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# THE ANTISEPTIC.

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## Original Articles.

### • THE GENERAL TREATMENT OF SYPHILIS.

BY

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 I HAVE already written briefly on the arsenical and mercurial treatment of syphilis,† and have shown that the latter still retains its place as the capital form of treatment. While arsenic is undoubtedly useful as an accessory drug, especially in the form of Donovan's Solution, all evidence tends to show that none of the new organic preparations of arsenic are capable of replacing mercury in the treatment of syphilis. It is true that the symptoms of syphilis may temporarily disappear under treatment by these preparations, but relapses are common—according to one authority, more common and more severe than after mercurial treatment. In fact, these preparations cure the symptoms, but not the disease. Further, there is increasing evidence to show that all the organic preparations of arsenic are liable to cause dangerous toxic effects. Atoxyl has been abandoned on account of its causing optic atrophy; Arsacetin, which was at first supposed to be free from this danger, has been abandoned for the same reason; the latest and most vaunted preparation—Arsenobenzol or “606”—was also said to be quite free from this danger, but some doubt has been cast on this assumption by certain recent observations.

I have also pointed out that the majority of cases of syphilis can be treated successfully by administration of mercury by the mouth; that

\* Specially contributed to *The Antiseptic*.

† See Nos. 7 and 10 of this Journal (Vol. VIII).

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 the most energetic method of giving mercury is by inunction; that  
 mercurial injections are useful when inunctions cannot be carried out,  
 that soluble injections are more rational and safer than insoluble;  
 that mercurial treatment should be commenced as soon as the diagnosis  
 is certain, and that it should be continued for several years, never less  
 than two.

There are three systems of mercurial treatment—the symptomatic, the continuous, and the intermittent. The first system, which consists in giving mercury only during the presence of symptoms is now generally discarded, and it is pretty generally recognised that mercury should be given either continuously or in regular courses with intermissions. The continuous system, advocated by SIR JONATHAN HUTCHINSON, is generally carried out by pills or some other form of internal medication. The intermittent system, advocated by FOURNIER, may be carried out by a series of courses of inunctions or injections, generally of six weeks' duration, with intervals of rest between the courses, the intervals being gradually extended as the treatment proceeds. Intermittent treatment may also be carried out by internal medication, with or without a preliminary course of inunction or injection. Personally I think mercurial treatment should be practically continuous till the secondary symptoms have disappeared, or at any rate for the first year; after this the treatment may be continued with intermissions. I think it a good plan to begin with a course of six weeks' inunction whenever feasible, but I do not regard it as essential. The after treatment can be well carried out by internal medication, generally in the form of pills. In the case of relapses during this treatment or in the case of severe symptoms occurring with or without previous treatment, more energetic measures must be taken in the form of inunctions or injections and the administration of Iodide of Potassium and other accessory drugs.

**Iodide of Potassium.**—This is the most useful accessory drug in the treatment of syphilis, but it will not cure the disease by itself. In fact, iodide cures the lesions of syphilis but does not prevent others recurring. It is useful in all stages of syphilis; not only in the tertiary stage as is generally taught. In cases which "hang fire" or are resistant to mercury the addition or temporary substitution of iodide will often bring about the desired result. As regards the dose of iodide, there does not appear to be any advantage in overloading the system with enormous doses, and if the lesion under consideration does not yield to doses of 10 or 20 grains, three times a day, it is generally wise to try something else. It may be mentioned here that Iodide of Potassium or Sodium is far superior to the so-called substitutes, such as Iodipin, etc.

GAUCHER considers that the action is due to the alkaline iodide and not to iodine, and that iodine and its organic preparations have no appreciable effect.

**Arsenic.**—We have already dealt with the organic preparations of arsenic, and have shown reasons for discarding them. The double iodide of mercury and arsenic known as Donovan's Solution is, however, a most useful accessory drug in cases which do not yield to the above-mentioned treatment. It should be given in gradually increasing doses, from 5 to 10 or 20 minims thrice daily. Donovan's Solution and also Fowler's Solution are especially useful in cases of syphilitic anæmia.

**Quinine.**—Quinine has been used for some time as an accessory drug in the treatment of syphilis, and is recommended by several authorities. MAJOR FRENCH finds it very useful in the early stages of the disease when there is syphilitic fever, also when there is a history of malaria. Since the micro-organism of syphilis, the *spirochaeta pallida*, has been discovered and found to be probably a protozoon, and therefore allied to the malarial parasite, there appears to be more reason for the use of quinine in syphilis; but the effect of quinine on the *spirochaete* appears to be uncertain. A few years ago intravenous injection of quinine was tried by LENZMANN and NAPP in cases of secondary, tertiary and malignant syphilis. The dose of hydrochlorate of quinine injected was 50 centigrams. The first two or three injections were given with 24 hours' intervals; afterwards every second or third day. The results are said to have been good. No effect was obtained, however, from subcutaneous or intramuscular injections. So far as I am aware this method of administering quinine has not been repeated to any extent. Nevertheless, it would perhaps be better if more attention was directed to the administration of quinine in syphilis, considering the unfortunate results which have followed the use of the new preparations of arsenic.

**Sulphur.**—The administration of sulphur forms part of the treatment of syphilis as it is carried out at such places as Aix-la-Chapelle. Sulphur acts as an eliminator of mercury. The sulphur compounds, especially sulphuretted hydrogen, redissolve the sublimate which has combined with albumin in the body in the form of insoluble albuminate of mercury. Sulphur may be given either in the natural water from the sulphur springs or as an artificial sulphur water, such as the following:—Silicate of Sodium 0.1, Sulphide of Sodium 0.15, Sulphate of Sodium 2, Chloride of Sodium 6.5 grams, dissolved in a litre of water. Sulphur tends to prevent stomatitis and other toxic effects of mercury and is therefore useful when large doses are prescribed and

when the patient is saturated with mercury. In these cases the sulphur dissolves the mercury fixed in the tissues, as can be shown by analysing the urine. Sulphur baths are also useful in the treatment of cutaneous syphilis.

*Iron.*—This is useful in cases of debility and also in syphilitic anæmia, with or without arsenic. A useful pill contains 2 grains of blue pill and 1 grain of reduced iron. Tincture of perchloride of iron is also useful in cases of syphilitic ulceration of the throat, especially in combination with quinine.

*Sarsaparilla.*—This drug is not used now so much as formerly, but in the form of the compound decoction, it is a useful addition to mixtures containing mercury and iodide, and has a beneficial effect in cases of syphilitic cachexia. Sarsaparilla forms one of the chief ingredients of "Zitmann's Cure." This treatment consists in the administration of 4 pints of hot decoction, containing sarsaparilla and many other less active ingredients, every day, for 15 days. Every 5th day the patient takes a 4-grain pill of calomel. This treatment certainly has a beneficial action in cases of severe syphilitic ulceration, but as the patient is kept in a room heated to 80° F., it is debilitating. It is probable that the good effect is chiefly due to the ingestion of large quantities of hot water, which assist metabolism and promote excretion of toxic matter.

*General hygiene.*—A patient with syphilis should pay attention to his general health, and should avoid as far as possible everything which would tend to lower the resisting power of his tissues. His diet should be abundant, plain and nutritious. Alcohol should be taken in strict moderation. A little beer or light wine with meals may be taken by those who are accustomed to these beverages, but spirits should be avoided. Excess in alcoholic indulgence is almost certain to aggravate the disease, and the association of syphilis with the effects of chronic alcoholism constitutes a disastrous pathological combination. The patient should get as much fresh air as possible, but should avoid exposure to cold, for mercury renders the body more liable to the effects of changes of temperature. Tobacco may be indulged in with moderation, provided there are no lesions in the mouth, but if these are present they are aggravated by tobacco smoke. Exercise, short of fatigue, is beneficial, but violent forms of exercise, such as football, etc., should be avoided, for fear of straining the arteries, which are liable to be affected by syphilis. Syphilitic disease of the arteries combined with overstrain are, in fact, the primary and exciting causes of aneurysm.

Lastly, it is of prime importance to make the patient understand that his disease is curable if he carries out regularly the prescribed

treatment for the necessary number of years. Many patients are absorbed with the idea that the disease is incurable, and sink into a state of hypochondriasis and syphilophobia. Some commit suicide.

## \*THE TRAINING OF NERVOUS CHILDREN.

By

H. E. JONES, M. R. C. S. (Eng.) L. R. C. P. (LOND.)

In this twentieth century the peculiar problem of the parent the teacher, and the doctor, is the management of the nervous child. In secondary schools whilst the general physique and health of the children show fair progress, and whilst epidemic disease is, at least, not more rife than fifty years ago, yet the number of nervous children increases by leaps and bounds. To many I know, this will appear not altogether undesirable, for I often have parents telling me with pride what nervous, highly-strung children theirs are, evidently regarding this as a desirable distinction, in much the same way as an ignorant hospital outpatient will boast of her family as being very hysterical.

It is difficult to define exactly what we mean by "a nervous child." In medical work we use the word "neurotic" to express the same condition. I shall define the neurotic or nervous child as one in whom the emotions are easily excited, strongly felt, and not readily restrained. Such a temperament is compatible with the happiest and healthiest of lives; indeed, in a sense it is calculated to secure this, but unfortunately, by its abuse and mismanagement, it is more common to find the nervous child drifting towards lack of control, enfeeblement of will-power, or undue appreciation of real or imaginary physical ailments. The neurotic child becomes later the hysterical woman, or the sufferer from that most painful and fashionable disease, viz., "neurasthenia."

We hear a good deal now-a-days about "The Child's Inheritance," so let me say at the outset that this nervous temperament is, in nine cases out of ten, an inheritance handed on to the child from neurotic parents. This may seem so obvious as not to need comment, but I often find parents searching anxiously for the cause of their children's abnormality and failing altogether to attach to themselves the final responsibility. Nervous children are the product of nervous parents, including under the head, not only the insane, the neurotic, the alcoholic and the hypochondriacal, but also those persons who suffer from such diseases as migraine, asthma, epilepsy, and rheumatism. When the State

\* Specially contributed to *The Antiseptic*.

regulates the life of the individual and the home (and even before it does this entirely), the marriage of neurotics will be a criminal offence. this far-off day the supply of nervous children will be still further curtailed, for with the disappearance of stress and competition and with the improvement in the lot of the woman as well as man, we shall not see that tendency to nervous break-down or neurasthenia that so often appears at present during the middle years of married life.

Though heredity is the chief factor in the causation of the neurotic state, faulty up-bringing and bad example, together with the lack to train the faculty of attention play contributory parts of vast importance. Parents and teachers who allow their children to acquire bad habits of thought, who do not inculcate habits of self-control, and who do not carefully watch over the physical development of their children are surely and certainly laying up for them a future of neurasthenia or hysteria.

Such an infant is seldom breast-fed, for neurotic mothers will generally say that they are unable to feed the child, and if able, should not. The first trouble of the nervous child is therefore the selection of a suitable milk or patent food. No one food can be found that gives satisfaction to the mother, the nurse, and the baby, which at the same time will calm the infant's ceaseless cries, give rise to no vomiting, and soothe its restless nights. Before the problem is solved the child generally grows out of the stage of milky-foods, instead of rearing the infant on milk and barley water in their proper proportions.

The nervous infant is fretful and restless, waking every few hours at night, starting at the slightest sound, subject to fits of screaming, and a joy to no one but the mother, who, however, sees it at but infrequent intervals. The process of teething is especially eventful. At this period the digestive troubles are redoubled; convulsions are not infrequent, and "croup" lends a new terror to the night. Between the ages of three and eight years the evidences of the neurotic taint may assume many forms: a taste for eating garden soil or cinders as in hysteria; an over-sensitiveness to certain sights or sounds, or smells; abnormal shyness or groundless fears; night terrors and somnambulism; objections to certain articles of food; bed-wetting; disorders of the stomach or bowels; oft-repeated and unexplained feverish attacks. With these and other physical signs there is combined a mental attitude which the parents regard as "clever" or "sharp", other relatives as "precocious," and more distant acquaintances as "forward."

The time having come for the child to go to school, in the better-off children the question arises as to whether a day school or a boarding

school shall be selected. In nine cases out of ten I have no hesitation in deciding in favour of a boarding school, for in removing the child from his or her home we secure that less attention will be directed to the child's various sensations and trivial maladies, and at the same time we ensure a removal from the neurotic surroundings of the family life. In the home there is not only the danger of too much attention being paid to the child's physical peculiarities, but there is also the more serious danger of undue attention being paid to his mental development. These nervous children are, as I have previously stated, intellectually quick and bright, sometimes clever, and occasionally (and this is the worst combination of all) they have a touch of genius. The parents never forget this and they never allow the child to forget it. Friends and relatives are all told about the youngster's brilliant school career, how he is always top of his form; always a prize-winner, and how later on he is to take a scholarship. The child hears all this, and soon acquires an undue sense of his own importance which quickly renders him to other people an insufferable little prig. Later on such child not infrequently dominates the whole house. When his parent realises this, he may, by judicious snubbing and by the application of parental authority correct the evil, or it may be found necessary to send the boy to a boarding school to teach him his true position. This constant harping on the boy's school attainments is to my mind in all children one of the commonest causes of over-pressure of school-work and subsequent break-down. Every day the child is asked about his school marks, his position in form, his chances of a prize, and his prospects of beating some other boy. The periodical reports of his masters showing his marks and place in his form are eagerly devoured by his parents, and made the occasion of most serious family counsels. This spirit of competition not only fosters all that is meanest and most egotistical in the boy, but it keeps him constantly in a condition of nervous strain and high tension. As a result of this he begins to flag, and his work falls off slightly in value; he looks pale and develops twitching movements of the face or body, chorea, or other nervous symptoms, until before long the inevitable breakdown occurs. Fortunately such break-down is not at first very serious. It takes the form of head-ache, languor, peevishness of temper, lack of attention and inequality of work. The boy says he feels "rotten," and his parents regard him as "run down." A few days' respite from lessons speedily restores him, and this process is repeated once or twice a term. Other forms of nervous break down in neurotic children are attacks of sick head-ache occurring periodically, and even more common are feverish attacks accompanied by slight sore throat and vomiting. The

temperature in these attacks may remain high (100 to 102° F.) for several days, and for weeks it may be found half to one degree above normal. Such attacks of fever or vomiting are generally spoken of as "stomach attacks", or "chills on the liver." Whatever name be given, they give rise to great alarm to the parents, who, as the temperature keeps high day by day, begin to entertain thoughts of consumption. The thermometer is now used every few hours, and there are doubts as to its correctness. There are also doubts as to the capability of the doctor, and a desire for consultations at hospitals and elsewhere, for new remedies, and for multiplication of applications. By his parents' conversation, which is too often unchecked in the presence of the patient, and still more by their undisguised anxiety, the child is rendered extremely nervous, and begins to take note of every new sensation, and every trivial rise of temperature. In this way there is begun that unwholesome interest in medical detail which is so characteristic of the nervous child to-day, and of which I shall have to say more later.

There is one other characteristic symptom of the nervous child to which I wish to draw attention, namely, "fainting." If some of these highly-strung, excitable children are made to assume for a time some fixed position, such as standing at drill or at church, or in class, they suddenly faint. This used to be peculiarly the failing of girls, but has recently come to my notice in children of the other sex also. Such children are fortunate indeed if they fall into the hands of a common-sense medical man or teacher. Invariably, if they are taken to a specialist or consultant, something is said about a "weak heart," and for years the child's exercise is curtailed and his mind constantly oppressed by a fear of heart disease or sudden death.

It is not a frequent occurrence for a nervous child to utterly break down during school life from the pressure of over-work. Occasionally, however, a child becomes so listless and indifferent, suffers so much from headache, becomes so thin and pale, that he is withdrawn from school. This, however, is the exception; the chief penalties of over-working the nervous child are expected later on in life.

It is in the prime of life, when the man or woman has to meet the full stress of hard work and competition, that the ill effects manifest themselves, and it is then that nervous break-down follows, necessitating a diminished output of energy, a prolonged cessation of business, a rest-cure, or a permanent retirement altogether from the struggle. Occasionally the nervous and over-worked child does meet with ultimate success, but the penalty of such success is too often a life of misery from dyspepsia, and perhaps of melancholia.

I will remind you of secondary school-girls working forty-five to fifty hours a week, exclusive of the time spent in music practice. They are generally aiming at obtaining the Cambridge Higher Certificate or the London Matriculation, and as no ill effects beyond slight malaise accompanies this effort, parents are apt to think that no harm is being done. Probably the healthy girl gets through unscathed, but the highly strung, nervous child will be found almost certain to collapse: possibly when she has just finished a college career, and commenced an important life-work. The hysterical woman has been in nearly all cases a nervous child, and inquiry into the history of many a subsequent break-down reveals a childhood of easily excited emotions imperfectly controlled.

Space will not permit me to give in greater detail the characteristics of the nervous child. One can almost recognise the type in the streets. There is "a baleful light of intellect in the child's eye, a preponderance of forehead combined with a certain lackness of hair," the muscular development is poor and flabby, and above all there is a look of anxious care, of resignation, or of self-importance, which readily distinguishes this type from the average normal, healthy school-boy.

I pass on now to consider what line I think should be adopted by parent and teacher in the treatment of these children. In the first place, from the earliest years, an attempt should be made to moderate outbursts of excitement, whether they be expressive of bad temper, or whether they be pure childish hilarity. Extremes of emotion are not good for these children, and the wild excitement of games may do as much damage as paroxysms of temper. When spirits are getting out of bounds the attention should be diverted to more sedentary pursuits, table games, or reading. It is a great advantage if nervous children can be got to take interest in gardening, stamp collecting, or photography. Not less important is training in tidiness, regularity of habits, and concentration of thought. The children are peculiarly liable to be slap-dash in their methods, averse to routine, untidy, and unpunctual. Steady perseverance in correcting these propensities may be invaluable in ultimately securing that self-control which in future life must be the saving of the neurotic child. For a child of thirteen or fourteen, ten or eleven hours in bed is not too liberal an allowance, and nine o'clock is not too early for bedtime, whether evening preparation has been finished or not. It is not fair to send a child to bed with the prospect of being awaked by an alarm clock at an early hour in order that studies may be completed; sleep under such conditions is neither sound nor refreshing. The regularity of meals should be insisted upon, and

every effort made to make the child eat although there may be little or no inclination to do so. Breakfast, especially, should be provided at an early hour so as to give ample time before school begins. One of the commonest signs of the neurotic temperament in children is the distaste for food in the morning. This is partly due, I think, to the attention of the child being concentrated on school work and it is indeed an unhealthy sign when a child thinks more of its lessons than its food. It is no compensation for this that a hearty meal can be made at night; indeed, it is altogether undesirable for children to have a heavy meal later than about half-past six in the evening. Alcohol in any shape or form is prejudicial to the neurotic child. I am constantly asked if a little burgundy, port, medicated wine, or stout would not be beneficial. I have been asked this even by the friends of children in whose family there has been no taint of alcoholism. We should always remember that it is the neurotic temperament with lack of self-control which so often, later in life, degenerates into drunkenness or dipsomania.

Accuracy of statement even in a trivial matter should be enforced in the home. The neurotic has a vivid imagination, and in small children fancy is frequently interpreted and expressed as fact. The habit of romancing quickly grows on these children, and they are the origination of most of the weird and improbable rumours which spread with lightning speed amongst school children. The tales of devastating epidemics which immediately circulate when a case of infection arises in a school are started by these children of artistic temperament, to whom anything relating to disease is at once a fascination and a terror. Get such children then accustomed to speaking the plain truth, and try also to get them to appreciate truth when they hear and read it. Train the child to use its own judgment. Never talk to the child about sickness, or discuss symptoms or medicines before him. It is almost incredible—the facility with which children pick up medical information which although it inspires a certain amount of fear, yet suggests to them a priceless hoard of diseases and symptoms they may one day have. I have known a child often sob bitterly because he and a friend had diagnosed that he had pneumonia and was likely to die. Children of twelve to fourteen, of better class parents, are well acquainted with all the symptoms of the infectious diseases, and can talk fluently of adenoids, appendicitis, and uric acid. Do not drug these children if it can be helped, but let them be taught that medicines are dangerous things, to be used only on rare occasions. I know we doctors are at fault in this matter, but parents too often insist on just a tonic being needed, and we yield to their importunity. Let it be part of the child's inheritance to dwell in healthy surroundings

of thought and sight. Do not let the sensitive child, of whom I am treating more especially, see sick persons if it can be helped; their powers of receiving suggestion are so acute. Let me give you two trifling instances of this. A boy complained one morning of headache, "a queer feeling inside his head" and inability to remember facts immediately after he had read them. I prescribed him two or three days' rest from lessons. The next day another boy had the same symptoms, and on the third day there were four or five boys each with funny feelings in his head and inability to remember things just read. At this juncture, I handed treatment over to the master, and an immediate cure was effected. In another instance a girl contracted a peculiarly aggravating barking cough. Within a fortnight, nearly fifty girls had a similar cough, which was only cured by a threat to stop the approaching monthly holiday. Sometimes fussy mothers (and fussy mothers are the greatest offenders against nervous children) suggest symptoms to a child who is at school. One hears then say: "Have you that pain in the stomach now that you used to speak of?" or again "Are you sure the pain is quite gone?" and so on, till the child's mind manufactures a pain and it is the doctor's difficult task to dislodge it. When these nervous children are ill, parents should not express surprise at the long duration of the illness, or show anxiety regarding the severity of the symptoms. These are the children in whom all slight ailments are exaggerated, and the mother's unnecessary fear is only too soon communicated to the child.

With regard to the question of over-pressure of school-work I wish to be as brief as possible. To guard against it—abolish once and for all the spirit of competition which is, unfortunately, only too common in the homes of many nervous children. Let the child know that good behaviour and steady application to work will ensure commendation regardless of place in form, or successful rivalry with other children. Do not encourage the highly strung child to undertake the extra effort involved in working for a prize or scholarship. Pleasing as success may be to parent and child, both may have later on in life to confess that success has been purchased at too high a price. Whilst it is true that a nervous child may readily over-exert himself, do not be too ready when there is a sign of flagging to attribute this to games. Often I see boys and girls cut off from games because they come home tired, and yet cannot sleep, or because they dislike this or that form of exercise, and say it does not agree with them. Such children hear their parents speak of the roughness of football, and the great exertion involved by long runs, and they are quite ready to shirk a form of play at which,

perhaps, they do not excel. It is, however, more especially the nervous child that profits by school-games, for they learn those habits of self-control and self-reliance which are most needed in their characters.

One point in connection with work is, I think, often overlooked, namely, that uncongenial work, even though not excessive in quantity, quickly leads to brain-fag. Many children are worked out in the vain attempt to fit the round peg in the square hole. Especially is this the case with the nervous child, and as soon as possible such children should be allowed to specialize.

The last point upon which I intend to touch in the management of these children is that of corporal punishment. Whilst I believe that for the average boy corporal punishment is wholesome, salutary, and provocative of much good, yet I am sure it should be seldom employed on the more highly-strung, excitable children. I have known the fear of such punishment excite in a nervous child an attack of chorea of many weeks' duration, and the actual punishment may determine an outbreak of hysteria, or the commencement of a long period of nervous break-down.

It is not only the fear and pain of the actual punishment which affect these children; it is also the sense of shame and humiliation which affects them, where such feelings would be entirely foreign to those who may rightly be styled their thick-skinned friends.

In conclusion, I wish to emphasize the fact that I have been throughout speaking of exceptional children. If my methods are applied to the treatment of ordinary robust children they will do nothing but harm. The points I have tried to illustrate are these: The highly-strung, nervous child owes his condition partly to heredity, largely to training; and that, whatever may be the cause, there is as much need for special treatment as if the child were mentally deficient.

(To be continued.)

## SLOW HEART OR "BRADYCARDIA."

With Illustrative Cases.

BY

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A very slow pulse is rarely met with in health. The great Napoleon is said to have had a pulse-rate of only forty per minute. But excepting this example of super-human physiology, we do not find on record

many cases of so slow a pulse in men, under ordinary conditions of life. In the puerperal state the pulse may be even as slow as 34 per minute. It is also associated with hunger and old age.

Abnormally slow pulsations of the heart are sometimes only temporary, lasting but a few days, as after typhoid, influenza, and rheumatism.

In what is known as "paroxysmal bradycardia," the infrequency of the apical pulse is attributed to either a functional nervous cause or an organic cardiac cause. Cases of permanent bradycardia may be associated with degeneration of the myocardium.

Before enumerating the conditions that can reduce the pulse-rate to less than the normal, let us briefly pass in review the mechanism by which the heart-beats are maintained as they are in health. Having discarded the "ganglionic" theory of the rhythmic contraction of the heart, physiologists are now looking upon the cardiac muscular tissue itself as possessing that property of contractility. Further, the stimulus of contraction is shown to start near the sino-auricular junction, and pass in a regular sequence from the auricles to the ventricles along a bridge of muscular fibres, the bundles of His, that connect those cavities of the heart. It would appear that although the different parts of the cardiac muscle have in themselves the property of rhythmic contractility, they do not, in health, contract independently of one another. For example, the ventricles do not contract until after the auricles have done so. It is the *sequence* of events (that commence with the discharge of stimuli at the sino-auricular junction and end with the ventricular systole) that renders the circulation of blood through the heart possible. Each stimulus that originates at the sinus, after traversing the auricular muscle and inducing it to contract, ultimately reaches the ventricular fibres and brings about the ventricular systole. We see therefore, that, as long as the conducting muscular pathway is intact, every stimulus starting at the sinus will produce an apical impulse in due course. Conversely, if 72 apical beats are produced in one minute, we may conclude that they are the resultants of 72 stimuli generated at the sinus. In bradycardia (= slow heart) the number of apex beats, (*i.e.*, of ventricular systoles) may be reduced to thirty or even twenty per minute. The questions at once arise: Are the *stimuli* originating at the sinus reduced to that abnormal number? Or, the original stimuli remaining the same in number, has something happened to interrupt the conduction of these stimuli from the sinus *en route* to the ventricle? Or, thirdly, has the main portion of the ventricular muscle itself become

incapable of *responding* to the stimuli transmitted to it? Bradycardia may result from any of these causes, or a combination of them.

It is possible that the variations of certain internal secretions, like the thyroid, the suprarenal and the ovarian, alter the rate of stimulation of the sino-auricular spot. Until we know more about the origin of the rhythmic stimuli that start from the sino-auricular region, we are not in a position to explain the cause of the diminution in the number of stimuli per minute that the cardiac muscle receives. But we know from pathology that cases of bradycardia have at times shown lesions in the muscle fibres that propagate stimuli from the auricular to the ventricular walls. A *complete* arrest of the rhythmic flow of stimuli along the auriculo-ventricular bundles would soon result in a stoppage of the ventricular action. [The ventricle, although it can contract by itself by reason of its inherent contractile power cannot *time* its systoles in any sequential order in relation to those of the auricle.] A *partial* arrest of that flow or an impairment of the conducting power of the bundles, would mean the loss of a few of the stimuli that the ventricle should have received. Thus results one form of slow heart. Degenerated patches of cardiac muscle tissue, especially of those situated in the conducting pathway, lead to this form of bradycardia. Once established, this form of bradycardia remains permanent—unlike the nervous forms we shall consider later. Even if the conducting path remains intact, the pulse can be slowed when the *irritability* of the general mass of the myocardium to the stimuli supplied is diminished inordinately. The united strength of two or more stimuli may be required to induce one single systole of the weakened ventricle. We may in this way come across a case where the pulse, instead of being 72, has become only 36 or 24, per minute. The impairment of conduction or irritability may thus be due to either a local or a more general cause, both within the heart itself, either in the shape of a degenerative process, or of acute poisons (*e. g.*, aconite, digitalis, strophanthin, carbon-dioxide, or of the fevers) circulating in the blood. The slowing of the pulse, so common in the more serious of the organic valvular diseases of the heart, is to be attributed to the condition of the myocardium rather than to the mechanical defects of the valves themselves.

To turn next to the extra-cardiac causes of bradycardia, we have to remember that the inhibitory and the accelerator centres of the heart are situated in the medulla oblongata of the spinal cord, and that any over-stimulation of the vagus or its nuclei (by lesions in those regions) can retard the pulse-rate. A withdrawal of the accelerator stimuli may also precipitate a bradycardia, allowing the vagal control to

exercise more than its usual amount of inhibition. The vagal inhibition sometimes results from reflex sources of irritation—as in severe colicky pain. The higher controlling centres in the brain are in other cases responsible for the indirect slowing of the pulse. Their communications with the vagal nuclei, and their susceptibility to local and reflex irritations render them capable of acting on the heart indirectly through various channels of nerve reflex.

To summarise: An abnormally infrequent pulse may arise from:—

1. (a) Cardiac organic disease (with arterio-sclerosis).

*Examples*—in aortic stenosis; mitral stenosis; degenerations, inflammations.

- (b) Cardiac weakness of a temporary nature.

*Examples*—after typhoid, rheumatism, influenza, etc.

2. Nervous affections involving the vagal neurones or the higher cerebral neurones.

*Examples*—cerebral compression (by tumours or hæmorrhage); meningitis, and in some of the so-called “functional neuroses,” neurasthenia and melancholia; epilepsy, etc. These may be classified into (a) Organic and (b) Functional, causes.

3. Reflex causes, the reflexes operating either through the medullary centre or the higher brain centre.

*Examples*—the severe pain of colic, emotions.

4. The variations of certain internal secretions.

Slighter degrees of slowing of the cardiac pulse may be encountered in chronic dyspepsia, ulcer or cancer of the stomach, in pulmonary disease (especially emphysema), and in disease of the generative organs. These are probably of reflex origin. In jaundice, uræmia, anæmia, chlorosis and diabetes, either a toxin or malnutrition of the heart accounts for the infrequent pulse.

[The subject of Bradycardia is still in the hands of investigators.]

By the courtesy of Major T. H. Symons, the District Surgeon, I am able to report a few cases that I observed at the Rayapuram Hospital in this connection.

