ENURESIS IN CHILDREN

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by

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INTRODUCTION

The subject of Enuresis in children is not one which at first sight would seem to be of particular importance.

It is not one of the major ills of mankind, it is not a painful condition, at least not physically, it is not dangerous to life and the prognosis is usually good, relief customarily being obtained with the onset of puberty. It might in fact be described as one of the "growing pains" of childhood. Yet just as "growing pains" have been identified in recent years with one of the most insidious and health-wrecking diseases to which children are subject, so is Enuresis the destroyer of one of the most precious things a boy or girl can have - a happy and care-free childhood.

It is commonly said that enuresis is a disease of nervous children, and Dunham [43] has found in an analysis of 800 such children, that 7 percent were so affected.

How much more nervous many of these children must have been made as a result of the anxiety their condition caused them! What, for instance, must be the state of mind of the small boy, who, suffering from this complaint, knows that soon he must go to boarding-school, where of necessity strangers will learn of his plight and where he will be subjected to much dormitory ridicule.

The likelihood of this has probably been pointed out to him by a misguided if well-meaning parent, in the hope one supposes, that it would act as an incentive to better habits.

Even if the prospect of school is not present there is often the ridicule of the family circle to be faced, sometimes more cruel to a sensitive nature than that of any outsider. In any event, many of the pleasures of a normal child's life are denied to the enuretic, such as a weekend with a school-mate or a camping expedition.

Nor is this all. The child's education is gravely interfered with; a period "off school" being frequently advised at the beginning of treatment, with consequent loss, not only to the child who is missing his schooling, but to the State, which is paying for it, while later on there is the difficulty of regaining his former place in class 12). Further, the whole trend of modern education, following on the ideal of Rousseau, "depend only on things, never on people", is to make the child think for himself, rely on himself, and, therefore, have confidence in himself. What enuretic child can really have such confidence, or any feeling of non-dependence on others?

"However, the child will grow out of it; the prognosis is good." Actually this is by no menas always the case and the difficulties of treating the adult enuretic greatly exceed those in the case of the child.

Recently, an investigation was carried out Koster[3] on soldiers and recruits in the Netherlands, and as a result it was estimated that there are over 4,500 adult enuretics in that small country alone. A case of a woman, who had actually reached the age of 65, without having recovered from this complaint, despite the fullest investigation, the enuresis having persisted since infancy, was recently brought to my notice.[2]

Surely the majority of these people must at some time or another have sought medical advice, and it seems right to make a plea for a more thorough investigation and "follow-up" of these obstinable cases.

Enough has perhaps been said to show that the condition is not an infrequent one, and that its effects, direct and indirect may be far-reaching. Certainly experience in private practice and in the busy Out-Patient department of a large Children's Hospital, has impressed on me the misery and unhappiness that enuresis can cause.

Much has been, and doubtless yet will be written on this subject, although contributions to the treatment of the condition have not been frequent in recent years.

It is perhaps therefore a not inopportune moment for a comprehensive survey of the literature on the subject especially with reference to hygienic and psycho-therapeutic measures and preventive

treatment as opposed to routine medical measures.

This, in the hope that, as a result, some contribution however small, may be made towards the amelioration of this common and distressing complaint.

HISTORICAL.

Most of the ancient Physicians have something to say on the subject of Enuresis; apparently it has been a source of worry to mothers right down the ages, and the variety of remedies offered then, was no less varied than is the case today.

The works of Hippocrates [9] and Galen [8] contain references to the condition as well as those of their less distinguished successors.

One of the earliest references to the subject is contained in the writings of Xenophon who was Physician to the Emperor Claudius (B.C.10-A.D.54) who remarks:-

"If a child wets the bed after the age of 3 or 4 years we say he has the Dandelion disease. Dandelion eaten in large quantities produces these symptoms, and a decoction of dandelion leaves cures them."

Evidently then, Hahnemann was not the first to propound the Homeopathic theory of like curing like, and the remedy must indeed have been a sovereign one because its use persisted until comparatively recent times. The plant's old name of Piss-a-bed still survives in some rural areas.

The condition was well known to Paulus Bagellardus [4] who was Professor of Medicine in the University of Padua in the 15th century.

He comments on "the sadness caused to parents when boys beyond the age of 3 pass their water in

bed continually every night, not until the age of 5 or 6 but sometimes beyond the time of puberty."

In the prevention of the condition, his opinions are in line with those of modern Psychologists for he warns against "accidents of the mind" and "immoderate exercise from anger."

Exigencies of space he says, prevent him from mentioning other than particularly well-tried remedies, and he recommends powdering down and drinking in an astringent wine, either the cerebrum of a hare or the lung of a kid. He also suggests that powdered cock's comb scattered over the enuretic's bed will be found very efficacious in diminishing the flow of urine. One presumes that this latter remedy acted by diminishing the depth of the patients sleep!

The first English text-book of Pediatries, Phaer's [5] "Boke of Children" devotes a whole chapter to the subject which he entitles "On Pyssing in the Bedde". He is an advocate of dietetic restriction and all fat meats are prohibited. A number of remedies are suggested including the "wesand of a cock" the "stones of a hedgehog", a treatment in which he has particular faith, and the claws of a goat, all to be taken in powdered form. But his therapy does not stop at drugs. "Take plates of leade with holes in them" he exhorts, "and lette them lye often to the naked backe." Fortunately for the sake of younger sufferers this is only to be done if the patient is of age.

This form of treatment would certainly be less comfortable than the modern bobbin attached to the back, but most people would prefer it to the epidural salines of today!

The complaint was well known in Shakespeare's time and he refers to it in two of his plays thus:-

MERCHANT OF VENICE. Act IV, Scene I.

SHYLOCK: "And there are others when the bagpipe sings i' the nose
Cannot contain their urine.

As there is no firm reason to be rendered

Why he, a woollen bagpipe, but of force.
Must yield to such inevitable shame
As to offend, himself being offended."

Also in

ALL'S WELL THAT ENDS WELL. Act IV, Scene III.

PAROLLES: "In his sleep he does little harm,
Save to his bedclothes.
But they know his condition and,
Lay him in straw."

The condition also engaged the attention of mediaeval artists and the role of fright in the production of enuresis is brilliantly portrayed by Rembrandt in his picture "The Capture of the Infant Ganymede by an Eagle."

Most of the older Physicians believed that enuresis was due to a weakness of the bladder

musculature itself, hence the popularity of that organ as a remedy.

Nicholas Fontanus[6] in his commentary on Sebastian Autrius' book on Pediatries mentions this use of the bladders of animals. Thus:-

"The bladder of the lamb or kid ... invigorates the bladder, and, being strengthened thereby it now retains the urine. Of all these the most strongly recommended is that of a young porker, and rightly, for if the bladder is of assistance on account of the affinity and similarity it has to the human bladder, much more will the porkers be of service, for pigs are like man in every respect."

This unflattering comment evidently refers to the fact that the taste of pig and human flesh is almost indistinguishable, and that the one has been sold and eaten as the other without anyone being the wiser.

Hydrotherapy was first advocated by the famous paedatrician William Heberden[7] who advised cold bathing at night, and to Bretonneau of Tours[11] goes the credit for the discovery of the value of Belladonna in enuresis.

