of this university, in a study of the loss of sensation in twenty patients suffering from division of tendons (uncomplicated by any nerve lesion), has recently confirmed this observation.

III. Recovery of Deep Sensibility.

From the study of the recovery of the deep sensibility after nerve suture in a large number of patients it has become evident that deep and cutaneous sensations are strikingly comparable. Just as Head found two stages in the recovery of cutaneous sensation, two similar ones have been found in the study of deep sensation. Two elements of deep sensibility (recognition of contact and pressure pain) recover early and very completely, as a rule during the stage of protopathic recovery; while the other two elements (localization of pressure and recognition of passive movement) recover later and less perfectly, as in the case of epicritic sensation.

When we notice the elements of sensation in both cutaneous and deep sensibility, which recover early and late, in connexion with Head's researches on the sensory cortex, we seem to get some light upon the problem as to why two stages in recovery are found. It has been suggested that protopathic sensibility recovers earlier than epicritic because the former is more primitive and regenerates at a more rapid rate. Such an explanation supposes some structural difference in the two systems, but Adrian has shown that it is highly improbable that there is any definite structural difference in the fibres concerned with protopathic and epicritic sensation. A simpler and more effective explanation is suggested when we take into consideration all the forms of sensation, in both skin and the subcutaneous tissues, which return during the later stage of recovery. The forms appearing late, and which more frequently exhibit imperfect recovery, are those which Head has proved to have cortical representation; while the forms which recover early and more completely and constantly are those which may be expected to persist after destruction of the sensory cortex. Therefore it appears more reasonable to discover an explanation of the two stages of recovery in the central nervous system, rather than to find it due to a different rate of regeneration of two sets of fibres which anatomically appear to be identical. After suture and regeneration of a peripheral nerve a much longer period must be expected to elapse before the fibres subserving cortical forms of sensation function correctly than in the case of the fibres conducting thalamic aspects of sensation, since a very much more complex readjustment and re-education is necessary after regeneration in the former case than in the latter. This central explanation of the two stages in recovery also offers obvious reasons for the more perfect and complete recovery, after nerve suture, of those elements of sensation which have thalamic representation.

Summary.

To summarize the more important results of these investigations of deep sensibility, I would suggest:

1. No nerve of sufficient size to be of clinical interest is distributed solely to skin, and in consequence it is practically impossible to isolate cutaneous and deep sensibility.
2. The principal innervation of the deep tissues is by nerve fibres which arise from the main nerve trunks and pass directly to the end-organs. The supply by fibres which accompany the motor branches and pass to their final distribution along tendons seems to be only supplementary.
3. It is necessary to divide deep sensibility into two systems, comparable to Head's subdivision of cutaneous sensation. Recognition of the contact of pressure and the appreciation of pressure pain recover early, while the recognition of passive movement of joints and the localization of a pressure stimulus recover late and less perfectly.
4. A more satisfactory explanation of the reason for the two stages of recovery in both cutaneous and deep sensibility is to be found in the central nervous system, from a study of those forms of sensation which are dependent upon the sensory cortex and the thalamus.

5. For a classification of the elements of sensation affected by division of a peripheral nerve the following scheme may prove serviceable:

I. Cutaneous Sensibility:

Thalamic (early recovery).—Discrimination of wider difference of temperature. Cutaneous pain.

Cortical (late and less perfect recovery).—Appreciation of lightest form of touch. Localization of lightest form of touch. Discrimination of finer differences of temperature. Recognition of two compass points, simultaneously applied, as two.

II. Deep Sensibility:

Thalamic (early recovery).—Appreciation of contact of pressure. Pressure pain.

Cortical (late and less perfect recovery).—Recognition of passive movement of a joint. Localization of pressure.

A British Medical Association Lecture

ON

THE NERVOUS CHILD AS SEEN IN MEDICAL PRACTICE.*

BY

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THE nervous child may be described as one who is capable of intense emotions which can be quickly aroused and over which he has insufficient control. His nervous system is unstable. This is made very manifest in sickness, and certain symptoms thus aroused may long act as a reminder. Guthrie states that individual instability may be shown in defective control of the lower nerve centres by the higher.

There are two types of the nervous child, which were called by Leonard Guthrie (1) the unrestrained emotional type, and (2) the restrained emotional type.

