most active (thyreoglandol) contains practically no iodine, although the function of the gland itself shows a general correspondence to its iodine content. We are not yet in a position to say that any one of these substances or any mixture of them acts in exactly the same way as the internal secretion of the thyroid gland, and therefore it is still advisable to rely on the fresh *liquor thyroidei* or on preparations of the dried gland substance for the purposes of administration. Judging by clinical results the products of the best firms are remarkably constant if not kept for more than a month or two. They should be standardised to contain at least 0·05 per cent. iodine.

Susceptibility and Dosage

One of the most remarkable things to be noticed during the administration of the drug is the varying susceptibility of different patients to its toxic effect. In one child, whom I treated, 1 gr. a day at the age of 2 years produced toxic effects; in another 9 gr. a day produced very little effect, either remedial or toxic, but improvement began immediately when the dose was increased to 12 gr., and this dose was continued for years with excellent results. Gordon, in a collection of 280 cases from the United States and Canada, found that in one case thyroiditis was produced by $\frac{1}{2}$ gr. daily, and that in another case 45 gr. were given with impunity. It is a very general experience that it is much easier to overdose a cretinous than a non-cretinous child. This is the opposite of what one would expect on the

supposition that the thyroid extract is merely supplying a deficiency, and shows that even in apparently simple cases of endocrine deficiency there is a complicated mechanism involved. The more caution has to be exercised because effects, whether remedial or toxic, are apt to lag behind the increases of dosage, so that there may be a cumulative effect. When once toxic symptoms have appeared it is not enough to reduce the dose slightly; susceptibility seems to be heightened and the dose has to be dropped by a considerable amount. Thus it is important to avoid all toxic effects or progress may be much delayed. On the other hand, it is possible to be too timid, and fail to affect the cretinism sufficiently by using too small doses. A very small beginning ($\frac{1}{4}$ gr. daily), with regular weekly increments and careful inspection, will make for safety, and at the same time ensure adequate dosage. The minimum adequate dose is the rule, but it must be remembered that it is possible to be satisfied with a medium progress when a little more boldness would produce much better results. Certain cases where the margin between the therapeutic and toxic doses is small are very difficult to treat. It is said that arsenic is of value in such cases.

The symptoms of an overdose are restlessness, insomnia, screaming, sweating, diarrhœa, vomiting, tachycardia, wasting, and exhaustion. It is not difficult to detect these symptoms in an early stage, and especially so if a weekly record of the weight be kept. After the first two or three weeks (while the thickened subcutaneous substance is being absorbed), the cretin under treatment should gain in weight regularly, and a loss in weight should at once raise the suspicion of overdosage. When this occurs all thyroid should be stopped for a week or longer, and then reinstated at half the previous amount. In two cases I have known epileptic convulsions begin during treatment, and cease again when the dose was diminished.

It is quite unnecessary to operate on the umbilical hernia which is so frequently present. It almost invariably disappears rapidly, pari passu, with the other symptoms. Aperients, such as calomel, combined with moderate doses of sodium bicarbonate, are sometimes of value in the early stages of treatment.

The operation of *grafting* has been tried from time to time, but no great claims can yet be made for it. It is generally agreed that the human gland should be used, though S. Voronoff has claimed success with that of an anthropoid ape. It is important to distinguish between temporary and permanent success, the former being not uncommon.

Factors determining Ultimate Results

The ultimate result after prolonged treatment with thyroid extract is variable, the greatest variation being in the amount of mental defect left. In my own experience there has been

variation from complete idiocy to normality. What is the most important factor in determining the result? It has been stated, and it would at first sight appear plausible, that the most important factor is the age at which treatment is begun, combined with the intensity of the cretinism. My observations do not support this view. The following are two instances of contrast:

A cretin girl was brought up for the first time at the age of 13; her size was that of an average baby of 2 years old; she was carried in her mother's arms. By the time she was 18 she was entered at a special school for the physically defective, where she learnt easy reading, writing, and arithmetic.

Contrast her case with that of a cretin boy on whom treatment was first commenced at the age of 2 years and 10 months. The torpor and all the distinctive features of cretinism rapidly disappeared, but he was transformed into a chattering idiot unable either to walk or talk.

Again, about ten years ago, within a short period of time two cretins each of the age of $5\frac{1}{2}$ months were brought up. They appeared of about the same grade and responded equally to treatment, which has been kept up ever since. The one, a girl, is now taking her place in a class with girls of her own age, and by the Binet tests her intelligence quotient is 98. The other, a boy, after being in the infants' class for about two years, has been discharged as ineducable.

It may be that some of the endemic causal factors are present in the more unsatisfactory cases, but there appears to be also a general correspondence between the final mental result and the age at which the first symptoms were noticed. Thus the idiot mentioned above is the son of an intelligent mother who has had a normal child both before and since his birth. Her story is quite explicit that he lay like a log from the day of his birth, and never uttered a sound until treatment was begun. This correspondence between age of onset and final mentality runs through all my cases, and, if not a mere coincidence, would receive a ready explanation from consideration of the time of myelinisation of the cortical fibres, the harmful effect of thyroid deprivation being more permanent on the immature nerve tissue.

Where thyroid treatment only unmasks an idiot we are faced with the question as to whether it is worth while. Probably most parents would prefer King Log, and it would be merciful to let the patient relapse into his previous condition.

XXIX

BURNS AND SCALDS

By H. S. Souttar, F.R.C.S.Eng.,

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Burns and scalds are injuries with which almost every practitioner may have to deal, and which offer him an exceptional opportunity both for the immediate relief of his patient and for the prevention of subsequent disfigurement or deformity. Yet there are few conditions in which opinions are so varied as to the best methods of treatment, perhaps one indication of the immense importance of individual attention in these cases.

In an extensive burn the first consideration is undoubtedly shock, which may be very severe, and depends on the extent of the surface involved rather than upon the depth of the lesions. If one half of the surface of the body is involved the injury will certainly be fatal, but a much smaller burn over the abdomen or thorax may have a similar result. The pain and shock are best combated by a substantial injection of morphia, varying from gr. 1/12 in an infant to gr. $\frac{1}{4}$ or even gr. $\frac{1}{2}$ in an adult. This has been for many years the routine treatment in my wards, and I consider the idea that morphia should not be given to children under these circumstances to be entirely without foundation. If shock is severe immersion in a warm bath brings great relief, especially in the case of a child; the water should be rendered slightly alkaline by the addition of a handful of sodium carbonate in the form of bath salts or washing soda. No attempt should be made to remove the clothes, which can later on be cut off in the bath. A hot rectal saline infusion containing brandy may be given with great advantage.

Local Applications other than Paraffin Wax

The essentials of a satisfactory local application are that it should be protective, painless, easily obtained, easily changed, and if possible mildly antiseptic.

Small burns, where the skin is not broken, may be dressed with gauze or other soft material soaked in a 10 per cent. solution of carbonate of soda (washing soda); a compress so made will

give considerable relief to the pain, which is often especially severe in those parts which show only an erythema. Where the skin is broken a weaker solution should be used. In a limb Bier's method of passive congestion applied by means of a thin rubber bandage may give great relief, the bandage being applied high up the limb and with only just enough tension to obstruct the veins. Later on an ointment composed of equal parts of zinc ointment and castor oil may be used.

For *larger burns* it may first be necessary to clean up the surface, and this must be done under a general anæsthetic. But even under anæsthesia the procedure must be carried out with the utmost gentleness, and it is far better to leave the surface as it is than by rough handling to increase shock and destroy tissues which might otherwise survive. So far as is possible, the whole surface should be thoroughly cleansed with soap and water and then with 1/1000 perchloride of mercury, which is finally washed off with warm sterile water. The perchloride forms a coagulated layer on the raw surface and to some extent inhibits pain. Carbolic must not be used as it is too readily absorbed. Loose skin should be cut away, but blisters should only be punctured and the cuticle left for protection.

In my opinion, the best permanent dressing for the larger burns is paraffin wax, which will be described later. If this is not available, wet dressings may be used soaked in calamine lotion, or lead lotion to which 30 per cent. of alcohol may be added; or the area may be covered with strips of lint soaked in parolein or covered with the castor oil and zinc ointment already mentioned, a method especially applicable to burns of the face. Moist dressings should be removed when necessary by immersion.

If the limb, or indeed the patient, can be kept continuously in a *warm alkaline bath*, nothing else can compare with this for comfort and rapidity of healing. It is not very difficult to keep children immersed in a bath, at least during the day, and in extensive burns of the body it is well worth while. As the patient floats in the water the injured surfaces are saved from all contact, perfect drainage is established, local hyperæmia is induced, the body heat is preserved, there are no dressings, and there is no pain. If an air ring of suitable size can be obtained and slipped round the body under the arms it furnishes an excellent means of support.

Picric acid has been very largely used and recommended as a dressing, but the danger of poisoning even with weak solutions is so considerable that we have given up its use. Picric acid in itself possesses only very weak powers as a disinfectant, and a weak solution of iodine would be far more potent if any such action is required. To some individuals picric acid is intensely toxic, its mere application to the uninjured skin producing serious results.

Paraffin Wax

Of all local dressings paraffin wax, when it can be applied, is by far the best. It must melt at about 50° C., and it may usefully be combined with mild antiseptics. Of the many compounds on the market the original ambrine is as good as any. The following was widely used during the war as No. 7 paraffin: resorcin, 1 part; eucalyptus oil, 2 parts; olive oil, 5 parts; soft paraffin, 25 parts; hard paraffin, 67 parts. This should melt at 48° C. and will be found very satisfactory. It should be melted over a water bath and may be applied with a soft brush or with a spray. The burnt area should first be cleaned and dried, best of all with a stream of warm air. It is then covered with a layer of the wax, over which a very thin film of cotton-wool is applied. This in turn is covered with wax, so that the whole is converted into a thin protective shell, which does not adhere to the raw areas. Any discharge can readily break its way through cracks in the wax envelope. The whole is surrounded by a bulky layer of wool. Simple though it is, the method requires a certain degree of skill, and unless a special appliance is used it is not very easy to apply the wax at just the right temperature. I recently devised the following method which will be found to have several advantages. Strips of ribbon gauze, of narrow bandage, or of thin soft paper about an inch wide and 12 inches long are prepared. Holding a strip by its two ends it is run through the melted wax. The strip is now held for an instant over the area to be covered, until the edges are seen to whiten, when it is at exactly the correct temperature and is immediately applied around the limb or over the area. The strips are applied to the limb in series, exactly as if it were being strapped. They furnish complete protection and afford considerable support. By perforating the strips, or by leaving narrow gaps, room can be allowed for the escape of discharge. The burning of the patient with hot wax is absolutely impossible. One great advantage of a wax dressing is the time for which it may be left undisturbed. In many cases it may be left in place for a week, and at the end of that time it can be changed with great facility, for it will not adhere either to skin or to granulations. If the wound is very dirty, the wax dressing may be changed every day with very little inconvenience to the patient, the exposed surface being cleansed with peroxide of hydrogen and dried before a fresh layer of wax is applied.

Avoidance of Exposure

Whatever method of dressing is adopted it is most essential that bandages should be applied very loosely. There may be considerable swelling of a burnt limb, and in any case any pressure on a burnt area is intolerable. It has been well said that in these cases a neat bandage is the sign of a bad surgeon.

It is equally important that in extensive burns no attempt should be made to change the whole dressing on one occasion, and the utmost care must be taken to reduce exposure to the absolute minimum in doing what dressing may be necessary. To expose the whole of a large burnt area on the body at one time is not merely bad surgery. It is criminal.

Prevention of Deformity from Contractures

In certain areas great care is required to prevent subsequent deformity from contractures. This is especially the case in the neck, in the neighbourhood of joints, on the palmar surface of the wrist and hand, and in the calf. Such support must be provided as will keep the burnt area extended, and in some cases it may be better to fix the parts in a plaster case with an opening over the denuded area. When the skin all round the joint has been destroyed the position must be varied from time to time so as to maintain a full range of movement in all directions. Unless these precautions are taken contractures will form which are exceedingly difficult to correct. During the second week sloughs will separate and the area will commence to granulate. In this stage a peroxide spray is invaluable in assisting the separation of sloughs, washing away discharge, and combating sepsis. An occasional boric fomentation may help to clear things up. As the granulations become cleaner a compress of lint soaked in equal parts of red lotion and glycerine will be found to check exuberant granulations and to stimulate epithelial growth. The lint should be cut exactly to fit the granulating area, and it should be covered with a layer of rubber tissue or oiled silk cut a little smaller than itself so as to allow free escape to any discharge. The whole may be covered with a gauze dressing.

Grafts.—As soon as clean granulations have formed they should be covered with Thiersch grafts, as only by the provision of an epithelial covering can contractures be permanently prevented. The grafts will be more certain to take if gentle pressure can be applied to their surface, and for this we have found tinsel dress trimming most effective. It is a very fine elastic wire gauze, sold in large sheets and quite inexpensive. It is wrapped round the limb as a sleeve, which is stitched up along the side of the limb opposite to the grafts. Over it a dressing of gauze soaked in equal parts of red lotion and glycerine may be applied. After ten days the tinsel is removed, bringing with it a layer of dead cuticle, but leaving firm and healthy grafts behind, which will rapidly spread to cover the whole area.

Conclusion

The successful treatment of a severe burn demands a degree of individual attention and of unremitting vigilance not always

realised. In this way alone can severe contractures and terrible disfigurements be avoided, but the fact that they can be so avoided is a full recompense for the labour involved. Much can be done by massage, by ionisation, by very cautious X-ray therapy to soften and remove scar tissue, but in preventing or at least limiting the formation of these scars the surgeon who first treats the case has an opportunity which will never recur.

XXX

THE TREATMENT OF POSTURAL DEFECTS IN CHILDREN AND ADOLESCENTS

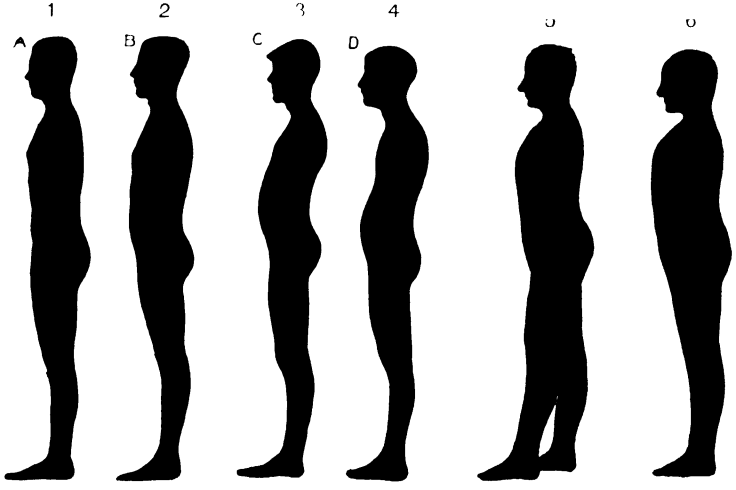
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The spinal column consists of four regions, which are alternately rigid and flexible. From below upwards there are: 1. The rigid sacrum. 2. The flexible lumbar region (including the lowest two thoracic vertebræ) capable of bending in all horizontal directions and of a considerable degree of rotation. 3. The thoracic region, including only the second to the tenth thoracic vertebræ. No appreciable movement is normally possible in this region, although the normal curve may gradually be altered from various causes. 4. The mobile cervical region (including the first thoracic vertebra), in which bending in all directions and some rotation is possible. The regions most concerned in the posture of the body are the lumbar and thoracic, each of which reacts on the other, because to attain or preserve equilibrium an increase of curvature in one region must be compensated by an increase of curvature in the other. The lumbar curve is also affected by the position of the head. An increased lumbar curvature may also be compensated by an inclination of the trunk forwards pivoting on the hip-joints. While the limits of the range of motion are set by the shape of the articular surfaces and the length of the ligaments, the position assumed within those limits depends on muscular action, which is capable in the course of time of enlarging the range of motion in one or another direction. A similar but more objectionable result may be attained by the action of gravity, if unregulated by muscular action.

From what has been said as to complementary curves, and as to the rigidity of the curve in the thoracic region, it would be expected that extensive changes of the figure could only be brought about by long-continued, slowly acting agencies. Actual experience accords with this expectation. The relative strength and tonicity of the muscles constitute the immediate cause of the attitude assumed in the standing-still position. Figs. 1 to 4 represent the grades A, B, C, D, into which R. I. Lee and

Lloyd T. Brown[1] divided the Harvard freshmen examined by them in the attempt to establish a normal standard. If the abdominal muscles are over-balanced by the lumbar muscles, an exaggeration of the lumbar curve results. Over-action or contracture of the psoas muscles leads to a like effect. Such relative weakness of the abdominal muscles may be the result of overstretching by distension of the belly. Muscular fatigue is a common cause of postural defect. Most of us are aware that when we are tired there is a tendency to relax the muscles, and to allow the spine to collapse, throwing all or most of the strain on the ligaments, whereas when we are fresh and vigorous we sit or stand without conscious effort with the trunk and neck



Figs. 1 to 4 (from R. I. Lee and L. T. Brown, *loc. cit.*, 1923) represent the four grades A, B, C, D, among Harvard freshmen of the thin type.

Figs. 5 and 6 (from L. T. Brown, *Amer. Jour. of Orthop. Surg.*, 1917, xv. 774) represent a freshman of grade A, of heavy type, standing at his ease (5) and again when told to hold himself up (6).

well braced up. Incidentally, the degree of curvature in the several regions of the body which constitutes abnormality is not an easy matter to determine and even the normal posture regarded as ideal varies in different ages (see Figs. 7, 8, 9, 10).

Postural *lateral* deviation of the spine may be due to inequality of length of limbs or to a habit of standing on one leg in the stand-at-ease position. It disappears in the one case when the shortness of the limb is compensated by means of a high boot, or when in the other case the patient stands evenly on both, equally extended, legs. If it does not then so disappear,

[1] Roger I. Lee and Lloyd T. Brown, *Journ. of Bone and Joint Surgery*, 1923, v. 753.

the deformity, although postural in origin, has gone further and become fixed. There are also cases in which postural lateral deviation is due to want of tonicity in the muscles allowing the spine to sag to one side, just as it more often does in the direction of the normal spinal curves. Round shoulders, when not due wholly to abnormal curvature of the thoracic region of the spine, represent the direct result of relaxation, weakness, or atony of the scapulo-spinal muscles—that is to say, loss of the normal

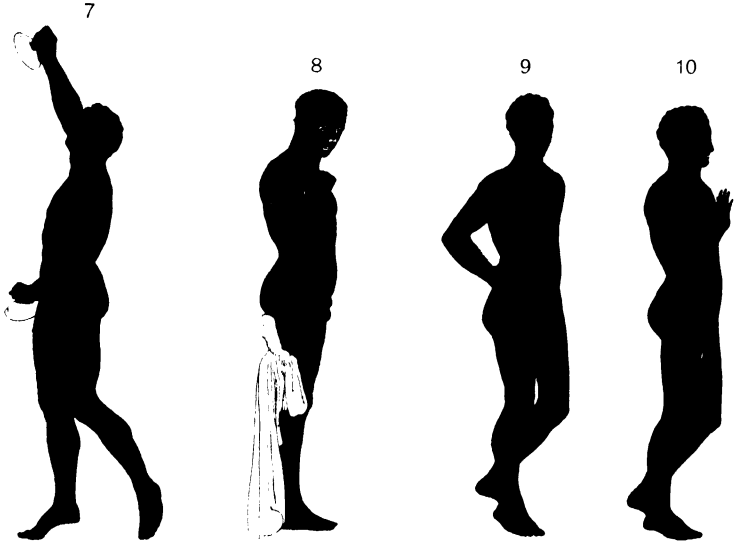


Fig. 7. From No. 1655. Third Græco-Roman Saloon, British Museum. "Satyr dancing. Known as the Rondinini Faun."

Fig. 8. From No. 120 in the Cast Gallery, British Museum. "A copy of a statue by Polycleitus, 2nd half of V. Centy. B.C."

Figs. 9 and 10. From a Votive Relief, No. 2155. "Offering a torch to Artemis Bendis. About 350 B.C."

The above show the Greek ideal of the great period. There is in these a comparatively sharp angle in place of the longer lumbar curve in Figs. 1 to 6.

balance between them and the powerful pectoral group, from whatever cause arising.

Postural defects are generally the result of abnormal conditions and not the cause of them, but it must be admitted that if they are allowed to persist they probably aggravate those conditions, and thus a vicious circle is entered upon. The muscular weakness and atony which allow round shoulders and hollow loins and visceroptosis are themselves signs of malnutrition and faulty innervation, and the hygienic treatment which relieves the latter conditions will indirectly correct the postural defects. There is no lightning cure, but the example

of army training which can turn the slouching recruit into an upstanding, well-set-up man, shows what may be done by unremitting, well-directed treatment. Good results are only obtainable by oft-repeated and persevering efforts. Flat everted feet must be treated by exercises and the use of proper shoes and boots. Painful affections of the feet may prevent the normal distribution of weight by causing the patient to spare one part of the foot or feet, and to load unduly another part, either of conscious choice or instinctively. Thus, it is a common complaint by the parents of flat-footed children, that they are pigeon-toed, and they are brought to the surgeon because they turn their feet in. In such cases the weak inner side of the foot is unconsciously relieved and its flatness corrected by inversion and concomitant supination of the foot at the medio-tarsal joints. Inequality of length or contraction of any of the joints of the lower limbs may affect the general posture of the body by making it impossible for those limbs to support the centre of gravity of a normally poised trunk and thus necessitating an abnormal poise. Loss of normal muscle-balance acts in a similar manner. For instance, palsy or weakness of the calf muscles is followed by excessive dorsiflexion of the foot and secondary knee and hip flexion. A similar condition of the anterior muscles of the ankle favours excessive plantar flexion, to compensate which the knee and hip are hyper-extended. High heels are accused of causing defects of posture, as well as deformities of the toes. It is open to question whether this accusation is justified. As long as the heels are not so high as to place the foot in a position of such extreme equinus that no further plantar flexion is possible, it is difficult to understand how they can affect the posture of the body.

Inequalities in the length of the lower limbs must be compensated, knock-knee and coxa vara if found must be dealt with, as well as all other remediable abnormalities. The next step is to ascertain what is the best position which the patient can assume voluntarily, and to train him so that he may know when he is in that position. For this purpose a large mirror is of considerable value. The patient being placed in front of it in his best position is able to see for himself what it is that he has to do. This is the more desirable because it is not unusual for a patient to put himself in a worse instead of a better posture when first told to hold himself upright.

Fig. 6 shows the effect of a well-directed conscious effort of correction from the position at ease in Fig. 5. When such a position can be maintained indefinitely *without* conscious effort a good deal of progress has been made. Treatment includes every measure that tends to the improvement of health and strength, and excludes all those of a contrary tendency. It is in the stationary erect position that it is most difficult to avoid falling into bad attitudes and lolling, and therefore standing still should be as far as possible avoided, at any rate, in the early

stages of treatment. When the patient is not actively occupied he should be seated or recumbent. In this connexion I am of opinion that cricket, which involves, for a large proportion of the players, much standing about doing nothing, is not a suitable pastime for the subject of postural defect.

The Form and Dimensions of Chairs

The form and dimensions of chairs are of great importance. Much has been written on school chairs and desks, and many patterns have been recommended, especially in the United States. The desiderata in a chair for reading differ much from those in a chair for desk-writing. The first should have a low seat of such a height that when the feet rest on the floor, its front edge does not press unduly on the posterior surfaces of the thighs. The seat should have a backward slope downwards of ten degrees with the horizontal. The back should be high enough to reach to the sitter's occiput, and should be set at an angle of at least 95 degrees with the seat, and thus at one of 105 degrees with the horizontal. In such a chair the whole of the back is supported and the slope is great enough to check any tendency of the spine to sag, especially if a small thin cushion is fixed to correspond to the lumbar region. For writing or for reading books which are too heavy to be held long in the hands, a sloping desk is desirable, which should be of such a height that its front edge should be at the level of the middle of the patient's sternum when he or she sits upright. A sloping seat is of no advantage for use at a desk, but rather the contrary, and as the back of the chair does not come into use in desk-writing any chair with a level seat of a height as above described will be suitable.

Exercises and Massage

To describe in any detail the exercises by which it is hoped to correct postural defects is beyond the scope of a short article such as this. They may be learned from a manual of physiotherapeutics, such as *Exercise in Education and Medicine*, by Dr. R. Tait Mackenzie, and are to be carried out by those trained in that branch. Suffice it to state that massage of relaxed and overstrained and undertoned muscles is of value, in addition to volitional exercises selected to enable the patient to attain and to maintain a normal healthy posture. In every scheme of corrective training the importance of the abdominal muscles must be borne constantly in mind.

XXXI

THE TREATMENT OF GINGIVITIS

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The word gingivitis implies inflammation of the gingivæ or soft tissues in the immediate vicinity of the teeth, and should not in any way be confused with chronic general periodontitis, more colloquially known as pyorrhœa alveolaris, the latter being a disease of the periodontal membrane, the delicate structure which closely surrounds the tooth root, and therefore a deeper seated disease. Cases of chronic general periodontitis may be met with where there is no inflammation of the gingivæ; this may be explained by the fact that the inflammation of the periodontal membrane is situated at the apex of the root. More often, however, it is the gingivitis which draws attention to the other condition. Gingivitis may be divided up into (1) marginal, (2) general, (3) chronic, and (4) ulcerative.

Marginal Gingivitis

Marginal gingivitis is usually catarrhal in character and may be found both in children and adults. The free margins of the gums appear red, congested, and swollen. The patient may or may not complain of soreness, the gums tend to bleed when touched, and if squeezed a thick muco-purulent discharge often exudes from around the necks of the teeth.

The normal gingival trough is accentuated forming a pocket; this pocket is caused by the swelling of mucous membrane and not through loss of tissue as in the case of periodontal disease. This may be demonstrated by gently investigating the pocket with a probe, when the pocket will be found to end at the neck of the tooth. A careful examination will show that the free margin of the gums has advanced towards the biting edge of the tooth covering part of the crown. The condition may become purulent, and not infrequently the interdental papillæ become hypertrophied and the whole gum swollen, the chronic hypertrophic gingivitis more often found in children.

One of the chief causes of gingivitis is mouth-breathing. Constant friction of the cheeks against the teeth, efficient mastica-

tion of food, and above all a constant flow of saliva washing away débris are necessary to bring about the physiological conditions. Mastication will aid in inducing a normal blood-supply to the teeth, but the presence of functionless or tender teeth in the mouth not only provides infected foci, but impedes normal functions. Mouth-breathing allows any particles of food remaining around the front teeth to dry and putrefy, and there is no cleansing action by saliva. Apart from the need to wash away bacteria the gingival organ secretes actually substances which, if allowed to dry, form calcareous rough deposits injurious to soft tissues. In a mouth-breather the gingivitis is generally limited to the anterior teeth.

Other mechanical causes may be traced to overhanging edges of fillings, but these tend to cause a chronic hypertrophic condition locally. Continued and indiscriminate use of floss silk may cause damage to mucous membrane if forced between the teeth in such a way as to cut the gums, but perhaps the most dangerous is the tooth-pick. This is seldom kept even socially clean, and is often stabbed into the gum in a vain endeavour to remove food lodged between two teeth, and then replaced in the waistcoat pocket.

General Gingivitis

General gingivitis is commonly found as a sequela of fevers, also in wasting diseases. This may be largely attributed to loss of tone of muscles of mastication following on a liquid diet. The sticky, starchy, and sugary foods, popular in convalescence, unless thoroughly acted upon by ptyalin, form somewhat insoluble substances which stick to the teeth and putrefy. The ætiology of the gingivitis of pregnancy appears to be somewhat obscure.

Metallic poisons, particularly lead and mercury, lead to general gingivitis which, if not treated, may become serious. Care must be taken to differentiate between a true lead poisoning and other conditions such as tartar or black pigmentation seen in dark-skinned races. A true lead poisoning will usually be characterised by general conditions such as colic or wrist-drop, and the blue line situated on the gum around the lower incisors. Patients undergoing a course of mercury treatment frequently develop a severe gingivitis, and the teeth should be put into a healthy condition before such a course is begun, since in an unhealthy mouth mercury is deposited in minute globules at the gingivæ where they become turned into the sulphide, which acts as a powerful cell poison.

Chronic Gingivitis

Chronic gingivitis is nearly always due to some mechanical irritation, such as the wearing of a denture at night, and lack of

hygiene. In some cases diet may be a factor, such as hot sauces ; one case that came under observation appeared to be caused by a sour-milk diet.

The Routine to be followed by Patients

In all cases of marginal, general, or chronic gingivitis the cause should be looked for and removed. Where there is mouth-breathing, then any post-nasal growth should receive attention, but in order to break the habit of mouth-breathing, which may persist although there is no nasal obstruction, the patient should wear an oral screen at night. This screen consists of a piece of vulcanite or metal made to fit against the labial aspect of the gums as far back on either side as possible. Thus the screen will be held in position by the pressure of the lips in front, and owing to the shape of the sulci there will be little possibility of much movement or any tendency to swallow it, apart from the fact that the screen is of some size. After a week the patient becomes used to the appliance and will sleep comfortably. In all cases the gums will require an astringent mouth-wash, and the following will be found useful :

℞	Zinci chloridi . . .	} ãã gr. ii.
	Zinci sulphatis . . .	
	Spiritus chloroformi . .	℥v.
	Aquam menth. pip. . .	ad ℥ss.

Misce.

Ten drops in half a tumbler of water as a mouth-wash. All tartar should be removed before using such a mouth-wash.

Where there are tags of gum between the teeth an application of pure trichlor-acetic acid may be found useful, administered for not longer than 30 seconds, to be repeated if necessary in a week's time. It is best applied to the tag of gum on a small pledget of wool. An excellent routine for the patient to carry out daily would be somewhat as follows. In the morning two or three drops of some cleansing preparation, as milton, should be placed on the tooth-brush and all the teeth should be carefully cleaned and the mouth then rinsed with the zinc astringent mouth-wash. Next, the gums should be massaged by pinching the gums with the finger and thumb towards the crowns of the teeth, and finally rubbing laterally with the index-finger. During the day the mouth should be rinsed out with the zinc mouth-wash two or three times. At bed-time some non-gritty tooth-paste may be used in preference to the milton, and this should be followed by careful massage with the fingers, using glycerine and tannic acid B.P. preparation. Some people, however, do not tolerate tannic acid for more than a week, in which case some bland preparation as myrrh and borax is substituted, followed by a rinse of water as cold as the patient can stand. It is of importance for the patient to have a small tooth-brush and one

which is fairly stiff; if the bristles show a tendency to come out it should be discarded. After use the brush should be rinsed and placed in a suitable position to dry. In the case of hypertrophic gingivitis the application of ferro-pyrin on wool to the pockets once a day will be helpful, this drug being a powerful astringent and anodyne. The treatment of gingivitis by electrical means is a specialised subject and should be carried out only by experts. Gingivitis caused by wearing a denture at night will clear up when the habit is discontinued and with constant mouth-wash. Poisoning from mercury and lead is not difficult to deal with once the poison is discontinued. Hydrogen peroxide may be used with great success in the case of mercury, but if the gums have started to ulcerate then the condition may be dealt with as though it were ulcerative gingivitis.

Ulcerative Gingivitis

A condition prevalent during the late war was known as "trench-mouth." Of this condition two varieties are described: a diphtheroid type, which is superficial and somewhat less severe than the second type, which is ulcero-membranous and may involve the whole of the buccal mucous membrane and penetrate to the bone. In both types the *Bacillus fusiformis* of Vincent's angina is found besides the pyogenic bacteria always associated with such ulcerative conditions. The appearance of both forms is typical. Ulceration usually commences around a septic tooth or badly fitting crown. Within 48 hours the infection spreads to both jaws and the gums become swollen with grey slough around the teeth. If the infection is of great virulence the teeth become loose. The breath is very foul and the temperature may rise to 102° F. The infection may spread to the tonsils and pharynx. Unless dealt with, the teeth may be lost, and serious scarring take place from the cheeks becoming attached to the gums.

In treating such a condition it is most unwise to extract teeth; this procedure will only allow the condition to penetrate deeper. No great harm will be done by leaving in infected teeth until the condition is improved, unless, of course, an abscess is present. The patient should have a purge followed by saline each morning for four days, and his general health maintained by tonics containing iron and arsenic. Locally, the mouth should be cleaned up by constant rinsing with a chlorine preparation such as eusol, milton, or fecto, about a teaspoonful to a glassful of water. The ulcerated part should be swabbed over with the following preparation:

℞ Liq. arsenicalis . . . } ā̄ ʒiii.
Vin. ipecacuanhæ . . . }
Glycerini . . . . ʒii.
Misce.

The patient may suck not more than six 5-gr. tablets of potassium chlorate a day. In a week the patient should be nearly recovered, and the treatment for simple gingivitis may be carried out, but the gums should not be massaged until the mucous membrane has fully recovered. All vessels, especially drinking glasses, should be carefully boiled, as the disease is easily communicable.

The best method of applying drugs to the buccal mucous membrane is by the use of wooden applicators bound with cotton-wool such as are employed in aural surgery; these should be burnt after use.

XXXII

THE TREATMENT OF ANAL FISSURE

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Anal fissure, though one of the minor and common rectal conditions, can cause an extraordinary amount of suffering. The prolonged periods of pain, and fear in anticipation of succeeding actions of the bowels, combine to produce a real vicious circle.

It is now generally agreed that fissure results from over-distension of the anal canal during defæcation: a split occurs, usually posteriorly, and if the injury is repeated the tear tends to become deeper and indurated with increasing chronicity. The view originally advanced by Sir Charles Ball that fissure results from tearing down of an anal valve is probably only true in a very small percentage of cases: most anal fissures are at the extreme lower end of the anal canal well away from the line of the anal valves, and, moreover, one sees numbers of cases of enlarged anal papillæ which have not caused fissures.

In women, about 5–10 per cent. of fissures occur anteriorly. There is a troublesome class of case in which multiple superficial fissures tend to occur; this seems to be due to abnormal narrowness of the anal canal, whether as a congenital defect or resulting from contraction of scar-tissue.

Before deciding on the line of treatment to be applied in a given case, it is essential (1) to decide if the fissure is a simple one, (2) to ascertain the local characteristics of the fissure, whether shallow or deep, soft or indurated, and (3) to exclude any other rectal lesion.

Simple fissures form the very large majority of cases seen. The differential diagnosis is not difficult. A tuberculous ulcer has the characteristic discoloured undermined edge of tuberculous lesions elsewhere, and on close examination may be found to be spreading up into the anal canal and down to the peri-anal skin in a manner quite foreign to the chronic simple fissure. Anal fissures occurring in syphilis are generally multiple and associated with condylomata; there will probably be other evidence of the disease and the W.R. will confirm the diagnosis. It may be difficult to differentiate a squamous carcinoma arising

in the anal canal in an early stage from a very indurated simple ulcer; in a suspicious case in an elderly subject a section for microscopic examination should be taken through the margin of the ulcer.

Indurated Fissures.—The determination as to whether the fissure is or is not indurated is of vital importance from the point of view of treatment. Induration is a mark of the chronicity of the lesion and a sign that inflammation is taking place around it. The characteristic smooth inflamed tag at its lower margin is due probably to infection and lymphatic stasis, and offers an insuperable barrier to effective drainage of the ulcer apart from operative treatment. A large majority of anal abscesses are found to originate in a chronic fissure which has pocketed; a submucous abscess forms and makes its way externally, pointing just outside the anus. If the fissure is not palpable with a finger, it is clearly a superficial lesion which may heal under palliative treatment.

Associated Rectal Lesions.— It should be the rule in every case of fissure to make a thorough digital examination of the rectum as soon as practicable, so as to ascertain whether the fissure is the only rectal lesion. Sometimes it may be impossible to do this except under general anæsthesia, but in most cases, by adopting the methods presently to be described, it will be found possible, either immediately or after a short course of palliative treatment, to pass a finger and perhaps a speculum into the rectum. It is essential to discover if associated conditions such as piles, polypi, proctitis, etc., are present before embarking on any set line of treatment. The most important condition to exclude is the presence of a carcinoma. The following case is an example of the difficulty in diagnosis in certain cases without general anæsthesia:

> A man, aged 29, came up to St. Mark's Hospital with a typical history of severe pain on defæcation accompanied by slight bleeding. On examination a dorsal fissure could just be made out but was so painful that digital examination of the rectum could not be effected; palliative treatment was given. A week or so later he attended again and was found to have developed an ischio-rectal abscess. He was recommended for admission and was shortly after operated upon under general anæsthesia: when a finger was passed into the rectum the presence of the fissure was confirmed, but above it there was an extensive inoperable fungating growth which was proved in due course to be a carcinoma.

Method of Examination

Inspection of the anus may show the characteristic œdematous "sentinel" pile, and on separating the anal margin the lower extremity of the fissure may be seen; the stretching may cause

it to bleed slightly. Associated conditions such as external piles, evidence of fistula, etc., will be noted.

Palpation of the fissure and digital examination of the rectum should then be attempted; sensitiveness in a very painful fissure can be reduced by local application of a 5 per cent. solution of novocain, by insufflation with anæsthesin (Ritsert) or by injecting its base with 5 per cent. novocain. The finger, well greased with vaseline and with the pulp facing the fissure, is then passed, and pressure made on the surface remote from the fissure. It should then be possible to differentiate a recent superficial abrasion from a chronic indurated and possibly infected fissure, and also to locate palpable rectal lesions such as foreign bodies, and polypi and other tumours.

Finally, if possible, a small tubular speculum ($\frac{3}{4}$ in. diameter) should be passed and the lower rectum examined. As the speculum is withdrawn the fissure will come into view and very often fibres of the external sphincter muscle will be seen transversely at its base. Sometimes a bead of pus is seen emerging from the fissure: this indicates most certainly that pocketing has occurred and that a submucous abscess has formed, and is a definite indication for operation.

Palliative Treatment

Only superficial non-indurated fissures can be expected to heal under palliative treatment; the same treatment should, of course, be given to indurated fissures as a temporising measure pending operation, and if for any reason operation is contra-indicated.

(*a*) *Relief of Constipation.*—Constipation must be relieved and the motions rendered soft and regular. An initial dose of castor oil, 1 oz., is often advisable, followed by paraffin liq., $\frac{1}{2}$ oz. t.d.s., with senna or cascara at night, p.r.n. It is a good plan to instruct the patient each night to run into the rectum through a small rubber catheter and funnel about 3 oz. of warm olive oil; this may be retained all night with the help of a pad of wool and a T-bandage, and will render the morning stool smooth and painless.

(*b*) *Relief of Pain and Sphincteric Spasm.*—General treatment in the way of pot. bromide, gr. xx t.d.s., with aspirin gr. x nocte will be useful. Local treatment consists in the application of sedative ointments and suppositories. The following ointments are suitable for introduction after each action of the bowels either digitally or by means of an ointment introducer attached to a collapsible tube: Bismuth subnitrate, ℥ii; cocaine, gr. x; lanoline, ℥i, or hydrarg. subchlor., ℥ss; pulv. opii co., gr. x; extract. belladonnæ, gr. v; lanoline, ℥i. At night a suppository containing extract of belladonna gr. 1 may be inserted, with addition to it of morphine acetate gr. $\frac{1}{4}$ if pain is severe.

(*c*) *Local applications* at intervals of a week or two may be

given to the fissure through a speculum to stimulate healing and form a protective covering to the raw surface. Pure ichthyol may be applied on a glass rod, or the fissure touched with silver nitrate or nitric acid (Hilton in *Lectures on Rest and Pain*).

Operative Treatment

Thorough preparation is most important seeing that the majority of these cases are very constipated, often with hard scybala impacted in the rectum. Castor oil, 1 oz., is given two nights before operation, followed by a dose of salts in the morning. On the evening before the operation a soap-and-water enema is given, and an astringent mixture by the mouth containing tincture of opium (℥x) and tincture of catechu (℥ss). A half-pint rectal wash-out of plain water is administered on the morning of operation and is repeated if necessary. The usual hypodermic injection of morphia and atropine is given before operation.

The operation of incision of a fissure is designed simply to give drainage. After careful antiseptic preparation with ether soap and lysol solution (℥i to Oi) an incision is carried from the upper end of the fissure out on to the peri-anal skin to the extent of about 1–1½ inches. The safe rule in this connexion is to make the external part of the incision double the length of the internal. A few of the fibres of the external sphincter may be divided, if it seems necessary, to secure adequate drainage. Complete division of the sphincter is never required. The lateral skin margins are then excised, including the sentinel tag, leaving a flat oval-shaped wound. Any accompanying rectal polypi, hypertrophied papillæ, or piles are removed at the same time. Some sterilised vaseline is injected into the rectum; a piece of drainage tubing and dressing with dry cotton-wool complete the operation. The wound is left to granulate. It is unwise to attempt a primary suture of the wound as the results of this operation are most uncertain.

After-treatment.—Careful attention is given to local cleanliness. The bowels are opened on the third day and after this the patient should have a warm bath twice daily. The wound is dressed with flat cotton-wool swabs moistened with dilute perchloride or carbolic lotion; they should be inserted so as to keep the skin margins separated until healing takes place, which should be in about three weeks. If healing is slow, brilliant green or scarlet red ointment may be applied. As an alternative to general anæsthesia, operation may be performed under spinal, sacral, or local anæsthesia. If the last method is decided upon the external sphincter should be put out of action by injecting into it on each side of the mid-line posteriorly about 5 c.cm. of 2 per cent. novocain. The perineal branch of the fourth sacral nerve and part of the inferior hæmorrhoidal nerve will be blocked and a good degree of relaxation obtained. The operation can then be

continued in the usual way after infiltration of the operation area.

The old operation of "stretching" the sphincter is now rarely performed. It is unsuitable for a chronic fissure and in a recent fissure a deep laceration is liable to occur—moreover, the sphincter is liable to be torn rather than stretched. The object of operation in a chronic fissure can be summarised in the one word—drainage.

XXXIII

THE TREATMENT OF TWO CHRONIC SKIN DISEASES

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I.—Chronic Eczema

Almost every skin affection may become chronic, but probably the two which occur most readily to our minds when we speak of a chronic skin disease are chronic eczema and chronic acne. The term chronic eczema may cover a large field, and it is proposed to take some common clinical types and consider the methods appropriate for their treatment.

Types of Chronic Eczema

One of the most characteristic forms of chronic eczema is that met with in children from a few years of age upwards towards adult life. The common history of such a case is that the patient has suffered from eczema since infancy—at first the usual form of "infantile eczema," with mask-like distribution on the face and perhaps patches of eczema also upon the limbs and trunk. The eczema, instead of clearing up under treatment or disappearing spontaneously, as it does sometimes at the age of about 2 years, has continued into later childhood, has become less pronounced upon the face and more extensive and persistent upon the limbs and trunk, and especially behind the knees and at the bends of the elbows, though seldom confined to these areas. There may be periods of weeks or of months when the eczema is comparatively though not completely well, alternating with periods when the eczematous areas become red and weeping and more intensely itchy, so that the child is seen to be constantly scratching them. In most cases the skin behind the knees and at the bends of the elbows and at other parts where there is eczema becomes infiltrated and thickened, or, in dermatological language, lichenified by constant scratching. Such children are often thin and have a worried expression from want of tranquillity and of sleep, and they not infrequently suffer from

asthma. The pathogenesis of such cases need not be discussed here, but suffice it to say that it is seldom that they can be cured by dieting, by internal medication, or by measures taken to improve the general health. Such means may help to advance the cure, but they are generally of little avail without careful attention to local treatment.

Another common type of chronic eczema is that seen in adults, which frequently begins as an occupational eczema upon the fingers and hands and sometimes also upon the forearms. Such occupational eczemas are of common occurrence in those who work with dyes, chemicals (such as photographic chemicals), acids, French polish, formalin, flour, sugar, packing materials, certain woods, strong alkaline soaps, and in dusty occupations generally. Frequently the eruption disappears if the patient discontinues his work for a time, but sometimes it continues with obstinacy for months or even for years, although the patient may have abandoned the occupation which induced it. Then, too, the eruption may appear upon other parts in the form of patches of eczema upon the arms and legs and sometimes upon the trunk—the clinical type known as "patchy eczema."

In persons who have none of these occupations this chronic eczema of the hands and the patchy eczema of the limbs and trunk may sometimes be seen, and it is often attributed to some internal cause; but usually on careful inquiry it will be found that the chronic eczema had its origin, perhaps months or years ago, so that the incident has been forgotten, in a dermatitis, the result of some local irritant. Contact with a poisonous plant or weed, use of a strong soap, of a patent ointment, prolonged use of sulphur ointment, the application of tincture of iodine, or in various other ways—all these may form the starting-point of eczematous conditions.

Acute Localised Dermatitis the Origin of Chronic Eczema

The important point is that the more closely we inquire into the origin of these chronic eczemas the more do we find that they have their origin in some more acute localised dermatitis. The dermatitis once established, the skin becomes hypersensitive to any form of local irritant, and this hypersensitiveness extends to other parts so that the eczema appears elsewhere. Here again, as in the chronic eczema of children, it is the scratching which is mainly responsible for the continuance of the eczema, though mere friction of the clothes, too frequent bathing, excessive use of soap and friction with the towel will serve to keep up the eczema. It may happen that a chronic eczema will sometimes get well during a change of diet or under other altered conditions of living, such as residence in a new locality. But other cases under similar changed conditions will not improve, and it seems impossible to lay down definite rules whereby cases of chronic

eczema may be cured by dieting or other internal or general treatment.

Management of a Case

For the majority of cases of chronic eczema the keynote to successful treatment is protection from local irritants and careful attention to local treatments. The first rule in the treatment of chronic eczemas is to avoid the intermittent contact with water, so that as far as possible the patient should wash the unaffected parts without getting into a bath. The affected areas must be continuously protected by some soothing application. One of the most generally useful is a modified Lassar's paste—i.e. Lassar's paste without salicylic acid—thus: ℞. Zinci oxidi, oz. ½; pulv. amyli, oz. ½; vaseline, oz. 1. The paste should be spread upon small pieces of butter-muslin or upon small sections of white open-wove bandage—lint is too thick and too heating—and the spread pieces applied like a plaster. Over this is placed the thinnest possible layer of wool and a bandage of light material. This dressing is changed twice in the 24 hours, and at each change the old paste is very gently wiped off with olive oil before applying a fresh piece of spread muslin. It is convenient to keep a number of pieces ready spread in a tin box so that they are at hand when the dressing is changed. For extensive eczemas, or where the eczema is in positions as the face, the buttocks, or the back, this method can be only conveniently employed if the patient is kept in bed; but for eczema on the limbs or hands it may be used while the patient is getting about. It is of importance that the treatment should not be relaxed until the affected areas are completely well, or scratching or other irritation will soon bring it back. When progress is slow, in spite of careful protection in this way, more rapid improvement may be brought about by the addition of lenigallol to the paste or by the use of White's tar ointment. The prescription for the lenigallol paste would be: Lenigallol, gr. 10–20; zinci oxidi, dr. 2; pulv. amyli, dr. 2; vaseline, oz. ½. For the tar ointment: Crude coal-tar, dr. 1; oxide of zinc, dr. 1 (mix together and add starch powder, oz. 1, vaseline, oz. 1, previously mixed). Each of these should be employed in the same manner as the zinc and starch paste.

Obstinate Cases.—In some cases of obstinate eczema, especially in the infantile eczema, in chronic eczema in children, and in the patchy eczema in adults, rapid improvement may be obtained by the use of a tar paint, as follows: Crude coal-tar, oz. 1; collodion, oz. 1; acetone, oz. 1. The tar paint is applied with a brush and allowed to dry on and the painting repeated every two or three days. In some cases of chronic eczema between the more acute attacks it will be found useful to apply without any bandaging a zinc and starch paste, or a zinc ointment (dr. 1 of zinc oxide to oz. 1 of vaseline), with the addition to either of

small quantities of one or other of the following drugs, or with a combination of two or more: Oleum cadini, min. 5 to oz. 1 of ointment or paste; acid. salicyl., gr. 5; acid. pyrogallic., gr. 1–2; chrysarobin, gr. 1–5 to the ounce.

Still another local application of the protective type which suits some cases of chronic eczema is a zinc cream made, not in the usual way with olive oil, but with linseed oil, thus: Zinci oxidi, dr. ½; olei lini, oz. 1; aq. calcis, oz. 1. This forms a flexible protective coating which is not greasy and need not be removed at each fresh application.

X-RAYS

In spite of diligent endeavours to cure a chronic eczema by one or other of these measures we may fail to eradicate the disease and to prevent fresh outbreaks. The use of the term "chronic eczema" is in itself an indication of the difficulty experienced in curing these cases. But fortunately we have now another resource, the use of X-rays. X-ray treatment may be employed in all forms of eczema, and in chronic eczemas it is often invaluable. It is used with perfect safety provided the dosage is correct. In the treatment of eczema the best results are obtained with small doses, but even these must be carefully measured and, above all, carefully spaced in point of time, so that we do not get an overdose by an accumulation of small doses. The most generally useful dose for the treatment of eczema is one-third of a full dose, a full dose meaning the largest dose that may be given without subsequent damage to the skin. This corresponds with the depilation dose used in the treatment of ringworm of the scalp and with the B tint of the Sabouraud pastille. If fractions of the full dose are being given they are ordered as 1/5 B Sabouraud or 1/4 B, 1/3 B, 1/2 B, 2/3 B, 4/5 B, 5/6 B, and 1 B for the full dose. The important rule is that a full dose must not be repeated in less than one month, and that in the course of one month a greater number of fractions than will produce one full dose should not be given. A 1/5 B dose may with safety be repeated at intervals of seven days, a 1/3 B dose at intervals of ten days, a 1/2 B dose at intervals of two weeks, and these doses may be continued at these or longer intervals as long as required. If the intervals between the doses are diminished 1/5 B doses should not be repeated more than five times, 1/3 B more than three times, 1/2 B more than twice, that is not after one full dose has been administered.

In treating a chronic eczema by X-rays, each of the affected areas may be given a dose of 1/3 B. If this, after a few days or a week, effects great improvement, as it generally does, a further dose of 1/3 B may be postponed for several weeks or longer. Where there is much infiltration and thickening the 1/3 B dose may be repeated at intervals of ten days. In some cases it will be found that better results are obtained by giving

a series of 1/5 B doses at intervals of from one to three days until a maximum of five 1/5 doses have been given. But then an interval of a month must be allowed before giving any more. It may happen in obstinate, though perhaps not very pronounced, chronic eczemas that the eruption will be cleared up by a single application of 1/3 B. Among hospital patients X-ray applications are of particular value in chronic occupational eczemas of the hands. It is even possible in many instances to cure the eczema while the patient is still following his occupation, by means of properly spaced applications of small doses of X-rays over considerable periods.

XXXIV

THE TREATMENT OF TWO CHRONIC SKIN DISEASES
(continued)

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II.—Acne Vulgaris

Acne vulgaris is sometimes regarded as a trivial complaint which will right itself as the patient gets older. But it is a disfigurement even in its mildest forms and may if neglected take on a more serious aspect. It may last over a number of years and lead to permanent scarring. It should, therefore, never be left to take its own course in the hope that it will eventually clear up without treatment. Acne vulgaris is a disease of puberty and of early adult life. Its essential feature is the comedo or "black-head," without which there cannot be acne. The comedo was supposed formerly to be due to a blocking of the mouth of the pilo-sebaceous follicle by dried sebum and immature hairs. It is really a dense mass of acne bacilli enclosed in a sheath of horny epithelial cells which have been thrown out by the epidermis as a protection against the bacillus. The acne bacillus is not found on the skin until puberty, and the theory which best explains its presence at puberty is that the sebaceous glands then become more active and thus form a suitable soil for the acne bacillus, which flourishes on an oily skin. Greasiness of the skin in the areas affected is an early and constant feature of acne. When only the oily skin and the black-heads are present we have "acne punctata." A further stage is presence of papules and of papulo-pustules. Each papule or papulo-pustule is formed around a comedo, and is due to a secondary infection by the *Staphylococcus epidermidis albus*, or more virulent forms in more severe cases.

