

CHAPTER 16

The Association Between Enuresis and Emotional Disorder: a Review of the Literature

D. SHAFFER

Introduction

Early beliefs that persistent bedwetting was a sign of psychiatric disturbance (Anderson 1930, (Gerard 1939) have been followed by more recent suggestions that enuresis is primarily a maturational or learning abnormality, unrelated to psychiatric disorder except in so far as the symptom may itself give rise to some reactive distress (Lovibond 1964).

However, the relationship is probably more complex. Werry (1967) has undertaken a limited review of the subject, in which he analyses several early studies which have frequently been cited as evidence supporting the view that enuresis is a psychogenic entity. It is the intention of this paper to review the literature more fully, and in particular to investigate the following points.

- (a) If there is an association between bedwetting and emotional disorder,
 - (i) how strong is it;
 - (ii) does it hold for any special class of enuretic; and
 - (iii) is the associated emotional disorder in any way specific?
- (b) Is any association
 - (i) psychogenic (*i.e.* is the emotional disorder wholly or partially the cause of the enuresis);
 - (ii) reactive (*i.e.* is the enuresis the cause of the emotional disorder);
 - (iii) because enuresis and emotional disorder in childhood share common antecedents which result in a child's vulnerability independently; or
 - (iv) a coincidental occurrence of two common conditions?

Research Difficulties

Problems of Definition

Before describing an association between two conditions, it is important that the research worker should choose valid and reliable definitions of both. The definition of enuresis poses no problems (Lapouse and Monk 1959), but the same is by no means true of psychiatric disorder in childhood. MacFarlane *et al.* (1954), Glidewell *et al.* (1957) and others have shown that the presence of a single psychiatric symptom cannot be equated with significant emotional disorder. Psychiatric disorder in childhood is better defined in terms of the extent of disturbance in different areas of function, and the number, duration and severity of symptoms.

Measurement Techniques

The validity of any single measure of child psychiatric disturbance, whether it be the child psychiatric interview, teacher questionnaire, a symptom inventory completed by the parent, or a projective or other test, is less satisfactory than a combination of such measures (Mitchell and Shepherd 1966, Rutter and Graham 1966). Studies which rely on information from a single source need to be treated with caution, and assessments of emotional or behavioural changes after therapy are subject to their own form of bias (Rosenthal 1961, Orne 1962), especially when the assessment of change is also made by the therapist.

Sampling Procedures

Many studies which have examined the relationship between emotional disorder and bedwetting have drawn their populations from general practice or paediatric or psychiatric clinic populations. Hallgren (1957a) showed that enuretics referred to any sort of doctor—general practitioner, paediatrician, or child psychiatrist—were more likely to have an emotional disturbance than enuretics who had never seen a doctor. Findings of an association between enuresis and emotional disorder in a medically selected sample should not be generalised to the enuretic population as a whole.

Finally it goes without saying that, with conditions as common as enuresis and emotional disorder, information obtained from uncontrolled studies (Barbour *et al.* 1963, White 1968) must be treated warily.

Age and Sex Specificity

The bed-wetting population is not a stable or homogeneous one. It diminishes in size with increasing age, and it contains significantly fewer girls than it does boys (MacFarlane *et al.* 1954, Blomfield and Douglas 1956). We also know that parental expectations and discipline vary, not only with age, but also with the sex of the child (Sears *et al.* 1957). It is therefore probable that both aetiological and reactive factors will operate differentially at different ages on the different sexes. Ideally, we should look for studies which take both the age and sex of the enuretic child into account, before drawing conclusions about whether any suspected association is psychogenic or reactive.

IS THERE AN ASSOCIATION?

Evidence for an Association Between Emotional Disorder and Enuresis

Michaels and Goodman (1934) studied a group of children attending a summer recreation camp. The children were of widely differing ages, and sex was not taken into account in the analysis. A behaviour trait questionnaire was administered to all parents, and a significant association between enuresis after the age of three years and other abnormal behaviour traits was found. Werry (1967) subsequently analysed the material presented in this study, and reported that there was a significant association between enuresis and the presence of more than three abnormal behaviour traits.

Hallgren (1957b) administered a behaviour questionnaire to teachers and parents of a large group of seven-year-old enuretic school children of both sexes, and their matched controls. He found no association between enuresis and an adverse score on the questionnaire.

Cust (1958) studied teacher and parent behaviour reports on twenty enuretics of varying ages, drawn at random from enuretics in a circumscribed school population. Significantly more of the enuretics were said to be disturbed than matched controls.

Tapia *et al.* (1960) studied all the enuretic children in an eight- to nine-year-old school population. Using both teacher and parent questionnaires, they were unable to identify any significant differences in emotional adjustment, except amongst a small group of extremely disturbed children. They concluded that although enuresis is not usually a symptom of maladjustment, the possibility that in some cases it might form part of a severe behaviour disorder syndrome could not be excluded.

Lovibond (1964) identified a group of 85 enuretic boys aged between seven and nine years, through a method of incidental sampling. He compared them with matched controls on a number of measures, including parent and teacher questionnaires and self-administered inventories, and projective tests. Although he identified quantitative differences on these test measures, he found no enuretics with a severe psychiatric handicap.

Stein and Susser (1965) found a significantly higher incidence of enuresis amongst twelve-year-old male delinquents sentenced to Approved School training, than in an age-matched sample, living at home, with no history of delinquency.

Baker (1969) studied 30 enuretics aged between six and twelve years recruited by a press advertisement. Each subject was compared with two controls on a variety of behavioural measures, including direct classroom observations, parent-teacher inventories, and projective tests. No differences were found between the two groups.

Rutter *et al.* (1970b, and this volume Chapter 17), using a parental questionnaire, identified enuretics amongst the total population of five-, nine- and ten-year-olds on the Isle of Wight. They simultaneously identified children with psychiatric disorder in the same population, using a variety of measures, including questionnaires completed by parents, questionnaires completed by school teachers and direct interviews with parents and children. The same children were studied later when the five-year-olds were aged seven, and the nine/ten-year-olds were aged fourteen years.

