He was inoculated with benign tertian on September 8th, 1922. During the attack of malaria and for some weeks afterwards his mental condition underwent a change. From being apathetic and lacrymose he developed well marked auditory and visual hallucinations, and also delusions of persecution, which for a time made him very troublesome with his food. Gertsman refers to similar cases and seeks to explain the presence of the auditory hallucinations by the greater infiltration of the temporal lobes. The patient, however, made a good recovery and was discharged. He has since written a letter to his medical officer which shows that he has at present remarkably good insight.

On his discharge (June 30th, 1923) the following notes were made:
Nervous System.—Pupils: right, slightly irregular, reactions (direct and consensual) to light sluggish; left, dilated, oval reactions to light, direct sluggish, consensual absent. All superficial reflexes equal and present; tongue, no tremors; speech, no impediment. Right knee-jerk diminished; left knee-jerk diminished; sensations normal, gait normal; Rombergism absent. Plantars flexor; sphincters normal. In good bodily condition. Cerebro-spinal fluid: Lange gold test, zone 2 curve; gamboge, precipitation in all five tubes; cell count 61; Wassermann test positive. Blood: Wassermann test positive 1 in 5.

CASE II.

J. A., male, aged 36. Admitted October 11th, 1922.

History.—Patient is unmarried. He is stated to have had ordinary health prior to being wounded in the head during the late war. He was, however, in the army until September, 1919, and was able to follow his employment until July, 1922, when he complained of severe headaches. No history of his having contracted syphilis has been given. On admission he was rambling and incoherent in conversation, disorientated, wet and dirty in habits. He usually lay in bed with his legs drawn up, and his face partially or wholly covered with blankets. He was in poor bodily health; unable to walk; his weight was 9 st. 4 lb.

On examination, the cardio-vascular and respiratory systems were normal. The pupils were small, unequal, irregular, and sluggish; tongue and lips tremulous; speech slurring; knee-jerks positive; plantars both flexor; showed intention tremors in hands. The blood and cerebro-spinal fluid both gave a positive Wassermann reaction; Lange gold test, zone 1 curve; gamboge test, precipitation in all five tubes; protein tests, positive; cell count 24.

He was inoculated with benign tertian on January 25th. At the end of March he was noted to have improved a little mentally—he was not so apathetic; there was also a slight improvement in his physical condition and he was just able to walk. In another month his condition improved both mentally and physically; he still remained wet and dirty in habits, but was able to walk a great deal better. By the end of June he was no longer wet and dirty in habits. His weight had increased by 2 st. and he was able to walk fairly well. At the time of writing he is in good bodily health, is able to walk fairly well, takes an interest in his surroundings, but his memory is very defective for recent and remote events.

CASE III.

J. W. B., male, aged 52. This patient contracted syphilis in 1906; he was diagnosed as a case of general paralysis in 1915 in another mental hospital, and was discharged presumably in a state of remission. He was admitted here in December, 1921. From the date of his admission until May, 1922, the disease did not seem to be making much progress so it was decided not to inoculate him with malaria. In the beginning of May, 1923, however, he had several seizures and his condition began to deteriorate rapidly. He became wet and dirty in habits, and eventually a bed sore developed. It was then decided to inoculate him with malaria. This was done on June 9th, and on June 20th he was put on quinine. Since that date he has improved steadily. He is up and able to walk about, the bed sore is practically healed, and his mental condition has improved a great deal.

CASE IV.

J. B., male, aged 54. On admission the patient was simple and childish; was completely disorientated for time and place. He was in feeble physical condition. Since March of this year he had been confined to bed and he was unable to walk. He had marked tremors of his hands and was unable to do anything for himself. He was inoculated on June 5th. He continued to improve rapidly after inoculation and is now able to walk about. He still has tremors of the right hand, but is able to work in the ward. His mental condition is much better; he is now orientated for time and place. The rapid amelioration of his mental and physical condition was commented on by his relatives.

CASE V.

