much to do with impairment of function of the chromaphil system? Addison's disease, for all its continued obscurity, may be regarded as at least to a great extent attributable to disease of the suprarenals. One of its characteristic features is asthenia, which is sometimes profound. And there does not appear to me any tenable distinction between the asthenia of Addison's disease and the asthenia of neurasthenia. Cases of the former are not infrequently diagnosed as ordinary neurasthenia at first. It is difficult to avoid the conclusion that defect of glandular function is responsible for much in the clinical picture of neurasthenia.

In the familiar symptoms of the climacteric how prominent are those which are derived from the sympathetic system. Palpitation, noises in the ears, "rush of blood to the head," hot and cold feelings, mist before the eyes, sweating, trembling, paraesthesiae of all sorts, sinking feelings, vertigo—who does not know the whole gamut of climacteric symptomatology? Analysis indicates at once the sympathetic origin of practically all of it, but why should this branch of the nervous system be disturbed? The answer is ready to hand. At the climacteric a physiological involution of glandular activity occurs, ovarian function alters, and thereby the function of other glands is thrown out of gear. Sympathetic tone is dependent on adrenal support, and until the glandular equilibrium is once more attained sympathetic symptoms are likely to occur. Let it not be supposed that the male sex is free from such glandular upset. The age of 63 was regarded by those of another generation as the crucial year for the male; but it is not necessary to postulate an actual climacteric—it suffices that the physician should be able to interpret the symptoms complained of in the light of what has been said.

The protean phenomena of hysteria can in many instances be readily explained by reference to sympathetic function. Not only are vasomotor symptoms of very common occurrence in that disease, but a vasomotor theory has even been advanced to account for the whole symptomatology. It is impossible, obviously, to subscribe to such a view; at the same time the tendency to-day is to ignore the somatic symptoms of the disease, especially those of vasomotor origin—a tendency which should, in my opinion, be discountenanced. In hysterical paraplegia one often finds a vasomotor paresis; in hysterical anaesthesia failure to draw blood on pricking the skin is as easy to demonstrate to-day as it was 300 years ago. The results of such a failure, however, are not quite so serious from the patient's point of view as they were in the "good old days." In some cases of hysteria multiple cutaneous gangrene, so-called, is known to occur, and I have seen a case where the diagnosis of a somewhat similar skin condition was attended with the greatest difficulty. Dermatographia or urticaria scripta, no doubt, occurs as a more or less isolated phenomenon, yet in hysteria, above all other conditions, it is seen in marked degree.

The pathogenesis of the sympathetic impairment in hysteria is not easily elucidated. This is not the time to venture even on a brief attempt to sketch an adequate theory of hysteria, but I may remark that the occurrence of unmistakable sympathetic symptoms in that disease argues for the central representation of the sympathetic system, and the central control, in certain not yet clear conditions, of the ramifications of that system in viscera and blood vessels.

Many more conditions might be referred to in this connexion. I have said nothing of asthma, of migraine, even of transient symptoms which can scarcely be said to constitute a disease, such as blushing, local sweating, etc., although it may be remarked that in these and other morbid states of a like kind good results are being obtained by treatment on opotherapeutic lines. I have given only a brief account of some of the chief features of interest revealed by a study of the sympathetic system and its relations, but it may serve to show that the fresh light which is being thrown on sympathetic function by recent investigations exemplifies once more the mutual interdependence of scientific research and medical practice.

THE late Mr. Charles George Lee, Honorary Surgeon, Liverpool Eye and Ear Infirmary, left estate valued at £7,638.

VARIETIES AND TREATMENT OF CHOREA.*

BY

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CHOREA is insidious in its onset. The child who becomes the subject of chorea is usually nervous, excitable, and imaginative. She is easily frightened. At school, though by no means a dunce, she lacks concentration of thought and perseverance. Her attention wanders from the work to the creations of her active mind. It is easily diverted by all manner of extraneous and trivial circumstances.