Dittel[111] in 1872 described the condition as being due to a lack of development of the prostate gland, apparently oblivious of the fact that this theory only accounted for the male cases.

It was not until 1889 that the neurotic nature of many of these cases was commented on by Guyon[10]

but the treatment of the condition by suggestion is not as recent as might be thought, for we find in the Saxon Chronicle that the Magi taught the patient suffering from this disorder to "drink the ashes of a pigs pizzle in sweet wine and so to make water into a dogs kennel, lest I, like a hound, should make urine in my own bed."[114]

Some of the methods practised in the olden days are mentioned by Carter[115] who notes the frequent recommendation of chastisement on the grounds that the resultant hyperaemia was of value! This treatment was carried to its logical conclusion by Boerhaave and Casper who actually recommended the burning of the skin with hot irons. These, and other cruel thrapeutic measures such as ligation of the penis were first condemned by Forster who quoted a case of gangrene of that organ due to a tightly applied piece of cord.

It is easy to be critical of the views, and facetious about the prescriptions of these old Physicians and to forget how sound much of their teaching was. It is a chastening thought too, that in a decade or two many of our own most cherished theories will seem just as ridiculous to our descendants as the strange concoctions of Bagellardus' time appear to us today.

THE PHYSIOLOGY OF NORMAL MICTURITION.

The mechanism of bladder activity is simple. The ureters squirt small quantities of urine into the bladder at intervals thus distending and stretching its muscular wall. When the intra-vesical tension reaches a certain point rhythmic muscular contractions are set up and as the pressure inside the bladder increases they eventually become strong enough to cause expression of its contents.

Urine is retained in the bladder by two sphincters one voluntary, one involuntary.

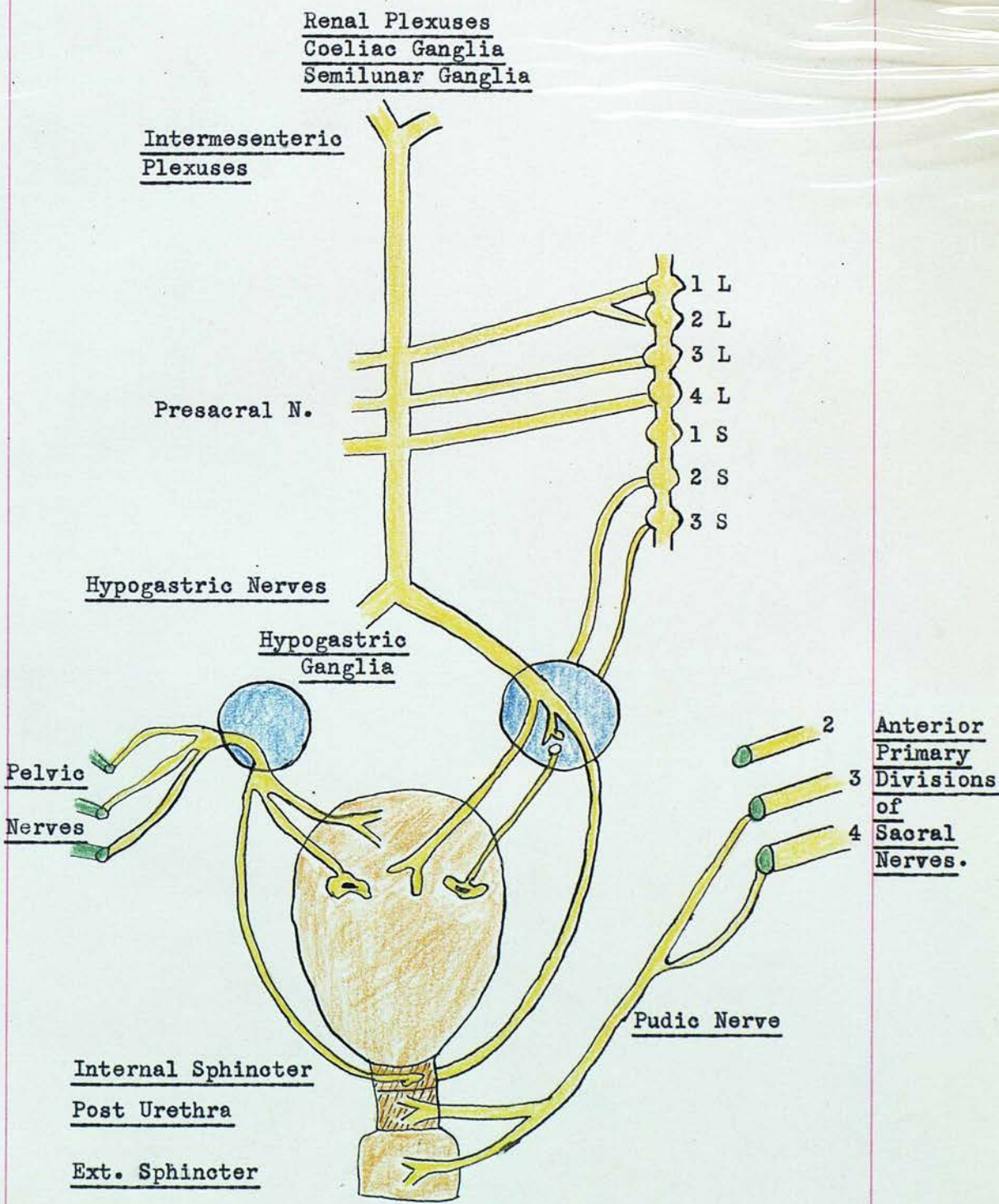
The latter comprises two parts, a vesical and an urethral. The vesical fibres form an encircling ring at the origin of the urethra while the urethral fibres form a more powerful sphincter consisting of a specialised bundle of muscle, looped sling-like, round the urethra. 12).

The voluntary sphincter consists of the bulbo-cavernosus muscle, by means of which even an over-distended bladder can be controlled.

Micturition is a reflex act controlled by a centre in the lumbo-sacral cord which is connected to the bladder by two sets of nerves.

(1) The Hypogastric Nerves, through 2nd and 3rd Lumbar roots, and cell stations in the inferior mesenteric ganglion.

(2) The pelvic vesceral nerves from 3rd and 4th sacral roots which end in cell stations in the bladder musculature.



ANATOMIC DIAGRAM of NERVES TO BLADDER

(After Learmonth)

The Hypogastric N. is at least theoretically, inhibitory, and Elliott [13] has shown that a complete antagonism exists, in the cat, between it and the pelvic visceral nerves.

The nerves supply from S. 3 and 4 is motor to the detrusor muscle and also produces urethral relaxation.

It is believed, that distension of the bladder causes afferent impulses to reach the spinal centre through the hypogastric nerve and thence afferent impulses pass to the detrusor muscle.

In addition, the spinal centres are believed to be under cortical control, though in what way is as yet obscure.

According to Von Kleist [14] there is a motor centre in the paracentral lobule, while Rietschel postulates the existence of a "will centre" in the frontal lobes. Sherrington [16] on the other hand believes there is a vesical centre in the region of the foot while other observers such as Marburgh locate it in the hip area.