R. B., male, aged 44. This patient made a spontaneous recovery from his attack of malaria. Parasites appeared in his blood nine days after inoculation; they remained in the blood for thirty-nine days, and then disappeared. He has had no rise of temperature since, nor have any parasites been found in his blood. A period of over three months has now elapsed.

Of the 40 cases under treatment during the past fourteen months, 6 have died. Three patients have been discharged to their homes and are now following their usual occupations. Three patients formerly wet and dirty in habits have ceased to be so. Two of the cases formerly confined to bed have regained their strength to a considerable degree and are able to be up and about.

We are of opinion that this form of treatment is worthy of an extended trial, as, in our experience, benefit seems to be obtained in almost every case. In 296 cases Gertsman

claims to have obtained a complete remission in 38 per cent. So far, we are not in a position to make a similar claim. Our idea in this article has been to record preliminary observations on the 40 cases under treatment in the hope that we may be able to refer to them at a later date.

It has been suggested that better results might be got from subjecting the patient to relapsing fever, a spirochaetal infection which produces a continuous fever for three or four days instead of an intermittent fever for a longer period. It is hoped that the antibodies produced will have an effect on the *Spirochaeta pallida*. We have, again, through the kindness of Professors Stephens and Yorke, been able to inoculate with relapsing fever, and we hope to be able to refer to this form of treatment again.

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THE CARE OF CHOREIC CHILDREN.

BY

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THE overflowing nervous energy of healthy children exhibits itself in lively motor activity, which to the adult eye appears constant, and may be regarded as uncontrollable. The healthy child is nervous in the sense that his nervous system is comparatively unstable; but, granted moderate heredity and suitable hygiene and environment, he develops within the bounds of an ever-increasing power of control. Psychoanalysis and neurology must here be based on child-study and experience of children; knowledge of the characteristics of childhood is the essential basis for the interpretation of nervous phenomena. Much can be learned by close observation of emotional control, mental activity, and the neuromuscular condition, but it is important not to exaggerate the significance of nervous symptoms. A marked form of expression of nervous instability is muscular spasm, and this spasm in some form is a common symptom in most illnesses. Its form of expression ranges from general restlessness to twitching of individual muscles, from violent convulsion to faint tremor.

DIAGNOSIS.

The "nervous" child oversteps the limit of self-control. The mild initial symptoms of "nervousness" are excessive motor and mental activity. Later, it may be noticed that, while the mental activity remains excessive, it becomes increasingly associated with emotionalism, and a lack of sustained or reserve motor power. The child is easily tired, he is irritable, he cries readily, and jumps at sudden sounds, etc. There may be motor lethargy, unwillingness and inability to play strenuous games. With further development of the condition emotionalism becomes more strongly marked, lack of reserve mental power and even mental peculiarity supervenes, and motor spasms occur. The cause of such a "nervous" condition is usually complex. Neurotic heredity is common, and, when present, is usually supplemented by neurotic environment. An extreme sense of responsibility on the part of the parents or guardians, or their ignorance or fear, often develops the unsuitable environment.

Frequently, however, the nervous element, whether in heredity or environment, is not primarily at fault. The common basal error in these cases is digestive. Irregular, improper, or excessive diet deranges digestion, and manifold sequelae result—among them nervous instability, diminution in the power of control, spasm. Endocrine function is sometimes, but rarely, markedly affected.

This "nervous" child is, further, exposed to the common hazards of childhood. In outstanding degree he is liable to suffer shock from the onset of puberty, from arresting and violent physical stimuli, and from rheumatic infection;

while, on the other hand, these factors in themselves may each suffice to produce a condition of "nervousness." In the case of rheumatic chorea the cause is demonstrably organic.

It is obviously desirable and very important that diagnosis should be exact as to the condition present, and as to the primary cause. The term "chorea," however, as generally used is a comprehensive one. Commonly associated symptoms are those already mentioned—namely, nervousness, lack of control, spasms—and with these frequently "turns," or "faints," or "fits," and mental peculiarity. A large proportion of such cases is diagnosed chorea. Under this term in addition to cases of Sydenham's chorea undoubtedly occur cases of excessive fidgetiness and cases of habit-spasm. Both these conditions are sometimes very hard to diagnose from true chorea. Sturges remarks that there is no sharp division between the movements of mild chorea and of excessive fidgetiness, and Still writes of some cases which he diagnosed as "Chorea? Habit-spasm." But with care and accuracy in examination such doubtful cases are very uncommon. The fact remains, however, that a considerable number of children suffering from excessive fidgetiness or from habit-spasm are designated choreic, and for present purposes I would include in one group (Group 1) children designated "choreic" and whose condition falls within the category of these three conditions.