It will thus be seen that the rational treatment of acne is to begin in the earliest stages to try to control the oily state of the skin and to remove the colonies of acne bacillus from the mouths of the follicles. In most cases the time-honoured method of soap and hot water and sulphur lotion is successful if carried out thoroughly and with perseverance over weeks or months. The

face should be soaped every evening, for two or three minutes by the clock, using a face towel or a shaving brush. It should then be bathed with hot water and a sulphur lotion rubbed on with a piece of absorbent wool and allowed to dry on. When the skin gets a little rough and sore the treatment should not be discontinued but should be merely omitted for a few evenings and glycerine of starch applied at bed-time. It is sometimes advised that the comedones should be expressed, but this should never be done by the patient and, if at all, only by the medical man. An ordinary toilet-soap may be used for the soaping or a sulphur soap. A suitable sulphur lotion is :

℞	Sulphur precip. . . .	oz. ½
	Glycerini	dr. 2
	Tinct. quillaiæ . . .	oz. ½
	Spirit. coloniensis . . .	dr. 1
	Aq. destil. . . .	ad oz. 6

In cases where there are papules and pustules the same treatment may be employed, with the addition that any pustule should be broken with a pointed match stick dipped in tinct. iodi before using the soap and sulphur lotion. Where there is much pustulation a sulphur and resorcin paste may be applied at bed-time instead of a sulphur lotion, thus :

℞	Sulphur	gr. 15
	Resorcin.	gr. 10
	Pulv. amyli	dr. 3
	Vaseline	ad oz. 1

Internal Medication

Although acne vulgaris appears to be due to an external infection and there is really no evidence that an internal cause has to do with its origin, it is generally taught that anæmia, constipation, indigestion, or improper feeding are important factors, and arsenic or iron tonics and saline aperients are often prescribed. A favourite mixture is the classical Startin's mixture of iron, magnesium sulphate, and sulphuric acid. Calcium sulphide may be given internally, gr. ¼–½, with the view to control suppuration, or some preparation of yeast with the same object. But reliance cannot be placed upon these internal remedies, and vigorous and persevering external treatment must not be neglected with the hope of curing by more general measures.

Associated Seborrhœa Capitis

An important practical point is that most cases of acne are associated with seborrhœa capitis, with greasy scales and sometimes loss of hair. The acne bacillus is found in the scales and it is probable that continued infection of the face may take

place from the scalp. To overcome this condition the head should be shampooed once a week with a spirit soap as follows :

℞	Saponis kalini . . .	oz. 3
	Spirit. vini meth. vel rect. .	oz. 1½
	Spirit. lavandulae . . .	dr. ½
	Aq. dest.	ad oz. 6

The head is made wet with warm water and lathered with ordinary toilet-soap. A few teaspoonfuls of the soap solution are then poured on to the scalp and the lathering continued for several minutes, and the lather is then rinsed off with clean water.

Of recent years two new methods of treating acne have been employed—namely, vaccine treatment and X-ray treatment.

Vaccine-therapy

Vaccine treatment of acne, although occasionally very successful, is uncertain in its results, so that one may hesitate to prescribe what must be a long course of treatment without any assurance of a good result. It is seldom, if ever, successful in acne punctata, and even where there is pustulation it frequently fails. It is, therefore, rather a remedy to use as a last resort or in addition to other measures than as a routine. Autogenous vaccines are more likely to succeed than stock vaccines.

X-rays

In X-rays we have a very valuable addition to our methods of treatment. It is always of great assistance, and, generally, very successful in at once clearing up the eruption or considerably shortening its duration. It is sometimes avoided as a dangerous remedy, and it is so if not carefully applied; but with proper precautions it is entirely free from any risk of damage to the skin. This does not imply that any medical man who employs an X-ray apparatus, however skilful he may be in radiographic work, is necessarily competent to treat safely a case of acne by X-rays. He must have also experience in therapeutic dosage. Probably those only who have experience in the treatment of ringworm by X-rays are able to appreciate fully the true meaning of an accurate dose; and there are many radiologists throughout the country who have now had this experience at the numerous ringworm treatment centres. X-ray treatment may be employed even in quite early cases of acne punctata, and with excellent results. In more advanced pustulating acne, X-ray treatment always shortens the cure. In cases of acne indurata with deep-seated indurations and pustules, no other treatment is so successful. In regard to the manner of application of the X-rays there is a difference of opinion. Some prefer to give repeated small doses, others larger doses less often. But

since there is no improvement until by repeated small doses we reach by their cumulative effect that of a large dose, it is really safer to employ the larger dose at once, because it can be more accurately measured than can the cumulative effect of many small doses. A dose which is quite free from danger is a 2/3 Sabouraud pastille dose, and this may be safely repeated in three weeks, and after the second dose, at intervals of four weeks. In order to expose the whole face three doses are given, one to the forehead and one to each cheek. The hair at the scalp margin and the orbits, including the eyebrows, are covered with thin lead shield protections. Improvement is seen in from ten days to three weeks after each application. In some cases one or two applications are sufficient; in others, the treatment must be continued at intervals of four weeks or longer, sometimes for many months. Where in spite of a general improvement, fresh pustules continue to appear, we may supplement the treatment by a course of autogenous vaccines. Acne of the back and shoulders or chest may receive the same treatments as acne of the face.

Acné Excoriée

It has already been mentioned that scarring is a common sequel of pustular acne. The patient should be warned of this lest the treatment by X-rays or by other methods be afterwards blamed for the scarring. Scarring, sometimes quite extensive, may be produced in another way than by the healing of pustules. A patient who has acne, and particularly a female patient, may acquire a habit of squeezing, pinching, or tearing with the nail every little acne spot, and may sometimes spend much time in front of a looking-glass performing this operation. Eventually, it may happen that even in slight cases this pinching, squeezing, and scratching becomes an almost unconscious habit which continues for long after there have ceased to be acne spots. Each erosion so produced not only causes present disfigurement but subsequent scarring. Such cases have been called by French writers "acné excoriée," and in cases of acne in a girl or young woman which seems to resist all treatment this cause should be considered. It will often be found that there is really no acne—no comedones and no papulo-pustules—but only dug-out excoriations and scars. In such cases it is generally merely necessary to convince the patient that the lesions are entirely due to her own interference, and that she has only to refrain from touching her face with her fingers in order soon to bring about a cessation of the supposed acne eruption.

XXXV

LOBAR PNEUMONIA

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In the treatment of a self-limited disease such as lobar pneumonia, the nursing and general management of the case are of greater importance than the exhibition of drugs. At present, however, the help which is afforded by drugs in the symptomatic treatment of the disease is apt to be somewhat under-estimated, in part no doubt due to a healthy reaction from the days of the so-called "heroic" treatment by blistering, bleeding, tartar emetic, etc., and in part due to the search for purely specific remedies, such as anti-sera or vaccines. Treatment by specific anti-sera is effective only against infections with the pneumococcus belonging to Group No. I, and since these constitute only some 33 per cent. of all cases, it is obvious that, in the treatment of the majority of cases, we must depend on general or symptomatic measures.

The researches published in recent years from the Rockefeller Institute have shown that virulent strains of the pneumococcus can be recovered frequently from the mouth and throat of cases convalescent from pneumonia, and from those in attendance upon or in contact with them, whereas they can be recovered only rarely from non-contacts. The possibility that pneumonia can be disseminated by carriers should therefore be kept in mind and a careful prophylaxis instituted. The patient should be isolated in a room by himself and visitors prohibited. Particular attention should be paid to the frequent cleansing and disinfection of the mouth. The throats of all contacts should be swabbed, and if pneumococci are found, appropriate disinfectants, such as liquor thymolis diluted 1 in 10, prescribed. Sputum should be expectorated into a sputum cup containing 1 in 20 carbolic acid, or into paper handkerchiefs which can be burnt. After convalescence the room should be thoroughly disinfected, and the bedding sterilised, as in the case of any other infectious disease.

The room should be thoroughly well-ventilated and kept at a moderate temperature of 60–65° F. Nursing in the open air in this country does not seem advisable, more especially in elderly or debilitated patients. The initial rigor of pneumonia has so impressed the lay mind with the idea that the disease is due to

chill that most patients are made unnecessarily uncomfortable by an excess of both bed-clothes and underclothes. A light flannel jacket, opening down the front, is ample, and allows the necessary examination of the patient without discomfort or fatigue. After the diagnosis has been made the patient should be disturbed as little as possible by physical examination. The heart and front of the chest can be examined without causing any discomfort. He should be allowed to assume the position in which he is most comfortable, but, if very ill, the position should be changed from time to time to avoid congestion of the bases. Even if the temperature is not unduly high, tepid sponging twice a day, if skilfully carried out, is comforting. When the temperature exceeds 103° F., tepid or cold sponging is repeated more frequently, and where the range of temperature is still higher, and there is danger of hyperpyrexia, sponging with iced water and the application of cold compresses to the thorax and abdomen should be carried out.

At the commencement of the disease the bowels should be thoroughly evacuated by calomel, gr. ii to iii, followed by a morning saline aperient. Throughout the course of the disease constipation must be avoided by the regular use of salines or other aperients. In many cases abdominal distension is a distressing symptom, which is best relieved by the use of turpentine stupes, turpentine enemata, and the passage of a rectal tube. Where the distension is severe, small doses of pituitrin ($\frac{1}{2}$ c.cm. hypodermically) are useful.

The *diet* should consist mostly of milk and semi-fluid foods, such as arrowroot, cornflour, or the various prepared foods: fruit juices; custard; junket; soft-boiled eggs. Two or three ounces of sugar in the 24 hours is a valuable addition to the diet, and can be given as lactose in the farinaceous foods or as glucose in the fluids. In children especially good plain chocolate is a convenient method of giving glucose. Home-made lemonade, prepared from fresh lemons and sweetened with glucose, is a palatable beverage, of which the patient should be encouraged to take two or three pints in the 24 hours in order to promote an efficient action of the kidneys. For the first 48 hours fluids only—milk, lemonade, beef-tea, fruit juices—should be given.

Relief of Pain and Cough

The relief of pain and the procuring of rest and sleep are two of the most important principles in the treatment. For the relief of the pleuritic pain, linseed poultices, renewed every two or three hours, are effective, but when skilled nursing is not available the frequent changing of the poultices may cause considerable disturbance of the patient. The weight of the poultice, too, is a disadvantage, and in children especially may add seriously to the already embarrassed breathing. Antiphlogistine is therefore preferable, since it is equally effective in alleviating the

pain, it is readily applied, and it does not require to be renewed oftener than once in 24 hours. The very painful, frequent, non-productive cough of the early stage of the disease should be controlled by a sedative linctus, or a preparation such as glycoheroin, 1 drachm repeated as necessary. Many patients are allowed to become exhausted from lack of sleep, due to the frequent warnings against the use of morphia in this disease. The milder hypnotics, such as bromide, chloral hydrate, etc., may be tried, but they are generally ineffective, and opium or morphia in some form is necessary. Dover's powder in 10-grain doses is frequently successful, but if it fails, morphia, gr. $\frac{1}{4}$, combined with atropine, gr. 1/120, should be used hypodermically. In the later stages, where the toxæmia is very great and where there are signs of impending respiratory or cardiac failure, morphia is, of course, contra-indicated, but in the earlier stages lack of sleep is more dangerous than the use of opium.

Drugs have probably no effect in modifying the course of the disease, though it is customary to prescribe a simple diaphoretic mixture, such as one containing pot. cit., gr. x to xx, liquor ammon. acetat., ʒi to ii, syrup. aurantii, ℥xx, aqua ad ʒss. A combination of pot. iod. and creosote had a considerable reputation for a time, but many patients find the creosote nauseating, and it is very liable to upset the digestion. In view of the dense consolidation of the lung, it is difficult to see how drugs belonging to the expectorant group can have any beneficial effect.

Conservation of an Efficient Circulation

In spite of the negative findings from the pathological side, most clinicians are agreed that, in fatal cases of pneumonia, the issue is decided in the greater number by failure of the cardio-vascular system, either from right-sided cardiac failure or from failure of the blood-pressure-regulating mechanism, or from both, and for these reasons the main object of treatment is to conserve and promote by every possible means an efficient circulation. As pointed out by Levy,[1] aside from structural changes, the three factors which throw an added burden on the heart are (1) the impairment of the circulation in the pneumonic lung; (2) toxæmia; (3) anoxæmia.

Careful watch should be kept for signs of right-sided failure—e.g. an increasing cyanosis, weakening of the second pulmonic sound, slight venous stasis in the vessels of the neck, œdema of the lung bases, or a fall in the tension of the pulse and of the blood pressure. Digitalis is the most generally useful drug, and it should be used early before the signs of circulatory failure are present. Tincture of digitalis may be added to the diaphoretic mixture, or preferably given separately in 5 to 7 minim doses three times a day from the onset of the disease, increased to

[1] Levy, R. L., *Archives of Internal Medicine*, vol. xxxii. p. 359.

10 to 15 minims, according to the necessities of the case. In cases of known cardiac disease, the larger doses are used from the onset; where cardiac failure is severe, digitalin gr. 1/100 should be used hypodermically or intramuscularly. Strophanthin gr. 1/100 may also be used hypodermically or intravenously, but only with caution in patients already under the influence of digitalis.

Falling blood pressure is always an ominous sign, and calls for more energetic stimulation of the cardiovascular system. Numerous drugs have been recommended—strychnine hydrochloride or sulphate gr. 1/60 to 1/30, camphor gr. iii in olive oil, or caffeine gr. v hypodermically every four or six hours. Strychnine has rather fallen out of fashion as a "cardiac stimulant," and is perhaps more useful in threatened respiratory failure. Latterly I have used adrenalin in preference to any other drug, giving it hypodermically in doses of ℥v to x of 1 : 1000 solution every six hours for 24 to 48 hours before the crisis. Adrenalin is not recommended as a routine in all cases, but only as an emergency in those cases which show a falling pulse tension. Pituitrin ½ c.cm. may be used in place of or with the adrenalin.

Miscellaneous Points

Where there are signs of œdema of the bases of the lungs, or where there is excessive sweating at the crisis, *atropine* is of very great value. It should be given hypodermically in doses of gr. 1/120 to 1/100, repeated if necessary once or twice. Atropine, like adrenalin, is an emergency remedy and should be used with caution.

The use of *alcohol* as a stimulant is still much in dispute, but the general tendency seems to be to use it less and less frequently. It seems to be beneficial in certain cases, particularly elderly and debilitated patients and in those habituated to its use, and may be prescribed in doses of 4 to 6 oz. in 24 hours. In young robust people one seldom has recourse to alcohol.

Oxygen has a considerable effect in relieving the cyanosis, but generally has little effect on the dyspnœa. Its use is indicated in those cases where early and marked cyanosis is present. In private practice it is usually given by means of a wide filter funnel, held close to the nose and mouth of the patient, or by means of an ordinary gas-bag, and the patient is allowed to breathe the oxygen for 10 or 15 minutes at a time, repeated every hour or so.

Venesection is frequently recommended but seldom practised. In the obese plethoric individual, with a full bounding pulse and marked cyanosis, the withdrawal of 15 to 20 oz. of blood at the beginning of the illness gives considerable relief to the symptoms. Later on in the disease it is indicated in any case presenting signs of right-sided cardiac failure. A mild delirium is not uncommon in many patients, preceding the crisis, but an active, noisy

delirium occurring early in the illness adds greatly to the responsibilities of those in attendance on the case. Paraldehyde in doses of 2 to 4 drachms, repeated as may be necessary, should be tried. Constant observation is essential in all cases of delirium.

Specific Therapy

Specific therapy has been successful so far only in cases infected with pneumococci belonging to Group No. 1. An antiserum has been prepared against Group No. 2 pneumococcus, but has not been successful. The results, even against Group No. 1 infections, are much inferior to those obtained by the use of anti-sera in diphtheria. A specimen of sputum should be sent to the laboratory in order that the group to which the infecting organism belongs may be determined. A minute dose of the serum, 0·02 c.cm. of a 1 : 10 dilution is injected intradermically, in order to determine the patient's sensitiveness to serum. If the patient is sensitive, or if he has already received injections of serum for some other disease, he should be desensitised by repeated small doses given at intervals of half an hour, 0·01 c.cm. : 0·1 c.cm. and 1 c.cm. hypodermically. The serum should then be diluted 1 : 10 with normal saline solution raised to body temperature, and injected slowly. In ordinary cases the serum should be diluted with equal parts of normal saline solution. Large doses are necessary, as much as 100 c.cm. in the first 24 hours, and 40 to 50 c.cm. on subsequent days. A dose of 30 to 40 c.cm. of serum should be injected and repeated at eight-hour intervals. Serum treatment in this as in other diseases should be commenced as soon as the diagnosis and the type of infecting organism are established. The necessity for very large doses and for the intravenous route are serious drawbacks to the routine use of serum in private practice. Vaccines, whether autogenous or stock, do not appear to have any very beneficial result except in cases of delayed resolution.

In ordinary cases where cardiac or other complications have been absent, the patient should be allowed to sit up in bed a week after the crisis, and after another week may be allowed to get up. If feasible, he should be sent to the country for two or three weeks before returning to work.

XXXVI

THE TREATMENT OF ANOREXIA IN CHILDREN

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The treatment of a child who has lost inclination for food will always be one of the commonest problems which the practitioner is called upon to deal with, but it will not always be one of the easiest. One reason for this is that the trouble appears at the onset to be so trivial, so likely to right itself spontaneously, that the medical adviser usually does not see the child until a series of domestic remedies have been employed and have failed. At this stage of affairs the causal factors of the original anorexia may have been obscured by its results, rendering the exact nature of the trouble extremely difficult to determine.

Owing to the multiplicity of causes it is quite impossible to propound any line of treatment which will be applicable to every case of anorexia, and the administration of a "pick-me-up" without thorough investigation of the underlying cause is strongly to be deprecated. In every case a physical examination of the child should be carried out, careful inquiry should be made into the diet and the daily routine, and some idea of the child's temperament and mental attitude should be gained by observation of his behaviour. One must admit that in a certain number of children no precise cause of the anorexia can be discovered, but it is usually possible to place the case into one of three classes: (1) Cases in which the loss of appetite is due to the presence of some definite disease. (2) Cases where no sign of gross disease is found, in which anorexia is due to a temporary disturbance of the alimentary tract occasioned by errors of diet. (3) Cases in which refusal of food is a manifestation of neurosis.

Anorexia resulting from Definite Disease

It will be found that this class comprises a very small minority of the children who are brought for advice for this symptom. Nevertheless, cases are met with in whom the mother has noticed no other abnormality, but who show signs of disease at the time or shortly after. In these children there is usually obvious cachexia, which is not the case in the other classes which will be

described. Scurvy, though not a common cause, may produce marked anorexia before any of the more typical symptoms have developed. In children of 3 years or more, tuberculosis, usually of thoracic or abdominal glands, is more likely to be found than any other disease. These children generally lose weight, but do not show any definite evidence of disease of the alimentary tract, and the tongue is usually clean. The treatment in this class of case must be directed against the underlying disease rather than against the symptom. Tuberculous children usually recover their appetite after they have been sent away to the country or on the balcony of a hospital ward. Cod-liver oil and malt are generally well taken, and serve to maintain nutrition until the desire for food is normal.

Anorexia due to Temporary Disturbances

Anorexia due to temporary disturbance of the alimentary tract is occasioned by errors of diet in by far the largest number of cases; the great majority of the cases occurring between the ages of 2 and 6 are attributable to this cause. Some dyspepsia may be present, but it is usually not severe, and has often passed off, perhaps as a result of the abstention from food, before the child is brought up for advice. The mother states that the child "picks at" his food, and refuses to continue his meal after a few mouthfuls have been eaten. The child is usually fairly well nourished, but looks out of sorts and is fretful and irritable. The tongue is pale, with slight furring of the posterior part, but is not usually decidedly "dirty" unless constipation is present as well. There may be some vague discomfort on pressure in the abdomen, otherwise examination reveals no abnormality.

Careful inquiry into the diet of these children nearly always brings to light some unsatisfactory element in the composition of the diet or the arrangement of the meals. A certain number of them have been frankly overfed, and in them the anorexia is merely an expression of the need for alimentary rest. They should not be pressed to eat, but should have a small allowance of concentrated forms of food, and should not have more than half to three-quarters of a pint of milk in the day; they usually make a good recovery in two or three weeks. In a number of others the trouble will be found to have arisen from habitual irregularity, hurried meals at odd hours, supplemented by pickings from the parents' table, and biscuits or sweets at all times of the day. Correction of such obvious errors as these generally brings about a gradual return of the appetite. But in the majority of cases the dietetic error is qualitative, and this is especially so in the most severe and obstinate ones. It may take almost any form, but the first place can certainly be given to a sloppy diet containing excess of carbohydrate: a dinner of which the most frequent item is a mash of gravy and potato, probably followed by a milk pudding almost every day, and a

breakfast or supper consisting largely of hot bread-and-milk. A diet such as this, relatively poor in protein and definitely deficient in fat, consumed readily with little need for mastication, is an extraordinarily constant feature of the histories given by the parents of this type of patient. It is in most cases well tolerated for a considerable time, and gives rise to no signs of malnutrition, but eventually the child begins to lose appetite, and perhaps to complain of vague dyspeptic pains. At this stage some Parrish's food or other iron tonic is obtained, and this never fails to aggravate the trouble. Finally, it is found that the child is losing weight, and advice is sought.

Cases of this type respond to treatment more readily than those of the two other classes; if the intelligent coöperation of the mother is obtained, one may be fairly confident of restoring the appetite in all but a few of them in a few weeks. The treatment demands a certain amount of attention to detail, and may be considered under the headings of management, diet, and drugs.

Management.—It is most important that a child's meals should be unaccompanied by anxiety, the effect of which upon the appetite is well known to most people by personal experience, and may be attributed to inhibition of gastric secretion by increased outflow of adrenalin. An unpunctual breakfast, eaten hurriedly and in apprehension of penalties for late arrival at school, is a situation which must never be permitted. The initiative in discovering this situation will rest with the medical adviser, for the information is not likely to be volunteered. Regular meal-times must be observed, and no food allowed at other times. It is well to make sure that the child is getting an adequate amount of exercise in the open air. Constipation is common, though by no means constant, and should of course be corrected when present.

Diet.—The diet must be regulated according to the age of the child. Slops, such as bread soaked in milk, or gravy and potato, should be forbidden altogether, and it is best to withhold potato in any form until the appetite has returned. Milk puddings should be restricted to two or three in the week, and replaced by baked apple, stewed fruit, and an occasional steamed pudding. Benefit often follows reduction of the daily allowance of milk to 1 or 1½ pints. The principal constituents of the diet should be eggs, in any form; fish, meat, fat bacon, with beans, peas, lentils, or green vegetables.

Porridge is a useful alternative for breakfast unless the child strongly objects to it; in hospital practice it is best to secure a good trial for it because of its cheapness. Bread-and-butter may be taken, but in moderation, and *after* the more essential constituents of the meal.

Drugs.—In this type of case drugs are usually of considerable benefit, but harm is often done by unsuitable ones. Iron tonics are contra-indicated in all cases while the anorexia persists; they

may be used later if the tongue is of normal appearance, but are not really needed even then. Cod-liver oil may do good to some children, but it certainly upsets others, and should be reserved for the few cases in which nutrition has suffered severely. An alkaline mixture containing sod. bicarb., gr. v–viii, with infusion of gentian, rhubarb, and ginger roots, made up in peppermint water, is almost always of value at the onset. To this may be added tinct. aloes, ℥|v–x, if required. The mixture should be taken 15 minutes before meals. Patent foods and medicines, particularly those containing malt, should be stopped.

Anorexia as a Manifestation of Neurosis

Refusal of food as a manifestation of neurosis is found more often among the children of well-to-do parents, and the features which it presents vary to some extent with the age of the child. As a general rule, the older the child the more definitely psychopathic are the characteristics of his behaviour. In quite small children anorexia occurs as a form of mere "naughtiness" or negativism, often produced, and generally aggravated, by unwise management. The child usually shows signs of nervous excitability or spasmophilia, but under suitable conditions may develop into a perfectly normal child. The majority of these cases occur at a rather later age, between 5 and 10, and the neurosis has many points in common with other neurotic symptoms, particularly enuresis; in both cases it serves as a means of obtaining attention and exerting power for a child who has failed to do so in other ways. Anorexia and enuresis are not found to occur in the same child, but in dissimilar types, probably determined by the endocrine pattern. The child is usually fairly well nourished, but does not look robust, and the tongue is clean. The mother states that the child scarcely takes any food, usually refusing solid food from the very beginning of a meal, sometimes taking milk or tea fairly readily. If the child is forced to eat, the food may be vomited almost immediately afterwards. There is some loss of weight, but generally surprisingly little. It is nearly always found that as a means of exerting power this symptom has been entirely successful: the mother has devoted a large part of her time to coaxing and entreating, or to equally futile punishment.

Drugs have no place in the treatment of this type of case. The trouble will persist as long as his object is being achieved, and the essential part of the treatment is the removal of all signs of anxiety on the part of the parents. The medical attendant should be careful not to discuss the subject in the child's presence. The mother and nurse must be persuaded to stop coaxing and to make no comment on the appetite. If this is really carried out, a certain number of the patients will regain their appetite in a short time. But success on these lines is not obtained in every case. A large proportion of the parents are of an emotional

type, and do not succeed in concealing their anxiety; moreover, a child who has borne the pageant of an empty stomach successfully from home to the seaside and to relations in the country will not always accept a sudden change of attitude. In many cases it is necessary to remove the child from home to the care of some one who will adopt the desired attitude from the start. If there is serious loss of weight hypnotic suggestion may be employed, and is usually successful, but relapse is likely unless the environmental conditions are dealt with at the same time.

XXXVII

THE TREATMENT OF MISPLACEMENTS OF THE UTERUS

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Uterine displacements fall naturally into two large classes according as the displacement is backwards or downwards, though it must be remembered that the two are often coexistent. It is not within the scope of this article to discuss the causation of these abnormal positions of the uterus, but rather to indicate the modern ideas of the means best suited to remedy them. These means may be educative, mechanical, or surgical, and there are certain indications for the employment of each of these methods. Again, the treatment may be palliative or curative, according to the general condition or the wish of the patient herself. In this article it is proposed to consider: (*a*) backward displacements—either retroversion or retroflexion, or both combined; (*b*) simple prolapse; and (*c*) prolapse together with retroversion. Common to all three is the principle that treatment is only indicated when the symptoms complained of can be definitely ascribed to the malposition present. There is undoubtedly a tendency to assume that a displacement of the uterus is giving rise to symptoms, when in fact it has no part in the production of the clinical picture presented. Very careful consideration must be given to the individual case in order that the relation between the abnormality discovered and the symptoms complained of may be properly determined. An example which might be cited is the comparative frequency with which menopausal symptoms are ascribed to uterine misplacements, with subsequent disappointment when measures for the relief of the misplacement are not followed by any mitigation of the symptoms.

Backward Displacements

Controversy rages around every aspect of the treatment of these conditions, and it is difficult to present a succinct and reasoned view of the present position. In my opinion congenital

backward displacement is but rarely accompanied by symptoms which call for treatment.

Congenital Backward Displacement.—When such symptoms do occur in congenital cases, it is reasonable to attempt to satisfy oneself that a correct position of the uterus would cure them; therefore a trial should be made of replacement, if necessary under anæsthesia, and the use of some form of pessary. If by these means the symptoms are relieved, it is legitimate to suggest that some permanent steps should be taken to keep the uterus in a normal position. It has frequently happened in my experience that a retroversion, probably congenital, has been found in cases of sterility or of repeated early abortions. In such cases I suggest that replacement and a pessary be tried before any further line of treatment is advocated. Particularly is the risk of early miscarriage minimised if the retroverted uterus be gently replaced as soon as pregnancy is known to have occurred, and a soft rubber pessary be worn for the first three or four months.

Backward Displacement of Acquired Origin.—These cases usually date from a confinement, though one has seen cases in which a traumatic origin has been probable. The routine examination of patients six or eight weeks after confinement should make it possible for a number of these acquired cases to be recognised and treated early, and it is probable that many of them could be cured by simple means. When discovered in retro-position the uterus should be replaced and a pessary of appropriate shape inserted. The patient should then be carefully instructed as to three points: (1) the regular emptying of the bladder; (2) the prevention of constipation; and (3) the efficacy of lying on the face for a time every day. At the end of three months the pessary is removed and in a fair number of cases no further symptom develops.

In cases of longer standing in which the symptoms call for treatment, the effect of replacement and a pessary should also be tried, and operation reserved for those cases in which the uterus cannot be replaced or in which the pessary and the replacement have been followed by a definite relief of symptoms. When operation has been decided upon an essential point is to leave the uterus in an approximately normal position, and in my opinion a curettage does not fulfil the conditions for a cure. The relief experienced after dilatation and curettage does not last, and many patients suffer a return of their symptoms after a shorter or longer interval.

As to the operation to be practised for the permanent replacement of a retroverted or flexed uterus it is difficult to be dogmatic. Numberless varieties of operative technique have been devised, falling into groups: (*a*) Suspending the uterus from the parietal peritoneum; (*b*) fixing the lower part of the anterior wall of the uterus to the anterior abdominal wall; or (*c*) using the round ligaments as a means of slinging the uterus in its normal position. The second and third varieties alone have claims to serious con-

sideration, the second in spite of M. Dartigues'[1] recent dictum that it should be eliminated from the operative methods. It is so simple, so effective, and so free from danger should pregnancy supervene that it seems worthy of continued use. The third group of operations has almost an infinity of modifications according to the predilections of the operator, and within the limits of a short article it is impossible even to enumerate them. A reflection born of experience is, that before using the round ligaments to keep the uterus in position, it were well to investigate the condition of those ligaments in the particular case. It is no uncommon experience to find such thin, ill-developed ligaments that to trust to them for maintaining a proper uterine position would be unwarrantable optimism. A second may be added—namely, that care should be taken to avoid strangulating the round ligament during the operation, as persistent pain has often been noticed over the area where the ligament has been drawn through the fascia.

My personal experiences of the after-results of both direct fixation and of various methods of shortening the round ligaments have been uniformly good, but of the two there have been fewer complications after the plain fixation.

Simple Prolapse of the Uterus

The treatment of this condition when causing symptoms resolves itself into either supporting the uterus by some form of pessary, or devising such reparative operative procedures as will permanently maintain the uterus in its proper position. It is a growing conviction of the writer that the symptoms of prolapse are less dependent upon the actual position of the uterus than they are upon the concomitant prolapse of the vaginal walls. Early stages of prolapse may undoubtedly be cured by careful attention soon after childbirth by the insertion for a few months of a suitable pessary and by the institution of regular muscular exercises, not the least important being those which have for their object the re-education of the vaginal muscles themselves. In more advanced cases the question arises as to whether the condition is to be palliated or cured. Comfort can be secured by pessaries, but at the cost of several minor troubles and with the need of constant supervision. In some cases the general health, age, or considered choice of the patient may preclude any other method of treatment, or she may be at a time of life where repeated pregnancies are to be anticipated. In any of these instances the palliative treatment must be considered, but, in general, curative treatment by operation is the method of choice. In any given case the operation must be most carefully considered and so planned in its scope and details as to restore the cervix and vaginal walls as nearly as possible to their original

[1] *La Chirurgie illustrée*, Pauchet, Paris, 1924.

condition. The orthopædic rule that it is wise to over-correct a deformity is equally true in carrying out operations for the cure of prolapse. In a simple case of prolapse it is hardly ever necessary to open the abdomen, while, however advanced the condition is, the uterus should on no account be removed unless there be some other condition making the course imperative.

In patients past the menopause, with marked cystocele and prolapse, the operation of interposing the uterus between the bladder and the vaginal wall has a certain though limited usefulness. My own experiences of it have been uniformly good. Lastly, in appropriate cases Le Fort's operation (uniting anterior and posterior vaginal walls along the middle line) is easy of accomplishment and gives very good results.

Prolapse associated with Retroversion

Prolapse associated with retroversion is commoner than simple prolapse. The treatment follows closely the lines indicated for the last-named condition but with this important difference, that a constant aim in the operative technique should be to leave the uterus in the normal position of anteversion. This position may be obtained during the vaginal procedures, but should it be found on the completion of these manipulations that the uterus is still retroverted or flexed, the abdomen should be opened and a ventral fixation done. The round ligaments are not to be relied upon in the operative treatment of prolapse with retroversion.

XXXVIII

THE TREATMENT OF SPRUE

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Sprue, formerly, and, in fact, until comparatively recently, a disease of the tropics, is coming to assume an ever-increasing importance for medical practitioners in this country. Whether the disease ever occurs in an individual who has not at some period resided in the tropics is not certain, but in the same way as pellagra was found to exist in England, when it was looked for, so may it turn out to be in the case of sprue. Apart from this, however, patients return home from the tropics in large numbers on account of sprue; after apparent cure they relapse while at home, for, at all events, until recently, a sprue patient was always advised against returning to the tropics; and, lastly, cases undoubtedly occur where persons who have lived abroad enjoying good health begin to show symptoms of the disease months, even years, after they have retired and settled down at home. For these reasons it is important that the practitioner at home should know something about sprue, and, further, that the diagnosis of the condition should be based upon a sure foundation. This point is essential, since some of the symptoms present in true sprue, such as loss of weight and fatty diarrhœa, are found in other diseases, and also, a matter of greater moment, because recent, rational methods of treatment bring about a rapid and, so far as we can judge at present, a permanent cure if the case is taken in hand early—a marked contrast to what occurs under the older, empirical methods of treatment, which lead usually to temporary improvement only, with the risk of relapses and in many cases to death, with symptoms indicative of pernicious anæmia after a varying period of partial invalidism.

Empirical Methods

The empirical methods of treatment most generally employed are as follows:

Dietetic.—Some patients are kept on milk, at first solely, later chiefly, for weeks, and even months, and on leaving hospital

are given a fairly rigid dietary, which they are warned against infringing at their peril. Others improve on the Salisbury treatment (hot water and scraped meat), being unable to tolerate milk in the quantities necessary to form the main article of food. Whichever line is adopted it is found that mixed diet in the early stages is not good. Others, again, pin their faith to liver soup, and some patients may even come to like it, but man cannot live by soup alone. It is, perhaps, given on the idea that bile is absent from the white frothy stools, and that the hepatic functions may be stimulated thereby. The "strawberry cure" must also be mentioned under this head. Well-to-do patients have been known to travel about from place to place in order to keep in touch with the fruit; poorer persons who have to stay in England take strawberries in season, then pass on to raspberries and next to loganberries and, when these can no longer be obtained, to bottled fruit and strawberry jam until the next crop is gathered. As the fruit constitutes only a small part of the dietary, its value in sprue cannot be accurately estimated.

Vaccines.—The administration of these is in some cases attended by good results; the rationale of this is explained later. That the organism cultivated is not the one causative of sprue as an entity is proved by the fact that different vaccines will in various hands produce equally beneficial effects—monilia, coliform bacilli, streptococci—while others record no benefit from the use of any of these.

Drugs.—Santonin was in considerable vogue for a time, but it was said to be a requisite that the drug must have been sent on a voyage to tropical countries in order that the white crystals might take on a brilliant yellow by exposure to tropical sunlight, otherwise it was ineffectual. It is now but little used, and is most uncertain in its effects. Emetine, also, has been, and is now, used in sprue, and some cases with sprue symptoms undoubtedly improve and even get well with it; in others it proves quite useless. Many sprue patients give a history of previous dysentery, and it is probably some residual effect of that disease which the emetine clears up, since dysentery is one of the conditions whose later symptoms may in some respects resemble sprue. Such cases as have come within the knowledge of the writer do not answer to the laboratory tests for sprue.

Calcium-parathyroid Treatment

The most recent form of treatment, based on the results of laboratory tests, is that by calcium and extract of parathyroid gland. This is, at least, founded on rational grounds and the progress and results of the treatment can be tested in the laboratory. The fatty diarrhœa, the cramps which are often present, the œdema and tetany seen in late and severe cases are some of the symptoms which may be ascribed to faulty calcium

metabolism. The total calcium in the blood is, however, normal or very nearly so, hence absorption of calcium is little if at all interfered with. It has been shown that, normally, calcium is present in the plasma in two forms: some 6 mg. per cent. (i.e. per 100 c.cm.) being in what H. W. C. Vines[1] describes as the free or ionic form, and readily precipitable by its chemical equivalent of ammonium oxalate solution; the remainder, 4 mg. or a little more, is bound and requires, perhaps, three times its equivalent. This he calls the combined or coagulative calcium, since it is closely concerned with blood coagulation. Normally, when coagulation takes place, practically the whole of the calcium is found to be in the ionic form in the serum. In sprue, but in no other sprue-like conditions in which similar tests have been carried out, the ionic calcium in the serum is reduced, in severe cases, by as much as 30–40 per cent. Although absorption of calcium does not appear to be interfered with to any extent, since the total is within the normal limit, the regulation of this element is upset. By flooding the system with calcium, as by giving large quantities of milk, by the use of pulvis Bataviæ, by the administration of powdered cuttle-fish shell (as used in China), this deficiency is temporarily made good and improvement ensues, but, and this is the important point, the improvement is not stable. The regulator of calcium metabolism is believed to be the parathyroid glands, and this is borne out by the fact that if parathyroid extract is given in doses of one-tenth of a grain twice daily, the symptoms of sprue have been shown to clear up with marvellous rapidity. The ulcerative stomatitis may disappear in ten days or so, the diarrhœa is replaced by constipation, the colour begins to return to the stools in two to three weeks, the patient puts on weight, often 3 to 4 lb., sometimes as much as 7 lb., in a week by the end of a month, and his sense of well-being is restored.

The technique of estimating the ionic calcium by Vines's method is as follows: Blood is taken in a glass tube, about 1·5 to 2 c.cm., and allowed to clot. The serum, of which about 1 c.cm. is needed, is then separated and heated in a water-bath to 56° C. for an hour. The steps in the test are three: In the first, by adding fixed amounts, 4 vols., of various dilutions of ammonium oxalate to 10 vols. of fresh normal blood (usually that of the person carrying out the test) and placing the mixture in the thermostat at 37° C. for ten minutes, that strength of oxalate is found which just prevents clotting under the terms of the experiment. The next step is to find out, by adding 2 vols. of various dilutions of calcium chloride to fresh arrangements of the above mixture (4 vols. of the determined oxalate dilution and 10 vols. of blood), what dilution of calcium chloride just suffices to bring about complete clotting of the blood. The third step consists in carrying out tests similar to the last but

[1] *The Parathyroids in Relation to Disease*, 1924.

replacing the calcium chloride solution by the same volume of dilutions of the patient's serum, prepared as previously described. By a calculation the calcium content of this serum is thus determined, and in normal subjects will be found to be somewhere between 10·4 and 11·4 mg. per 100 c.cm. In severe sprue it is about 6·5 mg., and after the treatment to be detailed shortly is begun, if this test of blood is carried out weekly, a steady progress is noted, till, at the end of four to six weeks, it is found to reach normal. The theory in part is that one of the actions of the parathyroid glands is to counteract intestinal toxins; that it carries on this work until the toxins are too great for it to cope with. Under these conditions, if the toxins can be reduced, as by careful dietetic regulation, the glands can recover and perform their function again, at least for a time. If, by good fortune, one of the chief causative organisms is isolated and a vaccine made, the administration of this may relieve the gland for a time, hence the good results of some vaccines in some cases and of other vaccines in other cases, as mentioned above; hence, also, the failure of vaccines in the hands of many, some other than the toxin-producing organism having been isolated.

The usual line of treatment by this most recent method is to put the patient to bed for the first 14 days, allowing milk only, beginning with 3½ to 4 pints a day, taken warm (not hot) with a teaspoon, at regular intervals, and increasing by ½ pint in the 24 hours, till at the end of the fortnight 7 to 7½ pints are taken daily. Calcium lactate is also given in cachets containing 15 gr. each, thrice daily, and parathyroid extract gr. 1/10 twice daily. It is absolutely essential that the extract be free from thyroid. If there is constipation a small dose of liquid paraffin is probably the best aperient. From the tenth day onwards some plain biscuits may be allowed, such as water biscuits or Mellin's food biscuits. By this time the ionic calcium has probably increased to between 7 and 8 mg. per cent., and gradual increase in food may be allowed and the patient permitted to be up for an increasing time each day. At the end of three weeks the patient, unless a very severe case or one of long standing, can take milk-puddings, eggs, fish, potato, carrot, bananas, and in the fourth week chicken and non-acid fruits. The calcium can be reduced in the third to fourth week and probably stopped altogether at the end of the fourth. The parathyroid extract should be continued in full doses till the fifth week, then reduced to half doses for a week, and in most cases further reduced until it in turn is stopped altogether at the end of six to seven weeks. This, however, can only be gauged with certainty by the blood test, and the drug must be continued until this shows that the ionic calcium has reached the normal.

It will be found that any return of symptoms, whether due to dietetic or other indiscretion, will be evidenced also by a fall in the ionic calcium, hence the enormous value of the test as a gauge of progress in this disease.

Though it is, perhaps, too early to claim permanency of cure, several of those who had been invalided home and forbidden to return to the tropics have, nevertheless, gone back and remained perfectly well, and equally good results have been recorded of patients treated in the endemic centres of the disease.

XXXIX

THE TREATMENT OF MENINGITIS

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The prognosis in acute and subacute lepto-meningitis varies according to the organism responsible for the infection. Cerebro-spinal fever (meningococcal meningitis) is by far the most hopeful as regards response to treatment, but many cases of recovery have now been reported in the pneumococcal, streptococcal (especially of otitic origin), and influenzal (*B. pfeiffer*) forms of meningitis, as well as in that due to various other organisms. Even in tuberculous meningitis, which has the worst possible prognosis, some 46 authentic cases of recovery are recorded in the literature.

General Management.—Careful nursing is of paramount importance. The patient's head should be kept fairly low, not more than one pillow being allowed; sitting up is not permitted. Unconscious patients must be turned frequently, since hypostasis is a predisposing factor in the development of pneumonia. In cases running a course of longer than ten days a water-bed should be provided to obviate bed-sores. The patient must not be allowed to suffer from retention of urine; if necessary, the catheter must be used twice daily.

Diet.—In acute cases, milk, beef-essences, cocoa, and lemonade are given. If vomiting is present, four-hourly feeds consisting of 5–15 oz. of citrated milk (sod. citrate gr. 2 per oz. of milk) diluted with an equal part of water are often kept down. Peptonised milk whey, and albumin water are also useful. In cases recovering, semi-solids—custards, bread-and-milk, eggs, under-done mutton—should be given as early as possible. Infants suffering from posterior basic meningitis should be breast-fed if possible.

Bowels.—Constipation is the general rule. Calomel or castor oil may be given at night, followed by a saline purge next morning. Liquid extract of cascara and compound liquorice powder are also useful, but enemas are frequently required.

Vomiting.—To allay mild vomiting not due to hydrocephalus, the following mixture is often helpful: ℞ Acid hydrocyanic dil.; ℥4, liq. morphinae hydrochlor; ℥10, sodii bicarb. gr. 10, aq.

chloroformi ad ℥i, t.d.s. The most efficacious measure for the prevention of vomiting, however, is repeated daily lumbar puncture (*vide infra*).

Headache.—Cold applications are beneficial. Phenacetin (gr. 12) with caffeine (gr. 2) may be given twice or three times daily.

Sleep, etc.—Sulphonal (gr. 20–30) is often useful. For obstinate insomnia, or when continued delirium with restlessness is present, morphine (gr. $\frac{1}{4}$) should be administered hypodermically and repeated if necessary. When morphine fails, potassium bromide (gr. 15–25) sometimes gives good results. Paraldehyde is of little value in meningitis, and hyoscine should be avoided. Warm sponging and occasional warm packs are also of help.

Should symptoms of cardiac failure or a falling blood pressure develop, hot saline infusions (T. = 100° F.) should be given rectally or subcutaneously in the pectoral regions, together with digitalin (gr. 1/100). Strychnine, owing to its tendency to precipitate convulsions, is contra-indicated. Cases recovering should remain in bed at least 14 days after the termination of the course of disease. Patients recovering from cerebro-spinal fever should sniff a solution of 1 per cent. chloramine into the nose twice daily in order to sterilise the naso-pharynx: relapses may be due to a reabsorption of meningococci from this situation.

Special Treatment

Two principles are important. (1) The establishment of adequate drainage for the meningeal exudate; (2) the application of a specific immune serum in as close contact as possible with the inflamed tissues.

Drainage.—Adequate drainage can usually be supplied by the performance of repeated daily lumbar puncture. Since 1916, more especially in cerebro-spinal fever, my routine practice has been to follow a period of intrathecal serum administration by repeated daily lumbar puncture, with complete drainage of the subarachnoid space, until the cerebro-spinal fluid becomes clear to the naked eye. With this method I have encountered no recrudescence nor relapses. When no cerebro-spinal fluid is obtained by lumbar puncture ("dry-tap") by reason of adhesions existing between the meninges and spinal cord at a higher level or a progressive increase in the density of the pus, one has to consider puncture at other sites.

Cervical Puncture.—Puncture of the theca below the seventh cervical vertebræ I have found quite a safe procedure provided the needle is inserted without a stylet.[1] Puncture in the thoracic region is not advisable, as in many normal individuals a posterior subarachnoid space is absent in this region.

Puncture of the Cisterna Magna.—The technique of cisterna puncture is as follows: With the patient prone and his forehead

[1] *Jour. Neurol. and Psychopathol.*, 1921, i. 216.

supported, the needle (graduated in centimetres) is inserted directly over the spine of the second cervical vertebra, the point being directed upwards in the mid-line at an angle of 45°. The needle pierces the occipito-atlantal membrane between the occipital bone and atlas, and reaches the cisterna magna at a depth of 4 to 6 cm. This method of puncture is indicated when no fluid can be drained off at any lower level. Occasionally, when purulent exudate occludes the region of the foramen magnum, even this puncture may fail in its object.

Sphenoidal Puncture.—If the above measures are unsuccessful, sphenoidal puncture—after the method of Bériel and Cazamian—may be tried. This consists of introducing a needle 2 mm. external to the supraorbital notch, upwards and inwards along the outer wall of the orbit in its upper part, and entering the most external portion of the sphenoidal fissure.

Ventricular Puncture.—In children with open fontanelles, puncture of the lateral ventricle is easy and may be resorted to at once if lumbar puncture fails to yield fluid. The needle is introduced at the lateral angle of the superior fontanelle, the direction being downwards, slightly backwards and inwards to a depth of 3 cm. In older children and adults, the usual method of draining the lateral ventricles is to trephine, a procedure which causes considerable "shock," especially as it is necessary to operate on each side. The patient seldom survives, and this operation should not be considered unless the patient's condition is almost desperate.

More recently, instead of trephining, I have merely drilled a hole through the skull over Keen's point and punctured the ventricle through the small opening thus made. In most cases it is possible to perform this operation without an anæsthetic, the "shock" is negligible as compared with that resulting from a trephine, and drainage appears equally effective. Two cases of apparent internal hydrocephalus complicating meningococcal meningitis treated by this method recovered.

As regards meningitis secondary to otitis media or other local infection, an attempt should be made to remove the original septic focus and to establish free drainage of the subarachnoid space. In otitic meningitis the translabyrinthine method of drainage has resulted in several recoveries.

Administration of Serum

In order to exert its maximum effect, serum must be introduced directly into the subarachnoid space and must be renewed at intervals not exceeding 24 hours. When there is evidence of systematic infection, the intrathecal medication should be supplemented by the intravenous administration of serum in doses up to 200 c.cm. Herrick, indeed, advises doses up to 600 c.cm., the resulting serum-sickness being no more severe than with smaller amounts. Anti-meningococcal, anti-pneumococcal, and

anti-streptococcal sera are available for the respective forms of meningitis. Also, for the very rare cases of meningitis due to *B. typhosus* and *B. dysenteriæ*, we have anti-typhoid and anti-dysenteric sera. The serum should be polyvalent for the specific organism obtained from the cerebro-spinal fluid and is administered at the earliest possible moment. Later, if the actual type of organism is determined in the case of the meningococcus or pneumococcus, the corresponding univalent serum can be substituted.

Method of Administration.—The usual method of introducing serum into the subarachnoid space is by puncture in the lumbar region, from which situation it quickly reaches the ventricles.

Following the evacuation of cerebro-spinal fluid in any region, the serum is injected either with a syringe or run in from a small funnel and tube—the last-named method being safer. The end of the bed should be raised for half an hour following the serum administration. For the performance of lumbar puncture and intrathecal injection, a general anæsthetic is only necessary when the patient is particularly restless or violent. In restless cases a hypodermic injection of morphine (gr. $\frac{1}{4}$) and atropine (gr. 1/100) given 20 minutes before the puncture will assist in keeping the patient calm.

Dosage of Serum.—The initial dose of serum is from 30–50 c.cm., followed by 30 c.cm. daily for at least four days or until clinical improvement is manifest. The quantity of serum injected should, however, be at least 5 c.cm. less than that of the cerebro-spinal fluid withdrawn. To children the following doses may be given: 1–5 years, 5–15 c.cm.; 5–10 years, 10–20 c.cm.; 10–19 years, 20–40 c.cm. However great the patient's improvement may appear, serum injections should be continued until no more organisms are present in stained films of the cerebro-spinal fluid deposit. After this period repeated daily lumbar puncture is advisable until the cerebro-spinal fluid is clear to the naked eye. At each puncture the fluid is allowed to escape until the flow practically ceases. Should signs of a recrudescence appear the injection of serum must be resumed; if the period since the last serum administration exceeds eight days anti-anaphylaxis must first be induced.

Other Methods of Treatment

As regards other forms of meningitis for which no specific sera are available, it is best to rely on general treatment and the performance of repeated daily lumbar puncture. In very acute cases puncture may be performed at first every 12 hours. The introduction of chemical substances—lysol, protargol, flavine, hexamine, etc.—directly into the subarachnoid space is not to be recommended, nor have I observed any benefit result from attempts to wash out the intrathecal space with saline solutions.

It is usual to prescribe hexamine (gr. 10, t.d.s.) by the mouth

in all cases of meningitis. It is, however, of doubtful value. Recently Maloens[1] has advocated the intravenous injection of an iodo-urotropine preparation in septic meningitis, each injection being preceded by lumbar puncture. Vaccines are applicable only to subacute and chronic cases, and cerebro-spinal fever and tuberculous meningitis are the only two forms which exhibit such stages with any degree of frequency. In the former, an autogenous vaccine may be given, starting with a dose of 200 million organisms and increasing by 200 or 250 millions per dose every fifth day up to a maximum of 2000 millions. The reactions with these doses are negligible.

[1] *Bruxelles Méd.*, Nov. 16th, 1924.

XL

TREATMENT OF ACUTE PERITONITIS

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Acute general peritonitis is nearly always, unless it is a terminal condition, the result of a sudden incursion into the peritoneum of infecting organisms from a local source of supply. There are many causes, but by far the greater majority of cases will be found to originate in a perforated appendix or a perforated gastric or duodenal ulcer. Less frequent causes are ruptured tubes, ruptured gall-bladder, acute pancreatitis, traumatic perforations—e.g. a kick in the abdomen—and so forth. The main point in the treatment is to establish the diagnosis at once, open the abdomen, stop the leak, and provide for the removal by drainage of the products of the leakage.

Signs of Peritonitis

The signs of a general infection of the peritoneum are as a rule unmistakable. Rigidity, complete and universal, over the whole abdomen, is enough in itself. More important, because a few hours earlier in onset, is the "expression" of the abdomen when it moves. For, contrary to the usual teaching, the peritonitic abdomen is *not* always motionless except in late cases. The movement, however slight, is characteristic.