In the first type the child is as a rule thin and of slight build. The face is not infrequently pale, sallow-complexioned, and dark lines may be visible beneath the eyes. Cameron has called attention to the nervous stance which so many of these children adopt, in which the abdomen is very prominent, the shoulders thrown well back and the head slightly forward; lordosis is not infrequent, and winging of the scapulae is sometimes seen.

Although the nervous child appears to be a mass of animation and is possessed of restless energy, he tires easily. The vasomotor nervous system would seem to be a source of trouble in many cases, as instanced by the dusky-looking hands and feet, and sometimes chilblains or even Raynaud's disease, and the quick changes of colour which may occur in the cheeks and lips. Palpitation, precordial pain, tachycardia of a functional nature, abdominal pains, mucous diarrhoea, constipation, headache, and migraine, may be all due to vasomotor disturbance. Hyper-sensitiveness of taste, hearing, sight, smell, and touch are usually present, and especially the last named. No wonder that as babies they are difficult to feed. The intelligence may be normal or above, but occasionally it is below the normal average.

The nervous child is filled with restless energy, but unfortunately determination is not commensurate with his energy, and it is not difficult for him to be discouraged from his purpose. Difficulties seem to him to be greater than they really are. He may often enter into things with enthusiasm if the impulse so moves him, but he works with almost fierce energy for a short period and is only too ready upon the least feeling of exhaustion to leave his purpose uncompleted. It is strange, but this child, so often clever, is apt to be rather amiss in judgement and common sense. Trifles worry him, and yet he does not always appear to have it in him to do what is necessary to overcome the difficulties which cross his path. The child is generally timid, and in the majority of cases he will not protect himself if attacked by another child. Nearly every neurotic child is imaginative, fearful of trouble, and rather apt to believe in that which is superstitious. Many

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of them appear to be almost too affectionate, but upon more careful investigation it is often found that there is a distinctly selfish basis even in this affection. Such a child may be a "show off." The child craves for sympathy, and imagines that his parents, brothers and sisters, and the world generally do not understand him. His vanity may be unlimited. If his whims are not given in to he may demonstrate an undue attack of temper or simulate sickness. While liking to pry into the affairs of others he resents too much questioning into his own unless it serves his purpose. Such a child may vary in a short time from the seventh heaven of delight to abject depression. He wants the moon and cannot understand why it is not his for the asking. Discipline is strongly resented, but others are expected to carry out his wishes. Obedience is not a thing which commends itself, and if the child be not properly taken in hand fallacious arguments are used to impress his points. Often of prepossessing ways and learning easily, with a good memory, especially for recently learned facts, he is apt to appeal strongly to strangers, and easily becomes the pet of his own family, notwithstanding that his whims and ways may cause friction in the nursery. If he has, or believes he has, done wrong he may undergo inward torment even if the cause be comparatively slight. This is more particularly seen in older children.

The appetite varies enormously, in some cases being almost voracious and in others slight, and anorexia nervosa may be present. There may be constipation or diarrhoea and sometimes vomiting. Many complain of headaches and some of migraine. Dreams, night terrors, somnambulism, and enuresis are not infrequent. Various phobias may be present with regard to darkness, animals, etc. Many cases develop habit spasms and some chorea. In a certain number cyclical albuminuria is present; enlarged tonsils or tonsillitis should always be looked for. Many neurotic children suffer from urticaria and erythemas.

The after-history is rather interesting. They are often children of great possibilities, and may attain greatness on the stage, with the pen or with the brush, if possessed of the industry and the staying power. On the other hand, some of them may, after attaining initial success, become failures in one concern after another; while some of the failures may be found occupying undesirable positions or even undergoing terms of imprisonment.

Some in after-life become alcoholics or morphinomaniacs, etc., others may become neurasthenic, homicidal, or perhaps even insane. There is no doubt that a distinct number of the neurotic children grown to manhood or womanhood fill the consulting rooms and also the nursing homes in certain localities, ever hoping to be cured of symptoms real to them, but when cured invariably finding new maladies and rushing off from one specialist to another.

A young woman of 19 years of age, whom I demonstrated lately as a hysteric, had been a typical neurotic as a child and a constant worry and anxiety to the family. While full of expressions of love and affection for her brothers and sisters, she was known amongst them as the only selfish member in an otherwise unselfish family.