There is, however, another, and though a very much smaller yet a very important, group of cases which occurs under the designation "chorea." In this minority group are cases of encephalitis, epilepsy, and mental defect (Group 2). In still other conditions choreiform movements may at first confuse, but the diagnosis should quickly be clear on careful observation. Such are cases of "cured" meningitis, of cerebral tumour, and of birth injury. An inco-ordinate peripheral paralysis may be mistaken for a paralytic chorea, but in such a case also a correct diagnosis should quickly be reached.

But in connexion with the conditions mentioned under Group 2 the difficulties in diagnosis are often much greater. The child who has suffered from encephalitis may lack a definite history of the original illness. These are "nervous" children who display abnormality of conduct, of the nature of excessive naughtiness of healthy children. There is obvious lack of nervous control, and sometimes tremor and rigidity. Alfaro¹ considers that, just as Sydenham's chorea is due to the virus of acute rheumatic infection, so there is a form of chorea due to the virus of encephalitis lethargica. It is too soon as yet to tell the possible degree of recovery in the mental condition of these children. There is, however, no doubt that re-education without strain and in healthy environment is essential, and the experience of teachers is, in many cases, hopeful.

In cases of children in which a suspicion of epilepsy arises accurate diagnosis is often of extreme difficulty. In some of these children convulsions occur only after emotional excitement; the children are "nervous" and excitable, and habit-spasms are common. In others the mental hebetude produced by epilepsy is very similar to that which often persists for long in the choreic child. History is particularly liable to be inexact in connexion with a condition such as epilepsy, and the fact remains that a small number of cases of epilepsy are at first labelled "nervous" or "chorea." Choreiform movements are common among mentally defective children. The important point in diagnosis is recognition that the "chorea" is merely a symptom occurring in a mentally defective child.

TREATMENT.

Cases of "nervous" children, when considered from the standpoint of the diagnosis of chorea, have hitherto been alluded to as falling mainly into two groups. The standpoint of "chorea" is assumed because, under this medical term of diagnosis, is ranged, in practice, a very large number of children displaying the symptoms of excessive nervousness, lack of control, and spasm. Chorea, in many instances, is either a faulty or an incomplete diagnosis. But it is here adopted as being the generic term under which, for lack of facilities and history, the condition of the seriously nervous child is often designated. Fuller oppor-

tunities for examination permit of accurate diagnosis in each individual case, and consequently mark more clearly the necessary line of treatment. It is from the point of view of institutional treatment that the two Groups 1 and 2 have been defined.

Twenty-five years ago Sir Robert Jones and Dr. C. J. Macalister were largely instrumental in founding the Country Hospital for Children at Heswall, which is now amalgamated with the Royal Liverpool Children's Hospital, Liverpool. The object of the hospital was the cure of children requiring prolonged treatment in the country, and within the hospital was developed a school. During the years that have elapsed since the foundation, the provision of the founders has won widespread acceptance and recognition. Complete orthopaedic work under a master has revolutionized a branch of surgery, and has taught a lesson to physicians in their own sphere. The founders of the hospital recognized no less the potentialities here of medicine, in the directions both of prophylaxis and of therapeutics. A large number of the children admitted to the medical wards are cases of a nervous type, and falling within the category of "chorea" as here alluded to. The clinical material is rich and the types varied. Observation and study demonstrate striking points.

This communication is based primarily on a study of 317 cases. Of these, 53 were private cases seen in this area within recent years, and 141 were cases of old patients of the hospital—some of them patients so long as fifteen years ago—whom I have been enabled to follow up. For permission to investigate these latter cases I am indebted to the generosity of Dr. Macalister, and the valued assistance of members of the Child Welfare Association. The remaining 123 cases were recent hospital cases of my own.