*Case 1.* A youth of about 20 years. Acute lobar pneumonia of right upper lobe. He had two attacks of the same previously. On admission, the pseudo-crisis was noticed (on the 7th day of the disease). The pulse was about 115 per minute with a temperature of nearly 103°F. The mitral first sound was a trifle less loud than normal. No

mitral murmur. No displacement of apex. The pulmonary second sound accentuation was maintained. The right heart was extending a little to the right of the normal limit. After crisis, the temperature fell to 97°, and the pulse was only about forty per minute. The day after the crisis the heart was beating only at the rate of about 32 per minute. I shall not linger long with the description of this case which presented more interesting phenomena worthy of note. For our present purpose it is sufficient to note that the pneumococcal infection (the sputum showed the cocci) was the cause of the bradycardia. Digitalis improved the condition.

*Case 2.* Andalatumal, aet. 20. Had a clear history of syphilis and gonorrhoea. No rheumatic fever. She had on admission a double mitral lesion, with great loss of compensation. The heart was dilated. The pulsations were irregular in rhythm and in force. Every fourth beat, sometimes every fifth, was missed. The asystolic interval occupied about the time necessary for two or three systoles. The first of the next series of systoles was markedly powerful. Syncopal attacks were a bad sign, with temporary cessation of the pulse and respiration. She had on the average four or five such seizures (Stokes-Adam's) every day. The pulsations of the heart per minute, between those attacks, were on 9th October only 36. Strychnine had no effect on the pulse-rate. Digitalis, on the other hand, raised the pulse-rate to 41 per minute on 23rd October. As she insisted on going home, she was discharged on 3rd November when the heart was beating at the rate of 43 per minute, and she passed three days without any attack of syncope. Here was a bradycardia with irregularity of the heart.

*Case 3.* Munisamy aet. 50. Admitted 7th September on account of a double aortic lesion. Recovered from rheumatic fever on 15th August 1911. It was a characteristic aortic case; but there was probably also some involvement of the mitral valve. The cardiac hypertrophy had displaced the apex  $1\frac{1}{2}$  inches outside the nipple line, in the 6th interspace. The right border of the heart was  $1\frac{1}{2}$  inches to the right of the middle line. Compensation was lost—orthopnoea, and giddiness. Occasional syncopal attacks. The pulse on 7th September was only 54 per minute; on the 29th it was 52. Squill and strychnine were the chief drugs used till now. Compensation was restored, although the tendency to syncope had not left him. Under digitalis the pulse rose to 77 per minute on 26th October. While being discharged the apex occupied a spot  $\frac{3}{4}$  inch outside the nipple line. This case of bradycardia presented no irregularity of the pulse.

## NOTE.

In all the three cases above-cited, the heart-beats were reduced in number, owing to the weakened condition of the myocardium. In case (1) an acute, and in case (2) a chronic, toxæmia was responsible for the cardiac asthenia. In case (3), the rheumatic toxin had started the myocardial insufficiency which became aggravated by the mechanical defects of the aortic valve. In case (1), no auricular fibrillation was noticeable; but in (2), there was marked auricular fibrillation. This was probably due to the fact that the acute infection of case (1) depressed the conductivity and irritability of the *whole* heart (including the auricular wall), and consequently, the auricles did not show any fibrillary contractions. In (2), on the other hand, the auricles could receive and respond to the stimuli from the sinus, but could not, in their turn, induce the ventricles to follow suit—either because the connecting bands of His were partially damaged or because there was degeneration of the bulk of the ventricular walls. The stimuli from the sinus came crowding into the auricular wall, and finding themselves obstructed or reflected back, set the fibrils of the auricular muscle into vibration. Case (1) was probably an example of the summation of two sinal stimuli producing one ventricular systole—thus reducing what would have been a pulse of 80, to one of 40, per minute. In case (2) also we may conclude that each sinal stimulus had to be reinforced by another in order that the resistance of the damaged muscle bundles (of His, especially) might be overcome. The pulse, in consequence, was 36 on the average instead of 72. The intermission of the fourth or fifth beats in this case may be explained on the supposition that even the sum of two ordinary stimuli may, in the case of a degenerating myocardium, fail to accomplish its usual ventricular systole. The intermission gave the exhausted fibres a chance for recovery, after which the ventricular action was resumed. Under digitalis, these intermissions were few and far between.

*Treatment.*—As regards treatment, I should like to make a few observations. It would not do, of course, to arrive at general conclusions from a few examples of the bradycardiac pulse. In case (1), a tonic dose of digitalis with iron, etc., gave us satisfactory results. In case (2), although there was marked mitral stenosis, the accompanying regurgitation at the mitral valve and the fibrillation of the dilated auricles indicated the administration of digitalis. The result, however, justified the means, in this case. But what shall be our guiding principle in cases of this kind?

Digitalis is said to decrease the conductivity of the cardiac muscle, and at the same time increase its irritability. If the abnormally slow

ventricular action was in consequence of its receiving too numerous and irregularly timed stimuli from the auricle, a decrease in the conductivity of the muscle would give us a more steady flow of stimuli to the ventricles. The auricular fibrillation would cease and the ventricles would be compromised to the altered circumstances, and perform their functions as usual. The digitalis, further, has added to the irritability of the ventricular muscle. In other words, with a reasonable number of stimuli, so to speak, and with the increased irritability, the ventricle is encouraged to do its work as usual. Care has to be exercised in administering digitalis; for, a toxic condition due to digitalis would by itself induce a "heart-block." Having found other cardiac stimulants wanting, I was driven to prescribe digitalis in case (2), although this drug is said to slow the heart. I would have *thirty* efficient and complete systoles of the ventricles rather than *forty* feeble hemisystoles, in the minute. Instead of slowing, the heart beat faster, and each of these beats was more satisfactory than before. Case (3), where also digitalis would be contra-indicated because of the aortic regurgitation, also improved remarkably—the pulse rose to 77, and the area of cardiac dulness was diminished. Owing to the co-existing aortic stenosis the danger of asystole was perhaps not great. Also, the mitral valve was incompetent. It would appear that digitalis, when indicated, can regulate cardiac beats, by reducing a highly frequent pulse to the normal, or by raising a very slow pulse to its proper frequency. And, whether we deal with a tachycardia or a bradycardia, of cardiac origin, this consummation is arrived at by the property of this ideal cardiac tonic in rendering the condition of the myocardium as near normal as possible. It is tempting to suppose that the presence of the active principles of digitalis in the blood would sometimes do duty for the internal secretions some of which are known to control cardiac action.

## Our Contemporaries.

### MEDICINE.

#### Heart Failure from Purgation.

Prof. W. JAWORSKI.—Text books point out that the consequences of chronic constipation include circulatory disturbances, such as a sense of anxiety and depression, palpitation of the heart, and dyspnoea; also that the symptoms of diseases of the heart are aggravated by chronic constipation. Frequently an attempt is made to relieve these symptoms by

purgatives, some using saline and mineral waters, and others the common laxatives. The results are usually more or less satisfactory, but there is a class of case—with or without manifest heart disease—in which purgation is useless or even harmful. Purgation in the first group elicits cardiac disturbances, and in the second group it aggravates them.

A widow, aged 65, had suffered for several years from constipation and taken numerous purgatives which used to cause diarrhoea. This was followed by general weakness, giddiness, depression and cardiac arrhythmia which kept her in bed and lasted for some days. She found the constipation the less of the two evils and abandoned purgatives.

On examination she was fairly well nourished, but pale. The pulse was 60, regular, rather hard and tense. The temporal arteries were tortuous, the apex beat was in the 6th space, and the second aortic sound was accentuated. The abdomen was flaccid, and the transverse colon, which could be felt as a hard band, was at some points tender on pressure. With the onset of the diarrhoea her expression was distressed, her pulse irregular and 70-80, the cardiac impulse was scarcely perceptible, and the aortic second sound was soft. After 2 or 3 days the symptoms disappeared. Instead of purgatives she was given oil enemata or suppositories weekly, but though she tolerated these better, yet they also induced slight cardiac attacks. The weakness of the heart was progressive, and she died 2 years later.

A widow aged 61, had suffered for 10 years from constipation. She took various purgatives which after defaecation, caused great weakness, dyspnoea, and a sense of depression in the chest and abdomen. She was therefore compelled to lie down for some hours. Her skin was pale and flabby, but she was fairly well nourished. The deep cardiac dulness was diminished, the heart sounds were soft and muffled, and the apex beat was neither visible nor palpable. The pulse was 65, tense, intermittent. The abdomen was somewhat distended and the sigmoid flexure could be felt as a hard band. Instead of taking the prescribed cardiac medicines, she dosed herself with purgatives as the subjective abdominal sensations worried her. Her general condition grew worse, and after violent purgation and 5 watery stools she was seized with great weakness, cardiac spasm, dyspnoea and a sense of abdominal oppression. The skin was pale and cold, and there was marked "facies abdominalis." There was slight oedema over the knuckles, the pulse was 90, scarcely palpable, and irregular. The heart sounds were weak and the liver, which was tender on pressure, extended 2 finger-breadths below the costal margin. The cardiac and general condition grew worse, and she died 3 days later with symptoms of cardiac asthma.

The writer reports three other similar cases. Such cases are rare in hospital practice, but are commoner than is generally supposed in private practice. Treatment must be based on a knowledge of the relation between the intestinal disease and the resulting cardiac complications. In all the writer's cases in which cardiac complications followed diarrhoea, the following conditions were present—pallor and coldness of the skin, general weakness and dizziness, a rapid, irregular, soft pulse; and feeble heart impulse and sounds. These signs indicate peripheral anæmia and the heart action is faulty for lack of blood. The majority of the writer's patients suffered from spastic constipation. This condition is due to the contraction of the muscles of the intestine, the blood vessels of which contain only a small quantity of blood. Now purgatives act in various ways. Some stimulate the intestine and thereby produce peristalsis—pendulum and other movements which have been previously inhibited by spasm of the intestine. In the case of oils, jalap, scammony, and podophyllin, this action is limited to the small intestine. Senna, frangula, cascara, rhubarb, and aloes act mainly on the large intestine. The various salines act on the capillaries of the intestine and cause transudation of fluid. Both the increased peristalsis and the transudation from the intestine increase the blood supply to the intestinal vessels. These include not only the mesenteric vessels, but also the capillaries of the mucous membrane and peritoneum. With severe purgation this hyperemia increases till hæmorrhagic gastro-enteritis sets in. The blood required to fill all these abdominal vessels is drained from the skin, muscles, and brain. The heart has less blood to work with, and if its reserve powers have been sapped by hitherto unnoticed myopathy, this condition will now become apparent. The increased activity of the intestine causes "reflex shock" of the feeble heart, which is also starved owing to the stagnation and faulty aeration of a large quantity of blood. This condition resembles that which occurs in septic peritonitis, when toxins act on the medulla oblongata inducing paralysis and dilatation of the abdominal vessels. These drain large quantities of blood from the periphery and brain, leaving the skin cold and pallid, and producing "facies abdominalis," a small rapid pulse, low blood pressure, and finally collapse. To what extent diarrhoea acts on the heart directly through the nervous system, is yet unknown.

The treatment of this condition, which usually occurs in elderly people suffering from spastic constipation, is very difficult, for purgatives and diarrhoea induce symptoms of heart failure due to latent or manifest inflammatory or nutritive changes of the myocardium, such as

chronic myocarditis, fatty degeneration, and arterio-sclerosis of the heart. The constipation may have to continue for days, and purgatives, including mineral waters, must not be used. Permissible are glycerine suppositories, water or oil enemata, and the galvanic current. Belladonna, lactose and magnesia usta may be given by the mouth. The diet should consist mainly of fats, vegetables, and fruit. All these precautions may, however, be ineffectual, and diarrhoea may occur, requiring more rigorous treatment. The patient should be put to bed, and the blood driven from the splanchnic area back to the skin, muscles, and brain by vaso-constrictor drugs, such as nux vomica, hot bottles which dilate the cutaneous blood vessels, drugs such as caffeine, alcohol, and vinum kolæ which dilate the vessels of the skin and brain, while they constrict the intestinal vessels. Further, the intestinal movement should be checked by opium, and the transudation of fluid into the bowels should be inhibited by styptics such as tincture of quinine. The difficulties of treatment increase with age, for the mechanism of cardiac inhibition and general control becomes less perfect with advancing senile changes till the slightest provocation evokes irregular action and finally heart failure. Besides these senile changes the heart may be weakened by acute infectious diseases such as pneumonia, typhoid, diphtheria, and scarlet fever, any one of which may cause heart failure on the appearance of diarrhoea. In these cases the patient often suffers from tympanites, the relief of which by purgatives produces collapse with "facies hippocratica." Purgatives should therefore be replaced by carminatives given by the mouth, and enemata.

The occurrence of cardiac symptoms as a sequel to purgation is of diagnostic value, and a latent, hitherto undetected, heart affection may be discovered by the administration over a period of 2 to 3 days of such drugs as jalap and senna. But this test does not disclose the seat of the cardiac disease, nor whether the muscular or the nervous system of the heart is at fault.—*The Medical Review.*

## SURGERY.

### Local Anesthesia.

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### Operations on the Thorax.

The thoracic of all organs presents the most frequent positive indication for the use of local anesthesia. The very existence of a disease involving these organs places at once a contra-indication against general

anesthesia. The various affections of the lungs and pleural cavity furnish the most frequent objects for surgical attack, but the circulatory organs are beginning to receive the attention of surgeons.

Pleural effusions, emphysema and lung abscesses may all be satisfactorily operated under local anesthesia. It is of interest to note that the disastrous accidents attending operations for these diseases are strangely infrequent when they are done under local anesthesia. It is in exceptional cases only that a general anesthetic is permissible. Decortication and thoraco-plastic alone demand a general anesthetic, and in these the available lung space has become accustomed, because of the chronicity of the disease to the performance of the respiratory function, and in consequence the use of general anesthesia is less dangerous than in acute conditions in which the respiratory system has not yet reached in adjustment to the new conditions.

*Exploratory Puncture.*—The diagnosis of fluid in the pleural cavity is made easily from physical signs alone, but in some instances difficulties present themselves, and it is advisable in all cases to demonstrate the presence of fluid by exploratory puncture before aspiration is attempted.

The most convenient site for puncture is in the seventh, eighth or ninth intercostal space in the anterior, mid or posterior axillary lines. When the amount of fluid is small, points nearer the spine must be selected.

An ordinary hypodermatic syringe fitted with a standard needle is sufficient if the thoracic wall is thin. In many instances a longer needle is required. The caliber of the needle is dependent upon the character of the exudate. In fresh exudations a fine needle is satisfactory, but in long standing exudates or purulent effusions a needle of larger caliber is required. A syringe capable of being boiled with the needle should be employed. If such cannot be obtained the needle should be boiled and the syringe chemically sterilized, preferably with formalin or iodine. The skin may most conveniently be prepared by painting it with tincture of iodine or by soap and water, followed by alcohol. Many practitioners use no anesthetic in making the puncture, but a local anesthetic removes the pain at and after the operation. Freezing effectually prevents pain in the skin from the initial prick, but is evanescent and is attended by after pain. Salt and ice pressed against the skin for a minute or two lessens the sensibility to a considerable degree. Neither of these methods produces an anesthesia lasting long enough to permit a careful exploration. Injection anesthesia is, therefore, preferable because it not only permits the operator to study the character of tissue through which the needle passes but, if therapeutic measures are to follow the exploration, the operation

may proceed at once. Quinine, because of its efficiency and duration, is the most suitable substance to be employed. Ten or twenty minims of a 1 percent. solution is drawn into the syringe, a fold of skin over the intercostal space in which the puncture is to be made is caught up between the thumb and forefinger, making it anemic and thus less sensitive. The needle is made to penetrate the skin at a slight angle and a few drops of the fluid are deposited in the skin. The needle is then gradually forced inward above the next rib below in order to avoid the intercostal vessels which lie in the groove of the upper rib. As the needle reaches the pleura the resistance is increased or the patient experiences slight pain. The remainder of the anesthetic fluid contained in the syringe is deposited at this point. An interval of a few seconds permits anesthesia to become effective and the needle may be pressed into the pleural cavity. The sudden lessening of resistance indicates the penetration into the pleural cavity. The syringe is then steadied with the left hand while the right gradually withdraws the piston. If the fluid is present it should appear in the barrel of the syringe. If no fluid appears it is either absent or the needle may be too short to enter the thoracic cavity or the fluid may be too thick to pass through the needle. If there is no fluid present the needle will strike the visceral pleura, which can be felt by the operator and usually the patient complains of pain. If there is doubt about the entrance of the cavity by the needle a longer one should be employed. If the physical findings for fluid are definite and the case is of long duration the possibility of the presence of a fluid too thick to pass the needle must be entertained and a needle of larger caliber employed. Adhesions at the site of puncture may give a negative aspiration. In that event the same procedure must be repeated in other likely situations. If the site of an adhesion is punctured the needle enters the lung. This is manifest by the entrance into the syringe of bubbles of air covered with blood.

*Thoracentesis.*—The former practice of awaiting resorption of pleuritic exudates has very properly given place to the removal of the fluid by aspiration. It has been the practice to await urgent symptoms or conclusive demonstration of the inability of the system to absorb the fluid before operation was resorted to. It is now becoming generally recognized that the absorption of the fluid even in the favorable cases is capable of injury to the patient. The sole objections to the operation are the danger of converting a sterile into a purulent exudate and the discomfort to the patient from the operation—or to the doctor if he be over-timid. All these objections can be effectively obviated by the use of local anesthetics.

*Apparatus.*—The correctness of the diagnosis having been demonstrated by exploratory puncture the question of the removal of the fluid must be decided. This may be best undertaken at the time of the exploratory puncture, for it saves the patient a second annoyance and the doctor a second preparation. The clinical diagnosis should be sufficiently accurate to determine the character of apparatus which will be required. The exact point where fluid will be obtained is known from the previously performed puncture. A tract for the aspirating needle in case aspiration alone is needed is already anesthetized, the interval between the puncture and the aspiration permitting perfect anesthesia to take place.

In the absence of more suitable apparatus a syringe holding a few drams fitted with a stopcock may be employed. It is a slow method and is trying to both patient and operator, but it is possible to remove large accumulations with this simple apparatus. The most suitable apparatus is the Potain aspirator, an instrument which should be in the hands of every practitioner, for if he is awake in his diagnoses he will find sufficient use to warrant its purchase. The principle of this apparatus is that of an air pump and its purpose is to produce a vacuum within the container intended to receive the fluid which will outbalance the negative pressure of the thorax and thus prevent the formation of a pneumothorax. A simpler improvised apparatus may be employed. A cork with double perforations is fitted with two glass tubes to which are fitted lengths of rubber tubing. To one of these the aspirating needle is attached and the other is employed by the operator to make suction to counterbalance the intra-thoracic pressure of the patient. Whether a needle or trochar shall be used is a matter of personal preference. The tracer being dulled enters less readily but has the advantage that when the stylette is withdrawn there is no sharp point to injure the expanding lung. The needle, on the other hand, enters readily, easily injures the lung, but it enables the operator to judge the character of the tissue through which it passes.

*Technic.*—All apparatus coming in contact with the patient should be prepared by boiling. The hand of the operator should not touch that portion of the needle which is to enter the tissue. The needle is passed along the tract of the puncture already anesthetized. This may now be accomplished without pain. It is often desirable to nick the skin with a scalpel, for the pressure of forcing a none too sharp needle may annoy the patient. The preliminary use of the scalpel is particularly indicated when a trochar is used. The point when the parietal pleura

is passed will be perceived by the operator. Suction may now be begun. If a Potain apparatus is employed the cock on the tube leading from the aspirator may be opened (the air having been previously pumped from the bottle) and the fluid will trickle into the bottle. When the flow ceases the stopcock on the tube leading from the aspirator is closed, the one leading to the pump is opened and the pump started. When sufficient vacuum has been created within the bottle the cock on the pump-end is closed and the other is opened, when the flow will start again. If the operator is sure his apparatus is working well the pump may be worked with both cocks open so that the fluid flows into the bottle as the air is being exhausted by the pump. If the improvised apparatus is employed when the aspirating needle is in position suction is made on the lead tube. The pinchcock on this tube should not be released before the tube is in the operator's mouth and suction started. The pinchcock must be reapplied each time the operator pauses to renew his breath.

*Amount of Fluid to be withdrawn.*—Whether all the fluid obtainable is to be withdrawn at the first sitting depends on circumstances. In neglected cases when a considerable amount of fluid is withdrawn a temporary irritation indicated by coughing may attend the expansion of the lungs or the replacement of the heart to its normal position may cause a sense of faintness. Either of these sensations, if at all marked, should be a signal to the operator to desist. In early cases the first evidence of discomfort is evidenced when the fluid is nearly all removed and the expanding lung causes the visceral pleura to come in contact with the end of the aspirator. Often by slightly withdrawing the aspirator or tilting the tip downward the pain can be relieved. When the operation is ended the aspirator is withdrawn and the opening is closed with gauze and collodion or adhesive. If it is necessary to interrupt the aspiration before the fluid is all withdrawn aspiration should be repeated after an interval of a few days.

*Permanent Drainage.*—Purulent fluid requires a permanent exit. In children this is satisfactorily accomplished by the introduction of a fair sized soft rubber catheter through a simple intercostal incision. A large trocar is sometimes employed through the sleeve of which the catheter is pushed and the sleeve withdrawn. It is often possible to employ this method under local anesthesia in quite young children. This method is especially efficient when permanent suction is applied to the drainage tube. This has been accomplished in various ways. The simplest method is by the permanent application of a

Potain aspirator. The negative pressure in the receiving bottle is kept at the point of easy tolerance.

*Rib Resection.*—In empyema, except in children, the resection of a rib is necessary in order to secure satisfactory drainage. Its diagnosis is less certain than is serous fluid by physical means alone, but before operation it is always advisable to demonstrate its presence by puncture.

*Instruments Required.*—The resection of a rib is a simple operation, but since it is always done upon a dyspnoic patient the complications are often annoying, and instruments sufficient to meet all possible emergencies should always be at hand. Aside from the usual syringe and solution for local anesthesia, a rib shears or a bone cutting forceps, a periosteal elevator, knife, scissors and a number of hemostats and a needle threaded with catgut should be provided. The latter may be needed should the intercostal vessels be inadvertently severed.

*Technic.*—The site of operation is selected, usually the seventh or eighth rib at the mid-axillary line and an area of skin disinfected either by iodine or soap and water. A line of skin three inches long is injected over and parallel with the rib selected for removal. The area immediately beneath the rib at both ends of the line of injection in such a manner as to deposit a pool of fluid about the intercostal nerve. Next the periosteum over the rib is freely injected. If the operator is not experienced in the use of local anesthetics it is better to wait until the periosteum is exposed before injecting it. A wait of a few minutes permits anesthesia to take place. An incision is made through the skin the length of the line infiltrated. The muscle over the rib is next incised. All hemorrhage should be controlled at this point. If the periosteum was not injected at the time of the initial infiltration it is now infiltrated by passing the needle between the periosteum and rib. The periosteum over the rib is then incised for a distance of two inches. The periosteum is elevated from the rib about its entire circumference, care being taken to remove it from the groove containing the intercostal vessels. The visceral surface of the periosteum must be loosened without perforating it. The periosteum being loosened for the entire distance of the incision the rib may be cut. At least an inch should be removed. The opening thus made has for its floor the periosteum and parietal pleura. All hemorrhage should now be checked. If the periosteal vessels have been cut they may be controlled by mass ligatures through the muscle. When all hemorrhage has been controlled the drainage tubes are made ready and the periosteum quickly incised and the tubes passed into the opening. The tubes must be sutured to the skin in

order to prevent their slipping into the thorax. Many operators permit the pus to flow out before a dressing is applied; others prefer to quickly apply a large snug dressing and permit the pus to gradually soak into this.

If the visceral periosteum is inadvertently opened the pus flows at once and the cutting of the rib and the control of any hæmorrhage that may appear must be done in a puddle of pus.

*After Treatment.*—The duration of the quinine anaesthesia is such that nothing is required for post-operative pain. The dressings must be removed as they become soiled. After the flow has lessened the tubes are gradually shortened and can usually be removed in from two to six weeks, depending on the nature of the infection, the earlier period of the pneumo-coccus or influenza bacillus is the infective agent, the longer if the empyema is secondary to some infection of the abdomen or pelvis.

*Drainage of Lung Abscesses.*—The drainage of abscesses of the lung is difficult only in locating them. Physical examination can usually determine their presence with a considerable degree of certainty, but it is only by aspiration that it can be proven and the exact location determined. The technic of exploratory puncture is not unlike that of exploration of the pleural cavity except that a longer needle is required and that the search is more prolonged and much more difficult. Physical examination must locate the lesion approximately and the point of the needle must be made to enter the suspected region. The density of the tissue which the needle penetrates can usually be perceived and often when the cavity is a considerable one the entrance of the needle into it is felt. Whenever resistance to the advancing needle suddenly ceases after passing through a comparatively dense area the piston of the syringe should be withdrawn in order to determine if pus has been reached. Often numerous punctures must be made at the same or at several sittings before the nidus of infection can be located. The needle must be removed at each change of direction. Usually withdrawing it until the point is just within the visceral pleura will permit the desired change of direction.

The pus once located, the exploring needle should be left in situ and a rib resected as explained above. When the pleura has been opened the needle may be followed by closed artery forceps in order to secure an opening large enough to admit a drain. Better still is the instrument devised by me for this purpose. The needle is straddled with the instrument which is then forced through the lung until its tip enters the abscess. The blades are then separated, the

needle withdrawn and a drainage tube substituted and the instrument withdrawn. This permits the tube to be introduced more quickly than if the dilatation is made with forceps.

If the pleural space is not obliterated by the adhesions of the parietal and visceral pleura, the area must be packed for a few days until obliteration does take place. It is often possible to determine if the visceral and parietal pleura are adherent by the sensation imparted to the needle when it is passing from the one to the other. If there are no adhesions, the movement of the lung will be felt by the tug upon the needle. This method is by no means a certain test, and it is only after a rib has been resected and the pleura opened that there is any reliable information obtainable. If the pleural space is obliterated, the abscess is drained at once. If there is a free space, the opening in the parietal pleura is packed with plain gauze in such a manner that it comes in contact with the visceral pleura, thus exciting adhesions. Reliable adhesions will have formed in three or four days. The method of obliterating the space by suture is not suited to local anesthesia and is objectionable because immediate suture does not certainly protect the pleural cavity from infection if the abscess be drained at once.

The opening of lung abscesses following pneumonia offers no difficulties under local anesthesia. Those following prolonged suppurative processes in the pelvis or abdomen in which the patient is often soaked for many months and usually more or less accustomed to the use of morphine are not favorable cases for local anesthesia. Unless the operator is experienced, both in the treatment of lung abscesses and in thoracic operations under local anesthesia, he will do better to place the additional burden of a general anesthetic upon the patient.

#### *Appendicitis and Operations.*

The whole difficulty in determining the time to operate in appendicitis is largely the difficulty in diagnosis. It is impossible to determine by the physical signs as to the nature of the individual attack, for example, whether the appendix is gangrenous or not. The pulse, temperature and leucocyte count are all useful clinical guides, but neither these nor the severity of the pain, nor of reflex symptoms of vomiting, etc., are sufficiently characteristic to assist us in differentiating the simple cases from those of the most dangerous form, and until an accurate clinical diagnosis can be made our only safe course is to remove the appendix the moment a definite diagnosis of appendicitis is made. There may be some instances where the general condition of the patient, or his

surroundings may necessitate delay, or may cause one to conclude that the direction of least risk lies in temporizing, but these cases are exceptionally rare.—*The American Journal of Surgery.*

#### **Appendicitis Without Physical Signs.**

BY

HERBERT J. PATERSON, M.C., M.A., M.B., F.R.C.S.

It is now generally recognized that chronic appendicular disease may exist without physical signs. Indeed the appendix may be the seat of gross lesions although there has never been a recognizable attack of appendicitis. In acute appendicitis the physical signs may be slight, in rare cases absent, so that there may be little indication of the serious condition of the patient. Chronic appendicitis may, especially in children, cause indefinite abdominal pain and discomfort, the origin of which is obscure, and the true cause of which is discovered only when the disease shows itself as an attack of acute appendicitis. In other cases chronic appendicitis may mimic gastric disease with remarkable fidelity ("appendicular gastralgia").

The writer has operated on 44 cases of appendicular gastralgia. In some, operation was undertaken for a supposed gastric or duodenal ulcer. Further experience has shown that in the majority of cases it is possible to make a correct diagnosis.

The prominent symptom is pain, varying in degree. Some patients describe the pain as severe, while others complain of severe continuous discomfort. As a rule the pain follows the ingestion of food, at a variable interval. In most cases the pain is referred to the epigastrium, usually to the left of the middle line. Sometimes the pain radiates downwards to the right iliac fossa, suggesting its appendicular origin. In one case the pain radiated to the left iliac fossa, and at the operation the cæcum and appendix were found there.

A feature of many cases is periodical exacerbations. This was so in 30. Three patients were quite well during the interval between the attacks, but the others suffered from discomfort and flatulence after meals.

Another striking feature in a large number of cases is the long history. The average duration of illness in the writer's cases was 5 years. Tenderness in the epigastrium, usually to the right of the middle line, is an almost constant feature. In one half of these cases there was tenderness

over the appendix area, as well as in the epigastrium. Twenty-nine patients suffered from vomiting in varying degrees. Seven vomited blood on one or more occasions, and three had melaena. The writer believes that the haemorrhage comes from the gastric mucosa. In one case the whole of the mucosa was found studded with numberless bleeding points. The stomach was in the condition described as "weeping blood." Probably the condition is due to the irritation of hyperacid gastric juice or to the continual presence of gastric juice in a fasting stomach. The writer has seen a similar condition in a case of duodenal ulcer associated with hyperchlorhydria.