Another case I saw recently was a man, aged 38, who was suffering severely from neurasthenia. He had been a typical neurotic child and had been very excitable, restless, suffered from night terrors, was afraid of people and animals, and to go out alone, of dark rooms, and of being shut up alone in a room, etc. When I saw him recently he stated that he felt as if he were going to die and that his heart palpitated severely nearly all day, causing him infinite anxiety. There was a peculiar sensation in the precordial region. He was apt to stutter under stress, the memory was bad and he had difficulty in collecting his thoughts. He had occasional dreams, and stated that it was necessary for him "to breathe consciously from time to time." If the bus in which he was travelling went fast he felt the necessity of clutching the rail tightly. As a matter of fact he had a normal heart and his pulse rate decreased from 100 to 80 when informed that there was no disease whatever of his heart. The urine was clear, of specific gravity 1005, and acid. The knee-jerks were unduly active. Not only was his condition interfering with his vocation but he admitted that his constant talking about his own health and introspection was causing great unhappiness in his household.

This man and woman could have been spared the symptoms complained of in adult life if they had been properly brought up when it was first discovered that they were neurotic children. They further show that fully to

comprehend the effect of a disease or type upon an individual we must observe the child carefully, not only to adolescence but to adult life, or, in botanical parlance, to the bud, to the flower, to the fruit.

The great point in the second type is the possession of sufficient self-control to enable the neurotic child to hide his strong emotions from those with whom he comes into contact, and more especially with people he only sees occasionally. Like the first type, this child is often distinctly intellectual and may be well above the average, but he is a very serious person, and again differs from the first type in that he has no sense of humour, which is itself a saving grace. He broods, craves for affection, but does not show any. He often has a bad time at school. Later he may become neurasthenic or lose his self-control, becoming very dejected, and a member of society whom most people desire to avoid.

It is a very important matter that medical men should agree upon what is believed to be a nervous child. Some medical men may state undue excitability, others may go by expression, stance, and actions. It must not be forgotten that any normal child may become unduly excited and lose self-control in certain circumstances, but may not be what is ordinarily described as a nervous child. In order to demonstrate some of the chief characteristics of nervous children the following statistics were made. Every nervous child was so designated by me, but the special forms from which the statistics were made were filled in by my clinical assistants.

The total number of children examined at the Children's Clinic was 1,200, those of the neurotic type being 132, which is equivalent to 11 per cent. Of the 132 neurotic children 70 were males and 62 females. The mother was neurotic in every case but one. In 5 of the 82 cases in which special nervous forms were filled in the mother was also stated to be hysterical; the father was noted as neurotic in 21 cases. The father committed suicide in one case, suffered from shell shock in another, was noted as having a hasty temper in a third, a fourth had disseminated sclerosis, and two fathers were subject to fits. In 9 cases uncles or aunts suffered from fits, and a few had been inmates of asylums. In some instances one or more sisters or brothers were neurotic, the remaining members of the family being non-neurotics. In other cases the patient was the only neurotic member of the family. In one instance all six children were neurotic.

The first neurotic symptoms were noticed during infancy in 37 cases (2 at the Babies' Hostel, Alexandra Road, at 3 weeks). A number were first noted to be neurotic between the ages of 2 and 3 years, and a few between 8 and 9 years. In several instances the mother stated that the children were first terrified during air raids.

The first symptoms noted by the mothers were: nervous and excitable, screaming fits, fidgety, night terrors, sleeplessness, afraid of the dark, afraid of traffic, unduly afraid of animals, afraid of being left alone.

Of the 82 children whose symptoms were noted on the special nervous forms the following points were observed: Excitable 77, fidgety 69, cried easily 63, timid 49, shy 48, emotional 68, sensitive to scoldings 73, dainty ways 43, considered delicate 34, dark lines under eyes 48, love of sympathy 47, impressionable 56, imitative 42, weak will-power 14, jealous of the baby 16, likes to be the centre of attraction 41, love of attracting attention 44, egoism 23, ungovernable temper 31, stubborn 42, likes liberty of action 65, appears anaemic 24, appetite *plus* 35, appetite *minus* 47, constipation 22, diarrhoea 7, vomiting 10, sucking difficulty (babies) 2, gastric pain and discomfort 32, grimaces and habit spasms 30, arithmomania 16, twitching and convulsions 17, spasmophilia 5, stammering 7, thumb-sucking 7, nail-biting 29, nervous cough 25, feverish attacks 34, rheumatism 24, faintness 12, cardiac irregularity 5, fatigued easily 40, flushing and blushing 49, restless at night 53, dreams 53, teeth-grinding 42, night terrors 39, day terrors 6, somnambulism 14, enuresis 14, afraid of the dark 39, afraid of animals 29, afraid of horses 28, afraid of people 11, fear of being alone 37. Learns easily 61, slow intelligence 15, pica 3, katatonia 3, hysteria 1, nervous stance 3 (it is probable that the nervous stance is more frequent than stated here), air-swallowers 6.