A conservative method used to ascertain whether or not there was an association between enuresis and psychiatric disorder in this study was to examine the coincidence of enuresis with a deviant score on the teacher's questionnaire. This analysis largely avoided the 'halo' effect: bedwetters were, in general, not known to be enuretic by their teachers, and so were not more likely than non-enuretics to be reported as showing deviant behaviour. At all ages, emotional disturbance was more common in the enuretics than in the non-enuretics. The difference was particularly marked in girls. However, even in the age and sex groups where the association was most marked, only a minority of enuretics had deviant scores on the teacher's questionnaire, and only in the nine/ten year age group were more than one sixth of the enuretic boys deviant.

Summary. Evidence from controlled studies of age-identified enuretic children in unselected populations suggests that psychiatric disorder is commoner in enuretics than in non-enuretics. The association appears to be stronger in girls than in boys, and to hold at all ages; however, only a minority of enuretics show an emotional disturbance.

What is the Nature of the Psychiatric Disturbance in Enuretic Children?

Major Psychiatric Syndromes

Weigl (1938) reviewed the incidence of psychiatric syndromes in 250 enuretic children and young people referred to his psychiatric clinic, and compared the psychiatric diagnoses made in these cases with those made in 550 non-enuretics. He concluded that the enuretics presented no typical psychiatric syndrome, although evidence of 'anxiety' was commoner amongst them than amongst the non-enuretics.

Lickorish (1964) compared 100 consecutive cases of enuresis referred to an adolescent treatment centre with 100 non-enuretics referred to the same clinic, and found no significant association between enuresis and either neurotic or conduct disorder.

Werry and Cohrssen (1967) studied a group of 37 enuretics over a wide age range referred to a psychiatric clinic, and compared them on a variety of teacher, parent and patient test measures with their 34 non-enuretic siblings. They found that, although the majority of the enuretics had no psychiatric disturbance, behaviour abnormalities were significantly more common than amongst controls. However, no distinctive type of psychiatric abnormality could be identified.

Rutter *et al.* (1970b) found that enuresis was as frequent amongst ten- to eleven-year-old children diagnosed as having an anti-social disorder as amongst those with a neurotic or a mixed anti-social/neurotic disorder.

Summary. Studies have been carried out both on unselected enuretics and on enuretics referred to a psychiatric clinic. None of these studies have demonstrated any characteristic association between enuresis and a specific psychiatric syndrome.

Nail-biting and Other Behaviour Symptoms

Michaels and Goodman (1934) (see above) suggested that enuresis was especially likely to be associated with tics, temper tantrums, nail-biting and thumb-sucking, and that these traits were significantly more likely to be found together than alone or in association with other emotional disorders.

von Harnack (1953) studied the prevalence of a variety of behavioural symptoms in a large sample of German elementary school children aged between six and seven years. He reported an association between enuresis, tics and temper tantrums, but did not use statistical methods to test the significance of the association.

Hallgren (1957a) studied several hundred enuretic children, over a wide age range, referred to psychiatric and paediatric clinics in Stockholm. He compared them on a number of variables with their enuretic and non-enuretic siblings. In this study, although there was a significant relationship between nocturnal enuresis associated with day-time wetting and temper tantrums and nail-biting, the relation-

ship between wetting which only took place in bed and these behaviours was not significant. However, in another study (Hallgren 1957b, see page 120), on a sample of seven-year-old children not referred to a clinic but identified within the general school population, he could find no association between these behaviour disorders and enuresis.

Thaustein and Halevi (1962) found no association between enuresis and nail-biting, thumb-sucking, or temper tantrums, amongst a large population of five-year-old Israeli school entrants.

Oppel *et al.* (1968), in a longitudinal study of children of low and normal birth-weight, had found no association between enuresis and these symptoms by the time the sample had reached the age of twelve years. Rutter *et al.* (1970b) found no association between thumb-sucking and enuresis in a total population study of ten- and eleven-year-olds.

Summary. There is no consistent evidence of an association between bedwetting and thumb-sucking or other specified deviant behaviours. None of the studies carried out on older children drawn from the general population show such an association, and, as the studies which do report an association were carried out before the use of sophisticated statistical methods was at all commonplace, their significance is difficult to assess.

'Immature Behaviours'

Although many papers refer to an association between 'immature behaviour' and enuresis, 'immature behaviour' is rarely defined. An exception is Valenzuela (1959), who compared a sample of enuretic children referred to a Mental Hygiene clinic with non-enuretic children referred to the same clinic. He compared the incidence of the following 'immature behaviours' in the two groups: history of prolonged thumb-sucking, delayed weaning, delayed talking and delayed motor milestones, excessive dependence on mother, difficulties in peer relationships, and age-inappropriate behaviour on psychological testing.

This list, of course, comprises not only neuro-developmental delays, but also relationship disorders and aberrant rearing practices. It is difficult to see how any single measure summing such a heterogeneous group of behaviours can have any validity. However, Valenzuela did find that enuretic girls were significantly more likely to have a high score on such a list than non-enuretic controls, and the association was consistent amongst both negro and white enuretic girls, and amongst both groups of girls combined. There was no significant association between these 'immature behaviours' and enuresis amongst any group of boys.

Hallgren (1957a) also found a significant association between 'immature behaviour', speech delay and enuresis.

MacFarlane *et al.* (1954), in their longitudinal study of a group of children followed from the age of 21 months until they were 14 years old, found that children who were persistently enuretic were significantly slower to lose and acquire age-related behaviours than non-enuretic children.

Summary. The studies quoted are apparently consistent in reporting an association between enuresis and immaturity. However, behavioural 'immaturity' is difficult to define, and these apparently consistent studies may well have been measuring different behaviours.

Personality and Social Difficulties

Lovibond (1964), in the study described above, found that, although none of that group of enuretics was psychiatrically disturbed, they showed less outgoing behaviour both at home and at school, and had a significantly lower opinion of themselves (as measured on a projective test) than non-enuretic controls.

Stein and Susser (1965) compared appraisals made by psychologists and House Wardens on a group of 78 delinquent enuretic boys (mean age 12.8 years) in Classifying and Approved schools, and those made on a group of non-enuretic delinquent controls. The enuretics were found to be significantly less domineering and less interested in sex, and were significantly less likely to have been convicted of a breaking and entering offence.