As regards gastric analysis, the findings are usually those of chronic gastritis, except that the protein HCl is higher than is usual in this condition. In 17 of the 34 cases free HCl was absent, while in 11 it differed but little from the normal. In 4 cases only was there hyperchlorhydria, and in one of these the writer subsequently reopened the abdomen and found a duodenal ulcer. Probably the ulcer was present at the first operation, but with so little induration and thickening that it could not be felt. In many cases the volatile acids were much increased.

The appendix presents fairly constant features. Usually it is bulbous, somewhat thickened, and constricted near the base. A concretion was found in nearly half of the cases. In many appendices there were minute haemorrhagic patches in the mucosa, and in 14 a definite ulcerated area. In 3 cases the appendix was not obviously diseased externally, but was very long and contractile. In 2 of these the lumen was filled with faeces, and in the other a concretion was present. In all microscopic examination showed extensive inflammatory infiltration.

The frequency with which duodenal ulcer is associated with appendicular disease is striking. During the past 3 years the writer has discovered obvious appendicular disease in 66 per cent. of the cases in which, at operation, he found a duodenal ulcer. This association suggests that appendicitis may be one of the causes of duodenal ulcer. Possibly duodenal ulcer is the result of toxic absorption from the appendix or from the large intestine. It is well known that acute duodenal ulcers occur in case of extensive burns, and also in acute appendicitis. It may be that chronic duodenal ulcer is a similar pathological process, but of slower progress. Perhaps the gastric erosion referred to above is the prelude to definite ulceration. If this be so, the sequence of events would be as follows: appendicular disease; erosion of the gastric or duodenal mucosa; superficial ulceration (the so-called "medical ulcer"); and indurated ulcer.

The chief conditions from which appendicitis without physical signs has to be differentiated are duodenal ulcer, gastric ulcer, and gall stones. Duodenal ulcer gives rise to the greatest difficulty. In both there is often the same history of recurrent attacks; both may give rise to hyperchlorhydria, and as well as to absence of free HCl. Even "hunger pain" may be a symptom of appendicular disease. The points of distinction are: (1) In duodenal ulcer symptoms are usually absent between the attacks; in appendicitis flatulence and discomfort after meals, occur even between the attacks. (2) The radiation of the epigastric pain to the lower abdomen is suggestive, if not diagnostic, of appendicular trouble. (3) Tenderness over the appendix, when present, points to the cause. (4) In duodenal ulcer hyperchlorhydria is the rule, and absence or diminution of free HCl the exception; in appendicitis diminution or absence of free HCl is the rule and hyperchlorhydria the exception. (5) Gastric lavage, bismuth and alkalis, have little or no influence on the pain of appendicular disease.

The lessons to be learnt from these cases are:

1. In operation for supposed gastric or duodenal ulcer, if these lesions cannot be found, examine the appendix.
2. In cases of recurring abdominal pain of obscure origin bear in mind that the appendix may be the cause, although there may have been no definite attacks of appendicitis.

With regard to acute cases, while marked tenderness and rigidity over the appendix usually leave no room for doubt, cases occur in which these signs are absent, especially if the patient be not seen until some hours after the onset. The writer has seen cases in which there was no rigidity, tenderness, or distension, and yet laparotomy showed extensive general peritonitis. The local signs and general condition of the patient frequently give no indication of the gravity of the condition within the abdomen. There appears to be no reason for immediate operation, and yet if we delay we submit the patient to a greatly increased risk. The following are three recent examples:—

A girl, aged 19, was seized with general abdominal pain 3 days before admission to hospital. The next day she vomited twice, but the pain was easier. On admission the temperature was 99.8°, and the pulse 112, but she had no physical signs, not even tenderness in the right iliac fossa. Under the anaesthetic slight impairment of respiratory movement in the right iliac region was noticeable. An acutely inflamed appendix, with a perforation from which pus was escaping, was found. There were

no adhesions round the perforation, but the collection of pus was still localised.

A boy was admitted with the history that 2 days previously he awoke with abdominal pain. This was not severe and did not get worse. He vomited once. On admission his temperature was 100°, pulse 96; he did not look ill, and said the pain was easier. He referred the pain to the ninth costal cartilage in the nipple line. There was slight tenderness in the right iliac fossa, but no rigidity and no abdominal distension. Nothing abnormal was discovered in the chest. He had had previously two similar attacks. Laparotomy showed a collection of pus lying free in the right iliac fossa. There were no adhesions. The appendix was enormously enlarged and pus was escaping from a perforation.

A girl attended the casualty department complaining of pain in the lower abdomen. There was no tenderness. She had vomited twice, and her temperature was just over 100°. She was treated for ptomaine poisoning and sent home. She returned 2 days later with slight tenderness in the right iliac fossa. She did not look ill, but on opening the abdomen the peritoneal cavity was found full of very offensive, purulent fluid. The appendix contained a large concretion; the distal half was completely gangrenous and perforated.

The writer could give a number of similar cases, in all of which the symptoms appeared slight, and the physical signs absent, or nearly so. The operation findings showed that postponement of operation would probably have been fatal. It is impossible to distinguish between cases which it is safe to leave, and which it is dangerous. The writer therefore operates on every case as soon as he makes the diagnosis. His mortality is just over 4 per cent., but in all but one of the fatal cases the patients had been ill for a week before operation.—*The Medical Review*.

#### Strangulated Hernia Without Vomiting.

JAMES R. JUDD.—A Chinaman, aged 64, was admitted into hospital. For 15 years he had an inguinal hernia, which had gradually enlarged. On several occasions there had been difficulty in reducing the contents, but he had always finally succeeded. He had never used a truss. Four days previously to admission the swelling had increased in size and he had been unable to reduce it. He had suffered considerable pain. The bowels had moved once. According to his statement, which was corroborated by that of his friends and relatives, he had not vomited at all,

He was fairly well nourished; pulse 120; temperature 101; respiration embarrassed. The abdomen was greatly distended and tympanitic. The right inguinal region showed a tense, tender swelling involving the right side of the scrotum. The overlying skin was reddened and oedematous. There was no impulse on coughing. Rectal examination was negative.

Incision disclosed a tense sac adherent to scrotum and containing a loop of gangrenous intestine, and the cavity of the sac filled with fluid faeces. Gas and faecal material were escaping from two openings in the bowel. The sac was irrigated, the constriction relieved, and the gangrenous bowel wrapped in moist gauze. The loop of intestine was brought well outside of the abdomen, and the distended bowel divided at a safe distance above the gangrenous area. This, which was 12 cm. long, was resected, and end-to-end anastomosis was performed. The spermatic cord was found to be flattened out by pressure and pulsation was absent in the vessels. The right testis was greenish-black and did not bleed on incision. Accordingly the cord was ligated off and removed with the testis. The sac, much thickened and adherent, was removed and the neck sutured to the internal ring. The inguinal canal was closed in the usual manner. Drainage was provided for at the lowest end of the wound. Except for a slight discharge from the drainage tract, the wound healed by primary union. Uneventful recovery followed.

Vomiting, at first of stomach contents and later of faecal material, is considered an essential symptom of strangulated hernia. Sir James Paget, in his "Clinical Lectures" says: "If I were asked which of the signs of strangulation I would most rely on as commanding the operation, I should certainly say the vomiting." In the text-books the only exception is made by Treves who writes: "Vomiting appears early, is a marked and almost constant symptom."

The gangrenous condition of the testis was evidently caused by pressure of the sac and contents on the spermatic cord. This must be very rare as it is unmentioned in the text-books.

S. F. A. CHARLES, M. D.—A man, aged 54, was admitted to hospital in good condition. The temperature was normal, the pulse 60. He complained of pain in the left inguinal region in which there was a tender femoral hernia. He maintained that the lump was always there. It was irreducible, stony hard, with absence of impulse on coughing, and dull on percussion. The bowels had acted during the morning, and with an enema a good result was

obtained, with flatus. At no time had he vomited, though he stated he had a tendency to retch. His doctor stated that the hernia was always reducible. The writer therefore cut into the swelling only to find a strangulated piece of gut with serous fluid in the sac. The strangulated bowel was washed in hot saline solution and returned to the abdomen, and a radical cure performed.

His condition improved; he lost the tendency to retch, passed flatus, and felt fairly comfortable for at least 12 hours. This was followed by pain and tenderness in the left hypochondriac and lumbar regions. These increased both in severity and amplitude, and soon the whole abdomen became rigid; at the same time he acquired the pinched look of peritonitis. The pulse had not altered, still maintaining its full character. Twenty-eight hours after the first operation laparotomy was performed and general peritonitis was discovered. The whole gut was distended with gas. Death took place within 2 days.—*The Medical Review.*

### Surgical Complications of Gonorrhœa.

BY

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CINCINNATI, O.

For a long time gonorrhœa was looked upon as a trivial infection, both by the laity and by a large number of the medical profession. During recent years, however, this disease has been taken more seriously than formerly, and both the laity and the profession are beginning to realize what a disastrous and far-reaching infection it can be. When we stop to consider that it is responsible for more than 30 per cent. of all blindness, that it is the cause of about 75 per cent. of the pelvic conditions requiring surgical treatment in women, that it is responsible for the large majority of sterile marriages, and that it may attack almost every organ of the body we are forced to acknowledge that it is a disease worthy of our serious consideration.

Gonorrhœa in its incipiency is an infection of the mucous membrane of the anterior urethra. If we stop to consider the anatomy of the parts involved we can appreciate why gonorrhœa is not a simple disease to treat and how complications can arise that require surgical treatment.

Since man no longer roams the world without clothing he does not need a long prepuce to protect the glands. Instead of its being of any service now, it is a positive menace to the individual's health. It is always unsanitary, makes gonorrhœal infection more easy, and when there is gonorrhœa it may complicate the treatment. Phimosis and paraphimosis may develop, making it necessary to divide the prepuce. This can be done under local anesthesia.

The urethra is lined with mucous membrane covered with columnar cells as far as the fossa navicularis, where there are squamous cells. In the mucous membrane are numerous minute glands, the *glande of Littre*, with their ducts opening into the urethra. Gonorrhœal infection finds its way into these glands thus accounting for the persistence of some cases. If the duct of one of these infected glands should become blocked the infectious contents may find their way into the tissues outside of the urethra and a periurethral abscess forms. Urinary fistula may follow external drainage of this abscess. This may close spontaneously into a short time or it may require surgical treatment for its closure.

Beneath the mucous membrane of the urethra is an exceedingly vascular layer. In fact the entire urethra with its generative adnexa are in such intimate relation to the circulatory system that we can readily understand how gonorrhœal infection can enter the blood stream to be carried to remote parts of the body where it continues its destructive work.

The lymphatic system is another avenue for the spread of the infection. The lymphatic vessels of the external male genitalia are divided into two groups: those of the penis and those of the scrotum. The scrotum has proportionately more lymphatics than any other area of the body integument. The vessels extend in curves to the pubis and to the thigh and enter the middle chain of superficial inguinal glands.

The cutaneous vessels of the penis, commencing on both surfaces of the prepuce and from the margin of the urethra wind around the two sides to the dorsum of the organ where they extend to the pubis and curve laterally to either side to enter the first gland of the upper inguinal chain. The lymphatics from the glans penis are exceedingly numerous. They converge toward the frenum of the prepuce where they unite with the lymphatic vessels from the urethra. The urethral lymphatics begin at the prostate and seminal vesicles, and extend forward as a dense net-work surrounding the urethra. Opposite the frenum two or three trunks penetrate the urethral wall, join the trunks from the glands, then penetrate the substance of the penis.

Reaching the dorsum of the corpus spongiosum the two groups unite to form a single vessel which follows the course of the deep-bloodvessels to the pubis, again dividing to send a branch to each side which enters the median inguinal chain.

The lymphatics from the testicle and epididymis extend through the inguinal canal into the abdominal cavity, are joined by vessels from the seminal vesicles and finally terminate in the lumbar glands. This is important to know as will be seen later.

The urethra has in it many openings through which infection may pass and be carried to other structures where it often causes serious trouble. The ducts of the glands of Littre have already been mentioned. The two ducts from *Cowper's glands* communicate with the urethra in front of the anterior layer of the triangular ligament.

These openings are very small and gonorrhoeal infection of Cowper's glands is rather infrequent. When there is abscess formation in one of these glands it is very painful, and produces marked perineal tenderness and swelling located more anteriorly than in the ordinary perineal abscess. When these glands are infected we suspect tuberculous infection. The treatment is incision and drainage, and if the infection is not tuberculous, rapid restitution takes place, but if tuberculous there may remain a fistulous tract for a long time. It is always advisable to examine the pus for tubercle bacilli as well as gonococci and other organisms.

Following the urethra back as the infection does in probably 90 per cent. of all cases, it reaches the prostatic portion, communicating with other structures through a number of avenues along which infection may extend. The largest of these is the internal urinary meatus through which infection extends into the bladder, causing *gonorrhoeal cystitis*—but this is not a surgical complication.

The tubules from the acini of the prostatic glandular structure, opening into the floor of the urethra, are particularly exposed, and very frequently there is *abscess formation in the prostate gland*. This may develop as early as the third week of the patient's primary infection or it may be months or years later during an acute exacerbation of an old chronic posterior urethritis which has been lighted up by excesses and dissipation or by too vigorous and heroic treatment of the posterior urethra.

The general symptoms are those common to confined pus, such as malaise, chills, fever, loss of appetite, etc. The local symptoms are painful bowel evacuation, painful micturition, perineal tenderness, with

possibly swelling, and the patient is unable to sit or walk without discomfort. He is most comfortable when in the recumbent posture. I have seen this condition attended with an almost uncontrollable diarrhoea which I attributed to the toxæmia. This intestinal disturbance stopped immediately after the abscess was drained.

Often a prostatic abscess, following the lines of least resistance, will rupture spontaneously either into the urethra or rectum, seldom if ever into the peritoneal cavity. Upon digital examination per rectum, one side of the prostate, seldom both sides, is found to be enlarged, soft and tender. If rupture has already occurred into the urethra, pressure on the gland will cause pus to come from the urethra. If the conditions are growing worse and rupture does not take place, a perineal incision into the pus cavity should be made and drainage instituted. Relief is instant, pronounced, and gratefully received as soon as the abscess opens or is opened. If the rupture has been spontaneous, it is advisable to *gently* press out the contents of the abscess cavity once daily for several days. It has been my observation that these cavities do not have a tendency to refill after ten days or two weeks. About the time one side is cleared up, the other side may become infected and it is to be treated in the same way.

The *verumontanum* has within it a small cavity which often becomes infected and which is the seat of trouble in many cases of obstinate posterior urethritis. The condition of this little structure can be observed and treated to the urethroscope. It may be necessary only to inject into this cavity some medicament or it may require amputation which can be easily done through the urethroscope.

In the region of the anterior portion of the *verumontanum* are two openings, the ejaculatory ducts. These communicate with the seminal vesicles, through the vas deferens with the epididymis, and through the latter with the testicle. Of these three structures the epididymis is most frequently attacked. *Gonorrhoeal epididymitis* rarely develops before the third week of the urethral infection and seldom goes on to abscess formation. Slight trauma to testicle and epididymis may precipitate an attack. The infection usually lodges in the tail of the epididymis but it may invade the *testicle*. It is usually unilateral and is more frequent on the left side. The pathology of this process is that of an acute inflammation during which time the seminiferous tubules are swollen, the walls are infiltrated and edematous, and the tissues about the tubules are in the same condition. There may be semen and pus in the tubules. After a day or so the tunica vaginalis may become inflamed and an increasing amount of serum accumulates in this sac

producing a very painful *acute hydrocele*. Simple aspiration of this fluid often gives the patient great relief.

It may be necessary to repeat this several times at intervals of 24 to 72 hours. The hydrocele may remain and require a radical operation later.

In a great many of the cases of gonorrhoeal epididymitis the inflammatory exudate gradually resolves, but during repair connective tissue changes take place and hard nodules are left, which may occlude permanently the tubules and thus prevent the passage of spermatozoa. This explains the resulting sterility. These nodules may invite tuberculous infection later. Under the usual treatment of rest in bed, support of the parts, and cold or hot applications, the symptoms usually subside in from a few days to two weeks.

A few years ago HAGNER conceived the idea that early drainage would shorten the attack and lessen the liability to sterility. He makes an incision through the scrotum so that the epididymis can be exposed. The tunica vaginalis is opened and the testicle with the epididymis is held firmly. The epididymis is punctured in several places with a very sharp pointed knife. If pus is found in any of the small punctures, the incision is enlarged and the cavity is washed out with a 1-1000 bichloride of mercury solution, followed by salt solution. The parts are cleaned off, and gavage drainage is introduced, but allowed to remain only for a few days.

My experience with this operation is too limited to be of much value, but if early puncture and drainage will shorten the attack and lessen the liability to sterility, which I believe it will, it is to be recommended. The immediate benefits from this operation are sudden cessation of pain, fall of temperature and drop in the leucocyte count, from 25,000 or 30,000 to about 6,500.

The secondary urethral discharge, too, seems to be less difficult to control.

*Chronic hydrocele* often follows gonorrhoeal epididymitis. This is best treated with radical surgery; that is, removal of that portion of the hydrocele sac that is not attached to the testicle and epididymis.

Closely associated with epididymitis is *seminal vesiculitis*. The seminal vesicles communicate with the urethra through the ejaculatory ducts and are therefore exposed to infection, which occurs more frequently than many think it does. Examination of the seminal vesicles in cases of persistent urethral infection with irritable bladders, symptoms of cystitis and lumbar pains, often reveals the cause of the obstinacy.

The vesicles, which can scarcely be palpated when normal, are found to be enlarged, soft, tender, and many pus cells and few spermatozoa are found in the expressed contents. Careful, intelligent massage of the vesicles together with proper treatment of the urethra usually brings about a cure in most cases. Still there are some that do not clear up under this treatment and little the wonder when we recall the interior arrangement of the vesicles. In fact, the tortuous interior with the numerous diverticular or little sacs would seem to preclude any satisfactory treatment other than complete removal.

For these persistent cases of vesiculitis, BELFIELD has recommended an operation whereby the pus can be drained and the cavity of the vesicles treated. The vas deferens is open just above the epididymis and a  $\frac{1}{2}$  per cent. solution of protargol or 5 per cent. argyol is introduced by means of a small hand syringe.

The incision in the vas is kept open for drainage and subsequent treatment if necessary. Benefit from this operation is probably due to the drainage more than to the drug injected. While it is possible to do this operation under local anæsthesia in one's office, I believe it is better and safer to have the patient in the hospital for at least 24 hours. In several cases this treatment has proven very satisfactory.

FULLER prefers the more radical operation of opening the seminal vesicles through an incision at the side of the rectum and draining them directly. He recommends this method of treatment for the early severe cases and claims for it immediate relief of painful symptoms, and a more rapid recovery, thus saving the patient both time and suffering. I would recommend this operation as a last choice after all the other simpler methods have failed, rather than as a routine treatment in all cases.

*Lymphadenitis* is present in many cases to some degree. This may vary from a slight inflammatory involvement to pus formation. One or many glands may be involved. It is usually on the same side as the noticeable lesion on the glands of prepuce, if one be present, or both inguinal regions may be involved simultaneously. Pus formation is often slow. All of the upper groups of glands may be enlarged, tender, with a great deal of periglandular inflammation. Many times the appearances are deceptive and one is led to incise these glands for the release of pus and no pus escapes. This chagrins the physician and disappoints the patient. Such glands, if left alone or simply incised, will proceed very slowly through a long, tedious course of inflammation, pus formation, discharge of pus, and finally repair. During the greater part of this time the patient is incapacitated for work, suffers great

pain and is losing time, as this often covers a period of many weeks. This class of cases is best treated by dissection and removal of the glands involved when it is evident that rest and cold applications will not check the progress of the inflammation. The patient is given a general anæsthetic and through an incision, just large enough to introduce the index finger, the entire mass is removed. The glands near the iliac vein are usually involved and here careful dissection must be made in order not to damage the vein. The cavity is lightly packed with gauze for drainage and to control hemorrhage. This packing is removed in 24 hours. It does but little good to suture the incision as the edges do not unite very rapidly; hence the importance of a small incision. If the cavity is slow in healing, or if there be a purulent discharge, cleanse the cavity with hot sterile water and introduce a  $\frac{1}{2}$  per cent. solution of basic fuchsin. After ten minutes wash out with a solution of warm salt water. Two or three such treatments at intervals of 48 hours produces a clean cavity which closes very rapidly. The advantage of radical removal are that the patient is immediately relieved of the pain, he is able to resume his work in a few days, thus saving him much loss of time, which means money to most men, and the resulting scar is small and not disfiguring.

Gonorrhœal infection of an axillary gland following infection of a scratch on the forehead was reported in the *American Medical Journal*, April 30, 1910. Shortly after the infection on the forehead, other pustules formed in succession on the side of the face and neck, four in all. A little later the axillary gland showed evidences of infection and suppuration, was incised and gonococci were found in the pus. This was an unusual case in many ways and reminds us that it is the unexpected that often happens, and that we should search for many causes of trouble in all obscure cases.

Another infrequent complication of long standing chronic gonorrhœa is "*painful heel*." It is due to an exostosis on the os calcis. Just why this particular region should be selected for an exostosis from gonorrhœa I am not prepared to state. This condition may be mistaken for rheumatism, that medical mantle which covers so many indefinite pathological conditions. It has probably often been diagnosed as flat foot, neuritis, or tuberculosis. It is an ossifying periostitis where the flexor brevis digitorum muscle is attached to the os calcis. Pain is more pronounced when the patient is standing and it extends to the muscles of the leg. The patient walks slowly and carefully, selecting his ground and throws the body weight on the anterior part of the foot.

Little can be seen, but nodules can be felt. Antisyphilitic treatment should be tried.

The treatment consists in exposing the nodules through an incision on the inner side of the heel parallel to the plantar fascia, and curetting or chiseling away the exostosis. It is not necessary to drain. The patient is kept at rest for ten days or two weeks. Results are satisfactory.

While *surgery of the eye* is not in the domain of the genito-urinary surgeon, it can be mentioned here that not only is the usefulness of the eye destroyed by gonorrhœa, but that sometimes enucleation becomes necessary.

*Arthritis* is a most common complication of specific urethritis. It is said to occur in more than 2 per cent. of all cases, but my experience has not found that high a percentage. The joints attacked are, in the order of their frequency, the knee, ankle, wrist, elbow, shoulder, hip. This complication may occur as early as the fifth day of the disease but usually it appears during the chronic stage. When a joint is attacked it goes through the following stages unless its progress is checked: 1st, hydrops, that is, increased amount of fluid in the joint; 2nd, formation of sero-fibrinous exudate; 3rd, suppuration; 4th, ankylosis. It is the aim of the surgeon to prevent ankylosis.

During the first stage the joint may be aspirated under the strictest asepsis. Removal of the fluid gives relief from severe pain and may stop further progress of the disease. If mixed infection is present, aspirate, make autogenous vaccines and use these according to the needs of the case.

This is often very satisfactory. The aspirations may be repeated several times. If necessary, slight passive motion should be instituted early. Active hyperemia, or what is better, passive hyperemia according to BIER'S method, is very beneficial. Notwithstanding all this, ankylosis does occur, and when it does it is a serious and difficult surgical problem. Forcibly breaking up the adhesions does little or no good. Opening the joint, which in reality is no longer a joint, and interposing fascia to form new articular surfaces has been successful in some cases. This treatment is best suited to the knee and elbow. Every possible means and the greatest diligence should be used to prevent ankylosis.

*Gonococcal infection of the kidney* is very infrequent, but there are probably many more cases than have been reported. Such infections were not suspected until a few years ago. More cases will be found when more of the profession look for them.

The diagnosis must not be made from the simple fact that during the process of a gonorrhoeal urethritis the patient shows symptoms referable to the kidney. A positive diagnosis rests upon the actual and unquestionable finding of gonococci in the urine or pus from the kidney or in the kidney itself. This can be done through the ureteral catheter or by exposing the kidney.

Infection may reach the kidney through the ureter or through the lymph and blood stream. Extension of gonococci up the ureter is difficult under ordinary circumstances. The ureteral orifice in the bladder is closed except when there is urine escaping; thus it prevents the entrance and passage of infectious organisms.

However, let there be an obstruction to the escape of urine or an injury to the ureteral mucosa, then the resistance to infection becomes lowered. It has been demonstrated experimentally in animals that if one ureter be ligated and a pure culture of staphylococcus aureus be introduced in the jugular vein, the kidney with the ligated ureter becomes infected. Gonorrhoeal pyelitis, simple and uncomplicated, is therefore improbable if not impossible.

Some claim that infection can reach the kidney through the lymphatics without the bladder involvement. The danger of renal infection is in direct proportion to the surfaces involved in gonorrhoeal complications. The bladder wall is poorly supplied with lymphatics, but there is lymphatic communication between the epididymis, seminal vesicles and the kidney.

Since gonococci have been demonstrated in the blood it seems that this would be the most logical route for invasion of the kidney. The normal kidney is not very susceptible to infection as it is well known that many varieties of bacteria are separated from the blood with the urine without infecting the kidney. The gonococci in the kidney may not do much damage until invasion by secondary organisms, when symptoms of pyonephrosis are produced.

Tuberculous infection of the kidney may be secondary to gonorrhoeal invasion. Careful study and thorough examination of all cases of kidney involvement in patients who have had gonococcal infection is very important and valuable.

Having made a diagnosis, the kidney should be exposed through a lumbar incision and dealt with according to the conditions found. If a single abscess be present it should be drained, but if the kidney is largely destroyed and if there is tuberculosis present, nephrectomy is indicated.

Never fail to demonstrate the presence and activity of another kidney, before one is sacrificed.

*Stricture of the urethra* is a very frequent complication of gonorrhoea. It may develop within 18 months from the patient's first urethritis, but usually it appears later. It may not give any trouble for 15 or 20 years. Strictures receive more abuse and unscientific treatment than any other pathological condition. A few treatments with sounds will control most cases in their incipiency. No case should be overtreated. Almost every stricture can be satisfactorily treated without incision. If a filiform can be passed, further dilation is usually easy and rapid. In the treatment of strictures, *patience is a virtue*. No force should ever be used in passing instruments through the urethra. Internal urethrotomy is mentioned only to be condemned. External urethrotomy for stricture is seldom indicated. Neglected cases may cause urethral rupture and extravasation of urine into the perineum and scrotum, causing gangrene and sloughing, a very disastrous complication. Hence the importance of the early recognition of stricture and of early and proper treatment.

In conclusion, let me again emphasize the value of careful study of all cases, never forgetting the great prevalence and activity of the gonococcus.—*The American Journal of Surgery*.

#### A Simple Method of Completely Removing Serous or Purulent Pleural Exudates.

BY

H. C. JACOBÆUS, Stockholm.

Replacement of exudates by means of filtered air has gained in popularity. The author has successfully used the following method in ten cases: He anaesthetizes the skin, muscle and intercostal nerves with  $\frac{1}{2}$  per cent. novocain. He then incises the skin and introduces a large trocar (one which will admit the No. 12 straight Nitze cystoscope). The trocar is introduced at or above the ninth interspace so as to lessen the danger of injury to the diaphragm. After all the fluid which runs out is evacuated he introduces a ureter-catheter, whose end is weighted with lead. The tip of the instrument, with the patient in the erect posture, sinks to the lowest part of the pleural cavity and by means of aspiration the last drop of fluid can be evacuated. The cystoscope introduced through the trocar permits of direct inspection. In 10 cases of acute pleuritis Jacobæus has noted tubercles on the pleura in five. It is too early as yet to state whether complete emptying has a decided curative effect on tuberculous pleurisy or empyema.—*Ibid.*

**A further Note on the Clinical Use of Scarlet Red and its component Amidoazotolnol, in stimulating the Epitheliation of Granulation Surfaces.**

J. S. DAVIS.—The beneficial effects of scarlet red ointment (8 %) on sluggish and extensive granulating areas were reported by Davis two years ago. His further experiences confirm his good opinion of the efficacy of this remedy. Recently he has tried the effect of amidoazotolnol ointment (8 %) as recommended by Hayward and finds this ointment equally, if not more, effective. The dressing with either of these ointments is simple, non irritating, and causes less discomfort than other forms of dressing. The use of scarlet red or amidoazotolnol in blue ointment is advantageous for syphilitic ulcers. Davis has never seen a wound healed with these ointments break down. At times it is advantageous to apply either ointment directly to the wound and then expose to sunlight and air. The substances can be used as a dusting powder in four to eight per cent. strength to boric acid. The method of application briefly is as follows: The ointment is applied alternately with some bland ointment every 24 or 48 hours. Anoint the skin surrounding the defect with some bland ointment to within 1 cm. of the edge; then spread the scarlet red ointment in a thin layer on perforated old linen and apply to the wound. If a 4 per cent. scarlet red ointment is applied on partial skin grafts 48 hours after grafting, there is rapid stimulation of the wound edges and also of the grafts themselves.—*The American Journal of Surgery*.

**The Treatment of Severe Hand and Finger-Contraction the Result of Tenosynovitis.**

R. MUHSAM.—In a case of severe contraction of the flexor tendons of the hand following an extensive suppuration tenosynovitis which proved resistant to other methods of treatment, Muhsam resorted to the plan adopted by Henle for ischemic contractures. This consists in a re-section in continuity of 3 cm. of both radius and ulna. The result was excellent. Soon after healing of the bones the patient could close and open the fingers in a normal manner. The extensor tendons soon accommodated themselves to the shortening. One and a quarter years after the operation the use of the hand is almost perfect.—*Ibid*.

