the Lady Superintendent particularly for the manner in which she has adapted the work of the nursing staff to the altered conditions which have resulted from the erection of the new Labour Wards.

ART. V.—*The Recognition and Treatment of True Idiopathic Epilepsy in Children.*^a By JAMES NOËL GREENE NOLAN, M.D. Univ. Dubl.; B.A. T.C.D.; Member Medico-Psychological Association; Assistant Medical Officer, Hellingly Hospital, East Sussex County Asylum.

IN making these suggestions as regards diagnosis and treatment of epilepsy in children, I wish to confine myself as far as possible to those cases of true idiopathic epilepsy, of which Aldren Turner gives the following:—

Definition.—"Epilepsy is a chronic, progressive disease, characterised by the periodic occurrence of seizures in which loss of consciousness is an essential feature, commonly, but not invariably, associated with convulsions, and frequently accompanied by psychical phenomena. It generally occurs in persons with an hereditary neuropathic history. It runs its course uninterruptedly, or with remissions, for a number of years; and terminates either in a cure or in the establishment of the confirmed disease."

However, the subject would be very incomplete without at least mentioning and classifying the various nervous diseases to which children are subject in which seizures may occur, often indistinguishable from forms of true epilepsy. These cases of secondary epilepsy are not in general nearly so tractable, with certain definite exceptions, as will be noted. In this class, too, must be mentioned those cases occurring from traumata—*i.e.*, cases of true Jacksonian epilepsy.

Epilepsy occurs more frequently in males than females,

^a A Thesis read for the Degree of Doctor of Medicine in the University of Dublin, June 1913.

and this is noticeable from the first year onwards. One child out of every 500 is subject to the disease. The diseases originate more frequently in the first year of life than in any other. Then the fourth, seventh, and ninth years show a greater number than the intermediate years, and there is nearly as great an initial incidence in the fourteenth and fifteenth years with the onset of puberty as there is in the first year.

It has been conclusively proved that a neuropathic inheritance is the chief causative factor in the disease, and I have rarely found a case in which there was not a neurotic blemish on the parental tree. One authority gives the following table :—

Epilepsy	-	-	-	37.2	per cent.
Insanity	-	-	-	5.4	„
Alcoholism	-	-	-	3.1	„
Other nervous disorders	-	-	-	5.3	„
No known heredity	-	-	-	49.0	„
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					100.0

More common exciting causes are the undermentioned :—

A.—*Reflex Influences*.—Diseases of the nose—rhinitis, adenoids; diseases of the eyes—strabismus, myopia; diseases of the ear—mid-ear disease, polypus; diseases of the teeth—caries, pyorrhœa-alveolaris; disease of the throat—tonsillitis; disease of the stomach—gastritis; diseases of the intestines—constipation, parasites; diseases of the genitals—phimosis, pruritus.

B.—*Psychical Causes*—Fear, emotional excitement, shock, grief, overwork, prolonged anxiety.

C.—*Infective Diseases*—More frequently scarlet fever, but measles, influenza, diphtheria, pertussis have also been observed to bring to light the latent disease.

It should be noted that a temporary arrest of the seizures occasionally occurs in consequence of an attack of pyrexia. Also, the onset of the catamenia is frequently the exciting cause of the first seizure in a neurotic girl. As far

as can be ascertained there are no definite conclusions to be drawn between the state of the maternal health during pregnancy or an alcoholic condition *per se* existing in either parent during conception, or in the mother during intra-uterine life, and the incidence of epilepsy occurring in the child.