No tongue-chewing, thigh friction, etc., or stigmata of degeneration were noted; thigh friction and other forms of masturbation are likely to be present in a certain number, but the mothers would not like speaking of such things. Negativism is a prominent feature in some of these children.

Examination of the Nervous Child.

In the medical examination of the nervous child it is advisable for the doctor to make a point of taking as little obvious notice of the child as possible, although he should closely scan the little patient to observe the smallest points of interest. If the child thinks that he is being made the subject of a close investigation he is apt to become an obstructionist, cry, or go off into a fit of temper. The more he is ignored the more natural he will

be and the more easy the examination becomes, therefore the more that can be learnt. A few explanatory words to the mother beforehand will be sufficient for her to understand the method of procedure. This method also teaches the mother an object lesson in that she will see that instead of promising the child a chocolate or some treat for being good the child is simply ignored, promised nothing, and expected to be good because it is his duty to be so. Nothing should be said in front of him except that which is desirable and mentioned on purpose for his edification. The real talk to the mother should proceed only when the child is taken out of earshot by the nurse.

In Sickness.

Probably no child is a greater source of trial to medical men than the nervous one in sickness. If unrestrained and always given in to he will, unless severely ill or too weak to make himself heard, indulge in the antics of the pronounced obstructionist. Things will not be made easier if the mother or nurse has been in the habit of stating to the child at not infrequent intervals that should it not do as it has been told she will send for the doctor. It is a matter of great importance to enter the sick-room of a nervous child without taking any special notice of him and quietly and gradually proceed to examine his organs while ignoring any protests which may be manifested, as if the child was really not in any degree refractory. One can definitely state that this method practically always succeeds.

Some nervous children get active delirium upon any marked rise of temperature. No prescription should be written to please the mother because she is overanxious. Such a matter needs a little sound common-sense talk from the doctor as to the method of procedure. Whether a nervous child be well or sick it can be made to do almost anything and submit to treatment if it be represented to him as a game and a privilege. If a nervous child be seriously ill he will readily enough submit to treatment. No matter how often a nervous child may have slight illnesses or pyrexia, it is necessary to exclude every likely possibility whenever he is sick, lest the cry of wolf be made once too often.

In the nursing of such a child it is wise to have a nurse who is a stranger and not one of the immediate family. She should be a well trained sensible children's nurse of quiet demeanour, quick understanding, and common sense, with a sufficiency of determination interwoven with fairness, sportsmanship, and absolute self-control. The lesson taught by such a nurse bears good fruit and augurs well for the future if the same method be persevered in after recovery.

At School.

The question often arises, Should the nervous child be sent to school? and unless the child in some way be mentally affected, physically unfit, or if a suitable school be not available, I think the answer should always be Yes. Where a suitable school, schoolmaster (or schoolmistress in the case of girls), and staff are available there is no question that the nervous child is much better off there. He should be sent as a boarder at the age of about 8 to 10 years. He needs plenty of fresh air, hygienic surroundings, good light to read by, a sufficiency of exercise without being allowed to become exhausted, adequate sleep, not too much mental work, but the usual amount is generally well within his powers as he works quickly. It is necessary that he have a sufficiency of good food, which he must be taught to eat slowly and not to bolt, and, perhaps one of the most important things of all—suitable manly boys in the one case, and fine sensible quiet type of girls in the other. Undesirable companions must be kept away from this type of child as he is so impressionable, more especially when he is reaching the age of puberty. Well trained, with a little encouragement and with the knowledge that he can approach the schoolmaster for a heart-to-heart talk whenever it seems desirable, such a child can be made into a fine creditable specimen and gain that self-control which is essential to the evolution of the manly boy or the sensible, mentally balanced girl.