Chorea begins as an accentuation of this psychical unrest. Before the actual movements appear the patient becomes more excitable, more irritable, more emotional, and less reliable. The distinction between when the mental state should be called choreic and when it should be regarded merely as evidence of a neurotic disposition is subtle. There are some who look on the many symptoms of nervous instability to which choreic children are liable as evidence of a rheumatic toxæmia, whilst others speak of chorea as especially prone to attack neurotic children. A compromise between these opinions is probably nearer the truth, for, if we accept the former view, we must acknowledge a persistent rheumatic toxæmia dating from very early life, whilst if we ignore it we shut our eyes to the very obvious psychical disturbances which a definite attack of chorea brings with it.

As evidence of the ill-balanced and hyper-excitable mental state is the frequent occurrence in the history of the same child of such functional errors as night terrors or day terrors, somnambulism, enuresis, nervous diarrhoea, and tic.

Long before the chorea is recognizable by its erratic movements the child's school work deteriorates. It becomes inaccurate, slovenly, and uneven. Perhaps this is best shown in writing and arithmetic. The letters and figures are badly formed, irregular and wavy, crowded in some places, spaced in others, and sloping at various angles. This falling off is readily detected by the teacher, who metes out punishment which he believes to be condign, but which is, of course, unmerited, and may precipitate symptoms of a more obvious form. The attack is then not unnaturally laid by the parents at the teacher's door.

Forms.

In almost every case, in addition to the erratic pseudo-purposive movements and the psychical changes, there are also some loss of power and some sign of cardiac affection. The loss of power is denoted by the characteristic crouching attitude when the child sits up, due to weakness of the back muscles and those which hold the head erect. The grip is feeble, and there is atony of the muscles and laxity of joints. The signs found by examination of the heart in many cases are merely those which may accompany functional disturbance—rapidity, a short, sharp, and rather slapping first sound, approximation of these sounds, and sometimes irregularity. A slight systolic murmur and slight dilatation may be present, and probably indicate a local rheumatic toxæmia or infection, especially if a mid-diastolic murmur or so-called reduplicated second sound are heard at the apex. In many cases signs of previous valvular disease are found.

The mental state when the chorea is readily recognizable is usually ill-balanced and the emotions are beyond control. It has been aptly likened to April weather, sunshine and shower alternating in quick succession. Tears flow as part of real distress for which there is no adequate reason or perhaps no reason at all.

Each of these four factors which contribute to the clinical picture of chorea—namely, erratic movements, psychical disturbance, weakness, and cardiac changes—may be exaggerated, so that it assumes the dominant part, and in this way four chief forms occur: (1) Motor, (2) maniacal, (3) paralytic, (4) cardiac, to which two other forms may be added, (5) latent, and (6) residual.

In the *motor* form the movements take the chief place;

* Based on a lecture delivered at the Hospital for Sick Children, Great Ormond Street.

and may be so severe that the child is unable to sleep or feed, and is in danger of death from exhaustion.

In the *maniacal* form the child is seriously ill and has all the appearance of one suffering from severe toxæmia. The temperature, which is usually only slightly raised in chorea, may in this form reach 103° or higher, and often remits from 102° to 99° . Sores are present on the lips, the tongue is coated, dry, and sometimes fissured. Hallucinations are not uncommon and the patient exhibits a considerable degree of mental distress, crying and moaning in bouts and howling in a manner reminiscent of a caged animal. A feature of these cases, which so far as I know has not attracted attention, is a dry, harsh, scaly skin, especially of the hands, which are often sore and cracked. The prognosis is usually favourable in spite of the alarming nature of the symptoms. Permanent mental derangement is very exceptional. Usually when the violence of the toxæmia is over the child recovers fairly rapidly, and the chorea is ended more quickly than in the more chronic and milder varieties.

The *paralytic* form usually supervenes upon one in which the movements have been active. Its most striking feature is the extreme atony of the voluntary muscles. On palpation they feel soft and almost downy, an attribute which has given origin to the term *chorea mollis*, by which this form is sometimes known. If the patient be taken out of bed the head falls back entirely unsupported and the limbs fall down as though lifeless. Grimacing and slight twitching of the limbs can still be seen. Generally the pupils are dilated and react feebly to light. The knee-jerks are lost in most cases. A special characteristic, more in evidence in this form than in others, is aphasia. For weeks, even for months, no attempt is made to speak. Motions and urine are passed incontinently, probably rather because the child is unable either by speech or gesture to signify its needs than from actual sphincter weakness. In spite of the apathetic state, of the aphasia, and of the incontinence, there is little or no dulling of the mind, for when the child is better it will be found that she remembers what has been going on under her observation, even to the minutest details. Such cases are always protracted and convalescence is slow, but ultimately, perhaps after several months, complete recovery occurs.