It is diagnostic in most cases before one puts a hand on the abdomen. A hand on the chest and an eye on the abdomen is the best procedure. In a normal patient the abdomen comes out when the chest comes out (except for the first three or four respiratory movements, which should be ignored because all patients breathe self-consciously when first exposed). If after the first few breaths the abdomen goes in when the chest comes out, then the patient has a diffuse leak, will be found on palpation to have complete rigidity, and on laparotomy to have general peritonitis. It is a most important sign because a perforation may be accompanied by a low pulse-rate (44–48), and when this is combined with a normal temperature and false abdominal movements, it is as though the forces of Nature were conspiring to deceive the unwary diagnostician. It must be distinguished

from the "morphinised" abdomen in which the movements are slight but in the normal direction. Moreover, there is a further refinement. If a transverse crease half an inch above the umbilicus is seen in an abdomen which has the reverse movement described above—or no movement at all, then the patient is likely to have a perforated duodenal or gastric ulcer. If, on the other hand, there is a transverse motionless axis about two inches below the umbilicus round which the abdomen "rocks"—i.e. the wall goes in below this axis and out above it—then the trouble is probably in the appendix, which is leaking mainly into the pelvis and less so towards the upper abdomen.

Owing to duodenal leakings coursing down over the right iliac fossa, duodenal perforations and ruptured appendixes are often identical in abdominal "expression" and rigidity. Vomiting is against gastric or duodenal ulcer and in favour of appendicitis. High temperature early is against both. But since diffuse rigidity tells us that a suprapubic drain will be required, a useful plan is to make a small suprapubic incision first and see what kind of fluid escapes. Pus which smells suggests appendicitis; pus without smell suggests a perforated gastric or duodenal ulcer; blood, an ectopic gestation, or pancreatitis. The next step is to stop the leak. Duodenal and gastric ulcers can nearly always be felt before they are seen, and the bubbles and turbid fluid will lead to the right direction. The ulcer should be boldly inverted, going through all coats with, for choice, floss silk. The second row of inverting sutures can be and should be catgut.

Drainage

If the lesion is appendicitis the appendix should be removed, the stump inverted, and suprapubic drainage provided. This may be of glass or rubber. If of glass, which I prefer, it should be long rather than wide, and should settle down firmly in the pouch of Douglas so that its deep end cannot be moved by pushing the superficial end backwards, forwards, or from side to side. The feel of a "set" suprapubic tube is characteristic, and it will not be displaced by the patient's movements. Care should be taken that there is not a coil of small intestine between the tube and the rectovesical pouch. The average time to leave it in is 1½ to 2 days, but if any doubt exists a smaller rubber tube should be pushed down the glass tube *before* removing the latter, and in any case the tube should be rotated round its own axis within 24 hours to prevent omentum growing into the holes.

It is the practice of many surgeons to sew up these cases without drainage. Personally, I have never seen a suprapubic tube—properly managed—do any harm, and I believe that occasionally a case can be saved through providing drainage. Speed is an important factor in these operations.

The treatment of the extravasated contents and turbid fluid

or pus has been much discussed. Most surgeons are now of opinion that it should not be wiped or washed. Lymph should not be picked off; it is protective. The function of the peritoneum is, in fact, to have peritonitis if necessary. Incidentally the use of packs in diffuse peritonitis is to be deprecated. They waste time and they rub the peritoneum, both things to be

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Suprapubic drainage is based on the fact that while we cannot drain the whole peritoneum we can at least put a tube into a place towards which we can coax the fluid to run by the position of the patient. This is the basic idea of the Fowler position. No excuse about the patient having "just slipped down" should be accepted. The angle should not be extreme but should be constant; there are many methods for maintaining the position. I used at one time pieces of wood triangular in section and the length of the width of a bed. The three sides of the triangle were *unequal*, so that one side could always be found to match the patient's thigh. One of these was put underneath the mattress and fixed. The aim is to produce by this or another method combined with a back-rest a large V into which the patient sits. I gather from the angle at which Murphy bends the rectal tube that the angle preferred by him is an exaggeration of the Fowler position. Experiments on the cadaver suggest that an angle of 45 degrees is enough to drain the whole of the peritoneal cavity; but this may not be applicable to the living. The patient should be put in the Fowler position while waiting for operation. Further, when he has to be moved to a home or hospital an ordinary motor-car is better than an ambulance because he cannot lie down in it.

After operation the patient's whole lymphatic system should be flushed with fluid in order to help the excretion of the toxins through the peritoneum. Rectal salines by the continuous method or by repeated injection are the most valuable. These can be supplemented or replaced, if the rectum is intolerant, by subcutaneous salines into the chest, rather than the thighs, which are too near the drainage-tube and liable to suppurate. As much fluid as possible should be given short of waterlogging the patient, and plenty of fluid may be given by the mouth even if the patient vomits.

Purgatives

Purgatives after operation are open to discussion, but I always give 3 gr. of calomel 24 hours after operation—all in one dose so that if the patient vomits it can be given again without working out minute fractions. This is followed, in rapid succession until the bowels act, by mist. alb., a turpentine enema,

pituitary extract, and eserine. The two latter seem to act on different types of cases, but it is difficult to prophesy.

My object in giving purgatives is not that I think people recover from peritonitis by having their bowels moved, but, first, because any distension hampers chest movements and increases the liability to bronchitis, and, secondly, because I want to know early if the patient is going to have post-operative paresis of intestines or not. An enterostomy may save him on the third day, but will probably be credited with having killed him if done on the fourth day. Lastly, I believe if the bowels are kept mildly wriggling for a few days after operation it prevents a thin film of lymph attaching one piece of gut to another from becoming a permanent organic adhesion and thus causing obstruction in a week or two.

Special Cases

With regard to special cases, the question of doing a gastro-enterostomy at the time of perforation of an ulcer can only be decided by experience. Those surgeons who always do it appear to me to be wrong, and those who never do it equally wrong. It depends on a rapid summation of the following facts. If the number of years' history of ulcer is large, a gastro-enterostomy is indicated since mere suture is not likely to cure. If the number of hours since perforation is large, a gastro-enterostomy is not indicated since the toxæmia is great and operation should be as short as possible. If the number of minutes it takes the particular surgeon to do it is large, a gastro-enterostomy is not indicated. The fourth factor concerns the degree of stenosis produced by inverting the ulcer. This, I would point out, is never so extreme as one would think, from the peritoneal view of the pylorus or duodenum, and is only occasionally, by itself, an imperative indication for a gastro-enterostomy at the time of perforation.

Remote complications are, of course, bronchitis, pleurisy, and above all subphrenic abscess. Localised abscesses must be looked for as hard tender spots, and should be opened. The later they appear the safer it is to wait until they are localised.

Another complication which may supervene from 10 days onwards is a band forming as a result of the infection in the peritoneum. Persistent vomiting with a rhythmic pain and painless intervals is the best sign of this condition. Rarely have I noticed visible peristalsis under 11 days. The site of the band is fairly constant—it ties down the terminal ileum about two feet from the ileo-cæcal valve, and is due to this coil lying in the pelvis, the last part of the peritoneum to be freed from infection and, moreover, the site of the drain. The adhesion can usually be flicked off with a finger, and if operation is performed early nothing more need be done.

Conclusion

It should be remembered that the four factors—early and quick operation, suprapubic drainage, Fowler position, and the administration of salines—have altered during the last 20 years the mortality of general peritonitis from over 80 per cent. to less than 20 per cent.

XLI

THE TREATMENT OF LACRYMAL OBSTRUCTION

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Obstruction of the lacrymal passages leads to a troublesome epiphora for which the patient, usually after putting up with discomfort for weeks or months, finally seeks advice. The importance of treatment lies in the fact that these cases practically never recover spontaneously and that the presence of a chronically inflamed lacrymal apparatus is a constant serious menace to its possessor. It has been known bacteriologically that the thickened atonic lacrymal sac in these cases acts as a culture-tube and reservoir for a varied assortment of virulent micro-organisms. The most important of these, and one which is very frequently present, is the pneumococcus, and when it is realised that this organism can in the presence of the least abrasion of the corneal epithelium give rise to a serious hypopyon ulcer, and even lead to panophthalmitis and loss of the eye, it is obvious that no case of chronic lacrymal obstruction should go untreated.

The first step in the treatment is the recognition of the type of obstruction, and here a consideration of the history, the age of the patient, and the coexistence of nasal or other disease are of assistance.

One may roughly group the cases into three groups, the first being the commonest, the second less common, and the third very rare. 1. The patient is an adult usually past middle age. There is a slight swelling at the site of the sac, and pressure on this causes regurgitation of pus or mucus into the eye. The obstruction is somewhere in the nasal duct. 2. The patient is an infant and the obstruction was noticed soon after birth. There is regurgitation on pressure over the sac. In these cases the nasal duct, which develops as a solid rod of epithelial cells, has failed to canalise and has remained blocked by shed epithelium. 3. The patient is usually young or very old. There is *no* regurgitation on pressure over the sac, and on inspection an abnormality of the punctum can be seen. In the young this may be a congenital displacement, excessive smallness or complete atresia; in the aged it is displacement forwards due to the laxity of the lid (senile ectropion). Blocking of the punctum by

a scar, a foreign body, or a concretion may, of course, occur at any age.

The treatment in all cases should be in the first place conservative, operative measures being resorted to only when this fails.

Adults with Obstruction in the Nasal Duct

In the first group the treatment can be considered under three headings: (*a*) Re-establishment of the natural passages. (*b*) Extirpation of the affected sac. (*c*) Establishment of a new passage. The nose should be carefully inspected at the outset, since it is obvious that treatment directed towards the cleansing of the inflamed sac will be of little avail if the lower end of the nasal duct is blocked by a polyp, a hypertrophied turbinate, or a misplaced septum. If any intranasal cause is seen this should be dealt with at once.

The infected sac may then be treated as follows: After cocainising the conjunctiva the lower punctum is dilated with a Nettleship's dilator so that it will admit the nozzle of the lacrymal syringe. It is never necessary to slit up the canaliculus at this stage, and, indeed, this should not be done at all unless absolutely unavoidable, since, although a large opening is thereby made into the sac, the capillary action of the small duct is lost and the epiphora may continue from this cause alone, even after the passages are clear. Warm boric lotion is used to syringe the sac. Two or three syringefuls are slowly and gently injected, the patient being told to swallow if he feels the fluid in his throat. At first the fluid mostly regurgitates through the upper punctum, bringing with it flakes of muco-pus. The syringing should be done once a day and the patient instructed to empty the sac by pressure on it four or five times a day, so that it is kept collapsed. At the same time a mild astringent and antiseptic lotion, such as one containing zinc sulphate gr. i ad ℥i in a saturated solution of boric acid, should be prescribed for use night and morning. Under this treatment it will often be found that fluid passes into the nose at the fourth or fifth syringing, in which case the syringing is continued at longer and longer intervals until there is no regurgitation on pressure over the sac. In obstinate cases it is a good plan to inject argyrol 10 per cent. gently into the sac and leave it there, but if this is done one must be certain that there is no abrasion of the lining of the passages, since permanent staining of the tissues has been known to result.

If syringing does not bring about a cure the effect of probing the nasal duct may be tried before operation is advised. The passage of the probe does not require an anæsthetic if a solution of 2 per cent. novocain is injected into the sac beforehand. Cocainising the conjunctiva is not sufficient. The probe is passed along the canaliculus until the inner wall of the sac is felt and the point is then turned downwards so as to engage in the upper end of the nasal duct, when it is pushed steadily

downwards. Each probe is left in position a few minutes, then withdrawn and a larger size passed. Only the smaller sizes can be passed without slitting the canaliculus, as the punctum is the least distensible portion of the tract. Care must be taken not to probe if the sac and duct are very inflamed as there is risk that the damage done may only convert a stricture due to swelling of the mucous membrane into a fibrous cicatricial stricture, which will be much more difficult to dilate. Formerly, when syringing and probing had failed, recourse was had to the passage of lead or silver styles which distended the nasal duct and were worn for weeks or even months at a time. This form of treatment is seldom used now, as results attained with it were no better than with other methods, and the style, acting as an irritant foreign body, helped to keep up the discharge and in time led to still more fibrosis around the duct.

If after a fair trial of syringing and probing there is no improvement one must consider the question of operation. The operation, which will certainly remove at once the unpleasant purulent regurgitation and the grave risk of an infection of the cornea, is excision of the lacrymal sac. This is a simple operation and can be performed under a local anæsthetic (novocain and adrenalin); indeed, it is better so performed as the bleeding can be much more efficiently controlled. If the sac is completely removed healing is by first intention, and the little scar, which follows the direction of the skin folds, is hardly noticeable. The operation has the one disadvantage, however, that it abolishes drainage into the nose and therefore the epiphora is still likely to be trying in windy weather, though it becomes very much less owing to the removal of the infected and irritating discharge. It was this anatomical imperfection of the operation which led surgeons, such as Toti and later West, to devise a means of establishing permanent drainage by chiselling away the bone of the inner wall of the lacrymal sac and establishing a direct communication with the nose here. There are now various operations planned with this end in view. In West's operation the removal of bone is done via the nose and there is no external scar at all, the new passage being kept patent by means of a silver wire passed from the slit canaliculus through to the nose and out at the nostril. This is worn till healing is complete, usually ten days. In the earlier operations the bone was approached through an external incision. In successful cases the results of these operations are very good, a perfect functional return to normal being attained, but they all have the disadvantages that they require a general anæsthetic, the patient is incapacitated from work for a longer period, and in a certain percentage of cases the new passage becomes occluded by fibrous tissue and prolonged dilatation or further operation is necessary.

In some cases, as when acute glaucoma arises in an eye already the subject of chronic dacryocystitis, the closing of the sac becomes an operation of urgency. In these cases the quickest

procedure is ligature or cauterisation of the canaliculi, the next best incision of the sac. On no account must any intra-ocular operation be performed in the presence of regurgitation from the lacrymal sac, as there is a grave risk of panophthalmitis and loss of the eye. In a certain number of cases of lacrymal obstruction an acute dacryocystitis arises, for which the patient seeks relief. In the early stages, before the abscess is actually pointing through the skin, every effort should be made to secure resolution with discharge of the pus through the canaliculi. The punctum should be dilated, gentle pressure applied over the sac, and hot fomentations and hot bathings persevered with. In many cases incision or spontaneous discharge of the abscess through the skin may be avoided.

If the abscess is pointing it should be opened at the most fluctuant part, the pus evacuated, and the cavity packed with gauze so as to promote healing from the bottom. In most cases the severity of the inflammation has destroyed the lining membrane of the sac so that the cure is permanent by its obliteration. If some mucous membrane remains a permanent fistula results; it is then best to split up the little sinus and thoroughly curette the cavity, or, if large, dissect out its walls.

Infants with Congenital Obstruction

In the second group of cases, those occurring in infants, the complaint may be of watering and discharge from the eye or of an acute dacryocystitis coming on soon after birth. One should first try the effect of teaching the mother to empty the sac by pressure and instructing her to do this very frequently so that there is never any large collection distending the sac, at the same time keeping the conjunctiva clean with irrigations of boric lotion. If there is no improvement in the condition after three weeks a general anæsthetic should be given and a probe passed once *without slitting the canaliculus*. This in most cases will remove the epithelial débris blocking the duct and re-establish the natural channel. The operation can be repeated if necessary after three weeks' further treatment.

If an acute dacryocystitis has supervened an attempt should be made to dilate the punctum and express the pus. Otherwise the abscess must be opened and dealt with as described above in adults. If rubber tissue is used for drainage the piece must be large, as small pieces have been known to slip into the cavity and remain undetected for weeks, preventing healing. Ribbon gauze is better for the purpose, but it must be thoroughly wetted with lotion or the dressing will be painful. In some cases a fistula remains and on probing this bare bone can be felt. This always arouses a suspicion of syphilitic or tuberculous disease of the nose and calls for careful investigation and appropriate treatment.

Blockage Proximal to the Sac

In the rare cases where the blockage is proximal to the sac treatment varies with the condition.

(*a*) If the punctum is apparently absent careful search should be made with a good light and a corneal loupe when a small depression can nearly always be found. This can then be dilated, using a needle at first if necessary. In most cases with care a passage can be found into the canaliculus.

(*b*) Sometimes the punctum opens on to the outer surface of the lid margin and so does not lie in apposition to the globe. This may be remedied by slitting the first part of the canaliculus, taking care to turn the blade of the Weber's knife directly backwards so as to cut the posterior wall, not the roof of the little passage.

(*c*) In senile ectropion a small V-shaped piece of tissue should be removed (either with knife or cautery) from the conjunctival aspect of the lid below the punctum so that the resulting cicatricial contraction will pull this up into position.

(*d*) In cases where the puncta have been obliterated by a burn or other injury, treatment is difficult, as it is almost impossible to reconstruct the anatomy of the part. The epiphora is not likely to be so trying in cases in this group, since the element of infection and consequent irritation is usually absent. If, however, there is great discomfort the removal of whole or part of the lacrymal gland will afford relief. There is no danger of producing excessive dryness of the eye by this procedure, as Krause's glands and the mucous glands of the conjunctiva produce quite sufficient moisture. Usually the palpebral portion only is removed, since this involves so much interference with the ducts from the orbital portion that this latter subsequently atrophies.

(*e*) If a concretion or foreign body (usually an eyelash) is blocking the punctum, this can be removed by syringing or picked out with fine forceps after incising the canaliculus.

XLII

THE TREATMENT OF SYMPTOMLESS HÆMATURIA

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Under this term is included a group of cases characterised by the presence of hæmaturia as the only symptom or sign of which the patient complains—pain, frequency of micturition, pyuria, and other symptoms so frequently associated with bladder or kidney troubles being here conspicuously absent. Pain, however, may occur in symptomless hæmaturia if the bleeding be profuse enough for clots to form and to pass along the ureter or urethra, but such pain is merely an accident in the case, and is not dependent upon the actual cause of the hæmaturia. The hæmaturia is usually simply a chance discovery on the part of the patient, who happens to notice the altered colour of the urine.

Hæmaturia of this symptomless type may arise from a great diversity of pathological conditions—in fact almost any disease of the urinary tract may occasionally so first declare itself, though with most of such it is very exceptional. In 1922 I analysed 100 cases that had come under my own observation to ascertain the pathological conditions ultimately disclosed. The hæmaturia was of vesical origin in 65 (the commonest single cause being villous papilloma, 41 cases) and of renal origin in 35 (malignant growths, including hypernephroma, being the most frequent cause). In 86 cases the pathological cause was definitely ascertained, and of these 71—i.e. 82·5 per cent.—were due to neoplasm (44 benign and 27 malignant). Thus of all my cases of symptomless hæmaturia of known ætiology benign neoplasm accounted for 51·1 per cent. and malignant neoplasm for 31·3 per cent. This great preponderance of new growths will naturally lead the surgeon to think first, in any given case, of neoplasm, and especially of villous papilloma of the bladder; the fact, however, that in about one-third of all cases a malignant growth is present, possibly in an early and operable stage, should emphasise the extreme importance of tracing the hæmaturia to its source at the earliest opportunity. In my series, among the rarer causes of vesical origin were included prostatic enlargement, simple "solitary" ulcer, and calculus fixed in a post-prostatic pouch; of renal origin papilloma of the renal pelvis, angeioma

of a renal papilla, renal calculus, congenital cystic disease, chronic nephritis, mobile kidney, and "essential" hæmaturia. This term is applied to renal hæmaturia, the ætiology of which cannot be determined even after the application of all the methods of urological investigation at present known. It is an astonishing, and at the same time a disconcerting fact that, as in two of my cases, a kidney may bleed so profusely as to necessitate nephrectomy to prevent immediate death from hæmorrhage, and yet subsequent examination by an expert pathologist may fail to discover any macroscopic or microscopic change in it.

Investigation of a Case

The first step in the clinical investigation of a case of symptomless hæmaturia is to make sure, by microscopic detection of blood corpuscles, that it is really hæmaturia, and not the rare condition of hæmoglobinuria. Further, general diseases that cause hæmaturia such as scurvy-rickets, hæmophilia, the group of anæmias, and the passive congestion of heart disease, must be excluded. Next must be investigated, in order of urgency, (1) the source of the bleeding, whether vesical or renal, and if the latter whether unilateral or bilateral, (2) the nature of the lesion causing it, and (3) the functional state of the rest of the urinary tract. The physical characters of the blood—whether intimately mixed or not with the urine, whether bright red or darker in colour, and whether associated with clots of any characteristic shape although serving as a rough-and-ready guide to the source of the hæmorrhage, are not sufficiently trustworthy in any given case. By cystoscopy alone can the source of the hæmorrhage be determined with certainty, and its application, particularly if bleeding is actually in occurrence, should be regarded as a matter of extreme urgency. If the hæmaturia be of renal origin, it is only at this time that it can be traced to the defaulting kidney; it may last but a few hours, and may not recur for many months, during which, in about one-third of all cases, a malignant growth will be steadily progressing, and its chance of successful removal becoming lost. It still happens much too often that the practitioner's first efforts are directed not to the ascertainment of the source of the bleeding but to its immediate arrest; he puts the patient to bed and administers morphine and internal styptics. Although this may allay the alarm which many patients feel, in the long run it will prove the greatest possible disservice: it is far better to let the hæmorrhage continue until arrangements can be made for a cystoscopic examination to trace it to its source.

The Need for Cystoscopy

Cystoscopy is as urgently called for in this type of case as is early laparotomy in acute abdominal crises. Cystoscopy during

bleeding will, if this be of renal origin, show from which ureteric orifice the blood is escaping; if the bleeding is of vesical origin and not too profuse completely to prevent vision, both the source of the hæmorrhage and the causative lesion will be seen. If it be very profuse, repeatedly washing out the bladder with hot boric lotion, combined with the introduction of a solution of adrenalin, will usually suffice, but if these measures fail to secure satisfactory vision, then this fact alone is strong presumptive evidence of a vesical origin, and is sufficient justification, should the hæmorrhage be alarming, for immediate suprapubic cystotomy. Cystoscopy, after cessation of the hæmorrhage, may fail to show its source. Should it have been of vesical origin some lesion in the bladder sufficient to account for the hæmorrhage will be noted; the absence of such lesion indicates a renal source, though it does not indicate which kidney is at fault. If one ureteric orifice has a definitely abnormal appearance, this suggests, though it does not prove, that the corresponding kidney is the offender; no proof is, in fact, possible, save actually seeing the bleeding in progress, and this should emphasise the importance of not permitting the bleeding stage to pass without a cystoscopic examination. Thus in one case cystoscopy, after hæmorrhage had ceased, showed a large villous papilloma of the bladder, which might well have been a sufficient cause; later cystoscopy, however, during bleeding, showed blood coming from the left ureteric orifice, and renal exploration disclosed a hypernephroma. Another case, one of right renal calculus shown by previous radiography, was admitted urgently into the Manchester Royal Infirmary with severe right renal colic and profuse hæmaturia. The latter was thought, not unnaturally, to be due to the calculus; routine cystoscopy, however, traced the blood to the left ureteric orifice, and later exploration of the left kidney again disclosed a hypernephroma. If the bladder be normal and no renal tumour or other physical sign be discovered, then there is nothing for it but to wait until the hæmaturia recurs and cystoscope during the attack.

Bleeding from the Kidney

When the blood has been seen to escape from one ureteric orifice, a thorough investigation must be instituted by all the usual urological methods to ascertain, if possible, the pathological lesion in the corresponding kidney—careful palpation of the loin, a chemical, microscopic, and bacteriological examination of the urine, and possibly also of the separated urines after ureteral catheterisation, radiography, and pyelography. By these means positive evidence may be obtained of certain conditions—e.g. calculus, tumour, or tuberculosis—but if they only yield negative evidence an exploratory nephrotomy should always be performed. Only when this has been undertaken with negative result do I care to regard the hæmorrhage as "essential."

American writers apply the label "essential" when urological investigation short of exploratory nephrotomy fails to show a cause, and advocate expectant treatment of "essential" hæmaturia—intrapelvic injection of silver-nitrate solution through the ureteral catheter, the administration of calcium salts by mouth or intravenously, the subcutaneous injection of horse-serum, etc. I would fear in these cases that an early malignant growth was possibly being overlooked. This would certainly have happened in the two earliest malignant renal growths I have operated upon, which were discovered only after operative exposure, and the patients are both well four and a half and two years respectively after nephrectomy.

Before undertaking operative exposure of the kidney it is necessary, inasmuch as it may disclose some pathological condition requiring nephrectomy, that the functional capacity of the opposite kidney be estimated. For this I rely most upon the indigo-carmine test, the dye being injected intravenously, when the appearance of a deep-blue efflux at the ureteric orifice within three to six minutes is a safe indication of good renal function. Where the opposite kidney is efficient the bleeding organ is exposed from the loin, the upper end of the ureter and the pelvis carefully examined by palpation from without, the renal pedicle temporarily compressed with a light clamp, and the renal parenchyma freely incised a little posterior to its coronal plane until the pelvis and calyces are widely opened. If no macroscopic lesion be found, a small slice of the parenchyma is removed for microscopical examination, and the kidney carefully sutured with deep and superficial catgut sutures. The case must now be classed as one of "essential" hæmaturia, and should the hæmorrhage recur it may be treated expectantly with the confidence that a malignant growth has not been missed; only should the hæmorrhage become so profuse as immediately to threaten life should further operative treatment—i.e. nephrectomy—be considered.

XLIII

THE TREATMENT OF FROST-BITE

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Frost-bite is a local condition due to the action of cold upon the tissues of the body, as a result of which an area more or less limited in extent is deprived of its blood-supply. The condition is produced in two very different ways. In the first the direct action of cold upon the skin and underlying structures causes constriction of the capillaries and small blood-vessels, whereby they are so narrowed that no blood can pass through them; in the second, a reactive process, there is exudation through the damaged vessel walls into the surrounding tissues of the frost-bitten part, as a result of which the vessels again become constricted, and circulation cut off.

The first condition shows as an ischæmic waxy-white patch, well defined in outline, somewhat resembling the rapidly produced evanescent white area which results when ethyl chloride is used for local anæsthesia. The naturally produced condition has a somewhat dirtier, waxier appearance, with none of the "rime" characteristic of ethyl chloride. The second condition resembles the ordinary chilblain: it is aggravated by long-continued ischæmia, and by too rapid a return flow of blood. Certain factors predispose. They are those which cause a lowered vitality and a depressed circulation. The most important are: Cold (of the body generally), fatigue, exhaustion, hunger, and vitamin deficiency, especially scurvy. All these not only render the parts more liable to frost-bite, but by their mental effect cause the man to be less vigilant of its onset, a most important factor. Causes acting locally are winds, moisture, and grease. The parts of the body most liable to attack are the extremities, the exposed parts of the face, especially where the skin is stretched across underlying bone—e.g. the sides of the nose, the cheek-bones, and the chin; the ears, especially the tips and edges; the fingers and hands; the feet, especially the toes and heels. The parts most liable to permanent damage are the feet.

The frost-bitten part, if treated early and on proper lines,

recovers completely; if neglected the part dies and gangrene sets in. When the damage is superficial the skin becomes dry and black, and finally peels off, leaving a clean new skin underneath. In the case of extremities such as the toes, the damage may involve the whole thickness, so that they become dry, black, and shrivelled, producing the typical clinical picture of dry gangrene. The condition due to exudation is more serious. The part is at first dusky red, with a varying amount of swelling and œdema, and very irritable. Frequently blisters form which may contain straw-coloured serum, or in worse cases a thick purplish exudate. The part readily becomes septic, and moist gangrene follows, with absorption of toxins and severe effects upon the general health.

Signs and Symptoms

The onset of frost-bite is often insidious, and on inspection of the part in a suspected case there may be little to see. The waxy appearance may not be present, since the primary frost-bite may have passed off, or the condition have been produced by the prolonged action of less severe cold, especially if associated with wet.

Explorers are taught to regard all doubtful cases with the greatest suspicion, and to look upon the following signs as indicating that a part is seriously damaged: (1) Cessation of circulation, as evidenced by the lack of response to finger pressure; (2) loss of heat—the affected part feels colder than the surrounding areas; (3) loss of sensation; (4) inability to use the part—e.g. if the toes are frost-bitten they cannot be freely moved (this does not prevent walking, for there are numerous instances where men, to save their lives, have hobbled along on frost-bitten feet, with disastrous results locally); (5) changes in colour, especially any suggestion of mottling, which is at first red and pink, dark red and pale pink, later becoming blue-grey, and in the worst cases purple and dirty white. It must be emphasised that these signs are often very difficult to recognise, the circumstances under which frost-bite is seen in its early stages usually being very disadvantageous.

Prevention and Early Treatment

The importance of prevention and early treatment hardly needs emphasising, but one cannot too energetically condemn the principle, still taught, of rubbing the part with snow and snow-water. To do this to a perfectly healthy piece of skin is a joke often played upon the tenderfoot, but is never adopted in polar regions for the treatment of frost-bite. The snow has often a gritty feel, not at all like the mushy stuff of this country.

In the case of the tender parts, such as the face, it may actually do harm by removing the cuticle and damaged parts of the epidermis, leaving a weeping sore which heals with difficulty, and renders the part liable to further attack. It has the good point that it emphasises the danger of too great heat, which increases the amount of exudation and local damage.

Prevention is aimed at in two ways: generally by maintaining health and a vigorous circulation, and by attempting to eliminate the predisposing factors, and locally by providing suitable clothing. Whatever form the clothing takes the principle is the same—i.e. the placing of a non-conducting air-space between the skin and the cold outer air, and preventing its dislodgment. The two chief forms of clothing used for this purpose are "furs" and "woollens," which enmesh the air in the hairs and stitches respectively. The factors which tend to dislodge it are winds which blow it away, and damp or grease which takes its place. If furs are used the skin part acts as a wind-proof, but woollens must be fitted with an outer wind-proof covering. Local prevention may therefore be summarised as follows: (1) provision of suitable clothing and keeping it in repair; (2) keeping it dry; and (3) avoiding grease.

Clothing must be loose-fitting, with no constricting bands. With regard to keeping the clothing dry, the moisture may be derived from external wet, or internally from perspiration. Practically speaking, no part offers any difficulty except the foot-gear. Waterproof foot-gear retains perspiration, that which permits of ventilation allows access of damp from outside, and it is impossible to ensure absolute dryness. As long as the feet are warm from exercise no harm results from the damp; it is during halts on the march and in standing-about jobs that danger arises. Damp socks should always be removed before getting into the sleeping bag and another pair substituted, or none at all worn, and the feet should receive a brisk dry rub. The moisture acts detrimentally by producing a sodden, unhealthy condition of the skin, and by acting as a much readier conductor of cold.

It is commonly believed that fats, oils, and grease are good non-conductors, and if placed on the clothes or skin help to keep the part warm. This is not true of the oils and fats met with in polar regions, for they are much readier conductors than the air which they replace. It is probable that the same holds true for all the fixed oils and fats, which are not readily absorbed by the skin. The volatile oils may be beneficial, for they are absorbed by the skin and produce dilatation of the blood-vessels with increased flow of blood to the part, but if used in such excess as to fill the air-spaces they are detrimental. Vaseline and glycerine have been used on the face to protect it from strong winds, and apparently with success, but in still air they have no value. Where it has been necessary to immerse the feet

for long periods in cold water, as, for example, in the trenches during the late war, whale oil well rubbed into the skin was found beneficial in preventing trench-foot, but this condition must not be confused with frost-bite, though the end-results may be similar. A man's own hair provides excellent protection, but a beard is of doubtful value, since the moisture from the breath freezes on it, forming large masses of ice. Modern explorers keep the hair well clipped with a barber's fine clippers.

The *early treatment* of primary frost-bite consists in gently coaxing back the circulation by the application of dry gentle warmth, and the simplest and safest source of this is body heat. The application varies a little according to the part affected.

Face and Ears.—The onset occurs most frequently in windy weather. The part which has been cold becomes more comfortable, but with a feeling of numbness. Very often the man attacked knows nothing of his condition till warned by a companion, since the parts are invisible to himself. It should be a recognised custom for men in company to scrutinise each others' faces frequently; those travelling alone should keep a small mirror in the pocket. A hand warm from the mitt should be applied to the frost-bite. When one hand becomes cold the other may be used, and a companion may also "lend a hand." Very light massage may be used, but no rubbing violent enough to cause an abraded surface.

The *fingers* are commonly frost-bitten owing to the fact that fine manipulations cannot be carried out with mitts, so that the fingers have constantly to be exposed. It is easy to slip off the mitts for examination, consequently the white patches are usually instantly recognised. Treatment consists in placing the affected hand inside the clothing next the skin: commonly it is thrust under the upper part of the trousers and compressed between the thighs to slow up the return flow of blood, which is often painful. Work aloft at sea causes many cases, and is particularly dangerous, owing to the difficulty of keeping a firm grip on stays and rigging. Anything which produces pressure and tends to express blood locally predisposes, and contact with cold metal is particularly liable to produce the condition. The danger is greater if the mitts are damp and exposed to strong winds.

Feet.—In spite of close vigilance frost-bite of the feet is often not detected until long after its onset. This is due to the fact that the harder skin of the heels and the balls of the feet is relatively insensitive, and that foot-gear is comparatively difficult to remove for inspection of the suspected area. It is particularly dangerous for the following reasons: (1) the difficulty of recognition as above; (2) the feet are essentially extremities; (3) in snow it is almost impossible to keep the feet dry either from external damp or from perspiration; (4) pressure and constriction are more liable to occur than in other parts. As regards

prevention, the question as to type of foot-gear and its care is one of the greatest problems in polar exploration. Treatment, as elsewhere, is by the application of dry gentle warmth, but the harder skin of the feet permits of more vigorous massage, which is best carried out by a companion. If after some minutes there is no sensation of returning circulation, evidenced by a feeling of intense "pins and needles," the foot should be taken inside the clothing next the skin. This treatment should be persisted in for some hours before hope of recovery is given up. For the companion who has undertaken the thawing-out process it is decidedly unpleasant; others may take turns with advantage.

If recovery is delayed for some hours the part must be kept under careful observation lest the recovery be only temporary. If there is any doubt the part must be kept warm and dry, not used, and if circumstances permit, wrapped in dry cotton-wool and lightly bandaged or placed in a frost-bite sock. Ointments and greasy preparations should not be used, and any greasiness of the feet should be removed by turpentine or methylated spirit. Heat, especially damp heat in the form of fomentations, is not to be used, for there will be an excessive reaction with exudation, formation of blisters, sloughing, possibly sepsis, and subsequent moist gangrene. In spite of all care blisters may form containing clear serum or dark-coloured viscous fluid. If the skin of the blisters can be kept intact without great discomfort they should not be opened till this can be done aseptically. Dry dressings should be applied. The best and simplest in difficult circumstances is a piece of plain white lint, cut to shape, dried at a fire, over the flame of a Primus stove, spirit lamp, or at any flame which can be produced, and scorched to render it sterile. This should be covered with similarly dried cotton-wool, and the whole lightly bandaged. No matter what the subsequent course, nothing but dry dressings should be used in the field. The treatment of a gangrenous part comes within the domain of general surgery, and has no place in this article, but I would urge all field medical officers faced with the care of this really serious condition to pin their faith to dry gentle warmth, even over long periods of time, with no other application than perhaps occasional use of turpentine or methylated spirit.

Frost-bite of other parts of the body than those described are rare. I have seen one case only: frost-bite of the penis, which occurred under the most exceptional circumstances whilst a man, utterly fatigued, was attempting defæcation in the open. Even in the lowest temperatures momentary exposure of the bare skin does not produce immediate frost-bite, but the length of time that it can be exposed with safety depends upon factors such as degrees of temperature, presence or absence of damp, and strength of wind. Much depends also on the circulation: if the body has been at rest and the circulation is sluggish, frost-bite is more easily induced than if the blood is pulsating actively as the result of hard work, walking, or running. It is

the common experience of explorers that a part once frost-bitten is rendered more liable to further attack. When the body generally is cold, old frost-bitten areas can be picked out by a curious feeling of numbness, a condition which persists through life and is noticed even in our own temperate climate.

XLIV

THE TREATMENT OF EXCESSIVE LOSS AT THE PERIODS

By Victor Bonney, M.S., M.D., B.Sc.Lond., F.R.C.S.Eng.,

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I.—When the Uterus is Enlarged but no Fibroids are Present

General Considerations

Menorrhagia means excessive loss at the menstrual periods, but its occurrence is often not *monthly*, because the happenings in the ovary which determine the menstrual flow may occur at shorter or longer intervals than that. As a rule these happenings take place regularly, so that the menstrual flow is regular though perhaps not monthly, but sometimes the ovary itself is "irregular," so that the menstrual flow is irregular too. The term metrorrhagia signifies loss occurring between the menstrual periods and unconnected with those ovarian changes which are the basis of menstruation, and it is therefore necessary to distinguish this form of irregular bleeding from a menorrhagia which, though irregular, depends for its initiation on changes in the ovary. Metrorrhagia is quite independent of such changes, and indeed can, and sometimes does, occur in a woman who has no ovaries. This article deals with menorrhagia only.

Normal menstrual loss passes into menorrhagia so soon as the woman begins to lose more blood than she can afford. In this regard there are great individual differences. Some persons throughout their lives lose each month an amount of blood considerably in excess of the normal and yet without ill-effect, their blood-forming apparatus presumably being equal to the demand. In determining whether a woman has menorrhagia this fact must be taken into account and inquiry made as to the amount she has been accustomed to lose since her menstrual life began. The amount lost is also relative to the patient's physique. A big woman can, other things being equal, afford to lose more than a small woman. It is usual to gauge the blood loss by the number of diapers used during the whole period: thus 8 signifies scantiness, 12 somewhere about normal, 16 distinctly

too much, 20 undoubtedly excessive, and 30 or 40 "flooding." The rapidity with which the blood is lost must also be taken into account. A woman who uses 12 diapers during a period lasting three days loses much faster than one who uses the same number during a period lasting a week. In some cases, again, a large proportion of the total number are used within the first 24 or 48 hours, so that the loss whilst at its maximum rate is excessive, though the total amount lost is not so. A woman who uses 8 diapers in one day is losing too much, even though she only uses 12 over her whole period of five days. The loss may be excessive by too long continuance as well as by too rapid flow, and in the severe cases both abnormalities are coexistent.

The diagnosis of menorrhagia in any given case rests finally on a general survey of the patient herself. If she is losing too much she will be anæmic, at first only immediately during and after the period, but later on continuously. A woman anæmic from whatever cause is obviously unfit to lose any blood at all until her blood content is restored; to her even a normal period is "menorrhagia." Considerations of this sort frequently arise, notably in cases where it has to be decided whether to stop the periods altogether by hysterectomy or adopt some other course, operative or medicinal, with the view of making the loss "normal" again. Where a patient is very exsanguine, as, for instance, in some cases of fibroids, the periods of themselves often diminish in profuseness, and unless the medical attendant takes these facts into consideration he may mistakenly suppose his patient to be improving; whereas relative to her extreme anæmia the monthly loss is just as harmfully excessive as ever it was. Any improvement of the blood content of these patients by medicinal means at once causes the loss to increase again.

When it is determined that the patient is really losing too much, the next step is to seek the cause by physical examination. As far as the uterus is concerned, broadly speaking, one of three conditions will be found: either it will be (1) abnormally large, (2) normal in size, or (3) abnormally small.

Menorrhagia with an Enlarged Uterus

A large uterus, other things being equal, will bleed more than a small one because the menstrual area is bigger. Sheer enlargement then without any structural disease will cause the loss to be excessive. The size of the uterus varies a little in normal virgin women, but not to any great extent, though I have seen a few cases where the oversize was so marked as to suggest a developmental abnormality, the reverse of the undersized uterus much more commonly met with.

Subinvolution.—The commonest cause of simple enlargement unaccompanied by gross structural disease is subinvolution, and in its lesser degree it is present in many parous women whose wombs remain permanently bigger and whose periods remain

slightly but definitely freer than they were before the women conceived. When the failure to return to the normal size is marked, menorrhagia usually accompanies it. The subinvoluted uterus for at least six months after the pregnancy is capable, I think, of being reduced in size by suitable treatment, but after this period the enlargement becomes increasingly established, until eventually certain intimate structural changes take place in its substance which result in one form of the condition known as "fibrosis." The term, however, is ill applied to this class of case, for the primary change is in the nature of a hyaline degeneration of the muscle-fibres to which the apparent overgrowth of white fibres at a much later stage is secondary. A uterus in this condition usually bleeds profusely, and also often presents other abnormalities—e.g. retroversion, cervical laceration, chronic cervicitis, and erosion.

In the treatment of these cases the first point to bear in mind is that for, say, six months after labour there is certainly a fair chance that suitable treatment may cause involution to take place, but after this period the likelihood of the big uterus shrinking becomes less and less. Ergot is the first drug to try and should be given in full doses (℥i) t.d.s. from a few days before the period is due until the flow is over. If the loss is very great pituitrin can be given hypodermically once or twice a day. If these fail other uterine styptics are not likely to succeed, but they can be tried. Many of these cases present retroversion as well, and it is important to rectify this, not only because reposition at this period may permanently cure the displacement, but because retroversion delays or prevents involution. Drugs failing, the uterus should be curetted. The results obtained from this operation are best when its application is not too long delayed. If retroversion is present this should be corrected at the same time by manual or instrumental reposition and the temporary introduction of a pessary. Such treatment, if carried out within the first six months, often cures the patient. The pessary, however, should not be worn for more than six months; if at the expiry of this period the uterus retroverts when it is left out the instrument should be abandoned and the patient advised to have the displacement permanently corrected by operative means.

When subinvolution has existed for a long time the chances of curettage benefiting the menorrhagia are much diminished, because the uterine wall has undergone permanent change. In such a case when, after the usual drugs have been tried and failed, curettage is in contemplation the surgeon will be well advised if he tells the patient beforehand that the operation may fail in its intent, adding, however, that it is advisable because there is nothing between it and more drastic measures. If retroversion is present this should be dealt with at the same time by intraperitoneal shortening of the round ligaments and coexistent cervicitis should be met by excision of the inflamed

surface and repair, the aim of the surgeon being to leave the parts in as normal a condition as possible in the hope that the degenerative processes in the uterine wall may stop or regress.

There are times when the hæmorrhage is so severe that it becomes urgent to relieve it with certainty. In women over 40 years of age hysterectomy is the simplest solution of the problem, but the difficult cases are those in which the patient is relatively young, and removal of the uterus is to be avoided if possible. In such, as an alternative, I have employed abdominal hysterotomy. The abdomen being opened the uterus is incised through its anterior wall until its cavity is opened and the endometrium is then scraped far more thoroughly than can ever be done from below. The handle of the scalpel is a most efficient scraper. Such thorough curetting is often followed by several months' amenorrhœa, and in my hands it has proved a successful operation. There is this advantage in opening the cavity of the uterus—namely, that more frequently than would be thought some intra-uterine condition, like a small fibroid or mucous polyp, is discovered, which is the real cause of the bleeding, although its presence was not detectable by other means. When the uterus is considerably enlarged it may be reduced in size by cutting part of it away (utriculoplasty).[1] When doing this operation I used to excise a wedge-shaped portion, cutting through both front and back walls, but I now excise the front wall only so as to keep the suture line on the anterior surface.

There is a further class of case in which it is undesirable to remove the uterus because of the likelihood of making worse an already existent prolapse of the vaginal vault. In such cases I excise the entire corporeal endometrium and suture the rest of the corpus so as to make it into a solid column of muscle tissue. This column is then ventrofixed so as to act as a ligament to keep up the weak vault. This is a good operation.

There are two other ways of dealing with hæmorrhage from a *chronically subinvoluted uterus*—radium and X-rays. Radium acts by destroying less or more of the endometrium, and is, in fact, equivalent to curettage, except that it produces more fibrosis. If the destruction is limited to the superficial layers the periods may be lessened in amount, or even temporarily suppressed for several months, as after hysterotomy and curettage. If the destruction is complete permanent amenorrhœa is effected. Totally to destroy the endometrium a considerable exposure is required, but on account of its varying thickness it is impossible accurately to gauge the exposure required to do this, and, moreover, there is a degree of danger in procuring an effect so drastic. Where the uterus is definitely enlarged I hold that radium is not the treatment of choice, and still less so if, in addition, displacement or chronic cervicitis and erosion are coexistent. With

[1] *Arch. Middlesex Hospital*, 1910, vol. xviii.

a normal-sized uterus, or one smaller than normal, the indications for its use are stronger.

X-ray treatment in these cases is as much to be condemned as it is in cases of fibroids, under which heading I will refer to it more particularly.

XLV

THE TREATMENT OF EXCESSIVE LOSS AT THE PERIODS (*continued*)

By Victor Bonney, M.S., M.D., B.Sc.Lond., F.R.C.S.Eng.,

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II.—When the Uterus is Fibroid, Normal in Size, or Undersized

Fibroids.—Fibroids cause excessive loss at the periods, partly by increasing the size of the menstrual area, partly by augmenting the vascularity of the uterus, and partly by interfering with the retractility of its muscular wall. The amount lost bears no constant relation to the size of the tumours. One feature of fibroids is, however, pretty constant—namely, that they prolong menstrual life until well over 50 years. This is an important point to be considered when advising treatment. Menorrhagia due to fibroids should in nearly all cases be treated by removal of the tumour either by (1) myomectomy, or (2) hysterectomy, partial or total. Preservation of the uterus is desirable on several grounds, of which we may place first the potentiality for conception in a patient of child-bearing age. Beyond this, however, the idea of losing the womb is repugnant to most women, even though conception is no longer possible. Moreover, the removal of the uterus seems to hasten by a year or two the natural age-atrophy of the ovaries, so that the climacteric is hastened. A further point is that hysterectomy may have a psychological effect on the sexual attitude of both wife and husband, because desire is checked by the fact that the sexual act has lost its main significance.

Myomectomy, then, is the operation of election, but conservation is only advisable under certain conditions. An important one is that the surgeon should see the patient before her health has been seriously injured by hæmorrhage; where a woman has been bled white, even the amount of blood lost at a normal period is too much for her, and the quickest way to restore her to health is to stop the periods altogether by hysterectomy. Moreover, when the tumours are many and large the operation becomes a more difficult one than hysterectomy. For

these reasons surgery should not be delayed, since there is a period in the life-history of all fibroids, be they ever so large, so numerous, or so harmful in their effects, when they could be safely removed without sacrificing the uterus. Generally speaking, myomectomy is the proper operation for patients under 40 years of age, and hysterectomy for those approaching 50, while for those of intermediate age the decision depends on individual circumstances. I believe that most fibroids begin to be formed in the later twenties or early thirties, much earlier than is generally thought. I base this view on the fact that though I have now performed myomectomy on many relatively young patients, only twice have I seen new fibroids form, and those very small ones. No rule as regards the size and number of the tumours can be laid down. Large tumours are often easier to remove than small ones. Much depends on their situation in the uterine wall. I have removed as many as 52 fibroids from one uterus, reconstructing the organ afterwards, so that six months later it felt on examination to be absolutely normal. Finally, I would again emphasise the importance of surgical interference as early as possible. When hysterectomy is necessary I believe the subtotal operation to be preferable whenever the cervix is reasonably healthy.

Radium has been advocated in the treatment of certain cases of small fibroids, but I strongly disapprove it. It is a blind proceeding and not unassociated with risk. Any one who is familiar with the conditions found in a myomatous uterus after removing it knows how different they frequently are from what they were imagined to be before the operation: thus an enlargement held to be due to an interstitial tumour may be found to result from a pedunculated mass, accurately filling the cavity. Radium checks uterine hæmorrhage by destroying the endometrium, but it often destroys some of the musculature as well, and thus a fibroid may be caused to undergo necrosis, a dangerous thing. Moreover, small fibroids are those most suitable for myomectomy.

X-rays.—The treatment of fibroids by X-rays I heartily condemn. It is in effect a revival of the bad old operation of double oöphorectomy for fibroids; ablation of both ovaries led to an acute climacteric, and in a proportion of the cases the periods ceased and the tumour ceased to grow, or partially shrank. The price paid for this relief was an acute "change of life" with all the miseries which accompany it; worse than this in quite a number of cases neither the bleeding nor the growth of the tumour was checked. X-rays effect a bloodless oöphorectomy followed by results exactly the same and exactly as variable as the old operation. I have now a number of times had to operate on patients after they had had both ovaries unavailingly destroyed by X-rays. Moreover, I have seen irradiation followed by acute septic degeneration of the tumour and by severe X-ray burning of the abdominal wall. It is, to

my mind, a bad and retrograde procedure which appeals to the fearful patient as a means of escape from "the knife," though the physiological and anatomical alterations produced by it are in reality far more serious than those produced by hysterectomy, whilst the ideal surgical procedure of myomectomy cures without disturbing either function or normal structure.

Menorrhagia with a Normal-sized Uterus

Patients with a uterus of normal size are more difficult to treat because the cause of the bleeding is more obscure. The conditions which cause an unenlarged uterus to bleed too freely are mainly two—uterine fibrosis and so-called endometritis.

Uterine Fibrosis.—Uterine fibrosis, which is not dependent on subinvolution, is a true inflammatory fibrosis and is typically seen in cases with a history of definite uterine infection. It may follow gonorrhœal, puerperal, and post-abortional infections. The uterus is not enlarged, but it is very hard and fibrous, whilst the endometrium is much reduced in thickness. The menorrhagia is often exceedingly severe, and to complicate matters a large proportion of the patients are quite young women who desire children and have none. Some have previously been operated on for inflammatory disease of the appendages. Curettage is quite useless, though many of these women have been curetted several times and have taken every known uterine styptic.

In such circumstances two courses remain: (*a*) to remove the uterus or (*b*) to use radium. I would, in most instances, remove the uterus, firstly, because it is a useless organ, and secondly, because in many cases it is still the seat of chronic infection. Radium has a better field here than when the uterus is enlarged and much success has been claimed for it. My own experience is that though it checks the bleeding or even stops it altogether for several months, not infrequently the menorrhagia presently recurs and a further dose is requisite. Repetition of the treatment is not without risk. I have seen several cases in which deep necrosis of the uterine wall was produced. My impression is that the first application of the radium produces a condition of low vitality in the tissues affected on which a second application may act with destructive effect. A further objection to radium is that its prolonged or repeated use causes atrophy of the ovaries in the same way that X-rays do. This is a very disastrous thing if the patient is young.

So-called "Endometritis."—Cases in which no obvious change in the uterus or uterine wall can be discovered, and yet the woman bleeds too freely at her periods, are most difficult to treat, for we know little of the process of normal menstruation. Many of these cases are labelled as "endometritis," but there is no histological evidence of this condition. It seems reasonable to suppose that there may exist some abnormality of the function

of the ovaries or of the glands correlated to them, and on this theory endocrine treatment has been extensively employed of recent years. The results obtained are very unequal, nor do they help us to formulate any scheme of administration. The various ovarian extracts now on the market, together with thyroid, pituitary, and mammary substances, should be tried, but as to which combination is likely to give the best results in any individual case we have no certain knowledge. These, together with the uterine styptics, constitute our first line of attack. It is noteworthy that some of these cases of menorrhagia get well of themselves after all treatment has failed.

Curettage achieves success sufficiently often to be well worth a trial. This failing, *radium* may be tried. Its effect is identical with that of curetting in so far as it produces superficial destruction of the endometrium, but it produces far more fibrosis than does the curette and hence its effect is more likely to be lasting. On the other hand, the dangers and drawbacks referred to above accompany its use.

In place of radium, or following the failure of radium, we have *abdominal hysterotomy* with curettage from above. The operation has the advantage of enabling the surgeon to obtain accurate knowledge of the condition of the uterus, and occasionally reveals a definite though unsuspected cause for the bleeding like a small polyp, or a localised thickening of the uterine wall, which can be excised. Finally, we come to those distressing cases where, other treatment having failed and the patient being very anæmic, it is necessary to remove the body of an apparently normal uterus. X-ray treatment should never be employed for reasons already given.