If the theory of cerebral control be accepted it follows that the phenomenon of enuresis can be broadly and not very satisfactorily explained by postulating a failure of such control.

AETIOLOGY AND PATHOLOGY.

1. Hereditary Factors.

The possible influence of heredity in the production of enuresis has been considered by Frary [18]. He observed an hereditary tendency in a study of 59 clans in each of which occurred one or more enuretic children. He considers that environmental factors, though important, are secondary to hereditary factors.

Most authorities agree that a hereditary factor is present in some cases but by no means in all. It was an aetiological factor in 30% of Cimbal's [19] cases.

2. Racial Factors.

Enuresis is commoner among white children than black according to Strawbaum [20] who attributes this not so much to the fact that coloured people ignore the condition, as to the fact that neuropathic conditions are much less common among these peoples.

These observations are confirmed by Davison, [21] who also found a lower incidence, in coloured people, and who repudiates the idea of indifference being the reason for this.

3. Familial Influence.

In his statistical study of Enuresis, Addis [22], found that size of family had apparently nothing to do with the condition, nor was it influenced by the child's place in the family. He thinks however that the proportion of Enuretics is lower in families

having only one child than in those of two or more.

4. Economic Factors.

The economic circumstances of the families of 175 enuretic children have been the subject of an investigation by Weiss [23].

It was found that of these families:-

28.6% were dependent on Public Assistance

32% financial positions marginal

20.6% financial position moderate

18.2% financial position comfortable.

One family was described as affluent.

The conclusion is drawn that economic circumstances are of importance, but as these figures are arrived at from observation of the "hospital class" of child it is surely not surprising to find the poor predominating.

5. Sex Incidence.

The consensus of opinion is that this is equal between the sexes, though some observers have noted a slight male preponderance. Addis [22] found that boys outnumbered girls by 3 to 2. Schwarz [24] had 148 males out of 226 cases in his series and Grover [25] 124 males out of 200 cases in his.

McGregor [26] in an Analysis of 70 cases had 31 boys, and 39 girls.

Shelden [27] in a series of 5000 cases found males predominating in the ratio of 3:2, while Anderson [28] found the sexes equally divided. On the other hand, in Batty's [29] series of cases girls

formed 56% of the total.

In a series of 150 children treated in the Out-Patient Department at the Royal Hospital for Sick Children, Edinburgh, I found that 52% were boys.

Age Incidence.

According to Addis [22] the age incidence is highest between the ages of 5 and 12 years, reaching a peak at 8 to 10 and this peak figure agrees with that found by Campbell [30] in an analysis of 532 cases. McGregor [26] found the highest incidence at the age of 8 and Goodheart [31] at age 7. However the condition frequently dates from birth as in 115 out of 158 of Johnston's [32] cases, the child never having gained control, or, after a few months of continence, having relapsed into the infantile state.

It is comparatively rare for the condition to begin after the age of 14.

In my experience the majority of cases date from infancy.

Prevalence.

Enuresis is a relatively common condition as is shown by the figures of various observers. Pese [33] found it in 10% of the children in a Breslau hospital and, in a series of 800 cases Dunham found the trouble to exist in 7% of the children. Cimbal [34] puts the proportion as high as 12% - 15% of all children between the ages of

5 and 16.

The highest incidence is quoted by Bakwin[35] who obtained a history of nocturnal enuresis at one time or another in 26% of 1000 cases.

Of the approximately 3000 new cases who attend Out-patients at Edinburgh Sick Children's Hospital 10% are enuretics.

The presence of several thousand adult cases in the Netherlands has already been referred to.

Theories of Causation.

It may fairly be said that if none of the theories regarding the causation of enuresis attain to the subline, at least some of them border on the ridiculous. McGuiness[36] for example, quotes an American psychologist who states that in his opinion all male enuretics have a latent desire to become firemen.

An almost equally dubious explanation is put forward by Magaz[37] who postulates an increased urinary output in the horizontal position.

Much more credible is the theory of Wetz and Gotz[38] who attempted to explain the phenomenon on a psycho-physiological basis.

These investigators showed by taking intra-vesical pressure tracings, that in normal patients contractions were usually associated with a desire to micturate while in enuretic patients there was no such response to bladder contraction. That is, in the latter cases there was a heightened threshold to vesical stimuli.

These experiments however were repeated by Amberg [39] who failed to find any difference in response to bladder contraction between enuretic and normal children.

At one time another theory in vogue was that enuresis occurred in very heavy sleepers and that this depth of sleep was, in fact, an important aetiological factor.

This view has been favoured from early times by various writers (Oehsenius [40], Pese [33], De Haans [41])

The question was recently investigated by Courtin [42] who came to the conclusion that depth of sleep is not different in enuretics and non-enuretics and that there were as many light sleepers in the former class as in the latter.

Furthermore, by estimating the depth of sleep at various times during the night among enuretic children he found that maximum depth of sleep in no way coincided with the involuntary emptying of the bladder.

Numerous investigators have attempted to associate masturbation with enuresis [31]. It has been suggested that enuresis is a substitute for masturbation and is preferred to it as not provoking the same feeling of sinfulness, and also that masturbation causes enuresis by leading to pelvic congestion and irritation of the prostatic uretura Keating [43]. However, such an eminent sexologist as Havelock, Ellis [44] states that masturbation is at one time or another practised by a large majority of

both sexes while Walker[45] described its incidence as "almost universal in the human race." It would therefore seem unlikely, to say the least of it, that it is of significance in the production of enuresis.

Koplik[64] notes that enuresis occasionally occurs as a sequel to one of the exanthemata.

Classification of Cases.

1. Cases with Physical Defect.

It is natural that in the routine examination of enuretic children numerous physical defects have been discovered. It is natural too, that, an observor finding in a series of enuretic children a large number suffering from, say, diseased tonsils, and adenoids, may conclude that this condition is of aetiological importance in the production of the enuresis.

Thus Mygin[46] found diseased adenoids in 75% of 400 cases.

Fischer[47] however found enuresis in only 14% of his cases with diseased adenoids and Grover[25] stated that in his series of 200 cases 36% had adenoids removed without relief.

In an English hospital with a large childrens ward, I found that of 200 children sent in for removal of tonsils and adenoids, a very necessary operation in the majority of cases, less than 10% had enuresis.

It would therefore appear that diseased tonsils

and/or adenoids are not necessarily productive of enuresis, and are not of aetiological significance.

Spina Bifida Occulta.

The apparent relationship between enuresis and the presence of spina bifida occulta affecting the lumbo-sacral spine was first stressed by Fuchs [48] and his theory received support from subsequent writers [27].

In some cases operation was undertaken and Mertz [49] reports improvement in some children following the removal of fibro-fatty masses which were compressing the meningeal sac of the spina-bifida.

In 1935 however Karlin [50] successfully demonstrated evidence of spina-bifida occulta, by X-ray, in no less than 54% of a series of normal children, thus rendering the theory untenable.

Tuberculosis.

The frequent occurrence of a T.B. family history in these cases is noted by Godlewski [51].