McHale (1967) compared a group of male adolescent enuretics who had been referred to a psychiatric clinic with a group of non-clinic controls, on an inventory test. He found the enuretics to be significantly more acquiescent than the controls.

Umphress *et al.* (1970) compared a group of twelve adolescent enuretics who had been referred to an adolescent treatment clinic with non-enuretic referrals and normal school-children, with respect to their interactions with the other members of their families. He found that the enuretics had significantly more problems in the area of sibling relationship than the controls.

Summary. The studies described here have been performed on boys only. They have used projective tests of unproven validity and have been performed on selected populations. However, they are reasonably consistent in showing that boys who wet the bed are more acquiescent and less outgoing than non-enuretics.

Specificity of Wetting Patterns Amongst Enuretics with Psychiatric Disturbances

Hallgren (1957a) found that children who wet both during the day and during the night were more likely to have associated emotional disturbances than children who were wet only at night. However, he also found that the parents of day and night wetters were more likely to have been enuretic themselves, and that they also used more punishment than the parents of children who wet only at night. Rutter *et al.* (1970b) also found a non-significant tendency for emotional disturbance to be more common in children who wet both during the day and at night than in children with simple nocturnal enuresis.

Rutter *et al.* (this volume Chapter 17) found an inconsistent relationship between psychiatric disorder and the frequency of enuresis. However, except amongst fourteen-year-olds, the incidence of associated psychiatric disorder was higher in children who wet the bed at least once a week than in children who were only occasionally wet.

Summary. Both these studies report that emotional disorder is more common amongst children with combined diurnal and nocturnal enuresis. However, in both the actual number of children reported on was small. In view of the Isle of Wight findings that both associated diurnal incontinence and associated emotional disturbance were more common in girl enuretics, it is possible that the apparent strength of the association between daytime wetting and psychiatric disorder is in part due to a sex effect.

IS ENURESIS PSYCHOGENIC?

Psychodynamic Theories

Mowrer (1960) summarised some of the more commonly held theories on the psychopathology of enuresis as follows.

- (a) Enuresis represents substitute gratification of repressed genital sexuality.
- (b) It is a direct manifestation of deep-seated anxieties and fears.
- (c) It is a disguised form of hostility directed towards parents and parent substitutes, which the child cannot express openly.

Winnicott (1953) suggested that in some cases enuresis was a regressive symptom, which allowed for 'a persistent infantile relationship which has value in the economy of the child'.

Psychosomatic Theories

One theory is that enuresis is related to emotion through an ongoing effect of anxiety on bladder function, transmitted through the autonomic nervous system (Werry 1967).

Alternatively, anxiety or emotional stress may act at a 'critical period' in the child's development, thus interfering with the learning of complex patterns of behaviour (Yerkes-Dodson law, *i.e.* that although anxiety may assist learning, there is a level beyond which an increase in anxiety will reduce the capacity to learn.) Douglas (this volume Chapter 15) has presented most convincing evidence of this nature, and I will only briefly touch on it here.

Available Evidence

No studies have been designed specifically to test any of these hypotheses, and we shall have to be satisfied with gleaning incidental information from studies designed for other purposes.

Evidence in support of a psychogenic aetiology for enuresis in emotionally disturbed patients would be:

- (a) if emotional disturbance could be shown to antedate the onset of the enuresis;
- (b) if successful treatment of an emotional disorder, by a technique unlikely to have any direct effects on bladder function, resulted in a cure of enuresis;
- (c) if symptomatic treatment (*e.g.* bell-and-pad) were found to be less effective in maladjusted children than in children without an emotional disorder;

- (d) If symptom substitution could be shown to have occurred (*i.e.* if successful treatment of the enuresis were to result in adverse behavioural reactions).

Does Emotional Disturbance Antedate Enuresis?

The evidence here relates primarily to so-called 'onset' or secondary enuresis. Hallgren (1957a) found that 55 per cent of cases of secondary enuresis were precipitated by an event likely to have had an emotional effect on the child. Secondary enuretics also had more emotional symptoms than primary enuretics, although Hallgren noted that most of them had been described as 'nervous' even before the onset of their enuresis.

Paulett and Tuckman (1958) studied all cases of onset enuresis in their general practice. They found that the incidence of maternal pregnancies during the nine months before and after the onset of enuresis was significantly higher than would be expected from the age-matched population as a whole. They do not show how this calculation was made. They concluded that the events associated with the birth of a younger sibling played an important rôle in the precipitation of enuresis. However, Blomfield and Douglas (1956) had earlier found no excess of younger siblings amongst the enuretic children being studied in their very much larger longitudinal study.

Werry (1967), in his study of 58 cases of secondary enuresis, stated that the commonest antecedent appeared to be environmental changes likely to provoke a high level of anxiety. Rutter *et al.* (this volume Chapter 17) compared the incidence of behavioural deviance amongst five-year-olds who were dry at five and who were still dry at seven, with that amongst children who were dry at five but who had become enuretic by the age of seven (secondary enuretics). Amongst the five-year-olds who were to develop secondary enuresis, behavioural deviance was five times as common as it was in the five-year-old group which remained dry. This interesting finding supports Hallgren's retrospective impression that secondary enuretics had been 'nervous' before the development of the enuresis.

From these findings, one might expect that there would be more deviant secondary enuretics than primary enuretics. However, neither Rutter *et al.* (this volume Chapter 17) nor Novick (1966) have found this to be so. Novick compared groups of secondary and primary enuretics and found no difference in their 'level of adjustment', using a variety of different assessment techniques.

Summary. Several studies have shown that many cases of onset enuresis are precipitated by emotional stress, and that young children who go on to develop secondary enuresis tend to be more disturbed than children who do not. No study has set out to examine the efficiency and age of acquisition of sphincter control preceding the onset of secondary enuresis, and there are still no clues as to whether emotional stress precipitates enuresis by interfering with a poorly learned process, or whether a state of stress or conflict can in some way act upon bladder function *de novo*. Hallgren (1957a) found secondary enuretics in his medically referred sample to be more disturbed than primary enuretics, but this is not borne out by other studies, on unselected populations.