Menorrhagia with a Uterus smaller than Normal

A small uterus does not necessarily mean a small monthly loss; the most profuse and persistent menorrhagia may proceed from the undeveloped organ, possibly because the defective musculature is unable to close down upon and control the vessels of the uterine wall. Patients with this type of uterus are young and usually unmarried, and are therefore most undesirable subjects for any drastic steps. Endocrine treatment may first be tried in the hope of stimulating further development of the uterus, combined with ergot, styptol, hydrastine, and so forth. This form of menorrhagia may improve after marriage, whilst pregnancy is most desirable since it may result in cure; conception in an undeveloped uterus, though unlikely, is by no means impossible. Curettage should be tried, and radium may be employed seeing that if these measures fail it may be necessary to remove the body of the uterus. This step should not be delayed until the patient has passed into a profound anæmia, for then the risk of operation becomes very great. These cases of "terminal anæmia"—the end-result of severe and prolonged

menorrhagia—are not so uncommon. The skin is dead white with a slight lemon tinge; the temperature may be 102° or 103° F.; the pulse is very rapid, up to 160, and "water-hammer" in type; the mind is alert and anxious, but not frightened; and from the vagina flows a steady stream of thin brownish-looking blood, usually with a very unpleasant odour. This state is invariably due to ill-advised persistence in palliative measures long after there has ceased to be any hope in them. Patients so ill will not stand a long operation; the surgeon must remove the uterus in 15 minutes or less in order to save more than a small proportion of them.

XLVI

THE TREATMENT OF TACHYCARDIA

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Tachycardia may be due to a variety of causes, and is a condition which for two reasons may demand treatment. In the first place, rapid heart action, quite apart from any associated structural lesion, seriously impairs the efficiency of the circulatory mechanism. A heart which beats rapidly when the body is at rest lacks reserve power. It is severely handicapped when called upon to increase its output in response to an increased demand of the muscles for oxygen during physical activity.

And, secondly, tachycardia may make itself distressingly manifest to the sufferer in the form of palpitation. When this is so, he is continually being reminded that there is something the matter with his heart; and this aggravates his condition by adding to the other disabilities from which he is suffering an element of constant mental anxiety. Even in the absence of palpitation, tachycardia, discovered perhaps by accident, will afford a fertile source of worry to the introspective patient. He keeps feeling his pulse, and each time he does so the gruesome features of the bogey of heart disease loom more clearly before his eyes.

Differential Diagnosis

In health the rhythmic stimuli which excite the heart to contract arise in a group of specialised cells situated in the wall of the right auricle and known as the "normal pacemaker" or the "sino-auricular node." In accordance with the functional activity of this pacemaker, every case of tachycardia may be classified in one of two groups: either (1) *the primary tachycardias*, in which the disturbing factor lies within the heart itself—in these the stable government of the sino-auricular node has been temporarily or permanently replaced by a revolutionary régime; or (2) the *secondary tachycardias*, in which the rapid action of the heart is a mere secondary manifestation, indirectly or reflexly produced, by a lesion, or by the effects of a lesion, in some other organ of the body. Here the stable government is still in

power, but has been obliged temporarily to modify its policy in response to urgent pressure from outside.

Secondary Tachycardias.—There are two simple and extremely important criteria in the diagnosis of secondary tachycardia: (1) the heart's rhythm is regular, and (2) the heart rate is highly susceptible to variation in response to changes of posture or emotional disturbances. If the pulse exhibits these two features, and if there be no rheumatic history or other evidence suggestive of an organic lesion, in my opinion, tachycardia, *by itself alone*, never justifies a diagnosis of heart disease.

Most of the cases of rapid heart action which we meet with in practice are secondary tachycardias, and it is extremely important to realise that, in them, the heart is not primarily at fault; the mere fact that in such cases we can assure the patient that his heart is perfectly sound will prove to be a psychotherapeutic factor of real value.

The treatment of cases in this group is essentially the treatment of the underlying condition, for with the elimination of the toxic or nervous factor which is bringing pressure to bear upon the heart the tachycardia automatically subsides. The simple tachycardia of Graves's disease, or of early pulmonary tuberculosis, that associated with various febrile conditions, or met with during convalescence from almost any acute illness, the tachycardia of neurasthenia, or that which occurs in perfectly healthy individuals as the result of some emotional disturbance, are all secondary tachycardias, and they are all generally easy to recognise.

In all types of secondary tachycardia, including "D.A.H.," any therapeutic measure which tends to direct the patient's attention to the heart is definitely harmful and should be most carefully avoided.

Primary Tachycardias.—In the treatment of the primary tachycardias, as in all forms of chronic heart disease, the restriction of physical exertion is of fundamental importance. The extent to which the patient is able and willing to adapt his mode of life to the limitations of his impaired cardiac reserve will largely determine the success or failure of any line of treatment. The diet should be such as will not cause flatulent distension of the stomach; the bowels should be carefully regulated, and excessive intake of fluid avoided.

As regards drug treatment, the practitioner has to decide whether he will strike at the root of the trouble and endeavour to restore the normal cardiac mechanism, or whether he would not do better to neglect the relatively unimportant auricle and concentrate upon the ventricle. He should ask himself three questions: (1) What chance is there of restoring the normal cardiac mechanism? (2) Is the normal mechanism, when restored, likely to be maintained? (3) To what extent is the patient likely to be benefited by the restoration of the normal mechanism?

Auricular Fibrillation

The rapid heart action associated with auricular fibrillation is by far the most common of the "primary tachycardias." The features of this disorder, irregularity of the pulse both in rhythm and volume, numerous unproductive beats, which can be recognised by auscultation, but fail to reach the wrist, or even to open the aortic valves, and the commonly associated signs and symptoms of heart failure with venous congestion are characteristic and well recognised. In most cases the rapid ventricular rate is alone sufficient to account for the additional impairment in circulatory efficiency which accompanies the onset of fibrillation. It curtails diastole and thus hinders the filling of the ventricle, and it tires out the heart by frequent contractions, many of which are so premature that they serve no useful purpose. It is not surprising, therefore, that, without attempting to remedy the auricular mechanism, one can greatly improve the circulation by merely controlling the ventricular rate by means of digitalis.

The particular preparation selected is largely a matter of individual preference, but for general use either the tincture or the powdered leaf is eminently satisfactory. The larger dose of the infusion renders it less suitable when the drug is being given in large quantities, and the various proprietary preparations which I have tried appear to be less reliable in those cases of heart failure which demand immediate relief.

Recent work in pharmacology has shown that, in man, the absorption of digitalis from the alimentary canal is complete in six hours after administration, whereas the absorption of strophanthus from the alimentary canal is both poor and extremely variable. Full digitalisation can be rapidly obtained by the oral administration of massive doses. This procedure is perfectly safe provided the patient has not previously been taking digitalis or strophanthus, and provided that we allow an interval of six hours between successive doses. Morphine, gr. $\frac{1}{6}$, combined with the first dose of digitalis often brings great relief, by securing a few hours of much-needed sleep. The rate of elimination of digitalis from the body is such that, if necessary, a patient can take about 15 minims of the tincture per diem, over long periods of time, without any risk of cumulative effect.

The alternative plan of campaign is to attempt to restore the normal mechanism by means of quinidine, a procedure which requires careful supervision. In over 50 per cent. of cases of auricular fibrillation, normal rhythm can be restored temporarily by the use of quinidine, but it is only in a very much smaller number that the normal rhythm is permanent. When the symptoms are directly and mainly attributable to the presence of an abnormal rhythm, the results of quinidine therapy may be highly satisfactory; but when the myocardium is severely and permanently damaged control of the ventricular rate, by means

of digitalis, is likely to yield greater benefit to the patient than the restoration of the normal rhythm, which is often too rapid for the damaged heart.

The procedure which I usually adopt, first having got the patient fully digitalised, is to give an initial dose of 3 gr. of quinidine, either as a powder or in the form of a cachet, and then, after waiting 12 hours to guard against the possibility of any idiosyncrasy to the drug, I give 6 gr. every three hours for five doses, and if necessary repeat this procedure on the two succeeding days. My own personal experience suggests that, if the normal mechanism is not restored before the end of the third day, although it often may be restored later by prolonging the treatment, it is not likely to be permanent. Quinidine tends to increase the ventricular rate, and digitalis may be given simultaneously to counteract this action. Quinidine is withheld if the heart rate becomes excessive, and is discontinued as soon as the rhythm becomes regular or toxic symptoms supervene.

Auricular Flutter

In auricular flutter the pulse is generally regular, and in the neighbourhood of 150 per minute, while the auricle is beating at double that rate, every second auricular impulse failing to reach the ventricle. The degree of block between auricle and ventricle can be increased by digitalis, and the ventricular rate satisfactorily controlled in this way. By pushing the digitalis treatment, flutter can be converted into fibrillation; and then, if the drug be discontinued, in some cases the fibrillation will be replaced by normal rhythm. Flutter may persist for many years; but, provided the ventricular rate be efficiently controlled by digitalis, this disorder appears to impose surprisingly little additional burden on the heart.

Paroxysmal Tachycardia

In true paroxysmal tachycardia the attacks commence and terminate absolutely abruptly, and for no apparent cause; the heart without warning suddenly switching over, in a single cycle, from the normal to an extraordinarily rapid rate of beating, often in the neighbourhood of 200 per minute. In any condition such as this, where the attacks are liable to occur at irregular intervals and to terminate spontaneously, it is exceedingly difficult, if not impossible, to assess the true value of the therapeutic agents which we have employed. Various methods of aborting the attacks have been advocated by different physicians, but none has proved infallible; and one is bound to admit that, at the present time, we know of no really reliable method of combating this disorder. Sometimes vagal stimulation, either direct, by pressure in the neck, or reflex, by the introduction of vomiting or forced deep respiration, will abort an attack, but

more frequently such methods fail, and we have to be content with endeavouring to prevent the attacks by carefully eliminating any infective, toxic, or nervous exciting factor.

Before becoming permanently established, auricular fibrillation is liable to occur in paroxysms which alternate with periods of normal rhythm. Although it may hardly seem justifiable to draw any conclusions as to the results of treatment in such paroxysmal attacks, quinidine does appear to yield good results.

Structural cardiac lesions are generally permanent, but derangements of function are often extremely amenable to treatment; by appropriate management and drug therapy we can do much to restore balance, to relieve symptoms, and to enable the heart, even when badly damaged, to carry on its functions in a fairly satisfactory way for long periods of time.

XLVII

TREATMENT OF DEFORMITIES DUE TO INFANTILE RICKETS

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The deformities due to infantile rickets commonly met with in practice and requiring treatment are the early stages of spinal curvature, genu valgum and varum, tibial curves, flat-foot, and, rarely, curvature of the bones of the upper extremity. Thoracic deformities require no treatment, and true rickety coxa vara is rare, though the possibility of the occurrence of this and of pelvic deformity is an additional reason for a period of recumbency during the treatment of the active disease.

General Treatment

During the active period, whether deformity is present or not, the general scheme of treatment is relief from weight-bearing, without curtailment of muscular action, open air and sunlight, corrected diet, and cod-liver oil. This combination is best obtained in one of the many excellent country hospital homes or children's orthopædic hospitals now available.

The above indications can be met, under institutional conditions, by fastening the infant on his back to the cot with a light shoulder harness, which prevents him sitting up or rolling over, but leaves his limbs completely free. He lives in the open air wards with the lightest possible coverings consistent with adequate warmth in winter and at nights—completely in the open, with no coverings, in the day in summer. Helio-therapy is given to those who pigment well. The diet is fat-containing, modified according to age, and generally supplemented by cod-liver oil. The limbs are massaged, and deformities, if present, moulded, but not splinted. It is not advisable to divide or fracture bones during active rickets. Signs of active disease disappear, usually, in three months. The best working test of this is the return of the X-ray appearances of the lower radial epiphyses to normal. The child is then allowed to sit and stand, and later, deformities, if persisting, are dealt with by one

of the methods given below. Treatment on these lines prevents the formation of deformities and often results in spontaneous disappearance of those already present. When the child has to be treated at home a similar régime should be attempted. Artificial may be substituted for real sunlight. The mother is instructed to keep the child off his feet at least part of the day, the diet is corrected and supplemented, and cod-liver oil given. I am not in favour of splinting the legs to prevent walking, as this limits the valuable effect on metabolism of muscular contraction, and the possible prevention of some increase in deformity is not, in my opinion, sufficient compensation.

The treatment of the common deformities which have persisted in spite of, or arisen for lack of, treatment on general lines must now be considered.

Spinal Curvature

This is usually (1) a kyphosis in the lower dorsal region, or (2) lateral curvature in the upper dorsal region and at the dorsi-lumbar junction. These are postural deformities, the latter caused by habitually carrying the child on the same arm—the former by sitting.

In kyphosis, immobilisation on the back, as described during the active stage, is sufficient to prevent further deformity. Later, and in the case of older children untreated in the early stages, a course of Swedish remedial exercises is given, and a light Jones brace may sometimes be beneficial till muscular control is improved. Kyphotic children should have school desks at which they can sit upright, and errors of refraction, especially myopia, should be corrected.

Lateral curvature is treated in the early active stages on a plaster bed holding the spine straight or slightly curved in the opposite direction. Subsequently, Swedish remedial exercises are given by a trained masseuse, and, if there is any tendency to relapse, a moulded leather jacket should be worn, made from a cast of the body in suspension, with the spine held curved in the opposite direction to the deformity. This is put on lying down in the morning and only removed for exercises and at night. In more severe cases of scoliosis, with fixed structural deformity, institutional treatment is indicated for a series of plaster jackets to obtain the best correction possible, followed by Swedish remedial exercises and wearing of a moulded leather support to prevent relapse.

Genu Valgum and Flat-foot

I mention these together as they are often associated and the early treatment of each is similar. Genu valgum is a deformity produced and increased in the rickety child by standing. Flat-foot is caused by failure of the flabby musculature of

rickets to develop the arch of the foot: a process which occurs in the normal child on beginning to stand and walk. The former deformity tends always to produce or increase the latter by faulty weight transmission. A slight degree of genu valgum is common, especially in girls, and, if not associated with flat-foot or an in-toeing gait, requires no treatment. An in-toeing gait is caused by the patient's efforts to support his weakening arches with his invertor muscles by inverting his feet as he walks, and is often a sign of early genu valgum. If these symptoms are present, or the genu valgum more marked, the boots should be raised $\frac{1}{4}$ in. or $\frac{1}{3}$ in. on the inner side of the sole and heel by thickening the leather or adding wedges. The heel counter should be very accurately fitted, and, in some cases, the inner side of the upper may be specially stiffened to prevent treading over. The mother is told *never* to allow the child to stand without the altered boots on. If this is necessary for a few minutes in bathroom or bedroom, the child should learn (as children do easily) to stand and walk on the outer sides of his feet. Simple exercises should be taught to children over 3. The best for flat-foot are (1) with toes pointing inwards, rising on tiptoe and coming down on outer sides of feet, (2) walking on outer sides of feet, (3) (seated) raising and bringing together the forepart of the feet till the big toes touch, keeping heels on the ground, and a few inches apart. For genu valgum—double knee-bending and stretching with the feet separated. Young children with genu valgum should lie down for two hours or so in the day, with a small firm cushion placed between the knees, and ankles and knees tied together with slings or large handkerchiefs. If these measures fail, or if the genu valgum is more advanced, with a separation of say 3 in. and over between the internal malleoli, when the knees are extended and the femoral condyles touching, the alternatives are (1) instrumentation, (2) osteotomy of the femur. Thomas's knock-knee iron is the best instrument. In applying it, the knee, in extension (but not hyper-extension), must be first bandaged to the posterior bar and then pulled over to the lateral bar (which should be set out a little) by means of a webbing strap and pad of felt over the internal condyle as far as the patient will tolerate. The correction is increased as tolerance is established. The instrument corrects efficiently in a year or two if well supervised, but causes much lateral mobility of the knee and muscular wasting if worn night and day. This may lead to relapse unless careful observation, altered boots, and exercises are continued for a lengthy period. I now prefer osteotomy. This should not be done under 4 years of age. The femur is divided with an osteotome for three-quarters of its thickness and the remainder fractured. It is done from the outer or inner side, just above the condyles, with the knee flexed and a firm sandbag behind it. The limb is fixed at once in plaster in slight varum, with hip and ankle included. The plaster may be removed in eight weeks, and

weight-bearing, modified by crutches or sticks for the first week, allowed.

Flat-feet in older children, which are painful, or in which the arch cannot be restored by muscular effort, should be put in plaster in full inversion and dorsiflexion for a month and then treated by altered boots and exercises. If the flat-foot is rigid and the arch cannot be restored by manipulation, a preliminary wrenching under anæsthesia must be done until the foot is fully mobile and the arch can be restored. It is then put in plaster as above.

Genu Varum

This is an outward bowing of the femoral and tibial shafts, causing wide separation of the extended knees when the feet are in apposition. It is not generally associated with flat-foot and tends to decrease with growth, so that treatment is not a matter of urgency. Should it persist after the age of 6, correction, if desired on cosmetic grounds, is obtained by osteotomies of the tibiæ first, followed by division of the femora later, if necessary.

Tibial Curvatures

The commonest tibial curve (and the most characteristic deformity of rickets) is an antero-external bowing of the lower half or third of the shaft. This is a sitting deformity produced by the child squatting with legs crossed under the thighs. Less commonly the curve is anterior in the lower half, or, rarely, involving the whole shaft like congenital syphilis. Occasionally a tibial curve exactly compensates genu valgum and, functionally, these cases do not require correction. Straightening of the tibiæ for cosmetic reasons will have to be followed by correction of the unmasked genu valgum. Tibial curvature is an unsightly deformity and, if persistent after the age of 3 or 4, should be corrected.

The method of choice is *osteoclasis*. This is a simple procedure. Both tibiæ may be done at a sitting as shock is not great. Under full anæsthesia the point of maximum curvature of the tibia is applied to the narrow edge of a wooden wedge covered with a layer of wool. The weight of the body is suddenly thrown on to the hands, grasping the shaft of the tibia above and below the deformity, and the bone fractures with a crunching sound. A greenstick fracture is usually produced with bending or sometimes fracture of the fibula. Care must be taken in a low osteoclasis not to displace the lower tibial epiphysis by pressing on the foot. Occasionally the bone cannot be fractured by hand, in which case an osteoclast may be used, if available. Osteotomy should not be done immediately if manual osteoclasis fails, as the wound is liable to become infected owing to the preceding damage to the tissues. A firm bandage over wool should be applied and osteotomy deferred a week or

so. After fracture the curve is corrected by moulding, but the line of the tibia should not be made too straight. There is normally a slight inward curve of the shaft. The leg is put in plaster immediately. This includes the knee, and the upper portion down to the fracture is allowed to harden slightly before the remainder, including the foot, is rapidly completed. This allows the final correction to be obtained by moulding before the lower portion sets. Any inward rotation of the lower fragment must be corrected at this point. The foot should not be dorsiflexed too much or an angulation of the fracture may be caused.

In older children, or when manual osteoclasis fails, the deformity is corrected by osteotomy. The leg is placed on a firm sandbag and the tibia partially divided with an osteotome subperiosteally, through a very small incision at the site of the deformity. Sometimes, especially in anterior curves, a wedge must be removed. The remaining bone is fractured, the small wound sutured, and the deformity corrected and put up in plaster as described.

Upper Extremity

Deformities are rare but occur occasionally in the crawling stage of infancy. They are simple bends of the humerus or radius and ulna, and, if persistent after treatment in the active stage, can be corrected by osteoclasis and plaster fixation.

XLVIII

THE TREATMENT OF DEMENTIA PRÆCOX

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I.—The Investigation of the Case

The condition known as dementia præcox was first described by Kraepelin as including a large group of insane patients, mainly adolescents, who, after passing through phases of extreme mental excitement, settled down into a progressive dementia. From this early description the term derived a sinister connotation in view of the terminal dementia, and indeed, for a time, whenever a suspected case recovered the diagnosis was called in question.

Of late years, however, the conception of the disorder has radically changed, and the prognosis, although not favourable in any advanced stage of the disease, yet affords considerable hope if cases are placed under treatment sufficiently early. In out-patient clinics and in private practice it has been possible to investigate cases at a much earlier stage than that which would warrant certification as insane and detention in a mental institution. It has become clear that the original conception was derived from the study of severe and degenerative end-products of a process of which the early symptoms may be manifested by many adolescents whose mental status would not be seriously questioned. The most satisfactory view of the causation of the condition is to regard it as the failure to adaptation of the individual under the stress of circumstance. No one can have failed to realise that from the time of puberty, through adolescence, and up to adult life, great changes are in progress physiologically and psychologically as the boy grows into the man and the girl into the woman. These changes are such as to fit the individual for the detail of his life, and they should so march as to keep pace with the increasing demands for self-control and a sense of responsibility. Growth, both mental and physical, may be looked upon as the unfolding of the bud, a natural process of development; vagaries in the final form depend upon the innate characteristics and upon the pressure of environmental factors. There is a continuous modification of the organism, constituting a delicate adjustment to the natural process of growth on the one hand and to the moulding pressure of the environment on

the other ; a satisfactory adaptation within the personality and character is shown by the practical capacity to utilise and obtain pleasure from the opportunities which life always presents. Should circumstances be unduly hard, should innate vitality be weak, or should the original germ-plasm be abnormal, then adaptation is liable to fail. The result may be a warping of the character and personality and consequently of the subsequent life-history, but in more serious instances a breaking-up of the integrity of the organism will ensue. This is shown mentally by a schizophrenia or dementia præcox development, and the demented mind will be housed in a dilapidated physical body which exists vegetatively, and is an easy prey to infection by such organisms as those of tuberculosis or pneumonia.

If the disorder is to be successfully combated, it is of the utmost importance that early failure of adaptation or the tendency to such failure should be recognised before the establishment of degenerative changes such as those described by Mott in the endocrine organs and in the central nervous system. Yet it is an extremely difficult task to set forth in any systematic way the indications which are of value, for there is no definite organic sign, and the symptoms of early failure of adaptation are revealed only in the higher mental functions.

Suspicious Symptoms

The spring-time of life is noted for inconsequentiality and variability of conduct and thought, and it must not be assumed that extravagance in either direction is necessarily a mark of mental deterioration, but normal biological evolution ensures that there shall be a swing back from any extreme to adjustment to practical life. Experience must be eagerly courted and as intensely avoided from time to time ; disappointments must be encountered, successes must be lived down, childish sentiments must be superseded, and the domination of the parents must give way to self-conscious recognition of the ties and limitations as well as of the possibilities of adult life. Many of the episodes of youth, its emotional storms, its ideational excursions, are of the nature of psychotic crises through which the more fortunate individual passes by virtue of a firm supporting home influence and his own innate stability. Where the home influences are complex and where there is a constitutional weakness, serious results may follow. Persistence of mood is, perhaps, the most striking of the early symptoms, for it is not normal for the adolescent to be depressed, obstinate, or sulky for more than a few days at a time, nor should he live in a constant state of lively self-satisfaction. There should likewise be a fluidity of interest ; absorption in one person, one kind of play, or one line of work for several months on end portends failure of proper development. Self-absorption is natural in the girl of from 16 to 20 as is conceit in the boy of the same age, but neither state

should be so persistent or so profound as to interfere with enjoyment of social intercourse and a proper consideration for the practical details of life. Self-depreciation with undue sensitiveness, persisting for any length of time, is strongly suggestive of some internal difficulty of adjustment. Religious conversions, sudden changes of disposition, or of the choice of milieu are always indicative of important subjective crises and show that the patient needs careful handling for the time.

If the stress is not relieved, grosser symptoms are encountered, such as seclusiveness or deliberate withdrawal from play or home life; frequent and violent emotional storms of anger or of tears; and obstinacy carried to the point of negativism, which is a studied and deliberate opposition to the wishes of parents or friends, persisting and involving considerable limitations on the subject. Apathy and listlessness in the presence of opportunity for enjoyment or progress are characteristic of a certain type of præcox development. Regressions to more childish ways, an indifference to dress, to appearance, and to the opinion of others, and a falling away from the intellectual standard attained are all features of importance. Temperamental inadequacies, a failure to develop the normal interests, such as dancing in the girl and sports in the boy, are the forerunners of future difficulties.

As the condition progresses more positive symptoms appear —e.g. passionate attachments between children of the same sex, ruthless antagonisms between members of the family, habits of a perverted nature, sexual or otherwise, careless behaviour fraught with danger to the self or to others, violent assaults, destructive outbreaks, and phases of intense restlessness with excitement. Finally, it becomes apparent that the patient is definitely deluded or is being distracted by hallucinatory voices, while faults of conduct, of commission or of omission, show that a serious mental change has occurred.

Physical Signs

Physical signs are not wanting; pathologically, as Mott has demonstrated, the disorder is associated with disturbance of the endocrine system, and there are indications pointing to this morbid change, such as alterations of nutrition, excessive adiposity, or emaciation. There may be rapid overgrowth of the bony framework or a failure of physical development. The normal distribution of hair for the age or sex may be greatly disturbed, and there are changes in the texture of the skin with a patchy hyperidrosis. In the female there is invariably a disturbance of the menstrual function; usually it is delayed and, when established, there may be marked irregularity or suppression for months or years.

As a rule the patient is brought to a doctor with a very vague history of "nervousness," of being "run down," or "not

quite himself lately." The tendency is for the case to be regarded as belonging to the group of functional nervous disorders, but no label of "hysteria" or of "nervous exhaustion" should blind the practitioner to the essential mental nature of the disturbance. Having satisfied himself that he is not dealing with an organic disease, he has to make up his mind whether the failure of adaptation is to be considered due mainly to innate weakness of constitution or to pressure of circumstance. The personal and family history will indicate to some extent how far responsibility should be ascribed to the innate factor, but much caution must be exercised in accepting the statements of the relatives. It is best to get them to describe facts of the patient's history rather than to listen to their interpretations. If an aunt, for instance, is said to have had "nervous breakdowns," the practitioner should ascertain whether these entirely incapacitated her and, if so, whether she were treated at home or away: in the latter case the breakdown was probably psychotic and therefore would have considerable bearing on the prognosis of the case under consideration. The character of the parents or guardians should be carefully estimated. If they are faddists, eccentrics, or emotionally unstable individuals, then the patient will have been subjected to much harmful emotional influence, and the disturbance may be a natural outcome of such an environment and accordingly more favourable in outlook. Where the parents show sound common sense and can be regarded as competent not to make life impossible for a developing adolescent the occurrence of a breakdown is all the more grave. In older patients, young men at college and girls away at school or engaged in full social activity, inquiries must be made as to any emotional situation which may have arisen. Where a love affair has played an important part as an exciting cause there has usually been some abnormality; either the patient has not been able to derive proper satisfaction within the bounds of convention or else these bounds have been overstepped. In cases where the difficulty in the life of the patient is one that time cannot solve the prognosis is bad. For instance, a young man, the son of a widow, had made great efforts to pass an examination which would have given him an assured position and so enabled him to support his mother. He was unsucessful and developed an extreme depression from which he passed into an acute dementing psychosis. Here the opportunity of his life had gone, never to recur, and the situation could not be solved by time.

XLIX

THE TREATMENT OF DEMENTIA PRÆCOX (*continued*)

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II.—The Management of a Case

Having gleaned all that he can from the parents and friends, the doctor is prepared to examine the patient himself.

Early Cases

It may happen that sensible parents or relatives bring the patient to the notice of the physician before evident mental disturbances have arisen. The patient may be found to be mildly excited with a certain degree of incoherence of thought and a general childish demeanour and reaction, or the picture may be one of emotional apathy and resistiveness with reticence. In the former case no good can be done by any attempt at psychological investigation; the treatment must be carried out on the general lines indicated below, modified to suit the requirements. Where there are depression and apathy, however, much can be done by a painstaking effort to obtain the confidence of the patient. Very often it will be found that the apathy is more apparent than real and that the reticence is deliberately adopted rather than indicative of lack of thought process. A dramatic change in the situation can be brought about in many such instances by patience, goodwill, and a real heartfelt attempt to understand the difficulties which the patient is experiencing. An acquaintance with human nature and a sympathetic understanding are worth more in dealing with such a situation than all the scientific technique of the schools. The physician must guard against showing any surprise or emotional revolt at any of the facts which may be confided to him. Very often it transpires that the girl or boy is suffering from a serious loss of self-esteem due to some unconventional behaviour. With this feeling of inferiority there goes a sense of estrangement, of being cut off from social contact, and the attitude of the relatives is often interpreted in this light. It is surprising how completely the whole outlook of the patient may change when once he or she discovers that this secret and carefully hidden difficulty can

be freely and naturally discussed with the doctor. Without betraying the confidence of the patient, the physician can often effect some readjustment of the family life or of the environmental situation and so relieve the stress of circumstance. One interview may not be, and often is not, enough to clear up the matter. It may be necessary to stop any active work, even to institute a definite sick routine for a month or six weeks. According to the response to treatment manifested greater latitude may then be allowed and the patient may be sent away for a change before taking up his life again under such circumstances as are indicated. It is unwise in these acute adolescent disturbances to permit of any systematic psychological investigation; analysis in the Freudian sense has, in the experience of most psychiatrists, been productive of more harm than good and it is certainly unnecessary.

It is desirable to relieve the acuity of perceptional life by the administration of bromides, and the following prescription may be used for a period of six months or even longer with advantage:

℞	Ammon. Brom.	gr. x.
	Liq. Arsenic.	℥ii.
	Sp. Ammon. Arom. . . .	℥v.
	Aq. Chlorof.	ad ℥j.
	Sig.: ℥j, t.d.s., p.c.	

Although there is no definite knowledge in regard to specific endocrine disturbances, yet any indication of failure or of hyperactivity of one or other of the organs of internal secretion should be noted and appropriate treatment adopted. The empirical use of compound glandular extracts is often of value; the "Elixir polyglandin," in drachm doses three times a day, may be given in this way over a period of months. Iron and strychnine should be used with care in the early stages of the treatment, but are useful adjuncts during the convalescence.

More Advanced Cases

Where there is evident mental disturbance of a pathological nature there is no doubt of the condition, and the line of treatment to be adopted will depend upon the severity and nature of the disturbance of conduct and upon the circumstances of the relatives. The age of the patient has also a bearing on the case, because much can be done to manage the younger patient at home, whereas, for the safety of every one concerned, the older boy or girl may have to be placed under certificate and treated in an institution. If it is decided to treat the patient away from home it is far wiser to place him in a recognised mental institution. The ordinary general nursing home does not provide the right atmosphere, and much valuable time may be lost before the case is brought under the care of those who have a proper understanding of the condition. The practitioner must

not forget that it is illegal to treat a certifiable patient in any nursing home other than one of those licensed by the Board of Control.

Home Treatment

If the case is to be treated at home it is always advisable to insist on a specially trained nurse; the relatives are not to be relied on and the general nurse does not appreciate the points against which to guard. The difficulties generally encountered are impulsive behaviour or suicidal tendencies, excitement and noise, stupor and refusal of food. The treatment should be carried out in a well-ventilated room on the ground floor, having easy access to a garden, which preferably should not be overlooked, so that the patient can take exercise when desirable and so that his bed can be placed in the fresh air when the weather is suitable. It is wise to aim at keeping him in bed for at least a month or six weeks; the causal factor is exhaustion, and all expenditure of energy should be cut down to a minimum. Where there is marked restlessness with tendencies to destructiveness it is advisable to put a mattress on the floor and nurse the patient without a bedstead at all. Where he is inclined to tear up sheets and to strip himself, as is so frequently the case, he may be dressed in a strong and warmly-lined combination suiting of canvas or some untearable material and so protected from the effects of exposure. Where there is excitement with motor restlessness or depression with suicidal tendencies the room should be cleared of all breakable objects which might form sharp-edged instruments for self-mutilation. He should be kept on sloppy foods which do not demand the use of a knife and fork; a spoon is a far less dangerous implement in the hands of an impulsive patient. Emotional instability with marked depression is a sign of considerable gravity because of the liability to impulsive suicide. In such a case continuous observation is absolutely necessary, and for this two or even three nurses may be required. The noisy case must be nursed in an isolated house or he will be a nuisance to neighbours. It is not correct treatment to restrain a patient mechanically or to keep him quiet by the use of strong sedatives.

Diet and Drugs

The diet should be plentiful and contain an excess of fat in the form of butter and cream. Care must be taken to see that a sufficiency of fresh fruit and other vitamin-containing substances is included. Where the patient refuses food or is stuporous a competent mental nurse is of great assistance, but resort should be made to tube-feeding if there is any suspicion that the patient is not getting an adequate amount of nourishment; if matters are allowed to drag on, a point is reached

when he seems incapable of digesting or assimilating, and serious physical consequences may ensue. Feeds should be given three times in the day and should not fall below a diurnal minimum of four pints of milk, three eggs, three ounces of cream, four ounces of sugar, and the juice of an orange or lemon or whatever fruit may be available. The milk may be given in the form of custards or one of the prepared foods. A vegetable soup makes a good variant in the dietary. Any medicines, such as aperients, may be dissolved in the feed and so given at the same time. Careful attention should be paid to the bowels and to the state of the mouth, which may become very dirty. Sedatives may be found necessary from time to time, especially where there are insomnia and excitement. The administration of paraldehyde in doses of from two to four drachms, given every six hours or night and morning, may be continued for some time without any harm to the patient. The use of the more toxic sedatives over any prolonged period is to be deprecated. Sulphonal, in doses of from 5 to 15 gr. once or twice daily, soneryl, which may be given up to 9 gr. throughout the day, and luminal, in 4 gr. doses at night, have all been found useful. When sulphonal is being administered the appearance of dark smoky urine, due to the elimination of hæmatoporphyrin, indicates that the drug is accumulating and exercising a deleterious toxic effect.

During the patient's rest in bed, massage and hydrotherapy will materially assist in keeping up the physical condition and in maintaining a healthy tone in the skin and muscular system. Prolonged hot baths, at a few degrees above blood-heat for five or six hours at a time, are sometimes of great benefit in controlling restlessness. If the patient should develop acute phases of excitement the hypodermic administration of a combination of morphine gr. $\frac{1}{4}$ and hyoscine gr. 1/100–1/50 will be found efficacious. Objections to the use of hyoscine, based upon complaints from patients of "feeling held in a vice," etc., should not be considered too seriously; in these conditions of excitement it is a valuable and useful drug.

The treatment will take time. Whereas the course of physical illnesses is usually measured in days or at most weeks, that of the mental illness is measured in months and possibly years, though it is unusual for an acute mental disturbance to persist longer than a year and a half. The relatives must be prepared for at least six months' continuous treatment, and they must be accustomed to the idea that no sign of progress may appear for many weeks. A change of phase is often indicative of response to treatment; the excited patient may become depressed, stupor may replace motor restlessness, confusion may alternate with clear periods, but eventually the more acute phenomena subside, the hallucinosis becomes less vivid and disturbing to the patient, impulses are less frequent and more easily controlled, and he shows a tendency to occupy

himself more consistently and to take a normal interest in affairs around him. Care must be taken not to let him re-enter life too quickly, and he should be kept under supervision and prevented from taking up any social responsibilities for at least two months after all definitely morbid symptoms have disappeared.

It will be seen that the treatment of the mental patient at home is not to be lightly undertaken, and unless conditions are very favourable it is usually better for him to be dealt with in an institution. The practitioner must exercise his discretion and judge each case on its merits, but no time should be lost in getting the patient under proper control when the symptoms are as gross as those described above.

L

THE TREATMENT OF HAMMER-TOE

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Part I.—General Considerations: Conservative Measures

Prophylaxis

The prophylactic treatment of hammer-toe deformity necessitates the use of shoes and stockings of sufficient length in the actively growing age, and correct posture in standing and walking. Shoes should be broad in the toe portion, straight along the inner borders, and not too pointed. The tendency to deformity should be detected early and rectified by the use of metatarsal bars or anterior arch supports, and by such active and passive movements as encourage the flexion power and range of the toes.

While the term *hammer-toe* is often loosely applied to any flexion deformity of the toes that may be found associated with various malformations of the foot, it should be more correctly reserved to describe a fixed flexion deformity. Of this there are two types, the *acquired* and the *congenital*, and in both the condition is commonly bilateral.

The *acquired* form is the more common; it involves the second toe, and is associated with hallux valgus, the combined deformity resulting from too short and too pointed footwear in the growing age, and from the improper method of walking with feet everted. The second phalanx is flexed on the first, and the latter is slightly over-extended at the metatarso-phalangeal joint. The terminal phalanx is in line with the second, or flexed or extended on it. The approximation of the tips of the great and middle toes buries the two terminal phalanges of the second toe, forcing them into a vertical position, while the proximal phalanx remains horizontal. The vertical portion of the toe is pinched at the top and bottom by the shoe; a painful corn forms on the head of the proximal phalanx and another on the tip of the terminal phalanx, just at the end of the nail, which becomes thickened and distorted. The tip of the toe is swollen, broadened, and flattened. On the dorsum of the metatarso-phalangeal joint the extensor tendons become contracted, maintaining the hyper-

extension deformity at this joint. A similar contracture occurs in the capsule and flexor tendons on the plantar aspect of the acutely flexed proximal interphalangeal joint, which after a time prevents straightening of the toe at this joint by passive movements. Occasionally the flexion deformity is in the terminal and not the proximal joint.

The *congenital* form differs from the acquired in that the middle toe is always involved, alone or together with the fourth and fifth. The proximal, and particularly the terminal, joints are both flexed to some degree; and the terminal phalanx is rotated and twisted, underlying its mesial neighbour. In infancy the toes can be straightened by passive movements, and are therefore amenable to conservative treatment. A slight adduction of the little toe alone, and with no disability, is so common that it cannot be considered abnormal.

In its less strict application "hammer-toe" may denote flexion deformity of the toes, associated with exaggeration of the long arch (*pes cavus*). All the five toes are involved, and usually bilaterally. These should be described as "clawed" rather than "hammer" toes. Hyperextension contracture of the metatarso-phalangeal joints is more marked than in real hammer-toe. Both the terminal joints are flexed, but the toes are drawn towards the dorsum of the foot, with no pressure effects on the tips, and the terminal flexion is more easily corrected by passive stretchings than in real hammer-toe.

In some cases of hallux valgus all the smaller toes are flexed in the two terminal joints and pushed backwards into adduction and dorsiflexion by pressure of pointed and short footwear, resembling "clawed" toes, but with the addition of the adduction. The great toe is valgus, and not "hammer" shape, thus distinguishing this boot-produced deformity from real pes cavus and claw toes, where the great toe is also hammer-shaped and less valgus. In rheumatoid arthritis the toes may be similarly deformed.

In any "hammer" and "claw" condition involving several toes, the anterior transverse arch is depressed and painful callosities form on the balls of the central toes. The corresponding metatarso-phalangeal joints may exhibit mechanical synovitis, due to weight stress being unrelieved by the deformed toes, which are unable to assume the normal flexion effort in the "push-off" in the last part of the step in walking. Toes that will not flex and grip the ground in the "push-off" are functionally useless.

The indications for treatment of real hammer-toe are: (1) The relief of pain from pressure on the dorsum of the prominent proximal interphalangeal joint or on the tip of the toe at the nail. (2) To fulfil the requirements necessary for admission into some of the public services. (3) For cosmetic reasons in children. There are two general procedures. (1) Conservative: By daily manipulations to correct the deformity passively, with retentive

splints to hold the toes straight by day and night. (2) Operative: The gradual method is so tedious and lengthy that in anything but the slightest degree of deformity, even in the case of children, I strongly advocate early resort to operation.

Conservative Measures

Conservative treatment is indicated in early cases of acquired deformity, and in children when the parents prefer it. For the single deformed toe of the acquired condition the best splint is a short covered metal one, of the width of the toe, and extending from the tip to the ball of the toe, where the splint is expanded into a small plate. This is fitted with a padded elastic loop passing over and exercising pressure upon the prominent proximal joint, and by tapes or elastic to fix the rear end to the mid-foot. It can be worn without discomfort within the shoe by day, and also at night. Various modifications of this splint are on the market and can be obtained from any foot appliance shop. Palliative appliances can also be obtained, consisting of an elastic sheath for the toe, with a sponge rubber pad attached, protecting the dorsal or terminal corns from pressure. These appliances take the place of the old strapping method, which was tedious. Splints are of service only in cases that can be corrected passively.

In the flexed and adducted third and lesser toes of the congenital deformity the use of a corrective splint is more difficult, on account of the twisting distortion and the smallness of the toes. The appliance used is a separate leather insole within the shoe, fitted with elastic loops for the toes. It is known as a "half-sole plate with loops," the half sole being fixed to the forefoot by a broad elastic band or tapes over the instep; it can also be used at night.

When appliances are used passive stretchings should be done morning and evening, to flex the toes at the metatarso-phalangeal joints, and extend them at the proximal and distal interphalangeal. While there is no doubt that in the slighter and earlier degree of deformity conservative treatment, if carried out with patience and assiduity, is successful, yet it is so slow and so expensive in time, splints, boots, exercises, etc., that operative treatment is mostly to be advised.

LI

THE TREATMENT OF HAMMER-TOE (*continued*)

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Part II.—Operative Measures

One difficulty in these small operations is that of access. The operation must be done delicately, and a dressing applied which maintains complete correction without being cumbersome. To fix the deformed toe, and to hold the toes on either side out of the way, a stout fishing-gut suture is passed through the pulpy end of each of the three toes. The ends of each suture are gathered up in three separate artery forceps, and the toes held rigidly and firmly out of the way of each other by the assistant. At the end of the operation, when the dressing has been applied —the toe-tip being left uncovered in order to watch the circulation subsequently— the retention sutures are removed. To assist precision and delicacy a rubber bandage should be used as a tourniquet, applied immediately above the ankle after the foot has been exsanguinated by a similar bandage, and is not removed until the dressing is dry and set. The best dressing is sterile ribbon gauze of the same width as the length of the toe, applied directly to the wound (which is sewn up with two or three fine interrupted fishing-gut sutures), and wound around the toe moderately firmly and closely (but without risk of strangulation), with thick collodion applied as the layers are increased. About a dozen or so layers are requisite, and the retention sutures hold the toes corrected for a few minutes while the collodion dries. The "splint" is rigid, and the circulation is noted to be satisfactory in the uncovered toe-tip before the patient leaves the theatre.

The dressing does not shrink subsequently. It is maintained for two weeks, and then cut off with strong scissors, and the skin sutures removed. A similar dressing is applied, and renewed again in another fortnight, taking six weeks in all. The patient can walk a week or two after the operation in this dressing, which is so rigid and small that the walking is harmless and comfortable. Another advantage of the sealed dressing is the avoidance of the thickening of the joint which is liable to persist for many weeks if an ordinary gauze dressing be used.

In retentive splintage after correction, when the toes need to

be held flexed in the metatarso-phalangeal and extended in the more distal joints, the sealed dressing and looped sole-plate methods described above are more practicable than the use of plaster-of-Paris, in which it is difficult to obtain precise correction without risk of producing pressure sores.

Excision of Head of Proximal Phalanx, with Removal of Cartilaginous Base of Middle Phalanx

Of the several operations that have been advised from time to time for acquired hammer-toe, excision of the head of the proximal phalanx, combined with the removal of the cartilaginous base of the middle phalanx, is to be preferred. No flexor tenotomy or division of the flexor capsule is done, and only just as much of the head of the proximal phalanx is removed as will enable the toe to be made *quite* straight on strong passive stretching into extension. There should be no tension tending to reproduce flexion when the operation is finished. An ankylosis (arthrodesis) of the proximal joint is desired. If the base of the middle phalanx is left untouched, fibrous rather than bony ankylosis is likely to result, with some risk of recurrence of the flexion deformity. The dorsal incision is elliptical, of about three-fifths the width of the toe, and the redundant skin with the dorsal corn is removed. There is no need to damage the lateral digital arteries. If the deformity be severe, the dorsal expansion of the extensor tendon should be removed with the elliptical piece of skin; if not, it may be preferable merely to incise the tendon longitudinally, to give access to the head of the bone. But the excision is more difficult to do delicately in this case. The head of the bone is best removed by fine-pointed bone-cutting forceps, and the neck of the bone need not be fragmented. A fine chisel or stout, small knife is used to denude the base of the second phalanx of its cartilage. The skin suturing helps to maintain subsequent correction.

In operating on the congenital type, the proximal or terminal joints are similarly corrected, according to the site of greater flexion. It is never necessary to correct both joints. To correct the adduction and rotation of the terminal (one or two) phalanges, the elliptical excision of the skin will be placed somewhat to the outer side of the joint, at the site of the maximum bend. The dorsal expansion of the tendon is removed. In these tiny toes the joint excision is best done with a small, stout scalpel. The skin wound can be sutured in such a way as to assist in correcting flexion, adduction, and rotation. Two or three toes can be operated upon at the same time.

Alternative Operations

The alternative operations may be mentioned. Amputation of the whole second toe in the acquired variety is not usually

desirable unless its terminal nail portion is grossly deformed, or the toes on either side so rigid in their position that there will be no longer room for the corrected toe in its proper place, or unless, as in neglected cases, lateral corns exist. The objection to total amputation is that the frequently associated hallux valgus is liable to increase subsequently, from pressure of the stocking and want of the preventive effect of the second toe. Amputation of the terminal phalanx alone would in most cases leave an awkwardly dorsiflexed proximal stump. In some cases, however, where the hammer deformity is not giving trouble from pressure on a dorsal corn, but where the nail is thick and distorted, with painful terminal corn, the terminal phalanx can be amputated at the end joint, with removal of the bone and nail bed, by the palmar flap method.

Total removal of the proximal phalanx has been advocated, leaving a short, stumpy toe which would serve to prevent the hallux valgus from increasing, but with no other function. The writer has no experience of this method, nor does it appeal to him. In milder cases of acquired deformity, subcutaneous division of the flexor tendons and capsule may be done, followed by passive correction and splintage as after the open operation, but there is some risk of relapse. Flexor tendons do not unite after tenotomy, and thus the only important function of the toes, flexion, is permanently lost, which is not the case after excision by the dorsal method.

In any operative method extension contracture of the metatarso-phalangeal joint must also be overcome by subcutaneous division of the extensor tendons, otherwise relapse into flexion at the distally corrected joint is fostered. After the tenotomy the toe is forced into flexion at the metatarso-phalangeal joint, and retained thus in the dressing while the joints of the toe are kept fully extended.

Correction of "Clawed" Toes

In the correction of "clawed" toes—i.e. those associated with pes cavus and boot-caused deformities—attention is directed chiefly to the extension of the metatarso-phalangeal joints rather than to the flexion of the distal joints. In pes cavus the toes are dealt with after the arch has been flattened sufficiently by the Steindler operation. The various procedures for correcting the toes are: (1) Division of dorsal extensor tendons and capsules, and tethering the toes down to a slotted and looped sole-plate for four to six weeks, by night and day, followed by active and passive exercises and electrical stimulation of the intrinsic muscles. This is the older method, and is liable to result in relapse after some months. (2) Transplanting the dorsal extensor tendons into the necks of one or more metatarsals or into the dorsum of the foot. There are several modifications of this method. (3) Transplantation of the long flexor tendons from

the terminal to the proximal phalanges, a method first advocated by the writer. The hyper-extension at the metatarso-phalangeal joints is corrected by one or other of these methods, while the flexion of the toe-joints is overcome by passive stretchings and active exercises, perhaps assisted by tenotomy of the flexor tendons. In deformed toes associated with hallux valgus the excision and tenotomy methods as described for real hammer-toe may be carried out on those toes which are causing painful disability.

LII

THE TREATMENT OF WARTS AND MOLES

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Warts

The common wart is of infective origin and auto-inoculable, and is most frequently seen on the dorsal aspects of the fingers, about the knuckles, and round the nail-folds. These villous papillomata are easily contaminated with dirt and therefore usually of a brown or blackish colour. In association with the "mulberry" tumours there are sometimes found a flat variety (*verrucæ planæ juveniles*) on the face, particularly of children, thus suggesting their contagious nature.

Local treatment in cases of multiple warts of children may be preceded by oral administration for a week or two of magnesium sulphate (dose according to age), or lime water, half a pint daily (Sequeira). Glacial acetic acid is the best local caustic and should be applied twice daily, the surrounding skin being protected with vaseline. Care must be taken when it is used on the face; a 5 per cent. solution of resorcin and salicylic acid in spirit is a better application in this situation. Ultra-violet rays from the Kromayer lamp in skilled hands will also effect a cure of this superficial type by causing a general exfoliation of the parts irradiated.

The thickened chronic warty growth on the knuckle may have to be attacked with the actual cautery. This is not necessarily a painful procedure, and in adults no anæsthetic is required. The cautery point should have a cutting edge which is allowed to sink vertically in parallel lines at a dull red heat into the excrescence until the patient complains of pain. This method is especially useful in cases in which the fold of the nail is involved.

Plantar warts, owing to their situation and configuration (apex of a pyramid directed upwards), are worthy of special notice as they cause great pain on walking. There may be a group of two or three such conical tumours on the heel or ball of the great toe. Pain is almost invariably relieved and walking rendered possible by surrounding the warts with a ring of felt, to take the weight of the body. The best curative agent is

radium, an unshielded applicator of full strength being applied for an hour to an hour and a half.[1] The wart is usually extruded in about three weeks, within which time a further application should not be made. X-rays (2 β dose), through a half millimetre aluminium shield, may be substituted for radium and given at intervals of ten days.

The *filiform* wart, most commonly seen on the mucous membrane of the external genitals, or on the lips, or on the skin of the eyelids, has probably the same ætiology as the flat wart. Its minute size and the delicate character of surrounding structures contra-indicate the use of caustics. Careful removal with the cautery is the simplest and safest procedure.

Venereal warts are usually massive cauliflower-like excrescences about the external genitals of persons with gonorrhœa or other specific infection in which discharges occur. They are easily contaminated with the organisms of secondary sepsis and soon become an exceedingly offensive complication. The anal mucous membrane may also be involved. Frequent washing with lotio nigra, and the liberal application of a 5 per cent. calomel dusting powder, should precede more radical measures, and are sometimes successful in causing involution. Surgical ablation with the sharp spoon under anæsthesia is the usual procedure in these cases, but a more modern method which precludes the possibility of hæmorrhage is the diathermy current. The excrescences are well soaked in saline, a flat applicator electrode is held against them, and the current turned on slowly until they coagulate, whiten, and begin to steam, owing to the heating up to boiling-point of the contained fluids. Charring by spark discharge (fulguration) should be avoided. Frequent dusting with an antiseptic powder is the only subsequent treatment required. To prevent recurrences after removal it is, of course, essential to treat the associated specific infections. A few doses of X-rays ($\frac{1}{2}$–$\frac{3}{4}$ β) through a $\frac{1}{2}$ mm. shield may be tried at weekly intervals when surgical procedures under anæsthesia are refused or inadvisable, and chemical caustics, such as pure phenol or acid nitrate of mercury, may also be used. In this case great caution must be used in protecting surrounding parts.

Seborrhœic warts occur in association with the seborrhœic diathesis on the scalp and cause annoyance by the constant trauma of the brush and comb. Here again the actual cautery is the best and cleanest ablation method; recurrences may be prevented by prescribing an antiseptic hair lotion. Another type of seborrhœic wart occurs on the back, flanks, and abdomen of predisposed persons of both sexes after middle-age. They are black or yellowish-brown in colour, associated with a greasy skin, and do not undergo malignant change. Sometimes pruritus is complained of and removal requested. Mild exfoliative doses of the Kromayer lamp (ten minutes at three feet) at weekly

[1] Vide *Clinical Index of Radium Therapy* (A. E. Hayward Pinch), pp. 40, 121.

intervals, or the X-rays ($\frac{3}{4}$ β unshielded) once or twice at an interval of 14 days, usually effect a cure, which has to be maintained by the daily use of a sulphur or sulphur-naphthol soap; this is sometimes effective without other treatment. More chronic isolated lesions can be removed by soap plaster or salicylic plaster (5 per cent.) applications, and if these fail recourse may be had to freezing ($\frac{1}{4}$–$\frac{1}{2}$ minute) with the carbon-dioxide snow pencil.