According to Kovat [52] enuresis is frequently a sign of early tuberculosis especially affecting the suprarenal glands.

He advances no evidence to support this assertion except the statement that Tuberculin cured the condition.

A later investigator, Mueller [53] suspecting that suggestion was the therapeutic factor involved, gave Tuberculin to a series of patients in whom he

claimed that this factor was eliminated, and failed to obtain Kovats results.

If there were any truth in this rather improbable theory it is surprising that the much more common condition of tuberculous cervical adenitis has never been related to enuresis as far as I am aware. Further, Tuberculin has no effect on the course of Addisons disease, which is, of course almost invariably a manifestation of tuberculosis of the suprarenal glands, and in fact, its value in any form of Tuberculosis except tuberculous adenitis is disputed by many authorities.

Syphilis.

The importance of a routine Wassermann reaction in cases of enuresis is stressed by a French worker Bouquet [54] who found it positive in 26 out of 180 cases of enuresis.

Other Organic Diseases.

Undoubtedly the presence of such conditions as diabetes mellitus, diabetes insipidus and chronic interstitial nephritis is responsible for a small percentage of cases of enuresis, and this rather obvious fact is mentioned just because the obvious is often ignored.

Diseases and Defects of the Urogenital System.

Numerous malformations and diseases of the urinary tract may cuase enuresis.

These include congenital malformations such as

strictures, congenital posterior urethral valves, hypertrophied verumontanum etc., in addition to such gross and obvious congenital malformations as ectopic bladder.

While these conditions have been held by Urologists to be responsible for a certain number of cases M.F. Campbell [30] gives it as his opinion that 90% of enuretics have no demonstrable urological lesion.

Some cases are due to such conditions at T.B. kidney, chronic nephritis, cystitis, trigonitis and urethritis. Urinary infection accounts for others, the Bacillus Coli being the usual organism responsible. Thus Fleischner [55] found the urine so infected in 20% of his cases.

Irritation from the presence of urinary calculi and the passage of abnormal crystals, especially oxalates, is also causative, while such minor local defects as phimosis and the presence of an unduly long foreskin undoubtedly account for some of the male cases.

The results of circumcision however are disappointing. [116] Further, in my experience the vast majority of children who come to hospital for circumcision have never had enuresis.

The local irritation due to threadworms is sometimes responsible but again many children have threadworms without having enuresis and removal of the threadworms often fails to cure the trouble.

It would appear then that there is no disease or defect, general or local for which we can blame other than a very small proportion of cases of enuresis.

2. Cases with Mental Defect.

It might reasonably be supposed that the problem of enuresis might, in some way, be associated with the intelligence of the child and that the condition would be more frequent in those children whose mentality was of a low order.

This question of the intelligence of enuretic children has received the attention of several writers and the results of their investigations are rather surprising.

The Intelligence Quotients of a large number of children were worked out by Addis [22] who found that 982 non-enuretic children had a peak I.Q of 100.

The I.Q's of 225 enuretic children on the other hand showed two peaks, one at I.Q = 90 and one at I.Q = 110. This latter finding bears out the clinical observation that there are two main types of enuretic child, one type is especially bright and alert; the other tending to be dull and apathetic.

Other interesting figures are obtained with regard to mentally retarded children. Of 11 children with an I.Q of 40, i.e. idiot level, only one was an enuretic, and of 23 children with an I.Q of 50 again only one had failed to gain control.

These observations are confirmed by the work

of Schroeder[56] whose average I.Q for 70% of a series of enuretics was 90.

It would appear that there is no relationship between enuresis and mental development.

3. Allergic Conditions.

It has recently been suggested by Bray[57] that enuresis may, in some cases, be an allergic condition.

He quotes cases associated with Asthma and hay-fever and other allergic manifestations such as lichen urticarius; while he considers that in other cases the enuresis per se, to be the allergic manifestation.

I was able to take careful histories from 37 enuretic children and their parents. Of these, one child had asthma and another suffered from attacks of a skin condition which might possibly have been allergic. The remaining 35 gave a history that was completely negative.

4. Cases with Environmental Defect.

This section of course includes a wide group of cases, in my opinion the majority.

Careful enquiry in taking the history of these children will almost invariably disclose some defect, either because the environment is obviously faulty, or because the child has not adjusted itself to an environment which is perhaps fairly good. Inasmuch however as that the child has not been trained, guided and helped to adjust itself, such

an environment must still be judged defective.

The question of economic circumstances has already been considered but the question of their importance is the more difficult to assess because in general the statistics have been obtained from the hospital class i.e. the poor.

Nevertheless, it is easy to understand how the combination of a poor home lacking warmth, accessible lighting and perhaps even an indoor lavatory must tend to inculcate and perpetuate the habit.

The question of the child's happiness is of the utmost importance and it has been suggested that the child, finding life less pleasant as he gets older, obtains in this prolongation of an infantile habit a means of escape from actuality [24]. Why the way of escape should take the from of enuresis is not as difficult to explain as might be supposed because usually enuresis is only one of the infantile traits which these children manifest, thumb-sucking, nail-biting are others commonly found [62].

In these cases of environmental difficulty the enuresis is often directed against one of the parents, usually the mother, who is associated in the child's mind with its unhappiness. So much so is this the case, that it has been recommended that the other parent should be associated in the trouble caused by the child's habit, to defeat this purpose.

Jealousy plays a large part in many of these cases, jealousy of an elder member of the family,

or of a new baby. How often one hears of the enuretic child that "he was all right till baby came"

The neglect, real or imagined, felt by the child engenders a desire to attract once again the attention he believes he has lost, to be once more the focus of attraction, and the formation of the bad habit of bedwetting represents his attempt to do so.

The importance of environment is well illustrated, as is the value of kindly discipline, by the behavious of these children when admitted to hospital. Almost at once, as if by magic the enuresis ceases.

Where the environment is defective, the training of the child, will, of necessity almost, be defective also, and even a "good" theoretical environment must stand condemned if the training is defective, as it is in many of these children 60, 61).

This error in training, in my experience, manifests itself in two ways. Firstly there is in the upbringing of the child a lack of discipline, andssecondly there is a failure on the part of the parent to induce and encourage the child gradually to accept the increasing responsibility necessarily associated with a more mature existence.

That this lack of discipline, and I do not of course refer to the extreme Victorian form of it, is extremely common among the hospital class of child, no one who has had much experience of them will deny and no doubt it applies equally to the other class.

How often in an Out-Patient Department is one solemnly informed by troubled parents that their budding off-spring just will not do this, that, or the other, and, unfortunately the child's refusal is usually related to some important matter for his own welfare, what he shall eat, or when he shall go to bed.

The fault is undoubtedly parental in these cases, for one knows quite well from experience, that the same child, admitted to the ward, will prove instantly amenable to the kindly discipline prevailing there, will eat and drink what he is given, and settle down at a reasonable hour. And, as a corollary, it may be noted as mentioned above that enuresis, if present, would almost certainly cease 109).

With regard to the failure to accept responsibil-:ity, the position seems to me to be that most of these childrens parents lack the time, even if thay have the ability and inclination, to inculcate good habits and gradually to eradicate infantile ones from their children.

