EPILEPSY AND BEHAVIOUR DISORDER IN SCHOOLCHILDREN

By

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1. *Do epileptics show behaviour disorders?*

In approaching a survey such as this, one is immediately faced not only by the obvious difficulties in a study of a broad cross-section of the population with many divergencies and categories in the hands of so many different physicians and observers, but also, as Gibbs and Stamps (1958) point out, by the fact that "new information has developed so rapidly in the last few years that no time has been allowed for dead opinions to be given a decent burial".

That many epileptic children show disturbances of behaviour as well as of intelligence seems agreed (W.H.O., 1957), as will be seen from the list of traits alleged in a subsequent section, but opinions vary considerably as to the cause of the phenomena and their actual relationship to epilepsy.

Henderson (1953) found that about 12 per cent. of all epileptic schoolchildren had obvious personality difficulty, and he admits that difficult children in whom behaviour disorders are seen are often sent to special schools for epileptics, which would presumably weight the statistics in surveys which have been done in such schools. Strauss *et al.* (1940) found some evidence amongst children referred to the New York State Psychiatric Institute, and Gibbs and Stamps (1958) state that behaviour disorders, personality problems and psychiatric symptoms are common in certain types of epilepsy. Certainly teachers in special schools for epileptic children would seem to agree that many of these children are also "problem children", but this too may be a result of selection.

It would be thought, if there were a positive correlation of any significance between epilepsy and behaviour disorder, that this would show in crime records or statistics of delinquency. Whilst Healy (1915) found 7 per cent. of "definite" epileptics in 1,000 delinquent cases, Burt (1925) comments that Healy's figures appear remarkably high, and evidences only 2 grand mal cases from 200 delinquents. Scott, in a personal communication to W.H.O. (1957) found only 7 epileptics (2·3 per cent.) amongst 294 consecutive boys referred for psychiatric report at a London Remand Home, and Bridge (1949) remarks that "the contribution of epilepsy to juvenile delinquency is no greater than would be expected in any social class with difficulties in social adaptation". Conrad (1937) has in fact reported increased incidence of criminality in epileptic families, but Alström (1950) disputes his findings.

2. *Is there an epileptic personality?*

The general tendency in the literature is to admit that whilst certain classes of epileptics—e.g. institutionalized epileptics (Wallin, 1949); patients with temporal lobe or thalamic/hypothalamic epilepsy (Gibbs

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and Stamps, 1958); and "deteriorated epileptics" (Mayer-Gross *et al.* 1954; Herd, 1930)—show strong evidence of extreme personality disturbance which may reasonably be labelled "typical", nevertheless there is little evidence to show that any general behaviour found in epileptics and superficially "characteristic of epileptics" is in fact due to any "epileptoid personality" (Myers and Brecher, 1941; Bridge, 1934).

This is not to deny the existence of this behaviour. A survey of the descriptive literature follows, and an attempt is made to evaluate the suggested causes and to appraise diagnostic measures and possible methods of treatment.

Zanker (1960) describes similar behaviour as being characteristic not only of epileptic children, but of handicapped children in general. Bridge (1949) finds the list of disorders attributed to 65 epileptic children "differs little from the norms for the general population".

3. *Descriptive of the alleged "Epileptic Personality"*

It is hardly to be wondered that an "epileptic personality" has been postulated, when one finds in the literature numerous papers alleging at various times that epileptics (of various kinds) show in the aggregate the following characteristics:

(1) Amongst the vast number of personality traits given, *irritability*, *peevishness*, *temper* and *aggression* stand out as almost unanimously reported. Together with these we find, from one or more sources, epileptics described as:

(2) Aggressive characteristics: explosive, quarrelsome, domineering, bullying, anti-parental, vindictive, maniacal, brutal, violent—together with: malice, gossip, cruelty, lying and rancour.

(3) Passive anti-social characteristics: morose, sullen, sulky, stubborn, easily-slighted, obstinate, moody and ill-humoured.

(4) Personality traits: short-attention, alcoholic, apathetic, antagonistic, bigoted, confused, circumstantial, "clammy", coarse, contrary, undextrous, deluded, despondent, disliked, discouraged, dissatisfied, egotistical, fussy, fickle, familiar, garrulous, hypochondriacal, hysterical, impetuous, irresponsible, impulsive, inadequate, insecure, of limited interests, lacking feeling, monotonous, poor in memory, changeable in mood, narrow in outlook, perseverative, pedantic, plateau speech, rebellious, retarded, mock-religious, mock-righteous, sexually troubled, shallow, spoiled, sensitive, superior, sub-standard, temperamental, taciturn, troublesome, truant, slow-thinking, unstable, unreliable, unpredictable, undisciplined, unamenable, vain, vulnerable, vicious, wilful and withdrawn (Andrews, 1943; Bridge, 1949; Burt, 1925; Cattell, 1946; Hall, 1947; Herd, 1930; Halstead, 1957; Hill and Watterson, 1942; Kreyenborg, 1928; Mauz, 1939; Minowska, 1937; Mayer-Gross *et al.*, 1954; Pond, 1952; Stubblebine, 1957; Wallin, 1949, and others).

To offset this formidable list of derogatory terms, Hall (1947) comments that "the majority of epileptic children do not show these characteristics . . . over a number of years they remain kindly, thoughtful, considerate and amenable"; Putnam (1945) describes extra-institutional epileptics as being on the whole "outstandingly even-tempered, uncomplaining and devoted, and . . . among them are to be found many unusually stable, intelligent and

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delightful personalities"; Bumke (1924) maintains that epileptics are "by nature simple, good-humoured, conscientious though limited folk, and show in fact a personality deviation of a non-psychopathic kind".