Does Treatment Directed Towards Emotional Disorder Have a Curative Effect on Enuresis?

In looking for evidence along these lines, one is faced with the problems of drug treatment of enuresis. Most of the drugs used successfully to treat wetting, such as imipramine (Shaffer *et al.* 1968), also have a marked psychotropic effect. Thus the possibility that they mitigate enuresis through an effect on anxiety or internal conflict cannot be ruled out. Certainly they are more effective than other drugs which have an even more potent effect on the autonomic nervous system, such as ephedrine or amphetamine. However, their mode of action is so problematical that it would certainly be unwise to make any claim that they operate by modifying any associated emotional disorder.

De Leon and Mandell (1966) compared the efficacy of psychotherapy, conditioning treatment, and no treatment, on groups of enuretics. They found that conditioning treatment was significantly more effective than psychotherapy, and that there was very little difference between psychotherapy and no treatment at all. Unfortunately, this study does not advance the enquiry very much further, because behavioural changes were not assessed. If such a trial were to show that psychotherapy had modified the emotional disorder but had not improved the enuresis, this would provide good evidence against theories that enuresis is a consequence of being in a state of emotional disturbance.

Molling *et al.* (1962) conducted a controlled trial of perphenazine, placebo, and no treatment at all, on groups of disturbed adolescent delinquents in an institution. Treatment was directed towards improving behaviour, but the frequency of bed-wetting was also noted. Both adolescents treated with placebo and those treated with perphenazine showed significant improvements in behaviour and a marked reduction in wetting frequency, when compared with the no-treatment group. However, there was no significant difference between the results obtained with perphenazine and those obtained with the placebo. The authors concluded that the optimism, interest and increased attention generated by the trial procedure itself had had a therapeutic effect. The reduction in wetting frequency could not be attributed to an active drug, nor did the procedure involve any of the usual measures designed to instil responsibility or reduce anxiety over wetting, such as frequency charts and pep talks. One is led to the conclusion that psychological mechanisms exerted a favourable influence on both behaviour and enuresis.

It is common clinical experience that enuretics are dry when they are away from home. Stein and Susser (1965) looked at the wetting frequency of a group of institutionalised deprived delinquent boys when they were in their dormitories, and when they were admitted for some reason to the sick room. There was a marked reduction in wetting frequency in the sick-room. The authors attributed this improvement to the more intense mothering relationship enjoyed by the boys in the sick-room setting.

Summary. Systematic studies support what we know from clinical experience, *i.e.* that modification of the psycho-social environment can produce a reduction in the frequency of wetting. The studies of Molling *et al.* (1962) and Stein and Susser (1965) were both carried out on deprived adolescent boys in institutions, and we do

not know whether their results are applicable to other groups of enuretics; nor do we know the mechanism by which the changes they described were brought about.

Is Symptomatic Treatment Less Successful in Disturbed Enuretics Than in Enuretics Without Psychiatric Disturbance?

Behrle *et al.* (1956) studied 20 enuretics, before and after treatment. Twelve of these children had more than one abnormal behaviour trait. It was found that response to treatment was not in any way related to the degree of psychiatric disturbance present before treatment.

Kolvin *et al.* (this vol. Chap. 26) investigated the behavioural predictors of response to treatment with the buzzer, imipramine and a placebo. From an initial analysis, two predictive factors in the child seem to be 'excitability' and the 'absence of somatic symptoms', both of which were predictive of a response to imipramine but not to the buzzer. 'Absence of somatic symptoms' in turn correlated at a low level but significantly ($r = 0.28$) with 'absence of psychiatric disturbance'. Pending further analysis of the data, the authors suggest that absence of psychiatric disturbance augurs well for response to imipramine treatment.

Rutter *et al.* (this vol. Chap. 17) examined enuretics at 9 to 10 and again at 14 years. In those who were to become dry by 14, the rate of psychiatric disturbance at 9 to 10 years was 29 per cent, whereas in those who would still be wetting at 14 the rate was 50 per cent. The study did not investigate the rate of treatment intervention between the ages of 11 and 14, or whether this varied with whether the children were psychiatrically disturbed.

Summary. There is no evidence that psychiatrically disturbed enuretics are less responsive to conditioning treatment than psychiatrically normal enuretics. There is tenuous evidence that psychiatric disturbance may interfere with a therapeutic response to imipramine, in that the psychiatrically disturbed do appear to have a poorer prognosis than undisturbed enuretics, but the mechanisms for this relationship are unclear, and may relate to treatment referral or acceptance.

Does Successful Treatment of Enuresis Result in Adverse Behavioural Reactions (Symptom Substitution)?

It is often a matter of opinion whether or not genuine symptom substitution has occurred, and interpretation of available data is often difficult. Behavioural psychologists and paediatricians often point to the absence of symptom substitution as evidence against enuresis being a manifestation of neurotic conflict. However, numerous papers (*e.g.* Sieger 1952, Bostock and Shackleton 1957, Wickes 1958) which purport to show an absence of adverse behaviours or symptoms developing during bell-and-pad treatment have used only the most rudimentary behaviour assessment techniques.

Even if adverse behaviour change could be demonstrated during treatment, it would be difficult to know how to interpret this. Winnicott (1953) says that: 'in most cases cure does no harm, and where it could do harm the child usually manages through unconscious processes either to resist cure or to adopt another s.o.s. sign that produces transfer to another type of clinic.' Werry (1967) points out that the

behaviour of childhood is a dynamic process, and that it would be surprising if changes in circumstance, such as cure of enuresis, did not produce new behaviours.

Behrle *et al.* (1956) assessed 20 enuretics before and after treatment with a bell-and-pad. Although the majority showed a marked resistance to treatment, in no case was cure of the enuresis followed by a noticeable deterioration in behaviour or the appearance of new symptoms.

Novick (1966) treated groups of primary and secondary enuretics, and assessed their behavioural status before and after treatment. He found that new symptoms did appear in a small minority of the cured group. Furthermore, these new symptoms occurred three times as often amongst secondary as amongst primary enuretics. However, because of small numbers the differences were not statistically significant.