My experience leads me to emphasize certain points, which seem to corroborate the validity of the present trend of care of these cases.

The first outstanding feature in the private cases is the importance of heredity. In 60 per cent. of these cases there was a marked neuropathic heredity. The next common feature was improper feeding and disturbed digestion; with this may be noted usually absence of sign of any marked endocrine dysfunction. Preceding and at the time of puberty these well-to-do children are the subjects of close attention and examination. The whole question of schooling is thoroughly investigated and arranged with studied care, and with a view to the later work of life. In some cases the wisest course is roughing it with his fellows, but in many others restrictions and special courses are necessary. This is particularly the period when moral neuroses may develop—not only sexual, but petty theft, causeless lying, etc. Whatever course is adopted, constant, wise, non-meddlesome observation is necessary.

How is it with the child of the hospital class? As regards immediate treatment, for this nervous "choreic" child, when of doubtful type, such a hospital as that at Heswall affords accommodation impossible to obtain in a hard-worked city hospital which has perforce to deal with acute cases. In the Country Hospital he is retained while an accurate diagnosis is made. The question then arises, Is he a suitable case for prolonged treatment, or is he occupying a bed which could be filled to better advantage? It is here that justification for Groups 1 and 2 appears, although there can be no absolutely fixed dividing line.

Members of Group 2 are, with few exceptions, unsuitable. On the other hand, members of Group 1 are most suitable as inmates for such a hospital, if on full examination hospital treatment is advisable at all. When an accurate diagnosis has been made, prolonged treatment here may bring about cure—otherwise almost impossible. In addition to ordinary medical and nursing care these patients require fresh country air, good plain food, mental and physical rest—it may be complete—and, along with this, individual attention as to the gradual restoration or development of the power of control, and a suitably attuned system of education. In the course of months, or it may be years, some of these patients are cured, and their hearts saved from lasting damage. Such cure may be permanent. But we are dealing with a class of case in which recurrence is common.

Certain points stand out prominently in the records. Chorea commonly recurs; it is not uncommon to meet with cases of recurrent chorea in which there is no other evidence of rheumatism and no cardiac lesion; but with recurrent chorea the heart is usually involved. In connexion with tuberculous infection the following points were noted: habit-spasm is common in the cases of children suffering from tuberculous lesions; chorea sometimes occurs after acute localized tuberculous infection or an operation for the same, and in such a case, so far as here noted, is non-rheumatic; tuberculous infection sometimes supervenes after true Sydenham's chorea with cardiac involvement.

But the most outstanding feature in the records is as regards home conditions. Many of these children relapse frequently, become weakly invalids, have little education, and find it hard if not impossible later to obtain any work for which they are fitted. On the other hand, those children, even when crippled by heart affection, who survive childhood with a modicum of education, with fair vitality, and who are able to work and find work suited to them, are those whose home conditions, though poor and often to the outside eye dismal, are described as good of their class.

Apart from actual lack of the necessities of life and maternal overwork, lack of wisdom in the home is the common determining factor in the welfare of the child. Members of the Child Welfare Association do a great work in attempting to remedy this—a work ultimately of lasting educative value, and which deals with the problem at its root. But the day is yet far distant when the possibilities and wisdom in our poorer homes will prove a satisfactory and thoroughly responsive medium for even the wisest of health visitors. For the wisest of our well-to-do the problem is very difficult, and particularly so at the time of puberty and with the vista of life's work in view.

Our children's hospitals receive in their wards children till the age of puberty, and with the development of country hospitals such as Heswall suitable and picked cases may reach this age with possibilities otherwise unattainable of a useful active life. But at this most critical period adequate support suddenly fails. True, if the patient be sufficiently ill he will be admitted to a general hospital, or perhaps a convalescent home; but even there he is not graduating for a useful life. If he is merely weakly, there are large numbers of dispensaries or out-patient departments which he can attend, while living at home, and such medical supervision may suffice to give him a satisfactory introduction to adult life.