It would therefore seem to be the general opinion that epileptics, whilst not invariably, do in many cases possess characteristic personality traits or further exhibit behaviour disorders which are not, however, due to epilepsy *per se*.

To what, then, can this categorization be due?

4. *Possible explanations for the "epileptic personality"*

(a) *Medication*

Lennox (1929, 1940) and most other workers have refuted the suggestion that anti-epileptic drugs are in any direct sense responsible for deterioration either of intelligence or behaviour. Stauder (1938) however, found cases in which the behaviour of epileptics improved when the dosage of their drugs was critically adjusted. Gibbs and Stamps (1958) more recently affirm that "continuous psychiatric symptomatology . . . may be exacerbated by drugs that control seizures", and they especially instance phenurone. As will be discussed later, this observation marches with their view that *ad hoc* ictal psychiatric symptoms and continuous inter-ictal manifestations are independent.

Kimball (in a personal communication to Penfield and Erickson, 1941) gave the opinion that "Luminal and other drugs may have a distinctly stultifying effect on the mind, and will accentuate rather than relieve the abnormalities of personality". It would seem pertinent to suggest here that the academic distinction between primary and secondary effects of medication should be modified, if not dropped (Keating, 1960). If a drug, by its depressant effect on neurone activity, interferes with the patient's energy-producing chemical reactions (McIlwaine, 1955) and so renders him incapable of understanding or responding to those standards of conduct which maintain the accepted code of normal behaviour, then that drug obviously has a causal effect in behaviour disorder. Incidentally, Stauder (1938) goes beyond the question of behaviour in epileptics and suggests that Luminal "accentuates the abnormal picture . . . characteristic of the 'genuine' epileptic . . . and further that even normal persons who take this sedative will begin to show the same type of reaction".

(b) *Cerebral damage*

That structural damage to the brain is likely to have some effects on the personality has been mentioned by Mayer-Gross *et al.* (1945); Bender (1940) describes the "clinging personality" of children with cerebellar lesions; Earl (1936) found a small hyper-kinetic group whose over-activity could be attributed to lesions in the basal ganglia, and the W.H.O. Report (1957) draws attention to the psychomotor sequelae to damage in the anterior-temporal and mid-temporal lobes or in rhinencephalic epilepsy—damage "in the highest levels of presentation of the somatic expression of the emotions and (perhaps) of consciousness".

Whether a reason for this damage should be sought in the aetiology of the fits or whether it is actually caused by the latter themselves (or both) is a matter for discussion.

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That cerebral damage is caused by anoxia due to vascular spasm during the fit (Scholz, 1951; Ruf, 1952) and certainly in status epilepticus (W.H.O., 1957) seems established, and evidence from E.C.T. (artificially induced convulsions) endorses this view (Henderson and Gillespie, 1956; Bridge, 1949; Mayer-Gross *et al.*, 1954; Penfield, 1933).

Mayer-Gross *et al.* (1954) specifically suggest that "pathological factors not infrequently enter the picture (of delinquency) particularly as some form of brain damage". They add, however, that "the change produced will depend on the original constitutional make-up as well as on the site of the lesion. We are yet far from a cerebral localization of the psychopathic symptoms".

Hodskins and Yakolev (1930, 1931) who have published case-histories and photographs of deteriorated epileptics, mention that "when mental deterioration does occur, it is often associated with evidence of widespread progressive cerebral atrophy". That deterioration is a phenomenon frequently found in epileptics is confirmed both by experience in special schools for epileptics and by authors such as Hodskins and Yakolev (*supra*). Minkowska (1937) and Mayer-Gross *et al.* (1954) who postulate "in many cases a typical schizophrenic end-result". Herd (1930) says that "the deteriorating epileptic is probably one of the most difficult of difficult children, with the possible exception of the encephalitic", but also points out that "the child who has petit mal only seems almost as liable to mental deterioration as one who has severe attacks of major type . . . partly on the side of intelligence . . . but perhaps more marked on the temperamental side".

(c) *Environmental conditions*

In view of the above evidence it has been suggested that an explanation of this question should be sought at secondhand—in the nature of a reaction to some environmental factor, past or present.

Firstly, of course, there is the actual basic reaction to "being an epileptic", and this may perhaps be included in the more comprehensive term of "being handicapped" (Jones, 1953). (In point of fact, epilepsy in the special school is rarely the only and often the least obtrusive of all the handicaps suffered by a given child—some, for instance, may be at the same time epileptic, spastic, maladjusted, mentally retarded and seriously speech-defective.)

Putnam and Merritt (1941) draw attention to the "manifestly heavy psychological burden" of living under the constant threat of convulsions, a factor also noticed by Bridge (1949), who says: "The most serious handicap to a happy and satisfactory living that most epileptic children have to face is not the seizures but the failure to adapt themselves psychologically to their disease and to its accompanying circumstances." Secondly the "comparative isolation and the seeming unfairness of their situation produces a characteristic anti-social disgruntled attitude" (Gunzburg, 1958). Goldfarb (1943) has compared groups of institutionalized and non-institutionalized children and decides that "it is the lack of individual affection, attention and intellectual stimulation, so often a concomitant of large institutions, which may make for poor mental development" (Clarke and Clarke, 1958), but O'Connor (1956) gives a summary of researches to show that "the mere fact of institutional care itself may not have deleterious effects".