The term "*cardiac form*" has been applied to those cases in which the heart is seriously affected, whilst the signs of chorea are proportionately slight. Pericarditis, myocarditis, and endocarditis may each or severally accompany chorea, but they should more properly be regarded not as chorea of the heart but as indications of rheumatic heart disease. It is doubtful whether true chorea cordis is ever so obvious as to justify us in naming a special form of chorea after it. Indeed, some have denied its existence, and regard all cardiac signs in chorea as due to local infection or intoxication by the rheumatic organism.

Latent chorea especially deserves attention, for it is a form of the disease which is little recognized and frequently overlooked. Moreover, it is important, for coincident with it serious crippling of the heart may be in course of development. This is more particularly true of mitral stenosis, as Dr. Poynton has recently indicated.

It is diagnosed by regarding unconsidered trifles. Slight fidgetiness and mild psychological unrest, with deterioration of school work, especially in writing and arithmetic, and a weakened mental concentration may be the only indications of chorea. The diagnosis is assisted by signs of mild rheumatism other than chorea, signs which taken alone carry little conviction, but when considered together, indicate a smouldering rheumatic infection. Such are epigastric pain, growing pains, epistaxis, anaemia, and recurrent tonsillitis.

In this respect the *ocular phenomena* which I have described afford, I think, considerable help. The pupils are frequently dilated in chorea, and the action of the iris muscle is abnormal. Perhaps the most striking pupillary sign is hippus or a rhythmical contraction and dilatation. Not infrequently the pupils are unequal, an inequality which increases when contraction is induced by light or accommodation, the iris in the more dilated eye reacting more sluggishly than its fellow. When the choreic attack is over the pupils again become equal in size and activity.

Alteration in the shape of the pupils may occur. Thus the usual circular orifice may become oval or irregular, to regain its normal shape when the attack has subsided. Lastly, its position may be altered so that it becomes eccentric, and on contraction this eccentricity is increased, the pupil usually travelling upwards and inwards. The only explanation I can give for these various phenomena is that the iris muscle shares with other muscles inco-ordinate movements, paresis and atony. In such a case the heart's action is often rapid and may be irregular, whilst dilatation and murmurs generally appear sooner or later. As has already been mentioned, a mid-diastolic murmur is likely to be heard. Such a murmur often indicates the advent of mitral stenosis, being gradually replaced by one presystolic in time and rough and rumbling in quality.

Residual chorea is the name given to a condition which persists, sometimes for several weeks after the disease has ceased to be active. It may have all the features of latent chorea. Indeed, in such cases it is really a form of latent chorea, for, in spite of the absence of active signs of the disease, the heart may become steadily more affected, showing that the rheumatic infection is still smouldering on, although its virulence has diminished. In other cases the movements become automatic, so that those characteristic of chorea persist although the disease proper is over. In yet others the child lies almost motionless and aphasic, though generally still grimacing slightly.

Treatment.

A very astute physician, so I have been told, once said that one of the most dangerous attributes of chorea is its treatment. While it is active, rest both to body and mind is essential. All occasion for excitement or fear should be carefully avoided. It is common knowledge that such events as a birthday party or a Christmas tree are followed not infrequently by an accentuation of the symptoms. In hospital in all but the mildest cases recovery is quicker if the child be screened off from the others in the ward. Where the movements are severe enough to cause the child to hit and bruise herself against the side of the cot it must be suitably padded.

The food need not be restricted in any way, for an ample diet is required to supply the loss of energy, which may be very considerable. In cases of difficult mastication and swallowing, semi-solid foods will usually be found the most satisfactory. In quite exceptional cases oesophageal or nasal feeding may be necessary.