Defects of sight and hearing should be efficiently treated, the memory should not be overtaxed nor the mind bored by too much of one subject. Children probably learn with little effort those subjects for which they have talent, but nervous children should not be allowed to work for too long at a time. Indeed, these children should neither be encouraged nor allowed to overwork. Mental overstrain may be accentuated by overwork, failure with its disappointments, or apprehension of failure. Ambition thwarted may also lay bare undesirable traits, such as hatred and jealousy of rivals. There may be severe headache which would require treatment.

He learns "to play the game" at school, to speak the truth fearlessly, to be absolutely honest, to perform services for others, to play for his side and school and forget his own interests when they are opposed to those of the school, self-sacrifice, manliness, self-control, and *esprit de corps*. No child needs more to learn "the other man's point of view" and all these wholesome lessons than the neurotic child. The games, the outdoor life, the botany excursions, and good companionship will make a man of him. Neurotic girls can safely be sent to a suitable boarding school at the age of 12 to 14 years. Previous to this arrangement it is wise in some cases for the girl to go to a day school, more especially where the Montessori system obtains, and in others to have a governess of the right type at home.

General Lines of Treatment.

We must keep in mind here that whereas we cannot change the neurotic disposition of the nervous child for a placid one, we can teach the child self-control. As the mother is practically always neurotic, she should carry out self-control upon herself in order that her child, full of imagination, and very impressionable, may copy from her that absolute requisite—self-control. Should the environment be impossible, it is wise either to place the child under a suitable nurse or person in the home, or send the child away to a relative or friend in the country who possesses the necessary qualities to bring him up. Later on a suitable school is selected to carry on the good work.

Corporal punishment is not likely to be successful in the case of neurotic children, as they are sensitive, impressionable, and often well aware of their own peculiarities or shortcomings; gentler ways are conducive to much greater success, and save much heart-breaking. Confidential chats with the right person and good example are much more beneficial. Let us repeat here that suitable companionship is essential in order to produce the best effect; an undesirable companion to a neurotic boy or girl spells great danger.

During infancy a neurotic baby is apt to be awkward in taking the breast. He should be handled little, kept quiet in a room without a too strong light in it, and encouraged to sleep peacefully in a warm cot free from draughts, from whence he should be brought to the breast before he is fully awake. Digestive difficulties are apt to appear early, as their taste is very sensitive, and therefore much caution and care are required to get and keep the infant on breast milk, and, failing that, on a milk mixture which does not vary in taste. It is best to accustom nervous babies from the first to an exact well regulated routine if possible. For sleep the room should be made dark and the cot warm. Quietness is essential. I am convinced that from a very early age a baby takes its cue from its mother's face as to who is to be master. It must not be the baby.

After 2 years of age discipline is essential, and is chiefly attained by good example, fairness, firmness, honesty, sportsmanship, and understanding. We bring up and educate our children with the intention of making them worthy citizens, and in time good husbands and wives, fathers and mothers. In this we must fail to a certain extent, for by no means all fathers and mothers, perhaps especially the latter, are fit to bring up their children. We do not desire the severe discipline dear to our grandparents, nor the laxity and spoiling too frequent to-day. It is well not to be always on the outlook for faults, better sometimes to pretend not to see them. These children should always be taken quietly and without getting angry, or they will be only too apt to lose respect for their instructors, even if they be the parents. Commence the right methods early,

so as not to lose the most impressionable time of their lives. Should you have to break your promise to a child tell him frankly the reasons which made it necessary, and he will understand and appreciate the confidence. Never give away or scold a nervous child in public; always have heart-to-heart talks when no one else is present. A little encouragement is essential, and credit for good qualities should be given wisely.

Mens sana in corpore sano is a motto specially suited to the nervous child, for generally speaking the fine physical condition of the athlete is a help to the building up of a well trained mind upon which to inculcate that priceless quality most necessary to the neurotic child—self-control. On such a child it will not be difficult to impress moral lessons and good example.