Briefly we may divide the environmental effects into three categories:

(*a*) Reaction to institutional conditions and routine;

(*b*) Reaction to treatment by staff; and

(*c*) Reaction to treatment by, and social contact with contemporaries.

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Of these there can be, and are, wide variations in the first two, whilst the third is to a large degree affected by them.

The material aspects of institutional life are very important in meeting troubles before they arise. The standard of comfort and of amenities in the Home may be a very vital factor in determining the ease of settling down of a new entrant, especially one from a good home. Material provision must be made for the child's welfare in the often depersonalized state of the immediate post-ictal period of a major fit. Security, too, calls for routine—fixed enough to stabilize, flexible enough to avoid exacerbation of temperamental disorders. Even apparently unrelated details such as times of meals and intervals between them may influence behaviour in unstable children, since, for example, children become irritable more readily when hungry (Jersild 1957; Gates, 1926; Young, 1937).

But it is in the child's reaction to personalities rather than to material environment that we may seek more revealing evidence.

"Most of the psychological difficulties, adjustment problems and maladjustment exhibited by many epileptics, children and adults, are probably produced less by the ravages of the disease itself . . . than by the derogatory attitudes of parents, siblings, playmates, neighbours and the ill-advised and misdirected treatment or maltreatment to which many epileptics may be subjected by their associates and caretakers because of lack of understanding or prejudice" (Wallin, 1949).

Nor, in passing, is this a situation peculiar to epileptics. Burt (1925) says: "Children, from their position of physical and social inferiority, are peculiarly liable to have their childish whims frustrated. Hour after hour, by the adults around them and by the hard world of fact, their hopes are disappointed, their activities disturbed, their natural wishes defeated or baulked. Hence, since childish behaviour lies so largely upon the instinctive plane, this constant thwarting cannot fail to stir up the spirit of strife in those who possess it, and the wrath of the more irascible is inflamed almost daily." If this can be written about the "normal" child, how much more must it apply to the handicapped, and especially the institutionalized child.

There is also the possible factor of deprivation or maltreatment at an earlier age. The W.H.O. Report (1957) states that "clear correlations are found between the severity of the behaviour disorders and environmental factors such as broken homes, inconsistent discipline and neurotic parents" (Pond, 1952; Strotzka, 1954; Bridge, 1949). The same Report considers that "so striking are the associations between severe temporal lobe disorders and disturbed family background that one is tempted to postulate a genetic or familial factor to account for it". Kanner (1948) found the families of two-thirds of his tantrum children were unrestrained in expressing their feelings, inferring this as a causative factor, and Mayer-Gross *et al.* (1954) in considering that "a persistent difficulty or frustration in the life of the child may also be responsible", suggest that in such cases "worthwhile results will only be obtained by a comprehensive treatment of the whole family situation psychologically or socially".

It should not, however, be considered that the effects of early deprivation are necessarily of a permanent nature. Tizard, in Clarke and Clarke (1958) discusses this matter very fully, pointing out that although Harlow (1949), Hebb (1949) and many others have suggested from their experiments that early restriction of environment means a poorer subsequent performance in animals, and although a number of writers (Spitz, 1945; Goldfarb, 1945,

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1947; Bowlby, 1951; Bowlby *et al.*, 1956; Lorenz, 1952; Tinbergen, 1951) have put forward a somewhat similar hypothesis apropos of child development, yet others have contested the necessarily permanent nature of the effect and have also questioned the validity of drawing an analogy between animals and children.

Clarke, Clarke and Reiman (1958) have studied backward children whose retardation appears to be partly due to early deprivation and have found them often to have made surprising accelerations in adolescence or early adult life which have enabled them to achieve a performance quite at variance with their apparent potential at the outset, and a well-known protagonist of the maternal deprivation hypothesis (Bowlby, 1951) has recently adopted a somewhat modified version of his own previous views (Bowlby *et al.*, 1956).

(d) *Exacerbation of irritability*

It may be of interest to study the possibility of a lowered ceiling of frustration-tolerance in the epileptic with the consequence of greatly increased irritability.

Masserman (1943) was able to produce rage in cats by electrical stimulation of the hypothalamic region, and found that this response was greatly increased by doses of metrazol or picrotoxin, which act by lowering the epileptic threshold. It may be of therapeutic interest to note his contention that a contrary effect was found with hypnotic drugs.

Mayer-Gross *et al.* (1954) point out that the higher centres in the cortex which normally inhibit emotions of rage may have their function impaired by structural damage, for example by toxins or by physiological changes such as hypoglycaemia or cerebral anoxaemia. They mention also the fact that brain trauma has clinically been found a "very common antecedent to a change of personality towards increased irritability".

Tylor Fox (1950) quotes Fuchs (1947) as turning the problem round and judging the fit to be "a symptom of a deep-seated conflict in which the child has been able to discharge his embittered feelings and emotional strain". If this view be true, it throws a great deal of light on the "volcanic" outbursts so common with epileptic children in which some minor irritant stimulus seems to trigger off a violent temper tantrum directly or through a chain reaction of increasingly explosive events and which have given rise to considerable discussion as to whether these warrant the term "subclinical fits". The progress of these outbursts takes on a psychological rather than a physiological form and bears little relationship outwardly to an actual seizure, though the ictal symptoms of onset and working to a climax, and the post-ictal symptoms of sudden depletion, exhaustion and slow recovery to normal if not euphoric state, are somewhat analogous.