As regards secondary epilepsy, the convulsions are not always accompanied by a loss of consciousness, which is invariably present for a greater or lesser time in the idiopathic variety. I mention below the more common conditions in which these secondary attacks occur :—

1. *Congenital Cerebral Diplegia.*
2. *Acquired Cerebral Paralysis*—
 - (1.) Infantile hemiplegia and diplegia.
 - (2.) Atrophic sclerosis and cystic formation.
3. *Intra-cranial Tumours.*
4. *Vascular Lesions*—
 - (1.) Thrombosis.
 - (2.) Hæmorrhage.
 - (3.) Embolism.
5. *Encephalitis.*
6. *Hydrocephalus*—
 - (1.) Congenital.
 - (2.) Primary.
 - (3.) Secondary.
7. *Cerebro-spinal Syphilitic Lesions*—
 - (1.) Meningitis.
 - (2.) Vascular lesions—especially thrombosis.
 - (3.) Gummata.
 - (4.) Diffuse specific lesions.
8. *Juvenile General Paralysis.*
9. *Traumata.*

Practically all cases of secondary epilepsy may be regarded as incurable, save those in which congenital syphilis has been the predominant existing factor. These cases, if they are to have a fair chance of a recovery, must be recognised early, and here the Wassermann reaction proves of the greatest assistance. Taking only the imbecile children

under fifteen years of age in my care at present, the Wassermann reaction was + in 8.3 per cent. in those who suffered from convulsive attacks, whereas it was + in only 2.7 per cent. in those who did not, and it is interesting to note that no physical stigmata of congenital lues could be detected in any of these children.

Other hopeful patients to deal with are those who have recently suffered some injury which is directly causing their attacks. These recent traumatic cases give a fair percentage of recovery if seen early, when operative measures can be undertaken. The success of the operation depends on the absence of post-operative adhesions or scar tissue formation beyond a minimum amount, and even then good results are not always assured. However, once the convulsive habit has been established there is a tendency to its perpetuation in the form of recurring epileptic seizures, so that the convulsions introduced by the above-mentioned disorders (and by uræmia and eclampsia in adults) may be the forerunners of genuine epileptic seizures which persist after the exciting cause has been successfully treated or surgically removed. The prognosis, therefore, is invariably bad, for the subject is always handicapped by a poorly developed nervous system, and the mental condition may range from that of slight backwardness to one of total idiocy. The treatment, therefore, is directed towards removing the existing cause and controlling the convulsive attacks. These may range in form from the severe major fit to a scarcely noticeable minor attack, or, indeed, may be replaced by one of the various psychical equivalents, though the latter condition is not readily recognisable in children.

Diagnosis.—It is not difficult to recognise the majority of these secondary cases. The symptoms of the causative disease are generally sufficiently obvious to prevent a mistake being made. Some doubt may arise in the cases due to specific disease, and, as already pointed out, the aid of the Wassermann reaction is required. It is important to remember that the symptoms to which the parents draw

one's attention are those of the seizure, and a careful examination of the child must be made in any doubtful cases.

Treatment.—The general treatment of the causative disease must be undertaken thoroughly, and of great importance is the building up of the patient's general strength.

These points will be dealt with more fully later on, and it is sufficient to say here that, having rigorously adopted general measures which always necessitate home care by suitable nurses, or in schools intended solely for defective children, one can hopefully attempt to check the convulsions. A nutritious purin-free diet enables one to do this with the aid of much smaller doses of the bromides. The addition of borax is, I have found, very efficacious in these cases. The dosage may be increased until control is established, but it is unnecessary to exhibit more than 60 grs. of the combined salts per diem. Larger doses only cause a worse mental state due to the condition of bromism being established. Géligneau's treatment proves of great service in these refractory cases, and by the use of dragées there is very little difficulty in administering the drug.

The general educational treatment is the same as that advocated for the idiopathic cases. But these children are usually more backward, and are rarely able to take their place among their fellow members in general society.

I come now to the recognition and treatment of the idiopathic disease in the young, and, first, I should like to draw attention to the neuropathic symptoms which manifest themselves in the mentally unstable. Long before any convulsion occurs a child may be noticed to exhibit very indicative neuroses, and if treatment be at once undertaken the convulsive attacks may be permanently warded off. Infantile convulsions are of serious import when they occur in the neuropathic child. Equally important from the medical point of view are such disorders of childhood as night-terrors, head-banging, teeth-grinding, nocturnal incontinence, sleeplessness, outbursts of temper, choreiform movements, the habit spasms, and

often some such definite objective phenomena as abnormal timidity, shyness, and self-consciousness. In addition, it may be noted that these nervous symptoms have their physical counterpart, and the child rarely looks healthy, or as well developed as it should for its age. Eye defects are frequently present.