Warts which tend to Ulcerate

Senile warts, arsenical warts, warts from the constant exposure to sunlight, X-rays, tar exhalations, paraffin and soot, have to be sharply differentiated from the foregoing types, as they not infrequently tend to ulcerate and to be transformed into epitheliomata. Senile keratosis or warty patches on the face or backs of the hands in persons over 60 are not uncommon in fair subjects, especially if they have lived in tropical climates. Usually the condition is associated with small areas of cutaneous atrophy and brown or yellowish pigment spots. In the other types which resemble the senile variety clinically, a history of causation is usually forthcoming. In such conditions removal of the warts should always be advised and may be effected with CO_2 snow, diathermy, or surgical excision. It should be remembered that ineffective radiotherapy may actually stimulate these growths, and for this reason X-rays and radium should be employed by an expert only, or in cases which can be kept under observation for a long time.

Moles

All moles are of congenital origin, although not always apparent at birth. They are arbitrarily classified as pigmented, non-pigmented, and hairy. In size they vary from a pin's head to a large area involving half the face or one buttock or even more. The treatment which is always sought for at some period or other of the patient's life, either on account of the disfigurement or for fear of subsequent malignant changes, must be guided by the size and situation of the anomaly. Once decided upon, radical procedures should not be postponed as moles grow with the child.

Small non-pigmented moles can be easily removed by freezing for periods varying from 40–60 seconds, according to their apparent depth in the subcutis. The ensuing blister should be pricked aseptically and then dressed with calamine lotion. The scab should never be forcibly removed but allowed to separate spontaneously. The procedure may need repetition.

Hairy moles, if very small, should be treated by electrolysis of the individual hairs. The pigmented elements tend to fade as the hair-bulbs are destroyed. Remaining pigmentation can

be dealt with by freezing. For larger moles, especially when warty, excision followed by grafting or the application of diathermy as described in the section dealing with venereal warts, is the method of choice. Radium, X-rays, cautery, and chemical caustics are not advised in this type of mole.

LIII

THE TREATMENT OF ABDOMINAL ADHESIONS

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The scope of this paper is limited to a consideration of abdominal adhesions secondary to inflammatory processes or to operation, and does not include the various recognised types of colonic adhesions whose sites and appearances are constant—e.g. Jackson's membrane.

Inflammatory Adhesions

In the first place, we must recognise that the formation of adhesions following inflammation of, or operation on, abdominal organs is a natural and life-saving process. It is only when these adhesions interfere with the normal functions that the patient seeks advice and treatment.

Adhesions which result from inflammation may cause severe symptoms of acute or subacute obstruction, and these are more liable to occur following a lesion in the lower abdomen. While in some patients symptoms supervene shortly after the acute attack, others may enjoy many years of unimpaired health before symptoms supervene. Cases are frequently seen in which the signs strongly suggest cancer of the colon, and in which it is difficult to estimate the true significance of a history of "a bad attack of inflammation of the bowels" 15 to 20 years previously. Tuberculous adenitis of the mesentery is not an infrequent cause of acute or subacute obstruction, either by the formation of bands stretching across the abdominal cavity from the infected gland, or by actual attachment of the bowel to the gland. In cases of the latter type the prognosis ought to be guarded, because frequently the gland is acutely inflamed as the result of secondary infection from the bowel, and its close relationship to the large mesenteric vessels makes the development of thrombosis, embolism, or generalised infection fairly probable. The development of inflammatory adhesions tends to mask the signs and symptoms of the original lesion. For example, when a gastric or duodenal ulcer has become adherent to neighbouring organs the regularity of the appearance and dis-

appearance of the pain in relation to the taking of food becomes less noticeable and is replaced by a continual discomfort or dragging pain. The seasonal remissions from pain also become incomplete or altogether absent.

Traumatic Adhesions

After every abdominal operation a certain degree of peritoneal adhesions necessarily occurs. In the majority of cases no signs or symptoms result. In other cases discomfort develops and the surgeon must carefully consider whether at the primary operation an important lesion had been overlooked or has subsequently developed—e.g. a duodenal ulcer or gall-stones in a case on which appendicectomy has been performed—or whether in a neurasthenic patient operation has been performed on insufficient evidence owing to exaggeration of the original symptoms.

The "Adhesions Diathesis"

In the treatment of adhesions there is no difference between those of inflammatory or traumatic origin except, of course, that the former call for more urgent treatment of the primary focus, increase the difficulties at operation, and may cause a more prolonged convalescence. A great deal of experimental work has been done to try to elucidate the causes of post-operative adhesions and to devise methods for their prevention, but progress has been slow and unsatisfactory. Sepsis of low virulence, excessive trauma, and incomplete hæmostasis are without doubt important predisposing factors. In certain other cases an "adhesions diathesis" is said to be the cause. It is well known that certain individuals may suffer from acute and widespread peritonitis, that the abdomen may be opened, swabbed, packed, and drained without the development of any subsequent trouble from adhesions, while a slight and strictly limited operation in other cases may lead to prolonged crippling and suffering.

Points of Technique

Strict attention to the established rules of surgical technique will greatly reduce the number of cases of "adhesions diathesis." Injury to the visceral and parietal peritoneum by mechanical or chemical means occurs all too easily, and in the subsequent repair harmful adhesions may result. It is now generally believed that the use of iodine or picric acid in the preparation of the skin is not conducive to the formation of adhesions if ordinary care be taken to protect the intestines from escaping outside the abdominal cavity. The use of strong disinfectants for lavage or for the moistening of packs is, however, to be strongly con-

demned. Undue exposure of the intestines to the air causes an injurious drying of the peritoneum and predisposes to the development of adhesions. Opinion is divided as to whether packs ought to be used dry or moistened in saline. In experimental work on guinea-pigs no marked difference between the two methods was noted, but the observations were not conclusive because in neither group did extensive adhesions develop. The use of rubber dam or jaconet to protect the intestines from the gauze is theoretically of advantage but mechanically is difficult to apply. All raw or bruised surfaces should be carefully and systematically covered by normal peritoneum whenever possible. The use of detached pieces of omentum to cover denuded surfaces is of doubtful value, as Mann [1] has shown that they quickly become converted into fibrous tissue with all its tendency to contraction and adhesion. The graft also shows very poor resistance to septic invasion. The use of undetached great omentum, the lesser omentum or ligamentum teres to cover raw surfaces is more likely to be of permanent benefit, but care must be taken that no undue strain is put upon these structures, or trouble will supervene, particularly after an operation in the lower abdomen, where a short omentum has been pulled down to protect the posterior surface of the wound.

Introduction of fluids such as liquid paraffin, vaseline, and gum acacia in gelatin into the abdominal cavity has not proved of practical value in the prevention of adhesions, nor has the introduction of oxygen after closure of the wound. In closing the abdomen care should be taken to evert the cut edges of the posterior rectus sheath and parietal peritoneum, thereby minimising the raw surface to which bowel may become adherent. Attempts have been made to overcome the harmful effects of adhesions by the early induction of peristalsis. Pituitary extract, eserine, and hormotone by hypodermic injection, and aperients injected into the bowel at operation or given by mouth soon after operation have been advocated. It is doubtful, however, if any of these methods can have a direct action on the bowel, which remains temporarily paralysed as the result of handling for about 24 hours; by this time the "glueing" together of coils of intestines by lymph will have laid the foundation of fibrous and permanent adhesions. All that can result is a drawing out of the fine adhesions before permanent deformity of the gut has occurred.

Relief of Post-operative Pain and Discomfort

Regulation of the bowels by suitable diet, regular habits, aided by mild non-irritating aperients, such as liquid paraffin, and massage, together with the assurance that the pains and aches are only temporary, will lead to a cure in many cases. In

[1] Mann, *Surg. Clin. of N. Amer.*, 1921, i.

more resistant cases the use of heat in the form of hot fomentations or of " radiant heat " will be found to give considerable relief. Some patients complain of pain and dragging in the wound itself, and it is frequently difficult to determine whether the " fons et origo mali " is in the abdominal wall or is the pull of adherent intestine on its posterior aspect. The distinction may sometimes be made by observing whether or not the injection of novocain into the abdominal wall gives immediate relief. If the point of pain or tenderness is well localised in the wound the use of a counter-irritant—e.g. emplast. epispasticum or the injection of 20 to 40 c.cm. of normal saline into the abdominal wall—will be found to be very beneficial in some cases.

Operative Measures.—Should symptoms persist, and particularly if signs of acute obstruction develop, operation is called for and should on no account be postponed, in spite of the natural objection to a second operation. Very extensive interference with the blood-supply of the small intestine may rapidly and insidiously take place in a patient suffering from abdominal adhesions. Repeated attacks of vomiting, a tongue tending to be dry and coated, with perhaps some slight distension of the abdomen, are enough to justify exploration without waiting for other text-book symptoms of obstruction. A large incision should be made extending well beyond the limits of the scar of the previous operation in order to expose an area of peritoneum which has not been injured previously and to which it is unlikely the abdominal organs have become adherent. The opening into the peritoneal cavity should be made slowly under direct vision, unobscured by blood, and with a sharp knife in preference to scissors. By using this method injury to a knuckle of bowel which may, perchance, be adherent will be recognised before its lumen has been opened and another area further from the original wound selected. After the peritoneal cavity has been opened and the original wound reached, the cutting must be done with great care, as a segment of intestine is frequently adherent to the posterior surface. In some cases a narrow band will be found to be the cause of the trouble and its ligature and division are all that is necessary. The more difficult cases, however, are those which show widespread adhesions, and it is often difficult to determine which of these is giving rise to trouble. Extensive " glueing " of the segments of the bowel does not cause symptoms, and one must look for the sharp angulation or narrowing which is the responsible factor. A loop of bowel showing dilatation and hypertrophy may be of great help in guiding one to the proper quarter. In the separation of adhesions I would again emphasise the advantage of a sharp knife used cautiously in place of scissors or any form of blunt dissector. All raw surfaces must be covered as well as possible and all bleeding stopped. Accidental punctures into the intestine or wounds involving its serous and muscular coats must be carefully closed, while in cases of extensive damage resection of the segment may be the

quickest and most efficient method of treatment. Drainage should not be employed unless there has been persistent and uncontrollable oozing of blood or extensive soiling of the peritoneal cavity, as the presence of a foreign body predisposes to the formation of further adhesions.

LIV

THE TREATMENT OF DISSEMINATED SCLEROSIS

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Disseminated sclerosis is an infective disease of the central nervous system, which usually starts between the ages of 15 and 30. In its typical form the disease is characterised by relapses and remissions. This feature is of the utmost importance in diagnosis and can be explained by the invasion, from time to time, of an organism or its toxin into the brain and spinal cord producing an acute inflammatory lesion. This prevents the conduction of nervous impulses through the affected area. Depending on the situation of the "patch," various symptoms will be produced, such as paræsthesia in a hand, weakness of a leg, failure of vision, a "stroke," etc. After a short time the inflammatory process subsides, often without leaving any permanent damage behind it, and this clinically results in a remission. As the onslaughts on the nervous system become more frequent, or intense, irretrievable damage to important conducting pathways in the brain or spinal cord follows, and a permanent disability, such as a paraplegia, results.

The causative organism has not been definitely determined upon, but there is some evidence in favour of the view that the disease is due to a spirochæte, which, however, is not *Spirochæta pallida*. Spirochætes occur in the mouth and intestines of a large number of healthy persons; they are frequently present in diseased tonsils; they exist in the middle ear in many cases of otitis media, and therefore, presumably, may be present in infections involving any of the sinuses which communicate with the nasal passages.

Clinical Forms

It must be remembered that the classical picture of disseminated sclerosis, as described by Charcot, consisting of intention tremor, scanning speech, and nystagmus, is present, in its entirety, in only about 14 per cent. of cases. The most

important part in the investigation of a possible case of disseminated sclerosis is a close inquiry into the previous health of the patient. In a person between the ages of 15 and 30 the occurrence from time to time of symptoms referable to the central nervous system, which appear suddenly and are often accompanied by slight pyrexia, sometimes earning the name of "influenza," and which clear up as a rule within a few days or weeks, should strongly suggest a diagnosis of disseminated sclerosis, provided the Wassermann reaction is negative. These symptoms, which may occur singly, are: temporary diplopia, temporary blindness, paræsthesiæ in one or more limbs, weakness or stiffness in an arm or leg, precipitancy of micturition or actual incontinence, and attacks of vertigo, often with headache.

Further, the rarer manifestations of this disease should not be overlooked. (*a*) Cerebral form, ushered in by a "stroke," usually without loss of consciousness (sometimes a fit, indistinguishable from epilepsy, may complicate the picture), and attended by a hemiplegia, which clears up quite rapidly. Further "strokes" may occur, affecting the limbs on the same or opposite side. In a person under the age of 40, in whom a hemiplegia occurs, if syphilis, cardio-vascular disease, and a cerebral tumour can be excluded, disseminated sclerosis should always be thought of as a possible cause. (*b*) A retro-bulbar neuritis, which is due to a patch somewhere in the optic nerve, producing varying degrees of temporary blindness, may be the first sign of the disease. A similar condition may result from an infection of the sphenoidal and posterior ethmoidal cells, and this must be excluded. (*c*) The spinal form of disseminated sclerosis, characterised by a paraplegia without nystagmus, intention tremor, speech defect, or affection of the arms. Such cases must be differentiated from spinal syphilis, spinal cord compression, and subacute combined degeneration of the cord.

On examining a suspected early case, attention should be paid to the presence or absence of the following signs: Nystagmus; pallor of the temporal half of one or both discs; weakness and ataxia of an upper or lower limb, often with some loss of postural sensibility; exaggeration of the deep reflexes on one side or in one limb; a unilateral Babinski, or even an indefinite plantar response; and diminution or absence of the abdominal reflexes, on one or both sides. If no definite physical signs can be elicited the case should not too rapidly be labelled hysterical, but the patient should be requested to report at once should any deviation from health be observed. It is only in this way that an early diagnosis can be made.

A case of disseminated sclerosis is always a long and protracted affair. The doctor should not be misled, as is often the patient, by the natural remissions of the disease, into believing that a particular form of treatment is proving curative. It is necessary to watch the patient closely, for, unfortunately, it may be assumed that a relapse will sooner or later ensue, and patiently

to treat symptoms as they occur. Certain general measures can be laid down.

General Measures

It is of importance to deal at the outset with all possible foci of sepsis. The mouth should be carefully overhauled, and all septic teeth or stumps removed, but this should not be done in an indiscriminate manner, as a relapse may follow, within a few hours, the too drastic clearance of septic stumps. The tonsils, if severely infected, should be removed. In cases which have shown blindness in the initial stages of the disease, an examination of the posterior ethmoidal and sphenoidal sinuses should be made to exclude infection. The optic nerve is separated from these sinuses only by a thin layer of bone, and therefore an infection may readily pass to the optic nerve, as occurs in cases of optic neuritis associated with suppuration in these sinuses. Any middle-ear infection should be dealt with. The general health should be carefully looked after and over-fatigue avoided. Alcohol and tobacco should be indulged in but sparingly. Special attention should be paid to constipation, which often becomes aggravated prior to a relapse.

During a relapse the patient should be confined to bed at least for a week, but preferably longer, and the diet should be light.

Medicinal Treatment

Arsenic is the drug that has been used for many years past in the treatment of this disease. It can be administered orally in the form of liquor arsenicalis, commencing with 2 minims thrice daily, gradually increasing the dose so that at the end of three weeks the patient is taking 20–30 minims during the day. At the end of four to five weeks the treatment should be stopped, when mercury and iodides may be substituted. Further courses of arsenic should be given with monthly intervals for several years. Incontinence of urine can be helped by the administration of tincture of belladonna. Painful flexor spasms, which may be troublesome in the later stages of the disease, can be alleviated by the use of hot baths or radiant heat and by a single dose of sodium bromide, gr. 15–20, at night.

Special Forms of Treatment

In practice such treatment, founded on the assumption that a spirochæte is the causal organism in disseminated sclerosis, is sometimes beneficial, and in a few cases seems to arrest the progress of the disease; but as this form of treatment has been under trial for a comparatively short time, it is too early to

judge of its permanent effects. Such treatment is only of use in the early stages of the disease before extensive and irreparable destruction of nervous tissue has taken place. A course of six to eight injections of N.A.B. at weekly intervals may be given, the maximum dose not exceeding 0·6 g. Concurrently mercury should be administered either orally (1 drachm of the liq. hydr. perchlor. thrice daily), by inunction (1 drachm daily), or intramuscularly. Potassium iodide, commencing with gr. 15 and increasing to gr. 30, thrice daily, should also be administered. At the end of the course of N.A.B. the mercury and iodide should be stopped for two or three weeks, and during this time an iron mixture may be substituted. The mercury and iodide should then be resumed, and at the end of a further three or four weeks a further course of N.A.B. should be given. Further courses of treatment should follow with suitable intervals.

Various preparations of organic bismuth compounds have been recently investigated in France in the treatment of syphilis and have been found to possess spirillicidal properties only slightly inferior to those of arsenic. These preparations[1] are given intramuscularly into the buttock. In the treatment of disseminated sclerosis they may be used alternately with N.A.B., or may replace this drug should the individual prove hypersensitive to arsenic. A course consists of 10–12 injections, one or two injections being given each week.

Typhoid Vaccine Treatment.—This non-specific form of treatment, probably allied to protein shock, seems to have a favourable effect in some cases in bringing about a remission. A course of about ten intravenous injections of typhoid vaccine are given at an interval of two days. The first dose is 25 millions, and with each subsequent injection the dose is increased, an effort being made to bring about a moderate rise of temperature after each injection. N.A.B. in small doses may be given concurrently at weekly intervals.

Treatment in the Advanced Stages.—In an advanced case with severe paraplegia any treatment can only be palliative, and the special forms of treatment outlined above are, as a rule, contra-indicated. Arsenic should, however, be given by the mouth.

It is not uncommon to find an hysterical element grafted on to the organic paraplegia. This, if recognised, may be removed by means of persuasion, so enabling the patient to use the limbs more than seemed previously possible. The patient should be encouraged to use the affected limbs, and unless in the final stages every effort should be made to prevent him becoming bed-ridden. Massage is of considerable importance, but even more so are a series of active and passive movements. Electrical treatment is rarely called for and may be injurious. Spasticity may be lessened by passive movements and the application of hot baths or radiant heat. Frequently there is a tendency

[1] Quinby, bismuthyl, and biquinyl are prepared in France; luatol, bismostab, and bismuth metal in England.

for contractures to develop in the tendo Achillis; a light aluminium shoe should be worn at night in order to prevent this deformity. Re-educative exercises will lessen incoördination and ataxia. A walking chair may be used in order to give the patient confidence.

LV

TREATMENT OF EXTERNAL OTITIS AND FURUNCULOSIS OF THE EXTERNAL AUDITORY MEATUS

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Inflammatory implications of the pinna and fibro-cartilaginous external ear are accompanied by symptoms and local manifestations, sometimes almost indistinguishable from those which arise from extensions of primary middle-ear suppurative infection to the cutaneous tissues behind the auricle. Since a mistake may have distressing consequences where the diagnosis is not obvious after careful examination the surgeon should act as if the more serious condition were present, provided always that he feels assured of his skill in the necessary surgical technique; no harm could come from doing a simple mastoidotomy when only the external ear is inflamed, but most severe complications may follow the treatment of mastoid disease on the lines of an external otitis. In practice, however, it is rare for a surgeon in daily contact with these affections to have much difficulty in making the differential diagnosis. The swelling and tenderness have been superficial throughout in external otitis, and have only recently become so in suppurative mastoiditis. In the last-named condition the shape of the external meatus is similar to that of the sound ear, whilst in external otitis it is narrowed, slit-like, red, and very sensitive to touch with the speculum or a probe. In mastoiditis the drum and middle ear show evidence of inflammation, perforation of the membrane, or discharge of pus, whilst in external otitis the drum may be absolutely normal, except in patients who give a history of old middle-ear suppuration. The discharge from the ear in mastoiditis is stringy and sticky, owing to the presence of mucus from the inflamed middle ear, this property being absent from the pus of furuncular origin. Tenderness to touch is localised to movement of the pinna and external meatal tube when they alone are inflamed, and to the tissues over the surface of the mastoid when the bone beneath is involved. Deafness and tinnitus may be common to both conditions, but pain, which is often the dominant symptom, may be even more pronounced in the less grave of the two affections, because the close attachment of the skin to the cartilaginous

tube affords little accommodation for inflammatory œdema; moreover, the pressure is rendered still more intense by the unyielding bony walls if the furuncle is deep in the meatus.

Furunculosis is by far the commonest type of external otitis; the differential diagnosis of the other forms met with—diffuse otitis and acute recurring eczema—is much easier.

Diffuse otitis does not tend to point like a furuncle: the inflammatory induration is not definitely circumscribed, but resembles a cellulitis. It may result from a skin abrasion, infection by staphylococci or streptococci, but is occasionally due to the *Bacillus pyocyaneus*, the latter form being much commoner in parts of the continent than in this country.

Acute recurring eczema is not usually included under the heading of otitis externa in text-books, but the acuteness of its onset, the distress it causes, and the frequency with which unresolved patches of eczema in the region of the external meatal orifice act as the starting-point of furuncular and diffuse inflammation, entitle it, in my opinion, to be so included.

Furunculosis

The treatment of external otitis of furuncular origin must necessarily vary with the stage of the affection. In all cases, to begin with, 3 gr. of calomel should be given at night followed by a saline in the morning. If the patient is seen very early, before inflammatory infiltration is pronounced, touching the point of infection with pure carbolic may cause the furuncle to abort, but care must be taken to prevent the carbolic flowing beyond the exact spot, otherwise an area of skin may be denuded of epithelium and a further infection result. If the exact spot cannot be discovered, carbolic oil should be applied with a piece of wool to the entire meatus twice daily. It serves two purposes, the first being to render practically inactive any organism present in the meatus at the time, and the second to act similarly on any fresh organisms entering from without or from pus escaping when the furuncle matures. In mild cases it is ample treatment and prevents the tendency to recurrences. Excessive moisture in the meatus leads to maceration of the epithelium, and as this facilitates reinfection the amount of liquid left behind should be reduced to a minimum, whether it be oil, lotion, or drops. When there is much inflammatory induration present, accompanied by pain, fomentations give considerable relief, and if persisted in for 24 hours will often suffice to bring the furuncle to maturity and spontaneous rupture. It is a moot point whether fomentations favour the occurrence of furuncular crops or not. If too moist they may do so by macerating the epithelium, but probably not otherwise. If carbolic oil has been previously used it should be cleaned off the skin as carefully as possible or the application of heat over it may result in a blister. The fomentation by itself will produce a blister if too hot, and is then probably

responsible for reinfection and some discredit to an excellent method of treatment. Dry sterile wool in the meatus, concha, and around the pinna, over which a rubber hot-water bottle is applied, is very comforting.

Advanced Cases.—When, however, the induration is considerable with some surrounding œdema, the progress of the case is slow, and the pain persists, free incision through the furuncle offers the best prospect of early success. An attempt should be made to render the meatus as sterile as possible by using hydrogen peroxide and syringing with warm boric lotion; under a short general anæsthesia, a short, straight tenotomy knife is then passed into the passage, deep to the furuncle, and carried outwards through its centre and down to the base. It is most important to cut deeply, otherwise the inflammatory tension and pain will persist. Syringe again with the warm lotion, dry out, and dress with a strip of sterile ribbon gauze partially soaked in bipp. The first dressing may remain for 48 hours, but should be changed daily afterwards. In cases where the furuncle has opened spontaneously a daily dressing of gauze or bipp is satisfactory. As lotions are frequently used in treating meatal inflammatory infections it is well to emphasise the risk that maceration of the epithelium may give rise to reinfection. All excessive moisture tends to macerate the skin, but mercurial or carbolic lotions are particularly liable to do so, especially the former.

Recurrences of furunculosis, in my opinion, are often due to the reinfection of denuded areas of skin, resulting either from the inflammatory process or the maceration of epithelium by some fault of the medicament or technique, which with care may be guarded against. However, despite every known precaution, recurrences will take place, when vaccine therapy promises the most effective line of attack. Autogenous vaccines, if obtainable, are the best, but if they are not available stock vaccines are worth a trial. I have seen excellent results from their use in some cases, and from such small dosage as 50, 100, and 200 million staphylococci (*pyogenes aureus*) in successive weekly doses.

Diffuse Otitis

Diffuse otitis is much less common than the furuncular form and is usually an accompaniment of an existing middle-ear suppuration. The treatment follows the same lines as that indicated already in the inflammatory indurations of furunculosis —namely, a sterile drainage-wick in the ear, fomentations, and, if suppuration occurs, surgical incision under general anæsthesia. In the form due to *Bacillus pyocyaneus* a perichondritis is present, but it never suppurates. It may last five or six weeks and tends to recur through reinfection, probably by the patient scratching the meatal orifice with the finger-nail. The organisms usually have their habitat in the axillæ and groins of persons of

indifferent hygienic habits and surroundings. Frequent bathing and the application of a weak biniodide of mercury lotion to the groins and axillæ with the daily use of 3 per cent. silver nitrate drops in the ear is the best treatment. As hydrogen peroxide is now so commonly prescribed in the treatment of ear affections, it is interesting to note that if this is used in external otitis of pyocyaneus origin these organisms will flourish luxuriantly.

Acute Recurring Eczema

Acute recurring eczema responds well to treatment. During the acute stage Lassar's paste (zinc oxide, pulv. amyl., lanolin and vaseline, each 2 dr.) should be applied on strips of muslin or lint (smooth side) over the pinna and in its folds and on a few inches of half-inch ribbon gauze lightly packed into the external meatus, night and morning. Gauze wick will prove useful as a drain from a middle-ear suppuration, should such be present, until the condition of the external skin permits of the local use of lotions and drops. When the eczema has passed into the dry and scaly stage, 10 gr. of salicylic acid should be added to the ounce of Lassar's paste and applied direct to the affected area, which may be otherwise left uncovered. As eczema of the pinna is invariably accompanied by seborrhœa of the scalp, which in the opinion of some dermatologists is the starting-point of the infective ear process, the scalp should be shampooed about twice a week, taking care to protect the ear from the water or shampoo liquid used. Soap spirit (sapo mollis and spirit. vini rect. 2 oz. each) acts well, but much care must be taken to remove all traces of it by repeated rinsings of water. In less acute cases of deep meatal eczema (so often the starting-point of external otitis, diffuse and furuncular) the following method gives excellent results. If there is any loose skin débris about, remove it by gentle syringing or wiping out with wool with a solution of sodium bicarbonate, 2 dr. to the pint of warm water. Dry meatus and fill with a rolled pledget of wool soaked in the following preparation:

℞ Ung. hydrarg. nitr. dil. . . . 1 dr.
Liq. carbon. deterg. . . . 10 ♏
Paraff. liq. . . . . ad 1 oz.

This oily preparation should be brought into intimate contact with the meatal lining by pressing the tragus on to the wool several times. This wool should be removed and a small dry portion placed in the external orifice only.

LVI

THE TREATMENT OF EPIDEMIC DIARRHŒA

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Although the prevalence of infantile diarrhœa in the hot months has been noted for centuries, there is still no common agreement as to its cause. While it is generally accepted that bottle-feeding, heat, and infection all play a part, it is still a matter of dispute whether it is purely a zymotic disease or whether the remaining factors are primary. Probably the majority of cases are due to an extended form of the diarrhœa (usually fermentative) which occurs in infantile dyspepsia and are, therefore, more in the nature of a chemical disturbance of digestion, the rôle of bacteria being only secondary. With the facts so uncertain, it is better, from the practical view-point, while taking every precaution to exclude extraneous infection (by milk, dirty utensils, and so forth) to pay equal attention to the composition of the food and, in particular, to the avoidance of mixtures too rich in sugar, especially when combined with much fat. Lately, suspicion has been cast on the whey.

The fact that epidemic diarrhœa is limited to hot weather makes it evident that the effects of a high temperature must be accounted the most important of exciting causes. It is probable that heat not only influences unfavourably the digestion and absorption of food, but also by depressing vitality helps to lower the power of resistance.

The Clinical Picture

The clinical picture varies according to the severity of the condition. In the milder cases the diarrhœa is accompanied by slight fever without much general disturbance. In the more severe types, of which the "choleraic" represent the extreme, the symptoms lose their purely alimentary character and become widespread. This change is dependent mainly upon loss of fluid and upon toxic absorption. Evidences of this are found in the rapid loss of weight, inelastic skin, pinched features, sunken eyes and depressed fontanelle, rapid feeble pulse, and anuria. Toxic symptoms are chiefly conspicuous in the nervous system

in the form of restlessness, drowsiness, and finally coma. Another leading symptom of this class may be "air hunger," evidenced by rapid, deep, and often irregular breathing. In detailing therapeutic measures one would first urge the necessity both of studying the clinical picture as a guide to treatment and of watching these patients from hour to hour, in view of the rapid advance.

There are two distinct phases—the acute one, where the main indication is elimination by stopping all food and evacuating the bowel; and the later one, in which the main problem is to find a suitable diet.

The Management of a Case

1 *General Measures.*—If there is much collapse a mustard bath (at 100° to 105° F.) should be given. After this the child should be put to bed and kept warm in a well-ventilated room or even in the fresh air. The clothing should be light, and scrupulous cleanliness in the child's person should be secured. Napkins must be changed frequently and removed from the room. Excoriation of the buttocks can be prevented by cleanliness and the use of starch and boric powder; in the event of the buttocks becoming sore an efficacious application is lime-water and olive oil in equal parts. The baby should be bathed twice daily with tepid water and the mouth carefully swabbed with cold water.

2. *Elimination.*—If there is abdominal distension with fever and offensive stools, castor oil should be given, or, if this is vomited, calomel gr. ½ may be tried; but in cases in which the diarrhœa is already profuse further purgation will only do harm. Early irrigation of the colon with normal saline is advisable in all cases as it hastens the effect of the cathartic and removes offensive material. This should be done two or three times a day on the first day and only once a day afterwards, for prolonged treatment of this kind will merely exhaust the child.

3. *Restorative Measures.*—Thorough evacuation, no food, and plenty of water form the essentials of treatment in the first 24 hours. A bottle should be kept filled with half strength normal saline and offered to the baby when awake. Though the degree of recovery by this method alone is often surprising, in most cases further measures are necessary to make good the dehydration. The simplest is the subcutaneous injection of 2 to 3 oz. of normal saline (at temp. 105°) into each side of the abdominal wall, though the amounts should be regulated by the rate of absorption. 5 per cent. glucose is an alternative for infusion.

In urgent cases saline may be injected into the peritoneal cavity, a method which allows of large amounts being given quickly, and of more complete absorption. This is a safe procedure, under aseptic precautions, if care is taken to relieve abdominal distension and to empty the bladder; 6 to 12 oz

at a temperature of 100° may be given in this way, slowly, by the gravity method.

Of stimulants, brandy (m 5–10) well diluted, given every one to two hours, is the best. The value of many of the stimulants often advocated is debatable: but if there is acute circulatory collapse with rapid pulse, m 1–2 of 1/1000 adrenalin chloride hypodermically is certainly effective. Camphor in olive oil (gr. $\frac{1}{4}$ to m 5) may be tried in desperate cases.

The injection of 10 to 15 c.cm. of human blood, with the idea of increasing immunity, has seemed beneficial in some cases, but further evidence is required.

4. *Diet.*—All food must be withheld for 12 to 36 hours until the acute symptoms subside, boiled water, weak tea, or weak barley-water being allowed. Starvation at this stage is essential.

The next stage, the return to food, presents difficulties. What may suit one case may not suit another, because, as already stated, the causal agents are not always the same. While ideally, perhaps, the mode of treatment should be suggested by the predominant type of organism (proteolytic, fermentative, etc.), this is not a practical proposition. Though no definite rules can be laid down, certain general lines may be indicated. Whatever kind of food is chosen it is important (*a*) to give small feeds at first, (*b*) to make additions slowly, (*c*) to note the effect of increases of food on the temperature, the general condition, and the stools, though it is not always wise to wait for too great an improvement in the latter. Milk is best avoided until the temperature is nearly normal, and, in all cases, when feeding is recommenced, fat is best omitted entirely at first unless albumin milk is used. Some help may be gained from the child's reaction to starvation. If there has been a decided improvement and a fall in temperature, success is often attained on a mainly protein diet, especially in those cases where the stools have been strongly acid. This may be given in the form of skimmed milk, fresh, or perhaps better, dried (such as Cow and Gate or Trufood), added cautiously to the water, giving at first $\frac{1}{4}$ to $\frac{1}{2}$ oz. every second feed and gradually increasing if improvement is maintained. The next step, the stools now being formed, is to add sugar in small amounts. The safest variety of sugar is undoubtedly dextrimaltose, as it tends to ferment less easily than lactose. Finally, a half-cream dried milk or ordinary milk and water mixtures may be embarked upon.

As an alternative albumin milk may be prescribed; in dried form this has proved useful in my hands. Its value lies in the fact that while containing little sugar and whey the protein content is high and lactic acid is added. Whey may be well tolerated after the starvation period, but while satisfactory in milder types, it does not always prove so in the severest ones and is hardly to be recommended as a routine. To cases developing an infective colitis, recognised by the persistence of

the temperature and by the continued frequency of the stools which become mucoid and contain blood, it is better to give foods containing little residue, and if skimmed milk does not agree, better results may be obtained by a malted milk or whey with added Benger's food. Fat is badly tolerated and should be ordered with care. Finally, if breast milk is available it may be given on the second or third day, and is superior to any other form of feeding.

5. *Drugs.*—Though they have their use, too much reliance must not be placed on medicines to the exclusion of the more important general measures. Opium is the most valuable, and is specially indicated when the stools are very frequent and there is much pain: it is perhaps of the greatest service in the choleraic cases. It must, however, be used with discrimination, and as a rule should not be prescribed in the early stages before the bowel has been emptied, if there is collapse, or if the motions are small and offensive while the tongue is furred. It may be exhibited as tinct. opii (♏ $\frac{1}{6}$ at six months, ♏ $\frac{2}{3}$ at one year) four-hourly, or as pulv. ipecac. co. (gr. $\frac{1}{8}$ at three months, gr. $\frac{1}{4}$ at six months) six-hourly.

After the initial stages when the diarrhœa is less but still persistent, small six-hourly doses of castor oil are valuable (ol. ric. ♏v with mucilage). Another plan is to alternate this mixture with a combination of hyd. c. cret. and pulv. ipecac. co., a dose of each being given three times a day. Bismuth, if ordered in large doses (gr. 5 to 20 from a few weeks to a year old), may be effective, especially when the large bowel is affected.

Special Symptoms

Persistent Vomiting.—After a preliminary wash-out of the stomach with a weak sod. bicarbonate solution vomiting is, in many cases, controlled merely by reducing the feeds in size. If even small sips of water are rejected, feeding by mouth must be stopped and recourse had to saline injections to supply the necessary fluid. Drugs are of little value with the exception of morphia, which may be given hypodermically (gr. 1/100 at three months) in urgent cases when other methods have failed.

Hyperpyrexia.—A persistently high temperature (105° F.) should be relieved either by tepid sponging or by the application of a cool pack. This latter method helps to control not only the high temperature but also the nervous symptoms which accompany it. If restlessness is extreme sedatives may be given.

Ketosis.—Where there is clinical evidence of this state (stupor, air-hunger, acetonuria) it is best treated by giving plenty of fluid and, specifically, 5 per cent. dextrose solution (intravenously), which provides a more rational and safer treatment than alkalies.

Tenesmus.—This is best relieved by rectal irrigation with

warm saline, combined, if need be, with doses of silver nitrate (gr. 1/12 to 1/6) or opium by mouth.

Prophylaxis

The comparative immunity of the breast-fed is a testimony to the importance of breast-feeding, and if a child is on the breast it is unwise to wean during hot weather. Babies who have had previous dyspeptic disorder so readily fall victims to the disease that great care should be taken to see that prescribed mixtures are rational ones, and that upon the slightest sign of indigestion immediate steps are taken to correct this and to modify the feeds to suit hot-weather needs. Over-feeding by giving excess of milk, instead of added water, to satisfy thirst must be guarded against. The food should be prepared with care, fresh milk should be boiled, and if not beyond suspicion should be replaced by a dried milk. Attention to the details of the nursing care and hygiene of the child and his protection against the excessive heat by light clothing and adequate ventilation of the rooms contribute not only to his comfort, but also to the prevention of what may prove a serious disease.

LVII

THE TREATMENT OF IRREGULAR TEETH IN ADOLESCENCE

By G. Northcroft, O.B.E., L.D.S., D.D.S.

Our knowledge of the causes which produce malrelationship of the teeth and jaws is still very imperfect, but that knowledge is slowly increasing, and to the majority of workers in the field of orthodontics it is becoming evident that maldevelopment and lack of coördination of the factors governing growth account for by far the greatest number of malocclusions. The further back these causes are traced the surer becomes the conviction that treatment should be commenced far earlier than at one time was considered necessary.

Preventive Orthodontics

Many cases are on record whereby successful treatment of the deciduous teeth at 3–6 years of age has rendered further movement of the permanent teeth unnecessary. No cases, so far as I know, have been described where a definite effort has been made so to influence antenatal development that the resulting child has been successfully reared with normal occlusion. Indeed, it would be difficult to prove to the scoffer that careful supervision of antenatal conditions helped to produce a normality which might occur in any case. The fact, however, that malocclusions have occurred even under a most favourable environment would tend to show that mixture of races and inherited tendencies must not be forgotten when considering this problem. Attention should be drawn to the work of Harold Chapman, who, in making an effort to trace the causes of malocclusion, has been studying the teeth and jaws of members of the same families reared under similar or different environment, and other workers are being enlisted to enlarge the scope of this investigation.

One of the causes which leads to a grave complication which intelligent foresight could so easily eliminate is the loss of space in the temporary dentition caused by the reckless extraction of deciduous teeth, and it is surprising that so many operators have so little regard for this important point. It is not to be denied that septic temporary teeth are a specific source of danger to the whole organism and can rarely be treated satisfactorily, but

it is reckless prematurely to remove deciduous teeth without restoring lost function and retaining the interproximal space. The dental surgeon who impresses on parents and teachers the value of a healthy deciduous dentition, and carefully conserves those that come under his immediate care, may thus be regarded as a practitioner of preventive orthodontics.

Diet. — The careful preservation of the temporary teeth through the agency of well-thought-out diets, attention to general health, and oral hygiene is the ideal to be aimed at, supplemented, if necessary, by simple conservative treatment. For infants breast-feeding should be urged, the child's mouth being cleansed after each feed with a soft piece of muslin, wrapped round the little finger and dipped in normal saline solution. The desirable diets for young children have been thoroughly worked out by Sim Wallace and Harry Campbell among others; the reader is referred to their works for more elaborate details and arguments, which are beyond the scope of this article. Suffice it to say that the chewing of hard foodstuffs should be arranged and wholemeal bread, crusts, and toast used freely. Most children enjoy biting hard things, and can easily be trained to do so. It will be found that they refuse to swallow lumps of food unless unduly hurried by an impatient nurse. Every meal should end with some form of sweet acid fruit, a little orange-juice, grated apple, or squeezed grapes when the child is very young; as a child gets older the quantity and method of preparation can be varied.

Oral Hygiene. — Sweetmeat eating is a habit forced on children by indulgent parents and relations, and becomes a most pernicious one; some of the most dreadful ravages from caries have been seen to result from giving a child a chocolate "to go to sleep with." The mouth and teeth should always be cleansed most carefully after the last meal at night, which must always be finished with fruit, and nothing at all given after. In the very young probably the cleansing is done most efficiently by training a child to rinse and gargle vigorously with plain cold water or normal saline; antiseptic washes and tooth-pastes should be avoided. Teach a child to use the buccinators from the earliest age, and the tooth-brush, which really needs very skilful use to be efficient, can be eliminated. When used, tooth-brushes should be the smallest made. Most manufacturers make tooth-brushes far too large, and adults would do well to use what are called children's brushes.

When brought up on these methods it will be found that until children go to preparatory schools, where such simple means of preventing dental caries are not appreciated, the deciduous teeth survive their full term of usefulness without a spot of decay, and the jaws are developed within the limits of their inherited possibility. It must not be forgotten that the first permanent molars appear at the age of 6 and ultimately become the oldest inhabitants of the mouth, with the greatest chance of

becoming carious. According to the readings of Friel's dynamometer these are the teeth round which centres the greatest masticating stress. The utmost care should therefore be employed in the constant inspection and conservation of these teeth.

Treatment of Established Irregularity

We are often called upon to give advice in cases where, through ignorance or possibly unfortunate environment, the patient has suffered a loss of growth that can never be restored and the apical base of Franke and Lundström is permanently reduced in size. It is then very doubtful if tooth movement alone will relieve permanently the overcrowded denture. The treatment of children of 13 14 years of age suffering from malocclusion, who have been deprived up to that time of any but the most primitive kind of dental service, is a difficult problem. Dolamore has shown that the most desirable ages for some forms of treatment, for example, when endeavouring to cure excessive over-bite by means of a biting plate, are those which correspond to the most active periods of bone growth, that is to say, during the eruption of the first or second permanent molars, and should the latter teeth be late in erupting it may be quite feasible to undertake a line of treatment that would be doomed to failure in a child of more advanced development. It must be recognised that the physiological age of an individual does not necessarily correspond with the actual age. The dental surgeon in England is hampered by the boarding-school system of education, for children are mostly seen infrequently, if at all, during the school term, and dental apparatus of any kind must be so strongly constructed as to withstand a good deal of hard wear without supervision or repair. In this respect girls, who are still sometimes educated at home, have the advantage, and this is fortunate in that parents of girls are, as a rule, more concerned about disfigurement.

Another important practical problem that has to be faced is the length of time that may be involved in a course of treatment. Most authorities agree, although this idea has been a matter of controversy recently, that tooth movement should be slow enough and gentle enough to produce bone growth concurrently with that movement, thereby shortening the period of retention. The prognosis in adolescent cases is always obscure, because it is difficult to study the action and reaction of the different groups of muscles of the masticating face, and to ensure an harmonious coördination between them. If muscle exercisers such as Rogers recommends are used, it is only in exceptional cases that such treatment can be carried out without close supervision If, for instance, a child is even a partial mouth-breather the group of muscles concerned in closing the mouth is necessarily kept below par for that individual, but muscle exercisers require regular and constant use and make almost impossible demands on an un-

watched or unencouraged child. Much may be done in treating the disability of mouth-breathing by the insertion of an "anti-mouthbreathing valve," to be worn at night with the object of re-establishing the habit of nasal breathing after nasal stenosis has been eliminated. Rhinologists often overlook the fact that mouth-breathing persists as a habit even after the nasal airway has been rendered fully patent.

All cases will not, of course, yield to the same treatment. Cases of post-normal occlusion of the mandible with proclination of the incisors are reported successfully treated at the age of 15, and after, without extraction. But, on the other hand, many are known to have reverted that have been treated at a still earlier age. This type of case is often accompanied by a marked "over-bite," the mandibular incisors impinging on the gum behind the cingula of the maxillary incisors. After the second molars have fully erupted it would seem of slight avail to make any attempt to "raise the bite." If the canines are late in erupting and occupy a high position external to the arch the sacrifice of the first upper premolars will often produce a satisfactory result without any supplemental treatment. If at the age of 13 to 14 lower incisors are markedly imbricated, showing a developmental lack of bone growth uncomplicated by post- or pre-normal occlusion, the removal of the most lingually placed incisor will often improve the appearance when the attempted retention of all the teeth would involve expansion of both jaws, a long process, and at this age of doubtful utility. Similarly, if second premolars have been allowed to erupt inside or outside the arch, it is doubtful if it is advisable to attempt to regain the lost space and place such teeth in their correct positions in the arch. But there are many cases where the occlusion, which always has to be most carefully studied, will not permit the success of this simple treatment, and misplaced teeth, even after the extraction of others, must be guided into the desired positions with extra mechanical help. Great care should be exercised to make this aid efficient—the mere "wearing of a plate" will not work miracles; any apparatus worn must be designed with intelligence and adjusted with skill. At this age cases of post-normal occlusion of the mandible with proclination of the incisors are probably treated best in this way. Prenormal occlusion of the mandible is usually accompanied by lack of development of the premaxilla, and any treatment undertaken must be accomplished with the additional aid of mechanical appliances.

Although there are many cases of all types that have been treated successfully without extraction at the age-period under discussion, intelligent use of the forceps with or without supplemental treatment would seem to offer the surest means of obtaining a reasonably æsthetic result with far less fear of relapse than any other method.

LVIII

THE TREATMENT OF PSEUDOCOXALGIA

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The rationale of the treatment of pseudocoxalgia cannot be readily understood without a clear understanding of (1) the nature of the disease, (2) the various suggested causes, and (3) the clinical signs which vary in each phase of the process. As will be seen, treatment is different in the different phases.

Nature of the Disease Process

Pseudocoxalgia is a condition of the hip-joint commencing in young children between the ages of 5 and 10, until recently not distinguished from tuberculous disease, and identified by means of serial radiograms which show a characteristic cycle of changes in the head and neck of the femur. Clinically, radiographically, and for the purposes of treatment, pseudocoxalgia may be divided into three stages named according to the predominant change in the head of the femur as seen in the X-rays. Normally, in the child, the head of the femur consists of a cartilaginous envelope enclosing a bony nucleus. In the X-rays the bony nucleus appears as a dense shadow. The surrounding cartilaginous envelope casts no shadow, but its extent can be judged by the clear space shown between the head of the femur and the acetabulum. The changes of pseudocoxalgia concern both the bony nucleus and the cartilaginous envelope.

In *Stage 1*, the stage of flattening, the head of the femur retains its normal shape as a whole, but the bony nucleus becomes smaller; there is more cartilage and less bone in comparison with the normal. Not only is the bony nucleus smaller but its density is irregular; in parts it is more, in others less opaque than usual.

In *Stage 2*, the stage of fragmentation, the cartilaginous envelope becomes flattened; it is no longer hemispherical but is spread out over a wide area and the neck on which it sits expands to accommodate it. The ossific nucleus becomes fragmented

and in places disappears completely. It is as though the strength of the head of the femur has departed with the disappearance of the bony nucleus, and as a result the cartilaginous envelope has been flattened out by the superimposed body-weight of the patient.

In *Stage 3*, the stage of repair, the cartilaginous envelope retains the flattened expanded form it acquired in stage 2, while the bony nucleus gradually re-forms until a final stage is reached when the ossific centre has filled out the misshapen cartilaginous envelope, leaving only a narrow peripheral margin of cartilage. The time necessary for the completion of this cycle of changes—flattening, fragmentation, and repair—is uncertain. It is usually considered that two or three years elapse before repair is established.

Ætiology

A number of different causes have been suggested to explain the changes of pseudocoxalgia; of these only two need here be considered—viz.: (1) That pseudocoxalgia is a mild inflammatory condition affecting the head of the femur. The arguments against this are many: Often the condition is without symptoms at any stage, and in nearly every case is symptomless in stage 1. In contra-distinction to inflammatory conditions, such as tuberculous disease of the hip-joint, the radiographic changes precede the clinical signs. Microscopic examination reveals no evidence of inflammation. Abscess formation is unknown. The blood count never shows a leucocytosis. The Pirquet test is usually negative and the Wassermann test is invariably negative. (2) That the condition is due to trauma. The traumatic theory best explains the sequence of changes in the head of the femur. This theory supposes that, following a mild trauma, the blood-supply to the epiphysis is damaged, and the bone cells, deprived of their nutrition, die or at least become decalcified. The cartilage which derives its nutrition from the synovial fluid of the joint remains alive, but with the disappearance of the bony nucleus there is nothing to retain the shape of the epiphysis, which, therefore, is flattened out under the influence of the body-weight of the patient. Eventually, the vascular supply is restored and new bone is laid down, but not before the epiphysis has become misshapen and deformed. Pending a more exact knowledge of pseudocoxalgia the acceptance of this theory is justified when the results of treatment based on the theory are reviewed.

Clinical Signs: Management

As noted above, the clinical signs and symptoms, as also the treatment, vary with the stage of the disease.

In *Stage 1* there are few or no clinical signs, and for this reason only a few patients with the early changes of pseudocoxalgia come under observation. There may be a limp, and careful examination will reveal a slight limitation in the range of movement at the joint; the X-rays will show the characteristic change in the head of the femur. Various authorities, particularly on the continent, have stated that treatment will not prevent the characteristic cycle of X-ray changes. Observation on the effect of treatment in early cases of pseudocoxalgia does not confirm this statement. It is true that even with efficient treatment fragmentation does occur — one cannot diagnose the condition as pseudocoxalgia without; but I am convinced that if the patient is seen early — before the cartilaginous capsule has become flattened and spread out — this flattening can be prevented by the removal of superincumbent body-weight, so much so that when repair has taken place it may be difficult to tell which hip has been affected. It is important to prevent the flattening; the flattening leads to a large expanded head which will not fit into the socket of the acetabulum and the function of the joint is thereby impaired. The relief from weight-bearing should be continued until sufficient bone has been re-formed in the epiphysis to bear the body-weight without danger of the head becoming deformed. If the body-weight is removed the epiphysis does not flatten and the fragmentation of the bony nucleus is not so clearly shown and it is therefore difficult to know when the stage of regeneration has commenced; in view of this uncertainty six months' relief from weight-bearing should be the rule. The surest way of doing this is to confine the patient to bed; but the patient may be allowed up on crutches with a patten on the boot of the sound leg providing the parents can be made to understand that the child must on no account put the foot of the affected leg to the ground. Movement at the hip does no harm. Treatment only aims at preserving the shape of the head of the femur during the stage when it is soft and malleable.

In *Stage 2* the clinical signs are those of irritation of the joint, and may exactly simulate those of an early tuberculous arthritis of the hip-joint — i.e. limp, wasting (usually slight, however), deformity, and limitation of movement in all directions caused by muscular spasm. On the traumatic theory, one may suppose that the signs of irritation are due to the fact that the contour of the flattening expanding head no longer corresponds to the contour of the acetabulum. This stage may be of long or short duration or may even never exist; many cases of pseudocoxalgia do not at any stage reveal their presence clinically. As regards treatment, rest is indicated for as long as the signs of irritation persist. The body is attempting to treat itself on these lines by keeping the joint still by muscular spasm. By rest is meant avoidance of weight-bearing and cessation of movement at the joint. The child should therefore

be immobilised on a hip-abduction frame in bed. Alternately a plaster-of-Paris spica will enable the child to get about on crutches with a patten on the boot of the good leg to prevent the affected leg touching the ground.

In *Stage 3* the cycle of changes known as pseudocoxalgia are at an end. The active process—whatever it is—has terminated : repair is completed. When, therefore, a patient with pseudocoxalgia is seen in this stage no treatment is called for in respect of the pseudocoxalgia, but the function of a hip-joint that has been altered by the process may be improved. Instead of the normal spherical head of the femur fitting into an exactly similar shaped acetabular socket, the head has an expanded, flattened surface which is markedly different from the contour of the acetabular socket. This incongruity between the shape of the head and the shape of the socket may give rise to two conditions which will impair the function of the joint :

(1) There may be a limitation of movement preventing normal use of the limb. The important movement that is apt to be restricted is abduction ; the leg will not abduct beyond the midpoint (sometimes there is fixed adduction). Now, abduction at the hip is essential for a normal gait. If abduction is impossible, when weight is borne on the affected leg, the pelvis cannot be raised on the opposite side, and to preserve the balance of the body the trunk is thrown over to the affected side, exactly as happens in the gait of a patient with a congenital dislocation of the hip. This " dipping " gait is unsightly and can be overcome by performing a trans-trochanteric osteotomy of the femur and re-setting the fractured femur with the lower fragment abducted, as in the treatment of an old tuberculous hip with adduction deformity.

(2) As a result of the asymmetry of the opposed contours of the head of the femur and the acetabulum osteo-arthritic changes occur, causing pain and stiffness and limitation of movement at the joint. The continued irritation, leading to osteo-arthritic changes, can be prevented by an operation at which the head of the femur is exposed and moulded by trimming off its expanded periphery so that it conforms more in size and shape to the acetabular socket. The contour of the head is not changed by this operation, but its size is diminished to such an extent that it will fit into the acetabulum. This does not damage the joint as the remodelled head is covered for the most part with cartilage and fits into an acetabulum lined with normal cartilage.