(e) *Exacerbation of normal anxiety states*

One other aspect remains to be considered—the possibility that at least a component of the behaviour disorders seen may be an exacerbation of "normal" anxiety states which are often present to a mild degree in some children and in an exaggerated form in others, especially at adolescence (Burt, 1925).

That these anxiety states do arise in children is well authenticated in the literature (Schwab and Veeder, 1929; Ziehen, 1926; Bridge, 1949 and others), despite the cynical doubts of quite a few members of the teaching

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profession. Schwab and Veeder (1929) say: "Sometimes the adolescent, instead of making an escape and then an adjustment through devices well within the normal . . . makes them through the devious pathways of a frankly abnormal state." If the child is escaping from some psychological effect of his epilepsy, then we have an example of the dual psychopathology to which Gibbs and Stamps (1958) refer, and even if one part of this is eliminated by anti-convulsant medicine, the other—the defence reaction—may persist as a behaviour problem.

5. *Diagnosis*

To diagnose the teleological causality behind much of the epileptic child's behaviour disorder is an essential and yet a particularly difficult thing to do Cattell (1946).

The means at our disposal for diagnosing these causes group themselves into:

(*a*) Introspective and intuitive comment from the child;

(*b*) Inferences which one can draw from the child's comments in the light of psychiatric experience;

(*c*) Information from psychological tests;

(*d*) Clinical evidence, past or present, of brain damage;

(*e*) Evidence from the EEG.

Much could be written about these sources, especially in regard to specialized techniques necessary in order to obtain a full and an accurate impression, but the following brief comments may indicate the field in each case.

(a) *Introspective or intuitive comment from the child*

"Children very rarely complain in words about their health or happiness", says Stafford-Clark (1952), "in fact they tell us that there is something wrong by what they do rather than by what they say, and very often their behaviour is not under their control." It is to discover the inner feelings which the child is unable to put into words that diagnostic techniques must be directed, since as Stafford-Clark continues: "It is neither reasonable, just, nor incidentally of the slightest use, to punish him for disturbances which are symptoms of illness and which he himself may not be able to control at all."

(b) *Inferences which we may draw from the child's comments or behaviour in the light of psychiatric experience*

Although the child may be unable to give much direct information bearing upon his problems, a skilled psychiatrist or an experienced layman may be able to paint quite a lot of detail into the picture after listening to the child's views and opinions. Sometimes the best approach may be by question and answer, sometimes by a technique almost resembling that of the analyst's couch, sometimes by a mixture of insight, cunning and sixth sense! Quite a lot of light, for example, may be thrown on conditions both in the institution and in the child's mind by a quiet, friendly chat with returned absconders instead of punitive action (Fraser, 1951). Absconding is essentially a diagnostic factor (Allen, 1949), and Burt (1925) emphasises that "in every case, and most of all in the most hardened, a full study must be

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made" by a team including social, medical and psychological workers. The child must have some reason sufficient to itself for absconding, or alternatively its mind must be in a state which leaves it no control over its actions. In the latter case we should apply therapy rather than blame, and in the former, investigation into the apparent cause for absconding may help considerably in straightening out the personal problems of the child on which are based his behaviour disorders, and incidentally may surprise the enquiring adult. The clinician will obviously not accept the first nor the simplest explanation. An admitted fear of the teacher and the school, for example, might in fact point to an unresolved earlier disturbance of the parent-child relationship Klein (1945). Familial factors have often been found to contribute extensively to truancy. (Stengel, 1943).

(c) *Information from psychological tests*

The possibility of obtaining diagnostic information from various psychological tests has been mooted by a number of authors. Gann (1945) for example, claimed that backward readers compare with normal and fluent readers in being "emotionally less well-adjusted and less stable . . . insecure and fearful in relation to emotionally challenging situations and socially less adaptable to the group". Jones (1953) gives a comprehensive summary of many psychological tests given to epileptics, and recently Clarke and Clarke (1958) have evaluated the findings of investigations into the social significance of results in personality tests with a performance or verbal bias respectively. They find that "subjects with either no bias at all or a performance bias, have generally a better social prognosis" (Earl, 1940), have "high behaviour efficiency and inherent stability" (Bijou, 1942a, 1942b, 1944; Bijou and McCandless, 1944) and are "likely to get along in the academic work of the institution school" (Abel, 1945), whereas "verbal bias in mental defectives has generally been considered as indicating poor prognosis and has often been found in behaviour problems" (Hamlin, 1938). They point out that yet other investigators were unable to differentiate between adjusted and maladjusted cases on the basis of subtest patterning (Brill, 1936; Sloan and Cutts, 1945a, 1945b).

A good deal of this work has been done with cerebral palsied children (Cruickshank and Bice, 1955) but it would appear strangely enough, that studies of C.P. children do not contribute very considerably to our knowledge of maladjustment (Clarke and Clarke, 1958).

Clarke and Clarke (1958) also find that "the good Kohs performer tends to show some personal stability and social adjustment (Sarason and Potter, 1947; Wile and Davis, 1930; Gunzburg, 1956), whilst poor performance in the Block Design may be due to maladjustment, brain injury, confusion of visual organization, etc. (Goldstein and Scheerer, 1941; Wile and Davis, 1936; Shapiro, 1951a, 1954). It may be that very large and striking discrepancies between the Kohs performance and the efficiency on other tests are indicative of disordered cerebral functioning, whilst a less dramatic lowering of Kohs performance may suggest emotional disturbance (Wile and Davis, 1930; Earl, 1937, 1940)".