**Hydrocele and its Radical Cure by the Insertion of Catgut.**

C. H. WHITNEY.—Whitney reviews the anatomy and clinical aspects of hydrocele thoroughly. Excluding the open radical method for the cure

of hydrocele, he believes that the insertion of catgut, as recommended by Van Schaick, is the best. This consists in the insertion of about eight to sixteen inches of sterile catgut into the sac through the canula while the sac is being emptied. Soon after the operation, the sac begins to refill and is red and tender. The pain is moderate and does not require opiates. In 96 hours the swelling begins to absorb and a period of four to six weeks is required for complete absorption. Of 118 cases operated upon by this method, there were nine recurrences. Ten could not be followed. A case was regarded as cured if there was no recurrence after six months. Whitney also reports his results after the injection of pure carbolic acid. Of 61 cases, there were eight recurrences, while 12 patients were lost sight of. The author regards the injection of iodine as less satisfactory.—*The American Journal of Surgery*.

**Some Methods of Physical Examination in the Diagnosis of Surgical Diseases of the Kidney.**

HAROLD NEUHOF.—Neuhof emphasizes the value of a few methods, not generally employed, in the diagnosis of ambulatory renal affections. 1. Inspection: "When one kidney is the subject of an acute infection, the corresponding lumbar and abdominal regions remain almost or quite immobile." "If the patient be placed on his back in a light so cast that the lateral chest and abdominal walls are in shadow—in such affections as acute pyelonephritis, for instance—the shadow overlying the lateral abdominal region moves with respiration on the normal side, but remains immobile on the diseased side." 2. Cutaneous hyperalgesia. Neuhof reaffirms the value of the head zone. 3. Muscular spasm and rigidity. Spasm of the quadratus muscle is of special significance.—In connection with clinical history, this sign is almost pathognomonic of surgical renal disease. 4. Lumbar tenderness. Neuhof calls attention to a small area of tenderness, overlying the lowest two or three ribs at the margin or overlapping the erector spinal muscle. 5. Movements of the trunk. Hyperextension or hyperflexion of the spine will cause pain on the affected side. 6. Percussion of the kidney. The author has not found this sign of great value. It affords only approximate results in connection with inflation of the colon. In this particular it is of value to diagnose presence or absence of the kidney.—*Ibid*.

**Burns of the Eye.**

THE treatment of burns of the eye, whether caused by flying sparks and particles, caustics, steam, or boiling liquids, is still in a stage of

development, and results are still often unsatisfactory. In the *Prescriber*, Dr. P. A. Harry advocates the use of chlorethane dissolved in liquid paraffin, which considerably reduces the percentage of serious after-effects from these disastrous accidents. A saturated solution is used, and is dropped in from an ordinary eye-drop bottle. On admission of such a case, regardless of the source of the injury, the face and external surface of the lids are cleansed with green soap and water. The conjunctival sac is douched with normal saline until all foreign particles are removed. It may be necessary to use a fine pair of forceps to detach small pieces of coal or metal that have become adherent to the conjunctiva. The everted lids must be carefully searched for such particles. In the case of the cornea a spud may be used, though it is not advisable to separate the opaque coagulated layer from the corneal surface. For the first twelve hours an ice-pad is applied to the injured eye. If there is much œdema of the lids the outer canthus must be slit for half an inch. During this period picric acid solution (10 grains to the ounce) is instilled hourly. After twelve hours chlorethane in paraffin is substituted, two or three drops being used every half-hour. The eye is now left without pad or bandage, and the patient instructed to move it about as much as possible. Symblepharon is thus reduced to a minimum. The use of a probe to prevent this complication is strongly condemned by the author.

—*The Hospital.*

## PÆDIATRICS.

### The Use of Cold Baths in Diseases of Children.

BY

JAMES NEWELL, PH.B., M.D., CH.M.

*Examiner on Diseases of Children, College of Physicians and Surgeons of Ontario, Watford, Ontario.*

I have chosen the subject of cold baths in the treatment of children's diseases. When I received an invitation to read a paper before this Association I cast about, thinking what would suit me as well as those who were to listen to me. I had intended to confine my remarks to the cold bath treatment of convulsions in children, attended by high temperatures, but when I received the printed programme I saw that it stated that I would furnish a paper on the use of cold baths in diseases of children instead of the treatment of convulsions attended by high temperatures. As the subject is comprehensive and the time limited, I shall make a few cursory remarks in general, outlining the salient points in the treatment of a few of children's diseases by the use of cold

water. I may say it has for over 30 years been a favorite method of treatment in children's diseases, attended by high temperature and irritability of the nervous system, and that baths in general, cold, tepid and warm, are not more generally used by our profession is a pity. I feel very certain that many of the diseases of children can be just as successfully treated by baths as, and with less subsequent danger than, through the agency of drugs or other potent remedies. When we come across a child lying in convulsions, with a temperature of 104 or 105, rigid, stertorous, and insensible to external impressions, we are very apt to think of inhalations of chloroform, hypodermics of morphia, chloral by the rectum, etc., but in such cases I have seen the happiest results follow the immersion of the child into a bath of 75 or 80 degrees, followed by affusion of cold water over the head, and supplemented by friction of the limbs and body till the rectal temperature dropped to 100, when the child is removed from the bath, and wrapped up with hot water bags or bottles applied to the extremities, if they should have become blue and cold. In many of the sharp, acute febrile attacks of children, it is often difficult or impossible to say positively why there should be such a rapid and high rise of temperature, and frequently attended by nervous twitchings or actual convulsions. Now, it is just in such cases that I have experienced the happiest results from the bath treatment. I am fully aware that, to stay and superintend the bath treatment takes up time, and that it is much easier and less loss of time to deal out a few acetanilid or phenacetine powders, and tell the mother to give one every hour or two till the fever has dropped down or left, but I have always been suspicious of the after-effects of these drugs in the high temperatures of sepsis, inflammations or diseases due to pronounced organic disturbances.

Cold baths or packs are among our most efficient means of reducing temperature.

The coal tar preparations, antipyrin, phenacetine and acetanilid, are all reducers of febrile temperatures, and may sometimes be employed, but their action is apt to be followed by depression of the nervous system and heart, besides which is their injurious action on the blood, of destroying the red cells and converting hæmoglobin into methæmoglobin.

The use, therefore, of baths to bring down dangerous high temperatures in certain diseases of children, complicated by convulsions, has been followed by me for 30 or more years, and with what I think very successful results. The application of cold water lowers temperature

without the bad effects of the coal tar preparations, although I must say I occasionally meet with parents who would allow you to fill their children with powerful drugs with impunity, but who are quite often apprehensive as to the baleful or injurious effects which a bath may have on a sick child.

The stimulating action on the skin, the consequent reflex action on the heart and respiratory centre causing an increase in the general blood pressure, as well as a greater depth in the respiration is productive of very beneficial results, by increasing the oxidation process, increasing diuresis and other metabolic changes, such as rise in the number of red cells and an increase in the quantity of hæmoglobin. Time well not permit me to go into the various *modus operandi* of the remedial actions of baths in the treatment of children's diseases, but if I am permitted to draw conclusions from an experience of thirty or more years, they have proved themselves very efficient and safe therapeutic agents in my hands, and I have many times thought that sufficient space is not given to hydrotherapy in our standard works on children's diseases.

Hippocrates has wisely said, in his Aphorisms, that "Experience is fallacious, and judgment difficult"; and, as a recent writer in one of our college papers puts it, I shall end by quoting his concluding sentence:

"I am ware, of course, that experience does not carry much weight now-a-days, and also that experience is not an infallible teacher. But sometimes it is well for experience and observation to sit in judgment on the actions of the pushing mass of humanity, pushing towards goals of novelty, in order to reduce this spirit to a just degree of conservatism, lest the flights of impulse reach a degree of irrationalism which may react to dim the fair name of science."—*The Canadian Practitioner and Review*.

## Cases and Comments.

**Removal of a Tumour (Fibroma Molluscum) weighing  
16 lbs. 10 oz. from the Back of the Head hanging  
down to Hip and Recovery.**

BY

C. ROCKASWAMI CHETTY,

*Senior Sub-Assistant Surgeon, Civil Hospital, Bassein, Burma.*

These cases being rather rare, notes of the following case of a big heavy tumour hanging from the back of the head to the hip will be of interest.

Mah Nit U, a Burmese woman, age 38 years, living in a village called Kayagoung, Yegyi township of the Irrawady delta division of the Bassein District, was admitted into hospital on the 12th of February 1910. Her whole body was covered with small tumours, the biggest being the one on the back of the head. She stated that these tumours were from her infancy, but the one on the back of the head was of the size of a hazel-nut to her knowledge when she was about 10 years old and in the space of 28 years assumed the present tremendous size and weight, reaching down to her hip. Being so heavy she had to bend her head forward just like a woman carrying a big load on her back.

*Present condition*:—Is married, has two children, a daughter 5 years old and another, a boy, 2 years old. Both are quite healthy. She is well nourished. Heart healthy and normal.

*Lungs*:—Breath sounds slightly harsh, but otherwise normal.

*Urinary system*:—Sp: Gravity 1015; slightly acid in reaction. No albumen or sugar, but contained phosphates. As the Civil Surgeon was on leave, I operated on her on the 18th December 1910. She was chloroformed by Sub-Assistant Surgeon Ruldu Ram.

I made two incisions, an anterior and a posterior one, reflected the skin flaps; the tumour was found to be firmly attached to the periosteum of the occipital bone and radiating like a fan. The tumour being very vascular, I transfixed the tumour near the periosteum with two stout silk ligatures and the tumour dissected away. The flaps brought together with silk-worm gut sutures. She made an uneventful recovery and went to her village highly pleased.

**Incised Wound exposing the Shoulder Joint, completely  
severing the Muscles and the Capsular Ligament  
with Dislocation of the Head of the Humerus.**

**Treatment and Recovery.**

BY

C. ROCKASWAMI CHETTY.

*Senior Sub-Assistant Surgeon, Civil Hospital, Bassein, Burma.*

Maung Saw, a palmist, age 37 years, a muscular and well-nourished Burman was brought to hospital by the police on the midnight of 26th November 1907 covered with blood all over his body. His left shoulder was wrapped with a dirty longyee (Burmese Dhoti). He was

put on the table. On gently releasing the longyee, the following wound noticed: An incised wound 5" x 2" cutting the upper border of the scapula, supraspinatus muscle, partially, and the capsular ligament completely: the head of the humerus projecting upwards and outwards.

*Condition of the wound on admission.*—As described above, the wound was covered with a dirty longyee and was covered with clots of blood and some Burmese medicament—a paste made from some leaves.

*Condition of the patient on admission.*—The patient was anxious; much alarmed of his state. Pulse weak. Temperature 98.

*Treatment.*—All the clots were carefully and gently douched out with hot carbolic lotion, bleeding vessels ligatured, and the whole joint was again thoroughly and gently douched with the same lotion as hot as could be borne. Dislocation was reduced easily, the ends of the capsular ligament brought together with a continuous thin cat-gut suture, the cut ends of the supra spinatus with interrupted sutures of a fairly stout cat-gut; the skin flaps with silk-worm gut interrupted sutures with a small drain of iodoform gauze at the back of the shoulder; the wound dressed and the limb supported on a well-padded rectangular splint.

On the 28th his temperature rose to 102 but the patient did not complain of any pain. The dressing was opened, the gauze was slightly soiled with oozing of blood; the iodoform drain was removed, the wound gently douched with carbolic lotion, a piece of gauze strip loosely put in and dressed. Blood from his finger examined and malarial parasites found. He was put on quinine. Temperature came down to normal on the 2nd December. He improved satisfactorily and was discharged cured on the 3rd January 1908. He was kept so long to practise passive movements on the joint as he would not have done if discharged earlier. I saw him a few days ago and the movements of the joint are quite good.

### The Lavage of the Urethra in Gonorrhœa.

(From within outwards.)

BY

K. I. VERGHESE,

*Hosp. Asst. in ch. Dist. Disp., Chengannoor, Travancore.*

The action of Potassium Permanganate is admitted by the whole medical profession to be inhibitive to the gonococci.

Many genito-urinary surgeons even maintain that gonorrhœa can be aborted or at any rate rapidly brought under control at any stage by large injections of a weak solution of Permanganate of Potash introduced with sufficient force to distend the urethra in all its parts and enter the bladder. But the method of bringing the drug into efficient contact with the affected urethral canal by irrigation is so very unsatisfactory, and in many cases productive of untoward effects, such as "sick feeling," syncope, &c., in addition to setting up reflex phenomena, that I venture to suggest the following method, and request the members of the profession to kindly enlighten me through the columns of the *Antiseptic* on any dangers that are likely to follow its use, and its degree of usefulness if no untoward effects follow.

*Technique of the Operation.* As soon as a patient, whose condition indicates a urethral injection, comes suffering from gonorrhœa, get a soft Jacque's Catheter, sterilise and pass it warm into the bladder, draw off any urine that may be present and almost fill the bladder with a solution of Potassium Permanganate at 100°F., by means of a rubber tube and glass funnel attached to the end of the catheter. Now draw off the catheter without emptying the bladder and get the patient empty the bladder at once by the natural method. The process may be repeated if necessary. I am inclined to believe that this method will act as a sure and efficient lavage of the urethra avoiding all untoward effects. Cases that admit of irrigation of the urethra several times (to be effective) in one sitting through a glass syringe may fare better with the introduction of a soft Jacque's Catheter one introduction of which provides for a much larger quantity of Permanganate solution to pass through the urethra.

Further it is likely to bring suppurating areas, lacunæ, fissures, folds of mucous membrane, &c., into better contact with Potassium Permanganate than by irrigation by a method directed from without inwards. The danger of infecting the bladder is also minimised by the fact that any possible infection carried by the catheter to the bladder is immediately met there by the Potassium Permanganate solution, rendered inactive and washed out by the subsequent lavage directed from within outwards.

Medical Women for India.

N some provinces of India the mortality among the female population has been appallingly high, and throughout the country in spite of the comparative inactivity of the women, the death-rate has been such as to stimulate enquiry. To add to the gravity of the situation there has been a steady deterioration in Indian public health. Doubtless, a multiplicity of causes have been in operation. With them, however, we are not at present concerned. What we venture now to bring to public notice is the state of health of the female population of India, especially among those who live, move and have their being behind the *purdah*. It has long been recognised that the *purdah* women are among the greatest sufferers from want of medical relief; and though most Indian women do not observe the traditional secrecy of the *purdah*, not a few of them prefer to be treated for their maladies by members of their own sex. To meet the needs of this class of silent sufferers the Dufferin Fund has been organised, offering facilities to enlightened Indian women to qualify themselves as medical practitioners. But the Dufferin Fund organisation, excellent as it is, and influentially backed up as it has always been, cannot meet the increasing demand for medical aid. Under it a few scholarships, tenable for a term of years, are established in nearly all the advanced provinces of India, in connection with the existing medical schools and colleges. But when we consider the area to be covered and the extent of the population to be relieved, the utter inadequacy of the present arrangement will make itself manifest. It is true that the efforts of the Dufferin Fund organisation have drawn the attention of Native States and of men of independent means to the necessity of turning out an increasing number of medical women; and, so far, the movement has not been without good results. But a closer and more careful study of the problems connected with the people of India has brought home to thoughtful men that the situation cannot be dealt with in an hap-hazard manner and without organised effort on the part of the State and of the people towards the establishment of a regular service consisting of Indian medical women able to undertake the task of giving timely medical relief to their unfortunate sisters.

It is encouraging to know that the stern facts of the situation are realised in England, and when the impulse, the stimulus, comes from that quarter we shall look forward to something being done in this

country. In connection with the Royal visit the question has been raised in a series of articles in the *Times*, whether or not it would not be in the interests of India to establish a special branch of the Indian Medical Service consisting of medical women, in order to provide medical relief for *purdah* ladies. The Indian Medical Service, in all its grades and branches together, includes all the medical men in Government service, and the point is whether we are to have a separate service completely detached from the rest but apparently placed under the same head. But this is a matter of detail to be worked out in the future. That India stands urgently in need of the services of an increasing number of medical women, all who are acquainted with the country will admit. It is also evident that if in the matter of pay, pension and official status satisfactory arrangements can be made, educated Indian women, whose number has been steadily increasing, will avail themselves of the facilities offered and take up the work. We may at once say that if the intention is to provide an outlet for the clamorous section of the women of England, who have been agitating for the assertion of their rights in competition with men, the idea will have to be abandoned. Indian women would prefer the services of their own sisters who know their language, customs and manners and to whom they can freely communicate what they feel. It is, however, gratifying to know that one of the writers in the *Times*, who has assumed a more responsible tone than the rest, insists that an essential part of the scheme should be the education of Indian women in medicine for them to join the profession. This naturally leads us to the question of the medical education of Indian women.

It is well to bear in mind that the present system of mixed schools and colleges will not be largely availed of by Indian women. In nearly every important province of India the question of *separate* colleges for ladies, prosecuting their studies for the arts courses, has been raised; and in Calcutta and in one or two Native States girls' colleges have long been established. If with regard to arts colleges, a demand of the kind is made, it is needless to point out that for purposes of medical education separate schools and colleges for women there should be in almost every province. The Indian social system and the nature of Indian women are such that without separate educational institutions for them no progress is possible. The suggestion has already been put forward that in honour of the visit of the Queen-Emress a separate medical college for women should be started in Bombay. We are not sure whether the citizens of Bombay who are anxious to found a memorial of the Royal visit, will take up the idea. Whether they do so or not, the time has come for the Government of India and the public-spirited section of the people to co-operate with one another and bring into being a well-equipped medical school or

college in almost every provincial centre. We are convinced that this question forms part of the question of the formation of a medical service composed of women. Without educational institutions an adequate number of medical women cannot be obtained. But with medical schools and colleges in every great and populous Indian city there will be no paucity of suitable candidates for the places thrown open to women. The two questions are so organically related to one another that our surprise is that the writers in the *Times* did not choose to consider them side by side as two parts of the same scheme.

### CORRESPONDENCE.

#### The Enlarged Spleen in Malaria.

By

A. M. MASILAMANI MUDALIAR, L.M.S.

*Asst. Superintendent, Nayapuram Medical School.*

I am obliged to return to this subject as I am afraid that the importance of Enlargement of Spleen in Malaria, is still not understood by many of the members of our profession. And therefore I consider it my duty to adduce again some further evidence with regard to this all-important sign of malaria. I sent round a circular letter to a great many of my professional brethren in the Madras Presidency as to the following points:—

1. Splenic enlargement found in what percentage of malarial fever cases?
2. The period of quinine treatment they would recommend.
3. The kind of quinine used and in what doses.
4. Result and remarks.

I have received replies from a very small number of my friends, and I refrain from making any use of such a feeble response.

In the meanwhile I have continued my observations and I must say, that the more cases I see, the more thoroughly convincing is the conclusion that enlargement of spleen is a very correct estimate of not only the existence of the malarial infection, but also affords the inestimable data for continuing the treatment until every vestige of the enlargement disappears completely. And even afterwards, the stay in a malarious place would necessitate the administration of quinine about 5 grains daily. Very few have actually acted according to such an advice. There is yet a very large majority who have to be educated or advised to adopt such a course of treatment. A few days of taking the bitter quinine, and finding the earliest opportunity to give it up (which is generally a few days after the fever subsides) have been religiously followed in some quarters to the great detriment of the sufferer.

Such imperfect administration of quinine is a very disastrous procedure—disastrous to the patient and as well disastrous to scientific knowledge and treatment of malaria. Fever recurs and again quinine is resorted to, only to be given up in a very short time. I have known hundreds of cases where the history is given of imperfect dosage and a repetition of the attacks. A steady taking of quinine for long periods until the sign of enlargement of spleen is completely effaced is yet to be taught and learnt in many a quarter. I append here Sir Ronald Ross, K. C. B.'s kind and sympathetic reply—Enclosure A.

Then it struck me that it would make a very valuable statement on the subject if permission was obtained to publish it in the *Antiseptic*. I wrote a letter and I beg to be allowed to put down his reply—Enclosure B.

Now, so far, I have gathered all the forces to make the subject attract as much attention from the profession as possible. I earnestly beg of every member of the profession to bestow the attention necessary in the study of this dire disease which is virtually eating into the vitals of our society. May God help us in this our honest endeavour.

*Enclosure A.*

#### THE INCORPORATED LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

*Johnston Tropical Laboratory,*

*University of Liverpool,*

*7th September, 1911.*

DEAR SIR,

I am much obliged to you for your letter of the 29th July with enclosed papers written by yourself. These papers are interesting, and I think that you have taken in general the proper view of the enlargement of spleen and treatment by quinine. I am glad that you have read the excellent book by Col. Hehir, and you might also study my "Prevention of Malaria" (John Murray). You will see that enlargement of spleen is already well known to occur invariably in connection with malaria. This point was first fully proved in America by Thayer and Hewitson. But at first the enlargement is often so small that it can be detected only by the increased area of dullness as shown on percussion. It is a good sign that so many native medical men in India are taking an interest in these subjects. I do not think that republication of your articles in British journals would be easy, because the articles have already been published elsewhere; but I will put the ones which you send me in our Library, and will be glad to receive any further copies.

Yours faithfully,

(Signed) Ronald Ross.

Enclosure B.

THE INCORPORATED LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

Johnston Tropical Laboratory,

University of Liverpool,

19th October, 1911.

DEAR SIR,

You can certainly publish my letter of the 7th September, but scarcely think that it is worth publication.

Yours faithfully,

(Signed) RONALD ROSS.

## ACKNOWLEDGMENTS.

We acknowledge, with thanks, receipt of the following journals:—

The Polyclinic. The Bristol Medico-Chirurgical Journal. The International Journal of Surgery. The American Journal of Clinical Medicine. The Dietetic and Hygienic Gazette. The Good Health. The Indian Medical Gazette. The Practical Medicine. The Sanitary Record and Journal of Sanitary and Municipal Engineering. The Northumberland and Durham Medical Journal. The Canada Lancet. The American Journal of Ophthalmology. The China Medical Missionary Journal. The Medical Review of Reviews. The Post Graduate. The Therapist. The Canadian Practitioner and Review. The Australasian Medical Gazette. The Caledonian Medical Journal. The Canadian Medical Journal. The Monthly Cyclopædia of Practical Medicine. The Ophthalmoscope. The Dental Era. The Interstate Medical Journal. The Medical Notes and Queries. The Calcutta Medical Journal. Folia Therapeutica. The Indian Medical Journal. The New York State Journal of Medicine. The Hospital. The Medical Review. The Medico-Surgical Journal. The Journal of the Out-Door Life. Bulletin Journal of the New Animal Therapy. The Journal of Practical Dietetics and Bacterio Therapeutics. Monde Medical International Review of Medicine and Therapeutics. The Sei I-Kwai Medical Journal.

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## Original Articles.

• THE TREATMENT OF MENTALLY DEFECTIVE  
CHILDREN.

BY

H. E. JONES, M. R. C. S. (ENG.), L. R. C. P. (LOND.)

## 1—General.



THE general treatment of these children must of necessity be an ameliorative process in which there is absolute co-operation between the teacher, the nurse and the physician, and the wise parent will have no hesitation in placing such a child where the co-ordinated efforts of the three can be the best obtained. Provided the mother be not of "neurotic temperament, is sympathetic and not emotional, she may be permitted to act as nurse; on the other hand should she be at all emotional, a sympathetic nurse will have a much better chance of success in the training of such a child than the mother. Naturally the first question that arises when the mental deficiency has been diagnosed is: "Can anything be done to modify or improve the existing abnormalities in such a child?" This must be answered at once in the affirmative. Much can be done, even in the early days, by a patient parent or nurse to promote development of co-ordinate movement, to cultivate habits of personal cleanliness and, above all, to help to produce the faculty of attention, the cardinal principle being that the child should be trained to fix its attention on one thing at one time. As early as 1866 SEGUIN<sup>1</sup> laid down the principles on which to proceed. He says: "As soon as any function is set down as deficient at its due time of development, the cause must be sought and combated; if external, removed, if seated in the nervous apparatus, counteracted by the earliest course of training and hygienic measures. The

<sup>1</sup> Specially contributed to *The Antiseptic*.

arm of the mother becomes a swing or supporter, her hand a mistress or a compressor, her eye a stimulant or a director of the distracted look; in other words the cradle is converted into a class-room or gymnasium." Looking at an infant or young child, especially if such child be strong and healthy, we see much spontaneous movement, movements which do not appear to be stimulated through the senses and at the early age are certainly not controlled by sight or sound, though they appear to be quite regular and in order. This spontaneity, seen while the child is awake, is produced by the activity of groups of nerve cells in the brain, for these cells discharge nerve currents to the muscles and thus stimulate them to movement. If we see these spontaneous actions in the child we may infer also that the nerve cells of the brain are acting spontaneously. This brain action can be compared to the cellular system of young seedlings whose unequal swelling and growth on successive sides of the stem produce the well-known movements which afterwards become adapted by light, gravitation & etc., into definite controlled movements, such as turning towards the light and climbing. This spontaneity of the nerve centres of the brain is temporarily lost when the child is ill and is not seen in the idiot, though in the mentally defective child, provided the deficiency is not extreme, some of this spontaneity is generally apparent.

When observing an infant four or five months old the sight of an object, such as a bright light or silver ball, may temporarily arrest the spontaneous movements, and this may be followed by the turning of the head, the eyes and the hands in the direction of the object seen. This perhaps is the earliest mental act, which may be called such, seen in the young child. The pause in the spontaneous action is usually only momentarily, after which the infant can be seen again to move its fingers, this time, however, in a new and to some extent co-ordinated manner. This new action which is seen after the pause is the result of control of the brain centres during the temporary absence of movement and is a further degree in the process of "attention." Hence during the pause the infant's "attention" is attracted towards the object and functional unions are formed among the brain centres preparing them for combined action.

Proceeding a step further, by the interaction of these earlier workings of the brain, *viz.*, controllability and spontaneity, it is possible to co-ordinate the brain cells by appropriate methods of training. As the child grows older some attempt must be made to cultivate the mental faculty and to control his or her playfulness for a few moments while trying to produce a new impression.

DR. WARNER states the ages at which these actions should be manifest as follows:

|           |                |                              |
|-----------|----------------|------------------------------|
| 1st month | .. Spontaneity | .. Spreading Action          |
| 4th "     | "              | and Inhibition.              |
| 5th "     | "              | Inhibition and Co-ordination |
| 9th "     | "              | " and Reflex                 |



These of course refer to the development of the processes in children of normal power; in the mentally deficient children they will naturally be greatly retarded. Hence the object one should have in view in the early training of the latter class is to proceed with every means at our disposal in producing impressions by brain training, exactly as in the training of the normal infant, but with infinitely more patience and zeal. One must proceed, stage by stage, to attempt to develop such elementary mental impressions as it is intended to employ in subsequent teaching. The chief classes of such impressions are classified by DR. WARNER<sup>2</sup> as follows:

(1) *Impressions of sight.*—When an object is seen light passes from the object to the eye, stimulating the retina, from which nerve impulses pass to the brain and so control its nerve centres. The thing shown is seen if the child's eyes are turned towards it and an impression is produced through sight.

(2) *Impressions by hearing.*—These are produced by nerve impulses from the internal ear when the sound vibrations of air have acted on the tympanum.

(3) *Impressions from muscular action.*—When a muscle contracts and produces a movement, an impulse passes upwards from the nerves situated in the muscle to the brain, and this produces an impression which may be felt.

(4) *Impressions caused by muscular tension.*—An example of this is the appreciation of weights as held by the hand. The weight held in the hand makes a strain upon the muscles, the feeling of this strain is carried by nerve impulse to the brain, and thus the weight is perceived. Hence movements produced in training the child through the senses result in some control over the nerve centres in two ways. *Firstly*, through sight, as the child sees the movements of the teacher, which sends a nerve impulse from the brain to the muscles; and, *secondly*, by muscular sense, an afferent impulse passing from the muscle to the brain. Exercises with the hands and fingers may be trained by sight in imitation of the teacher, while muscular sense also produces results in the

brain. I have said that movement stimulates and controls the brain centres. This is well shown in what DR. WARNER has called "exercises in transfer movements." Let a child hold out both hands: take his left hand in yours and explain to him that he is to move the fingers of his right hand in the same way as you move those in his left. Let him shut his eyes: then if he is a well-trained lad and intelligent, the action in his right hand will be an imitation of those movements which you are making in his left hand. Here the feeling of movements in the left hand controls the action. The feeling of movement is also employed and exercised in measurement or counting by looking, or in measuring with the hand. Muscle strain in feeling weights, and in manipulation or using instruments in the hand, and in using graduated force in working any material produces impressions by muscular sense. The hand and fingers are moved by the muscles of the forearm in gymnastics and the heavier kinds of work and grasping a tool, while the small muscles situated in the hand itself are mainly used in producing the finer movements of the fingers as in drawing, writing, etc.; the latter need exercise, and in their action aid brain culture. The means for training the hand are chiefly by making the pupil look and see. He may look at a picture to be copied, a model, or the material upon which he is employed, and so he may also be trained to look at the hand of his teacher and imitate the movements he sees. The methods of training the intelligence through the hand are by the exercise and control of the nerve-muscular system which moves the hand, and this is effected chiefly through seeing. Movements of the hand and fingers, when the latter are free, may be produced in imitation of the teacher's hand. Imitation is a natural brain faculty in normal children, which is affected principally through sight; the objects imitated by the pupil in school are principally the teacher's actions, expression, gestures, movements, and those of other children. Training in any physical action produces temporary control of the nerve centres, and exercises the healthy brain in the quick formation of impressions through the senses. Much good may be done in early training by following a moving object with the eyes, and in imitating movements with the hands and fingers. Such exercises, especially if repeated at frequent intervals, co-ordinate the brain centres that will, in time, be caused to act in harmony, and they promote good modes of action, accurate and orderly.

This mode of teaching is used in some schools as a means of imparting technical skill, in others as affording interesting occupations for children of normal mental capacity, and, in my opinion, the same methods

are undoubtedly the best for the early training of the children who are mentally weak, both in promoting "attention," in producing co-ordinate action, and in generally developing the mental power of such children.