Every child should be instructed in the meaning of sex so that the subject is learned in a clean and wholesome manner from the parent and not picked up in an objectionable form from another child or other source. The great danger is ignorance and pollution. The subject should be gently approached and shown by biological references to be one of the utmost purity. A beginning will probably be made at about the age of 8; the subject will again be referred to occasionally from time to time, and then if at puberty high ideals and good example be shown there will be little likelihood of foul thoughts, masturbation, and other objectionable things worrying the child. It is the neurotic that particularly needs instruction and example.

There can be no doubt that infinite harm resulted from the one-time popular methods of placing neurotic children in a dark room, in which they were semi-starved, threatened, shouted at, and whipped. Such methods were barbarous.

Treatment of Certain Conditions.

In treating vasomotor symptoms potassium bromide and strychnine are invaluable, especially for headache. Sometimes it is advisable to add small doses of liquor arsenicalis. For an actual attack of migraine a dark room, quietness, and phenazonum or aspirin are invaluable. Tics should be treated by creating a quiet environment, pretending not to notice the movements unless occasionally in a kindly way, and the administration of bromides and valerian. Any source of worry should be removed. Tonsils and adenoids needing treatment should be attended to at once.

Sleep.—Many nervous children are light sleepers. They may be restless on going to bed, and the activity of their brains is only too apt to prevent deep sleep. Avoidance, as far as possible, of disturbing and distressing scenes during the day, more especially the latter part, the carrying out of a healthy régime, a well ventilated night nursery with dull dark blue walls, are things of importance. Everything should be done to prevent mental worries or torments occurring during the day at school or at home. The child must be taught to forget himself in the street and learn to observe closely and be interested in his immediate environment. It may be advisable to remove him from school for a week or two. The child ought to be quietly put to bed at night in a night nursery with the window partly open, and at least two hours after tea. This should consist of digestible food only. Nothing tight must be placed around him, and sufficient but not too much clothing over him. If a night-light can be done without all the better. Holding the child's hands while it goes to sleep is not called for and is a waste of time. No one should stay in the room with him, but he should be aware that someone is in an adjoining room. If a child should dream or have night terrors a soothing hand placed on the child and a few words of assurance should he wake up will tranquillize his mind, and he will soon fall asleep again. Sometimes a dose of bromide is advisable at bedtime for a few nights.

Somnambulism occurs in an appreciable number of neurotic children. The food, the bowels, the daily routine need inquiring into and adjusting if necessary. It may be advisable to tie a bandage or cord to a belt secured at the back of the child, the cord being then fastened to the foot of the bed.

Anorexia nervosa is quite easily cured if the right person adopts the right methods. The child often acts the part, and knows that by refusing food it causes consternation to his mother and nurse, if satisfaction to himself. It is advisable for the mother or nurse to speak to the child alone and agree to have "a secret" with him, by which "he is to eat as much as he can at every meal for a whole week and give everyone a surprise." He loves the secret and the performance of something which will call forth surprise and praise at his achievement. Once successful, he feels that he must live up to his new reputation. If for some reason success is not realized, it is well to arrange for the child to be removed to a suitable nursing home with the right nurse in charge of him. Digestible food should be daintily served. The mother will be surprised at the good result.

High Temperatures.—These may be due to a serious condition, a slight one, or to no discoverable cause. The last mentioned is not infrequent, but in a number of such cases slight tonsillitis is present. Pyelitis, otitis media, throat affections, chest trouble, an oncoming illness, etc., must always be first excluded. Causeless temperatures are likely to recur. They can be treated by rest in bed, milk of magnesia, and small doses of bromide and salicylate.

Mental and physical fatigue are easily produced but soon recovered from after a short period of rest, when once again the child feels full of energy. As little as possible should be made of this in his presence, or indeed of any symptoms from which the child may suffer.

Enuresis.—Before treating as neurotic it is necessary to eliminate all other likely causes, such as diabetes mellitus or insipidus, chronic interstitial nephritis, pyelitis, affections of the bladder and urethra, epilepsy, drinking too much water, worms, endocrinic deficiency, certain diseases of the nervous system, etc. The urine should always be carefully analysed and microscopically examined. Should the enuresis be due to the neurotic condition of the child the following procedure is useful irrespective of whether or no drug treatment be adopted. Suppose a child is passing urine at half-hour intervals during the day, he should be encouraged to hold his urine for longer periods: at first for three-quarters of an hour, then one hour, gradually lengthened until the intervals reach two to three hours. The bladder will become accustomed to retain urine for longer periods, and the liability to nocturnal enuresis will be greatly lessened. In addition, it is a good plan for the child to repeat to himself deliberately three times immediately after saying his prayers: "Willie (or Mary)—will—not—wet—the—bed—to-night." Whether the child gains confidence from this or an effect is produced on the higher controlling centre over the lower I do not know, but it is certainly often successful. Scolding is harmful and encouragement most helpful. It is well considerably to restrict the amount of fluids drunk after tea. Waking up the child to pass urine half an hour before the accident occurs is often a useful procedure for a week or two. Obviously any abnormal condition present would receive appropriate treatment.