Another test which has been reported to illuminate the problem is the Goodenough "Draw-a-man" test (Goodenough, 1926). Hinrichs (1935) considered that the drawings were "affected by factors like maturity, environment and pathological conditions ranging from psychopathy to organic damage", but Popplestone (1954) considers that "the stimulating, intriguing and

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challenging hypothesis of these authors (Machover, 1949; Buck, 1948 and others) has so far seldom been supported by evidence of an objective kind". Gunzburg (1955a) seems to have found an explanation in suggesting that the "rule" (*supra*) does not apply to the "subcultural" defectives (the tail-end of the normal frequency distribution) but only to the "pathological" category ("symptomatic" defectives, see Lewis, 1929). It does apply, he maintains, "to defectives whose efficiency is affected by emotional disturbances, to defectives with superimposed psychoses and to those with organic involvement". This opinion would seem relevant to our enquiries, as Gunzburg compared two groups, one of them composed of cases diagnosed as epileptics, neurotics, organics and psychotics.

There are, of course, two aspects of the Goodenough test: on the one hand the straightforward application of the test to determine mental age by the comparison of the child's score with developmental norms (Goodenough, 1926) and on the other the implications of "projective" drawings and the inferences to be drawn from factors other than those originally listed in the Goodenough marking scale (Machover, 1949; Gunzburg, 1952). This is a point made by Brill (1937) who remarks that the Goodenough test as a quick determinant of I.Q. "can only be used in cases where factors like cerebral injuries, psychosis or neurosis can be ruled out". Clarke and Clarke (1958) give a number of other authors who have investigated this test relative to maladjusted children (Springer, 1941; Gunzburg, 1950a, 1955; Earl, 1933 and others).

Symonds (1949) discusses the projections of adolescents in connection with a series of pictures which he had specially prepared, and this study throws up some interesting properties of personality diagnosis which might be of use in the investigation of behaviour problems. Further work on projective techniques has also been done by Frank (1939), Abt and Bellak (1951) and Anderson and Anderson (1951).

(d) *Diagnosis and the Electroencephalogram*

Takerta and Katz (1951) state bluntly that "there is no apparent relation between the EEG and specific types of behaviour. . . . Neither is there any relation between EEG and specific emotional traits . . . as reflected in the Rorschach tests".

Halstead (1957), though finding "no significant correlations with the EEG" in an investigation of school-children, leans somewhat the other way in admitting that he found "trends" towards an association between grossly abnormal EEG and bad behaviour, and Hawkes and Roark (1951), whilst supporting the specific denial of a direct correlation between EEG pattern and behaviour disorder type, nevertheless found that 90 per cent. of these cases had abnormal EEGs—so suggesting actual cerebral disturbance as a basis for the behaviour disorder.

The tendency of recent writers, however, is to commit themselves to a greater or less degree to the view that there *is* correlation of some kind between EEG pattern and behaviour disorder, or that some correlation will emerge when sufficient results are subjected to systematic analysis.

Schwab (1939) showed an association of abnormal EEG patterns typical of petit mal and psychomotor epilepsy with an increased reaction time and periods of dullness. Cobb, Martin and Pampiglione (1952) forecast a "limited return to the concept of EEG-pattern-representation of cerebral disease" as a result of their work on the recognition of typical waveforms in

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lipidosis and subacute encephalitis. Williams (1941) goes further in stating that in the absence of a gross lesion an abnormal EEG suggests some constitutional deficiency which may possibly manifest in some form of behaviour disorder. It may be of interest too, that during the war Harty, Gibbs and Gibbs (1945) found that one-half of the recruits rejected for the U.S. Army on account of psychiatric disorders showed EEG abnormalities —nearly twice as many per cent. as for those accepted (Heppenstall, Hill and Slater, 1945).

Hill (in Hill and Parr, 1952) states that the "first report of the EEG in behaviour disorders of children was made by Jasper, Solomon and Bradley (1938). Their finding of an excess of 3–6 c/s rhythm was supported by Secunda and Finley (1942), Solomon, Brown and Deutscher (1944) and Gottlieb, Knott and Ashby (1945). Studies aimed at special problems of delinquency in childhood were made by Brill, Seidemann, Montague and Baker (1942), Brown and Solomon (1942), and Jenkins and Pacella (1943)".

More recently Kennard *et al.* (1954) reported "significant differences as shown by the frequency analyser between the EEG records of these . . . individuals, which can be separated according to different psychological criteria . . . and a strong correlation between such factors as anxiety, aggression or passivity, and specific EEG types".

Gibbs and Stamps (1958) confirm this finding and especially that EEGs showing anterior lobe, temporal lobe and psychomotor epilepsy and 14 and 16 c/s frequencies of thalamic and hypothalamic origin correlate with problem behaviour.

A possible explanation of the reason for much of the correlation found is that whilst "in the early days the finding of an excess of slow activity in the EEG of problem children was taken to substantiate the concept of the 'epileptic psychopath', it is now realized that most of this slow activity is related to a disorder in maturation rather than to epilepsy" (W.H.O., 1957).

Lindsley in 1939, having made a longitudinal study of 120 epileptic children, doubted that there was any good correlation between EEG pattern and personality, but in 1940 he quoted a higher percentage of beta and theta waves in problem children than was considered normal, together with increased abnormal activity induced by hyperventilation (Lindsley, 1940). Bellinson and Cowie (1947) found a greater incidence of slow waves in institutional epileptics than in extra-mural types, which Wallin (1949) considers to agree with Lindsley's findings because "personality disorder was the real reason for commitment, rather than the actual seizures". Study of the literature, as well as experience in special schools for epileptics (which are frequently found to include a large proportion of maladjusted children) warns one to investigate carefully the significance of any correlations based on a survey of institutionalized groups.