During the time in which I was Medical Registrar at this hospital I had an exceptional opportunity of judging the respective merits of some of the most lauded drugs employed in chorea. In one ward large doses of sodium salicylate were used; in another arsenic was pushed; in a third—in most cases—no drug was administered. Though watching these cases for a considerable time, I was unable to assure myself that progress was quicker or more sustained in one ward than another.

Sodium salicylate, however, has a special sphere of usefulness in this condition, for although its effect on the chorea itself may be unconvincing it strikes at the root of the matter. Chorea I believe to be always rheumatic, at least in part, and therefore I always administer sodium salicylate lest fresh rheumatic manifestations develop which might thus be avoided. If there is any rise of temperature the use of salicylate seems to me imperatively to be called for. I cannot altogether follow my respected teacher Dr. Lees, who gives as much as 400 to 500 grains daily, and has given even more, for I am not sure that such doses do more good than those which are smaller (10 to 20 grains three times daily). On the other hand, his cases show that there are no grounds for that fear of the cardiac depressant effect of salicylates which is so generally entertained. There are a few important points to be remembered when salicylates are given to children. It is essential that before the treatment is started the bowels should be opened freely, and it is a good rule before increasing the dose to be sure that an evacuation has taken place during the preceding twelve hours.

The ill effects of the drug which are most to be feared are those of acid intoxication. Vomiting is succeeded by drowsiness, which if untreated leads to air-hunger and coma. The breath smells of acetone, and acetone is found in the urine. A few deaths have occurred. Such a catastrophe may be avoided if the bowels are not

allowed to be constipated and if sodium bicarbonate is administered at the same time in double the amount. With the onset of acetonuria, vomiting, or drowsiness the salicylate should be stopped temporarily. I have been able to collect twelve cases of acid intoxication following the administration of salicylates, and in every one constipation had been present.

Arsenic, in spite of its general employment, ought not to be recommended, in my opinion. Its good effects are difficult to see, but its bad effects are occasionally only too obvious. Severe gastritis is apt to be set up, and not a few cases of arsenical neuritis have followed.

The good results claimed for ergot by Dr. Eustace Smith have not been obtained by most other physicians.

Sedatives such as trional, chloral, bromides, sulphonal, and chloretone are widely used. Of these sulphonal is far too dangerous a drug to employ in this condition. Chloretone is sometimes useful in doses of from 3 to 5 grains thrice daily; but, although it has only been used extensively for a few years, already cases of poisoning have been noted. To obtain sleep in maniacal or very restless forms of chorea, chloral and bromides are valuable, especially if combined with a warm pack.

After-treatment is important. When the chorea is no longer active, the child often remains apathetic, scarcely moving in bed, and occasionally refusing to speak. Good co-ordination may not be re-established for several weeks. Power is still feeble. In such cases absolute rest is no longer indicated, and does more harm than good. Massage and easy exercises should be employed, and the child should be encouraged to test her powers of motion and speech.

While still in bed such easy re-education exercises as touching the nose, apposing the fingers of the two hands individually, making figures or houses with bricks or dominos, and playing draughts, are all useful. Later, the cribbage board supplies a more difficult exercise, the patient being instructed to put the peg into particular holes—for example, into every second or fifth. Still more exacting is the building of card houses. The legs may be re-educated to perform co-ordinate movement in a similar manner. The following exercise is useful to begin with: Heel to toe, heel to shin, heel to knee, done first with one leg, then the other. Fraenkel's boards may be used when co-ordination has begun to improve. When the patient gets up the leg movements may be corrected still more by encouraging her to walk on a certain plank or along a straight line, or on a particular part of the pattern of the carpet. By such simple devices as these recovery may be hastened considerably.

ON AVOIDABLE DIFFICULTIES IN THE HAND-FEEDING OF INFANTS.

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So much has been written on the subject of infant feeding that it seems almost to require an apology from any one who ventures to add another to the many contributions which are made on this subject. The comparative values of raw milk and sterilized milk, of whole milk and milk diluted, of the various proprietary foods, of the usefulness of added sugar and cream—all these matters are discussed and rediscussed, and not without benefit to the reader, for the results of a man's own personal experience can never be anything but welcome. One cannot, however, avoid remarking that the writers, ably as they descant upon their several views, rarely ask themselves why it is that the infant should so often show a helpless incapacity to digest the food provided for him however skilfully this may be chosen, or however carefully it may be prepared.