The line of least resistance is to let the child do what it pleases, and if this "pleasure" consists in sucking a thumb or a bottle, long after the bottle stage is past, it is very unfortunate, but it keeps the child quiet and the mother has plenty else to do.

Peace is purchased at the price of faulty training.

It would be erroneous to assume however that in all enuretic children there is a failure to accept responsibility.

I think in the majority, there is but there are the other cases where too much responsibility is thrust on a young child and enuresis represents the attempt to escape back to the irresponsibility of infancy.

Conclusions regarding Aetiology of Enuresis.

All the theories regarding the cause of enuresis and all the conditions local and general associated with it and regarded in their turn as causative account for only a small proportion of the cases.

Thus Cameron [58] states that he considers enuresis a purely functional condition and this conclusion is agreed to by M.F. Campbell [30] who states that at least 90% come into this category. Further Walker [59] says that despite the prominence given to physical signs and symptoms "in practice the vast majority have no physical lesion."

From personal experience I am of the opinion that the views expressed above are correct, and this being so. I regard defects of environment and training as being causative in the majority of cases. A small and definite minority who have a specific lesion, cure of which will cure the enuresis, undoubtedly exists but it is a great

mistake to assume that, in these cases when some deviation from normal health occurs that this is necessarily the cause of the trouble. The "spot diagnosis" of the cause of a particular childs enuresis is likely to lead only to failure and disappointment.

CLINICAL MANIFESTATIONS.

The essential feature of the condition is, of course, the involuntary passage of urine while the child is asleep. There may however, be diurnal incontinuence as well and McGregor [26] found the two types to co-exist in 38% of her 70 cases. This figure is, in my view, much too high, and in my experience, Anderson's figures give a more correct representation of the true state of affairs. He found the condition to be nocturnal only in 76% of 108 male cases and in 87% of 40 female cases [28].

Other observers however find the percentage of those afflicted day and night even higher than does McGregor, and Davison estimated that 64% of his cases were of this type and only 34.5% of the purely nocturnal variety.

All authorities are agreed that diurnal enuresis alone is uncommon and in most series of cases it occurs in only 4% - 5%, [112, 113].

Faecal incontinence is sometimes a complicating factor and was present in 10% of one series of cases [113].

The term enuresis is used above in its broadest sense but some investigators confine its use to these cases in which the nocturnal or diurnal emptying of the bladder takes place "in the absence of a demonstrable organic, nervous, or genito-urinary lesion" (Davidson).

I have already stated my belief that the vast majority of these children who suffer from incontinence

of urine are enuretics in the restricted sense of the word, that is, they are of the "essential" variety.

Enuresis must of course be distinguished from these cases in which there is no voluntary control over the bladder at all.

In enuresis, the control is intermittent and wet periods are succeeded by dry ones. Furthermore in enuresis the bladder is completely emptied with each involuntary act, as opposed to the type having no voluntary control at all, in which there remains some residual urine after the bladder has attempted to empty itself.

Enuresis usually dates from infancy as in 116 out of 140 cases quoted in one series [28]. An alternative history sometimes given is that the child acquired control about the usual age of two years, and subsequently relapsed, for some specific reason in some cases and for no specific reason in others.

The different types of case are very diverse but they may, broadly, be classified as follows:-

1. Those in whom frequency is present from birth. They have enuresis of both the diurnal and nocturnal type.
2. Cases who develop control during the day at a normal age but who fail to gain nocturnal control.
3. Those who develop enuresis after an illness

such as scarlet fever or measles.

4. Associated with some mental excitement such as starting school, examinations, antipathy towards some other member of the family, etc.

5. Associated with definite signs of mental impairment.

With regard to this last type, I think it has been conclusively shown that while enuresis and mental deficiency may co-exist the latter is not responsible for the former, or only in rare cases.

6. Associated with some disease of the genital tract, a small but important group.

There may be, and usually are, no physical defects or symptoms whatever other than the enuresis; but there may, on the other hand, be associated conditions such as enlarged tonsils, threadworms, etc. the significance of which has already been discussed.

INVESTIGATION OF A CASE OF ENURESIS.

In the investigation of a case one should, I think, consider first of all the type of child presented and then the type of parent.

As has already been mentioned I believe there to be two main types of enuretic child, the one dull, lethargic and easy-going and the other, of an over active, eager, nervous disposition. There are of course many intermediate types between these two extremes.

With regard to the parent, one has to consider whether she is intelligent, whether she is likely to be co-operative, what is her attitude to the child, and the child's to her. Is she likely to scold the offender into a state of sullen resistance, is she of the doting type whose darling can do no wrong, or has she become indifferent at last to her child's affliction?

What of the attitude of the father, both to his child and to the mother.

One must enquire whether either parent suffered from the same complaint, if so for how long, and whether the child is aware of the fact. If there are any other children, are they affected, or did the present offenders condition date from the birth of one of them.

Information should be sought about previous illnesses particularly as to whether, any one of them coincided with the onset of the enuresis.

Particular stress should of course be laid on past disease which might have affected the kidney or bladder.

One must try to ascertain the relationship of the child to the rest of the family and whether or not he is of a happy disposition. In other words does he fit in well at home and at school.

The importance of the happiness or otherwise of relations between the parents and the general harmony or otherwise of the domestic scene should be enquired about.

Has the child any other "bad habits".

For example, does he masturbate, bite his nails, suck his thumb, or is he subject to sullen fits or to sudden exacerbations of temper. Is he a disciplined child or does he resent any form of parental control.

It is desireable to know the type of home from which the child comes, the financial circumstances of its parents and what domestic arrangements have been made with regard to the child's sleeping accommodation. Does he sleep alone or with others and is it easy for him to get up, put on the light, and find his way to the toilet should he require to do so.

Particulars should be asked as to whether the condition is worse in Winter than in Summer or if it is only present at certain seasons of the year. In cases drawn from the poorer classes of the community Batty[29] noted a marked increase in the

incidence of the complaint during cold weather.

It is also necessary to determine whether there is any relationship between the onset of an attack and some excitement or anxiety such as a school examination.

The attitude of the parents and family to the wet bed is of importance particularly as to whether the "accident" is discussed in the child's presence or not, and if he is laughed at, punished, or ignored.

A visit to the home of these children is often advisable, and much may be learned there of which one would never hear in the consulting room. Particularly the state of the bed should be noted and examined for cleanliness and adequacy of bed-clothes. The number of persons occupying the bed may also be noted along with the presence or absence of a chamber. It is surprising how often the latter article is missing and I can recall excellent results from its provision in at least one obdurate case. Many of these children come from homes where electric light is unknown, and, as many of these children are, in my experience afraid of the dark, the provision of a "night-light" may be tactfully suggested during the visit should it appear necessary.

Finally, in the investigation of a case it is essential to know what treatments have been previously tried and with what result.

This investigation, needless to say, involves

the expenditure of much time and tact, several interviews being necessary though the child should not be present at all of them. The reason for this is, of course that the child must be made to realise that the enuresis is his responsibility and that the cure is in his own hands with mother and doctor standing by to give him all the help they can. He must not be allowed to find some excuse for his trouble behind which to shelter, such as that his father had enuresis till 14 etc. I feel strongly that treatment is, in many cases, of no avail because the person in charge of the case either has not the time, or will not give the time, thoroughly to investigate it along the lines above suggested.