## 2—Hygienic.

The first important point in the Hygienic treatment of the Mentally Deficient Infant is that the child should be properly fed, and if the mother be at all neurotic, unsympathetic or emotional, she should not suckle the infant, her place being taken by a strong, healthy wet-nurse, or, if the latter cannot be obtained, the infant should be reared on the bottle with cow's milk and barley water in their proper proportions according to the age of the child. Patience is everything, especially in those many cases of this kind which have to be fed with a spoon in the early stages owing to their inability to suckle. Later on the child should have oatmeal porridge, and the muscles of the lips should be strengthened by simple exercises such as holding a pencil between the lips at certain times of the day and by teaching such children to blow a small trumpet or horn. These simple exercises will often tend to cure "dribbling" (which is frequently present) also. In addition to the porridge the chief part of the diet should be "fatty" in character, consisting of such foodstuffs as butter, dripping, suet pudding, bacon-fat, cod-liver-oil, &c.

Owing to the frequent unpleasant cutaneous exhalation that occurs in these children, more frequent baths are required than in children of normal mental power. These, together with gentle massage of the muscles will also tend to aid the usually weak circulation which is present. Habits of cleanliness must be the essential and initial step in the hygienic treatment, regularity in the relief of the rectum and bladder being insisted upon. Except in those cases of the low grade imbecile and idiot, these can generally be obtained by careful perseverance.

Muscle training is especially important, and hence in these, as in all children, the limbs should be quite free, allowing ample scope for muscular activity in all directions. Even more than this, the child should be encouraged in every possible way by coaxing and playing to use its limbs and exercise its muscles.

The clothing should be warm and light and free from bands. Natural wool in winter and cellular cloth in summer are excellent. Above all, the general costume should conform as nearly as possible to that of ordinary children of the same age. By dressing such children out of the ordinary fashion, one overcomes one's ends and really tends to

accentuate any personal peculiarities one wishes to overcome. It must not be looked upon that feeble-minded children are devoid of all pride, and by clothing them properly one may perhaps bring forth a good habit and tend to produce a sense of self-respect, which, if not lacking altogether, may be extremely deficient.

### 3—Medical.

Except in the cases of Cretinism and those complicated with Epilepsy, this is chiefly confined in preventing such common complications as Tuberculosis in all its forms, Mucous Diarrhoea and the Acute Specific Fevers. Special care should be taken in an attack of the latter occurring in these children, owing to the somewhat severe course they frequently run. I have already dealt with the Medicinal treatment of Cretinism in a previous paper.

### 4—Surgical.

As I have previously pointed out, the small cranium in the "microcephalic" cases is the result of the deficient development of the brain and not the cause of the condition; hence the operation of craniectomy for such cases has been entirely given up. In the few cases of mental defect associated with Jacksonian Epilepsy or following traumatism, craniectomy may be justifiable, but should this be decided upon, it must be carried out before atrophic changes have taken place in the brain.

(To be continued).

References.—(1) SERGIN—"Idiocy," p. 88.

(2) WARNER, "The Study of Children".

## \* THE NEW MEDICAL THERAPY.

BY

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When travellers in an unknown desert reach a fertile oasis they replenish their food and water supply and are enabled thereby to proceed on their journey towards the distant gates. So it was with the travellers in the realms of surgery when they discovered the wonderful oasis which gave them Anaesthetics and Antiseptics, enabling them to pass to the brilliant cities of surgical art which are indeed but resting places on the path towards the earthly heaven wherein man shall have fully conquered disease.

\* Specially contributed to *The Antiseptic*.

On the converging desert track, the medical clinicians and the bacteriologists have reached an oasis, and their progress towards the earthly heaven will be facilitated by the food and drink which the oasis gives them—Serum Therapy and Vaccine Therapy. How valuable these two aids of the long journey will be cannot be realised at the present time; we who are the travellers cannot use them to their full extent, for we do not realise their possibilities nor can we do more than use them very moderately and carefully until we learn gradually their fuller and more wonderful uses. But what of the future of Serum therapy and Vaccine therapy? in order to estimate even approximately their uses, we must consider where we stand at the present time.

### The present.

Perhaps the Serum of which the value is most widely known at the present time is the Diphtheria Antitoxin Serum. It has been in use for more than fifteen years, and the gradually diminishing case-mortality of Diphtheria which has followed its gradually increasing use is plainly shown in the records of the Fever Hospitals of Great Britain and European countries. We acknowledge now that if we can treat the case on the first day the mortality is practically *nil*. The later the Serum is used the higher the mortality of the disease reaches, and therefore it is the constant endeavour of our up-to-date Health Officers to track down the contacts of Diphtheria cases, to supervise them, and to have them treated without any delay on the first sign of the onset of the grievous disease. Indeed, there are many who advocate the free use of the Antitoxin Serum for all close contacts of a Diphtheria case even before they show any sign of having caught the disease, but this is not to be advocated—strict supervision if it is strict will warn us in time to check the disease.

I have mentioned the Diphtheria Antitoxin Serum first mainly in order to illustrate the progressive knowledge which is obtained only *gradually* of the best way in which to use our new found remedies. When the Serum first came into use very small doses were used—500 units. As our knowledge increased it was realised that very much larger doses were necessary to make certain of the best result, and now a dose of 2,000 units is regarded as a reasonable minimum. And so it is with the various Vaccines which we are now using—the early doses were very small, then the doses were very large, and now we are using the medium dose which we have recognised as more efficacious.

Recent progress in Great Britain and Europe has been greater in the field of Vaccine therapy than in that of Serum Therapy, and my

further remarks on our present position will refer to Vaccine Therapy. But, in passing, I may mention the use of a Serum in the treatment of a disease to which I have given considerable attention during recent years.

#### Anti-Scarlatina Serum.

The causative microbe of Scarlet Fever is probably a streptococcus, it is not proved. But it is certain that the complications of the disease, the septic processes, the grave toxæmia which occurs in the severe cases, and the acute nephritis which may occur during the third or fourth week of the illness, are due to a Streptococcal infection. And this statement is supported by the results which are obtained by the use of Antistreptococcus Serum. Some years ago, finding that such sera were being used in Scarlet Fever, I began to try them on all the very severe cases of the disease. At first I used the Sera produced by inoculation of Streptococci obtained from true Scarlatinal patients, but later I used Polyvalent Streptococcus Serum believing that the serious and fatal complications and types of Scarlet Fever, were due to a supplementary infection of varying Streptococci. In my last series of 500 cases of Scarlet Fever, all the bad cases of which were treated with the Serum, there has been only one death, and the usual complications have been comparatively slight. Now it is evident that the mortality rate of Scarlet Fever has decreased—the disease is not nearly as virulent as it was forty years ago, but, even so, a mortality-rate of one in 500 cases cannot be explained except on the supposition that Serum Therapy has proved a valuable weapon in our fight against disease.

#### Vaccine Therapy.

The brilliant work of SIR ALMROTH WRIGHT has opened a vast field of research in the treatment of disease. At first, it was thought that his method of treatment of microbe-caused diseases by Vaccine Therapy was too complicated for use in private practice, for the estimation of the opsonic index required prolonged labour and care; but it is now clear that careful observation of clinical symptoms is a safe substitute for this tedious estimation, and during the past two years, the use of Vaccine Therapy has developed widely. The mention of a few instances must suffice in this short paper.

#### Common Colds—Catarrh.

During the autumn of the winter months a high proportion of the population of Great Britain suffers, at one time or another, from "colds." Not infrequently these illnesses incapacitate the sufferer for a few days or for a week or two. The total loss in worker's time is enormous; the total money loss each year has been estimated in millions of pounds. No cure was known; no treatment to cut short successfully these attacks.

But during the past few years, the bacteriology of these "colds" has been carefully worked out, the name of DR. ALLEN being prominent among the workers. And for the treatment of "colds" due to these microbes, vaccines have been made which meet with a large measure of success. It is found that in the case of some microbes, a "stock" Vaccine will successfully check their action; in the case of others, an "autogenous" Vaccine must be made, *i. e.*, the organisms from the mucous membrane of the nose, &c., must be grown on agar or other nutrient mediums and a vaccine made from them.

Now, at the present time, our knowledge of "common cold" and catarrh microbes is incomplete, but these are some facts which are evident and accepted. In numerous cases, previous inoculation will protect the individual from the attacks of "cold" microbes; also "colds" may, in many cases, be cut short by the use of appropriate Vaccines. All this means that, in time, inoculation with appropriate Vaccines will protect the inhabitants of Great Britain from the attacks of "common colds" and catarrh, and apart from the prevention of the occasional serious sequelæ of these conditions, the saving of the time and money in the country will be enormous indeed; and here, as in so many other instances, the science and art of medicine pass over the border line into the territory of national economics.

#### Staphylococcus Vaccines.

Perhaps the most marked success of Vaccine Therapy is seen in the treatment of Staphylococcus infections. In the case of Acne Vulgaris, the use of a combined Vaccine made of Staphylococci and the Acne-bacilli clears up the condition in a marvellous manner when other measures have failed; and in the long list of conditions caused by Staphylococci infections there are few in which the use of Vaccines has not proved beneficial—ulcers and septic wounds, otorrhœa and periostitis, and the boils which used to take weeks of treatment for their healing, respond readily. This description may appear to be too optimistic. Let me admit that some of these cases are not always cured by Vaccines; but I believe these failures are due to our incomplete knowledge of Vaccine Therapy. The fact that there are failures should diminish in no way our hopes for the future; the high percentage of successes in Staphylococcus infections should be a stimulus to further trial and investigation.

#### Other Infections.

Meanwhile, Vaccine Therapy is being developed in other directions. Attempts are being made to cut short the attacks of Pneumonia by the use of Vaccine, and skin affections, chronic ulcers, bone and joint

diseases and suppurating sinuses are all being bacteriologically investigated and Vaccines made for their treatment. The percentage of success varies, but ever more frequently there comes startling success, rapid healing of the affected part. In my opinion, these brilliant successes are of good omen. They mean that we are on the right track; that whilst our knowledge is not complete at present, we are making progress towards complete knowledge. For this reason alone we may hope for great things from Vaccine Therapy.

#### Tuberculosis.

The modern plague of Great Britain and Europe is insidious in its onset; its ravages are slow but sure; its beginning is difficult to diagnose, its ending is difficult to check. Many efforts are being made throughout Great Britain to prevent the spread of the disease, but as long as a consumptive patient is allowed to share the same living room and sleeping room as other people, the disease will take its chance of spreading.

What can Vaccine Therapy do for us here? We know that the disease is due to the *Bacillus Tuberculosis*; we know also with regret that the old Tuberculin of Koch was both inefficient and unsafe. We are inclined also to believe that a Vaccine is more likely to be efficacious in a Coccus-caused disease than a Vaccine used in the treatment of a *Bacillus*-caused disease; and on the whole we approach the Vaccine treatment of Tuberculosis with minds that are not unbiassed. But what of the facts? During recent years, both in England and Germany, a *New Tuberculin* treatment has been developed. It is still on its trial, and the keenest scientific minds of both countries are watching the result of its trial. The trial is being carried on in a scientific manner; in sanatoria, control cases not treated by the New Tuberculin method are being watched side by side with patients who wish to undergo the treatment.

At the present time, no conclusive opinion can be expressed as to the permanent value of the New Tuberculin; writing towards the close of the year 1911, one can only say that opinions are divided, that the efficacy of the treatment is still to be proved, and that whilst we return again to the battle against the *White Plague* armed with a new weapon, we can but hope that it will enable us to defeat the dread enemy.

#### Tuberculin Dispensaries.

I have stated that opinions are divided in England concerning the ultimate efficacy of the New Tuberculin treatment. But many authorities are so convinced of its value that a new feature has been introduced into British Municipal activities. At the present time there are in

active work at least six Tuberculin Dispensaries carried on under the direction of Local Health Authorities—Councils of the County boroughs or cities. Patients suffering from Phthisis receive treatment by the New Tuberculin at the Dispensary, an experienced Medical Officer being in charge, and they are also visited in their homes by trained nurses who make reports on their temperature, general condition, &c. Sanatorium treatment by many Municipal Authorities in England has been in existence for some years; this advance has been in existence for less than eighteen months; but it proves that there are many Medical Officers of Health who believe that the efficacy of the New Tuberculin treatment is sufficiently proved. I would express my own attitude as one of hopeful criticism; and Hope tempered by Criticism, although it may not denote the zeal of enthusiasm, is still free from the stigma of despondency.

#### Conclusion.

In a brief paper such as this, it would be impossible to treat my subject except in a general way. The fascinating details of the subject, the fairy-land paths wherein one may wander in following the Will-o'-the-Wisp of the microbic form can only be referred to, but those of my readers endowed with the golden gift of imagination will surely walk with me in the bye-paths of progress when we may dream dreams of the future wherein man by intelligent investigation and due application of his acquired knowledge will subdue the dread diseases which handicap his progress towards the ideal of the Perfect Man.

There is an old Celtic motto which runs "Deffro, ma'en dydd"—"awake, for it is dawn"—I like to think of this as applicable to our present profession of Medicine. We have moved in the dusk of the twilight; for thousands of years we have groped with feet and hands of empiricism, moving forwards by our empiricism into the utter dark of the Night and the Unknown. But latterly, by the aid of scientific investigation, we have turned our faces to the light of the dawn. We of this generation may see nothing more than the rosy reflected light, but surely we shall know that it is the heart-comforting light of the rising sun. And so we may say sincerely, "Deffro, ma'en dydd."

## Our Contemporaries.

### MEDICINE.

#### Difficulties in the Diagnosis of the Cause of Pyrexia.

BY

W. HALE WHITE, M.D., F.R.C.P.

Exercise raises the temperature, even in healthy people. The temperature of a man walking for one hour at four miles an hour may rise to  $100.6^{\circ}$ , and 6 miles an hour to  $103^{\circ}$ . Sometimes external temperature affects the body temperature, and that is strikingly shown in a hot bath. A man's temperature was  $98.2^{\circ}$  before he got into a bath of  $112^{\circ}$ , and when he had been in it for 14 minutes his temperature was  $103.2^{\circ}$ . In a Turkish bath the temperature does not rise to anything like that degree, because sweating keeps it down. The capability of maintaining the temperature of the body fairly constant sometimes breaks down, and sunstroke follows. This is simply a failure of the thermotaxic mechanism to respond to the external temperature. As long ago as 1868, WUNDERLICH noticed that the temperature of fever patients was highest in the hot months of the year. The late Dr. J. H. BRYANT noticed the great majority of cases of hyperpyrexia occurred during the summer months—June—September.

Certain drugs will raise the temperature. Two children were admitted to Guy's Hospital covered with a red rash and delirious. They were put in an isolation room, because it was thought they had scarlet fever. Nobody could determine what the rash was. In the evening, it was ascertained that they had eaten belladonna berries. The rise of temperature and the rash were due to belladonna poisoning.

*Carbohydrate Fever.*—In some persons, especially children, even a slight excess of carbohydrate food at times produces pyrexia. Between the ages of 5 and 12 years a boy had several times a year attacks of pyrexia, which prevented him from going to school. He saw many doctors until Dr. EUSACE SMITH recognised the cause, and discontinued the carbohydrates, when the attacks ceased.

*Fracture of the spine*, especially in the cervical region, will cause a rise of temperature. So also will *damage to the corpus striatum*, and other parts of the brain. When the corpus striatum was damaged the temperature rose to  $107^{\circ}$ , and kept up for several days. In man as a result of ordinary *hemiplegia*, in which an effusion of blood into the internal capsule damages the corpus striatum, pyrexia is common. The temperature is higher on the paralysed side than on the other and the patient

frequently sweats more on the paralysed side. He must, therefore, be losing more heat on the paralysed side, yet the temperature is higher. He must, therefore, be producing much more heat on the paralysed side. In cerebral hæmorrhage the temperature is often subnormal.

Dr. J. H. BRYANT found that out of 250 cases in hospital of *fractured skull*, 10 had a temperature due to the damage to the brain. The writer has found a temperature of  $107.4^{\circ}$  in *cerebral hæmorrhage*,  $107^{\circ}$  in *cerebral softening*,  $108^{\circ}$  in *cerebral tumour*,  $108^{\circ}$  in *delirium tremens*,  $108.4^{\circ}$  in *chorea*, and  $109^{\circ}$  in *convulsions*.

*The hysterical temperature.*—Before concluding that a temperature is hysterical be careful to exclude fraud. To attract attention a woman may, by some means, get the mercury of the thermometer to rise. A nurse caused the thermometer to rise to  $110^{\circ}$  by putting a hot water bottle into the axilla before temperature was taken. A woman aged 30 had a temperature ranging between  $102$  to  $104^{\circ}$  for 6 weeks before the writer saw her. She was seen by a dozen doctors. Her blood was examined for bacteria, lumbar puncture was done and the cerebro-spinal fluid examined, and every known means was employed to find out why the temperature was raised, without result. There were many reasons that made it likely that it was hysterical. The pulse and respiration did not rise in proportion to the temperature. When the temperature was normal she was perfectly well, and in the afternoon of a day on which the temperature was raised she would become wildly delirious and shout. Then the temperature would fall and her shouting cease. All the doctors were convinced that there was no organic disease and no fraud; and the way the illness terminated bears that out. One day the temperature dropped, as it had done many times before, but, to everybody's surprise, it remained normal. It is now 6 years ago, and it has been normal and she has remained well ever since.

In investigating the cause of pyrexia blood examination is most useful. When there is pus anywhere there is usually an increase in the polymorphonuclears, but this is not of much value, because when there is much increase in polymorphonuclears pus is generally known to be present from other signs, and often there is considerable pus but no increase in polymorphonuclears. In some fevers, such as typhoid, the number of the polymorphonuclears is diminished. Examination of the blood may show the parasite which is causing the disease, as in malaria, blackwater fever, relapsing fever, and sleeping sickness, tic fever, and malignant endocarditis. But often microbes are not sufficiently numerous to be found in the amount of blood that can with safety be taken.

Examination of the blood is not so important, therefore, as might be supposed, because a case in which the diagnosis is in doubt, is usually so mild a case that the organism cannot be found. Sometimes pyrexia is due to syphilis; then the WASSERMAN reaction will be a help. Examining the blood will often help by an agglutination reaction, *e. g.*, in typhoid fever, Malta fever, dysentery, and glanders. The Widal reaction has the drawback that it usually is not present until the tenth day, or even later, and it is in the early stages that the diagnosis is doubtful. Further, a positive WIDAL reaction is not absolutely reliable, as it is sometimes obtained in diseases other than typhoid fever, *e. g.*, in a woman who died from streptococcal malignant endocarditis. It might be said that she gave the reaction because she had had typhoid fever previously, because the reaction persists for some time after the fever. It has been known to persist as long as 26 years, but that is very exceptional. But this cannot explain the positive result in this case, for a previous test was negative. Diseases of the blood will cause pyrexia. It is the rule in pernicious anæmia. Often the temperature is raised in Hodgkin's disease.

Examining the cerebro-spinal fluid will sometimes help to show the cause of pyrexia. In the case of a child who has fever and retraction of the head, the question is, has it got meningitis? A lumbar puncture is done, and if the fluid is turbid, if there are cells in it, if it contains albumin, or bacteria, meningitis is diagnosed. Often the finding of the bacteria will show the form of meningitis.

Examination of the urine will sometimes help to clear up obscure cases of pyrexia. Organisms which are the cause of pyrexia may be found when the urine contains no blood, no albumin, and no casts. A boy had several rigors during 5 weeks. In one the temperature was 107°. He was admitted into hospital with suppression of urine. On close questioning he admitted to a little pain at the end of the penis. Skiagraphy as well as every other method of examination failed to show the cause of the rigors. The suppression passed off, and the urine contained no blood, albumin, or casts, and was of normal appearance. But the centrifugalised deposit was a pure emulsion of streptococci. Under a vaccine made from these he recovered.

A woman had a pyrexial attack, thought to be influenza. After it she had hæmaturia. It was then thought the original attack had been acute Bright's disease, but she had no œdema. The bleeding went on, she was very ill, and many suggestions were made. At last the urine was examined bacteriologically; and a pure emulsion of bacillus coli was found. Under an autogenous vaccine she recovered.

Some of the most common cases of obscure pyrexia to be cleared up by examining the urine, occur during pregnancy. At the seventh month a woman became ill, and had a continual rise of temperature. She was thin, anæmic, and had a hæmic murmur. A practitioner diagnosed malignant endocarditis. As she did not get better the urine was examined bacteriologically, and a pure emulsion of the bacillus coli was found in the centrifugalised deposit. She was vaccinated, and recovered. The excretion of the bacteria in the urine is not the cause of the pyrexia; they only show that the same organisms are in the blood.

Forgetfulness of the fact that the temperature may be raised in *malignant disease* often leads to an erroneous diagnosis.

In another case a man had had a large hard liver, and his temperature was raised for weeks. Abscess was diagnosed, and a laparotomy done. The liver was examined, but there was no pus there, simply a rapidly-growing growth. Cirrhosis of the liver will cause a rise of temperature.

There is a condition termed "*tropical liver*," in which the liver is swollen but there is no abscess. Thus a man came from Marseilles to London overland because he was supposed to have an abscess of the liver. He had a raised temperature, and a large, swollen, very tender liver. All the swelling gradually disappeared, the temperature became normal, and he recovered. Such cases are common in India.

*Pylephlebitis* is a source of error, but it is rare, and it is difficult to diagnose unless one is on the look out for the symptoms. Another overlooked cause of pyrexia is *cholecystitis*. The patient may have irregular shivers and fever, and be better for a few days, and after a week or two another attack occurs, and this goes on time after time.

The most frequent undiscovered cause of pyrexia is deep-seated pus, *subphrenic abscess*, for example. A man had repeated rises of temperature over 2 or 3 years, lasting 3 days at a time. They were always said to be due to influenza. One day on examining his chest it was noticed there was a slight addition to the hepatic dulness on its upper margin. A needle inserted at the spot of tenderness revealed a deep abscess in the liver. That was drained, and he recovered. As a rule practitioners forget minute collections of deep-seated pus, and are led astray because sometimes these collections are so small that they do not lead to leucocytosis. One of the most valuable aids in finding them is a tender point, which is a guide to the spot at which to insert the needle. Sometimes skiagraphy will show the abscess.

A difficulty may arise in a case of pneumonia, because the temperature continues raised after the crisis. The temperature comes down, and remains down a day or two, and then rises again. There is generally an *empyema*, which may be difficult to find, because it may be small and may lie among a large amount of lymph; it may be between the lobes of the lung or between the lung and the diaphragm. All that can be done is to examine the patient most carefully, looking out for spots of extreme dulness, searching for a tender spot, and skiagraphing.

Pus in connection with the teeth or the various sinuses about the face and nose is often overlooked. It is not uncommon to be told that a patient has bronchitis. The sputum contains pellets of pus, but the key to the case is a small *empyema* discharging into the lung and causing bronchitis.

*Malignant endocarditis* as a cause of pyrexia is frequently overlooked. Great help is given by variations in the murmur, the presence of emboli, or the sweats and rigors, but rigors are often absent. Unfortunately, leucocytosis is often absent.

Obscure pyrexia may be due to tuberculosis which can be discovered only by examining the lungs and the expectoration, noting the rapidity of respiration, and whether the patient is getting livid, and doing a tuberculin test, which, however, only shows that the patient has tuberculosis, not that his pyrexia is due to tuberculosis. Examine for tuberculosis the genito-urinary apparatus. Skiagraphy of the lungs often will help. Even after all this care, tuberculosis will often be overlooked. Some cases of obscure pyrexia are rheumatic. Every possible care must be taken before concluding that a case is not.—*The Medical Review.*

#### SUMMARY.

Pyrexia may be observed in the following cases:—

After physical exercise, hot bath either in hot dry air or steam and sunstroke.

After the administration of drugs which give rise to rash.

In children when carbohydrates are given in excess.

In organic inflammations as meningitis. In cerebral tumours hæmorrhages softening hemiplegia.

In injuries to skull and spine as fractures injuries to corpus striatum.

In diseases of blood, septicæmia, pernicious anæmia and Hodgkins Disease.

In exanthemata.

In tubercle, gout and rheumatism.

Parasites in blood and urine as streptococci, bacilli colli. In malaria, black fever, relapsing fever, sleeping sickness, tic fever. Also when there is increase or decrease in polymorphonuclears, some times of no value.

Pyrexia in anæmic and hæmic murmurs.

In malignant diseases as endo-carditis, cirrhosis of liver and tropical enlargement of liver.

In phlebitis and chole cystitis. In subphrenic abscess, *empyema*, escape of pus into lungs, in sinus, and in gum and teeth affections.

#### Worry as a Source of Indigestion.

Worry is a baneful curse of untold evils. It seams the face with lines and furrows, and has a most depressing effect upon that hypersensitive organ, the stomach, which at such times becomes a most unwilling and laggard servant. Indeed, it is safe to say that unless encouraged by a cheerful temper and bright, or at least hopeful, thoughts, the stomach will play truant or sulk and do no work which it can shirk. The physiological explanation of this is the close alliance of the great sympathetic nerves, which are worse than the telegraph for carrying bad news; the worry and anxiety which depress the brain produce simultaneously a semiparalysis of the nerves of the stomach, gastric juices will not flow and—presto! there is indigestion. One sign of mental health is serenity of temper and a self control that enables us to bear with equanimity and unruffled the petty trials and jars of life, especially those arising from contact with scolding, irascible, irritating folk. It is well to remember at such times that these unfortunates are their own worst enemies, and a cultivation of the art of not hearing will help us very much. It is a very useful art all through life and well worth some trouble to acquire.—*The P. M. Journal.*

#### The Problems of Modern Psychiatry—III.

BY

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#### DIFFICULTIES OF DIAGNOSIS.

THE physician is sometimes greatly puzzled to distinguish between what may be called true technical insanity and various other states in which the mental action of the brain is disturbed. For instance, in the

delirium of fevers, inflammations, gross organic diseases of the brain, cerebral shock from mental or bodily causes, hysteria, religious and other mental excitement and stresses in neurotic people and traumatisms we may have marked mental symptoms which it would be improper to diagnose or treat as technical insanity, or to think of sending to a mental hospital. I have had cases suffering from all those conditions certified as insane and sent to asylums, and I have sometimes had great difficulty in saving the reputation of my professional brethren from having made incorrect diagnoses.

It is to be remembered, however, that all these conditions may sometimes be the preludes which end in true technical insanity, requiring certification and a mental hospital. The medico-legal question of certification under the Lunacy Acts comes in as a disturbing and very important factor in the consequences of a mistaken diagnosis.

In dealing with persons of a markedly neurotic and unstable brain constitution, and also in dealing with persons of unevolved races, one is apt to meet with transitory conditions which closely resemble true insanity. Certain tribes, such as the Esquimaux and some of the African negroes, will "go mad" from most insufficient causes for short periods and fully resume their normal condition in a few hours.

#### DEGENERACY.

There are a whole series of conditions which fall under the term "degeneracy" to which attention has been markedly drawn of late years as one of the problems of psychiatry. We call members of this class "degenerates." They all take their origin in hereditary defects, and mostly show some signs of the condition from an early period of life.

The conditions are incapable of definition; they are so wide and far-reaching. In most of them there are bodily departures from the ideal and normal, which we call "stigmata of degeneration." Faults in the shape or size of the head, in the special sense organs, in the face, in the mode of action of the "mind muscles," in attitudes and movements, may all constitute those stigmata. Faults of mental reaction, moral conduct, social instincts and conduct are the chief ways in which degeneracy shows itself.

#### BACKWARD EVOLUTION-REVERSION.

There is one consideration which it is well to remember in considering the causation of mental disease: The brain cell being the highest organic structure in nature, in the course of its evolution it has had to undergo, to reach its pre

s of natural selection during the



ages that have elapsed since nerve tissue first appeared in had to make adaptations and readaptations to innumerable different environments.

#### A PHYSIOLOGICAL LAW.

Now it may be considered a physiological law that the greater the integration of any form of cell or structure, the greater the risk there is of ontogenetic and phylogenetic degeneration. The brain cell has gradually acquired a sensitiveness to outside stimuli and outside agents which no other cell possesses. It is so highly organised that it is subject to the most delicate disturbing agencies. Its mental functions alone render it subject to influences to which no other cell responds. During those processes of *cell evolution* and *adaptation to environment*, it is subject from that cause to failures and liabilities, to disturbances and to destruction of its mental function.

Speaking generally, I consider that many cases of St. Vitus' dance, much of the epilepsy, some of the adolescent insanities, and most of the cases of dementia præcox, are the result primarily of the *incapacity* of the brain cell *to adapt itself to its environment*. It is a well-known fact that though mental disease is more uncommon in the primitive and savage peoples than it is in the highly civilised nations, yet when the primitive man is suddenly transferred into the life of the civilised city and has to take part in its social life, there is considerable danger of mental upset.

#### STAGES OF MENTAL DISEASE.

In psychiatry it is always most important to realise that most cases pass through various stages—the prodrometal, the initial, the fully developed, and the convalescent. The prodrometal stage is the most important on the whole for curative treatment.

The prodromata of mental disease usually consist of sensory symptoms, such as headache, neuralgia, and paræsthesia in various organs; of nutritive symptoms, such as falling-off in flesh, and neurasthenia; of blood changes, such as anæmia and leucocytosis. Especially the symptom of anorexia is extremely common. Then there are minor mental symptoms which are usually not counted as disease at all, such as deadness of mental feeling, oversensitiveness, irritability.

#### MUSCULAR EXPRESSIONS OF MIND.

All normal mind exhibits itself in a normal expression of face and eye and in natural postures and gestures. It is a most important thing in psychiatry to observe those muscular expressions of mind and to estimate their signification. Among the innumerable debts that

psychology owes to DARWIN, his work on the "Expression of the Emotions" is one of great importance. There are in the human subject between fifty and sixty muscles, many of them of extreme tenuity, the function of which is chiefly to express mind. I am in the habit of calling them "mind-muscles." They have an enormous supply of motor innervation for their size, the motor strands being connected directly with the mental cortex. They have the power of expressing almost every shade of depression, exaltation, of anger, and lethargy, of suspicion, and confidence which the human being can feel.