Summary

In *Stage 1*, relief from all weight-bearing is required to prevent the softening head from being flattened out by the weight of the body. In *Stage 2*, when signs of irritation are present, rest is indicated—relief from weight-bearing and from

movement. In *Stage 3* no treatment is required. In the aftermath of pseudocoxalgia an osteotomy of the femur may be necessary to increase the range of abduction of the limb, or a modified arthroplasty may be desirable to prevent arthritic changes developing in the joint.

LIX

THE TREATMENT OF FLATULENCE

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I.—Gastric Flatulence

Flatulence is a term applied to a collection of gas in the stomach or intestines in sufficient quantity to give rise to a sensation of fullness or even pain which is relieved when the gas is expelled. It may conveniently be considered according to its localisation in the stomach or intestines, its genesis being essentially different in the two situations.

Few symptoms are complained of so commonly as *gastric flatulence*, and certainly few are so misunderstood, a state of affairs due in large part to the persistence in medical parlance and literature of that mischievous term, flatulent dyspepsia. It will be well to emphasise at the outset that flatulence with very few exceptions is a symptom resulting from the habit of aerophagy or air swallowing, and that the fermentation theory, apart from rare instances, is a legacy of obsolete conceptions and has little more than historical interest to recommend it. Aerophagy is the cause; flatulence and eructations are its manifestations. A common courtesy amongst Mohammedan races, a gross breach of good manners in Western countries, a frequent associate of all forms of indigestion, and a visceral tic in an individual of neuropathic tendency, the results of aerophagy appear in so many and varied connexions that to maintain the term, flatulent dyspepsia, as a sufficient diagnosis is but to conceal the cause under the cloak of a prominent symptom. Under normal conditions the fundus of the stomach contains a variable quantity of air which is swallowed with the food and the saliva. This fundic air-bubble, so striking a feature of X-ray examination, may be increased by: (*a*) deficient absorption of air; (*b*) fermentation or putrefaction of the gastric contents; (*c*) aerophagy or air swallowing.

Deficient Absorption of Air

Deficient absorption of air from the stomach and intestines is a very rare cause of flatulence, but does occur at times as a

result of chronic venous stasis in cirrhosis of the liver and cardiac failure. Treatment consists in the measures usually adopted for the relief of an embarrassed circulation, in the careful regulation of the diet, and in the exhibition of drugs to relieve the discomfort. It should be borne in mind that digitalis may not be well tolerated in cases of heart failure with prominent gastric symptoms and may, indeed, aggravate them. As regards the diet the general principles are: (1) that meals should be small and dry and not more than three in the day; (2) that the intervals between meals should be not less than five hours and that the principal meal should be taken in the middle of the day; (3) that fats and carbohydrates, with the exception of glucose, should be used sparingly. For the immediate relief of distension small doses of the carminative oils are undoubtedly useful, and as shown by Plant [1] act by increasing tone and contractile power. Saundby recommended the following combination:

℞	Tinct. zingib. fort. . . .	℥x
	Olei cinnamomi	℥i
	Olei carui	℥i
	Olei cajuputi	℥i

Dose 2–5 drops.

Oil of turpentine, 10–15 drops on a lump of sugar or in a capsule, is also of value, and a teaspoonful of powdered charcoal after meals is another well-tried remedy.

It should not be forgotten that to the flatulence of cardiac failure may be added the discomforts of aerophagy.

Fermentation and Putrefaction

It is perhaps excusable for the layman to think that his food "may turn to wind in his stomach" and thus generate an apparently inexhaustible supply of gas, but such a view can no longer receive the serious attention of the medical profession nor be allowed further to obscure important issues. The rate of gastric emptying renders it impossible for flatulence to result from fermentation in the stomach apart from structural narrowing of the pylorus, and even in this condition flatulence is a somewhat rare complaint. The symptom may occur both in benign and cancerous stenosis and the eructated gases may be sour-smelling, putrid, or have the odour of sulphuretted hydrogen. Organic disease should be suspected whenever the eructations are malodorous, though, exceptionally, an odour may be imparted by oral or naso-pharyngeal sepsis. Investigation will speedily show the nature of the case and indicate the treatment proper to the condition, but as a temporary measure of relief and a useful preliminary to surgical procedure, frequent gastric lavage with

[1] Plant, *Journal of Pharm. and Exp. Therapeutics*, vol. xvi. 311.

hot water should be undertaken together with the oral administration of charcoal.

Aerophagy

Aerophagy or air swallowing is, par excellence, the cause of flatulence. In moderation a feature of normal digestion, aerophagy with consequent flatulence becomes abnormal under four main conditions.

1. As an unpleasant habit amongst those who bolt their food, or for other reasons are unable to masticate it sufficiently.

2. As a sequel to excessive salivation or sialorrhœa. This may result from oral or naso-pharyngeal irritation. Ryle [1] produced aerophagy in himself by painting the pharynx with an iodine preparation. Dental caries, pyorrhœa, neglected dentures, tonsillitis, naso-pharyngeal catarrh, and more rarely œsophageal cancer are well-recognised causes.

3. As a symptom in those whose main complaint is indigestion. Flatulence may accompany any type of dyspepsia, whatever its cause, and irrespective of any abnormal conditions of gastric motility and secretion. The mechanism of aerophagy in these cases is described by Hurst [2] as follows: "The patient feels some slight discomfort in the stomach, which he thinks is due to 'wind' and which he hopes he will be able to 'disperse' by eructation; as there is really no excess of gas present, the attempt proves unsuccessful and results in the swallowing of air. After half a dozen attempts have been made, air being swallowed on each occasion, the stomach becomes so distended that an attempt is at last successful." As Bennett [3] points out, the habit is acquired so gradually and unthinkingly that the patient is usually unaware of it until it has been brought to his notice. Although flatulence may occur with dyspepsia from any cause, its association with gall-bladder disease is often so striking as to have some diagnostic value.

In this connexion it may be noted that Bennett [3] has recently drawn attention to the extremely important rôle played by aerophagy as a cause of post-operative acute gastric dilatation.

4. As a psychoneurosis. In patients of neuropathic tendency, as a result of fear, anxiety, or other morbid obsession, aerophagy may occur as a habit and should be regarded, according to Hurst, as a visceral tic, but it is probable that here, too, the aerophagy had its origin in some gastric discomfort long forgotten. This type of patient presents a familiar appearance; his face is a mirror of his mental and abdominal unrest; he lives on the atmosphere, and his resounding gusty eructations are a source of grave perplexity to himself and mingled astonishment and dismay to his friends and neighbours. In such a one

[1] Ryle, J. A., Goulstonian Lectures, *The Lancet*, March 28th, 1925.
[2] Hurst, A. F., *Medical Essays*, London, 1924.
[3] Bennett, T. Izod, *Diseases of Stomach*, London, 1925.

the air does not enter the stomach but is drawn into the œsophagus and immediately and violently expelled. Excessive salivation may be a contributory factor, whilst cardiac symptoms such as palpitations, tachycardia, arrhythmia, and pseudo-angina may occur and make his distress the more acute.

Treatment of Flatulence due to Aerophagy

The aims in treatment will be three: (1) To search for and if possible remove the cause. (2) To treat the aerophagy. (3) To treat the flatulence resulting from it.

1. In all cases where the main complaint is of indigestion a careful investigation, by the usual methods, of the upper alimentary tract is essential, for, as Bennett [1] says, an organic cause must not remain concealed by such camouflage as flatulent dyspepsia. In a word, the investigation of these cases is that of a dyspeptic and the treatment will vary according to its results.

2. When the symptom is so obtrusive as to demand treatment apart from its underlying cause, it becomes necessary to treat the aerophagy itself. When possible an emphatic assurance as to the absence of gross disease should precede a careful explanation of the mechanism of air swallowing supported, if need be, by a personal demonstration. The patient must be told to suppress all desire to eructate, since no one ever has or ever will be able to bring up wind voluntarily, and any efforts in this direction will but result in the swallowing of air. In the majority of cases explanation on these lines is readily accepted and is usually all that is requisite to break the habit, but in obstinate cases the patient may be advised to hold some small object, such as a cork or cigarette-holder, between the teeth after meals or he may wear a tight band or collar around the neck to act as a constant reminder of his habit. Meals should, in the main, be dry, since less air is swallowed with solid than liquid food, and should be eaten slowly. Excessive salivation when of purely nervous origin should be treated with belladonna, and the bromides may be added for their general sedative effect. In hysterical patients the passage of a large-sized stomach-tube and its maintenance in position for half an hour may be tried, the patient being informed that this procedure will cure the condition. In cases of exceptional severity where the flatulence is no more than a prominent manifestation of a generalised psychoneurosis complete isolation combined with psychotherapy is desirable.

3. The drug treatment of gastric flatulence is of quite secondary importance, but for the immediate relief of discomfort the carminatives are valuable and in view of Plant's work their use is rational. They have already been referred to.

[1] Bennett, T. Izod, *Diseases of Stomach*, London, 1925.

LX

TREATMENT OF FLATULENCE

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II.—Intestinal Flatulence

Intestinal flatulence gives rise to a sensation of fullness or colicky pain in the abdomen which is due to the presence of gas under tension and is relieved by its expulsion. At times the frequent passage of flatus itself may cause considerable inconvenience. Though the discomfort is felt mainly in the lower abdomen, gas occasionally accumulates at the splenic flexure in such quantity that it may be mistaken for gastric flatulence and an attempt made to relieve it by eructation. If the flatulence be gastric in origin, relief will follow, but if intestinal, there will be increasing discomfort from aerophagy. The differential diagnosis may be readily confirmed by X-ray examination.

The intestinal gases arise from two main sources: air swallowed with the food and saliva, and gas evolved from the bacterial decomposition of carbohydrates and proteins. Whilst, under normal conditions, either a small quantity of gas only is formed or a large quantity absorbed so that the amount passing out with the faeces is small, flatulence may occur under the following conditions: 1. Increased formation of gas by (*a*) excessive aerophagy, (*b*) decomposition of carbohydrates and proteins. 2. Deficient absorption of gas. 3. As a result of obstruction. 4. As a result of increased peristalsis.

Increased Production of Gas

(*a*) Excessive aerophagy may result in intestinal flatulence and the passage of large quantities of odourless flatus.

(*b*) Although a rare occurrence in the stomach, the fermentation of carbohydrates and to a much smaller extent the putrefaction of proteins are common causes of intestinal flatulence. These conditions, though favoured to some extent by constipation, are more usually associated with diarrhœa, and have their origins in a variety of causes, of which the following are the most important: (1) Dietetic excesses. The ingestion of large

quantities of carbohydrate or protein will tend to produce fermentation and putrefaction from the residue which escapes digestion and absorption. The flatulence which results from the high cellulose dietary often given in habitual constipation is an example of this. (2) Deficiency in digestive ferments in the upper alimentary tract. The absence of hydrochloric acid in the various forms of achylia gastrica, and diseases of the pancreas leading to deficiency of its external secretion, will promote conditions favourable to intestinal decomposition. (3) Intestinal infections, whether as a result of infection from the food, from oral or naso-pharyngeal sepsis, or more rarely from chronic appendicitis, may lead to a condition of catarrhal entero-colitis, and by producing intestinal hurry will tend to prevent normal digestion and absorption and lead to fermentation and putrefaction.

Treatment.—The successful treatment of intestinal decomposition depends on the removal of the primary cause and the recognition of the associated disturbance of intestinal function. The stools are often characteristic; in fermentative cases they tend to be acid in reaction, frothy, somewhat sour-smelling, and microscopically show undigested starch granules, whereas in protein putrefaction they are alkaline, have a putrid odour, and microscopically show undigested meat fibre and an excess of Gram-positive organisms.

A full consideration of the treatment of these types of diarrhœa is outside the scope of this article, which is concerned with one symptom only—namely, flatulence. This may or may not be of importance, but its efficient control will depend on (*a*) regulation of the diet, and (*b*) use of drugs.

(*a*) *Regulation of the Diet.*—As a means of controlling fermentation and putrefaction much greater reliance can be placed on suitable dietetic modifications than on the exhibition of the so-called intestinal antiseptics, which are at best very uncertain in their results.

In *carbohydrate fermentation* the chief source of the flatulence is marsh gas derived from the break-down of cellulose. Green vegetables and uncooked fruits must, therefore, be strictly forbidden, and in some cases the total exclusion of carbohydrates from the dietary may be necessary. Generally, however, sugar, malted foods, milk, purée of potato and celery may be allowed in moderation. Cammidge[1] gives the following diet table for intestinal flatulence:

> The patient may have: White meat, lean red meat, sweetbread, tripe, calf's head, chicken, pheasant, partridge, tongue, lightly boiled or poached eggs, fresh butter, a little sweet cream, toast or old bread, crusts, wholemeal bread, light farinaceous food with fruit juices, spinach, celery, asparagus, a little potato, unsweetened stewed apples or

[1] Cammidge, P. J., *Fæces of Adults and Children*, 1914.

plums, raw apples not too sour, almonds, Brazil nuts, cocoa essence, meat extracts. One ounce of whisky in four ounces of hot water with two meals.

The patient must avoid: Green vegetables (especially cabbage, radishes, peas, beans, lentils, salads), pears, raw plums, mayonnaise, oily or greasy foods, milk, cheese, excess of sweets, pastry, fresh bread, pork, veal, venison, sausages, hare, goose, duck, pigeon, curries, re-cooked meats, smoked fish, eels, salmon, herrings, mackerel, tea, coffee, wine, malt liquors, soup, broth.

In very intractable cases a diet of cooked minced meat and water, the well-known Salisbury cure, may be tried, but it is very irksome and should be limited to a period of six weeks.

In *protein putrefaction* a strict lacto-vegetation diet is more suitable at first. Chicken, game, and fish may be added later, but mutton, beef, and veal should be withheld for some time after the diarrhœa has ceased. Sour milk is worth a trial in these cases with the object of replacing an abnormal intestinal flora with one inimical to putrefaction. The milk should be sterilised by boiling and then allowed to cool to a temperature of 120° F. A fresh culture of the *Bacillus bulgaricus* (tablets are too uncertain in their action to be reliable) is then added to the milk in a thermos flask and the whole incubated for 18 hours. It is then ready for use and may be taken in quantities starting with half a pint a day and gradually increasing until one and a half pints a day are taken. Better results are claimed by certain American writers, Rettger and Cheplin [1] and Kopeloff,[2] by the use of the *Bacillus acidophilus* as the souring agent. They use at least 1000 c.cm. of the freshly inoculated milk and combine it with the administration of lactose, which promotes the growth of the bacilli. The method does not appear to have received an extended trial in this country, and there are technical difficulties in the way of its general adoption.

(*b*) *Use of Drugs.*—Drugs are administered with three objects, to aid digestion, to control bacterial decomposition, and to relieve flatulence. In cases associated with achylia, hydrochloric acid should be given in the full doses recommended by Hurst, not less than 1 drachm of the dilute acid in a tumbler of water flavoured with orange being sipped during and for a short time after each meal. In pancreatic deficiency various preparations such as pankreon, holadin, and taka-diastase may be tried after meals, but are not very satisfactory. Intestinal antiseptics for the control of putrefaction and fermentation are legion, but the evidence of their value is somewhat unconvincing as a satisfactory clinical assay is well-nigh impossible. The best appear to be calomel, especially in divided doses, benzonaphthol (10 to 15 gr. t.i.d. in tabloid or in cachet), and dimol

[1] Rettger, L. F., and Cheplin, H. A., *Arch. Int. Med.*, xxix., 1922, 357.
[2] Kopeloff, N., *Arch. Int. Med.*, xxxiii., 1924, 47.

(2 to 4 gr. t.i.d. after meals). Colloidal kaolin is an efficient absorbent of bacterial toxins and may be given in half-ounce doses in water t.i.d. For the immediate relief of flatulence the essential oils are distinctly valuable, the best perhaps being oil of cajuput (minims 2 on a lump of sugar) and oil of turpentine (minims 15 in capsules or cachets). A tablespoonful of charcoal taken once or twice daily is also useful and helps to render the flatus odourless.

Deficient Absorption of Gas

As in the case of gastric flatulence, this occurs but rarely, and then as a result of chronic venous congestion in heart failure and hepatic cirrhosis. The main lines of treatment have been sufficiently indicated in the previous article. Inflammatory conditions of the colon may also interfere with the normal absorption of gases, and account, in part at least, for the flatulence complained of in these cases.

As a Result of Obstruction

Flatulence may occur as a result of organic obstruction or in cases of constipation when the intestine contracts on a fæcal mass and thus imprisons flatus. Treatment is directed to the relief of the obstruction.

As a Result of Increase of Peristalsis

Apart from the causes already discussed, great inconvenience and distress may be caused by the frequent passage of flatus from causes purely emotional. The condition is analogous to nervous diarrhœa, and is liable to be a very distressing symptom in moments of great mental strain. Diet is ineffectual in cases of this type unless, as sometimes happens, there is an associated intestinal catarrh, and treatment should be directed towards lessening the excitability of the gastro-colic reflex by a full dose of bromides combined with belladonna given at a suitable interval before the symptom is liable to occur.

Acute Flatulence or Meteorism

Acute gaseous distension of the intestines occurs in certain severe abdominal conditions such as intestinal obstruction, acute general peritonitis, and acute pancreatitis. It is met with also as an important complication in certain infective fevers, notably enterica and pneumonia.

Treatment.—Acute abdominal conditions require surgical treatment, but in the absence of intestinal obstruction, or following its relief, the general principles of the treatment of meteorism are applicable to all cases. All food should be

withheld with the exception of small quantities of whey and albumin water. Local applications to the abdomen such as turpentine stupes or hot fomentations are valuable, particularly for the relief of pain. Enemata of turpentine ($\frac{1}{2}$ to 2 drachms to a pint of soapy water) should be given, and oil of turpentine, 15 minims in capsules taken by mouth every three hours, is useful. In severe cases the hypodermic injection of pituitrin 1 c.cm., or eserine 1/50th gr., may be tried in the absence of obstruction. The danger of perforation in typhoid should be remembered and these powerful drugs used with great caution, and only as an extreme measure.

LXI

FRACTURE DISLOCATIONS OF THE UPPER END OF THE HUMERUS

By Ernest W. Hey Groves, M.D., B.Sc., M.S.Lond., F.R.C.S.Eng.,

Surgeon to the Bristol General Hospital; Professor of Surgery, University of Bristol

This complicated injury is fortunately a rare one. It is caused by direct violence upon the shoulder; the same blow which forces the head of the humerus out of the glenoid cavity breaks the neck of the bone. From this it follows that the fracture is often comminuted and that the head is usually rotated so that its axis in no way corresponds with that of the shaft. In this, as in the majority of juxta-articular fractures, a good result can only be obtained by early and exact diagnosis. The severity of the injury will cause so much pain, swelling, and distortion of the shoulder that there ought to be no excuse for neglecting thorough examination.

Dangers of Diagnostic Error

There are two very real dangers of serious error. One is that of simply putting up the arm with sling and bandage without making an exact diagnosis. In the first place this is done by way of "first-aid" and then, the patient being fairly comfortable, a policy of procrastination is followed for days and then weeks, and when the true nature of the disaster is brought to light by the fixed and painful shoulder on which the X-rays are turned for the first time, the chance of cure has passed by and a judge and jury are invited to the consultation.

The other likely mistake is to recognise the dislocation, by the emptiness of the glenoid cavity and the sagging inwards of the deltoid beneath the acromion, but to overlook the fracture. If then an attempt to treat the dislocation is made, a spurious reduction may be effected by forcing the shaft of the bone into the shoulder-joint and there leaving it. This mistake should be avoided by noticing that the head of the bone does not rotate with the shaft, and that crepitus is often elicited. Of course, the use of the X-rays within the first 24 or 48 hours of the accident should be regarded as absolutely essential, and the fact

that this rule is so often neglected, with disastrous results, affords a most puzzling comment on the mentality of doctors,

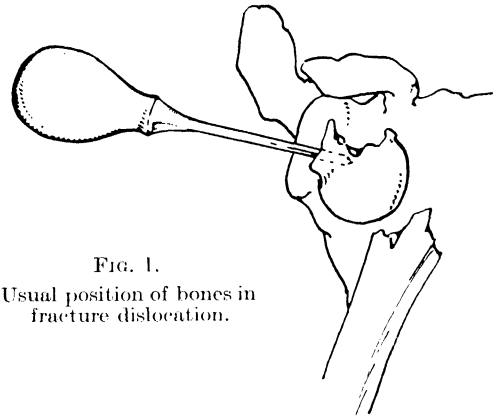


FIG. 1.
Usual position of bones in fracture dislocation.

who thus carelessly endanger the patient, themselves, and the reputation of the profession.

The X-ray picture ought to afford a clear indication as to the nature of the injury. The glenoid cavity is empty, the neck

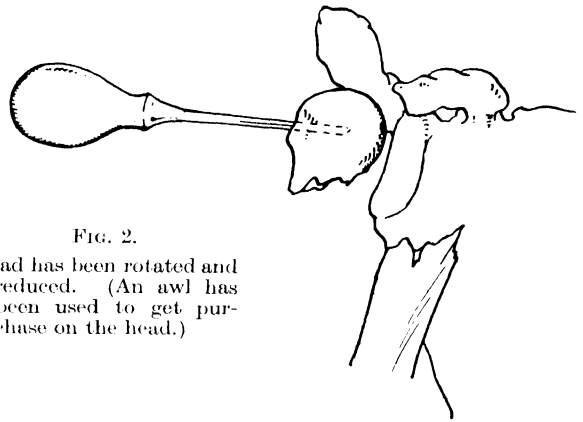


FIG. 2.
Head has been rotated and reduced. (An awl has been used to get purchase on the head.)

of the bone is broken, and the upper fragment is distorted so that its fractured surface is turned away from that of the shaft. (Fig. 1.)

OPEN OPERATION AND REDUCTION

When these facts have been made clear, immediate arrangements should be made for open operation and reduction in a suitable institution. There is no alternative to operative treat-

ment which can afford any hope of a good functional arm, and there is nothing gained by delay or the adoption of any temporising measures.

It is impossible to reduce the dislocation by any manipulation of the arm, because the continuity of the head and shaft of the humerus is broken. It is useless to wait for consolidation of the fracture and then to hope for reduction of the dislocation, because the alignment of the fragments is so faulty that only gross malunion can occur, and when it has occurred the torn capsule will be so united by scar-tissue as to make reduction impossible.

The operation for this injury involves the consideration of three main points—viz., adequate exposure, reduction of the

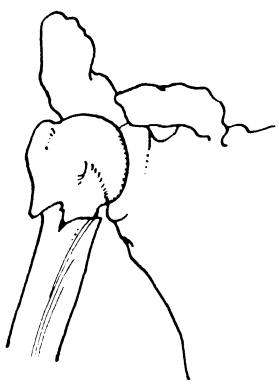


FIG. 3.
Fracture treated by simple impaction.

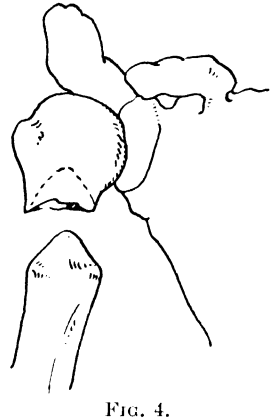


FIG. 4.
Fragments shaped for impaction.

head, and fixation of the fracture. Exposure should be by the ordinary anterior incision along the anterior border of the deltoid muscle. The cephalic vein is exposed and ligatured. Having made a three-inch incision and investigated the underlying conditions, it will probably be of advantage to prolong the incision upwards along the deltoid border to the clavicle, and then to cut outwards towards the acromion. The clavicular origin of the deltoid is cut and the muscle turned outwards. The capsule of the joint may be so much torn that no further division is necessary in order to get at the head of the bone. Otherwise the capsule should be divided by a vertical incision along the line of the long head of the biceps. The humeral head now being exposed, the difficulty consists in putting it back into the glenoid cavity and in rotating it into correct alignment. Probably the tendon of the subscapularis will already be torn, but it ought not to be necessary to cut any of the short rotators unless the operation is being done several weeks after the accident. Manipu-

lations of the head of the bone may be effected by means of a shoe-horn elevator or by transfixing it with a stout bone-drill on a handle. (Fig. 2.)

When the head has been restored to its socket with its broken surface directed towards the axis of the arm, fixation of the fracture can be effected. In most cases this fixation does not require any special apparatus. The fracture is recent and the ends of the bone are jagged. All that is necessary is by traction and leverage to fit the ends together (Fig. 3), when the tension of the muscles may be trusted to keep them in apposition. If the bone ends are oblique or have become so smooth that they will not lock, then some impaction may be necessary. Often the

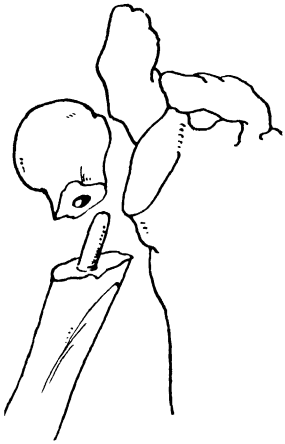


FIG. 5.

Union by pegging. Peg inserted into distal fragment.

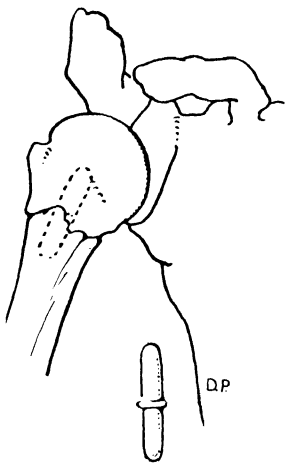


FIG. 6.

United over a peg. Inset shows the peg with central stop.

shaft will present an outstanding point which may be trimmed up and forced into a cavity gouged out of the head. (Fig. 4.) Or else an intra-medullary peg, two inches long and a quarter of an inch thick, with a central stop may be used. This is first hammered tightly into the shaft and the projecting end is manœuvred into a hole drilled in the axis of the head. (Figs. 5 and 6.) Whatever method of fixation is used, great care should be taken to secure correct orientation of the fragments in regard to rotation. The operation is concluded by suturing of the capsule, the clavicular origin of the deltoid and the skin. The arm is put up in moderate abduction for the first few days with an axillary pad and a sling. Then, when the patient can sit up the arm is put on to an abduction splint, which is retained for four to six weeks. After the first ten days the splint is removed daily for exercise and massage.

If the patient's condition contra-indicates a general anæsthetic, the operation may be performed under local anæsthesia, by infiltrating the brachial plexus with 2 per cent. solution of novocain. If the patient refuses an open operation, then the arm should be put up in full abduction from the outset.

Late Operation

If the nature of the case has been overlooked, and treatment has to be undertaken six weeks or more after the accident, then an attempt may be made to carry out the reconstructive operation above described, but it will seldom be found possible because the head of the bone has become so fixed and also so atrophied. Under these circumstances the head must be removed, whilst the shaft, which may be rounded off, is placed in the glenoid cavity. But at the best this operation will only secure a weak joint for which a subsequent arthrodesis may have to be done.

LXII

THE TREATMENT OF PAPILLOMA OF THE BLADDER

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Of the various methods of treatment of papillomata of the bladder, only two will be considered here; in one, the tumour is burnt or coagulated by the passage of an electric current at high voltage, contact being effected by an electrode introduced through a catheterising cystoscope, the method being known as fulguration; in the other, the tumour is removed by operation through a suprapubic incision. The old treatment of washing out the bladder with solutions of various drugs is not curative, and the removal of growths with the operating cystoscope is not advised for reasons which will be clear later.

Two Lines of Treatment

Each form of treatment has its advantages and disadvantages, and what is suitable for one tumour may be unsuitable for another. Each case must be judged on its merits, and, while no hard and fast line can be drawn, the following points should be taken into consideration when deciding which is the better method for any given patient.

Fulguration possesses these advantages. It can be done without a general anæsthetic, and the patient need only be confined to bed for a day or so, and in many cases not at all; it is therefore valuable for patients for whom a general anæsthetic is contra-indicated or who prefer a cure without a "cutting" operation. It is suitable only for growths which are undoubtedly simple, relatively small, and not numerous; mere multiplicity, however, is no contra-indication, provided the total bulk of the tumours is not too large. It is of the greatest value in dealing with the small recurrences or implants which so frequently occur after the cure of an original papilloma. Experience has shown that there is a somewhat less risk of the occurrence of secondary seedlets on the vesical wall after fulguration than after suprapubic removal.

The disadvantages of fulguration are as follows. As the process of coagulation is slow, the procedure required for the

complete destruction of a tumour, unless of small size, is often a lengthy one, frequently several sittings being required, especially when no general anæsthetic is employed. Fulguration is unsuitable for tumours that are sessile, as it is difficult to be sure of their non-malignancy, owing to the impossibility of determining for certain with the cystoscope the absence of infiltration of the vesical wall. It is unsuitable for tumours that are large or very numerous, owing to the number of sittings required and sometimes to the field of operation being obscured by the imbedding of the end of the cystoscope in portions of the growth. Lastly, it is unsuitable for cases in which hæmorrhage occurs on the least provocation and cannot be controlled; hæmorrhage of this type is most likely to take place when the end of the cystoscope butts into and traumatises the growth, which is often near the internal meatus or of large size. Fulguration is difficult to employ when tumours are situated in certain inaccessible positions, such as close to the internal meatus, on the antero-superior surface, and at the back of the retroprostatic pouch.

Removal by suprapubic cystotomy has the advantage of enabling the tumour or tumours to be eradicated at one sitting, and is indicated when the question of non-malignancy is in doubt, or when the tumour is sessile or of large size. It is the only form of treatment for the radical cure of definitely malignant growths, as by its means those tissues which are infiltrated, including portions of the vesical wall of varying extent, can be removed with the tumour. Furthermore, the suprapubic exploration of the bladder affords the only means of determining accurately the presence of infiltration in the earlier stages and the extent of it in the later.

Removal by suprapubic cystotomy has the disadvantage of subjecting the patient to a major operation with its attendant risks and complications and to a period of post-operative convalescence. Generally it is possible to suture the suprapubic vesical wound completely and, in the majority of cases, to obtain primary union without a urinary fistula; in favourable cases, therefore, the patient is confined to bed for a fortnight, while in those in which a fistula occurs, the wound will take from three to six weeks to heal. The occurrence of secondary seedlets is more common after this method of treatment than after fulguration, but is in part probably due to the more serious tumours being dealt with by this method. Recurrences, however, do take place not uncommonly in the suprapubic vesical scar and rarely in the scar of the abdominal wall.

In deciding which is the method of choice in a given case, in addition to the above considerations, due regard must be given to the temperament of the patient, his ability to attend for treatment, and his own views on the matter. Some surgeons are more strongly in favour of fulguration and others of removal by suprapubic cystotomy.

Of all the points to be taken into consideration, the determination of the innocence or malignancy of the tumour is the most important, and is often difficult. The signs suggesting malignancy are—the presence of sloughs or phosphatic deposits on the surface of the tumour; a ragged and torn appearance of its villous processes; the absence of a narrow pedicle; the presence of infiltration, which is responsible for a diminution of the normal vesical capacity and for the symptom of frequency; and the presence of a tumour on bimanual examination of the pelvis.

Whichever method is adopted, however, some important pathological properties of vesical papillomata must be borne in mind. First, the ease with which cells of, or portions of, the tumour will implant themselves, and grow, on the apparently intact mucous membrane of the bladder and in other tissues of the host; secondly, the frequency with which multiple tumours occur; thirdly, the frequency with which other and similar growths appear in the bladder months or years after the complete removal of the first; fourthly, the vagueness of the line of demarcation between a simple and malignant tumour, and the fact that a simple papilloma sooner or later usually becomes malignant if untreated. It is clear, therefore, in treating papillomata of the bladder that as far as possible living cells or portions of the tumour should neither be allowed to come in contact with the vesical wall or other tissues of the patient nor be left behind lying free in the bladder, and that, after the cure of one papilloma, the bladder, even in the absence of symptoms, should be examined with the cystoscope every two, or at most three, months at first, and later every six months, over a period of many years.

Technique of Fulguration

The employment or otherwise of a general anæsthetic varies with the practice of different surgeons. Its use may enable a growth which would otherwise require several applications to be destroyed at one sitting; moreover, the surgeon's attention is not distracted by the thought of giving the patient pain or discomfort; on the other hand, its use adds a definite risk, small though it is. Without a general anæsthetic, the duration of the treatment is limited by the fatigue of the patient induced by the presence of the cystoscope in the urethra, by the discomfort of the distended bladder, and by the pain caused by accidentally touching the sensitive trigone; moreover, the patient, and to some extent the surgeon, are under mental tension throughout. Generally speaking, the smaller the growth, the older the patient (the bladder and urethra being less sensitive in the aged), and the more stolid he is, the less the desirability of a general anæsthetic.

One terminal of the apparatus is connected to a malleable

metal plate, which is firmly bandaged to the thigh, suprapubic region of the abdomen, or back. The bladder is gently distended with fluid, the catheterising cystoscope introduced, and the electrode, connected with the other terminal of the apparatus, inserted into the cystoscope. To prevent living cells, or living portions, of the tumour from becoming detached during the subsequent procedure, the surface of the growth should as far as possible be dealt with first. The electrode is gently pushed on to the tumour so that its point lies among the villous processes and in contact with them, and the current turned on. In a few seconds the part of the growth immediately around the electrode turns white, then black, and a little later bubbles begin to appear accompanied by a sound of fizzing and the appearance of an arc. As little arcing as possible should be allowed to occur, and on its appearance the electrode is withdrawn a little, the current switched off, and the procedure repeated at a fresh place. It is important during the withdrawal of the electrode to avoid as far as possible the risk of pulling off pieces of living growth, as, apart from the theoretical objection of liberating living tumour cells, hæmorrhage is liable to be produced; this risk is lessened by keeping the current switched on during the withdrawal; portions of coagulated tissue will, however, often become firmly glued to the electrode and will come away with it. In the case of the smaller tumours the whole growth and its pedicle can in a short time be destroyed in this manner; it is, however, essential to treat a small area of apparently normal mucous membrane immediately surrounding the place of origin of the tumour in the same way; in the case of the larger pedunculated tumours, time can often be saved by cutting through the pedicle, a procedure, however, only to be adopted after the surface of the growth has first been coagulated.

During fulguration the electrode has to be removed frequently and its point scraped free from the pieces of coagulated tissue which become firmly adherent to it and prevent the conduction of the current; from time to time, too, the fluid in the bladder must be changed, partly because of its rise of temperature, which is considerable if much sparking has been allowed to occur, and partly because of its diminution in translucency caused by the presence of blood and particles of coagulated tissue. Should bleeding occur, it can usually be stopped by leaving in the bladder for a few minutes some fluid containing one or two ounces of 1 in 1000 adrenalin solution.

Sometimes, in treating a papilloma growing in the middle line of the trigone, difficulty is caused by the repeated accumulation of bubbles on the lens of the cystoscope obscuring the view; the difficulty can be avoided by turning the patient on his side.

Papillomata growing on the anterior vesical wall, usually recurrences in the scar of a previous suprapubic cystotomy,

may be brought into closer relationship with the electrode by an assistant placing his hand on the suprapubic region and pressing backwards the anterior abdominal wall and by only partly filling the bladder with fluid.

If fulguration is carried out under a local anæsthetic, half an hour is about as much as the patient will tolerate, while if under a general anæsthetic, it can be continued for say an hour and a half, but has then to be stopped, sometimes owing to fatigue of the surgeon, sometimes to hæmorrhage obscuring the field of operation, and sometimes, after the whole surface of the tumour has been coagulated, to the necessity of awaiting the separation of the sloughs before the amount of living tumour remaining can be determined.

At the end of the sitting the free sloughs are evacuated with a Bigelow's evacuator, and some surgeons wash out the bladder with a 1 in 10,000 silver nitrate solution with the object of killing any loose living tumour cells.

Post-operative treatment calls for no special comment. Some urethral discomfort from the presence of the cystoscope in the urethra is usual and a little hæmaturia may occur, but is not severe. In cases in which the tumour or tumours cannot be completely destroyed at one sitting, the next treatment should be undertaken three weeks or a month later. If at the second sitting it is found that no marked diminution in the size of the growth has occurred, its non-malignancy is in grave doubt.

Technique of Suprapubic Removal

The patient is given a general anæsthetic and the bladder gently distended with fluid. A long paramedian incision is made, extending from the symphysis pubis to the umbilicus or above, the rectus sheath opened, and the peritoneum stripped off the anterior wall of the bladder as far upwards as practicable. To avoid the possible contamination of the wound with living tumour cells which might perhaps be suspended in the fluid, the bladder may now be emptied by the catheter left *in situ* for the purpose. The patient is put in the Trendelenburg position and the bladder opened by a long vertical incision in its anterior wall. The wound, shielded with rubber pads, is held widely retracted in a good light. Thomson-Walker's self-retaining illuminating retractor is useful. Any fluid remaining in the bladder is removed either by a suction tube or by pieces of gauze, care being taken not to touch the papilloma. The amount of infiltration of the vesical wall, if any, must be determined. It is wise as a first step to destroy the whole surface of the tumour with the benzoline or electric cautery or the diathermy apparatus. In the case of the smaller growths, their complete destruction and that of their pedicles and adjacent vesical mucous membrane can be accomplished in this way. In the larger but pedunculated growths, the root of the pedicle

is seized with suitable forceps, after the preliminary cauterisation of the surface of the growth, and the tumour with a portion of the normal vesical mucous membrane cut or burnt away; the seizing of the tumour itself with forceps should never be done, as it will almost certainly cause hæmorrhage and the tearing off of portions of the growth. In dealing with the larger but sessile tumours and with those in which infiltration has occurred, a piece of the whole thickness of the vesical wall should be removed with the tumour by means of the knife or cautery, the line of section being kept well clear of the infiltrated tissue. The resulting wound, if made by the knife, is sutured with catgut after ligating the bleeding points, but if made by the cautery is best left to granulate after separation of the sloughs; should the whole thickness of that part of the vesical wall which is covered by peritoneum need to be removed, the knife should be used and the wound carefully sutured. If the tumour is growing on or near a ureteric orifice, no hesitation need be felt in removing that orifice or even a portion of the ureter itself if necessary. In many cases the vesical mucous membrane upon which the papilloma has been resting is dark red, granular, and velvety; the whole of the area thus affected should be cauterised. If thought desirable, the bladder may be washed out with a solution of silver nitrate. Some surgeons prefer to close the suprapubic vesical wound completely, drainage being established by a catheter tied into the urethra for a few days, while others prefer to provide suprapubic drainage; generally, suprapubic drainage is unnecessary unless hæmostasis is incomplete; but sometimes secondary hæmorrhage occurs during convalescence when the sloughs separate, and occasionally is so free as to necessitate reopening the suprapubic wound.

During convalescence the urine should be kept acid and the patient given hexamine, and it is as well to commence the use of this drug a day or so before operation. Whether the patient is submitted to bladder washes or not depends on the practice of different surgeons. In the majority of cases in which suprapubic drainage has not been adopted, the wound heals per primam, and the patient is out of bed at the end of a fortnight; in those in which a suprapubic fistula occurs, the wound closes in from three to six weeks.

At the subsequent cystoscopic examinations very careful inspection should always be made of the suprapubic vesical scar, as recurrences in that situation are not uncommon.

For the undoubtedly malignant tumours an operation planned on the lines indicated above should be performed, a more or less extensive area of the whole thickness of the vesical wall being removed, the procedure amounting to a partial cystectomy. Inoperable cases are of two types. In one the bladder is filled with a mass of papillomatous growth; the only radical treatment is total cystectomy, an operation having so high a

mortality that it is rarely performed; sometimes the whole mass of the growth is curetted out and the bladder cauterised, a procedure which, besides causing severe hæmorrhage difficult to control, is almost certain to be followed by recurrence. In the other type the growth invades the extravesical tissues, producing a large, firm, fixed pelvic mass. For both types, in addition to the treatment of symptoms, radium may be employed with advantage; sometimes the patient's existence is so miserable that it is advisable to put the bladder out of court by a bilateral ureterostomy, the ureters being either brought to the surface or inserted into some part of the intestinal tract.

LXIII

THE SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE

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Part I.—The Decision to Operate

In dealing with a patient suffering from exophthalmic goitre or other form of hyperthyroidism, the practitioner will always have in mind the general plan of treatment set forth by Prof. G. R. Murray, *Modern Technique in Treatment*, vol. i. p. 142, and by Sir Hector Mackenzie[1] and Sir William Hale-White.[2] Elimination of septic foci, rest, diet, drugs, X-ray and radium treatment, each has its appropriate place, and in the majority of cases does the patient some good. For those patients who respond well to these measures the question of surgical treatment does not occur. Various reasons may, however, be present to cause the question of operation to be raised, and Prof. Murray has indicated them shortly in his concluding paragraph (p. 145).

A discussion of these reasons and of the methods by which the desired result may be achieved with the minimum risk to the patient will form the subject of this article. It is to be understood that the procedures indicated are only to be entertained when therapeutic measures have not been successful; or when, for other reasons, it is deemed inadvisable to delay.

At what Stage to Operate

At what stage of the disease, then, should operation be performed? The chief consideration will be the fact that the patient is not improving—or is actually losing ground—at the end of a period of treatment, the length of which must vary according to the social position or the family responsibilities of the individual. No actual time limit can be laid down, though it is certain that operation is very rarely called for within the

[1] Mackenzie, Sir Hector, *System of Medicine*, Allbutt and Rolleston, vol. iv., part 1, 1908, pp. 383, 384.

[2] Hale-White, Sir William, *Proceedings of the Royal Society of Medicine, Surgical Section*, 1912, v. 81.

first six months of the disease. There is, however, a limit to the time during which a heart can endure the constant toxicity without failing in some respect, and when the failure begins it is usually progressive; also exophthalmos may become so extreme that its ultimate disappearance is unlikely, or it may lead to corneal ulceration; or, again, the restlessness associated with the disease may appear to be progressing towards mental instability. If conditions such as these are present when a patient first comes under the care of a practitioner, it is a matter for consideration whether there should be any delay in operating except such as is necessary for thorough investigation. Mental instability may even indicate that the time for operation has passed. If the surgeon can coöperate with a physician interested in these cases, some degree of heart failure should not be a bar to surgical intervention, for there is the certainty of great amelioration in the condition of the patient. The occurrence of corneal ulceration, due to extreme proptosis, should determine early surgical intervention, surgeon and ophthalmologist working intimately together.

The social position and family responsibilities of a patient will greatly influence a practitioner. When complications such as those indicated above threaten or are present, surgical treatment becomes imperative whatever the social position of the patient, but if the individual can afford to, and will, rest completely, there is less risk of visceral degeneration than in one who must work for a living or support a family. The time for operating on these patients can be chosen when they become weary of ill-health, or when the practitioner realises that enough time has been given to non-surgical treatment. With the poor patient the case is different. Even here operation should not be unduly hurried, but women earning their own living and working-class mothers or fathers of families can rarely rest at home, and there are not enough hospital beds available to give all of these patients continuous rest and nursing for a sufficiently long period. It is to be remembered that it is usually a matter of years and not of months. Furthermore, it is a fact that, because of this lack of facilities for rest, these patients lose ground more quickly, drift around from one out-patient department to another, with occasional periods of rest in hospital, and are not only unable to support themselves or their families, but become permanently ill. The economic factor, therefore, determines surgical treatment earlier in the less well-to-do classes of the community. A review of these factors will, in most cases, leave no doubt in a practitioner's mind when, in the patient's interest, the time has come to consider surgical intervention.

Special Operation Risks

Such patients present some special operative risks not present in the average surgical case. The symptoms of the disease

become incompatible with life if they are allowed to increase beyond a certain degree. Operation undoubtedly augments all of these, at least, temporarily. The knowledge that operation is impending, and the preparation for it, stimulate the activity of the gland, apart from the actual handling of it during operation. This cause was recently responsible for the sudden death of a young patient in the throat department of a hospital while she was waiting for her tonsils to be removed. Extreme mental unrest is a dangerous symptom. Glycosuria is not infrequently present and its type must be determined. If it can be, and is, controlled, it is not a contra-indication to operation, but if it cannot be checked operation should only be performed after careful weighing of the factors. No operation should be performed while the slightest catarrhal condition of the respiratory system is present, because the handling of the region of the laryngeal nerves and the trachea stimulates secretion and interferes with its efficient expulsion, and if catarrh has been present before operation much inconvenience and some danger result. A high basal metabolic rate, and a pulse-rate persisting at or above 130 per minute while a patient is in bed would indicate that operation should be postponed. These conditions can often be controlled temporarily, but sufficiently, to render operation safe (*vide infra*). Walton [1] has drawn attention to a fact recognised by all concerned—viz. that patients are decidedly more unhappy in warm weather. This is due to the fact that the skin is always hot and moist, and so heat cannot be eliminated rapidly enough for comfort or safety. Therefore no operation should be performed during a hot spell. C. Mayo has pointed out that it is not an emergency operation, and patients should always await the most suitable time. Lastly, loss of cardiac compensation brings its own dangers, and patients in this condition should only be handled surgically in coöperation with a physician who is accustomed to deal with this type of case, and whose judgment can be relied upon to determine what can and what cannot be done.

Preparation for Operation

In spite of the general agreement that operation is only to be considered after efficient medical treatment has been carried out, it is essential—in the light of constant personal experience—to re-state the imperative necessity of attention to teeth and tonsils before operation. The frequency with which patients come for operation with large septic tonsils or septic teeth still present shows that the importance of buccal hygiene is not yet sufficiently appreciated by practitioners as being one of the chief factors in medical treatment.

A patient should be prepared to spend at least seven or ten

[1] Walton, A. J., *The Lancet*, 1923, i. 53.

days in bed before operation. During the first two days the pulse-rate is recorded while the patient is kept at complete rest, but without medication. This shows the drop that occurs as the result of rest and freedom from outside worries. Physical examination, measurement of basal metabolic rate, and urinalysis are carried out. Then iodine medication is given (Plummer,[1] Mellanby,[2] Fraser [3]), Lugol's solution, ℥x, once a day being sufficient; often too much is given. The resulting drop in the pulse-rate and in the basal metabolic rate is definite, and reaches its maximum in about a week, and the excitability of the patient is usually decreased. The vascularity of the gland and the danger of operation are also reduced, so that the operative death-rate has been brought down from about 4 per cent. to nearer 1 per cent. in the hands of surgeons accustomed to operate upon cases of average severity. This does not mean that a severe case of Graves's disease, or an ordinary case which has undergone an exacerbation of the condition, may be given iodine treatment for a week and then operated upon with impunity; but it is a fact that some patients, who have not responded to rest and the drugs commonly used, do improve in a remarkable manner with small doses of iodine, and have been rendered fit for operation. Iodine must not be given unless the patient is in bed. Larger doses do harm, and no good purpose is served by continued administration. During these ten days of preparation the surgeon is gaining the confidence of his patient.

[1] Plummer, H. S., and Boothby, W. M., *Jour. Iowa State Med. Soc.*, 1924, xiv. 66.

[2] Mellanby, E., and Cowell, S. J., *Quart. Jour. Med.*, 1924, No. 69, p. 1.

[3] Fraser, Prof. F. R., *Brit. Med. Jour.*, 1925, i. 1.

LXIV

THE SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE (*continued*)

By T. P. Dunhill, C.M.G., M.D.Melb.,

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Part II.—The Operation and its Dangers

The surgeon who is practised in operating upon patients with Graves's disease can judge from his experience how much should be done at one operation in each individual case. The same surgeon will, in one case, simply ligature and divide an artery; in another he will remove one lobe and the isthmus; in a third he will remove one lobe, the isthmus, and from half to two-thirds of the second lobe. A surgeon who is not practised will begin by ligaturing one artery and dividing it. He will do this for several reasons. It tests the patient's reaction to operation by something smaller than the extirpation of a lobe, and the reaction is, to some extent, an unknown quantity in Graves's disease. It will also temporarily improve the patient's condition, so that a bigger operation can be undertaken later with more safety. An operator unpractised in these cases may kill a patient by mere length of time taken, together with the unavoidable handling and the hæmorrhage, if he attempts too much at the first operation. But no one should operate upon a case of Graves's disease at all unless he is prepared to do ultimately all that is necessary to cure the patient. To remove one lobe is comparatively easy. To slice through the second lobe may present many difficulties; but to do the former only and to leave the patient at that stage is to bring into disrepute the operation for the cure of exophthalmic goitre.[1]

Steps of the Operation

The steps of the operation may be briefly recapitulated.[2] A "collar" incision is made following Kocher's plan. This incision is always adhered to no matter how large the goitre. The flaps, including the platysma, can be dissected up and down

[1] Dunhill, T. P., *The Lancet*, 1917, ii. 883.
[2] Same author, *Brit. Jour. Surg.*, 1919, vii., No. 26, p. 195.

sufficiently to give good access, whether the lobe is approached subsequently through the mid-line, or by an oblique division of fascia in front of the sterno-mastoid. My own plan after the reflection of the flaps is to make a stab through the lower flap for subsequent insertion of a drainage-tube. The infrahyoid muscles and fascia are separated in the mid-line; if this is carried out from the larynx to the sternum the muscles can be retracted sufficiently for the enucleation of almost any lobe without lateral division of the muscles. Nevertheless, if the patient is very ill, or the lobe is big, division of these muscles will permit of enucleation with less manipulation. The superior vessels are clamped in two places and divided; these vessels should never be ligatured in continuity, for the upper pole is drawn down so far that any simple ligature may easily slip. Enucleation is carried out by peeling back the fascia from the lateral aspect of the lobe with plain forceps, while the lobe is gently rotated on its longitudinal axis towards the other side. It is wise to leave a thin shaving of thyroid overlying the region of the recurrent laryngeal nerve so that this may be protected. I believe that more damage is done by stretching the nerve in rough manipulation, or by infiltration following the damage to the surrounding structures, than by actual cutting it across or catching it in forceps. The latter may occur unless the surgeon keeps very accurately to the right plane, and unless hæmostasis is meticulously carried out as the operation progresses. The isthmus should be removed with the first lobe unless the patient is too ill, as this facilitates the second operation. Otherwise the isthmus becomes buried in scar tissue, and its subsequent removal is accompanied by much bleeding and consequent blurring of the field. On the other hand, if it is left at the first operation, and not completely removed at the second, so much of the gland remains that the patient does not receive the maximum benefit from the operation.

The second lobe will probably be dealt with some months later. The original incision is opened, the flaps are reflected as before, but the vertical incision through the deep fascia and infrahyoid muscles will be made laterally, and not in the mid-line, in order to approach the lobe at a place free from the scar tissue of the first operation. The whole field must be clearly defined before the lobe is cut into. Enucleation will be commenced at the lower pole for several reasons; it is the larger pole and it is easily rotated forward on its attachment to the trachea by the scar tissue of the previous operation. Therefore its resection can be commenced by cutting into it from behind, and a large part of the lobe removed while the upper pole with its blood-supply is undisturbed. The procedure is as follows: a row of pressure forceps are placed on the capsule of the lobe, the lower ones being behind the lower pole, the remainder in a line approaching the lateral surface in front of the region of the recurrent laryngeal nerve and gradually coming forward on to

the anterior surface as the upper pole is approached. These forceps grip vessels and arteries in the capsule and act as guy-ropes, so that the bleeding from the cut surface is under control until it is dealt with. Hæmostasis must be absolutely complete, and I believe that fine silk (or thread) is the only safe ligature for this reason—catgut loosens too readily through movements of the larynx and trachea in swallowing or coughing, and late hæmorrhage is a very serious matter.

Drainage at both operations is provided for by a split drainage-tube passed through the stab down to the bed of the thyroid. The infrahyoid muscles and fascia are brought together above this, the flaps of the collar incision are united by buried catgut sutures, which pick up the platysma, and the skin is closed by interrupted horse-hair sutures. These sutures and tube are removed in 48 hours, the flaps being held in position by the deep catgut sutures.