Baker (1969) used sophisticated measures of emotional disturbance before and after treatment. He found that children who improved with treatment were more likely to develop new symptoms than enuretics who were not cured, but that only a minority of the cured enuretics did so, and that the symptoms were of short duration. Most of the cured enuretics showed beneficial changes after treatment.

Summary. Carefully monitored studies of behaviour before and after bell-and-pad treatment suggest that new emotional or behavioural symptoms may develop in a minority of children, but are of short duration. However, the development of new symptoms does not necessarily provide evidence for a neurotic basis for enuresis. It may be that in some cases a cure of enuresis effects changes in, for instance, the child's relationships with his family and his expectations, and that it is these changes, rather than the persistence of unresolved subconscious conflict, which result in the appearance of new symptoms.

IS EMOTIONAL DISORDER REACTIVE?

The view that enuresis is a cause of emotional disorders is commonly advanced by clinicians, no doubt based on the following frequently-made observations.

- (i) The enuretic child often seems ashamed or distressed at wetting the bed.
- (ii) Parents of enuretics often adopt a hostile and rejecting attitude towards their child when he wets the bed.
- (iii) Both parents and children are usually grateful and relieved when a cure has been effected.

However, to observe that enuresis is a distressing condition, and that the distress is alleviated when the enuresis is cured, does not prove that the enuresis is the cause of any associated psychiatric disorder. Presumably most enuretics and their families are troubled by the symptom, and yet fewer than a third of enuretic children show obvious signs of psychiatric disorder.

Evidence suggesting that in some cases enuresis may be the cause of an associated emotional disturbance would be:

- (a) if symptomatic treatment of enuresis were found to have produced a beneficial change in disturbed behaviour;

- (b) if it could be shown that the backgrounds and personal histories of enuretic children with an emotional disorder were different from those of other disturbed children without enuresis;
- (c) if it could be shown that psychiatric disturbance was more marked at later ages, when the symptom is less common, and is, therefore, more likely to conflict with the expectations of both child and parent;
- (d) if psychiatric disturbance were found to be related to the frequency of wetting.

Point (c) above has already been dealt with in part, in that it has been shown that older enuretics are not more likely to have a psychiatric disturbance than young enuretics (Rutter 1971).

As for point (d), reference has already been made to the inconsistent results of the study of Rutter *et al.* (this volume Chapter 17), which reported only a non-significant trend for wetting to be more frequent in patients with an associated psychiatric disorder.

Does Symptomatic Treatment of Enuresis Affect Emotional Disturbance?

There are a number of studies which purport to show beneficial changes in children's feelings and adjustment after they have been cured of enuresis. For the most part, however, these studies deal with subtle changes in children who did not have a major psychiatric disturbance before treatment.

Behrle *et al.* (1956), based on the evidence of mothers' questionnaires and projective tests reported a significant gain in self-confidence in children successfully treated with the bell-and-pad. Lovibond (1964) also found that children who were successfully treated with the bell-and-pad gained in confidence, showed more outgoing behaviour at school, and did better on a projective test of 'social undervaluation', than they had done before treatment. On the other hand, Novick (1966) noted no significant changes in anxiety scores on a personality inventory test after successful treatment.

Baker (1969), using a combination of several different assessment methods, found that enuretics who had been cured with the bell-and-pad became more venture-some, and that their relations with their parents improved.

Rutter *et al.* (this volume Chapter 17) found that 59 per cent of enuretics who were disturbed at the age of ten years lost their psychiatric disturbance by the age of fourteen if they had stopped wetting. Only 29 per cent of disturbed enuretics had lost their disturbance by age fourteen if they were still wetting. This study was not designed to analyse the mechanisms of the disappearance of wetting (*i.e.* spontaneous, or as a result of symptomatic, psychological or milieu therapy), but it does lend weight to theories that in some cases the associated psychiatric disorder may be a reaction to the presence of enuresis.

Summary. Several studies have shown positive changes in the enuretic child's attitudes and level of adjustment after 'cure'. However, only one of these studies has dealt with behavioural changes in children with a major degree of maladjustment. Because of the nature of this study, the sum of the evidence remains inadequate, but nevertheless suggests that enuresis can by itself result in psychiatric disturbance.

IS THE ASSOCIATION BETWEEN ENURESIS AND EMOTIONAL DISORDER DUE TO THE
PRESENCE OF COMMON ANTECEDENTS TO BOTH CONDITIONS?

There are several possible mechanisms which could result both in enuresis and in emotional disorder.

(a) It may be that acute emotional stress at a 'critical period' of development can have both an immediate, but long-lasting, effect on the acquisition of sphincter control, and a delayed, but independent, effect on emotional development. Ainsworth (1962) and Rutter (1971) have reviewed the circumstances whereby early discontinuity of maternal care might give rise to subsequent psychiatric disturbance.

(b) An event such as the death, desertion or divorce of a parent might have both an acute effect on learning processes, such as the acquisition of sphincter control, and a more long-term effect on emotional development. Gregory (1965), Douglas (1967), and Greer and Gunn (1966), amongst others, have shown that the early experience of broken homes predisposes to the development of delinquent and other psychopathic disorders.

(c) The rearing practices of a disturbed or inadequate mother might quite independently have an adverse effect on the acquisition of sphincter control, and at the same time predispose the child to the development of psychiatric abnormality. Rutter (1966) showed that children of psychiatrically ill parents had an increased liability to emotional disorder.

(d) An interplay between genetic and environmental forces is another possibility. There is some evidence (see below) that parents who were themselves enuretic as children are more prone to family disruption than non-enuretic parents. It is possible that the emotional disorder in their children is a consequence of family circumstances, whilst the enuresis has a genetic basis.

Common Genetic Antecedents

Hallgren (1957a) found that enuretic children were more likely to come from a broken home if their parents had also been enuretic. Children from broken homes are of course more prone to personality disorders and delinquency.

Summary. A single study has suggested an association between enuresis in childhood and marital instability in later life. If this study could be replicated it might provide a partial explanation for the association between enuresis and psychiatric disorder in childhood in terms of common genetic antecedents. However, one needs to bear in mind that family patterns may be transmitted from generation to generation by non-genetic mechanisms.