EXAMINATION OF THE PATIENT.

This examination must enable one not only to get an idea of the workings of the child's body, but also of the workings of his mind. It must include in the latter connection, as far as possible an estimate of the type of mind possessed by the parent on whose good sense, good will, and co-operation, so much depends. Therefore, the parents attitude to the child must be noted as well as that of the child to the parent, especially if he be asked to do something or to stop doing something!

The demeanour of the child is important and one should take note of his response to questions, whether he is alert, sullen, or apparently stupid and, generally, how he conducts himself in the presence of a stranger.

A systematic clinical examination should then be carried out.

The general appearance should be noted with regard to physique, posture and nutrition. The child should be weighed and measured and any marked deviation from normal noted.

The mouth and throat should be carefully examined noting the presence of carious teeth, enlarged or septic tonsils or the presence of a dirty tongue or offensive breath. The tongue should also be examined for teeth marks which might suggest the presence of a nocturnal type of epilepsy.

It is advisable to test the acuity of vision

with Snellens types and to have a proper examination for errors of refraction carried out should any defect be found.

A past history of otorrhoea should be enquired about and the ears examined.

Particular attention should be paid to the genitals and any balanitis or vaginal discharge noted. The presence of both testicles in the scrotum should be verified. The anal region should be examined for signs of excoriation and both hairs and under-clothing examined for the presence of pediculi or other body parasites.

The urine must be carefully examined. It is desireable to obtain both a day and a night specimen and to compare the specific gravities of the two. This not only gives first-hand evidence of renal efficiency but prevents the overlooking of a case of reversed urinary concentration or of diabetes insipidus.

The absence of albumin, sugar and acetone should be verified and a specimen examined microscopically for the presence of pus cells, organisms or abnormal crystals especially of the oxalate type. In all doubtful cases a catheter specimen should be sent for bacteriological examination and in cases which are resistant to treatment for, say three months, a urological examination should be carried out.

In addition, a brief examination of chest, abdomen and nervous system should always be made

TREATMENT.

If it be true, as has been said, that the more remedies there are for a disease the less likely it is that any one of them will be efficacious, then the treatment of enuresis would indeed be a Herculean task. It is doubtful if such a manifold diversity of cures exists for any other disease, and certainly the range of treatment, which appears to be from major surgical operations to the administration of innocuous doses of medicine, must be unique.

Operative procedures.

Laminectomy.

Believing that spina bifida occulta was of aetiological importance in the production of enuresis, Mertz [49] performed a laminectomy on several cases and removed fatty masses alleged to have been compressing the meningeal sac. Improvement is said to have followed this drastic procedure.

Epidural Saline.

The injection of normal saline into the epidural space has been tried by Freeman [67] who, following on the original method of Cathelin [68] injects 10 cc. of fluid through the membrane covering the sacral hiatus. The pressure thus produced on the cord is said to have a tonic effect on the lumbar centres and thus to help the enuresis.

In a certain number of these children a congenital hypertrophy of the bladder has been observed. This

may be shown by urological examination to be due to the presence of valves in the posterior urethra formed in connection with the mucosa of the verumontanum, destruction of which affects a cure. Should no organic obstruction be found the hypertrophy has been assumed to be analogous to that occurring in Hirschaprungs disease and improvement has followed resection of the pre-sacral nerve. (Learmonth 110).

In addition to these methods various other forms of injection have been tried. Marion 69) for example, injects about 60 cc. of saline into the perineum on each side of the midline with good results. Jaboulay 70) however prefers a site midway between the sacrum and the rectum while a third method is to deposit the saline round the membranous sphincter of the urethra itself 73).

Other writers claim excellent results from the injection of sterile water given hypodermically 71,72).

On the grounds that many enuretic children have a genital hypoplasia Goldman 74) has treated them with the Anterior-Pituitary-like substance found in pregnancy urine. Good results are claimed and the rationale of the treatment is said to be that connective tissue structures are influenced in their rate of growth by Prolan B and that these structures have been shown to be deficient in enuretic children 75,76).

In none of these forms of treatment can the suggestion factor be excluded and in view of the

good results claimed with the use of hypodermic sterile water it seems hard to justify other more drastic, painful, and dangerous procedures.

The only contributor to the literature as far as I am aware, who claims to have excluded suggestion from his injection therapy is Mueller [53]. Following on the work of a colleague who claimed excellent results from the injection of Tuberculin, he, eliminating the suggestion factor, completely failed to confirm the good results previously obtained.

Mechanical Devices.

Probably the earliest of these was the cruel method of ligaturing the penis with cord, which barbarous procedure, though doubtless effective, sometimes resulted in gangrene. A somewhat later idea mentioned by Walker [59] was to seal the urethral meatus with collodion.

The modern mechanical method consists in the use of a penis clamp and this instrument is highly spoken of by Claser. The use of a simple rubber urinal has also proved satisfactory, although these measures are usually only palliative [58].

For the most ingenious method yet, devised for the treatment of enuresis, credit must undoubtedly be given to Grenouille [72], who fixed up an electric circuit in such a way that, when it was completed by the patient passing urine, a bell was sounded for the purpose of wakening him.

Electro-therapy.

Treatment by the use of a faradic current has been tried in the belief that the tone of the sphincters can thus be improved. The negative terminal is applied to the skin, over the sacrum [59] and the positive one to the abdominal wall.

The use of an interrupted current has also been suggested, one electrode being applied to the perineum and the other to the lumbar region [43].

Hydrotherapy.

Massage, followed by douching the lumbar region with cold water is recommended by Griffith [78] this treatment, by means of which 80% of cures are claimed by Prendergast [79] is given before retiring.

I have no personal experience of the methods detailed above but it is obvious that few of them have other than a very limited application and some are too drastic for further consideration.

Drug Therapy.

Thyroid Extract.

This remedy was first used by Leonard Williams [80] in doses of gr. ½ to gr. 2½ according to age and Goodheart vouches for its efficacy and says he has seen marked benefit from its use even in old-standing cases.

Thyroid is advocated also by Sundell [12] who thinks there is a dulling of cerebral perception in

enuresis which is combated by the use of this drug. Shelden[27] on the other hand is of the opinion that thyroid is valueless and advocates the use of a strychnine and ergot mixture.

Belladonna.

Tincture of Belladonna, lauded by all says Anderson[28] save by those who have some special drug of their own, is probably more than any other, prescribed for these cases.

Its mode of action is not clear but Cushing[81] suggests that its power of modifying spasmodic contractures account for its success. Indeed Hutchison[82] goes so far as to say that he believes it to be the only drug of any value in this condition but he stressed the importance of large doses up to 60 minims thrice daily continued for one month. It is interesting to note that 30 years later his opinion remains unchanged in the latest edition of his well-known book.

Ephedrine.