Now the majority of children at birth are healthy and fairly vigorous, and a healthy normal child has a digestive capacity which as a rule adapts itself readily to a food chosen with judgement—that is, with due regard to the age of the infant and the probable competency of its stomach. If the child give trouble and show signs of acidity and flatulence, it does so in most cases because the digestive organs are already in a state of derange-

ment. We must remember that a newborn baby is suddenly transported from a temperature of 100° F. in which he has grown and developed, to a temperature of 65° or 70°. This is its first shock: an abrupt drop of 30° or more in the warmth of its surroundings. The child is then, after more or less delay, bathed—often very leisurely; dried slowly, and afterwards laid quite uncovered upon his nurse's lap while she attends to the navel and sews on a flannel bandage. The exposure of the sensitive body during all this time, with little or no protection, to a temperature 30° below that to which it has been accustomed must constitute a second shock of no little severity. Many vigorous infants, no doubt, bear this exposure without obvious signs of injury, and if fed with discretion, especially if they have the advantage of a nurse's or mother's breast, give little trouble to their attendants. On the other hand, infants of low resisting power often by this means contract a serious chill which at once disorders the stomach and causes them to digest with difficulty even their mother's milk. They vomit after taking the breast or show signs of flatulence and discomfort, so that the mother, after a short trial, is instructed by her medical adviser to give up all idea of nursing, from the mistaken notion that her milk is unsuited to her child. If brought up by hand and fed from a bottle, such infants suffer still more urgently from vomiting, flatulence, and abdominal pain. For all this trouble the food chosen is generally held to be accountable, and change after change is made in the hope of hitting upon something which will be welcome to the stomach and put an end to the distressing symptoms, quite regardless of the fact that while the derangement persists no food can be expected to agree. If now the real nature of the difficulty be recognized and proper steps are taken, the signs of uneasiness begin to abate and finally disappear, for as the catarrh subsides the digestive processes recover their normal vigour. In that case the food last experimented with gets the whole credit of the improvement. But if the treatment be injudicious or incomplete, if the proper steps are not taken to avoid unnecessary exposure and protect the infant from further chills, the disorder of the stomach not only remains unrelieved but suffers almost daily a fresh impulse, so that that which was in the beginning a merely temporary upset becomes a confirmed disorder which drugs and changes of diet alone have little power to correct. It is only by attention to the simple cause of the trouble that we can have any hope of bringing the child's organs into a more manageable state and paving the way for his eventual recovery. Any one who examines an infant suffering from obstinate marasmus of this purely functional character will commonly find the feet icily cold, and probably the legs and thighs as well nearly as high as the hips. It is impossible that with such a condition of the circulation a child's digestive energies can be anything but unsatisfactory, and it is hopeless to expect an improvement as long as this state of things is allowed to continue.

It is by no means for the first time that I urge this vital matter upon the notice of the profession; but I find it very difficult to gain for it the attention it deserves. In spite of the consideration, which no one would venture to dispute, that to ensure completeness of digestion we must have healthy digestive organs to work upon, the means by which soundness of these organs is to be determined and maintained are too often completely ignored. The family practitioner is too apt to regard such domestic matters as washing, clothing, and nursery management in general as lying outside his province, to be left without hesitation or inquiry to the discretion of the child's mother or nurse. In some cases, no doubt, this can be done without risk of harm; but it is not every nurse, or even every mother, who is intelligent, careful, and accurate, and whose reports can be accepted as strictly in accordance with the facts. Without any intention to deceive, very wrong impressions may be conveyed; for loose thinkers are often poor observers, whose statements of fact must be received with caution, and only accepted if confirmed. Such persons are far too ready to mistake assumptions for realities, and to declare that to be right which they do not certainly know to be wrong. I should find it very difficult to say how often I have been told that an infant's feet were quite warm when the application of my hand has shown me that they were the exact contrary. I submit, then,