Dangers

There are dangers peculiar to operation on patients suffering from this disease, and these must be given due consideration. In the first place, the selection of the case is important. Patients are not operated upon unless they are ill enough to warrant it; on the other hand, some are too ill. To operate upon a patient with increasing pulse-rate, high basal metabolic rate, mental agitation and emaciation is to invite disaster, and yet patients and friends, when they realise that ground is being lost, will often plead for operation.

Anæsthesia has some dangers. The heart is already suffering from intoxication, so that its margin of safety is a narrow one. Chloroform is absolutely contra-indicated. A skilled anæsthetist may give it with comparative safety, but many lives have undoubtedly been lost through it. If the surgeon has the complete confidence of the patient, local anæsthesia, preceded by omnopon $\frac{1}{2}$ gr. and scopolamine 1/150 gr., is ideal; but to an anxious patient general anæsthesia should be given. I prefer ether administered by an endotracheal tube, but the method may be left to a capable anæsthetist who appreciates the conditions, and can manage his apparatus so that it does not hamper the surgeon. Ether should be preceded by a hypodermic injection of atropine to lessen secretion. Waiting in the anæsthetic room should be avoided.

While there should be no undue haste, a prolonged operation and the hæmorrhage associated with it definitely increases the risk. As Sir Berkeley Moynihan has so aptly pointed out in reference to gastric surgery, speed should be attained not through hurry, but through the precision which comes with practice.

Two dangers associated with technique are injury to one or both recurrent laryngeal nerves, and to the parathyroid glands. The former of these is much more common than is usually

recognised. If one alone is injured functional recovery of voice is good. If there is delay in this it has been demonstrated that re-educational methods rapidly improve the patient's comfort (Cortlandt MacMahon). If both nerves are injured the last state of the patient is worse than the first.

A danger not sufficiently recognised is that of slow hæmorrhage occurring beneath the deep fascia and the infrahyoid muscles after the patient has returned to bed. This may happen either through incomplete hæmostasis during the operation or afterwards through movements of the larynx and trachea in coughing or vomiting, which may dislodge one of the numerous ligatures. The danger is not from loss of blood, but from increasing pressure on the trachea as the blood collects in the cavity between the vertebræ and deep fascia. The small drainage-tube soon becomes blocked with clot and fails to relieve the pressure.

Results of Operation

The risks may appear to be so many that the practitioner may wonder if operation should be entertained. If the right time is chosen, due precautions observed, and the operation performed with precision, the results are striking, and the relief to the patient very great. There are those who believe that the signs of exophthalmic goitre are only the manifestation of general endocrine disturbance, but the result of the operation is so obvious that we are compelled to believe that whatever the primary cause of the disease may be the immediate seat of the evils which make the patient's life so unhappy is the disturbed thyroid gland. After operation the pulse-rate drops quickly, the skin becomes cool, the mental agitation subsides, there is always some recession of the eyeballs, and the feeling of strain at the back of the eyes disappears. If amenorrhœa has been present the periods become regular.

It is known that in the later stages of thyrotoxic disease, when cardiac compensation has been lost, auricular fibrillation not infrequently results. It has been shown recently that after a sufficient removal of pathological thyroid gland in this condition the auricular fibrillation disappears spontaneously and the heart rhythm becomes normal in many cases. In those patients in whom the pulse does not return to normal rhythm after partial thyroidectomy alone, it can be rendered normal by the administration of quinidine, and will, in most instances, remain so; whereas without operation normal rhythm cannot be maintained by the use of quinidine alone.[1]

[1] Fraser, Prof. F. R., *Quart. Jour. Med.*, 1924, No. 68, xvii.; Dunhill, T. P., *Brit. Med. Jour.*, Oct. 4th, 1924.

LXV

THE TREATMENT OF VISCEROPTOSIS

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A diagnosis of visceroptosis is one which it is only too easy to make on insufficient evidence, and which is only too readily accepted by the patient. To the lay mind the fact that the viscera are dropped or misplaced offers a reasonable explanation to account for symptoms of any and every kind; moreover, it is an idea which it is much easier to implant than to eradicate from the mind of the patient. Hence, it is most important to beware of informing patients that they have visceroptosis, whether general or of special organs such as the kidney, unless the clinical condition is explicable on no other pathological basis; further, when such a diagnosis is made it must be explained clearly that the condition is not a serious one and is readily amenable to treatment.

Possible Organic Lesions

Before attempting any treatment for visceroptosis the possibility of other organic lesions such as peptic ulcer must be excluded as far as possible, and the diagnosis should never be made apart from radiographic evidence. Even when the latter appears to support the diagnosis, it must be remembered that many individuals who are apparently in perfect health can be shown to have considerable ptosis of such organs as the stomach or colon. In fact, the position of the viscera depends largely on the habitus or general bodily configuration of the patient. Individuals with a long chest and narrow intercostal angle almost invariably have their viscera considerably lower than the broad-chested type with a wide intercostal angle.

The viscera are retained in their normal positions by the abdominal muscles, which maintain a positive intra-abdominal pressure, rather than by the support of the various mesenteries and peritoneal ligaments. Hence, in the treatment of visceroptosis it is to the abdominal muscles that attention must be paid. In this disease, as in all others, prevention is better than cure. Perhaps the most common cause of visceroptosis as a clinical syndrome is pregnancy or particularly a series of preg-

nancies at relatively short intervals. When the uterus is emptied and contracts down within a few days from a large abdominal tumour to a small pelvic organ, the intra-abdominal pressure is much decreased, and if the patient is allowed to get up too early the abdominal muscles, which have long been on the stretch, are unable to maintain themselves in a sufficient degree of tonus to counteract the tendency of the abdominal viscera to drop downwards and forwards. Hence, in the prophylaxis of visceroptosis it is most important to insist on a patient after delivery remaining in bed or at least recumbent for a fortnight or longer if the abdominal wall is thin or if pregnancies have been frequent.

Restoration of Tone in Abdominal Muscles

The ultimate cure of visceroptosis is dependent on the restoration of tone in the abdominal muscles, and it is therefore to this end that treatment must be directed. In too many cases abdominal massage is the sole method employed. Though massage may have its uses, particularly in the cases in which constipation is a marked feature, as far as the development of the abdominal musculature is concerned, it is vastly inferior to active movements. The patient should be given a series of exercises designed to bring these muscles into play; in severe and long-standing cases at the beginning the exercises will have to be comparatively light in character, but as the condition improves they can be increased in duration and severity. Where it is possible the patient should be placed under the charge of an expert in remedial exercises; moreover, it is always more satisfactory if these can be done in a class rather than individually, as the presence of other patients in a class tends to produce a competitive spirit and renders the maintenance of discipline more easy. It is impossible in the compass of these notes to describe the exercises in detail; in general, it may be said that they should consist mainly of active movements by the abdominal muscles and the diaphragm, which in most visceroptotic patients is unduly low with a restricted respiratory excursion. Breathing exercises are carried out lying on the back with the legs drawn up and the thorax partially fixed by the arms folded over the chest; the breathing is thus rendered mainly diaphragmatic in type. The recti muscles are exercised by raising the head and neck with the patient on the back and by flexion and extension of the hips with the patient in the same position. It is most important that the patient should be closely supervised especially in the earlier part of the training, in order to ensure that the movements are being carried out correctly and that they are not beyond the patient's strength. Moreover, in addition to the regular exercises done under supervision the importance of carrying out the treatment daily in the home must be impressed on the patient.

Constipation

One of the most constant and troublesome symptoms in visceroptosis is obstinate constipation. In most cases this is due originally to the lax abdominal muscles having insufficient power to produce a complete evacuation. As a secondary result of this a condition of dyschezia results, in which the rectum becomes insensitive to distension with fæcal material. For the cure of the constipation it is essential that the patient should be re-educated in defæcation; it must be insisted that at a fixed hour after breakfast an attempt should be made to obtain a movement, and that the use of strong purgatives should be discontinued. At the beginning of treatment a daily soap-and-water enema may be necessary, but this should be gradually diminished in bulk from day to day. Massage of the colon is also useful in the treatment, and where possible this should to begin with be carried out by the masseuse with the patient on an X-ray couch after a barium meal has been taken on the previous day to outline the large intestine; the masseuse is thus able to be sure of the exact position of the colon. If this procedure is not feasible the masseuse should be provided with a sketch or X-ray photograph showing the outline of the colon.

Abdominal Support

In severe cases an abdominal belt should be worn. This may be either of elastic and webbing material, or a leather and metal instrument such as the Curtis abdominal support. Although the latter is heavier and less comfortable to wear it gives better support and is free from the liability of the elastic type to stretch unduly. In either case the belt must be so adjusted that the direction of pressure must be upwards and backwards. It need not be worn when the patient is in bed or lying down, and when it is being applied the patient must invariably be in a recumbent position with the pelvis raised, as otherwise there is a grave risk of its tending to hold the viscera down rather than up. In cases where a belt is ordered the physician must be careful to explain to the patient that it is not in itself a cure and must not be made an excuse to discontinue the exercise treatment, which should be carried out with the belt removed.

In all true cases of visceroptosis all the organs, rather than a single one such as the stomach, colon, or kidney, are ptosed. Consequently, attempts to deal with individual organs are doomed to failure, though in some cases the most distressing symptoms are occasionally attributable to one particular organ, especially the kidney. In rare cases undue mobility of the latter may lead to severe attacks resembling renal colic, but where these so-called Dietl's crises occur there is often an aberrant renal vessel which obstructs the ureter. In the vast majority of cases with nephroptosis any attempt at nephropexy only aggravates

the condition. As a general rule surgery should never be advised unless there is undoubted evidence of ureteric obstruction.

Diet

As regards diet, patients with visceroptosis are, as a rule, thin and should be encouraged to take a nourishing mixed diet of small bulk. As an intestinal lubricant to enable the fæces to be more readily expelled liquid paraffin is most invaluable and should be taken in small amounts at least twice a day. In cases with marked gastroptosis the patient should be instructed to lie down on the right side for half an hour after meals, as this tends to accelerate the passage of food from the stomach into the intestines.

In very severe cases with marked laxity of the abdominal wall the patient may be kept in bed for some weeks, the foot of the bed being supported on blocks. This takes the tension off the stretched abdominal muscles and allows them to some extent to recover their tone.

The Mental State

Patients with visceroptosis are usually highly neurotic and often their main occupation in life becomes the minute observance and recording of their symptoms. This aspect of the case is often the most difficult to deal with, and quite apart from other considerations makes any operative treatment extremely undesirable. An attempt must be made to gain the patient's confidence and, if possible, to alter the general mental outlook. Naturally, the most difficult cases are those where the attention of the patient has been focused on some particular organ, such as the kidney, by the ill-judged remarks of the medical attendant.

LXVI

TREATMENT OF POST-OPERATIVE PULMONARY COMPLICATIONS

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When abnormal physical signs are detected in the lungs soon after an operation it is usually taken for granted that a post-operative complication has occurred, and usually the anæsthetic is blamed for the so-called "pneumonia" or "broncho-pneumonia." But a careful examination of the lungs in a large proportion of acute abdominal cases will reveal definite abnormal physical signs before operation. Unless these are detected, it is difficult to appreciate the significance of any pulmonary change that may be found after operation, especially as very similar signs may result from a purely post-operative condition. Briefly, these signs (which are nearly always confined to the right lung) are increase of size in the right half of the chest, raising of the liver dullness in the nipple line to the fifth rib or fourth space, impairment of percussion note, and diminution of breath-sounds (which are never definitely bronchial) over the base of the right lung, especially at a point 1½ in. below and to the left of the angle of the scapula; the apex beat is in the normal situation. By means of X-ray screening the right half of the diaphragm is seen to be raised and its range of movement limited, though what movement there is appears to be an active one. These signs are always present and occur at a very early stage when there is inflammation of the peritoneum in the upper abdomen, but with diminishing frequency as the inflammation is situated further from the diaphragm. They are constantly present in retro-cæcal appendicitis and when suppurative peritonitis is spreading up from the pelvis, and occur in cholecystitis and perinephritis; but they are absent in pyelitis, cholelithiasis unaccompanied by cholecystitis, all forms of colic, tuberculous peritonitis, salpingitis, unless there is a spreading peritonitis, in appendicitis confined to the pelvis, and in pneumonia or diaphragmatic pleurisy. The measurement of the chest is conveniently taken with a saddle-tape measure placed just below

the nipples in males and below the breasts in females. The difference is often as much as 1½ in., but an increase of only ½ in. may be regarded as pathological. Obvious fallacies are spinal curvature or old lung disease.

The explanation of these signs is not difficult; just as impaired movement of the anterior abdominal wall is an early sign of peritonitis, so is impaired action of the diaphragm. The latter is not inactive, but its excursion is limited, and what movement remains is apparently able to aerate the lung sufficiently to prevent any great degree of collapse. The liver rises in consequence of the partial collapse of the lung, and by its shape causes an enlargement of the right side of the chest. The treatment is, of course, mainly surgical, but after operation the patient should be encouraged to breathe deeply, and not allowed to remain too long in one position, as there is danger of hypostatic congestion. For the same reason he should be placed in Fowler's position, to avoid as far as possible the pressure of the liver against the diaphragm. Expectorants also help to avoid congestion of the lung base.

Post-operative Massive Lobar Collapse

There are two forms of this condition: (*a*) collapse with contraction, and (*b*) collapse with enlargement of the corresponding side of the chest wall.

(*a*) *Collapse with Contraction.*— The first symptom is usually sudden pain low down in one side of the chest (usually the right); the temperature rises (102° or 103° F.); respiration quickens and there is some distress which may be acute; after a few hours expectoration of white viscid sputum begins. The physical signs are impaired movement of the affected side of the chest and upper quadrant of the abdominal wall, impaired percussion note, at first diminution or absence of breath-sounds over the lower lobe of the lung, and later well-marked tubular breathing; displacement of the heart towards the affected side, diminution in girth of this side of the chest, inactivity of the diaphragm and upward displacement of the liver, if the collapse is on the right side, or heart, if on the left. The liver dullness may begin as high as the fourth rib, and this upward displacement is a most valuable sign, easy to demonstrate, and constantly present. On screening I have always found the cupola of the diaphragm raised on the side of the collapse and the movement either absent or much restrained, so that the excursion is small and jerky, suggesting tonic contraction.

Differentiation from Pneumonia

Massive collapse is easily distinguished from post-operative pneumonia by the displacement of the heart and liver, the decrease in size of the affected half of the chest, the viscid white

sputum which is never blood-stained or rusty, and the termination which may be as sudden as the crisis of lobar pneumonia, but followed by a much more rapid return of the normal signs of a healthy lung. There is no flush and the skin is usually moist, and has not the hot, dry feeling so often present in pneumonia. The change usually occurs on the third day after the onset of the collapse; the temperature drops to normal or thereabouts, the pain disappears, and the only remaining symptom is the coughing up of the characteristic sputum for another few days. At the same time the diaphragm begins to move in normal fashion.

In certain cases the change is dramatic in its suddenness, which suggests a mechanical cause rather than a pathological change in the lung tissue. The apparent tonic contraction of the diaphragm and the sudden onset closely resemble an attack of asthma, in which condition we also find a rigid (though not raised) diaphragm, which immediately begins to move on cessation of the attack. The similarity has led me to try drugs used to alleviate asthma, and I have found injections of 5 minims of a 1 : 1000 solution of adrenalin the most useful remedy, not only for the treatment of massive collapse, but when given as a prophylactic it seems to lessen the chances of this complication ensuing. It is better to give 5 minims repeatedly than to give larger doses at longer intervals. A second dose may be usefully given in half an hour's time. As a prophylactic 5 minims may be given every six hours for the first 48 hours after operation. Other drugs which are helpful are injections of ½ c.cm. of pituitary extract, or $\frac{1}{12}$ gr. of emetine hydrochloride. In addition, small doses of potassium iodide and ammonium carbonate with a few minims of ipecacuanha wine made into a mixture with camphor water, help to liquefy the viscid sputum and so assist its expectoration. Many patients have benefited from the application of a mustard leaf to the side of the neck, which was done with the idea of providing counter-irritation to the phrenic nerve, and with a similar object I have found it of some use to pass a descending constant current down the side of the neck. This form of massive collapse is an alarming complication, but unless pneumonia supervenes (and this happens but rarely) is never by itself fatal.

(*b*) *Collapse with Enlargement of the Chest Wall.*—In massive collapse with enlargement of the affected side there are several points of difference. The onset is painless and gradual; dyspnœa is not marked; the heart and liver are displaced in a similar way, and though the heart is never drawn over so far, the upward displacement of the liver is extreme. When screened the diaphragm can be seen considerably raised, moving very slightly and apparently passively on the affected side, as if paralysed and relaxed. The breath-sounds are feeble, the percussion note is considerably impaired, and bronchial breathing is never as marked or extensive as in the cases associated with

contraction of the chest. This is a much more serious complication than that already described and indicates a spread of infection up to the diaphragm and consequent risk of general peritonitis or subphrenic abscess. Treatment is mainly surgical, as there is need of free drainage. Drugs are of little use and adrenalin has no effect. Some cases recover with merely expectant treatment, for the peritoneum can deal successfully with infective organisms in very great measure.

The treatment of any condition involves consideration of the cause. It has been shown that the position and action of the diaphragm are modified in both kinds of post-operative collapse and in the cases which show pre-operative pulmonary signs. The diaphragm is just as much a part of the muscular wall of the abdominal cavity as the rectus abdominis and oblique muscles, and is affected by inflammation beneath it just as are the muscles overlying an inflamed appendix.

That infection greatly modifies diaphragmatic action is clear from a study of 39 cases in which one or other form of collapse of the lung followed operation. (1) Many needed subsequent drainage after the wound had been sewn up, or the wound was found to be suppurating when the stitches were taken out. (2) The more distant the focus of infection, the less likely was the diaphragm to be involved, and inflammation confined to the pelvis never affected it. (3) Subphrenic abscess invariably paralysed the diaphragm. Subsidiary causes of collapse are very large incisions, especially if they extend into the hypochondrium, and rough handling of the sides of the wound at the operation, so injuring the muscles and causing an alteration in the tone of the opposing muscle—i.e. the diaphragm.

A slight stimulation of a muscle causes it to contract, but a severe one removes the power of contraction, which accounts for the two forms of collapse. When the chest is contracted, the infection or stimulus appears to be slight; manifest suppuration seldom ensues and drug treatment is of great use. Where the side of the chest is enlarged, drugs are of little avail and subsequent drainage of the wound, or possibly of a subphrenic abscess, is usually necessary.

Subphrenic abscess is a further complication which may be mentioned. Measurement almost invariably shows the affected side of the chest to be larger than the other, and if the heart has been originally drawn over and the signs of collapse of the lung persist or increase, any movement of the apex beat towards or beyond its original situation indicates the presence of a subphrenic abscess or an abscess in the upper part of the liver. The treatment, of course, is purely surgical. The outstanding feature of post-operative massive collapse is its relation to interference with the peritoneum. The length of operation and the kind of anæsthetic employed appear to have no effect of this sort.

Pneumonia and Bronchitis

Lobar pneumonia following operation is uncommon, and its treatment in no way differs from that of the ordinary attack. I should like to urge the value of intravenous injection of strophanthin, gr. 1/100, in cases of failing heart with low blood pressure, always remembering that any severe grade of cyanosis must be relieved by preliminary venesection.

Bronchitis, which may progress to broncho-pneumonia, is best relieved by injections of atropine, gr. 1/100, or tincture of belladonna in moderate doses, if the sputum is fluid and excessive; if it is scanty and viscid, antimony wine in 20 minim doses with 15 minims of tincture of stramonium is often very useful. A little bronchitis may be unavoidable after long administration of ether, and possibly contributes to any collapse that may be present, but it never seems to be the sole cause.

LXVII

TREATMENT OF HYDROCELE, HÆMATOCELE, VARICOCELE, AND SPERMATOCELE

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Consideration of the treatment of these four conditions involves a brief discussion of their ætiology and differential diagnosis. It is clear that where the scrotal abnormality occurs as the result of the presence of some other focus of disease in the body, it is this primary lesion which calls urgently for treatment. Again, should erroneous diagnosis of these conditions be made, treatment directed to their cure is more likely to result in harm than benefit to the patient.

I. Hydrocele

This is the only one of these four conditions not essentially male, as it is occasionally met with in the labium majus, especially in little girls, as *Hydrocele of the Canal of Nuck*, when its treatment is that of excision of the sac through an inguinal incision.

Various types of hydrocele are met with in the male.

Diffuse Hydrocele of the Cord is a rare multilocular cystic condition of the whole scrotal extent of the spermatic cord, often extending up through the inguinal canal into the abdomen; and the treatment consists in dissecting the mass away from the cord, by no means an easy task.

Hydrocele of an Unobliterated Processus Vaginalis (congenital hydrocele) is a condition met with in young children and usually only diagnosed when there is some coexistent inflammatory condition of the peritoneal cavity, such as tuberculous peritonitis, which causes fluid to be exuded and gravitate into the vaginal sac. Congenital hernia is usually also present unless the opening in the neck of the sac is too small to allow of the passage of bowel or omentum, but is a fruitful source of misdiagnosis, the best point in differentiating the two conditions being the slowness with which the hydrocele fills and empties and the absence of resonance in the fluid swelling. In a young child both will be translucent. Treatment consists in excision of the sac through

an inguinal incision as for hernia ; should tuberculous peritonitis coexist operation should be put off till this has been cured, as not only is there grave danger of a tuberculous sinus following operation, but a spontaneous cure may result.

Encysted Hydrocele of the Cord presents as an ovoid swelling in or just below the inguinal canal ; if in the canal it may be mistaken for a bubonocele but has no expansile impulse on coughing, and can often be drawn down out of the canal by gentle firm tension on the testicle and cord, when the upper limit of the mass can be defined. Rarely chronic suppuration in the course of the cord, following gonorrhœa or tubercle, may cause a similar pyriform cystic tumour. Treatment consists in cutting down on the swelling through an inguinal incision and dissecting it off the cord, a difficult task since the membrane is thin and friable.

Hydrocele of the Tunica Vaginalis (hydrocele) may result from effusion into the tunica vaginalis secondary to some disease of the testis, or obstruction to the venous return, or may be the result of primary irritation of the lining membrane of the sac. It can be diagnosed by its translucency and tapering upper end.

Secondary Hydrocele may result from (1) acute or chronic inflammation of the testis or epididymis, as in gonorrhœa, tuberculosis, or syphilis ; or (2) follow on a testicular tumour. In the acute cases there is pain, and examination of the testes and adnexa after "tapping" the hydrocele reveals that they are enlarged. The condition may also be present, as a bilateral affection, in cases of ascites due to advanced cardiac and renal disease, carcinoma of peritoneum, retroperitoneal tumours, and chylous ascites (when the hydrocele fluid is also milky), due to lymphatic obstruction in filarial elephantiasis and blockage of the thoracic duct. In all these cases treatment must aim at the eradication or alleviation of the primary disease, no local treatment other than tapping being indicated.

Primary or Idiopathic Hydrocele can only be safely diagnosed when the foregoing conditions, and the possibility of a hydrocele in the fundus of a hernial sac, or even an irreducible hernia, have been eliminated. Treatment of the condition is operative and should, except in very old or debilitated patients, aim at effecting a radical cure by removal of the secreting membrane, though tapping may often be necessary as a diagnostic step. The patient should be seated or, better, lying on a bed or couch for this operation.

Tapping.—The position of the testes having been ascertained (usually by touch and the patient's sensation, though transillumination may afford valuable indication of its position), the pyriform scrotal swelling is grasped in the palm of the hand, and the penis being held away by the thumb the skin is made to stretch tensely over the mass. The scrotum is now painted with 2 per cent. iodine in spirit, and an area on the front free from veins being selected, a sterile trocar and cannula are plunged

sharply in, the trocar withdrawn, and the fluid allowed to escape through the cannula, the hand being used to press out the fluid toward the cannula. The trocar needs plunging sharply through the tense skin and tunica, both of which it can be felt to pierce, and then a sense of loss of resistance is encountered as it enters the fluid. The common source of inability to obtain fluid is that owing to the skin not being held tense and insufficient force used the trocar slips along the outer surface of the tense tunica between it and the skin, but occasionally it is plunged into the testis, as evidenced by the patient experiencing sickening pain, when it should be immediately withdrawn and reinserted smartly elsewhere.

When no more fluid escapes, the cannula is withdrawn and the opening sealed with gauze and collodion. Some surgeons prior to withdrawal insert a few minims of irritating fluid such as pigmentum iodi, or strong carbolic, which is massaged around, with the object of destroying the endothelial lining and so effecting a radical cure, but this proceeding causes some pain and the results are not on the whole satisfactory, as loculation very often occurs.

Radical Cure.—A short incision is made upwards and outwards from the pubic spine; the scrotal root is to be avoided, as not only is the skin difficult to approximate accurately, with consequent delay in healing, but fouling of the wound, with consequent sepsis, is very liable to occur during the use of the bedpan and urine bottle. The sac of the hydrocele having been exposed in the depth of the incision it is pressed well up into the wound from below and held there while it is incised alongside the cord. A fairly free incision should be made and the stream of fluid directed into a bowl, pressure being meanwhile maintained on the scrotum to empty the sac. The wound is mopped out, and the edges of the sac grasped in forceps, and the whole tunica and testis pulled up through the wound and separated gently from the surrounding cellular tissue, in which all bleeding points must be secured if hæmatoma of the scrotum is to be avoided. This is a serious complication in that it is very liable to infection, with resultant sloughing of the testis; unless, therefore, absolute hæmostasis is assured it is well to drain the scrotum for 24 hours through the lower end of the incision by means of a corrugated rubber drain. Two methods are in vogue for the treatment of the tunica vaginalis, which is now freely exposed, lying on gauze outside the wound:

1. The simpler method recommended by Winkelbaum can be practised only on thin-walled hydroceles, and consists in everting the testis through the hole in the tunica vaginalis, which is thus turned inside out and secured in this position by a few stitches passing behind the cord and epididymis. The whole rather bulky mass is returned into the scrotum and the wound closed, the object being to secure adhesions between the endothelial lining and scrotal cellular tissue, and so ensure

granulation and destruction of the former. The disadvantage of this method is that sometimes the endothelium grows over the cellular tissue and a pseudo-tunica is formed, becomes filled with fluid, and recurrence results; this is the more likely to occur if a small hæmatoma has been present. The percentage of recurrences recorded is, however, small, varying from 1 per cent. to 15 per cent.

2. The surer method consists in clipping away the whole of the parietal portion of the tunica vaginalis, an easy operation, but one accompanied by severe bleeding from the numerous vessels in the tunica. It is advisable to under-run the entire cut margin by a continuous glovers' stitch of catgut to prevent scrotal hæmatoma. The testis is then returned to the scrotum and the wound closed, with drainage for 24 hours if hæmostasis is incomplete.

The wound should be dressed with gauze, retained in position by a suspensory bandage, which acts also as a scrotal support. The patient may get up in four or five days, but should wear a suspensory bandage for two or three weeks.

II. Hæmatocele

The cause of a hæmatocele is nearly always a sharp blow or injury, but may occur as a complication of a malignant tumour of the testis, or in blood diseases such as hæmophilia, scurvy, or severe anæmia. Since in this case local treatment would be disastrous, a blood count should be done if there is any doubt. The tumour presents as a pyriform swelling in the scrotum, which may show subcutaneous bruising, and it can be diagnosed from a hydrocele by the fact that it is not translucent, and from a hernia by having no expansile impulse; moreover, its upper limit is defined.

Treatment in a recent case consists in supporting the scrotum in a tight suspender, or by strapping, and resting the patient in bed in an endeavour to limit the bleeding. Tapping should, if possible, be avoided for at least 48 hours, as it tends to cause recrudescence of the bleeding; but it should be practised as a routine after that time has elapsed. After the blood has been withdrawn the affected side of the scrotum should be strapped with zinc oxide adhesive plaster for four or five days, being previously shaved in an adult.

In older cases where clotting has already occurred and thickening of the tunica resulted, the only satisfactory treatment is operation by the inguinal route as for radical cure of hydrocele, and excision of the parietal tunica vaginalis. In very old-standing cases, where extreme thickening and fibrosis of the tunica and scrotal tissues exist, this operation may not be practicable; in such a case orchidectomy may be undertaken since the testis is usually atrophied and disorganised. The wound should be drained for 24 hours, whichever course is

adopted, since oozing from the scrotal cellular tissue is almost impossible to control. Such old-standing cases are not infrequently diagnosed as neoplasms of testis, and it is practically impossible to be certain that a testicular tumour does not coexist with the hæmatocele; for this reason orchidectomy should be carried out as the operation of choice.

LXVIII

TREATMENT OF HYDROCELE, HÆMATOCELE, VARICOCELE, AND SPERMATOCELE (*continued*)

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III. Varicocele

The ætiology of the varicose condition of the veins of the pampiniform plexus which is known as varicocele is often obscure, though its more frequent presence on the left side of the body suggests that the right-angled opening of the left spermatic vein into the renal renders its radicles more liable to obstruction than the sloping opening of the right spermatic into the inferior vena cava, and the condition is undoubtedly aggravated in constipated individuals by the drag of the loaded sigmoid colon and rectum, compressing and distorting the left spermatic vein as it crosses the pelvic brim just behind the pelvi-rectal junction. Varicocele may occur secondarily to neoplasms of the left kidney obstructing the venous return into the left renal vein, or to carcinoma of the pelvi-rectal region causing similar congestion, while more rarely retroperitoneal teratomata or sarcomata may cause varicosity of one or both pampiniform plexuses. In every case, therefore, especially where the history of onset of the varicocele is sudden, the urine should be examined for blood and the abdomen carefully palpated. Should one of these primary causes be discovered it obviously calls for urgent treatment by removal, if possible, when the secondary scrotal condition will certainly improve.

In the majority of cases, however, unilateral varicocele, usually left-sided, exists with no obvious cause, even constipation being absent; and in these cases it cannot be too strongly urged that no treatment is called for unless the condition is causing pain and discomfort to the patient. Unless his attention is directed to it, and his mind disturbed by unfounded tales of danger of impotence if the condition be left untreated, he is rarely troubled by its presence. In some few cases, especially in hot countries and in patients taking riding exercise, if the scrotum be pendulous, pain and a congested feeling result from exertion, and it is then, as also in candidates for the services,

where a varicocele may be used as a cause of malingering, justifiable to interfere.

In elderly patients all that is usually necessary is a well-fitted net-suspender to support the scrotum against the perineum; this need be worn only during the day, and is a source of comfort to the patient. Suspenders are not to be recommended in the case of neurotic young men, as their presence tends to concentrate the patient's attention on the genitalia. In those cases where a suspender is ill tolerated, or where the patient is a candidate for one of the services, operation may be undertaken and the main mass of the pampiniform plexus ligated.

Operation

The pubes having been shaved and purified, the patient is anæsthetised, and a short incision made upwards and outwards from the pubic spine on the affected side so as to expose the spermatic cord as it passes out of the external abdominal ring and down into the scrotum; there is no need to open the inguinal canal by incising the external oblique aponeurosis. The cord is elevated on a retractor, and the fascial sheath around it opened longitudinally, the cremaster muscle-fibres separated, and the vessels exposed. The vas deferens, lying behind the main mass of the pampiniform plexus, should be isolated together with the deferential artery and veins which closely accompany it. The veins are now held up on the retractor and search made for the spermatic artery, with which are usually associated one or two smallish veins; when found this also should be isolated together with the accompanying veins, but no very prolonged search should be made for the vessel, as although its ligation is not desirable, actual atrophy of the testis rarely follows. The remaining veins of the plexus are now dissected clear of the vas and artery for about two or three inches, ligated at the upper and lower limits of the cleared space, and the intervening mass removed, care being taken not to cut them within a quarter of an inch of the ligature for fear of this slipping off. A stitch is now passed through the parts of the veins distal to the ligatures, and these are approximated, a proceeding which holds up the testicle and saves the patient much discomfort and the need of a post-operative scrotal support. I do not consider it necessary to evaginate the testis through a slit in the tunica vaginalis, as the occurrence of a hydrocele of the tunica vaginalis, consequent on the cutting off of the venous return, is so rare if the operation is carried out as described above. The patient should be kept in bed for five or six days, after which he may be allowed up wearing a well-fitting net-suspender, which must, of course, be fitted after the operation. The use of this suspender is a great comfort to the patient for the first fortnight after operation, when its use should be discontinued, except in cases where the patient is indulging in occupations, such as riding or bicycling,

where friction occurs to the scrotum and perineum, when the suspender should be worn for at least a month after operation, on all occasions when such exercise is indulged in.

IV. Spermatocele

A further condition of interest in connexion with abnormalities of the scrotal contents is that of spermatocele, a condition usually met with in elderly men and frequently bilateral, the patient's attention being drawn to the presence of an abnormality by a sensation of fullness and discomfort in the testes. The condition arises from the blocking of the ducts of the epididymis, with subsequent distension of the tubules behind, so that one or more rounded cystic swellings occur in the course of the epididymis, usually around the upper and back part of the testes, and may be found to vary in size from a pea to a chestnut; occasionally such a swelling may arise from distension of the vestigial hydatids of Morgagni at the upper end of the testes, in which case they may be seen in younger subjects.

Treatment consists in excision of the thin-walled cysts from the surrounding epididymis, an easy task if no inflammatory reaction is present, the testis being exposed through an inguinal incision as for hydrocele. The tunica vaginalis usually needs incision to expose the cysts, and it is wise to leave it evaginated as described in order to obviate the risk of a hydrocele consequent on the handling at operation. The condition of spermatocele is not in itself dangerous, but removal of the tense cyst causes both physical and mental relief to the elderly patient, and is therefore advisable, although recurrence, usually from formation of new cysts, is by no means uncommon. Operation on both sides is liable to be followed by sterility, though it is somewhat comparable to Steinach's operation in that it is often followed by a temporary improvement in both general and sexual power.

LXIX

THE TREATMENT OF INFANTILE PARALYSIS

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Three separate and distinct phases are presented by the average case of infantile paralysis, and each phase has its particular treatment.

1. The Onset

There is usually a febrile period accompanied by great lassitude, headache, sickness, and flaccidity of muscles. In severe cases delirium and convulsions may precede a fatal issue. In others there may be absence of fever, and a child, at night apparently normal, may in the morning exhibit weakness of one or more limbs. There is no definite relation between the amount of initial constitutional disturbance and the degree of paralysis which ensues. Hyperæsthesia is almost a constant feature, with great tenderness of skin and muscles. Trophic changes are present early and the affected limbs become cold and reddish-blue in colour. Complete rest and warmth are the two most important essentials during this time. Support must be provided for the limbs, the joints being placed in the "normal" positions—hips and knees extended, ankles at a right angle. In upper limb paralysis the arm should be abducted at the shoulder, elbow at a right angle, and wrist dorsiflexed. The best means of securing such rest and warmth is by the provision of a plaster "shell." The body being first enclosed in cotton-wool, the plaster is then applied with the limbs, head, and back supported in the correct positions. If it is not possible to provide such a shell, a spinal frame with head-piece of the usual type, with the addition of foot or arm splints, makes a good substitute, but requires more attention. At this time no massage or electrical stimulation should be given and everything done to promote quietness and complete absence of mental or physical irritation.

2. The Recovery Period

This commences after a few weeks. The mental condition improves, irritability is lost, and the child becomes more interested in what is going on around it. Physio-therapeutic measures

should now be instituted, commencing with the gentlest form of massage, "effleurage" or stroking movements. The benefit of massage is soon shown by diminution in the degree of coldness and cyanosis. After each massage treatment the joints of the limbs affected should be gently moved through their normal range and every possible active movement encouraged. During the period of muscle-training active movements should be performed against the least possible loads. As an example of this may be given the movement of extension of the knee produced by the quadriceps extensor. In case of weakness of this muscle the patient should not be asked to extend the knee in the ordinary sitting position with the weight of the leg and foot against the muscle, but the patient should be lying down with the affected limb on its side supported on a smooth table. In this way the effort needed to extend the knee is very greatly reduced. At this time electrical stimulation may be introduced. Its greatest use is in the production of muscular contraction in the paralysed muscles where a voluntary contraction is impossible. The muscle is thus exercised and prevented from rapidly degenerating into mere fibrous tissue. If a contraction cannot be obtained by a moderate faradic current it will be necessary to use galvanism. Later it may be found that faradism will produce contraction and it should then be substituted. About the same time it is often found that voluntary contraction begins to be possible. By this date the acute stage is well over and the paralysis is beginning to define itself. It may be found, for example, that the right leg alone shows paralysis and that the foot is cold with no power of dorsiflexion, a little power in the calf, no extensor power at the knee, but fair power in the hamstrings. Moderate power is present in all hip movements. Such a limb should be exercised well, bearing in mind that support must always be provided for the weak muscles. The child should wear, at night, a splint to keep the knee extended and the ankle at a right angle. In the application of a splint to maintain the right angle at the ankle, it is of the utmost importance that the medical attendant should see that the nurse, masseuse, or mother who is responsible for the putting on of the splint should appreciate the fact that the heel must come down to the foot-piece. One so often sees such a splint applied with the heel a couple of inches away and the forepart of the foot alone meeting the foot-piece. In this way many cases of paralytic equinus are produced. In the daytime a walking appliance should be provided, and, in the case of such a paralysis as we have assumed, a "walking calliper" will be most suitable with a spring added to dorsiflex the ankle. With such an appliance a child will soon get about and will exercise the limb to the fullest possible extent. Should both legs be paralysed two callipers will be needed, and in this case a walking machine is of great assistance. After a period of such treatment for 12 months the degree of residual paralysis may be determined.

3. Residual Paralysis

This is the stage in which little or no further change takes place in the recovery of power and in which surgery must attempt to diminish, as far as possible, the need for appliances and to utilise the residual power to its best advantage. The handicap of steels, leathers, and straps, loaded on a limb already severely enfeebled, must be reduced to its absolute minimum.

Much may be done, and the measures which offer the greatest chance of improvement are: (*a*) tendon transplantation; (*b*) tenodesis, or tendon fixation; (*c*) arthrodesis, or stabilisation of joints. These procedures, which have been largely developed during the past ten years, have proved their worth and are now a well-established part of the surgical repertory. Three simple cases may be taken to illustrate the utility of the three operations.

Paralytic Talipes Valgus.—Here the residual paralysis affects the tibialis anticus and posticus, and the foot is drawn over into a valgus position by the unopposed peronei. In this case the peroneus brevis, and sometimes the tertius as well, is transferred to the inner side of the foot and fixed to the insertion of tibialis anticus and scaphoid bone. In all such operations the transplanted tendon must run in as straight a line as possible from origin to new insertion so as to act at the best mechanical advantage. The foot, after operation, is supported in inversion, preferably by plaster, for six weeks, and at the end of this period the transplant must be "re-educated" and developed to perform its new function. Such a transplant when successful will overcome the valgus and so avoid the need for an outside iron and T-strap.

Drop-foot.—In this hypothetical case the dorsiflexors of the ankle are paralysed and an iron with a "stop" at the ankle-joint or an uplifting toe-spring must be worn so that the toes may clear the ground in walking. The paralysed tibialis anticus is exposed in the lower third of the leg and its tendon is cut across at its upper limit. A tunnel is bored transversely through the crest of the tibia and the cut tendon is looped through the bone and sewn back to itself and to periosteum with the ankle at a little less than a right angle. There is always some "give" after such a tendon fixation, so that it is advised to give the ankle about ten degrees more dorsiflexion than is desired in the ultimate result.

Unstable Ankle.—In such a foot the remaining power is so small that, when weight is placed on it, the ankle "wobbles" to one side or the other and is forced over into a deformed position. There may be some available muscle power, probably in peronei or calf. The precise distribution varies greatly, but the need for stabilisation of such a foot is apparent. The ankle-joint movement, plus the mid-tarsal movement, permits a range about the ankle as great as a ball-and-socket joint would, and it must be our object to remove the mid-tarsal movement and leave

only the up and down hinge movement of the ankle-joint proper. There is, of course, a little side-to-side and rotatory movement at the ankle-joint, but it is slight, and amounts to very little when the mid-tarsal "wobble" is removed. Several methods of dealing with the mid-tarsal and astragalo-calcaneal joints have been devised, but the object in each case is the removal of the articular cartilage of the astragalo-scaphoid, astragalo-calcaneal, and calcaneo-cuboid joints and the procuring of bony union in these situations. Three months' fixation in plaster is required after such an operation. In a successful case it is then found that the foot is stable and can bear weight without rocking over. Usually a combination of the measures above mentioned is necessary, stabilisation of the mid-tarsus with the addition of a tendon transplant or tendon fixation being the common procedure. Mid-tarsal arthrodesis should not be attempted before the age of 8 years because of the amount of bone surface needed to ensure firm ankylosis.

Another common site for the use of arthrodesis is at the shoulder-joint, where power of abduction is lost and the arm cannot be carried away from the side, but where the shoulder can be effectively "shrugged" by the scapular rotators and elevators. In these patients it is usual to find a good forearm and hand. The articular cartilage of the glenoid and head of humerus is removed and the arm fixed at a little less than a right angle from the side and 30 degrees in front of the transverse axis of the pectoral girdle. The shoulder is fixed in plaster in this position from the time of operation for three months and, after firm ankylosis is procured, the arm can be lifted from the side by the scapular muscles quite strongly, so that very much more use can be made of the non-paralysed forearm and hand. Because of the ossification of the humerus and glenoid it is not wise to undertake this arthrodesis until the age of 14 years.

LXX

THE TREATMENT OF BREAST ABSCESS

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While the typical breast abscess of lactation follows infection through a cracked nipple, there are several precursors and variations whose treatment falls under this general heading.

Milk Engorgement

This is produced by the blocking of a duct or ducts with epithelial débris during lactation or by the sudden termination of breast-feeding. It may simulate breast abscess, and if unrelieved passes into it. The breast becomes swollen, tense, and painful, and the affected ducts present an irregular hardness without the presence of the central area of softening which indicates pus. This condition will be prevented if care is taken of the nipples (see p. 108), and suitable measures are used when lactation has to be terminated.

The breast should be supported by a thick pad of cotton-wool with a bandage passing beneath it and over the opposite shoulder. The nipple should be cleansed with pledgets of cotton-wool soaked in boric lotion, and the breast pump employed. Hot fomentations should be avoided, but lotio plumbi may give considerable relief. If the need for breast-feeding has ceased a belladonna plaster should be used, and the following additional steps taken to inhibit further lactation: drastic diminution of fluids, the administration of mist. alba morning and night, and if the breast is not too painful it should be firmly bandaged over layers of cotton-wool after evacuation with the breast pump.

Acute Puerperal Mastitis

This condition is one in which the inflammation is spread through one or more lobes of the breast, and is the immediate precursor of breast abscess. Practically all cases arise from a crack or abrasion of the nipple. The breast shows all the signs

of an acute inflammation and the general constitutional disturbances are very marked, while only the absence of an area of fluctuation or of a central softening distinguishes it from breast abscess proper. Until the latter diagnosis is made it should be treated energetically on the same lines as milk engorgement.

The following points should be noted. The abscess should not only be looked for in the area of greatest swelling in the breast substance, but also under the nipple, where one of the dilated ducts may be infected. The possibility of the pus tracking along the deep aspect of the breast must be borne in mind and increased prominence of the breast and pointing at the outer and lower margin watched for. In cases of doubt, if the constitutional symptoms are severe, an exploratory incision may be made. The incision should be planned as indicated in a subsequent paragraph. Even if pus is not found the congestion will be relieved and drainage provided in the pre-suppurative stage. The incision should be lightly packed with gauze soaked in flavine or acriflavine, or better still in an emulsion of equal parts of flavine and liquid paraffin.

Acute Puerperal Breast Abscess

When this condition is diagnosed from consideration of the foregoing facts, extreme measures must be taken at once. No attempt should be made to treat the breast with fomentations, nor should any small incision be made under local anæsthesia. In order that the whole breast shall not become infected and subsequently fibrosed the affected lobes should be thoroughly opened up under a general anæsthetic.

Abscesses are most frequently found in the following situations: (1) under the areola, (2) deep to the nipple in one of the dilated ducts, (3) in the main secreting portion of the breast, (4) the "shirt-button" abscess on the posterior surface.

(1) The subareolar abscess appears close to the nipple as a reddened area in which fluctuation can be readily detected. Usually the rest of the breast is unaffected. An incision should be made starting at the base of the nipple itself and extending radially from it over the centre of the affected area to the outer limit of the zone of induration. The incision should be deepened with the knife until pus is found, though in this area it is usually very superficial. The abscess cavity when completely opened up is mopped out and temporarily packed with gauze. On removing this packing careful inspection will show whether pus is welling up from a more deeply placed abscess.

(2) An abscess in a dilated duct deep to the nipple can be recognised by a markedly prominent and painful nipple surrounded by an inflammatory zone, in which deep œdema is present and possibly fluctuation. There may be a purulent

discharge from the nipple. This type of abscess will extend outwards into the parenchyma unless opened. The treatment is the same as that of the subareolar type.

(3) The parenchymatous abscess has already been distinguished from acute puerperal mastitis. The skin over it is red and œdematous and the breast feels irregularly hard. This type of infection is commonest in the lower half of the gland, but a decision must be made as to which lobes are involved and the treatment varied accordingly. In the lower half of the gland an incision should be made commencing just within the areola and extending radially over the lobe in which fluctuation has been detected and ending at the periphery of the breast. The lobe should be fully opened, carrying the incision well into its substance; the finger should be introduced and any loculi in adjacent lobes containing pus sought for and opened. These are sure to communicate with the main abscess cavity in the lobe most affected, but unless the fibrous partitions are broken down satisfactory drainage will not be obtained. Care should be taken that a pocket of pus is not left unopened in the region of the nipple. A half-inch drainage-tube of red rubber, with thin walls and several side openings, should be placed in the incision emerging at the outer end, and the incision lightly packed with gauze soaked in flavine and paraffin emulsion. After 24 hours the wound should be dressed, the tube and packing removed, and the wound repacked. The packing should be changed daily. After two days it is best to discontinue the flavine packing and to substitute eusol or Dakin's solution. The wound should not be swabbed out; any débris or small sloughs are best removed by irrigation with saline or eusol at the time of repacking. This also makes the removal of the packing an easy and painless process. The packing itself should be done systematically, being gently laid in from end to end of the wound in long strips.

In the case of the upper half of the gland a completely radiating incision is not satisfactory. In the first place, it will be objected to by the patient; and secondly, it will not give dependent drainage. An incision 2 or 2½ in. in length should be made over the inner part of the most affected lobe, extending as before radially from the nipple. This should be placed so as to lie somewhat obliquely, so that an incision placed in the most adjacent part of the lower half of the breast may be made to communicate with it. The second incision need not be much more extensive than the first, and may be commenced outside the areola. The intervening bridge of breast tissue should be broken down with the finger, and a drainage-tube inserted from the lower incision. A smaller tube may be placed in the upper one, and both incisions packed as before.

Cases treated in this way will be found to clear up much more rapidly than those in which more conservative measures are employed. Under the eusol treatment the wounds granulate

up very rapidly. As soon as the discharge has ceased to be purulent the packing may be safely left in for two days, though a daily dressing is more comfortable. When the granulations reach the surface a dressing of sterile vaseline spread on gauze is best.

(4) The "shirt button" abscess is recognised by marked prominence of the breast with but slight signs of inflammation in the gland itself. An area of fluctuation may be detected at the outer margin of the lower half of the gland. The best incision for opening this type of abscess is a semilunar one on the margin of the gland, and the pus will be found between the breast and the pectoral fascia. When it has been evacuated the finger should be inserted and a search made for the area of gland substance from which it has arisen. It may be possible to open this adequately from the deep surface; if not, a small radially placed incision should be made over the affected lobe and carried through to the posterior part of the breast. Tubes should be inserted in both incisions, but packing will only be of use in the anterior one. The tube on the posterior aspect of the breast should not be removed for four or five days, being taken out when the dressing is done, boiled, and replaced. At the end of that time it may be removed altogether or a smaller one inserted for a few days more.

The possibility of this being a retromammary abscess arising from caries of a rib or from an empyema must be borne in mind. In both cases the breast will be prominent, and one of these conditions should be suspected from the absence of signs in the breast itself. An abscess from caries of a rib is the more common condition, and must be inferred when examination of both the chest and the breast is negative. Both these abscesses will be beneath the pectoral fascia, and they tend to point a little farther out towards the axilla.

The subacute mammary abscess must be mentioned in passing as there is often some difficulty in differentiating it from malignant disease. It presents an œdematous indurated condition of the skin, often with retraction of the nipple, which very closely resembles carcinoma of the breast. However, the length of history, the association with recent lactation, and the absence of a lump should help in the diagnosis. Enlarged axillary glands will be present in both conditions.

Galactocele

This condition is the only form of chronic breast abscess within the scope of this article, and must be mentioned in conclusion. Tuberculous mastitis, gumma, and actinomycosis are pathological rarities. It is a condition of retention of milk in a dilated duct, together with a mild degree of infection. It may be readily recognised as a distinct elevation near the nipple

produced by a round or pear-shaped tumour, in which fluctuation may be readily obtained. It is painless, and firm pressure may produce a spurt of milky fluid from the nipple. In long-standing cases caseation of the contents takes place. It should be excised when lactation is over, the usual radiating incision being employed.

LXXI

THE TREATMENT OF OBESITY

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The modern treatment of obesity is based on the subdivision of this condition into two main types, in which the exogenous and endogenous factors respectively play the chief rôle. In the exogenous, the ordinary form, there is an excess of food intake over energy expenditure in an otherwise healthy person, while in the endogenous there is a tendency to accumulate fat independently of these causes. There is usually in the latter condition an alteration of function of one or more of the ductless glands. Naturally, cases occur which must be regarded as transitional forms between the two; these types will be considered under a separate heading.

Exogenous Obesity

Diet and exercise are the two most important points to attend to in the treatment of this form of obesity. It is possible to reduce weight by diet alone, but exercise is of great value in maintaining the tone of the muscles. It also facilitates the loss of weight by increasing the total metabolism.

Diet.—The bulk of the fat of the tissues is derived from carbohydrate, the remainder from fat. It is usual to cut down the fats to a minimum and allow a certain amount of carbohydrate in the form of vegetables. Bulk can thus be obtained in this way and the appetite satisfied. A low fluid intake is not necessary or desirable, except, perhaps, in cases with cardiac complications. Obesity can be reduced safely on a great variety of diets, so long as sufficient protein and carbohydrate are given to prevent loss of body protein. Of a number of schemes advocated from time to time, the dietetic régimes of Banting, Oertel, Ebstein, and Von Noorden are probably the best known. In these diets the proportion of protein is increased, while the carbohydrates and fats are reduced to various extents; for details reference must be made to the original monographs. A satisfactory diet should contain a considerable amount of protein in the form of lean meat and fish, a moderate amount of carbohydrate in the form of vegetables, and little fat. Of

fish, salmon, herrings, and sardines, containing more than 10 per cent. fat, should be avoided. Poultry, with the exception of duck (30 per cent. fat), may be allowed. Vegetables containing more than 10 per cent. carbohydrate should be used sparingly; the chief of these are the following: Potatoes, 16–20 per cent.; green peas, 13; broad beans, 14; broccoli, 10; onions, 10; parsnips, 18; artichokes, 17. Sugar is better cut down to a minimum and breadstuffs limited to one or two slices a day. All forms of bread contain a large proportion of carbohydrate, varying from 45–65 per cent., and the percentage in toast may be as high as 60. It should thus be condemned. Bread is a difficult article of diet to replace; the quantity must, however, be strictly limited or a patent bread made with casein (prepared for diabetics) may be substituted. Fresh fruit may be allowed in moderation. Bananas, cherries, grapes, and greengages contain more than 10 per cent. carbohydrate and should be restricted. As to cooking, the ideal form is grilling; boiling or roasting may also be employed, but frying should be avoided.

It should rarely be necessary to calculate the caloric value of the food intake. It is important that the body-weight should be controlled by weekly measurements. In most cases it is best to arrange the diet so that the weight is reduced gradually by 1 to 2 lb. a week. This prolongs the period of dieting and accustoms the patient to a small amount of food; he is less likely to overeat again.