Should the case come under notice later, when the convulsive attacks have made their appearance, more drastic treatment has to be adopted. The question of psychological equivalents occurring in these young children is too vague, and of too doubtful import, to require discussion, for one is apt to be misled by the spitefulness and bad temper which frequently is noticeable in some children, more especially in those who have been "spoilt," and who lacked parental control, but who have shown no other objective symptoms, and these children, as a rule, will not acquire this disorder.

The elements of an attack are twofold:—(A.) A convulsive, (B) psychical.

Under the convulsive element we note:—

- (1.) Aura.
- (2.) A complete attack in which there is a loss of consciousness, with a convulsive seizure (*haut-mal*).
- (3.) An incomplete attack in which there is only loss of consciousness (*petit-mal*).
- (4.) Sequelæ—*e.g.*, post-epileptic automatism. Coma.

B.—Under the psychical element there are to be noted—

- (1.) The diagnostic epileptic character and temperament.
- (2.) Definite paroxysmal psychoses which precede or succeed the convulsive phase.
- (3.) Psychoses which replace entirely the convulsive phenomena—*i.e.*, equivalents.
- (4.) The permanent inter-paroxysmal mental state resulting from the convulsive seizures.

It would be too long a matter to discuss the various combinations of these elements which may arise, for some cases merely exhibit an aura followed by an equiva-

lent. Others have a complete attack with no preceding aura or any sequela. Equivalentents are as likely to be followed by serious sequelæ as is an incomplete attack. Bearing this in mind, and aided by an unbiassed family history, it is not difficult to arrive at a diagnosis.

The differential diagnosis has to be made between hysteria, Gower's vagal attacks, febrile migraine, aural vertigo, heart disease, and, as we have tried to point out above, the seizures resulting from organic cerebral lesions.

Prognosis.—Hippocrates says :—" If it attacks little children the greater number die . . . if youths, recovery may take place. There is danger of its becoming habitual, and even increasing if not suitably treated."

This may be regarded as a somewhat hopeful view in the light of later day research.

The following table represents the present-time prospects more accurately. It has been compiled from the records of the Queen's Square Hospital.

Age at outset.	Arrests.	Improved.	Confirmed.	Cases.
	%	%	%	
Under 10	- 19.8	18.0	62.0	111
From 11 to 15	20.0	35.9	43.8	89
„ 16 to 20	- 34.3	29.6	35.9	64

Treatment.—1. Prophylaxis in a child who has exhibited the prodromata we have mentioned above should be undertaken at once. The management of the child should be based upon general hygienic and dietetic lines, and for its successful issue requires the alliance of the parent, teacher, and physician.^a Regulated periods of exercise and instruction must alternate with regular periods of rest and repose. Corporal punishment must be absolutely prohibited. All over-exertion and strain, whether mental or physical, must be assiduously guarded against, and here great tact on the physician's part is required. The usual stimulating dietary of tea and

^a It may be stated here that these children require constant observation day and night to prevent any untimely mishap occurring.

meat had better be abolished, and milk and cereals substituted. Drug treatment had better be avoided at this stage, save the administration of general tonics and necessary aperients.

The treatment of epilepsy at the onset of the disease may be :—(1.) Medicinal ; (2) dietetic ; (3) a combination of both the above, with general hygienic treatment. It need hardly be said that the last is the ideal course to adopt. A carefully-regulated life with a purin-free diet and a small daily dose of bromides is the treatment *par excellence*. The latter do not require to be given in great quantities or at intervals during the day. The smallest dose which appears to exert a favourable influence over the fits should be taken as the maximum, and this never should exceed 60 grs. The effect is intensified by the full quantity being given at one time. The best time is at night or before rising, depending on whether the patient is subject to diurnal or nocturnal attacks. Plenty of water should be given with the dose, and sufficient laxative to ensure a daily evacuation of the bowels. The best adjuvant is the syrup of Virginian prune.