The view is now more widely accepted that the "EEGs of a group of very bad children display more immaturities than do those of a group of good children" (Walter in Hill and Parr, 1952). "The type of bad behaviour most frequently associated with a relatively immature EEG", says the same author, "is bad temper, violence and uncontrollability, (and) the main feature of the records in such cases is usually a particularly large and persistent theta rhythm."

This "concept of maturation" is also referred to by Mayer-Gross *et al.* (1954), who think it probable that EEG maturation and psychic maturation proceed step by step, but the records obtained from children seem to be

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much more complex and variable than was at first realized (Walter, *supra*). Walter and Dovey (1946), for instance, suggest as a result of their experiments in introducing needle electrodes deep into the white matter of the brain in cases of brain tumour, that possibly theta rhythms in many cases may be "indicative of synchronized activity at several depths".

It would certainly seem fruitful, however, to enquire further into the nature of the theta rhythm seen so frequently in problem children.

Walter (*supra*) points out that theta rhythms typically are responsive to external stimuli, and Travis and Johnson (1957), from experiments with two groups of 33 young deaf children and 33 non-deaf controls specifically concluded that "the theta rhythm is a valid measure of frustration-tolerance in young children". As yet there is still much to be done in the way of research in this field, but Walter suggests that since pathological theta rhythms may be a sign of relative immaturity, there is a possibility that moderate damage to an area giving rise to theta rhythms may establish what might be termed a "theta fixation". This theory arouses speculation as to whether the theta rhythms are *indicative* of behaviour disturbance or whether the "theta focus" is *causative*.

6. *Treatment*

(a) *Medication and/or surgery*

In spite of great advances in the past couple of decades, the treatment of epileptic children with psychosis or behaviour disorders by medication or by surgery is at present still a controversial subject (W.H.O., 1957). Apart from the extreme resort of leucotomy, a number of cases have been described Falconer *et al.*, 1953; Pond and Bidwell, 1954), in which the excision of temporal foci appears to have brought relief, but time is yet young for a completely valid follow-up report.

Medication, although the largest school for epileptic children reports 47 per cent. discharged with fits controlled (C.S.U. Annual, 1958), is still largely empirical. Certain basic factors have been accepted, but still the main thing is the experimental individual adjustment of prescription and dosage, especially as regards idiosyncrasy of side-effects. New proprietary products are being offered with increasing rapidity, especially in America, and a new field is being gradually opened up in behaviour problem research by the acceptance of tranquillizers as a valid prescription for children (Gibbs and Stamps, 1958). These last workers deplore the "inadequate treatment of epilepsy by amateur and professional psychiatrists, with major emphasis on psychotherapy and little attention to medication". They stress the fact, however, that "when personality disturbances or psychosis are a major complication, the patient should be treated with whatever therapy is recommended by an informed psychiatrist". They also point out that although it is probable that hyperkinetic patients showing residual non-ictal behaviour disturbance will respond to tranquillizers (meprobamate, reserpine, chlorpromazine) together with the appropriate anti-convulsant drugs, it may be that control of the seizures will result in *increased* behaviour disorder. Phenurone, for example, although it may prove effective in controlling seizures in 50 per cent. of patients hitherto resistant to anti-convulsant drugs, seems particularly prone to exacerbate psychiatric disturbances in psychomotor patients (Gibbs, Everett and Richard, 1949). It should be clear that Phenurone merely intensifies an existent disorder and is unlikely to cause any new symptoms.

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The apparent reluctance with which any drugs other than anti-convulsants are accepted in the literature for use with children appears to be merely traditional. Stafford-Clark (1952) says "in the management of (disturbed or sick children) the part played by drugs is small (and) . . . limited to specific anti-convulsant and anti-epileptic drugs for epilepsy in any form and the adminstration of Benzedrine compounds in the treatment of excessively aggressive, destructive or over-active children". Bradley (1937) too, mentions amphetamine—usually regarded as an excitant—as having a calming effect on the hyperkinetic child and "improving his behaviour and adaptation", as do Lindsley and Henry (1942) and Hill (1952).

Very recently, claims has been made for a new type of psychotherapeutic compound, Librium (methaminodiazepoxide), which is "not a manipulated phenothiazine, nor a meprobamate derivative nor an amine oxidase inhibitor" but which nevertheless acts as a tranquillizer, anti-depressant and anti-convulsant (Symposium: *Dis. nerv. Syst.*, 1960). This drug, it is claimed, provokes few side-reactions (Farb, 1960), is essentially "safe" with children and adults (Bowes, 1960), as well as being remarkably rapid in action (Constant, 1960).

Interesting in relation to behaviour (especially as it has also been claimed to have anti-convulsant properties (Kaim and Rosenstein, 1960) is its reported calming effect on induced rage in rats and monkeys (Randall *et al.* 1960) and on "classical psychopathic personalities with life-long histories of anti-social behaviour" in an American penitentiary (Kinross-Wright, 1960) where 16 out of 19 patients showed improvement after previous barbiturates, phenothiazines and other tranquillizers had failed to help.

Tetrabenazine is another compound which is being experimentally used in America (Heise, 1960) and in Germany (Stockhausen, 1960) for similar purposes. At any rate the appearance of these drugs in the field of behaviour research would seem to implement the succinct comment of Mayer-Gross *et al.* (1954) that "the field of pharmacological psychiatry in the child deserves closer study."