In most forms of insanity their action is changed. The eye expression is a most subtle and most important symptom, the precise mechanism of which we have been yet unable fully to elucidate.

#### DIFFERENT STANDARDS OF MIND.

Speaking generally, the whole class of patients suffering from depressive states of mind are not regarded as insane till they become strongly suicidal or excited in conduct. It is this misapprehension which is the cause of vast numbers of suicides. The doctor is not consulted nor precautions taken until it is too late.

#### IDEAS OF WHAT A MENTAL HOSPITAL IS.

The most mistaken and preposterous ideas prevail among a large section of the public as to what a modern mental hospital is. The old ideas of "madness" and a "madhouse" are still prevalent at the present day. I need hardly say to you that a mental hospital is an institution specially adapted for treating the special disease of insanity, and differs in no essential respects from a general hospital or a special hospital for fevers, etc. You will have this abundantly confirmed in your visits to Morningside.

It is our duty as medical men to take special pains to disabuse the public of their wrong ideas on this point, because they cause infinite and unnecessary pain to the relatives of patients, and to the patients themselves, and they prevent early treatment, which means effectual treatment, in those hospitals at the most curable stage in the disease. If mental hospitals were regarded in the same way as ordinary and special hospitals, an enormous boon would be conferred on suffering humanity.

#### ÆTIOLOGY.

To enable you to form a general idea of the causation of mental disease I shall take two or three typical examples. In the first place it is necessary to assume that in by far the greater number of cases of

typical mental disease the cellular element, which is the vehicle of mind, has through a bad heredity acquired the inherent quality of a morbid instability.

\* This means that it is specially weak in its resistive power to the action of toxines, to unusual stimuli, and to mental stress. Its defences are weak. To a brain so constituted let us suppose that alcohol is introduced through the blood in excessive quantity and more or less continually. Each brain undoubtedly possesses its special resistive power in regard to toxines. In one man the mind cells select and attract more than their share of the alcohol circulated in the blood, and you have resulting stupidity or mental exhilaration, or delirium, while the individual is able to walk and write and talk fairly well. In another case the motor centres may select and attract more than their share, and the man remains fairly intelligent, but cannot walk or write. The former case is the one that best illustrates the action of a toxin in producing subsequent insanity.

#### TOXIC EFFECTS.

The molecules of the toxin come into the most intimate relationship with the excessively mobile molecules of the brain cell and the effects are an undue stimulation, irritation, and dilatation of the capillaries, diminished peri-vascular spaces, and marked hypertrophy of the neuroglia. In short, the man becomes insane, and we call it "alcoholic insanity."

In most such cases of alcoholic insanity there are hallucinations of hearing—that is to say, the man continually imagines he hears people speaking to him when no such thing exists. What has happened to produce this particular mental symptom? The alcohol has produced a special irritation in the auditory centres of the cortex, so that they act without the stimuli of sounds from without. His brain, as it were, speaks to his mind, and his mind cells, having undergone disease, are not able to exercise judgment and perception, so that the man believes in the real existence of those subjective sensations of his.

*Delusion.*—One form of insane delusion consists of a misinterpretation by the mind of real sensations in the body. For instance, a patient of mine had the delusion that the devil was inside her. She had undoubtedly real pain in the gastric region, and after a time we discovered that she had a cancerous growth in the pylorus. Another case believed that she was eaten up by serpents in the region of her heart; as a matter of fact, she had angina pectoris.

There is no more important thing to be kept in mind in examining our delusional cases than to find out if there is such a bodily cause for such delusion, and the action of various toxins which cause such bodily pains or discomforts has always to be kept in mind in delusional or hallucinatory cases.

#### URGENT PROBLEMS.

The urgent problems of modern psychiatry at present are psycho-physiological and bio-chemical, and not histological. We cannot explain mental and living processes by the examination of dead structures. In this consists the importance of the experimental work in brain toxins of KRAEPELIN and MACDOUGALL; of the chemical work of most of the elaborate "tests" of brain conditions by WASSERMANN and others, and of the bacteriological and the anti-toxin and serum experimental work of FORD ROBERTSON in general paralysis. In this lies the value of this modern clinical method where the observations at the bedside are combined with those of the laboratory. We have to solve the questions of why this human brain cortex is so liable to the special disorder of action we call insanity; why the human mind is thereby so affected that man loses the highest qualities that evolution has brought him, and how this terrible result can be prevented or remedied.—*The Hospital*.

#### Nocturnal Incontinence.

AMONG the childish ailments and troubles that vex the minds of anxious mothers and of all those who have the care of children, there are few which are so distressing and so refractory to treatment as incontinence of urine. As every practitioner gets to know, the worry and mental anguish of mothers whose children are thus affected is out of all proportion to the magnitude of the mischief.

#### INHIBITION AN ACQUIRED POWER.

Ability to control the passage of urine is, of course, an acquired power; in the nursing it does not exist. Moreover, the development of this control is gradual and at first somewhat irregular. It is therefore not possible to lay down any hard and fast limit or standard to which all babies should conform; but in general terms it may be said that in the majority of children full control, both waking and sleeping, is gained before the age of two and a half years—often long before—and that failure to control micturition after that age constitutes incontinence.

Incontinence of urine in children varies enormously in degree. At one end of the scale are those who merely micturate once or twice a

week during sleep up to the age of three or four years; at the other those whose life is rendered miserable, even to adolescence or adult age by unconquerable sphincter weakness, waking and sleeping. The former class is not separable by any hard and fast line from children who may be deemed normal; the latter's plight is perhaps as pitiable as it is extremely rare.

The cases of a moderate degree of incontinence are, however, not by any means rare. Usually the failure of control is nocturnal only,—that is, incontinence occurs only during sleep, and then only after several hours of it. For such children the remedies which have been suggested are innumerable, and this is evidence at once of the intractability of the condition and of the inefficiency of most remedies. First of all, the assistance of a medical man is essential, though his efforts depend largely for success upon the constant and intelligent co-operation of the mother and nurse. One reason why no parent should undertake to treat a child for incontinence without a doctor, is that in some cases conditions exist which must be remedied before there is any prospect of success in curing the incontinence—the condition known as phimosis is one of these, and there are several others. Assuming that such obstacles have been removed, if they exist, what are the next principles of treatment?

First and foremost, never punish the child for "being dirty." The occurrence is one over which he (or she) has no control, and any kind of severity is only likely to accentuate the trouble by making the child nervous. Next the intake of fluids should be limited during the hours preceding the ordinary bedtime; the patient must not be deprived of all fluid, or allowed to suffer from thirst, but curtail the fluid element of the food. An effort should be made to find out at what time the incontinence takes place; and the practice should be instituted of waking the child an hour before this time and of commanding it to micturate. It used to be supposed that sleeping on the back has something to do with enuresis, and devices were invented to prevent this. Unfortunately they are more or less cruel, and in addition there is little proof of any great utility; one of the favourite measures was to fix a cotton-reel in the small of the back by a tape passed round the waist. Some doctors believe that adenoids and incontinence are somehow associated; and cases have been reported in which removal of adenoids has been followed by cure of incontinence. Certainly a child with adenoids enjoys better health in every way after proper surgical treatment; and therefore removal of definite adenoids is always likely to be beneficial. But it seems doubtful whether there is any strictly causal

connection between the two ailments, and certainly no child should be submitted to operation on the nose because it has incontinence, if the adenoid condition does not warrant interference.

#### THE FIRST DRUG TO TRY.

Last of all comes medicinal treatment. Of all the drugs with which physicians have dosed the sufferers from incontinence, there was only one with which any frequent success was obtained; that one was atropine, the alkaloid of belladonna. Fortunately children stand atropine well, for it is generally necessary to give large doses for a considerable period of time and even then the drug often fails. Two years ago DR. LEONARD WILLIAMS described remarkable improvement in cases of incontinence following the regular administration of thyroid extract, and suggested that hypothyroidism may be the real explanation of the condition. Other physicians have failed to obtain results as brilliant, and atropine still remains the favourite drug for first trial.

In a recent paper DR. A. C. D. FIRTH records his impressions of the thyroid treatment of twenty-eight cases of inveterate nocturnal incontinence. Briefly, he noticed cure or marked improvement in sixteen patients, and total failure in twelve. Although the doses given were slightly smaller than those recommended by DR. WILLIAMS, symptoms of hypothyroidism were caused in five cases, and hence it may be assumed that the drug was pushed to the utmost permissible limit. The twelve children who failed to improve on thyroid treatment were then given atropine, and five of them showed marked improvement. DR. FIRTH'S analysis of his cases shows that thyroid extract is most likely to do good when the child is backward in other ways—that is, when there is confirmatory evidence of hypothyroidism. In children otherwise normal, atropine holds out the best prospect of cure.—*The Hospital*.

### Progress of the Medical Sciences.

#### "TUBERCULIN THERAPY."

Attention is drawn by HORT to the very extraordinary diversity of opinion which exists at the present time as to the many practical points in the *administration of tuberculin*. Some competent observers hold that safe and efficient dosage should not exceed a small fraction of a milligramme of tuberculin T. R. Others report that they have given with safety and good results the stronger preparation T. O. A. in doses half a million times as great. Some maintain that tuberculin should

only be used with the most careful clinical control; others that it may be used in relatively large doses with casual dispensary inspection.

Four kinds of reaction to tuberculin are known: (1) the local; (2) the focal, at the seat of the disease; (3) the general; (4) the reaction *in vitro* of certain of the body fluids, serum, blood, urine, milk, to certain artificially prepared reagents of the laboratory.

The local and focal reactions are the expression of an increased susceptibility of the tissues to the action of a substance to which before tubercular infection there was practically no susceptibility. These two reactions are a good example of the lowered resistance to the disease, on which increased resistance ultimately depends. Anaphylaxis is one of the body's greatest weapons in prophylaxis and cure. The detection of this anaphylactic state is the basis of the diagnostic use of the local and focal reactions produced by tuberculin administration.

It is the utilisation of this state which makes the therapeutic use of the tuberculin rational. On what exactly these local and focal reactions depend is at present unknown. With reference to the general action, it appears probable that this is due to the absorption of toxic material from the host's own cells which has been liberated owing to the action of the inoculated tuberculin on the focus of disease. A focal reaction is essentially a hyperaemia, and without this focal hyperaemia it is held that no general reaction can occur. Therefore an adequate dose of tuberculin in a tuberculous subject gives rise to a true auto-inoculation. The real goal of hetero-inoculation is successful auto-inoculation.

Tuberculin should not be used for diagnosis subcutaneously unless all other means of arriving at a diagnosis have been used, because (1) it is not always harmless even in the absence of such diseases as nephritis, cardiac disease or diabetes, all of which are held to be contra-indications to its use; (2) a positive reaction may be obtained in quiescent tuberculosis; (3) in advanced cases it often happens that no free so-called antibody necessary to the production of the reaction is present; (4) there must be an absence of marked remittent or intermittent fever; (5) there must also be an absence of syphilis, leprosy and actino mycosis, since a reaction may occur in these diseases even when they are not complicated by tuberculosis; (6) skilled clinical observation must be available for the detection of any slight increase in the physical signs in the focus of disease, as this evidence is one of the most valuable signs that a true reaction has taken place.

In using tuberculin treatment the aim should be directed towards the production of mild degrees of focal hyperaemia, which should be

far below the plane of clinical observation. In chronic mild pulmonary tuberculosis an initial dose of  $\frac{1}{10000}$  of a milligramme of T. R. may be given, gradually increasing to  $\frac{1}{1000}$ . In more active disease the initial dose should be  $\frac{1}{100000}$ . Good results are recorded from the continent from much larger doses, *e. g.*, even 1,000 milligrammes of T.O.A. If the dose is excessive quiescent disease becomes active, active disease more active.

HORT hopes shortly to have ready a method of measuring the reaction between antigen and antibody, and of thus producing a method of blood examination which will help the clinician to form a sound judgment as to the wisdom of employing tuberculin in any given case.

KRAUSE, working on the question of immunity to tuberculosis, draw several conclusions from his work on guinea-pigs. Among the main results of his investigations, he shows that guinea-pigs may be specifically sensitised by tuberculo-protein introduced by any parenteral route. These experiments on guinea-pigs further suggest that it may be quite possible to sensitise a non-tuberculous human subject with a von Pirquet, or intradermic or subcutaneous test, and that as a result of this the individual would later give a reaction to larger doses of tuberculin. Acute anaphylaxis was developed by toxic injections given post-orbitally or intravenously. Probably any of the products of the tubercle bacillus will sensitise guinea-pigs. The shortest incubation period noted has been six days, the longest two hundred and eighty-six, the size of the sensitising dose bearing no relation to the period of incubation. Once sensitiveness to the tuberculo-protein is acquired by a non-tuberculous animal, the repeated absorption of more protein tends only to increase the condition. Tolerance to tuberculo-protein cannot be attained in the non-tuberculous animal by gradually raising the dosage or diminishing the intervals of time between doses.

Very little work appears to have been done to establish the relations between hyper-sensitiveness to the products of a given micro-organism and susceptibility to infection from it. Experiments have, therefore, been carried out to ascertain whether guinea-pigs sensitised to tuberculo-protein would be more or less susceptible to experimental tuberculous infection than normal animals. The animals which were sensitised all became diseased, evidence which strengthens the opinion that sensitisation to a bacterio-protein does not carry with it an immunity to infection; further, hyper-sensitiveness and increased resistance, two different things, can co-exist in the same animal.

Other investigations on pulmonary tuberculosis carried out by CAULFIELD and BEATTY seem to show that certain classifications of the

disease may be tentatively drawn by gauging the tuberculin sensitiveness, by using the reaction of complement fixation, and by certain opsonic observations. Possibly different tubercular subjects may overcome their infection along different biological paths.

From work done by CAULFIELD on serum reactions in which the hæmolytic system consisted of sheep's corpuscles, anti-sheep rabbit serum and guinea-pig complement, it appeared that a positive test might be obtained upon a specific and non-specific basis. Tuberculous sera can be divided into two classes by their interaction with antigens derived from tubercle bacilli, and used in so-called anti-complementary strengths.

1. *Inhibition*.—Sera with this effect allow hæmolysis on the addition of the hæmolytic system because their sera-antigen resultants are repellant to complement (all clinical normals with positive tuberculin reactions and many suspects showed this in a more or-less degree).

2. *Tuberculous sensitisers*.—Sera with these specific bodies cause the fixation of the complement, shown by complete absence of hæmolysis.

These biological classifications carry with them to a certain extent comparable clinical tendencies, and certain prognostic values attributable to the type of tuberculin reaction may be further narrowed and safeguarded.

The production of immunity by the inoculation of living tubercle bacilli has been attained in the guinea-pig by G. B. WEBB and W. W. WILLIAMS. An animal was inoculated weekly for nine months with a tubercle culture from which one hundred and fifty bacilli had been found to infect a guinea-pig. The inoculations were made subcutaneously, and began with two live bacilli, increasing to 5, 16, 20, 28, 40, 55, 75, 100, 150, 200 and so on, until at the end of seven months it had received 42, 235 living bacilli and remained perfectly healthy. The animal was now tested with tuberculin according to the method of ROMER, and gave a negative reaction. Inoculations were continued till the end of the ninth month, when 141,835 living bacilli had been injected. The animal was then killed owing to an epidemic of guinea-pig cholera. They were no tubercular lesions at the inoculation points, and so sign of tubercular infection elsewhere. Pieces of both lung apices, liver, spleen, kidney and one small inguinal gland were ground up in salt solution, strained through gauze and injected intraperitoneally into a guinea-pig. Seven months later this animal was killed, when no evidence of tuberculosis could anywhere be discovered.

A guinea-pig has therefore received, without any production of tuberculosis, about one thousand times a lethal dose of living virulent bacilli. Inoculations along similar lines are being carried out on monkeys.

#### MULTIPLE ARTHRITIS AFTER THE INJECTION OF TUBERCULIN.

Hæmoptysis, broncho-pneumonia, pleural effusion, miliary dissemination of tuberculosis, angina pectoris, hemorrhagic nephritis and tetany may all result from the injection of large doses of tuberculin. DIEM records a case in which an injection of 0.5 mgm. of tuberculin T. R. was made in the right forearm. The following day the temperature rose to 102.2, the right forearm becoming oedematous and red. In the right wrist joint and in all the joints of the fingers much effusion appeared, the overlying skin becoming livid. The right axillary glands became enlarged and tender. The temperature became normal on the seventh day, and the swelling of the joints had disappeared on the tenth. The tuberculin was sterile and used without complications in other cases. The syringe had been kept in alcohol and the skin cleaned with alcohol. There was no sign of suppuration. It is interesting to note that all the affected joints were distal to the site of the injection.—*The Bristol Medical-Chirurgical Journal*.

#### Infantile Scurvy due to Sterilised Milk.

Walter R. JORDAN, M.D.—On May the 1st, 1911, a baby aged 11 months, was brought to the Birmingham Children's Hospital with the complaint that it had never been well since birth, was wasting, and was always crying. It took but little food, and never went a whole day without vomiting. Its bowels were at times relaxed, at others costive.

There were slight signs of rickets, and the spleen was just palpable. There was a marked *glossitis migrans*. The only teeth cut were the lower central incisors, and the gum was bluish and spongy about the left one. In the upper jaw, over the position of the central incisors were two large, bluish, spongy masses. There had been bleeding from the mouth, and two weeks earlier orbital ecchymosis had been observed. The child had been fed from its birth on sterilised milk exclusively, except that for the last 4 months barley-water, made with Robinson's patent barley, had been added, and two tins of Savory and Moore's food had been given.

Under fresh cow's milk, citrate of soda, orange-juice and raw beef juice, the infant began to improve at once. On May 15, the gums were normal, and there had been no vomiting for 4 days.

Few similar cases have been reported. Probably there would be many more if it was generally realised that feeding with sterilised milk involves the risk of scurvy, and it in all such cases, the gums were carefully inspected. In infants who have cut no teeth, the changes in the gums are lost in making a diagnosis, which has then to be based on exceptional tenderness of limbs, disinclination to move, and, in some cases, sub-periosteal or other hæmorrhages. By bearing the condition in mind and acting on suspicion, these extreme developments will often be prevented.

It is particularly important to bear in mind scurvy as a cause of anæmia, crying when picked up, and generally malnutrition in infants at a time when the conclusions of the Tuberculosis Commission are likely to lead to an increased use of sterilised milk and sterilised patent foods for infant feeding.—*The Medical Review*.

#### SURGERY.

##### A Simple Method of Treating Fractured Clavicle.

Perhaps other surgeons have found, as I have, that the usual methods, such as SAYRE'S, for treating a fractured clavicle are not very satisfactory. Previous to 1907 I had tried all the usual methods, except operative, but generally I found the patients complaining of being very uncomfortable. For this reason I devised the following very simple method, and used it, according to my notes, for the first time on June 24th, 1907; and since then I have employed it a limited number of times, always with satisfaction.

Having an assistant hold the patient with the shoulders retracted, a two-inch strip of adhesive plaster in the hands of the surgeon is attached firmly to the front of the affected shoulder and over the point of it. It is then swung around the back of the chest, under the opposite arm, across the front of the chest, and finishes under the mammary or axillary region of the affected side. Theoretically this is not quite proper, as it pulls down the affected shoulder, but this is corrected by a sling to elevate the elbow.

In regard to being the original user of this apparatus, I had never seen it described or employed before my own use of it, but I willingly concede that other surgeons have probably employed it before me. I heard DR. W. J. MAYO say some years ago, "If you discover what you think is a new method in surgery, you may rest assured that, if it is a good method, some one between HIPPOCRATES and yourself has

used it." And after I had tried this apparatus two or three times, I noticed, in reading an advertisement in the *New York Medical Journal*, April 13th, 1907, that DR. BELLAMY had described a method like mine, except that he advised raising the elbow by laying the hand of the affected side across the chest towards the opposite shoulder, and fixing it there by adhesive plaster, much as in SAYRE'S method, but I prefer the sling, as it is more comfortable.—*The Canadian Medical Association Journal*.

#### New Method of Skin Grafting.

In the *Chin Medical Journal* DR. C. H. BARLOW describes a method of skin grafting which, though he disclaims any originality for it, is novel as far as Great Britain is concerned. He aims at securing for the denuded surface a sprinkling of the cells of the *stratum germinatum* of the skin, which lie next to the corium. These cells have, he says, a most amazing vitality, and can even be kept alive in normal salt solution for many days or grown upon culture media. Moreover, each cell reproduces itself in favourable conditions in from one to eight hours, so that the grafts spread rapidly. In order to get these proliferating cells, the superficial layers must first be got out of the way; and the author's method is extremely simple. He uses an ordinary stiff fibre brush, such as is used for cleaning vegetables, or a stiff hand-brush. He scrubs the area adjacent to the denuded surface till it is thoroughly reddened and denuded of the superficial layers of non-proliferating cells. He then scrubs the denuded surface, if granulations are present, until it is clean and bleeding; if it is fresh it need not be scrubbed. Without waiting for bleeding to cease, he scrubs from the prepared sound surface down over the denuded area with a strong even stroke, stopping the brush with a slight tamping movement. This carries the fresh cells down over the denuded area and implants them. No especial care is needed subsequently beyond simple dressing, and the results are said to be excellent. Though somewhat painful, the process does not require anaesthesia.—*The Hospital*.

#### Shoulder-Joint Dislocations.

In the *Annals of Surgery* DR. TURNER THOMAS discusses the pathology of nerve troubles following dislocation of the shoulder-joint. Such complications are usually explained by compression of the axillary nerves or by lesions of the spinal nerve roots. Various mechanical hypotheses have been conceived to explain these accidents, DR. THOMAS offers, however, a different explanation. Dislocations and simple sprains

of the shoulder-joints are generally produced with the arm in abduction. As a consequence, the antero-inferior parts of the capsule are subjected to special violence, so as in all probability to lead to tearing. This tearing may be accompanied by hæmorrhage, and in any case becomes the focus of a formation of fibrous tissue in the axilla, which may set up a perineuritis. Immobilisation with the arm flexed to the side, aggravates the condition, and when the attempt is made to move the arm again, it is prevented by the axillary fibrous bands that have been formed in the meantime. Paralytic and painful nervous conditions are also likely to follow from the compression of the nerve trunks by these fibrous tissue formations. The author supports this view by several cases which have been cured by forcible abduction and breaking of these supposed adhesions on the antero-inferior surface of the capsule. This hypothesis might also be applied to explain certain birth paralyses, following traction on the arms, in which a sprain or subluxation of the shoulder-joint might be accompanied by tearing of the internal part of the capsule. In the light of this hypothesis the treatment should be directed towards early movements of the joint and rapid absorption of any axillary hæmatoma.—*The Hospital*.

#### Intramuscular Injections.

Some years back MELTZER and AUER demonstrated by experiments on animals that the intramuscular injection of a substance is much more prompt in its effect than a subcutaneous injection, and is almost as rapid and effectual in its action as an intravenous injection. This rapid absorption in the muscles is explained by the rich capillary supply to the muscles and by the elevation of intramuscular pressure consequent on the injection, causing a more rapid penetration of the solution through the capillary walls into the general blood-stream. In the *Berliner Klinische Wochenschrift*, MELTZER returns to this subject and points out that these conditions are not so favourable in all the muscles of the body, and he is of opinion that the muscles of the buttocks are much inferior in this respect to the lumbar muscles. The lumbar muscles are denser and the muscular fibres finer and interwoven with comparatively little connective tissue, and the whole mass is embraced by two thick aponeuroses. On the other hand, the muscles of the buttocks consist of coarse fibres separated by much fatty and connective tissue, and their aponeuroses are loose, so that the injected fluid can easily escape into the cellular tissue and fails to exert that intramuscular pressure which is so important a factor for rapid absorption. MELTZER is of opinion that the accidents following injections of salvarsan into the buttocks—persistent

pain, sciatica, paralysis of the peroneal nerve, thrombosis, ect.—are not the result of the intramuscular injection itself, but are due to the arsenical preparation spreading into the loose cellular tissue around the nerve trunks and blood vessels. On these grounds, therefore, he advocates intramuscular injections into the lumbar muscles. The method of procedure is as follows: The patient should lie down face downwards, so as to raise the lumbar region and make the lumbosacral muscles prominent. A line is then drawn from the most prominent point of the iliac crest to the spinous process of the third or fourth lumbar vertebra. The needle is introduced at the junction of the inner and middle thirds of this line. The needle should be inserted perpendicularly downwards towards the abdomen, till it reaches the aponeurosis which is very resistant. Having penetrated this it should be carried towards the head parallel with the vertebral column and a little inwards. The needle must be sufficiently strong and should be at least eight to ten centimetres long. In obese subjects the layer of fat between the skin and the sacro-lumbar aponeurosis is often very thick. The author has carried out these injections in twelve patients and the results have been very satisfactory, the injections causing little or no pain.—*The Hospital*.

#### Afebrile Erysipelas.

In NOTHNAGEL'S text book LENHARTZ writes: "Contrary to the opinion of many writers I find that erysipelas is invariably accompanied by fever which, though it may be slight, is still ever present." He further adds that fever was present in all his 140 cases. In one year the writer attended 324 cases of erysipelas in women, and found 29 were afebrile. In all the area involved was small and the disease was mild. Three of the patients had frequently suffered from the disease previously. One, a domestic servant, aged 30, had suffered from 6 attacks of erysipelas which always involved the face. The last occasion was 1½ years ago. On admission there was erysipelas of the nose and the left eyelid and cheek. Next day the right cheek was also affected by the inflammation, which presented a raised and sharply defined margin. On the third day the rash began to fade and desquamation occurred, the process being completed 4 days later. During this period the temperature was taken every other hour, and it never exceeded 98.6°. The writer's observations are confirmed by ROGER and FRICKHINGER, the latter finding 20 per cent. of his cases of erysipelas afebrile.—*The Medical Review*.

#### The Pathological Relation of the Anæsthetic to Surgical Procedure.

By

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BROOKLYN.

That the anæsthetic has an important pathological relation to surgical procedure no one, I think, will gainsay.

The mere opening of an abscess, amputation of a finger, removal of an appendix, or even resection of gut, in a human otherwise physically perfect, could only now and then cause death from fear, etc., but induce that toxic state called general anæsthesia for the purpose of doing even the most minor of these operative procedures and immediately a factor of danger more or less great is to be dealt with.

Excluding such surgical errors, as glaringly defective technique, which allows excessive hæmorrhage, or unnecessary dawdling away of time, which exposes the patient for three or four hours instead of one, excluding actual mechanical disturbance of vital nerve mechanisms such as the medulla, vagus nerves or cerebellum, excluding these things in surgical procedure we have few conditions of operative work which of themselves actually determine death.

It is the anæsthetic; look back at the pulseless estopic recover, the old chronic, septic, nephritic, cardiac stand amputation of a leg under spinal analgesia, a surgical risk not worth a farthing under general anæsthesia.

Look back at any number of subjects whose organs, vital to existence, are only remnants of their physiological selves and yet which live through years. This body of ours has an enormous factor of safety for most everything but overwhelming traumatism or poisons, organic and inorganic. Given the most severe operative procedure, the most grave pathological disintegration as from sepsis, the poorest old heart and kidneys, and if it were not for the necessity of general anæsthesia, most surgical procedures would meet with surgical success as far as life goes.

The toxicological effect of the narcosis is the element of morbidity in the handicapped subject for surgery, whose factor of safety has been so overdrawn that this last straw of anæsthesia determines death or serious sequelæ.

The anæsthetic is related to surgical procedure in several ways to be considered at this writing.

*First*, it produces unconsciousness and analgesia, both of which conditions are necessary to the successful accomplishment of surgical work.

*Second*, it produces of itself or in conjunction with surgical procedure varying grades of shock.

*Third*, it causes in addition to temporary cellular disarrangement of nerve tissue, blood, lymph, etc., greater or less permanent (lasting some time at least), cellular disintegration or cell lysis. Under this heading may be included hæmolysis, hepatic disturbance causing glycosuria or even acute fatty degeneration; nephritic disturbance, pulmonary and bronchial; protoplasmic changes in the nerve cell of the brain; insanity; lowering of opsonic resistance; acetonemia.

*Fourth*, it causes vomiting.

*Fifth*, disturbed cardiac compensation.

These conditions all being related pathologically to the surgical procedure and outcome.

The first effect, that of unconsciousness and general analgesia, is what we seek and need; all the others are elements to be modified at least and eliminated where possible.

The second, that of shock, is perhaps the most important, for that condition most often makes the surgical work of no avail through death of the patient, and indirectly hampers surgical progress on account of the bad reputation it gives, because of which reputation subjects are slow to accept operative relief. Surgical shock is either hemorrhagic, traumatic or toxic. The first the anæsthetic has nothing to do with, the second or toxic belongs partly to the surgical condition present, *viz.*, sepsis or other surgical toxemia and partly to the anæsthetic; sepsis the anæsthetist cannot help; the toxemia of the anæsthetic he is bound to reduce to a minimum.

The anæsthetist must be so familiar with the therapy of the drug that he is using and with the individual requirement as to dosage of each patient, that minimization of dosage is absolutely assured. He must be so familiar with the physical condition of his patient and the surgical work to be performed, that he selects the least toxic agent of narcosis and technic of administration consistent with the surgical requirements of the case in hand. For example: He must never initiate an anesthesia with ether in a strong, athletic, alcoholic, plethoric individual, for in these subjects ether has to be given in extremely toxic doses before the desired analgesia and muscular quiet is attained; at least this is the case unless preliminary hypodermatic medication has produced the desired lessening of that necessity for toxic dosage. As a

general rule nitrous oxide becomes a toxic agent of narcosis and dangerous to use in any condition where asphyxia is either present or may be induced by the mechanics of the operation, *e. g.*, adenoids and tonsils, angina Ludovici, empyema or other obstructive conditions of the respiratory passages.

He must never select chloroform where ether can be used with reasonable degree of safety.