This drug is claimed by Parkhurst[83] to be almost specific especially in treating older children but Christopher and Broadbent working five years later evidently found it necessary to give their cases Belladonna as well. In a series of 12 children they were able to control 8 with $^1/_4$ gr. given at night while the reamining 4 required $\frac{1}{2}$ gr. in addition in both cases to the belladonna.[84]

Their work is interesting in that they also tried pseudo ephedrine, an isomer of ephedrine which they found to be less effective.

Pituitary Extract.

Jacobs[85] states that this preparation is of value and quotes a series of 49 cases of which he cured 16 and improved 17 by its use.

This findings are confirmed by Moss[86] who cured 50% of his 30 cases and improved 25%.

As this preparation was injected the psychological effect of this procedure must be taken into account in assessing the value of the results obtained.

In addition to these fairly well-known remedies many other preparations have been tried for most of which it would be impossible to find any pharmacologic-:al justification. Thus Gibbs[87] Tincture of Valerian, Radcliffe[88] Taka-diastase and Moss, Rhus Aromatica[86].

An old remedy favoured by Ochsenius[40] was glycerine, while the claims of Camphor were sponsored by Pototzky[89] and Deangelis[90].

The latter cured 6 out of 11 cases by giving 2 gr. at night basing the rationale of his treatment on the hypothetical sedative action of camphor on the genital region.

It may be noted in connection with this drug that some modern pharmocologists consider it to be therapeutically, inert.

It is natural perhaps that some form of testicular extract should have been used in enuresis and this was done by Fischer [4] who observed cryptorchidism in many enuretics. He reported success in 479 out of 500 cases but rather invalidated his results by stressing the importance of "confidence" and other intangible factors. In my experience testicular abnormalities in enuretic children are very rare.

Benzidrene.

This comparatively recent preparation has already been tried in enuresis. Molitch [91] administered the drug to 22 chronic bed-wetters on the assumption that it would stimulate their mental processes and make their sleep more light.

On the first evening of the experiment all were given a placebo resembling benzidrene tablets. This placebo "cured" eight.

Of the remaining 14, 12 were kept dry on a dose ranging from 5 - 25 mgms. of benzidrene for a period of three weeks.

After withdrawal of the drug all 22 reverted to their original habits.

If Courtins work on depth of sleep be accepted there is no rationale for the use of this drug.

Efficacy of Drug Treatment.

While working in M.O.P.D. at the Royal Hospital for Sick Children, Edinburgh, I was able to observe

the effect of various kinds of drug on cases of enuresis, and was struck by the very large number of children who relapse completely under treatment with them.

In the following cases, the term "cure" is used to indicate freedom from trouble for a period of at least 3 months.

The term "improved" means that enuresis only occurred on an average of once a week.

All the cases quoted were normal to physical examination and urinalysis was negative.

The ages ranged from 4-12 years and all were persistent bed-wetters of the "almost every night" type.

No ancillary treatment save fluid limitation was given.

I am indebted to the courtesy of Dr. Eric Dott and Dr. H.L. Wallace for permission to examine and report on the majority of the following cases.

DRUG	NUMBER OF CASES.	RESULT IN THREE MONTHS TIME			PERCENTAGE FAILURE.
		CURED	IMPROVED	FAILED	
Potass. Citrate Mixture	19	1	3	15	78%
Belladonna	28	2	9	17	60%
Thyroid	12	1	2	9	75%
Atropine sulphate	14	-	5	9	64%
Eserine sulphate	18	1	5	12	66%
Total	91	5	24	62	-

HYGIENIC MEASURES.

Diet.

The question of diet in children suffering from enuresis does not appear to have been extensively investigated but Noeggarath [92] noted an excess of potatoes and Na Cl. in the diet of many of his patients, while Van der Bogert [93] reported numerous instances of grossly incorrect feeding.

Zappert [94] however pointed out that most cases are not improved by alterations in feeding even when the diet had been markedly defective.

Most standard textbooks recommend restriction of fluid in the evening, but Thursfield [95] advises no limitation on the grounds that it promotes an excretion of a highly irritating acid urine from the kidneys which provides additional stimulus to vesical contraction and so only serves to make the condition worse.

It would seem however to be a reasonable procedure to curtail evening fluids and it is my practice to allow no drinking after 5 p.m. On general grounds too a general mixed diet with ample milk and vegetables is advised.

With regard to the childs environment the importance of it being a happy one has already been stressed. Even if this be difficult, one must at least be certain that adequate and accessible toilet facilities are available and that the childs bed

coverings, especially in winter, are sufficient. This point is rightly stressed by Batty[29] in his monograph on the subject. One must also find out whether the childs hours of rest are adequate as they so often are not in the hospital class of child.

During the day the child should be encouraged to empty his bladder at frequent intervals and to take sufficient time over the act to ensure complete emptying of the bladder and not merely relief of tension, (Dott)[96].

Most important among hygienic measures is the simple one of cleanliness[97] which is most important in dealing with these children. The use of stained bed linen and malodorous mackintoshes, for example, is to be deprecated despite the additional trouble involved.

The child must be taught to regard cleanliness as among the highest of virtues, and to admire and respect the attainment of it. This aesthetic sense, often blunted in these children should be developed as much as possible. This can only be done if the person looking after the child is herself fastidious.

The question of emotional stability has already been stressed, hence the need for an atmosphere of harmony in the home. A common cause of such instability is the development in the child of an over-strong affection for one or other parent from which undue dependence on that parent develops. In these cases the emotional instability may well

have some degree of bladder instability as a concomitant factor the child finding great pleasure in, say, the mother's presence at his bedside at night should an accident occur. The obvious remedy is to remove the child from the mother's room and to ensure that, if necessary, he is lifted by some other person [99].

In this connection Alice Hutchison [97] relates the story of the mother who, following on advice given in his infancy lifted her 7 year old son every 3 hours!

The persistence of infantile traits in these children as instanced by the ease with which they are reduced to tears, their failure to assume responsibility along with a tendency to profound changes in mood for little reason, is commented on by M.F. Campbell among others [30].

The gradual eradication of such traits is, therefore of great importance, the child being made to realise that as each milestone is reached he is gradually "getting to be a big boy" and therefore can now do this and that for himself, and should stop doing so and so, it being a habit only of the very young and quite unworthy of his advanced age. Thus napkins are gradually discarded, the child graduates from cot to bed and finally to a room of his own.

Independence is fostered at every turn and no opportunity lost from the earliest years of teaching

the child to do things for himself, and, once he can do them, he should always be encouraged to do so and should never have them done for him.

A child brought up on these lines is unlikely to develop a conduct disorder such as enuresis and it is the difficulty of remedying long standing faults of training and of obtaining parental co-operation, that is the main obstacle in the successful treatment of enuresis.

PSYCHOTHERAPY.

The fundamental principle underlying all psycho-therapeutic measures is that of suggestion. The childs confidence is gained, he is made to believe, i.e. it is suggested to him, that he will get well, and, in theory he does get well.

As has already been noted, this factor enters into many methods of treatment other than psychological and in fact it might be said that in all treatment the power of suggestion has its influence. Especially is this the case when for example, injections are given. Thus injections of epidural saline, tuberculin, glandular extracts and sterile water have all given good results in some cases, nor has the site or quantity of the injection made any difference. Surely then the factor of suggestion must be the main if not the only one concerned?