'Brain Damage'

Oppel *et al.* (1968) carried out a longitudinal study of a group of low-birth-weight children, using a control group of children of normal birthweight. They found that enuresis was more common in the low-birthweight group, and also in a sub-group of children with obvious neurological abnormalities, than in the normal controls. However, the study was marred by the loss of a disproportionate number of children

in the upper social classes, amongst whom one would expect a lower incidence of enuresis.

Werry and Cohrssen (1967) administered perceptual motor tests to 30 enuretics referred to a child psychiatric clinic. The enuretic children did as well as their non-enuretic siblings on these tests.

In their study into the association between various psychiatric disorders in childhood and neurological abnormality, Rutter *et al.* (1970) also looked at the prevalence of enuresis in different groups of nine- to ten-year-olds. They found no association between enuresis and neurological abnormality. Furthermore, they found that psychiatrically disturbed children without evidence of a neurological abnormality were more likely to be wet than disturbed children with a neurological abnormality.

Summary. There is no consistent evidence to show that brain damage is related to enuresis.

Family Life

Mention has been made of Hallgren's finding of a relationship between a family history of enuresis and broken homes. No other study has looked into this relationship, but it is obviously one worthy of further research, especially in view of the plethora of studies showing that enuretic children are more likely to have abnormal family backgrounds than non-enuretics.

Analysing the longitudinal data from the British National Survey, Rowntree (1955) found that, at the age of four years, persistent bedwetting was significantly more common amongst children from broken homes than amongst children from intact homes. However, at the age of six years the association was less strong.

Stein and Susser (1967) studied a pre-school population, and could find no association between enuresis and broken homes. The same workers (Stein *et al.* 1965) also studied the family backgrounds of groups of enuretics aged five, ten and fourteen years, and compared them with matched controls. They found that ten-year-old enuretics were more likely to have a mother who was poor, overburdened and inadequate, and that children who were still wetting at the age of fourteen were more likely to have experienced a major family disruption.

Umphress *et al.* (1970) compared adolescent enuretics attending a clinic with other non-enuretic patients and normal controls. They found that the parents of enuretics showed less concern over home-making, earning or the mental and physical health of their children than the parents of the other groups.

Cust (1958) looked at a mixed range of randomly selected enuretics identified in a school population. He found that current family disharmony was much more common in the enuretic group. Oppel *et al.* (1968) also found a relationship between poor marital adjustment of the parents and enuresis, but the relationship was only significant for girl enuretics.

Stein and Susser (1965) compared the family backgrounds of enuretic and non-enuretic delinquents. Both groups had a high incidence of family disruption, but the enuretics had more frequently lost a mother through desertion, separation or divorce. Douglas (1970) found a significantly higher incidence of broken homes, maternal

remarriage and unfavourable family circumstances in enuretics at all ages, and noted that the death of a mother before the age of six years was also significantly more common amongst enuretics than non-enuretics.

Summary. There is consistent evidence from a number of different studies that family disruption, in general, and maternal loss or handicap, in particular, occur more often in the personal histories of enuretics than in the histories of non-enuretics. Similar factors are also known to be particularly associated with deviant behaviour. However, in view of the isolated finding by Hallgren that the parents in such disrupted homes carry a significant genetic loading for enuresis, it is difficult to know how to interpret these data.

Other Environmental Factors

The association between low social class and enuresis is important if only because it suggests that enuresis is in some way responsive to environmental influences.

Thaustein and Halevi (1962) studied a large number of five-year-old Israeli school-entrants. They found that enuresis was significantly more common in recent immigrants to the country, in entrants to religious schools, and in families where the parents had themselves received a traditional education.

Stein and Susser (1967) found that, whereas the working class Lancashire children in their United Kingdom study tended to acquire bladder continence during the day before they were dry at night, amongst some of the children of highly educated professional parents in the U.S.A. reported by Roberts and Schoellkopf (1951) this was not the case. This difference in the sequence of development of bowel and bladder control between the two groups suggests that environmental or rearing differences may influence sphincter control, and that the acquisition of day-time continence is not necessary for the development of continence at night.

An undue representation of children from lower social classes has been found in studies by Von Harnack (1953), Blomfield and Douglas (1956), Hallgren (1957a), Stein *et al.* (1965), Oppel *et al.* (1968), Umphress *et al.* (1970) and Rutter *et al.* (this volume Chapter 17). However, in most of these studies the predominance held more for girls than for boys, and more for children between the ages of seven and ten years than for older or younger children.

Stein and Susser's (1967) study suggested that the important determining factor was not social class itself, but rather whether or not the lower class family was 'aspirant'. 'Non-aspirant' working class families are particularly likely to experience adverse events and attitudes, and these may independently influence the development of both enuresis and psychiatric disorder.

Summary. There is consistent evidence that a relationship exists between enuresis which has persisted until middle childhood and low social class, and that this relationship is especially strong amongst girls. There is also evidence that environmental and cultural factors may play some rôle in the early acquisition of sphincter control. However, similar class biases have not been shown for most forms of psychiatric disorder in childhood (Lapouse and Monk 1958, Rutter *et al.* 1970b), although they

have been shown for juvenile delinquency (Mannheim 1948, Stein and Susser 1965 Douglas *et al.* 1966). The problem with interpreting such associations is that not only are low social class samples weighted with a lower overall IQ, but, depending on the population being studied, they may also contain a disproportionate number of deviant or broken families. It therefore requires sophisticated techniques of analysis before the relevant factors in a social class bias can be identified.

Stress Factors in Early Childhood

Comparing a small sample of randomly selected enuretics and their matched controls, Cust (1958) found that a history of illness in the third year of life was more common in the enuretics than in the control group.

Hallgren (1957a) found that enuretics were significantly more likely to have experienced separation from their mothers before the age of four years than their non-enuretic siblings. Lickorish (1964) found that an early separation from the mother had taken place significantly more frequently amongst enuretics referred to an adolescent treatment clinic, than in a non-enuretic patient group.