He must never use either ether or chloroform where the circulatory factor of safety has been reduced to a minimum by hemorrhage or sepsis or traumatic shock, in which cases every last drop of resistance must be conserved to the utmost.

These conditions are such as to make the improper selection of the anæsthetic agent the element of mortality in surgical procedure.

Traumatic shock from the anæsthetic stand-point furnishes some of the most interesting and recently studied pathological phenomena german to the subject. The traumatism of the surgical procedure itself is part of this traumatic shock but not included directly under our heading. The anæsthetic trauma referred to is that caused by all grades of afferent nerve assault upon the general nervous mechanism, as noted in the form of fear and apprehension of the anæsthetic, present just prior to operation and induced by the pathological nature of the narcosis itself.

In order to properly comprehend the nature of this afferent nerve assault or anoci-association, as Dr. CRILE terms it, one must study for a moment, at least, the nature of general narcosis as produced by the agents usually employed. The effect of ether, chloroform, etc., upon the nervous system to the end of producing general narcosis, is at present and has been attributed to some selective action on the part of the agents used, for the nervous tissues; such an hypothesis in the light of chemical knowledge of to-day is decidedly less tenable than that this apparent selective action of narcotics is due to the peculiar structural arrangement of the nervous system whereby even slight chemical change in one part is diffused and rediffused and communicated to all parts. We are all familiar with the fact that when nerve tissue is being subjected to an agent which arrests its functions, that agent serves at the moment of its action to excite that nerve. Hence when any agent capable of so changing the molecular state of nerve matter as to arrest its function, is carried into the blood, it first acts on the nerve cells. Each change produced in one of these, be it the decomposition of a molecule or, as is more probable, the isomeric transformation of a molecule, implies a disengagement of molecular motion or nerve force that is immediately communicated to its neighbouring

molecule, each molecule being a center of discharged nerve force in the act of being incapacitated for further transmittal of motion. Each nerve cell being thus quickly acted upon and emitting successive discharges as the successive molecular transformations are wrought in it, there results a general nervous chaos, a tempest of incoordinate nerve force discharge, and as is plainly to be seen a coincident desintegration of the action of vital organs which depend upon fine nervous co-ordination for their control.

The effect of afferent nerve assault from fear alone is familiar to you in its causation of vomiting, fainting, etc. In pre-anesthetic days surgical subjects have been known to die from fear alone. In the laboratories of Dr. CRILE, DOLLY, AUSTIN and SLOAN (*J.A.M.A.*, Vol. LVI, No. 9) have experimentally concluded that "the same nerve tempest of afferent nerve impulses that produce circulatory depression or failure, at the same time so far disturb the neurocytes, Purkinje cells, that their nucleoli change their relation to the cytoplasm, the limiting membrane loses its continuity in places and chromophylic reaction is changed. The varying degrees of these changes are in proportion to the degrees of surgical shock. The neurocytes in cats have undergone similar change from fear alone."

So material is this element of noxious afferent nervous assault in surgical procedure, that there is little room for doubt that in large operating clinics or small ones either where the reputation of the operator is such as to instil the utmost confidence on the part of patients for their surgeon, the surgical results are proportionately better and the belief is readily acceptable that in the unbalanced nervous mechanism of Graves' disease the post-operative hyperthyroidism may be due in no small part to the added noxious assault of anesthetic induction so that Dr. CRILE has not only adopted a pre-operative treatment in Graves' disease that prevents the patient knowing when the true anesthesia for operation is to take place, but in addition blocks all afferent nerves from the field of operation during the removal of the thyroid gland. *Surgery, Gynecology and Obstetrics*, August, 1911.

The same principle of anoci-association prompts the careful cocaine-ization of large nerve trunks in amputation of extremities instead of the rapid fire, cut and slash methods of battlefield days, with the result that much of the vaunted shock of amputation at the shoulder or hip is done away with.

The principle of anoci-association, against noxious nerve impulses, must become not only an important element of surgical technic but just as important a principle of anesthesia in combating shock.

In explaining the occurrence of surgical shock or rather anesthetic shock as seen in surgical procedure, Prof. YANDEL HENDERSON, of Yale Phys. Laboratories, has suggested some new ideas based on a new conception of the physiology of respiration.

*First*, the writer would express his belief that the actual physiological observations reported by Prof. HENDERSON are absolutely correct, but that the majority of his deductions relative to anaesthesia are misleading.

*Second*, that re-breathing in general narcosis depends only slightly, if at all, upon its raising the carbon dioxide contents of the blood, for its beneficial effects. That after such re-breathing or administration of carbon dioxide has once caused hypercapnia to replace acapnia, the consequent increase in depth and frequency of respiration can hardly be of sufficient benefit of itself to justify the combination of a procedure which utilizes the accumulation of waste material to whip the respiratory mechanism, at the same moment defeating the very purpose of that increased respiratory function, namely, the elimination of said waste material carbon dioxide.

*Third*, that such re-breathing as is adopted in nitrous oxide-oxygen—either anesthesia by Dr. GARCH has as its beneficial factors:

(a) The economy of the narcotic agents used, not from the viewpoint of cost, but from that of making the smallest amount of anesthetic do the greatest amount of work through limitation of pulmonary ventilation, therefore waste.

(b) The utilization of a technic of administration which excludes entirely the diluting nitrogen of air. When air is admitted with nitrous oxide and its quantity reduced to so small amount as to allow enough nitrous, the oxygen content of the respired mixture is so low as to produce asphyxia. In the closed technic, air is not only excluded from the breathing bag, but washed out of the lungs, too, and the patient is breathing nitrous and oxygen minus any diluting nitrogen of air.

(c) The gases are warmed by re-breathing and moistened

(d) An increased nitrous oxide pressure is obtainable when needed by filling full the breathing-bag, which increase in pressure insures a certain added saturation of the blood with nitrous.

If re-breathing is harmless, as reported, to the degree adopted in the GARCH technic, then no doubt such a pathological condition can be tolerated to accomplish the above cited objects, but not to any great extent because of its benefit from the acapnic theory of shock point of view.

The traumatic shock of anesthesia has as primary causative factors first the afferent nerve assault of fear, apprehension, *etc.*; second, the afferent nerve assault of the anesthesia, especially during its induction or throughout a too superficial maintenance; third, the afferent nerve assault of the operative procedure itself and the condition for which operation is performed. All these elements in greater or less degree combine towards the end of determining the degree of central nervous disorganization at the time of and after operation.

Granting that all the actually observed physiological facts be true as reported by Prof. HENDERSON, the hyperpnea, the acapnia, the acetone-mia and asphyxial acidosis, which factor in this state appeals more to reason as the important element in apnea vera, the over-ventilation of the lungs with reduced carbon-dioxide content in the blood or the raised threshold of the respiratory mechanism, which raised threshold simply means a degree of dissociation in that mechanism, as part of the general nerve dissociation, incompatible with its proper response to normal stimuli be that carbon dioxide or oxygen.

We believe most emphatically that this latter condition is the important one and not the coincidental, inconsequential over-ventilation of the lungs; we believe that beyond utilizing the rebreathing or administration of carbon dioxide for a few minutes as an emergency measure, that either of these procedures would have little value, and furthermore it is difficult to realize that any procedure which utilizes waste material as a stimulant to the respiratory function as being else but source of harm if continued for any length of time. We think that Prof. HENDERSON has adopted a coincident physiological occurrence, a concomitant condition of shock, as its cause and in so doing withdraws attention from the true cause.

In the case of irregular anesthesia the acapnia produced is not the condition to be remedied, but rather the erroneous manner of administration or poor selection of the agent of choice in a particular case, in this way preventing the toxic depression of the nervous mechanism which is responsible for anoxemia, asphyxial acidosis and the whole respiratory upset.

We believe that tracheal insufflation anesthesia would be sufficient to produce acapnia by its forced ventilation of the lungs and recent success with this particular form of narcosis has developed to date no such condition apparent.

The anesthetic state can of course only be explained by temporary atomic disarrangement of the cellular elements of the nervous system,

whether such disarrangement is of that nature which prevents the proper assimilation of oxygen by the cell, as held by Prof. MAX VERWORN in his recent lecture on narcosis before the Harvey Society, or other equally difficult to comprehend chemical changes in the protein element of the cell, we do know that in addition to this temporary change which produces unconsciousness and loss of sensation there exists more or less permanent cell change, that which bears an important physiological relation to the patient's surgical convalescence and recovery.

Ether and chloroform both produce disintegration of haemoglobin and blood cells and materially increase the coagulation time, this latter condition being present as late as the tenth post-operative day.

The acute fatty degeneration of liver cells is well known and in lesser degrees of hepatic disturbance, glycosuria is noted, renal disturbance is common as well as pulmonary and bronchial; insanity occurs and often lesser grades of psychic disturbance in the form of momentary lapses of consciousness occurring for weeks after anesthesia, especially when the mind is engaged in some of the finer co-ordinations of action. Opsonic resistance is distinctly lowered, which may be some isomeric change in certain gland secretions, a suspension of function in those organs or suspension of phagocytic activity, in any case illustrating the far-reaching activity of the toxins of the anesthetic state.

Out of four hundred operative cases observed at the Boston City Hospital, forty-six showed signs of acetonaemia of varying degrees of severity. General anesthesia does precipitate this acetone-mic crisis in patients whose condition is such as to favor imperfect oxidation of albuminous substances. Diacetic acid is the end product found in the excretory fluids of the body and in cases other than diabetes may cause post-operative death.

In the ordinary healthy individual all these remote effects of general anesthesia need hardly be considered, they are conserved by the enormous factor of safety of the human body. We administer thousands of anesthetics without noting the existence of any of them perhaps, therefore the general optimism toward anesthesia.

We must, however, save the thousand and first case and even in the thousand recognize the deleterious effects of narcosis on the surgical convalescence and recovery; here lies progress, science. We must study and know why the occasional case dies during narcosis. General anesthesia does not cease its responsibilities when the patient is wheeled out of the operating room, as any surgeon can testify.

We would ask again, what so often turns the slow but certain battle against sepsis into a losing one? The anesthetic. What makes a goitre's post-operative hyperthyroidism fatal? The anesthetic. What,

makes a post-operative anæmic subject die, apparently from lack of power to pull itself together as our saying goes? The hemolytic effect of the anæsthetic; forty per cent. hæmaglobin becomes twenty-five per cent. after operation.

What makes the mortality of prostatic removal so high? The anæsthetic. Sepsis, anemia, nephritis—age—handicapped subject. Remove the handicap of sepsis and nephritic disease by proper pre-operative care and great measure of success follows.

Some people vomit if their nervous balance is so far disturbed as to take an elevator up or down a few stories; many vomit if they are forced to ride on the elevated road, so we can hardly expect to eliminate vomiting entirely in anæsthesia. However, most of our post-anæsthetic vomiting is toxic, part of it traumatic as in mechanical disturbance of abdominal viscera causing acute dilatation of the stomach or misplacement of the bowel, some of it psychic, the result of nervous unbalance comparable to dizziness.

The anæsthetist who adopts the principle of constant minimum dosage instead of intermittent maximum will have in all cases less vomiting than he who doesn't. The anæsthetic technic which eliminates asphyxia, swallowing of strong ether vapor and provides for nitrous oxide, the major part of the narcosis will probably limit the occurrence of nausea to the lowest degree.

Post-operative emesis may disturb abdominal wound apposition, may cause secondary hemorrhage, may even cause death when persistent. If the vomiting is a symptom of acetoneemia, that condition must be recognized, if due to acute gastric dilatation, different measures for relief are indicated, other aspects are purely surgical.

Ether and chloroform must be pure chemically. Alcohol as a diluent of ether furnishes water, which in the presence of oxygen oxidizes the peroxides of ether forming acetaldehydes. Ether free from acetaldehydes causes much less vomiting than impure ether. Chloroform may contain alcohol, but should be protected from light by dark containers and from air and the cork by tinfoil or similar covering to the cork. BASKERVILLE and HAMOR, *Journal of Engineering and Chemistry*, May and June, 1911.

The principal relation that anæsthesia bears to cardiac disease is relative to the presence of serious transudation. Chloroform and ether have equal effect upon kidney lesions, except in the presence of a tendency to anasarca, in which case ether is extremely liable to increase such transudation, to the end of causing post-operative pulmonary edema. The effect on the heart itself is slight if not mechanically hampered by

asphyxia or similar pulmonary obstruction to the right heart action. Old asthenic myocardial hearts show tendency to weaken materially with gradual slowing of their force and frequency until beating at the rate of fifty or fifty-five they stop altogether. The anæmia that accompanies cardiac or nephritic disease is a much more important matter for conservation than any simple valvular disease.

In the light of what we know to-day about the dangers remote and coincident with general anæsthesia, in the light of what we know about its intimate connection with and influence upon surgical recovery and success, can we longer consider the anæsthetic in so optimistic a manner as to relegate it to the newest member of the house staff—or a nurse; can we longer consider it as simply a mechanical process of pouring so much ether or chloroform on a gauze mask; can we leave its teaching to information handed down from one member of a house staff to another, or dictated at long distance by the operating surgeon, whose only main object for the moment is to secure cadaveric relaxation of his subject? Is the fact that because the majority of patients whose factor of safety is equal to the anæsthetic assault, do not show ill effects of narcosis, going to make us blind to the safety of that patient whose handicap from disease is so great that the last straw of general anæsthesia is allowed to cause his death, with the surgical verdict that he was too far gone to recover?

I say no. The surgeon with the lowest mortality, other things being equal, will be ~~he~~ with the best anæsthetist, and I beg to submit the opinion that that surgeon who thinks, will find few greater influences in his success or failure than his anæsthesias.

If clinics where nurses are used as anæsthetists do well, they are condemned for they could do better and won't.

The surgeon who answers your argument by saying that the old ways are good enough for him, is condemned for he certainly can do better and won't.—*New York State Journal of Medicine*.

### Some Conditions Simulating Disease of the Hip or Spine

BY

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A subject which has always been of interest and has always called for general comment is that of referred pain, because of the probability of mistakes in diagnosis. I mean conditions in which the lesion is situated at a distance from the point where the patient locates his symptoms.

For example, a decayed tooth may indicate its presence by an earache, a pleurisy may simulate an attack of appendicitis, or a tumor of the pancreas may cause such symptoms as to direct attention to the gall bladder. Either directly through the nervous system or indirectly by reason of the proximity of the lesion to certain neighbouring muscles or organs, suspicion is at first directed away from the location of the trouble. All medical students are warned about the pains referred to a distance, when the spinal column is affected but not a few of them, later on, find out to their discomfort that they have overlooked a Pott's disease because the patient located his symptoms at a distance from the spine. In this paper I intend to relate the histories of some cases which were very interesting from the standpoint of diagnosis. Cases in which the attending physicians suspected disease of the spine or hip because of symptoms referred there, while the further course in each case demonstrated the trouble lay elsewhere. The first two cases, simulating hip disease, were of abscess following trauma, one located along the psoas muscle in front of the lumbar spine, and the other back of the left kidney. Of the remaining five cases, all simulating disease of the spine, the first was a case of retroperitoneal carcinoma, and the remaining four cases of tuberculosis, one a tuberculous kidney, another a cold abscess near the kidney, another in which the exact site of the lesion was not determined and the last a case of tuberculosis of the appendix, complicated by tuberculous endometritis. These cases point out the fact that there is a variety of conditions which may give rise to spinal or hip symptoms; such symptoms being pain, muscular spasm, deformity or loss of motion.

#### CASE HISTORIES.

*Case 1.*—Boy, aged 11. Three weeks before examination, this boy had been struck by a baseball in the right flank. He was in bed for several days, and since then had had pain and increasing limp. His physician suspected hip disease because of the limp and muscle spasm. The thigh was held in flexion and outward rotation, but on examination it was found that after flexing the thigh to a right angle hip motions were free. There was also spasm of the abdominal muscles and erector spinae, causing a postural lateral curvature, convexity to the left. Temperature 103. No definite tenderness. He was sent to the General Hospital and traction applied to the leg in the line of deformity. There was immediate improvement in all symptoms except that of psoas contraction. Weeks later the temperature rose again for a few days and tenderness was found in the right ilio-costal space. Three weeks later there was a repetition of fever, pain, and spasm for a few

days, and three weeks after that a recurrence, with a leucocytosis of 19000. The X-ray was not positive as to any spinal lesion and varied opinions were given as to the location of the focus. On account of the point tenderness in the flank, an incision was made there by Dr. MCGUIRE and blunt dissection soon found two ounces of thick pus over the psoas beside the lumbar spine. The culture showed staphylococcus pyogenes aureus. Recovery was prompt.

*Case 2*, similar to case 1.—Boy, aged 8. Two months before there had been some injury from making a high jump. This had been followed by pain, limp and fever. On account of the increasing limp and the flexion and rotation of the left leg, his physician had diagnosed an acute hip condition. On examination there was found some fulness and tenderness in the left ilio-costal space, but the hip was free after flexion of the thigh. Leucocytosis 17000. Dr. EUGENE SMITH made an incision below the ribs, opened the lumbar fascia, and found pus by the needle high up back of the kidney. Drainage brought about a prompt cure.

*Case 3.*—Man, aged 52. Two injuries of the spine had been sustained. The first, 13 years before, when he was thrown from a carriage and struck on his back. Recovery in two weeks. The second two years before, when he was dragged by a horse over the ground for a block. Many contusions were received but he did not stop work. His recent history was one of pain in the back for several months, continuous pain with sharp severe attack daily, bilateral and simulating root pains. Some loss of weight and occasional attacks of vomiting. Examination showed a flat back, with considerable rigidity; spasm of the back and abdominal muscles. Diagnosis in doubt. A plaster jacket was applied and some relief given. Following several attacks of vomiting and diarrhoea a new jacket was made as the first became too loose. Renewed pain, attacks of vomiting and rapid loss of flesh suggested a new growth. As the epigastrium on palpation felt abnormal, Dr. FREDERICKS opened the abdomen and found extensive retro-peritoneal carcinoma. Death followed in a few weeks.

*Case 4.*—Woman, aged 24, large and well nourished. Family and personal history good. Seven months before she had given birth to a seven month baby which died at once. Her convalescence was normal and the catheter was not used. She had complained of pain in the right side ever since. During the past month thigh flexion and limp had appeared and various diagnoses had been made. On examination there were found flexion and adduction of the right thigh; side bending of the spine limited and painful; tenderness over right abdomen and over the

whole of the right sciatic nerve. It was suggested that a few days' rest in bed might be of value before another examination. Three days later all the spasm had disappeared and a tumour of the right kidney could be palpated. The urine was loaded with pus and catheterization of the right ureter found pus coming from the kidney. As the temperature and white blood count were normal, a probable diagnosis of tuberculous kidney was made. Operation was refused and the patient was lost sight of.

Case 5.—Man, aged 32. Ten months before a heavy block of wood had struck his left side. After two weeks in bed he returned to work but suffered continually from soreness and pain. Later there was some bladder disturbance and weakness of the left leg and he was compelled to give up work. On account of his posture and his spinal symptoms he was sent to the writer. He stood, leaning on his right leg, with a tilt forward and to the right. The back was flat, motions limited and painful, and the left erector spinæ tense and prominent. The left leg motions were weak, the knee jerk less than the right and sensation dulled. A tender mass could be defined below the twelfth rib and the X-ray showed in that location a thickened area as of abscess. He returned to his home for operation.

CASE 6.—Man, aged 31. One uncle had died of tuberculosis. Personal history, good. For six years this man had had pain in the lower back running down the left side. Six months before he had been compelled to stop work by the increasing pain and an operation on his left kidney performed, but no stone found. It was then decided that his spine was at fault. Examination showed a weak looking man of typical tubercular appearance. There had been twenty pounds loss in weight. The dorsal curve was exaggerated but there was no hyposis and no spasm. Side bending caused pain and there was tenderness over the lumbar region. No exact diagnosis was made but a jacket was made for him and he was sent back to the country for rest and general treatment. He slowly grew worse and died about two years later.

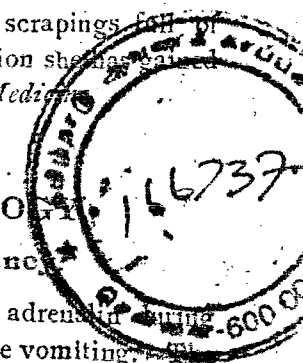
Case 7.—Girl, aged 20. Occupation seamstress. Family history full of tuberculosis. Personal history good. Two years before she began to have backache in the lumbar region and later aching pains down the thighs. The pain increased and widespread spasm of many muscle groups began. For one month before examination she had been walking on her toes. In fact her walk was an extraordinary spectacle, with body tilted backward, lumbar lordosis increased and a staggering gait with heels off the floor. Marked hysteria was evident, induced by her illness. The pharynx was anæsthetic and the skin hyperæsthetic all over the

back and down the legs. Many muscles contracted on slight stimulation. There was no evidence of Pott's disease and the X-ray was negative. A jacket was furnished and gave great relief as her pain diminished and she could walk on the soles of her feet. Six months later her right thigh drew up in flexion and adduction, the spasm being very strong, but under suggestion the leg could be drawn over in the opposite direction. Temperature at this time slightly above normal but general examination negative. She again improved but some months later had an attack of appendicitis. Dr. MEYER operated and found the appendix tied down in front of the spinal column. He also curetted on account of leucorrhœa. Dr. BENZ found the appendix and the scrapings full of giant cells and tubercular infiltration. Since her operation she has gained in weight and strength.—*New York State Journal of Medicine*.

## OBSTETRICS AND GYNÆCOLOGY

### Adrenalin in Vomiting of Pregnancy

ROBINSON reports two cases in which the use of adrenalin during pregnancy had been successful in the control of severe vomiting. The first case was one of incessant persistent vomiting, the patient being unable to retain the smallest quantity of food. All the usual remedies failed to give any relief. The author then gave ten minims of the 1-1000 solution of adrenalin, and the vomiting at once stopped, and the patient was able to retain food. After three weeks the treatment was suspended, and the vomiting then recurred. The treatment was resumed and continued for several months, and the patient was thus enabled to keep down her food, and her state of nutrition was maintained. The second case was also one of persistent vomiting, with much wasting and delirium. Termination of the pregnancy was decided upon, but before the operation was commenced, ten minims of the 1-1000 solution of adrenalin were injected hypodermically and repeated the same day. After the first injection the vomiting ceased and food was retained. Injections were continued for a week, and then internal administration was substituted, and the patient was thus enabled to go to full time. The author concludes that "the products of the genital and supra-renal glands neutralise each other in the normal state, whereas when one of these two organs is in a state of hyper-activity, the other succumbs, unless it is balanced by an opoatherapeutic treatment."—*The Australasian Medical Gazette*.



2-11-12, 1912  
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## THERAPEUTICS.

## Acquired Tolerance to Drugs.

Of late years EHRLICH has familiarised us with the idea of the tissue cell acquiring immunity against toxic proteins by the development of anti-bodies. But it is an integral part of his theory that these toxins should imitate food molecules and therefore be able to seize upon "side chains" which the cell had elaborated for the reception of food. The cell responds differently to such proteins or antigens on the one hand and to the alkaloids on the other. Although the alkaloids never induce the formation of anti-bodies, the organism may acquire tolerance for quite massive doses. The method by which this is done is an interesting and difficult problem.

The normal reaction of the body to simple inorganic and organic poisons differs in an important particular from the method adopted against bacterial poisons. The neutralising substances are normally present in the body and are not specific, each of them combining with several poisons. The reactions are few and simple, such as oxidation, reduction, hydration, dehydration, and methylation. The protective substances are also few, such as proteins, bile acids, glycuronic acid, etc. They are not the result of any special adaptation to meet a pathological condition. They are there as the result of normal metabolism; they have an affinity for various chemical substances, some of which happen to be poisons. If these enter the body, they are neutralised to some extent, though, as a rule, very incompletely. All this is very different from the highly specific nature of the immune substances produced against bacteria and their products.

Take a few examples. In herbivora acids are neutralised by the excess of alkaline carbonates always present in their blood, while carnivora react by splitting off ammonia from their proteids to the same end. Carbolic acid combines with the sulphates of the body to form a harmless ethereal sulphate. This is one of the ways by which the putrefactive bodies formed from proteins in the bowel are rendered innocuous. Camphor and chloral unite with glycuronic acid and are excreted in this combination. Hence the reducing action of urine after administration of these drugs. Salicylic acid combines with glycine, an amino-acid contained in many proteins, to form salicyluric acid, an almost inert body. Many of these combinations are brought about in the liver and some occur with difficulty or not at all *in vitro*. Thus sodium sulphate and carbolic acid have no chemical affinity outside the body, and inside the body they combine too slowly to be effective as an antidote in acute

poisoning. These facts point to some catalytic agent in the liver, probably a ferment, being responsible.

PROF. DIXON, in his presidential address to the Therapeutical and Pharmacological section of the Royal Society of Medicine, suggests that acquired tolerance may be explained by the production in increasing amounts of a ferment normally present, which is capable of destroying an alkaloid or rendering it inert by combination. After a hypodermic injection of morphine into the dog 70 per cent. can be recovered from the faeces. Habituation, however, leads to diminution in the amount thus excreted until daily injections can be given with no more than a trace of morphine being recovered. Post mortem analysis of the tissues shows absence of the alkaloid. This suggests that tolerance is acquired by increased power of the tissues to destroy morphine. Tissue extracts certainly possess the power normally of destroying certain alkaloids. Thus hyoscyamine disappears completely if kept at 22° C. for 2 or 3 hours in contact with the juice expressed from a frog's liver. Dog's liver has little or no destructive action on hyoscyamine. The natural immunity of the rabbit to atropine depends mainly on its power of destroying the drug, and the sensibility of the cat on the absence of such power.

DIXON and EMERSON LEE have investigated the interesting question of acquired tolerance to nicotine. That men can acquire some degree of tolerance to tobacco smoke is certain. It is proved that the toxic effects of smoking are due to the nicotine, the other products being comparatively insignificant. Now small or moderate injections of nicotine, administered at intervals to animals, always produce the usual physiological effect, no matter what previous injections have been given. This leaves only two probable explanations of tolerance in man. The first is that in the tolerant man nicotine is not absorbed. But this is disproved by the fact that excessive smoking readily produces toxic effects—alimentary, cardiac and nervous even in the most inveterate smokers. The second is that the nicotine is destroyed as an active substance, but that the rate at which destruction occurs is limited. So that if the nicotine were introduced directly into the circulation, the amount destroyed before its specific action was obtained would be practically nothing. This explains the failure of some observers to obtain tolerance to nicotine experimentally, for they took as their evidence of tolerance the ability to stand a large injection. DIXON and LEE tested the point by giving small and repeated injections of nicotine to rabbits. An extract of the liver was made and its power of destroying nicotine compared with that of normal rabbit's liver. It was found that

the liver of the animal that had been habituated to nicotine during life could destroy more of the alkaloid, weight for weight, than the normal liver. If the liver is first boiled its power of destroying nicotine is completely lost. This suggests that a ferment is responsible, and the suggestion is borne out by the fact that if the liver is kept for 10 days in a dried and powdered condition it loses this power of destroying nicotine. It is well known that ferments on keeping in the dried state may lose their activity. It is indeed difficult to conceive any other hypothesis to meet the facts. In tobacco smoking the nicotine reaches the circulation slowly and in minute quantities and so the tissues have time to destroy it if they contain the requisite ferment. Not only does the liver destroy the nicotine, but it has a selective power for taking it up from the circulation and holding it prior to its destruction. For when nicotine is injected into the circulation of normal animals it disappears quickly from the blood, but can be recovered from the liver by distillation.

The main factors then in acquired tolerance to nicotine are the picking out of the drug from the circulation by the liver, and its destruction there by a ferment which is formed in increased amount. The simplest evidence of tolerance in man can be obtained from the blood-pressure. If a man unused to tobacco smokes a cigar, his pressure first rises 10 to 25 mm. and then, after a quarter or half an hour, if the smoking has been continued, drops 30 or 50 mm. or even more. The habitual smoker under similar conditions shows no change beyond a slight rise of 4 or 5 mm. This acquired tolerance may be lost. An interesting example of this is related by FRANCIS HARE. A large sailing vessel going from Boston to Calcutta had by mistake no tobacco on board. Various substitutes were tried, but nothing suitable was found, and the crew were mutinous and troublesome throughout the entire voyage, which, owing to head winds, occupied nearly 6 months. As soon as they reached shore they all started to smoke, but in practically every case they became extremely sick.

Tolerance to alcohol, natural or acquired, is a well recognised fact, of which there is no adequate explanation. Alcohol is completely oxidised and destroyed in the body in physiological dosage, but the rate of oxidation appears to vary in different persons, and so soon as the blood contains a certain percentage, somewhere about .1 or .2, nervous symptoms become manifest. The habitual drinker can tolerate an amount which would profoundly affect the average moderate person, not because the alcohol has not been absorbed, but probably because the rate of oxidation is better able to keep pace with the rate of absorption. In-

creasing tolerance for alcohol is acquired by steady uninterrupted drinking of amounts generally inadequate to produce even incipient drunkenness. When the subject attains satiety he does not often proceed beyond it, but as time goes on he finds that larger and larger doses are required to reach that point. A man may thus be suffering from chronic alcoholic poisoning who has never been intoxicated, but, as FRANCIS HARE points out, he is in constant danger of severe nervous complications. For a corollary of acquired tolerance is intolerance of sudden abstinence, or perhaps even intolerance of any sudden large reduction in the amount of alcohol circulating in the system. A mere temporary abstinence or large reduction may give rise to an epileptiform convulsion; a rather longer abstinence or large reduction may lead to *delirium tremens*. Such convulsions always result from a sudden fall in the amount of alcohol circulating in the blood, and is most apt to occur in patients who have established a high grade of tolerance. But they may occur after a comparatively short outbreak of drinking in a previously moderate individual, even on the first day of abstinence, whereas *delirium tremens* does not begin until the 3rd day, or even later, and only in the chronic alcoholic. These convulsions do not appear to lead to ordinary epilepsy if the patient becomes and remains an abstainer. NORMAN KERR maintained that *delirium tremens* was directly due to poisoning by alcohol; HARE maintains, on the contrary, and with considerable evidence, that it is caused by the too sudden withdrawal of alcohol from a system in which tolerance has been established—in short, that it is a sudden abstinence phenomena of chronic alcoholic poisoning. This suggests that great caution should be exercised in depriving a drunkard of alcohol in an acute disease like pneumonia.