Strychnine, borax, belladonna, zinc salts, opium, and innumerable other drugs have all been tried with varying success in individual cases ; probably the bromides which have been given were the chief factor in obtaining a cure. Flechsig's treatment, in our hands, has yielded no success, and it appears fraught with considerable danger, more especially in children. Organotherapy and serotherapy have not as yet produced a cure, and the latter appears to be a very irrational form of treatment.

As regards actual treatment during an attack there is nothing new to be said. It should be noted that attacks preceded by a prolonged aura can be warded off by a method which each patient discovers for himself, and which an observant nurse can apply when an attack seems imminent.

As regards the condition of "status," hypodermic injection of the bromides, aided by "lavage of the colon,"

and chloral administered rectally in grs. 30 doses will prove sufficient in milder cases. In the more severe attacks the convulsions must be controlled by chloroform, or death from exhaustion will ensue.

The diet should be carefully regulated, and on the same lines as we have previously laid down. Sodium chloride should find no place in the *cuisine* of a "fitty" child. Regularity and moderation, in all things, and abstinence from the various stimulating condiments, so frequently used nowadays, should be insisted upon.

Surgical treatment is absolutely useless save for removing some pre-existing exciting cause; circumcision when indicated will prove as efficacious as excision of the cervical sympathetic ganglia.

Before an "arrest" can be claimed, freedom from an attack for five years ought to be taken as a standard. During this time the medicinal course must be systematically adhered to, being gradually diminished, but never abolished.

General Education.—Some children show no mental defect, others exhibit a considerable degree of dementia. Shuttleworth, from his observations in the London School Board, compiled the following table from 470 cases :—

17 per cent. showed no mental improvement.

27.5 per cent. showed some mental improvement.

40 per cent. showed considerable mental improvement.

15.5 per cent. were incapable of being educated.

However, by reason of their malady, these children ought not to go to general schools. Their education is fraught with difficulty, but it should proceed on general lines, with due regard to the child's future.

Manual and industrial work ought to figure largely in the curriculum. The Lloyd system is the best that has been devised for these backward children. Such education is, therefore, best obtained in special homes and schools under medical supervision, and unless all facilities are available at home the child's future prospects are

materially benefited if removal to a special school be insisted upon.

Exercise should be a *sine quâ non*; tennis, football, Swedish drill, &c., are admirable, and if massage can be given afterwards all the better, as the circulation is sluggish and the general nutrition poor in many of these cases.

Such, in the main, is the treatment employed for some time past at the Hellingly Mental Hospital.

Unfortunately, early cases are the exception, as certification is the last resort of the unhappy parent.

The scope for useful work will undoubtedly be much wider when the new Mental Deficiency Bill comes into being.

Even with these unsatisfactory cases we get gratifying results, and quite 80 per cent. of our defective epileptics are usefully employed in the various industrial shops; and the younger children all benefit by their school training.

I am indebted to Dr. Taylor, R.M.S., for affording me every encouragement, and providing me with all facilities for the treatment of these children. Also to Dr. W. Rees Thomas, my colleague, for carrying out the clinical blood-tests and for the use of much valuable information which he had acquired when in charge of the hospital.

In conclusion, I wish to point out that much may be done to alleviate the future lot of a confirmed case by an early practical education and judicious medication.

Many cases will be improved, and some will enjoy a complete arrest of their distressing malady if treatment on the lines we have indicated be thoroughly carried out.

The lot of a demented convulsive is not a happy one, either to himself or his friends, and the greatest care should be taken that the bromide state be not superimposed upon an already unstable mental fabric. Any improvement that may be effected is a gain to the patient, even if only temporary, and everything should be tried for a considerable period before abandoning the case to the ranks of the insane.