(b) *Staff*

In accepting the view that behaviour disorders of epileptic children spring to some extent from their reaction to environment and treatment, we have a field in which the trained layman can (and should be encouraged to) work side by side with the doctor and the psychologist. Pearson (1951), for instance, "would like to draw the reader's attention to the valuable observations that adequately trained teachers can make on children. Such teachers can be of great assistance in understanding the child's problem and in the treatment of the child." There is, however, a considerable dearth of such trained staff, and apparently also of aspirants of either sex having the basic personality characteristics and attitudes for undertaking the exacting task of living with and teaching these children.

A great deal of this shortage has an economic basis, but a great deal also is due to lack of provision of specialized training. To take only one example, Jersild (1957) maintains that "the concept of anxiety should be regarded as an essential topic in all teacher training" (Jersild, 1955, 1958; Jersild and Helfant, 1953), yet how many teachers, let alone attendants (who are required to produce less evidence of qualification for their jobs) have had any guidance in dealing with this major factor in the lives of their charges, or in many cases any conception of the extent to which it exists?

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Human nature being what it is, perhaps the greatest danger of failure in the adult/child relationship has been described by Dennis (1956) as a "situation where the staff is more concerned in overcoming and suppressing symptomatic reactions of the patients, than in assisting their emotional development, with the many accompanying disappointing failures" (Clarke and Clarke, 1958).

It is perhaps a truism to say, with Zanker (1960) that "a very important factor in the correct handling of children with physical handicaps in an institution such as a residential school, is, of course, the personality of the tutor, teacher, housemother, dealing with such children". We may, however, well go further with him and stress that "it cannot be sufficiently emphasized that only through frank self-analysis, insight into his own emotional difficulties, his own ambitions, projections, rationalizations and similar psychological mechanisms, often unconscious or not admitted, can the very responsible task entrusted to the individual staff member be made easier and more successful" (Stubblebine and Roadruck, 1956). Pursuing the ideal still further, Zanker even thinks "it might be an advantage for the *parents* to be instructed regarding the spastic child's temperamental characteristics, so that parents from the beginning can make the necessary allowances for the greater difficulties in gaining the child's affection." The present author suggests that for "spastic" we might equally well read "epileptic".

(c) *Planning the treatment*

Assuming, however, that adequate staff (quantitatively and qualitatively) are forthcoming for any given institution, there still remains the need for devising an overall scheme and curriculum. A programme or a curriculum copied from or borrowed from some other institution or from a school of normal pattern will not necessarily fit the needs of a particular special school.

Gunzburg (in Clarke and Clarke, 1958), discusses the position of mental defectives in institutions, commenting on the scantiness of published work, which suggests that "very little thought and attention have been devoted to (remedial education for) mental defectives in institutions, no surveys have taken place, very few techniques have been developed, and not many results have been reported".

Society's attitude to the epileptic child is altering (W.H.O., 1957) in a direction away from segregation and the setting up of special colonies and hospitals which was in general the only provision a short time ago. Obviously there are many considerations to be taken into account before deciding that an epileptic child should live in the normal community. "It is the epileptic with the behaviour disorder who forms the most difficult school problem" (W.H.O., *supra*). An attempt has been made to treat such cases at the in-patient Child Guidance Clinic at the Maudsley Hospital, where it is hoped that usually a stay of a few weeks or months will enable the child once more to try to fit into a "normal" (even if E.S.N.) school.

Amongst epileptic defectives there are a number of children who, although by no means ineducable, would be quite out of place in any school, even one for very retarded E.S.Ns. The difference is not merely of academic level, nor of detailed teaching technique as much as of the whole conception—the whole philosophy—of the scheme. "The better the plan of instruction fulfils its purpose of making the feeble-minded a useful member of society", say Mayer-Gross *et al.* (1954), "the further will it be removed from the academic pattern of an ordinary school."

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Both Gunzburg and O'Connor, writing in Clarke and Clarke (1958) give examples of the same outlook, the former stressing social training as a major factor (Wallin, 1924; Kirk and Johnson, 1951) and the latter considering that in institutional education "many factors relevant to learning such as . . . memory, curiosity, capacity for imitation, optimum conditions for exploration, trial and error learning, imaginative play and so on, have scarcely been explored" (Maier, 1949).

That this programme, even though unique in its adaptation to the needs of the particular child, must nevertheless paradoxically be made to approximate as nearly as possible to the community at large (for example, in being co-educational) is the view of Harris and Kinney (1947). In view of this paradox one may wonder with Hartwell (1940) whether after all the form of approach is of importance, since "all relationships are potentially therapeutic". It would seem that the Director of such a programme must be pre-required to be something of a genius! Yet even though such an ideal programme were in fact formulated and such a Director found, its application, which is the crucial thing, must be delegated to each and every member of the teaching and fostering staffs (Cotzin, 1948).

(d) *Discipline*

Since the "keynote of modern educational thought is individuality" (Burt, 1925), "the delinquent himself must be approached individually as a unique human being with a peculiar constitution, peculiar difficulties and peculiar problems of his own. . . . The aim must be, not punishment but treatment, and the target not isolated actions but their causes . . . (which assumes for their diagnosis a team comprising) . . . social investigator, . . . medical officer, . . . and psychologist. . . .".