The same principle is applicable to other narcotic drugs. The sudden or too rapid withdrawal of morphine may cause delirium lasting a considerable time. CLIFFORD ALLBUTT says: "Except on withdrawal of the drug we have never seen the excitement of violence to which the name morphinomania would be properly applied." CUSHNY says: "Prolonged abuse of chloral leads to a condition somewhat resembling that seen in chronic alcoholism or morphinism. The sudden withdrawal of the drug in these cases has sometimes led to symptoms resembling those of *delirium tremens*, which are specially dangerous here, owing to the fatty degeneration of the heart which may be present." Similar results have followed sudden abstention from the venereal habit. Sudden abstention from cocaine does not appear to cause delirium, though this may follow injections of the drug.

It is essential that the full significance of acquisition and loss of tolerance should be realised. A chronic alcoholic who has been system-

atically reduced until the habit is broken, cannot suddenly return to anything like the amount of drink he was previously taking. If he attempts to do so he becomes violently intoxicated, it may be for the first time in his life. He is considered not only to have relapsed but to be much worse than before. But this is not necessarily true; he has only lost some of his tolerance. Even death has followed from ignoring this loss of tolerance which succeeds a period of abstention from alcohol. Morphinists, as a class, seem to appreciate more fully the significance of the acquisition and loss of tolerance; this probably, as HARR suggests, is because they are conscious throughout that they are dealing with a dangerous drug, not, as many still regard alcohol, an every-day article of diet.

The explanations which have been offered of tolerance to organic drugs will not apply to the acquired tolerance which can undoubtedly be induced to certain inorganic substances, notably arsenic. Tolerance to arsenic is possible only if the drug be administered by the mouth; subcutaneous injections of the minimal lethal dose continue to be fatal to dogs who can tolerate twice or thrice the lethal dose by the mouth. It is urged that in such cases the drug is not absorbed from the bowel. But the argument already used in the case of nicotine shows that this does not follow. More probably the arsenic can combine with organic substances to form a relatively innocuous compound, if slowly absorbed, but not if suddenly injected. Cacodylates have no arsenical action till they are broken up. Atoxyl and salvarsan are organic compounds of arsenic, much less toxic than inorganic compounds. In support of this explanation it may be mentioned that the arsenic excreted in the urine appears to be in some organic form, the exact nature of which is unknown. However, many cases have recently been recorded in which an ordinary dose of salvarsan proved fatal to young and strong persons, who, though they had syphilis, were otherwise in good health. EHRLICH has attempted to exonerate the drug by attributing the fatalities to advanced organic disease of the nervous or vascular systems, which he regards as contra-indications. This explanation does not apply to the cases to which we refer. PROF. GAUCHER, the leading French syphiligrapher, attributes them to poisoning by arsenic, of which it must be remembered an ordinary dose of salvarsan contains a poisonous quantity. A prolonged attempt at Cambridge to establish tolerance to arsenic failed; yet the arsenic eaters of Styria are clear evidence of its possibility. They start with doses of  $\frac{1}{2}$  or  $\frac{1}{4}$  gr. of arsenious acid 2 or 3 times a week; the maximum dose they reach is  $6\frac{1}{2}$  gr., and, excepting on rare occasions, injurious effects are not produced.

It is important to remember that protozoa, such as the spirochaetes of relapsing fever and of syphilis and trypanosomes, may acquire tolerance to arsenic.—EHRLICH produced strains of trypanosomes which were immune to arsenic, so that when injected into mice they caused a trypanosomiasis, which the largest possible doses of atoxyl failed to influence. This is a very practical point, for it shows the danger of producing by small doses of atoxyl or salvarsan a condition in which the disease cannot be benefited by these drugs. If it is intended to treat a case of syphilis by salvarsan, it is inadvisable to administer any arsenical preparation previously, except for the cutaneous reaction, to test for idiosyncrasy to the drug.—*The Medical Review*.

## PÆDIATRICS.

### The Cold Bath in Diseases of Children.

JAMES NEWELL.—For over 30 years the cold bath has been a favourite method of treatment with the writer in diseases of children attended by high temperature and irritability of the nervous system. In a child in convulsions with a temperature of  $104^{\circ}$  or  $105^{\circ}$ , stertorous and insensible, he has seen the happiest results follow immersions in a bath of  $75^{\circ}$  or  $80^{\circ}$ , followed by affusion of cold water to the head, and supplemented by friction of the limbs and body till the rectal temperature falls to  $100^{\circ}$ . The child is then removed from the bath and wrapped up with hot-water bottles applied to the extremities, if they have become blue and cold. The same results were obtained in the acute febrile attacks of children with rapid rise of temperature and frequently attended by nervous twitchings or actual convulsions, of which the cause may be difficult or impossible to find.

Antipyretics are used for the same purpose, but are apt to be followed by depression of the nervous system and heart and hæmolysis. On the contrary the cold bath has a stimulating action on the heart and respiratory centre.—*Ibid*.

## REPORTS OF MEDICAL SOCIETIES.

### The Proceedings of a Meeting of the Medical Graduates' Association, Madras.

A general meeting of the members of the Madras Medical Graduates' Association was held in the Central Hall of the Madras Medical College at 5-30 P. M. on the 7th February 1912.

The Chair was occupied by Rao Sahib Dr. M. Thamman Singh, M.D., President of the Association.

The Secretary of the Association read the past year's report (below annexed).

This was followed by a very instructive lecture on "Some Blood Diseases" by Dr. T. K. Jayaram, M. R. C. S., (Lond.), who made his lecture clear by several sketches on the black board. The Chairman and the members present wished that a copy of the lecture may be sent to any Medical Journal for publication.

The next subject on the agenda paper was the election of the office bearers for the current year.

Rao Sahib Dr. M. Thamman Singh, M.D., was elected as President and the energetic and willing Secretary, Dr. A. Lakshminpathi, B. A., M.B. & C.M., was re-elected as Secretary of the Association.

The members who were elected for the Council are :—

Dr. M. Vijayaraghavalu, B. A., M.B. & C.M.

Dr. N. Venkatasawmi, M.B. & C.M.

Dr. G. L. Phillipz, L.R.C.P. & S.

Dr. B. Rajagopal, L.R.C.P. & S., D.P.H.

Dr. G. Narayanaswami Mudaliar, L.M. & S.

Next followed a discussion regarding the admission of Medical Graduates who are in Government Service as Members of the Association, in pursuance of a circular letter previously sent round by the Secretary to several members of the Association with a request to note down their opinions on the matter. After a warm discussion the following resolution was proposed by Dr. Phillipz, seconded by Dr. Vijayaraghavalu, and unanimously carried :—

"That graduates in Government service may be admitted to be Associates of the Society and allowed to enjoy all the privileges of other members excepting in such matters as are likely to lead to representations and memorials to Government in which, on account of their service under Government, they may be debarred from co-operating with the rest of the members."

The question of the enrolment of gentlemen who hold Local College Diplomas and Certificates was next discussed and the matter was referred to the Executive Council for a detailed report. The Medical Registration Act now before the Government of Bombay will, when settled by that Government, help the Association in deciding this question.

A letter addressed to the Association on the prevalence of Malaria in Georgetown by Dr. U. Rama Rao, Medical Practitioner in Georgetown, was read and the members of the Association agreed with

the writer that Malaria prevails in Georgetown to a very undesirable extent and requested the Secretary to inform the writer that they welcome any preventive measures. The matter was also referred to the Executive Committee for further action.

The Chairman and President of the Association next conferred with the meeting as to what might be done for Clinical Research work with regard to Diabetes Mellitus. He remarked that various Indian journals recently published opinions of several correspondents calling upon the Medical profession to state what measures they would advise to be taken by the public to prevent diabetes; that the death from diabetes of the Hon'ble Mr. V. Krishnaswami Aiyar was much regretted by all, and as it generally happens that the death of some eminent man—to wit, the Emperor of Germany from cancer of the throat a few years ago—led to further investigation of that malignant disease all over Europe. In a like manner the death of our eminent countryman like that of many others of the highly cultured and educated class from this dreadful but insidious malady loudly calls for a combined effort of the Medical profession to make further research into the clinic of the said malady and wished that members willing to devote a little of their precious time for its investigation would come forward and form themselves into a committee for research work. Work in the way of physiological experiments in laboratories was impracticable as there is not a single public laboratory accessible to them in the country. He therefore desired the members to devote a thought to it and see if the time has not come to ask the authorities for three beds to be placed at their disposal for clinical research either at the General Hospital, or in the Monegar Choultry Hospital where there is already an Honorary Physician chosen out of the private practitioners of the city of Madras to treat the sick.

The Chairman further explained to the members that the nature of the work before them was not to experiment upon rabbits for determining the production and disposal of glycogen in the animal frame, but to tackle such broad facts noticed every day in our own practice as for instance : why this disease should appear in a stout corpulent sedentary shopman, a highly cultured educated man in public service or practising as a lawyer, and why such men should fall victims to this disease? When the subject is broadly viewed it is found that diabetes is not prevalent in the army nor is it so among the Mahomedans and people of other countries. The Chairman further urged the meeting to consider that a number of drugs have been reported by medical men to have in some diabetics reduced the sugar in the urine while in others they have completely cured the disease. These are the heads under which the line of research should be laid, viz., what drug is best

suited in a given case and what method of treatment should be borne in mind to counter-attack the katabolic changes that are reported to occur in all cases of diabetes? He also said that all the resources at the command of the Medical profession have not as yet been fully availed of, for besides drugs there are yet Electricity and Vaccines for the cure of this frightful disease, which require investigation.

After a free discussion by the members regarding the application to the authorities for 3 beds in any of the public hospitals it was thought desirable that a small committee should be formed to formulate the line of research to be undertaken. For this purpose the Chairman and two other members were elected to form a committee to start clinical research work in selected cases of diabetes amongst their own private patients.

It was next resolved that the thanks of the Association be conveyed to the Principal of the Medical College for granting permission to hold the meetings of the Association in the College Hall.

The meeting terminated with a vote of thanks to the lecturer and to the Chair.

*Annual Report of the Madras Medical Graduates' Association for the year 1911.*

On behalf of the Executive Committee I have the pleasure to read to you a short report of the past year *re* the working of the Association which was started in December 1909.

The number of members on the rolls in the 1st year was 25. The number on the rolls in the 2nd year is 22. The fall is due to the resignation of one member and departure of 2 members from Madras. During the course of the year 1 member joined and 2 resigned. The number of members on the rolls now is therefore 21.

The closing balance at the end of the year 1910 was Rs. 44. The amount received by subscriptions for this year was Rs. 173. Total Rs. 217.

The expenditure during the year is Total Rs. 210-7-0 of which Rs. 126-3-0 were spent on journals, Rs. 56 for the attender and Rs. 35-4-0 for postage, contingencies and miscellaneous. Balance at the end of the year is Rs. 6-9-0.

Outstanding balance to be collected is Rs. 57.

Two members in full and 3 in part have paid their subscriptions in advance for 1912, *i.e.*, Rs. 45 not shown in accounts of the year under report.

The committee desires that the members will be pleased to remit their dues as early as possible so as to enable the Secretary to meet the expenditure of the current year.

During the year 4 meetings were called for. In one meeting a valuable paper was read by Dr. G. Raman Pillai, M. B., Ch. B., on Alimentary Auto-Intoxication. At the second meeting an interesting paper on Tubercular Diseases and their Diagnosis was read by Dr. N. Venkatasawmi, M. B. & C. M. The third one which was purely for conducting business was postponed on account of inclemency of weather and the fourth one, also for conducting business, was unfortunately postponed for want of a quorum.

The Association has been fortunate in securing the use of the Medical College buildings for its meetings and the thanks of the Executive Committee are due to the Principal of the Medical College for his kind help.

The Association received last year 10 medical journals which were circulated amongst the members. The average number of days each member retained each journal is 8 days.

The Executive Committee requests the members to return the journals as early as they can so as to expedite their circulation. Names of journals:— The British Medical Journal. The Lancet. The Therapeutic Gazette. The Practitioner. The Journal of Obstetrics and Gynaecology of the British Empire. The Medical Review. The Journal of Tropical Medicine. The Antiseptic.

NAMES OF MEMBERS

|                                       |                                           |
|---------------------------------------|-------------------------------------------|
| Dr. M. Vijayaraghavalu, M. B. & C. M. | Dr. C. V. Kristnasawmi Iyer, M.B. & C. M. |
| Dr. James Harris, M.D.                | Dr. G. Narayanaswami Mudaliar, L. M. S.   |
| Dr. J. V. Ramasawmi Naidu, L. M. S.   | Dr. A. Lakshmiopathi, B. A., M. B. & C.M. |
| Dr. P. M. Beliappa, L. M. S.          | Dr. B. Rajagopal, D.P.H.                  |
| Dr. M. Kristnasawmi Iyer, M. D.       | Dr. M. N. Anklesariah, L.M.S.,            |
| Dr. M. Subramanya Iyer, M. B. & C. M. | Dr. (Mrs.) Kamalakur, L.R.C.P.S. L.M.S.   |
| Rao Sahib Dr. M. Thamman Singh, M. D. | Dr. Rozario, L. R. C. P. & S.             |
| Dr. G. L. Phillipz, L.R.C.P. & S.     | Dr. (Miss) Thorpe, M. B. & C. M.          |
| Dr. N. Venkatasawmi, M.B.&C.M.        | Dr. Veeranna Naidu, L. M. S.              |
| Dr. Rajah Bahadur, L. R. C. P. & S.   | Dr. P. N. Rangasawmi, L.M.S.              |
|                                       | Dr. Nanjunda Rao, B. A., M. B. & C. M.    |

# THE ANTISEPTIC.

FEBRUARY 1912.

## The Late Lord Lister.

**B**y the death of Lord Lister the world has lost one of its greatest benefactors. His great discovery has probably saved more human lives, and in the years to come is destined to save still more, than any other medical or scientific discovery the world has yet seen. The introduction of antiseptic and aseptic surgery is even more far-reaching in its beneficial effects than the epoch-making discovery of Jenner, and has more permanently reduced human suffering than the blessing of general anæsthesia, which boon was given to suffering humanity by Sir James Simpson.

Lister, the great benefactor of the human race, was born on April 5th, 1827, at Upton, Essex. His father was Joseph Jackson Lister and his mother Isabella, daughter of Anthony Harris of Maryport, Cumberland. Both belonged to the Society of Friends. The marriage took place in 1818. Mrs. Lister died in 1864 and Mr. Lister five years later. Joseph Lister received his early education at a school kept by the members of the Society of Friends at Tottenham, and among his school-fellows were the late Mr. W. E. Forster and Dr. Wilson Fox. He proceeded subsequently to University College and graduated B. A. in the University of London in 1847 at the early age of 20. He then spent 5 years in the study of Medicine in the Medical Faculty of the University College and at the University College Hospital. During the early part of this period he seems to have been especially influenced by Graham, the professor of Chemistry, and Sharpey, the professor of Physiology. Mr. Lister's first investigation was directed to the verification of the existence in the iris of tissue identical with ordinary unstripped muscle and to its distribution. This paper was published in the *Quarterly Journal of Microscopical Science* for 1853. Another paper in the same volume "Observations on the Muscular Tissue of the Skin" is described as by Joseph Lister, M.B. (Lond.), F.R.C.S., and is dated University College Hospital, June 1st, 1853. Mr. Lister served the usual office in the Hospital; he was dresser to Mr. (afterwards Sir) J. E. Erichsen and the house surgeon under whom he served was afterwards Sir Henry Thompson whose death some years ago was

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mourned by the whole of the medical and scientific world. He himself was afterwards house surgeon to Mr. Erichsen, and at the end of his period of office in that capacity determined to visit Edinburgh in order to carry out the advice of Professor Sharpey to take six weeks of Syme's clinic. The six weeks, however, grew into years. At Edinburgh Mr. Lister commenced a course of lectures upon Systematic Surgery in the Extra Mural School, and among his earliest students was Professor Anandale, who was afterwards Professor of Clinical Surgery at Edinburgh. At this time Mr. Lister was carrying on his important investigations in regard to the coagulation of the blood. Before leaving for Glasgow in 1860 Mr. Lister had commenced his bacteriological work in connection with antiseptics. But at this time its practical details were still in their infancy. It may be mentioned that Mr. Lister married Mr. Syme's daughter. At Glasgow Mr. Lister took up his duties as Professor of Surgery in the University of Glasgow in the summer session of 1860. In the following year he was appointed Surgeon to the Royal Infirmary of Glasgow. Before coming to Glasgow he had already commenced a valuable investigation into the essential nature and determining causes of inflammation and suppuration in wounds. He taught from the first that the prime cause of suppuration in wounds was the decomposition of blood and serum retained within them, brought about in some way by the influence of the atmosphere. In the wards he insisted on scrupulous cleanliness; on the frequent washing of the hands of all those assisting at operations or engaged in dressing wounds, while he used constantly various deodorant lotions and recommended frequent changing of dressings in all suppurating wounds. While engaged in these observations, and in such strenuous and constant endeavours to improve the existing state of matters, the newly published researches of the French Chemist Pasteur on Fermentation and Putrefaction came under Lister's notice. Possessed strongly as he was of the scientific imagination, he seems to have recognised at once the all-important bearing which the result of those researches, if true, must have on the questions which had been occupying his own attention so long. In one of the earliest communications made by him on the subject—an address given at the Dublin Meeting of the British Medical Association in August, 1867—these were his opening words:

"In the course of an extended investigation into the nature of inflammation and the healthy and morbid conditions of the blood in relation to it, I arrived several years ago at the conclusion that the essential cause of suppuration in wounds is decomposition brought about by

the atmosphere upon blood or serum retained within them; and in the case of contused wounds, upon portions of tissue destroyed by the violence of the injury. To prevent the occurrence of suppuration with all its attendant risks was an object manifestly desirable, but till lately apparently unattainable, since it seemed hopeless to exclude the oxygen which was universally regarded as the agent by which putrefaction was effected. But when it had been shown by researches of Pasteur that the septic properties of the atmosphere depended not on oxygen or any gaseous constituent but on minute organisms suspended in it, which owed their energy to their vitality, it occurred to me that decomposition in the injured part might be avoided without excluding the air by applying as a dressing some material capable of destroying the life of the floating particles."

The material he was led to try was carbolic acid, a substance little known at that time. This was the beginning of the antiseptic system of treatment. In 1867, after he had been 7 years a surgeon to the Glasgow Royal Infirmary, he published his first paper on antiseptic surgery entitled "On a new method of treating compound fractures, abscesses, &c., with observations on the conditions of suppuration." We need not dwell in detail on the antiseptic system of treatment as advocated by Lord Lister. By this time they are well known. In 1869 Lister was appointed Professor of Clinical Surgery in the University of Edinburgh. In 1871, he delivered the address on Surgery at the Plymouth Meeting of the British Medical Association. At that time his doctrines were not in general favour; his opponents used to scoffingly say that Lister's solutions were becoming weaker, while his arguments were becoming stronger. But before Mr. Lister left Edinburgh in 1877 the profession had in the main accepted his doctrines and had attempted to follow out his practice.

When Lord Lister went to London, he was still using carbolic acid and carbolized gauze. At a later period when corrosive sublimate was demonstrated to be a good antiseptic he experimented very largely on its uses in surgery and introduced a variety of gauzes, wools, &c., impregnated with various preparations of mercury. He also steadily diminished the introduction of antiseptics into the wounds themselves and from time to time weak solutions of corrosive sublimate were introduced. He ceased to bring carbolic acid in contact with wounds, reserving it for the disinfection of the instruments and skin.

He was elected a Fellow of the Royal Society in 1860 at the early age of 33. He delivered the Croonian lecture on the coagulation of the blood in 1863. He received the Royal Medal in 1880 and Copley Medal

in 1902. In 1895 he was elected President of the Royal Society. He was President of the British Association in 1896. The University of Edinburgh conferred on him the honorary degree of LL.D. in 1878, the University of Dublin that of M. D. and the University of Glasgow that of LL.D. in 1879. In 1880 he received the honorary degrees of D. C. L. from the University of Oxford and LL. D. from the University of Cambridge. In 1897 he received the honorary degree of LL. D. from the Universities of Toronto and Montreal. He was an Honorary Fellow of the Royal College of Surgeons of Ireland and of the Faculty of Physicians and Surgeons of Glasgow. In 1893 he retired from active work at King's College, London, and was appointed Emeritus Professor of Clinical Surgery and Consulting Surgeon to the King's College Hospitals. He was a Foreign Associate of the Institute de France and Academie de Medicine (1899) and a Laureate of the French Academy of Science also (1881). He was an Honorary Member of the American Academy of Arts and Sciences, of the German Surgical Society and of the Medical Societies of Amsterdam, Buda Pesth, Dresden, Finland, Leipzig, Munich and St. Petersburg, and of the Imperial Academy of Sciences, Vienna. He had also received the Cothenius Medal of the Imperial Leopold Academy of Natural Sciences, and the honorary degree of M. D. from the Universities of Bologna, Buda Pesth and Winsburg.

While Regius Professor of Clinical Surgery in Edinburgh he was appointed Surgeon to the Queen in Scotland, and after his removal to London, Surgeon Extraordinary. In 1900, he was appointed Sergeant Surgeon in Ordinary to Queen Victoria, and a couple of years later was nominated to the same office to His Majesty King Edward VII. He was gazetted a Baronet in 1883 and, in 1897, was made a Peer with the title of Baron Lister. On the occasion of the Coronation in 1902 his name appeared in the first list of members of the Order of Merit, and he was sworn a Member of the Privy Council. He was also a Knight of the Prussian Order "Pomle-Merite," and a Knight Commander of the First Class of the Order of the Daneburg (Denmark).

From the time of his retirement from active work in King's College, London, in 1893, in the peaceful quiet of the evening of his life, Lord Lister has had the supreme satisfaction of watching the triumphal progress of his great discovery in all the civilized countries of the world and even in some semi-civilized countries. Before his death he was able to see the entire revolution of surgical methods. Listerism has triumphed over such dangerous forces as those of secondary hæmorrhage, tetanus, erysipelas, septicæmia, pyæmia and hospital gangrene, and the modern surgeon opens into the secret recesses of the human body,

such as the cranial cavity, with a light heart. In these Tropical countries Listerism has been one of the most powerful of civilizing agencies, for without the assurance and safety of Listerism the medical man whose lot is cast in these Tropical countries could never have succeeded in persuading the inhabitants of those parts to subject themselves to operative procedures.

Lord Lister is dead. But his work will remain for all time to come as an imperishable monument to the genius and devotion to scientific principles of the great and unostentatious Englishman who occupies a foremost place among the benefactors of human kind.

#### BOOK REVIEWS.

**On Food and Cooking :** BY J. M. MALLICK, B. L., M. A. & M. D. Published by A. C. BISHARAD, *Indian Medical Record Office*, Calcutta, 1912. Price Rs. 1-8-0.

This little book, which is a reprint of some of the lectures delivered by the author under the name *On Food and Cooking*, is at first sight somewhat misleading. The author's objection to students resorting to Tea and Coffee Clubs where only adulterated and cheap food can be obtained is well grounded. He rightly condemns the refreshments and sweets sold in Indian (Calcutta) bazaars. He considers this evil may be overcome by the introduction of suitable centres for cooking and catering establishments in students' gymnasiums and recreation and musical halls under adequate supervision. The author rightly condemns the method of overcleaning rice and wheat—the staple articles of food of Indians—and points out their inferior nourishing properties if so cleaned. The chapter on *Diet in Students' Life* is very instructive, and the relative use of animal and vegetable food for the support of the human body are discussed.

The author's 21 golden rules include physiological and hygienic facts. His dietary and classification of food with a list showing time for digestion of each have been culled from valuable works.

The conversion of food into energy and mechanical work in foot tons are also given.

The life curve diagram and statistics of average duration of life are noted. The early motherhood of Indian girls and manhood of Indian boys, and the disadvantages arising from these social drawbacks on the Indian population in general are highly condemned.

On the whole this little book is suited for the pupils of the higher classes of our schools and will prove of much use to them. It is a commendable little book worthy of their perusal.

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## Original Articles.

### \* THE NINE CHRONIC JOINTS.

BY

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CHRONIC joint affections are very common and may be very troublesome, especially if the cause is not clear. Owing to errors in diagnosis the treatment is not infrequently useless and sometimes disastrous. The principal source of error is to concentrate the attention on only a few of the possible causes and to forget all the rest. Many practitioners diagnose tuberculosis of the knee, and others, it may be, gonorrhoea of the same joint, far too often. It has been of the greatest possible assistance to the writer, and to others, to form the habit, whenever a chronic joint affection is seen, of passing in rapid review each of the nine conditions which might conceivably be present. If there is any difficulty in remembering them, some simple mnemonic can usually be devised from their initial letters!

It is not denied that there are a few cases in which none of these nine well-recognized affections can be diagnosed with confidence, and a few words may be said about these nondescript cases. Occasionally a joint trouble that is usually *acute* may run a more chronic course, such as *rheumatic fever*, in which case, however, the pain always flits from joint to joint, or *septic arthritis* due to cocci, typhoid or pneumonia. BENNETT has described cases of painless synovitis of the knees in young women associated with menstrual derangements and cured when these are reme-

\* Specially contributed to *The Antiseptic*.

died; such cases require exercises and massage, not rest. MARSH and others have described a curious intermittent hydrarthrosis that comes and goes, at regular intervals, which may be very painful. A few of these are cured by ten-grain doses of quinine, and others by a long course of arsenic.

Putting these ill-defined conditions aside, and confining our attention only to cases in which a definite diagnosis of a well-recognised disease is possible, we have to bear in mind the following nine joint troubles which must come into the question: *tubercle, hysteria, injury, Charcot's joints, blood joints of hæmophilia, arthritis* (including "rheumatoid arthritis," "osteo-arthritis," etc.), *gout, gonorrhæa, syphilis*. It is a great help to diagnosis when we have a definite list of the possibilities before us. We are assuming, of course, that the joint is really at fault, and that it is not a case of hip-disease simulated by psoas abscess, or of pain in the knee referred from the hips.

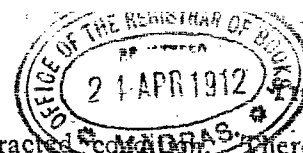
*Tuberculous joints.*—It is a great mistake to think that whenever a joint becomes painful or swollen and resists treatment, that tuberculosis must be present. No doubt it is common, especially in children, and the early signs are slight; moreover, it is very disastrous to make light of symptoms which did really signify the onset of this serious disease. If a mistake is to be made, it is safer to diagnose tubercle too often than to miss genuine cases.

The special signs of tuberculosis are *heat, pain, limitation of movement, and muscular wasting* not readily restored by massage. Swelling is often present in this and other joint diseases, but is not invariable. Reflex contraction of the hamstrings is a valuable sign of tuberculosis of the knee. If a joint moves as freely as its fellow in all directions, tuberculosis is exceedingly improbable, but it is very remarkable how a few days in bed may abolish the signs in an early case, and perhaps lead the medical attendant to overlook the nature of the case.

The special tests, such as Pirquet's, Calmette's, and the injection of tuberculin are not very reliable, and the last two are by no means free from danger.

A skiagram of a moderately advanced case shows a noticeable blurring of the joint, so that the radiographer is apt to be blamed for a bad result. This in itself suggests tubercle. The bony surfaces entering into the joint are a little irregular.

*Hysteria* causes great complaints but scanty signs. It is usually seen in young women, and the joint is little if any swollen, and there is on heat or redness. Pain and stiffness may be very evident, and the



patient may hold the limb in an absurdly contracted position. There is a case related in which a surgeon was beguiled into amputating twice for hysterical contracture, first of the wrist and then of the elbow!

An anæsthetic usually enables the surgeon to move the limb about and "cure" it. The skiagram is normal.

A limp in a child nearly always means organic mischief somewhere, and it is dangerous to say it is "merely functional."

*Injury* may leave a chronic synovitis, pain or stiffness for a variety of reasons. In many cases treated by prolonged rest, adhesions have formed which require to be broken down under gas when the heat and redness have passed off.

In other cases, especially in the knee, the semilunar cartilage may have been bruised or torn, and either the stiffness, pain or swelling persist, or, if they clear up, repeated attacks of locking and synovitis occur.

In yet other cases a piece of cartilage and bone has been chipped off, usually from the femur, and may be felt moving about in the joint, causing discomfort in particular positions, and occasionally giving rise to a sort of locking. A skiagram will often show it plainly.

A rarer cause of persistent synovitis and weakness after injury is the development of few or many synovial fringes and polypi.

The last three conditions usually require operation, though massage and a knee-cap may suffice for the displaced semilunar.

The relation of these conditions to the injury is far more definite than in tuberculosis.

*Charcot's joints.*—These are usually quite distinctive, the special characters being very marked signs but little complaint (the opposite to hysteria.) The joint may be very swollen and strangely deformed by fluid or bony swelling; there is often hyper-mobility, and grating may be felt; occasionally the joint is locked by osteophytes. In spite of this the patient has little pain, and may be trying to get about.

The diagnosis is assisted by finding evidence of locomotor ataxy or general paralysis of the insane, such as absent knee-jerks, lightning pains, bladder troubles, optic atrophy or the Argyll-Robertson pupil; and a skiagram will show great erosion of the ends of the bones and perhaps osteophytic outgrowths.

*Blood joints* occur in hæmophilia and are not very rare. The joint is stiff, painful and doughy, and may be ecchymosed. A good deal of permanent disability will result in a severe case. The diagnosis is