Headache and Migraine.—Every likely cause, such as errors of refraction, enlarged tonsils and adenoids, constipation, etc., must first be looked for and, if present, treated. Then the environment, school conditions, and daily routine need careful consideration, and must, if necessary, be regulated to suit the case. For a bad attack bromide or phenazonum with rest in a quiet darkened room is a valuable procedure.

Finally, let us bear in mind again that we desire to bring up our neurotic children in such a way that their best and most desirable qualities are accentuated in order to obtain the results conducive to success in life, while eliminating, diminishing, or keeping in check undesirable traits. Once a neurotic probably always a neurotic; but when the neurotic child has obtained full self-control not much fear need be entertained in the vast majority of cases as to his future. Hence the tremendous responsibility of parents, guardians, and schoolmasters.

During the late war a certain British general, after talking to an officer in charge of a battery of artillery, walked away to a spot about 150 yards distant. As soon as he

arrived there a shell fell at the feet of the artillery officer, literally blowing him to pieces. So great was the immediate shock produced on the general that he felt an almost overwhelming desire to bolt for his life. His nerve had completely left him for the moment. However, it so happened that he had been brought up from early childhood to have complete control of himself. It then flashed through his mind that, if he acted according to his first impulse, he would suffer severely from shell shock and be of no further use during the war. He therefore determined to remain, and, pulling himself together, quietly walked over to the spot where he and his brother officer had stood a few minutes previously. He stood at attention for five minutes, regained his nerve, and fought to the end of the war without suffering from shell shock. It is this self-control and sense of duty which we must endeavour to inculcate into every nervous child.

THE INCIDENCE OF ARTERIO-SCLEROSIS IN THE ARTERIES OF THE BODY.

BY

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THE following investigation was undertaken to ascertain which vessels in the body were most frequently and most extensively affected with arterial degeneration. The material examined was obtained from the dissecting rooms in the University of St. Andrews. The bodies were in an excellent state of preservation, and each was over 50 years of age. The method adopted was to dissect the arteries free from surrounding tissues, and to make a naked-eye examination in both longitudinal and transverse section. It is not possible to conduct an examination of this nature in the *post-mortem* room. Complete records of the incidence of arterio-sclerosis have not hitherto been published from dissecting rooms.

The pathological changes of which I took note were hardness and thickness of the vessel wall, the result of fatty or calcareous degeneration, a state which rendered the artery less capable of performing its proper functions.

With the naked eye there were seen projections of the inner coat, oval or circular, of a more opaque or yellow colour than the surrounding tissue. The patches, which were sometimes raised, varied in size from a hempseed to a shilling. In a few of the vessels the earliest naked-eye change was linear streaking. In many the intima was quite smooth, but on peeling it off a thickening of the media (with calcareous degeneration) was found. I did not make any distinction between sclerosis which commenced in the media or intima, as the established disease in either coat was almost invariably associated with secondary changes in the other. The changes which I took note of were observed by inspection and palpation, and included arterial decay of any form and from any cause.

Rokitansky and Lobstein, Thoma, Bellinger, and Clifford Allbutt have all conducted a similar investigation, but for certain reasons a complete examination of the body was not carried out. Clifford Allbutt reported, in his *System of Medicine*, that he examined 1,600 cases in the *post-mortem* rooms of Charing Cross Hospital, but only 380 were found to exhibit arterio-sclerosis, but then, "for some reason or other in 1,200 complete examination was not made."

I carefully made a naked-eye examination of all the arteries in eight bodies with the following results.

ABDOMEN.

The Abdominal Aorta (seven examined).—Atheroma was extensively present in six of the seven arteries examined, and the changes were more advanced in this vessel than in any other in the body. Only one did not show atheroma.