Exercise.—The second essential in treating this form of obesity is exercise. Muscular exercise increases the metabolism more than any other factor, and the loss of weight is accelerated. Moderate exercise has been found to increase the metabolism three times, severe exercise as much as nine times its normal rate. Obese patients cannot, of course, take severe exercise without throwing an undue strain upon the heart and circulation, but active exercise can generally be arranged on a graduated scale. When the degree of obesity prevents active exercise the chief substitutes employed are massage, active and passive movement, and faradisation. Massage strengthens the muscles and facilitates the taking of active exercise, but its direct effect on metabolism is slight. Faradisation in the form of the Bergonié system has lately been used considerably; by this means the principal muscles are made to contract rhythmically and in regular order against a load. Most cases of exogenous obesity respond to diet and exercise: the use of thyroid extract is seldom necessary or advisable. Recently, attempts have been made—it is claimed with success—to treat certain of these cases by a combination of subcaloric diet and thyroid extract, but it is probable that these patients really belong to the endogenous group. They are chiefly of the type developing after childbirth and associated with menstrual disorders. The administration of thyroid extract is controlled by repeated

estimations of the basal metabolic rate, which is maintained at a level of about +10 per cent. The uncontrolled employment of thyroid extract in obesity is to be condemned.

Endogenous Obesity

In this form of obesity fat is deposited independently of food intake and energy expenditure; diet and exercise are no more than useful adjuvants to treatment by gland extracts. In endogenous obesity there is a defect of metabolism due to deficient function of certain of the ductless glands, notably the thyroid, the pituitary, and the genital glands. When their function is defective, the ability to metabolise food, and particularly carbohydrate, is subnormal. There may also be a type of endogenous obesity due to excessive secretion of insulin, and the frequency with which obese patients develop diabetes suggests that this supply may ultimately become exhausted; but this condition is not yet definitely recognised.

Differentiation between cases of the exogenous and endogenous groups is not always easy. Onset at or about puberty, or in women after childbirth or at the menopause, and associated disturbances of growth, menstruation, and other conditions suggest a ductless gland disturbance. In other patients endogenous obesity is inherited and appears shortly after birth or about the time of the second dentition. Certain metabolic investigations enable a distinction to be made between these two groups. In the endogenous form the basal metabolism and the tolerance for sugar are usually both abnormal. These tests can be made without difficulty at the bedside. The former is chiefly of value in cases of suspected thyroid deficiency, while the latter can be used to unmask a defective mechanism for dealing with sugar in endogenous cases.

Obesity of Thyroid Origin

Obesity of thyroid origin must be suspected when a rapidly developing obesity occurs with slight symptoms of hypothyroidism, puffiness of the feet, apathy, diminution of memory, and subjective feelings of cold. The basal metabolism is usually subnormal and should be investigated. Thyroid extract acts as a specific and can be employed as a functional test. The tolerance for these extracts is remarkably high. Withdrawal of food, on the other hand, is tolerated badly. Cure by thyroid extract is rapid and complete. A reliable desiccated extract of the gland should be used and given in gradually increasing doses, starting with gr. $\frac{1}{2}$ once a day and working up to a point at which the patient loses 1 to 2 lb. a week. This rate of loss should be maintained, though as the tolerance increases it may be necessary to increase the dose still further. These patients may require as much as gr. 15 of the desiccated extract a day.

The dosage can be more accurately regulated by repeated estimations of the basal metabolism, an attempt being made to maintain it at a level of about +10 per cent. Marked acceleration of the pulse or glycosuria indicates the temporary withdrawal of the extract, or diminution of the dose.

Obesity of Pituitary Origin

The fat distribution is characteristic, being especially marked around the girdles. The degree of obesity may be excessive and is most commonly found in children and adolescents. It is usually accompanied by disturbances of growth and genital function. When the condition is due to a pituitary tumour little can be expected from treatment by gland extracts, but in other cases there appears to be only a disturbance of function. In these patients the basal metabolism is low—probably due to a secondary thyroid factor—and the carbohydrate tolerance abnormal. The literature contains numerous statements that in such cases pituitary extracts are of value when given by the mouth, the obesity being remarkably relieved in some patients. Thyroid extract is usually said to be of value, though the results are not so uniformly satisfactory as in cases of the true thyroid type. From our experience at St. Thomas's Hospital we have come to the conclusion that pituitary extracts, whole gland, anterior lobe, or posterior lobe, are not effective in reducing the obesity of these patients when given by the mouth. They have, however, a definite effect on their carbohydrate metabolism, and when given with thyroid extract greatly enhance the effect of the latter. We conclude that the best results can be obtained by treatment with gradually increasing doses of thyroid extract and whole gland pituitary extract, starting with gr. $\frac{1}{2}$ of each and working up to a point at which the patient loses 1 to 2 lb. a week. Some cases may require as much as gr. 15 of each extract a day. More accurate regulation of the dosage can be obtained by repeated estimations of the sugar tolerance. Reliable desiccated preparations should be used.

Obesity of Genital Origin

The tendency to obesity, observable in both sexes after castration, is generally attributed to the loss of the secretion of the genital glands. That treatment by extracts of these glands has not up to the present proved effective may be due to lack of effective preparations. The same may be said of the treatment of eunuchoid obesity. It is possible that genital grafts may ultimately prove to be the solution of these problems. Some of these patients can undoubtedly be helped by dietetic measures, others by thyroid extract. As their basal metabolism is sometimes low and carbohydrate mechanism usually defective,

the latter is probably the best method of treatment at present available.

Transition Forms

A number of cases of obesity develop at times when the function of the ductless glands is known to be disturbed; for instance, in women after childbirth or at the menopause, or after some infectious illness. They are not usually regarded as cases of endogenous obesity, but due rather to the sedentary habits and overfeeding of convalescence. In other persons, under exactly similar circumstances, obesity does not result, so that presumably there must be some additional factor. The mechanism of these persons for dealing with sugar corresponds to that of the endogenous type, the curves being nearly always abnormal. Again, treatment by diet and exercise is frequently ineffective in reducing their obesity, while good results can be obtained from treatment with thyroid and whole gland pituitary extracts. It would appear advisable to take all these points into consideration when dealing with any individual case of obesity.

LXXII

CHRONIC NASAL DISCHARGE IN INFANTS

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Coryza Neonatorum

Acute rhinitis in infants is of importance, because this affection may produce intranasal changes with a chronic discharge. Moreover, when older children are brought to us with "chronic catarrh," which is said to have begun with "a cold in the head" at or shortly after birth, a knowledge of the varieties of coryza neonatorum assists in elucidating the pathogenesis and in suggesting suitable treatment in each case.

There are three varieties of the acute rhinitis from which an infant may suffer shortly after birth :

1. Coryza neonatorum simplex, which is due to air-borne infection and which resembles the cold in the head of adults.

2. Coryza neonatorum blennorrhœica, in which the discharge is profuse and purulent from the onset and is caused by leucorrhœal or gonorrhœal discharge in the mother's vagina at the time of birth ; the nose is infected directly or from the eye through the naso-lacrymal duct.

3. Coryza neonatorum syphilitica, the nasal symptoms of which are manifestations of the secondary stage of inherited syphilis.

At an early period of the illness it may be difficult to determine which of these affections is present. It is usually found, however, that when a healthy infant contracts coryza after birth the symptoms appear later, are less severe, and of shorter duration. In the blennorrhœal variety the onset within the first day or two of life of an abundant and persistent discharge of pus, sometimes containing gonococci, and the swelling of the nose and crusting of the nostrils are outstanding features. Snuffles may be the first and for several weeks the only sign of a syphilitic infection. Confirmatory evidence of the existence of this diathesis is supplied by the characteristic signs on the buttocks, around the anus, and at the angles of the mouth. This specific coryza differs from the other varieties also in that the nose is drier and the nasal discharge is thicker and tends more to crust.

Coryza neonatorum, whatever its origin, is always a serious ailment owing to the swelling of the lining membrane of the nose and accumulation of secretion which prevent nasal respiration. The instinct to breathe by the nose is strong and mouth-breathing is not readily adopted, so that a constant tendency to suffocation is produced. The nasal obstruction interferes also with sucking, which has to be stopped at very brief intervals to allow of breath being taken. The efforts to obtain a sufficient supply of air and food cause rapid exhaustion, and when to this are added complications in the larynx and chest owing to an extension of the inflammatory process and the low vitality of the majority of these little patients, the outlook becomes extremely grave.

The indications in coryza neonatorum are: to maintain the strength, diminish the catarrh, improve the nasal patency, guard against infection of the conjunctiva if it has escaped, and treat any underlying dyscrasia. It is necessary to act promptly. Spoon-feeding or a tube must be used. If the inspiratory efforts tend to cause aspiration of the tongue the infant must not be laid on its back. The crusts filling the nostrils should be softened with warm almond oil or paroleine and removed. The pus and mucus in the nasal fossæ should be liquefied by instilling at intervals with a medicine dropper a few minims of a warm solution of bicarbonate of soda (3 gr. to 1 oz.) or other alkaline detergent. Great care must be taken that the fluid does not reach the naso-pharynx in any appreciable amount owing to the danger of causing otitis. When the discharge is thinned it should be mopped or sucked out of the nose by means of an all-rubber pear-shaped syringe having a long tapering end. The catarrh is best treated by silver preparations. The nitrate is most in favour instilled or used as a paint (2 per cent.) and less often as an insufflation (2 parts with talc 100 parts). Argyrol (10 per cent.), protargol (4 per cent.), collosol argentum, etc., are also recommended. If obstruction is great owing to swelling of the mucous membrane the passages may be painted every two hours with adrenalin solution (1 in 10,000). Cocaine is not admissible except in weak solutions ($\frac{1}{2}$ per cent.) and at long intervals, and menthol has produced fatal glottic spasm in babies. The skin of the nostrils and upper lip should be smeared with cold cream in order to counteract the tendency to excoriations and eczema.

In congenital syphilis constitutional treatment is of first importance; the local measures outlined above, or, if considered preferable, a paint of colloidal mercury or insufflations of calomel and sugar (1 in 25) may be employed. When there is a tendency to dryness of the nose tampons soaked with diluted Mandl's solution (iodine gr. 3, iodide of potassium gr. 12, glycerine 1 oz.) may be introduced.

Osteomyelitis of the Superior Maxilla

Osteomyelitis of the superior maxilla causes a variety of nasal suppuration occasionally met with. This affection in most cases sets in suddenly one to three weeks after birth, with general disturbance and unilateral local signs. Of the latter, the principal are swelling of the eyelids, cheek, alveolus, and palate on the affected side; formation of an abscess below the inner angle of the eye; and discharge of pus from the eye, nostril, and alveolus. Later, a tooth protrudes through the swollen alveolus and being loose is easily removed. Access is thus obtained to a comparatively large cavity containing pus and often communicating with the nose. This cavity is a dental sac, but it has been repeatedly mistaken for the antrum—which in early life is smaller than the sac—and the affection has been described as empyema of the antrum of Highmore in infants. Areas of bare bone may be detected in the alveolus and outer wall and floor of the nose; and during the later course of the disease sequestra are extruded. In some cases that have succumbed the whole upper jaw has been found necrosed. Metastases occasionally take place. The disease has been attributed to various causes, but the most probable is a blood-borne infection.

In the early stages of the disease special attention should be paid to nutrition of the infant in order to help it to withstand the effects of a long and debilitating illness. Free escape should be provided for purulent collections, but it is rarely necessary to incise the skin below the eye, and if possible this should be avoided. A tooth projecting through the gum should be removed. The patient may come under our care when there is merely a purulent discharge from the nose, alveolus or a sinus. Search should then be made for sequestra and their removal effected provided this does not entail a severe operation, which is badly borne and liable to be followed by disfigurement.

LXXIII

CHRONIC NASAL DISCHARGE AND SINUSITIS IN CHILDREN

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Foreign Bodies in the Nose

Occasionally a child pushes a foreign body into his nose without the parents' knowledge. If the object is hard or metallic—e.g. a bead or button—no trouble may arise until years later when a calculus has formed around it which causes obstruction, ulceration, and sanious discharge. On the other hand, when the object is soft or absorbent—e.g. sponge, paper, or wool—it soon becomes a foul purulent focus. The pus trickles from the affected nasal passage, excoriating the nostril, and the breath is fetid. Headache, aural and other symptoms may also be present. Inspection generally reveals the foreign body, but if it is covered with pus, concealed by the swollen mucous membrane, or offers no resistance to the probe its detection may prove difficult. Under such circumstances, or if the child is young or intractable, a few whiffs of adrenalin solution (1 in 10,000) should be sprayed into the affected nasal passage and a general anæsthetic given. If chloroform is chosen no adrenalin should be applied after narcosis is commenced. A thorough rhinoscopic examination is thus possible, and with a probe search can be made beneath the inferior turbinate and in the upper parts of the nose. The body having been located should be extracted by means of nasal forceps, a hook, or suitably bent probe. All manipulations should be carried out as gently as possible in order to keep the field free of blood.

Chronic Rhinitis

This term comprises: (1) Affections of the nose, in which the lining membrane has undergone chronic inflammatory changes. These are commonly caused by colds, influenza, the exanthemata, etc., irregularities of the nasal chambers, sinusitis, and adenoids. (2) The groups of nasal signs—the chief of which

is hypersecretion—manifested by certain general diseases—e.g. early tuberculosis, intestinal toxæmia, nephritis, etc.

As a rule, when the intranasal changes are slight or absent the discharge is serous or mucous, and when pronounced, muco-purulent. A serous or seromucous discharge is an early sign of simple chronic rhinitis. At this stage of the disease the inferior turbinates swell unduly, causing partial nasal obstruction and secrete excessively, thus giving rise to snuffling and running nose. Colds are readily contracted and the discharge temporarily becomes muco-purulent. In the course of time the congested inferior turbinates undergo hypertrophy. Obstruction and muco-purulent discharge are then constant and the inferior turbinates even after the application of cocaine, are flabby, especially along their lower edges and at both ends.

Chronic rhinitis is often associated with adenoids and tonsils. When these are removed before the stage of turbinal hypertrophy is reached, cure of the nasal catarrh generally follows. On the other hand, if permanent enlargement of the inferior turbinates has taken place, and is left untreated, the removal of the tonsils and adenoids will not free the child of its nasal symptoms. The frequency of these enlargements has so impressed some rhinologists that the recommendation has been made to reduce the inferior turbinates in every patient operated on for tonsils and adenoids. This is an over-estimate; nevertheless, inquiry should be made in all cases of adenoids as to symptoms of excessive swelling of the inferior turbinates—e.g. pronounced variations at short intervals in the patency of the nose, stuffing in the morning or in a warm room, which passes off on going out of doors, and blocking of one or other side of the nose from time to time. If nasal obstruction and hypersecretion occur independently of adenoids, the parents should be cautioned as to the harmful effects of overheated and close rooms, too little exercise, and too much food. The sending of a city-bred child to the country or of a boy to a preparatory school often dispels all nasal symptoms.

Intermittent obstruction due to turbinal congestion may be benefited, at least temporarily, by a camphor-menthol spray or ointment. A chronic discharge of mucus or muco-pus may be diminished or checked by a nasal wash. For this purpose a warm solution of bicarbonate of soda or common salt (1 drachm of either to one pint of tepid water) is effective. Elaborate formulas made up as powders, tablets, or solutions for the preparation of nasal washes may be found in the lists of manufacturing chemists, but it is doubtful whether these possess specific virtues. Their beneficial action probably is chiefly mechanical. The main requisite in a wash is that it does not irritate the nasal mucous membrane, particularly the olfactory epithelium, and so lead to blunting or loss of the sense of smell. Astringents such as alum and zinc salts are banned on this account.

When the discharge persists or recurs on contracting a slight cold, operative measures may be necessary. The shrivelling of the swollen inferior turbinates by the application of fused chromic acid or the galvanocautery may suffice. If hypertrophy is established it may be reduced by scissors and snare. This should be done sparingly so that the turbinates may not be undersized when the nose is fully developed. The resection of a deviated septum should be postponed until the patient is at least 17 years of age.

One of the most intractable nasal discharges is that following scarlet fever; it is largely purulent. The inferior turbinates are not enlarged and their lining membrane is not thickened. Nasal washes are only of temporary assistance; mild cauterisation with solutions of chromic acid (10-50 per cent.) afford most benefit. Frequently the antra and several of the other accessory sinuses contribute to the discharge and demand treatment both on this account and because of the recurrent infections—e.g. pneumonia—to which they give rise. When a vasomotor disturbance exists in addition to the turbinal congestion, sneezing may be a pronounced symptom. The obstruction, rhinorrhœa, and sneezing are then usually paroxysmal in character—they set in suddenly, are severe while they last, and cease abruptly. In such cases protein sensitisation and nervous exhaustion must be investigated. When the former can be excluded benefit is most likely obtainable from a course of arsenic.

Some children suffer from a watery nasal discharge which may excoriate the nostrils and upper lip. No turbinal swelling or other intranasal abnormal condition is found. The patients are usually of poor physique and backward; they feel the cold readily, suffer from chilblains, and sometimes from enuresis. Thyroid extract and calcium preparations are indicated in such cases. A unilateral watery discharge is usually due to unequal patency of the nasal passages, especially from deviation of the septum. The discharge comes from the wider fossa when out of doors on a cold day. The application of the cautery or escharotics to the inferior turbinate on this side, unless it is much hypertrophied, is useless or even harmful, because a considerable amount of the discharge is not secreted by the turbinate, but is due to condensation of the moisture in the expired air. The proper treatment is to equalise the patency of the two sides, but when this involves the correction of the deviated septum operation must be postponed, unless the circumstances are exceptional, until the patient is fully grown.

Sinusitis

Anatomical investigations, post-mortem examinations, and clinical experience all go to prove that the accessory sinuses of the nose, even in early infancy, may be the seat of inflammatory and suppurative processes. The infection causing these comes

oftenest from tonsils and adenoids, acute colds, measles, scarlet fever, diphtheria, and pneumonia. The commonest symptoms are nasal discharge, obstruction, and cough. Occasionally a severe local disturbance with orbital, intracranial, or other complications arises. In some cases the sinusitis is unaccompanied by local symptoms, but acting as a septic focus causes frequently recurring colds in the head, arthritis, nephritis, laryngitis, pulmonary affections, etc. Dean recommends that if, after the removal of tonsils and adenoids, the usual improvement is not obtained, the child continuing listless, pale, with poor appetite, etc., and if, apart from the respiratory tract, the systemic condition is satisfactory, toxæmia should be suspected and search made for a septic focus in the nose or its accessory sinuses.

When the accessory cavities in infants and young children are under suspicion, radiographs should be taken in order to determine which sinuses are present, and their size. Unfortunately, this method in the young is not helpful in diagnosing disease, owing to the pictures of the cavities being ill-defined. The source of a purulent discharge may be discovered by inspection of the nasal fossæ, but oftener no pus can be seen. The pharyngoscope sometimes proves a useful aid. Exploratory sounding, aspirating, and washing may be employed when the sinuses are sufficiently developed. The ethmoidal cells and antrum are of chief clinical importance in the young, the frontal sinus of least. Usually several sinuses on the same side are involved.

The first step in treatment is the removal of the tonsils and adenoids. The improved ventilation which results is followed by the cessation of the sinus discharge in the majority of young patients. Nasal washes and instillations—e.g. argyrol 10 per cent.—should be used to reduce the swelling of the nasal lining membrane and so facilitate drainage of the sinuses. Outdoor life in a warm climate has a beneficial effect. Skillern has found vaccines of greater service in this class of sinus disease than in any other. The ethmoidal cells, frontal sinus, and antrum have been opened and drained in patients even under 3 years of age, but excepting in the case of the antrum such operations are rarely called for. When the patient is over 8 years the antrum can be reached from the inferior meatus and intranasal treatment carried out as in adults. Reference to a radiograph will usually show that this method is not applicable in younger children owing to the floor of the antrum being still too high in relation to the attachment of the inferior turbinate and that attempts to enter the cavity will endanger the rudimentary teeth. For the latter reason the canine fossa route also is not available.

LXXIV

THE TREATMENT OF RUPTURED MUSCLES AND TENDONS

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A muscle or its tendon may become lacerated either subcutaneously or as part of an open wound. The following remarks are confined to subcutaneous rupture.

A muscle is usually torn as the result of a sudden and almost involuntary contraction, and the tearing may be partial or complete. The most common site is the junction of the tendon with the fleshy fibres, but the tendon itself may snap or be separated from its attachment, sometimes carrying with it a fragment of bone. A common symptom is sudden pain as though the limb were struck with a cane; the snapping of the tendon may be heard at the same time. But frequently the only symptom noticed is the weakness of the limb. The muscles or tendons most often ruptured are the tendo Achillis, ligamentum patellæ, quadriceps extensor, plantaris, adductor longus, biceps cubiti, and extensor tendons of fingers. These, too, are the muscles most frequently involved in the injuries of athletes.

Rupture of the Tendo Achillis

The heel tendon is the most frequent to rupture. The injury occurs when the tendon is subjected to any sudden or forcible strain, of which dancing is a traditional example. A gap can be felt between the divided ends, but by bringing the foot into the attitude of equinus the interval is lessened and good union always takes place under proper treatment. I know of no instance during the last 12 years at the Royal National Orthopædic Hospital, where tenotomies are very frequently performed, where union failed after tenotomy of the tendo Achillis for congenital talipes—and this in spite of the fact that the tendency is deliberately to increase rather than diminish the gap after section. In treating this condition there is no need to make the patient lie up. All that is necessary is to raise the heel of the boot by adding half an inch of leather and to prevent movement at the ankle. This is accomplished by attaching a rigid metal rod to the heel of the boot and running it up behind the leg to terminate in a padded leather calf band which buckles to encircle the limb

just below the knee. The patient will quickly accommodate himself to this appliance and walk with the limb rotated outwards. To keep the ankle quiet in bed at night a splint should be worn with foot and calf pieces so arranged as to keep the foot in slight equinus. Daily massage of the calf muscles with the foot grasped and held in the equinus attitude will help recovery and maintain muscle tone.

Another simple and efficient method is that devised by Lynn-Thomas through personal experience of the injury. A flattened strip of aluminium is moulded to the dorsum of the foot and front of the ankle and leg. It is then encased in a thick india-rubber tube and is worn between the tongue of the boot and the lacing, the lower strands of the boot-lace being made to encircle the splint to avoid undue pressure. The metal and rubber do not extend upwards much beyond the boot. The appliance may be discarded at the end of six weeks; by then the ends of the tendon will be united by strong white fibrous tissue.

If the tendon has parted from its insertion and taken with it a fragment of bone it is best to cut down and explore, and replace the fragment either by bone-pegging or suturing with kangaroo tendon. The appliance described above should be worn after about 14 days until bony union is established.

Ligamentum Patellæ

This tendon is usually torn in a strong effort to avoid falling backwards. It may break in the middle or at either end, in which case it is not uncommon for a piece of bone to be detached at the same time. The rupture is more often complete and the patella is retracted well upwards. In partial rupture the patient should be kept off his feet for a fortnight or longer, according to the severity of the injury, with the knee extended on a splint. A pad should be applied above the knee and bandaged so as to keep the patella pushed downwards. The extensor cruris group of muscles should be massaged daily, for they incline to waste rapidly in any serious injury about the knee-joint. In complete rupture the best treatment is to operate. The same precautions are necessary as when the knee-joint is explored. The joint capsule will be found torn and will require suturing. The tendon should be repaired with strong catgut. If a tibial or patellar fragment has been avulsed it should be reattached by wire or kangaroo tendon. For three weeks after the operation the limb is kept on a bed calliper with a knee-cap and a pad to keep the patella pushed downwards. When the patient is about to get up it is a wise precaution to have his bed calliper converted into a walking calliper, which he should wear for another fortnight or so. Daily massage should be given during the whole time, and when he begins to get up—i.e. three weeks after the operation—active and passive movements of the knee are commenced.

Quadriceps Extensor Tendon

This muscle is torn in much the same way as the patellar ligament. Owing to the attachments of the expansions of the vasti to the patella and tibia, it is unusual to find a wide separation of the ends. The treatment is the same as for the patellar ligament—i.e. explore and suture the divided ends after removing blood from the joint and closing the capsule. The after-treatment is also the same. In the elderly, or where for some reason the operation is ill-advised, a good result may still be obtained by wearing the bed calliper with knee-cap and pad for six weeks or so, and then, when up and about, a walking calliper for a further period of six to eight weeks.

Plantaris ("Lawn-tennis Leg")

What is commonly called "lawn-tennis leg" has been variously attributed to laceration of one or more of the following structures: the plantaris, soleus, inner head of gastrocnemius, aponeurosis, and deep plexus of veins. Therefore at best the diagnosis is speculative. The most typical symptom is a sensation of being struck by a stone on the calf, followed by weakness of the leg. The limb swells, and sooner or later there is a patch of discoloration due to extravasation of blood. On palpation a gap may be felt in the aponeurosis of the leg with distinct local tenderness. The limb should be treated by raising it for a few minutes to allow the veins to empty as much as possible. Brown holland strapping is then applied in overlapping strips of about an inch and a half wide, extending from just above the ankle to the upper part of the calf. The plaster bands should not encircle the limb completely; there should be an inch gap in front. The patient should then be told to walk freely. He may hesitate in bringing his heels down, but he should be encouraged to do this and to walk with a full step. The strapping will be loose in three or four days and should be then reapplied. The plaster is renewed at intervals up to a fortnight or longer until the patient has recovered sufficient confidence to dispense with it.

The essential points in the treatment are the splinting of the lacerated tissue by the plaster and the patient's own active movements. Massage is unnecessary.

Adductor Longus ("Rider's Strain")

Rupture of the adductor muscles of the thigh is an injury to which hunting men are liable. It is produced by the sudden grip of the saddle when taking a fence or in controlling a restive animal. A hæmatoma of varying size develops and underneath a gap can be felt in the muscle; there is frequently pain and discomfort which may extend to the perineum, and in a day or two there is considerable discoloration. The treatment should

first be directed towards dispersing the swelling and relieving the pain. This is best done by gently massaging the area from below upwards. A pad of wool is then placed over the seat of the injury and pressure maintained by a bandage applied in spica fashion. The massage is kept up for three or four days, and then the limb is strapped and the patient encouraged to move about.

The rest of the treatment resembles that of "lawn-tennis leg." Quiet riding may be resumed in a fortnight.

Biceps Cubiti

The biceps is torn more frequently than any other muscle in the upper limb. The rupture occurs during violent contraction in either the short or the long head or in the belly. Of three cases in my experience, one occurred whilst coal-mining, another during a climb in the Alps, and the third when carrying a load. This last case was characteristic. Two soldiers were carrying a plank when one of them accidentally dropped his end, and the other, suddenly lurching forward, felt something give way in the arm. All three patients complained of weakness in flexing the forearm. There is no difficulty about the diagnosis; on contracting the arm a prominent lump forms in front in striking contrast to the other limb; where only one head is torn this is retracted, leaving a groove where the tendon sheath only may be palpated, with the undamaged head running alongside.

Owing to the great tendency to retraction, massage is of little avail; the only satisfactory treatment is to operate and suture the torn muscle. Of the three cases cited two refused operation and no improvement resulted. The third had the muscle exposed and the inner head was found ruptured with the lower end coiled up. The sheath was intact for its greater part. The upper end of the tendon was pulled down inside its sheath and the two ends united by catgut. The arm was nursed in the flexed position on a splint for ten days, when massage and passive movement were commenced and the splint retained for another ten days. After that the patient was allowed gradually to use the arm and recovered completely.

Extensor Tendons of Fingers ("Mallet Finger")

The finger extensor tendon is frequently torn by a blow on the end of the digit. This occurs in the cricket field and amongst housewives when making up beds. The terminal phalanx drops with inability to extend it. The tendon is often only partially torn or the fibrils frayed. The best treatment is to splint the finger for three or four weeks according to the severity of the injury. A duralumin splint half an inch wide and extending from the finger-tip to the head of the metacarpal is applied with strapping and padded with wool. An extra small pad of wool is

applied between the splint and the tip of the finger to promote slight hyperextension of the terminal phalanx. This splint is worn for ten days and then a shorter splint reaching to the web of the fingers is applied. When the splint is left off the finger is massaged and active movements commenced gradually and increased until full voluntary extension is possible.

LXXV

THE TREATMENT OF SPASMOPHILIA

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Spasmophilia is a term which includes infantile tetany, both in its obvious spasmodic forms of carpopedal spasms, convulsions, or laryngismus, and also in its latent forms. In the latter recognition rests on the appearance of Chvostek's facial sign, Trousseau's sign (muscular spasm on pressure over large arteries or nerves), or Erb's sign of increased excitability to the galvanic current. The condition being a symptom-complex rather than a disease the treatment must be directed towards a correction of the underlying error of metabolism or nutrition, as well as towards an alleviation of the more urgent spasmodic symptoms.

The many advances during the past seven years in our knowledge of the factors concerned in the production of spasmophilia are due directly to researches into the chemistry of the blood, made possible by recent developments of micro-chemical methods of analysis. Prior to these but little advance had been made for a hundred years. The treatment advocated in the text-books of 1920 (and even later) differs very little from the sedative, purgative, and hot-bath treatment of the text-books of 1820. It had long been known that there was a close association between infantile tetany and rickets; that tetany was peculiarly prevalent during the winter and spring months; that digestive disorders were a strong predisposing factor. But now we can add to these clinical observations certain facts gathered from experimental and chemical investigations which point us more directly towards the exact nature and causation of the condition. A preliminary re-statement of some of these will make clearer the principles of treatment to be detailed later.

Biochemical Considerations

1. Measures which lead to an alkalosis increase the spasmophilic symptoms, while the administration of acids has a contrary effect. An example of this is the not uncommon occurrence of a case of mild latent tetany being thrown into active carpopedal spasms by the administration of large doses of alkalies, either by the mouth or in the process of blood transfusion.

2. The rôle of an alkalosis in the production of tetany is confirmed by a study of the examples of tetany in adults which may follow forced breathing and excessive vomiting. In each case the body is being depleted of acid radicles, CO_2 being washed out of the blood in "hyperpnœa tetany" and HCl being lost in the vomited stomach contents in "gastric tetany."

3. The most constant chemical fault in infantile tetany is a diminution of the calcium content of the blood. The normal level is about 10 mg. per 100 c.cm. of blood. If for any reason it falls to a level of about 6 mg. per 100 c.cm. spasmophilic symptoms will result.

4. The calcium content of the blood may be reduced under any of the following conditions: (*a*) Deficiency of calcium in the diet—e.g. use of a too dilute sweetened condensed milk. (*b*) Deficient absorption of calcium from the bowel—e.g. in intestinal indigestion where there is an excessive loss of calcium in the stools. (*c*) Lack of exposure to sunlight—e.g. a seasonal fall of calcium in the winter months has been demonstrated. (*d*) Diseases of the parathyroids.

5. Where sufficient calcium is available for absorption a restoration of a lowered blood calcium can be brought about or helped by: (*a*) Administration of acids, especially in the form of hydrochloric acid or ammonium chloride. (*b*) Exposure to direct sunlight, or artificial ultra-violet rays. (*c*) Administration of cod-liver oil, when a diet deficient in vitamin-containing fats has been a factor.

Treatment based on these points is being found by clinicians to yield satisfactory results. Readers wishing to go more deeply into the subject should consult the writings in recent years of J. Howland and W. M. Marriott, J. B. S. Haldane, H. Casparis and B. Kramer, K. Scheer and R. Salomon, Adlersberg and Porges, N. Paton and L. Findlay, D. Burns, P. Gyorgy, and others.

Management of a Case

Management includes (*a*) general measures devoted to a correction of errors likely to affect calcium utilisation or produce alkalosis: (*b*) emergency measures directed towards a relief of the urgent spasmodic symptoms such as laryngospasm, convulsions, etc. In a mild or latent case general measures will suffice, and should be continued until all evidence of spasmophilia disappears. In a severe case with spasmodic symptoms the general treatment must be promptly instituted and eagerly pursued, and reinforced by some method of local and symptomatic treatment.

General Measures.—In the child's diet and digestion lies the fault in the majority of cases of idiopathic infantile tetany occurring in the winter months, the lack of sunlight acting as an "accessory after the fact." An ample supply of calcium must be provided and any errors of digestion corrected to ensure

efficient absorption. After a few hours' starvation, while a purge is being given, a suitable diet of cows' milk should be prescribed or, when possible, breast milk should be given. Additions should be made to the diet of foods relatively rich in calcium—for example, cabbage, turnip, and oatmeal—given in the form of vegetable purée, with the addition of oatmeal gruel. If there is any doubt about the supply of calcium in the diet calcium chloride in doses of 10 to 15 gr. two or three times a day should be added. Intestinal indigestion should be treated on the traditional lines of cutting down the intake of fat and excess of carbohydrates and giving an increased amount of protein. Skimmed cows' milk or protein milk serves as a suitable basis of such a diet. Potatoes, bread, and rice, containing relatively little calcium, should be replaced by vegetable purée, oatmeal, junket, and meat. An initial dose of castor oil should be followed by a daily powder containing calomel, rhubarb, and ginger suitable for the age of the child. Cod-liver oil plays a part in the absorption or utilisation of calcium and should be given in all cases. A teaspoonful of a 50 per cent. emulsion twice a day suffices.

The chief hygienic measure is to have the child nursed as much as possible in the open air and sunlight. The modern fashion of withdrawing children from out-of-doors sunlight to indoor artificial light treatment is to be deplored; but at certain seasons, and in large industrial towns, a daily exposure to mercury-vapour lamp will serve as a useful supplementary method.

Most important, however, of the measures of general treatment is the systematic administration of acids, best given as hydrochloric acid or ammonium chloride. A child of 12 months should have up to half a drachm of acid hydrochlor. dil. (B.P.) diluted in 10 oz. of water in the 24 hours. The acid solution can be suitably given as a diluent to the milk, care being taken not to reach the proportion of acid to milk which will produce clotting—roughly 1 part of acid solution to 2 parts of milk. Ammonium chloride is just as efficacious. After absorption the ammonium is converted to urea and HCl liberated. The drug must be given well diluted. A suitable dose is half a drachm, dissolved in 10 oz. of water, to be taken during each 24 hours, or added to the milk.

Symptomatic Treatment

The chief urgent symptoms of spasmophilia are convulsions, laryngospasm, and carpopedal spasm. Success in their relief will be but temporary unless general treatment has been instituted. When called to see a child who has had a convulsion, the first step is to decide that it was spasmophilic in origin. Chvostek's sign (a sudden spasm on tapping one side of the face) will usually decide the diagnosis, but meningitis, polio-encephal-

itis, pyelitis, pneumonia, and other diseases should be excluded. A hot bath with cold compresses to the head is a valuable therapeutic measure which will almost certainly have been resorted to by the nurse or mother. In the presence of an actual spasmophilic convulsion, preparations should be made for a rectal washout and the rectal administration of chloral hydrate while the hot bath is being given. Chloral hydrate is remarkably effective and safe in these cases. For a child of 12 months a dose of 5 to 10 gr. dissolved in water should be left in the rectum after a preliminary washing out. If the child is able to swallow, 2 gr. chloral hydrate should be given by the mouth instead. In refractory cases an inhalation of chloroform should be used. A practitioner called to such a case should take a rubber catheter, a solution of chloral hydrate, and chloroform.

Laryngospasm, or *laryngismus stridulus*, is an urgent spasmophilic symptom; though improbable, it is yet possible that the condition *may* be fatal, the spasmodic closure of the glottis going on to produce cyanosis, convulsions, and death. The child should not be moved until the urgent symptoms have been controlled, since exposure to chill and fright, such as might occur in a cab on the way to a hospital, exercise a deleterious effect. Hot sponges should be applied to the larynx, while chloral hydrate and rectal wash-outs are used. While awaiting the effect of treatment it is wise to confirm the diagnosis, excluding laryngeal diphtheria or impacted foreign body.

The symptoms of *carpopedal spasm* are not necessarily urgent, but usually require active special treatment, leading after a few hours to much pain and discomfort. The child is usually miserable and crying. Successions of hot baths with chloral hydrate or antipyrin should be tried, until the general measures of treatment have produced their effect.

Chronic and Refractory Cases. Parathyroid Treatment

Almost every case of spasmophilia—i.e. of idiopathic infantile tetany, or "spring" tetany—yields readily to treatment on these lines. In the rare case of persistent or recurrent tetany which resists treatment there is commonly some chronic bowel condition, such as cœliac disease or idiopathic dilatation of the colon, which demands treatment. If, however, there is no chronic intestinal disease to account for it, a disease of the parathyroids may be suspected. I am in no position, however, to say how this can be proved, for in those cases of persistent and recurrent tetany in a child in which I have been forced to this diagnosis, various samples of parathyroid gland had no effect. The whole question of parathyroid therapy in tetany is centred in the problem of the preparation of an active extract. No doubt there will be great scope for its use when this problem is solved,

and the recent experiments of Collip and Clarke[1] appear to mark a definite advance. Nevertheless it is improbable that spasmophilia in infants is due to a parathyroid lesion. If it were so we would not expect it to be so readily curable as it is without the aid of parathyroid treatment.

[1] Collip, J. B., and Clarke, E. P., "The Extraction of a Parathyroid Hormone which will prevent or control Parathyroid Tetany, and which regulates the Level of Blood Calcium," *Journal of Biological Chemistry*, 1925, lxiv. 485.

LXXVI

THE TREATMENT OF IMPETIGO CONTAGIOSA

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Impetigo contagiosa has the distinction of being the commonest of all skin diseases, the preponderance being even more obvious in hospital than in general practice. Fortunately, in most cases its treatment presents no great difficulty.

Routine Method

The principle upon which successful management of the condition is based consists in a frequent removal of the characteristic "stuck on" scabs by bathing, followed by the use of almost any weak antiseptic ointment. The most popular and most satisfactory application is an ointment of ammoniated mercury, 10 gr. to the ounce of vaseline. The routine of treatment has become so stereotyped that in many out-patient departments printed leaflets with the necessary directions are kept for distribution to the out-patients. The scabs are to be bathed off with warm water thrice daily and the ointment applied immediately. It is not advisable to cover the affected part (unless necessary to protect it against rubbing) with a dressing or bandage. Healing seems to take place more quickly if the sores can be allowed to remain exposed to the air. Possibly this is because the streptococcus, the causal organism, grows best anaerobically. The essence of the treatment, then, lies in the frequent removal of the scabs by bathing, and this measure alone without any application of ointment would be sufficient to bring about healing in most cases, although perhaps more slowly than when assisted by the use of oi tment. In any case the procedure indicated above is invariably successful in an ordinary attack such as is commonly seen on a child's face, the most typical situation of the disease. But in special circumstances and situations the method may be modified with advantage.

Modified Methods suited to Special Conditions

Pemphigus Neonatorum.—For example, in very young infants I am inclined to think that boric ointment is preferable to a

mercurial ointment, even if very weak, because it is less likely to be irritating to the tender skin. In the newly born there sometimes occurs a condition known as pemphigus neonatorum. In this, as the name suggests, the tiny transitory vesicles of impetigo are replaced by large blisters. Unlike ordinary impetigo, although apparently caused by the identical streptococcus, this is a very dangerous disease and often ends fatally. Here boric baths are useful, and it is sometimes possible to prepare and use an autogenous vaccine with good effect. But in bad cases this disease runs a very rapid course and the issue may be decided before the vaccine can be got ready.

Impetigo of the Scalp.—On the other hand, in impetigo of the scalp, the skin of which is less easily irritated than that of the glabrous regions, it is advisable to use a stronger ointment than usual—e.g. the ordinary unguentum hydrargyri ammoniati of the British Pharmacopœia, the strength of which is 25 gr. to the ounce. Moreover, it is to be remembered that impetigo of the scalp is very often secondary to pediculosis, and by using a fairly powerful mercurial ointment the primary disease may be cured at the same time.

Impetigo of the beard region is often awkward to deal with. On the one hand it is inclined to be aggravated by the daily shave, and any slight abrasion of the skin facilitates the spread of the eruption, while if the beard be allowed to grow the dried and encrusted discharge clings round the stubby hairs and makes it very difficult to keep the surface clean. Perhaps the best course is to compromise and to instruct the patient to shave on alternate days and to be careful to use a weak antiseptic solution (e.g. biniodide of mercury solution in a strength of 1 in 4000) both before and after shaving to lessen the chance of auto-inoculation. For the same reason it is wise not to attempt too close a shave, but the razor should always be very sharp as nothing irritates a tender skin so much as the pulling of a dull blade. Most men refuse to put ointment on their faces during the daytime, but they should be encouraged to bathe the face frequently with boric lotion to remove the quickly forming crusts, and they can at any rate employ ointment at night. Impetigo of the beard region is especially important because if neglected or unwisely handled it can easily become complicated by the advent of a secondary staphylococcic infection resulting in the production of furuncles, while simultaneously the whole surface of the skin becomes inflamed and erythematous. In short, we then have presented to us the clinical picture known as *sycosis*, a condition notoriously difficult to treat successfully. In cases of impetigo of the beard region the help of the pathologist and the early preparation of a vaccine may be extremely useful in preventing this untoward development.

Cracks and Fissures.—Another troublesome and sometimes obstinate development of impetigo is the formation of painful cracks or fissures, either at the corner of the mouth, in the

vestibule or at the angle of the nose, or behind the ears. They sometimes seem to arise quite apart from any obvious impetiginous eruption, but bacteriological investigation shows that they are caused by the same type of streptococcus as is associated with frank impetigo and consequently can be considered as of like nature. Sometimes they heal up with simple ointments, but are prone to recur. I have known fissures resistant to the weak ammoniated mercury ointment which yield to it when 10 gr. of resorcin are added to each ounce. The stick of lunar caustic is often useful, especially if the fissure is bordered by rather exuberant granulations. This, as a rule, only happens when the crack is situated at the corner of the mouth and extends on to the mucous membrane. In more obstinate cases I have almost always found that one or two small doses (half a pastille) of X-rays will promote sound healing, and I have also had good results from ionisation with zinc.

Impetigo secondary to other Complaints

A word of warning is necessary as to the treatment of impetigo when secondary to other complaints, such as eczema or scabies. When eczema is complicated by impetigo, which frequently happens in occupational eczema of the hands, the treatment of the impetigo, which is an integral part of the management of the case, must be conducted so as not to aggravate the primary disease. It is advisable in such cases to remove the scabs by soaking them off with olive oil or liquid paraffin rather than by bathing with water or watery solutions of antiseptics. In such cases, too, boric ointment is usually found to be more easily tolerated than a mercurial preparation.

When impetigo is grafted upon scabies, the primary disease is often effectually masked. It is important to be on the watch for this combination of eruptions as it is useless to treat the impetigo while neglecting the scabies. On the other hand, if the usual method of treating scabies be employed the impetigo will often disappear *pari passu*, and in any case will be favourably modified. Any widespread impetiginous eruption, in which the buttocks, groins, and axillæ are implicated, should put the practitioner on his guard, and any septic and pustular eruption on the hands is exceedingly likely to be secondary to scabies.

In babies and young children widespread impetigo may also be secondary to that common eruption which causes so many sleepless nights to children between the ages of 2 and 6 years, and to their parents, and which rejoices in so many names—e.g. gumrash, strophilus, urticaria infantum, lichen urticatus, etc. Here the secondary impetigo is very important because it forms part of a vicious circle. It aggravates the original disease, and consequently causes increased irritation and scratching, leading to more impetigo. The treatment of urticaria infantum

itself, often a difficult problem, lies outside the scope of the present article; boric baths and boric ointment form the best method of attacking the impetigo, and when this has been subdued the little sufferers are often greatly relieved even as regards their urticaria.

LXXVII

MASTURBATION IN YOUNG WOMEN

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The term masturbation is here used to cover all means employed in order to experience, through the individual's own body, pleasure which is normally gained in sex intercourse. These means include manipulation of the genitals manually or with instruments, crossing and rubbing the thighs, and indulgence in erotic phantasies without handling the genitals.

When a patient presents herself for treatment, our first concern is to help her to understand the true significance of the habit, for it is merely an outward sign that mental and spiritual development have not advanced hand in hand with physical development. It is permissible for the small child to love his own body and all the pleasures associated with its functioning, but if the growing girl and young woman are to add each her contribution to the evolution of the race, then they must forsake the paths of childhood, where self-love is the dominant note, and advance to a new viewpoint from which they have vision of personal insignificance in comparison with racial development. That this is a true interpretation is proved by the patient's attitude of childish evasion of all the problems of life, and the extreme disharmony into which she is thrown by the ever-recurring remorseful conflict provoked by indulgence in what she regards as a sinful habit. Our duty it is to help her to achieve harmony by facing responsibilities, great and small, and by directing all her faculties in unison to the art of living. A thorough physical examination is absolutely essential in this as in all psychological states, since high endeavour may be brought to naught by the backward pull of physical debility. Any weight or tension in the pelvis must be relieved by attention to constipation, to tight clothing (including the present-day weight-reducing rubber corsets), and to dysmenorrhœa. The latter point is of extreme importance, as the period of congestion preceding the onset of the menses is a critical time, during which an orgasm may occur in sleep, even if temptation has been resisted by day.

Before entering on further details of treatment, it is helpful

to trace the habit back to its roots, which may be in early childhood or in girlhood. This at once destroys the plea put forward by the patient that she is helpless in the grip of an inborn or, as she may say, hereditary weakness, against which resistance is futile, and thus she can be led to accept personal responsibility. And investigation of the origin of the habit may in other ways prove helpful. In one case, for instance, a patient, badly in the grip of masturbation, expressed great disgust at the obsessive power in her thoughts of enema syringes in association with certain shops in Charing Cross Road, where these and other appliances are displayed. On carrying back her thoughts to childhood, her earliest recollections of self-abuse were found to be inseparable from the administration of enemata for an extreme degree of constipation. An enema syringe was thus found to be (in the subconscious) not a thing she hated but the motif of her sex-phantasies and the instigator of indulgence. The Charing Cross Road shops were also proved to give, in reality, an additional fillip to her phantasies, and to heighten the pleasure of masturbation.

Early to bed and early to rise is an excellent adage to recommend, while the tonic effect of a morning cold plunge (for those who react with an exhilarating glow) is undoubted. A sedentary life sets an obstacle in the path of progress, not only because it produces, or retards recovery from, constipation, but also because periodically it gives rise to a pent-up feeling which demands an outlet and finds it most easily through indulgence in masturbation. Although the opposite point of view has been put forward—i.e. that an exhilarating walk has a provocative effect on one who is predisposed to masturbate, it is the general experience that subsequent fatigue negatives the initial sense of desire (should it occur), so that we can confidently recommend physical exercise in excess.

Strict avoidance of enervating atmospheres (moral as well as material), of openly or subtly erotic literature, plays and conversation, must be earnestly urged, so long as the patient is still traversing marshy ground, since these may turn victory to defeat. Many women have found, to their dismay, that intellectual work which has not proceeded smoothly is apt to provoke sex feelings. If this be the experience of the patient under treatment, then every effort must be made to reorganise her life till she is on terra firma. But it is absolutely essential that the alternative work suggested should demand a keen coördination of all her energies in achievement and thus provide an adequate outlet for her sex urge.

It may be well to repeat here, what has been said often before, that the modern psychological attitude towards masturbation as retarded development and not a sin must be made very clear to the patient, since the object of treatment is to concentrate on development and to discourage the negative attitude of resistance to temptation and remorse over failure. It is frequently

necessary to repeat the explanation with varied phraseology and, as the patient's confidence is gained, to drive it home with illustrations gleaned from her own account of struggle and failure. However much we endeavour to capture the patient's imagination with the lure of an adventure in development, she must at the same time feel the support of practical ideas. To one patient, incredibly childish in her outlook on life, the suggestion was made to attack the problem of growth by making a list of minor evasions of responsibility. Among them she included: failure to brush the teeth regularly, inability to rise when wakened, dawdling over dressing, and unpunctuality.

Many authorities have advocated manual outdoor labour as the most satisfactory solution for refractory cases, but it is possible, when such an arrangement is not feasible, to provide the right atmosphere in quite other surroundings, as proved by a report received recently from a woman of 41 who had masturbated since childhood, and for some years earned her living with the minimum of effort in wealthy families. Writing from the institution in which, at the suggestion of the writer, she had accepted work, she said the life there had been incredibly hard and even painful, but that never once, since her arrival six weeks previously, had she even experienced any temptation to masturbate.

From these few suggestions on treatment, it is obvious that atmosphere is the most important element in successful handling, and that even at the first interview the patient should, so to speak, experience the tonic effect of a bracing wind. Everything depends on the physician's capabilities as regards successful investigation, initiative to meet the needs of individual cases, or even the varying needs of one case, sympathetic understanding which begets confidence, and a certain driving force which carries the patient along and which both inspires and energises her. The response to treatment is sometimes very rapid, but some cases make a grave demand upon the physician's patience, initiative, and staying power.

Certain views which are frequently put forward upon the subject of masturbation demand critical attention. Some, for instance, contend that the harmfulness of masturbation is grossly exaggerated, and that it serves a useful end in providing an outlet for sex feelings till marriage becomes possible. Three objections can be opposed to this contention. (*a*) That the injuriousness of the habit consists in the fact already pointed out, that it is an indication of arrest of growth, whereas the world has need of men and women who have attained to the full stature of development; (*b*) that the social ideal to be aimed at is an increasing inter-dependence of the sexes, whereas masturbation renders a woman sexually independent of men; (*c*) this independence may, later, wreck a woman's chances of married happiness, for some women have, even early in married life, fallen back on masturbation because through it they

experienced greater satisfaction. Others suggest that an outlet should be found in an irregular union, but overlook the fact that this is a pitiful evasion and not a solution of the patient's problem, if we accept it to be one of growth. Such a course inevitably increases the sense of conflict and disharmony, and brings with it an added burden of secrecy. Still others put forward what appears to be a plausible suggestion in advising the woman to avail herself of an opportunity of marrying, marriage being thus offered as a cure for masturbation. This is surely a poor conception of marriage. If we hold the function of wifehood and motherhood in high esteem, is it not well that the woman in question should first put from her childish things and plough the furrow of self-education with earnestness of purpose, before she attempts the difficult task of adjustment to marriage and motherhood? Also, in view of the fact that marital intercourse may offer a lesser satisfaction than masturbation, is it not better that the woman should first on her upward climb arrive at the point where she discovers that the habit of masturbation has fallen from her life as a worn-out and useless garment? For in some such words has many a one expressed to me the consciousness of increase in mental and spiritual stature.

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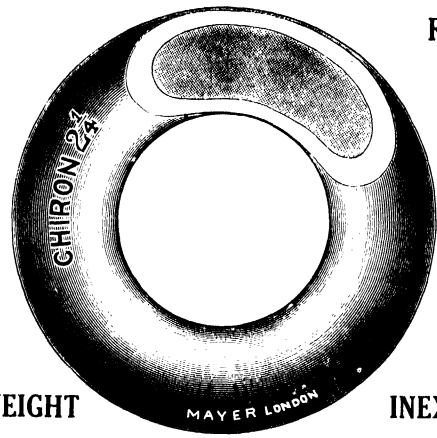
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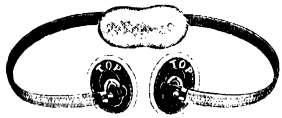
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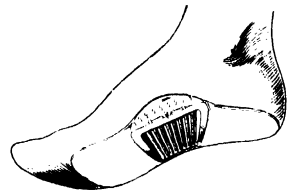


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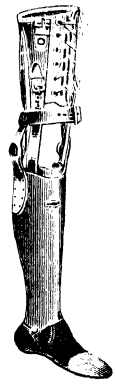
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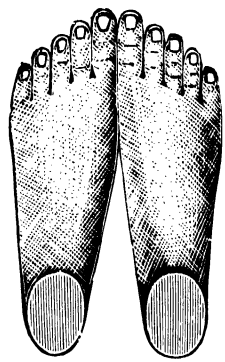
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