Douglas reports important findings from the British National Survey in Chapter 15 of this volume. Of special interest to this discussion is his finding that the early stress events which he found to be most strongly associated with enuresis—such as separation from the mother during which care was provided for the child in an unfamiliar environment and by unfamiliar caretakers—are similar to those which have been found to be most strongly related to psychiatric disturbance following separation (Rutter 1972). These findings would support a hypothesis that the observed association between psychiatric disorder and enuresis arises from common antecedent factors acting independently.

Summary. There is a good and consistent evidence to support the view that early stress events are more common in enuretics than non-enuretics. References have been cited above which affirm that a history of family separation and disruption in these years may result in long-term psychiatric sequelae, although there is little evidence to show that children suffer adverse long-term psychiatric effects from brief illnesses or hospitalisations (Rutter *et al.* 1970b).

CONCLUSIONS

There is consistent evidence, from controlled studies on unselected populations, of a relationship between emotional disturbance and enuresis at all ages. This relationship holds most strongly for girl enuretics and for children who wet both in the day and at night. Although emotional disorders are more common in bedwetters than in children who are dry, most children who wet the bed are, nevertheless, psychiatrically normal. When enuretics do display a psychiatric abnormality, there is no consistent pattern of disturbance, and the evidence for a syndrome of habit disorders, such as thumb-sucking, nail-biting or tics, in association with enuresis is unconvincing. There is some suggestion that enuretic children are slower to lose and acquire other age-

related behaviours, and are more acquiescent and less outgoing and confident, than non-enuretics.

The nature of the association between emotional disorder and enuresis remains uncertain. Although psychological stress almost certainly plays a large part in the genesis of secondary enuresis, such children are probably vulnerable before the onset of the enuresis. There are studies which suggest that producing general environmental changes in deprived adolescent boys may effect improvements in both behaviour and wetting frequency, but the evidence that the reduction in wetting frequency is a result of the behavioural change is not clear cut.

Most enuretics are probably distressed by their condition. However, any behaviour improvements noted by therapists after cure have been of a subtle nature, and have been noted amongst children who were not grossly maladjusted. These changes do not in themselves confirm the reactive nature of the association.

Children who wet the bed, particularly girls, share with delinquents and children with other forms of psychiatric disorder an increased tendency to be the victims of family disorganisation, early stress experiences and an adverse social class bias. There is evidence to suggest that parents who were themselves enuretic as children are more prone to family disorganisation when they marry. Further studies along this line are needed.

In view of the number of common factors shared by disturbed enuretic children and disturbed non-enuretic children, it is probable that the relationship is not a simple one. There may be some children who have developed a psychiatric disturbance because of their bedwetting, and other children whose wetting is a direct manifestation of their psychiatric disturbance. But it is unlikely that these cases account for the majority of disturbed enuretics. Rather, it is suggested, there are factors in families who produce disturbed children, which also influence the acquisition of normal bladder control. These factors may be genetic, they may be related to social expectations and reinforcement techniques, or they may reflect a greater frequency of environmental stress experiences. The value of any further studies would be greatly enhanced by taking such factors into account.

REFERENCES

- Ainsworth, M. D. (1962) 'The effects of maternal deprivation.' in *Deprivation of Maternal Care—A Reassessment*. W.H.O. Public Health Papers, No. 14. Geneva: W.H.O.
- Anderson, F. N. (1930) 'The psychiatric aspect of enuresis.' *American Journal Of Diseases of Children*, 40, 591.
- Baker, B. L. (1969) 'Symptom treatment and symptom substitution in enuresis.' *Journal of Abnormal Psychology*, 74, 42.
- Barbour, R. F., Borland, E. M., Boyd, M. M., Miller, A., Oppé, T. E. (1963) 'Enuresis as a disorder of development.' *British Medical Journal*, ii, 787.
- Behrle, F. C., Elkin, M. H., Laybourne, P. C. (1956) 'Evaluation of a conditioning device in the treatment of nocturnal enuresis.' *Pediatrics*, 17, 849.
- Blomfield, J. M., Douglas, J. W. B. (1956) 'Bedwetting—prevalence in children aged 4-7 years.' *Lancet*, i, 850.
- Bostock, J., Shackleton, M. (1957) 'Pitfalls in the treatment of enuresis by an electrical awakening machine.' *Medical Journal of Australia*, 2, 152.
- Cust, G. (1958) 'The epidemiology of nocturnal enuresis.' *Lancet*, 2, 1167.
- De Leon, J., Mandell, W. (1966) 'A comparison of conditioning and psychotherapy in the treatment of functional enuresis.' *Journal of Clinical Psychology*, 22, 326.