The Common Iliac Arteries (fourteen examined).—Ten of these were markedly atheromatous, especially in their upper parts, while the remaining four were not involved.

The Internal Iliac (Hypogastric) Arteries (fourteen examined).—These vessels were more subject to atheroma than the external iliacs. Nine of the fourteen examined were markedly involved, and the vessels on both sides were affected to much

the same degree. In one of them the orifice was very much narrowed, and there was an aneurysmal dilatation of the vessel just beyond. Four did not show any sclerotic changes.

The External Iliac Arteries (fourteen examined).—Only two of these showed well marked atheroma. Five showed a few small patches, and six were quite free.

The Coeliac Artery (seven examined).—Three of these showed patches of atheroma, with consequent narrowing of the orifices of the branch vessels. Four did not show any atheroma.

The Superior Mesenteric Artery (seven examined).—In four specimens the artery was narrowed at its origin by sclerosis; but a very prominent feature in my analysis was the comparative freedom from atheroma of the greater part of the main stem of the vessel, and the branches into which it divided; only in one ramus did I find a single patch of atheroma, and only in one subject was the main stem markedly affected.

The Inferior Mesenteric Artery (seven examined).—Except in one case the artery was absolutely free.

The Hepatic Artery (seven examined).—This vessel was extensively atheromatous in one case only, and in all the others it appeared to be healthy.

The Renal Arteries (fourteen examined).—Ten of these showed a moderate degree of degeneration. Four were not involved.

The Splenic Artery (seven examined).—Four showed fairly extensive atheroma in the main stem of the vessel. The orifices of the pancreatic branches were involved.

The Pudendal Arteries (fourteen examined).—Eleven of these showed atheroma in an extensive degree in the pelvic part of their course.

The Superior Gluteal Arteries (twelve examined).—Nine of these were very markedly affected. Their walls were extensively sclerosed, and the affection was usually bilateral.

The Inferior Gluteal Arteries (ten examined).—Six of these showed patches of atheroma, but they were not so much affected as the superior gluteal arteries. The remaining four were not involved.

HEAD AND NECK.

The Common Carotid Arteries (sixteen examined).—Just as the aorta was markedly atheromatous at its bifurcation, so the common carotid was extensively involved in the region where it divides into internal and external carotid branches. At its origin on the right side from the innominate patches were plentiful. The main trunk was found to be patchy, but in a much less degree. Fourteen of the sixteen arteries examined showed atheromatous changes.

The External Carotid Arteries (sixteen examined).—Only three of these showed atheroma to a moderate extent; the remaining thirteen did not show any.

The Internal Carotid Arteries (sixteen examined).—This vessel in the neck and carotid canal was subject to a very small amount of atheroma. The part of it which lay in the cavernous sinus was affected extensively. In eleven of the sixteen arteries examined this part of the vessel was affected with dense plates of calcareous degeneration, and was frequently sacculated.

The Subclavian Arteries (sixteen examined).—In eight of these atheroma was very marked. Usually the first part was more involved than the second or third part. Four vessels did not show any.

The Superficial Temporal Arteries (fourteen examined).—Contrary to my expectation this vessel was affected on the scalp in only two of fourteen examined.

The Internal Maxillary Arteries (eight examined).—Only two of these showed small deposits of atheroma.

The External Maxillary Arteries (ten examined).—Two of these on the face showed atheroma, and all the others were free.

The Vertebral Arteries (eight examined).—Two of these showed a large patch near their termination. Four were not affected.

The Basilar Artery (four examined).—In two of these atheroma was very well marked; two were not affected.

The Anterior Cerebral Arteries (eight examined).—Two of these showed atheroma, and six did not.

The Middle Cerebral Arteries (eight examined).—Four of these showed atheroma, and four did not.

The Posterior Cerebral Arteries (six examined).—Two of these showed atheroma, and four did not.

THE EXTREMITIES.

Lower Limb.

The Femoral Arteries (eight examined).—All showed well marked atheroma both in the femoral triangle and in Hunter's canal.

The Profunda Femoris Arteries (eight examined).—In one the artery was extensively involved, in five moderately, and in two it was healthy.

The Popliteal Arteries (eight examined).—All showed well marked atheroma, which extended to the termination of each vessel, and involved the origin of the tibial vessels. In two