But many of the cases of the type of which I speak are of an intermediate group, for whom the latter routine is insufficient, and who, if subjected to it, inevitably sink in the physical scale, and for whom the prospect of life is unutterably dreary—if life itself is retained. For these, then, who need, and who are capable of usefully responding to, special environmental opportunity at this critical period, what possibility presents itself? Just as in the case of tuberculous infection medical care is incomplete without restoration to safe life in the sanatorium and colony, so in these cases medical effort is frustrated without supervision and direction during the years of puberty and adolescence. The "Trade School for Cardiacs" in America deals with such "occupational" or "follow-up" therapy. The children with whom we have dealt here are potential or early "cardiacs," and, from the commencement of their neuro-muscular symptoms, education in controlled movements is important. We need beyond, and in conjunction with, our Country Hospitals, Country Apprentice Schools in order to complete, and to justify from an economic point of view, our medical efforts and outlay for the children.

Dr. Poynton and Dr. Moon have both recently in this JOURNAL written cogently with regard to the need for wider and fuller methods for the prevention of heart disease and for the abatement of this scourge, the devastating nature of which is emphasized by Sir George Newman. The founders of the Royal Liverpool Children's Hospital at Heswall took a great step forward along this path, and pointed a finger towards the method for completing the execution of the basal theme of their conception.

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British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, 1923.

SECTION OF MEDICINE.

Sir THOMAS J. HORDER, Bt., M.D., F.R.C.P., President.

DISCUSSION ON
THE ETIOLOGY AND TREATMENT OF HEART
DISEASE IN EARLY LIFE;

WITH SPECIAL REFERENCE TO THE PREVENTION OF
CHRONIC CARDIAC INSUFFICIENCY.

OPENING PAPER

BY

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THE honour of opening this discussion, of which I am very sensible, carries with it no small obligation, for there is no doubt that our subject—that of heart disease in early life—constitutes one of the major problems concerning the nation's health.

Directly we begin to think of this subject as a national question we find ourselves thinking in terms of one disease and one disease only, that of acute rheumatism—that great, essentially British, infective disease. Other diseases there are which will affect the hearts of children, and, of course, they are not ruled out of our discussion; but for practical purposes the problem of heart disease in early life is commensurate with the problem of rheumatic infection. It is to this subject that I shall confine my remarks, and for the purpose of our discussion I have somewhat painfully dissected out and labelled some of the various difficulties which keep us back from a more successful control of the disease.

PROGRESS MADE.

Before passing to these difficulties I think it might be of interest to express a personal opinion upon the progress made in the fight against this disease. The chief change in the last fifty years seems to be a reduction in the frequency of the severer manifestations of the disease. Taking all types, mild and severe alike, I suppose the frequency has declined a little; this is merely an impression, but the following considerations seem to prove the gradual reduction in the number of the severer types.

(a) *Hyperpyrexia*.—In 1882, to judge by the fifteenth volume of the *Transactions* of the Clinical Society, physicians would seem to have met with twenty, thirty, or even more cases in their own experience.* I doubt if anyone here has seen half a dozen. At Guy's Hospital, in the ten years 1900-1910 there was one case in 1,053 instances of "rheumatic fever." At St. Mary's Hospital in the last fifteen years I can recall two instances. The most dread of all rheumatic symptoms seems to be disappearing.

(b) *Rheumatic Admissions*.—The number of cases of rheumatism severe enough to require admission to hospital is also declining. Taking quinquennial periods from 1869 to 1914, the St. Bartholomew's Hospital reports show that the number of rheumatic cases per 100 medical in-patients has dropped from roughly 10 to 5. Instead of admitting something over 200 cases a year, there are now admitted something over 100.

(c) *Acute Pericarditis*.—The proportion of rheumatic in-patients who suffer from acute pericarditis perhaps gives us the most accurate idea of what is happening. The following table shows the percentage worked out in quinquennial periods (post-war figures are not yet available):

* In the five years 1873-77 at the Middlesex Hospital out of 778 cases of rheumatism there were 53 instances of hyperpyrexia (*loc. cit.*, p. 263).