- Douglas, J. W. B. (1967) 'Natural history of enuresis.' *British Medical Journal*, **3**, 234.
- (1970) 'Broken families and child behaviour.' *Journal of the Royal College of Physicians of London*, **4**, 203.
- Ross, J. M., Hammond, W. A., Mulligan, D. G. (1966) 'Delinquency and social class.' *British Journal of Criminology*, **6**, 294.
- Gerard, M. W. (1939) 'Enuresis—a study in etiology.' *American Journal of Orthopsychiatry*, **9**, 48.
- Glidewell, J. C., Mensh, L. N., Gildea, M. V. L. (1957) 'Behavior symptoms in children and degree of sickness.' *American Journal of Psychiatry*, **114**, 47.
- Greer, S., Gunn, J. C. (1966) 'Attempted suicides from intact and broken parental homes.' *British Medical Journal*, **2**, 1355.
- Gregory, I. (1965) 'Anterogressive data following childhood loss of a parent. II. Pathology, performance and potential among college students.' *Archives of General Psychiatry*, **13**, 110.
- Hallgren, B. (1957a) 'Enuresis—a clinical and genetic study.' *Acta Psychiatrica et Neurologica Scandinavica*, Suppl. 114.
- (1957b) 'Enuresis. II. A study with reference to certain physical, mental and social factors possibly associated with enuresis.' *Acta Psychiatrica et Neurologica Scandinavica*, **31**, 405.
- Harnack, G. A. von (1953) 'Wesen und soziale Bedingtheit frühkindlicher Verhaltensstörungen.' *Bibliotheca Paediatrica*, Fasc. 55.
- Lapouse, R., Monk, M. A. (1958) 'An epidemiologic study of behaviour characteristics in children.' *American Journal of Public Health*, **48**, 1134.
- (1959) 'Fears and worries in a representative sample of children.' *American Journal of Orthopsychiatry*, **29**, 803.
- Lickorish, J. R. (1964) 'One hundred enuretics.' *Journal of Psychosomatic Research*, **7**, 263.
- Lovibond, S. H. (1964) *Conditioning and Enuresis*. Oxford: Pergamon.
- MacFarlane, J. W., Allen, L., Honzik, M. P. (1954) *A Developmental Study of the Behavior Problems of Normal Children Between 21 Months and 14 years*. Berkeley: University of California Press.
- McHale, A. (1967) 'An investigation of personality attributes of stammering, enuretic and school phobic children.' *British Journal of Educational Psychology*, **37**, 400.
- Mannheim, H. (1948) *Juvenile Delinquency in an English Middletown*. London: Routledge & Kegan Paul.
- Michaels, J. J., Goodman, S. E. (1934) 'Incidence and intercorrelations of enuresis and other neuro-pathic traits in so-called normal children.' *American Journal of Orthopsychiatry*, **4**, 79.
- (1935) 'Left-handedness, intercorrelations with enuresis and other related factors in so-called normal children.' *Archives of Neurology and Psychiatry*, **34**, 758.
- Molling, P. A., Lockner, A. W., Sauls, R. J., Eisenberg, L. (1962) 'Committed delinquent boys.' *Archives of General Psychiatry*, **7**, 70.
- Mower, O. H. (1950) *Learning Theory and Personality Dynamics*. New York: Ronald Press.
- Novick, J. (1966) 'Symptomatic treatment of acquired and persistent enuresis.' *Journal of Abnormal Psychology*, **71**, 363.
- Oppel, W. C., Harper, P. A., Rider, R. V. (1968) 'Social, psychological and neurological factors associated with enuresis.' *Pediatrics*, **42**, 627.
- Orne, M. T. (1962) 'On the social psychology of the psychological experiment with particular reference to demand characteristics and their implications.' *American Psychologist*, **17**, 776.
- Paulett, J. D., Tuckman, E. (1958) 'Onset enuresis.' *British Medical Journal*, **2**, 1266.
- Roberts, K. E., Schoellkopf, J. A. (1951) 'Eating, sleeping and elimination practices in a group of 2½-year-old children.' *American Journal of Diseases of Children*, **82**, 121.
- Rosenthal, R. (1961) 'On the social psychology of the psychological experiment: with particular reference to experimenter bias.' Paper read at the Meeting of the American Psychological Association, New York, 1961.
- Rowntree, G. (1955) 'Early childhood in broken families.' *Population Studies*, **8**, 247.
- Rutter, M. L. (1966) *Children of Sick Parents*. Maudsley Monograph, No. 16. London: O.U.P.
- (1972) *Maternal Deprivation Reassessed*. Harmondsworth: Penguin Books.
- Graham, P. (1966) 'Psychiatric disorders in 10 and 11 year old children.' *Proceedings of the Royal Society of Medicine*, **59**, 382.
- Yule, W. (1970a) *A Neuropsychiatric Study in Early Childhood*. Clinics in Developmental Medicine, Nos. 35/36. London: S.I.M.P. with Heinemann.
- Tizard, J., Whitmore, K. (1970b) *Education, Health and Behaviour*. London: Longmans.
- Sears, R. R., Maccoby, E., Levin, H. (1957) *Patterns of Child Rearing*. Evanston, Ill.: Row Peterson.
- Sieger, H. W. (1952) 'Treatment of nocturnal enuresis.' *Journal of Pediatrics*, **40**, 738.
- Shaffer, D., Costello, A. J., Hill, I. D. (1969) 'Control of enuresis with imipramine.' *Archives of Disease in Childhood*, **43**, 665.
- Stein, Z. A., Susser, M. W. (1965) 'Socio-medical study of enuresis among delinquent boys.' *British Journal of Preventive and Social Medicine*, **19**, 174.
- (1966) 'Nocturnal enuresis as a phenomenon of institutions.' *Developmental Medicine and Child Neurology*, **8**, 677.

- Stein, Z. A. Susser, M. W. (cont.)
- (1967) 'Social factors in the development of sphincter control.' *Developmental Medicine and Child Neurology*, **9**, 692.
- Wilson, A. E. (1965) 'Families of enuretic children. I. Family type and age. II. Family culture, structure and organisation.' *Developmental Medicine and Child Neurology*, **7**, 658.
- Tapia, F., Jekel, K., Domke, H. R. (1960) 'Enuresis: an emotional symptom.' *Journal of Nervous and Mental Diseases*, **130**, 61.
- Thaustein, J., Halevi, H. S. (1962) 'Enuresis among school entrants in the changing population of Israel.' *British Journal of Preventive and Social Medicine*, **16**, 40.
- Umphress, A., Murphy, E., Nickols, J., Hammar, S. (1970) 'Adolescent enuresis. A social study of family interaction.' *Archives of General Psychiatry*, **22**, 237.
- Valenzuela, A. V. (1959) 'Enuresis: a symptom of immaturity.' *Acta Medica Phillipina*, **16**, 47.
- Weigl, E. (1938) 'Zur Psychogenese der infantilen Enuresis.' *Zeitschrift für Kinderpsychiatrie*, **5**, 103.
- Werry, J. S. (1967a) 'Enuresis nocturna.' *Medical Times*, **95**, 985.
- (1967b) 'Enuresis—a psychosomatic entity?' *Canadian Medical Association Journal*, **97**, 319.
- Cohrssen, J. (1967) 'Enuresis: an etiologic and therapeutic study.' *Journal of Pediatrics*, **67**, 423.
- White, M. (1968) 'A thousand consecutive cases of enuresis. Results of treatment.' *Medical Officer*, **120**, 151.
- Wickes, I. G. (1958) 'Treatment of persistent enuresis with the electric buzzer.' *Archives of Disease in Childhood*, **33**, 160.
- Winnicott, M. (1953) 'Symptom tolerance in paediatrics.' *Proceedings of the Royal Society of Medicine*, **46**, 675.