Dunbar (1959) puts the problem of discipline in a nutshell when he says that "by the time a badly handicapped child has reached school age, he or she has established a totally different behaviour pattern from the majority of children in order to attain the same ends . . .", which brings us to one of the greatest, if not the greatest of difficulties encountered in a special school: that to which Stafford-Clark (1952) refers as the necessity of determining "the difference between naughtiness on the one hand and behaviour disorder, which is a medical problem, on the other". No one would suggest that a child should be allowed to "get away with it", but it is equally necessary to be quite sure that he is in fact trying to get away with it, before undertaking repressive or punitive measures, especially those involving physical coercion or corporal punishment. Strangely enough, in the problem of the unrestrainedly aggressive problem child, the answer may come with dramatic suddenness in response to the lifting, rather than increased imposition of restraint (Burt, 1925). Such treatment, however, with other apparently similarly affected children might result in chaos. Again we come back to the underlying principle that discipline with the maladjusted child lies in knowing the individual child inside out—a difficult enough task and one which essentially presupposes that the teacher "likes children". Further than this we can postulate that he or she must not only like children but like those who are most difficult to like: "Try to love the unlovable child—he needs it most" (Servante, 1927).

A final point might be made about epileptic children, who are more often than not retarded by various causes associated with their complaint so

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that not only their academic work but also their general level of maturity is far behind normal. Earl (1936) has commented on the imbecile's emotional infantility. "He craves for caresses and protection like an infant. Judicious petting is the most potent stimulus to success in a task or in behaviour." In much the same way it can be agreed that epileptics will be helped by the individual interest and sympathy of those responsible for them.

(e) *Psychotherapy*

To what extent psychotherapy is effective in the treatment of epileptic behaviour problems is a question on which further research is needed (Gottschalk, 1953). Unfortunately conditions do not seem to permit of this being undertaken at many of the residential schools for epileptics from which one might have expected considerable guidance towards the best treatment of the maladjusted child in these institutions. The W.H.O. Report (1957) considers that "the place of psychotherapy of the individual child for the epileptic attacks *per se* is very limited" (which accords with Gibbs and Stamps, 1958), "but the broad approach to the child's problems along child guidance lines is of the greatest value". As Morgan (1950) points out, "many patients, particularly the younger ones, exhibit considerable emotional hunger", and if this is not satisfied by the provision of some positive attachment such as occurs in individual or group therapy, progress is bound to be limited or nil. Slavson (1950) has experimented with group therapy for children with behaviour problems, stressing the need for an environment in which the child can find at first an outlet for his aggression and anti-social behaviour without losing the affection and acceptance of the therapist. Then gradually the child can be brought to an understanding of the need for control and be helped to achieve it (Slavson, 1950, Stürup, 1952). The essential conditions for some degree of success in psychological treatment are summarized by Mayer-Gross *et al.* (1954) when they call for "a relationship with the patient that is based on a respect for his personality, a tolerance of his deficiencies and a sympathy and understanding of his predicament. . . . Disapproval of a patient's conduct is sometimes necessary, but criticizing him as a person, or treatment by moral exhortation is futile and can be disastrous. They agree with many other writers that "it is the most probable conclusion that any success that can be attributed to psychotherapy . . . is due to the personality of the therapist". The present author would suggest, in conclusion, that the personality of each and every teacher, houseparent, attendant, doctor or psychiatric worker is of more importance to the eventual well-being of the epileptic child than many a "scheme of training" or "educational curriculum". But to provide these workers with insight into the problems of behaviour which they have to face, more and yet more observation and research is crying out to be done amongst the maladjusted of all types and especially of epileptic tendencies.

SUMMARY

1. The general tendency in the literature is to admit that whilst certain classes epileptics, including institutional patients, temporal lobe cases and patients showing progressive deterioration—show strong evidence of extreme personality disturbance, there is little to show that this "typical" behaviour is in fact due to any "epileptoid personality".

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2. The main anti-social characteristics which so many epileptics exhibit, for whatever reason, are irritability, temper and aggressiveness, together with a moodiness and emotional changeability.

3. It appears established that anti-convulsant medication has no primary effect on the personality, but control of seizures by this means may reveal psychopathic tendencies hitherto less obtrusive.

4. Structural cerebral damage may have some part to play in behaviour disorders, but beyond the fact that epilepsy due to temporal lobe foci is largely productive of problem behaviour, we cannot yet localize psychopathic symptoms in the brain.

5. A great deal of the disturbance previously thought to be due to epilepsy *per se*, is now considered a reaction to conditions imposed on the child by reason of its handicap, either as frustration of natural desires or of intolerance of institutional standards, routine or unenlightened treatment.

6. Deprivation or maltreatment in early childhood may account for some present disorders, but it is now questioned whether this has necessarily a permanent effect, and often prognosis is relatively better for such children following removal of the deprivation than for controls.

7. At least a component of the behaviour disorders seen may be an exacerbation of normal anxiety states which appear to a greater or less extent in normal children.

8. The part which personality tests can play in the diagnosis of behaviour disorders is not fully established, but investigations to date offer hope in this direction. The same comment would seem to apply to EEG findings. More conclusive research is needed and proceeding in both fields.

9. In spite of great advances in recent years, the treatment of epileptic children with psychoses or behaviour disorders by medication or by surgery is at present still a controversial subject. Although anti-convulsant medication is proving increasingly effective, the field of pharmacological psychiatry in the child deserves closer study.

10. It is probable that behaviour disorders of epileptic children spring very largely from their reaction to environment and handling. In addition to adequate and suitably trained staff, a carefully planned scheme of treatment (both anti-convulsant and psychotherapeutic) needs to be considered.

11. The contemporary attitude is that the treatment and education of the epileptic child shall, wherever possible, be within the framework of the normal community.

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