Hence Zappert's,[94] I think accurate, summing-up of all therapeutic measures as being either symptomatic or suggestive.

Hypnosis.

The use of suggestion as a therapeutic measure is carried to its logical conclusion by those who make use of hypnosis, and thus render their patients ultra-susceptible to its influence.[58] Cameron believes this procedure to be invariably helpful in inveterate cases and Narath[100] claims 70% cure in his 182 cases by this means.

This mode of treatment is also advocated by

Kleeman [101] and Koster, [102] the latter claiming 99% of successes.

A much less drastic modification of this treatment is that of suggesting to the child when he is half asleep that next time he wishes to pass urine he will wake up before doing so [59]. It may be recalled that in his "Brave New World", Huxley [105] made use of an analogous device to render his laboratory children content with the station in life to which their Alpha masters desired to assign them.

Charts and Rewards.

With a view to obtaining the childs interest and co-operation the use of a small bed-side calendar on which the child is permitted to enter a star for each dry night was recently introduced. In a series of 70 cases 60% cures were recorded [26]. McGuiness [36] considers these charts a great help in cases which are otherwise progressing satisfactorily.

The importance of stressing to both parent and child that, with their co-operation the problem can be overcome is stressed by Beckford [106] who combines with this treatment such adjustment of environment as is necessary to remove any causes of psychic strain.

The relative virtues of medicinal and psychotherapy are compared by Wile and Orzel [107] in two parallel series of cases.

They found that results were approximately

equal. Approximately 38% of each group of children being rendered symptom free.

Personal Views of Treatment.

As a result of a fairly comprehensive survey of the literature I have come to the conclusion that almost every possible aspect of the enuresis problem has been considered, especially from the therapeutic aspect with the exception of one, which is hardly mentioned at all.

I refer to what one might term the prophylactic treatment of enuresis.

Time and again one reads that faulty training and bad habits are largely responsible for the trouble, but to whom must the blame for this be assigned? Partly no doubt to the parents concerned, especially the mothers, in whose province the child's training chiefly lies, although I fail to see how an educational system which trains girls for almost every conceivable occupation, save that of child care and training can altogether escape censure. Nor, in fact is the medical profession altogether blameless. Even today, a very large number of women still have a doctor in attendance at their confinements and he, who should at least know something about the care and training of children, too often leaves the mother at the end of her puerperium without any advice for the future welfare of her child, apart perhaps from some perfunctory admonitions on the subject of diet.

I suggest with all due deference that this is a mistake.

It seems to me, that, as enuresis causes so much unhappiness and discomfort to children it would be better to regard each new arrival into the world as a potential enuretic, and therefore to give the mother some advice on the inculcation of good habits from the earliest age. If this is tactfully done the mothers interest is aroused and her co-operation secured at the very beginning and thus one has in hand as it were, a valuable asset should future trouble arise. It is undesireable of course to stress the question of enuresis to the mother, it can be put to her as a matter of convenience to herself and benefit to the child.

It may be objected that nearly a year must elapse ere good habits with regard to micturition can begin to be taught but the seed of future good training cannot be sown too early and most babies in any case are seen several times in their first year of life if only for dietetic reasons.

Right at the beginning then, the mother should be told that the earlier training is begun the sooner will bladder control be established. When the child is 9-10 months old, she should take note for a few days of the times at which napkins have to be changed, and, subsequently he should be placed on a vessel at these times and signs of approval given should he succeed in passing urine. These routine

times should include before and after naps, after meals, and when the parents themselves retire. In this latter connection, must be emphasised the importance of thorough wakening. I believe that to get a child to pass urine in a semi-unconscious state is worse than useless, whether from the point of view of training, or, to anticipate a little, of attempting to cure an established case of enuresis.

In the latter case, to ensure that the child is thoroughly aroused, I frequently recommend that his face be gently sponged with tepid water.

The child should not be allowed to sit too long upon the vessel nor should he be scolded if he fails to urinate. If he passes water on a napkin shortly afterwards he should at once be placed on the chamber. It is also desireable that at an early age he should be taught a word to indicate his needs as far as his bladder is concerned.

After some degree of control has been established the mother should avoid expressing annoyance or dismay over occasional lapses. She should reward success rather than condemn failure. She should also be told that as children vary much in the rate at which they learn she must practice patience and perseverance.

I make a practice of giving a resumé of this advice to mothers whom I see at the time of their confinements. I am confident that only good can result from so doing and that much future unhappiness

and trouble may be avoided for both parent and child.

Even despite careful training some children will develop enuresis and if this persists after the third year a thorough investigation along the lines previously indicated, is called for, as it is impossible to feel confident in treating such a case as functional, until all possible organic causes are excluded. In obstinate cases a urological investigation should be carried out. Next, everything possible should be done to improve the child's hygienic and environmental conditions as detailed under that heading. This may be difficult if not impossible, particularly if the parents are unco-operative, and, in my opinion, leads to many failures. Further, economic circumstances may preclude even the most elementary improvements such as the provision of adequate bedding.

The question of the attitude of the parents to their other children is of importance as jealousy often plays a large part in these cases 28).

Parents must be warned against showing undue favouritism to any one member of the family and particularly against showering attention on a new addition to the family in the presence of an older child. I have frequently noticed that enuresis developed in a previously continent child only after the birth of another brother or sister.

Too much stress cannot be laid on the importance

of taking time and trouble to gain the childs confidence and to impress on him that while everything possible will be done to help him, he himself must make the initial effort to cure his complaint. 98).

With regard to the use of drugs the results shown in an analysis of cases is not, to say the least of it, impressive, though I still think that large doses of Belladonna are worth trying as an adjunct to other measures. I regard the keeping of charts and the giving of rewards as being of value in certain cases but they should not be unduly emphasised, the ideal being to get the child to regard a dry night not as something wonderful to be put on special record, but rather as something naturally expected of him. Naturally, as a corollary of this neither successes nor failures should be the subject of family conversation in the childs presence.

The power of suggestion being in my opinion the most powerful therapeutic weapon available in an established case and second only in importance to what I have called prophylactic treatment, it seems logical to make full use of it. I have therefore, in older children who have been in my care, followed, with some slight success a method first used by Dunham, some twenty years ago, to which I have found no subsequent reference made in the literature. The children were given four associated sentences

printed on a card thus:-

1.) I am not going to wet the bed.

2.) I am going to wake up tonight.

3.) I shall get up and pass water.

4.) I am not going to wet the bed any more.

The child repeats these sentences several times during the day while urinating and again, half a dozen times, before retiring.

I have been able to try this method in a small series of eight cases between the ages of 7 and 12 years in whom physical examination and urinalysis revealed no obvious defect.

All the children wet their beds from thrice weekly to nightly as a general rule. In five cases the condition had persisted more or less since infancy, one developed aged 4, following the birth of another child, while the remaining 2 had wet the bed for 3 years and for 9 months respectively.

The results of treatment by Dunham's method with the addition of encouragement and all possible hygienic and environmental improvements are as follows:-

Case No.	Age.	Duration.	Result.
1. Male	8	Since infancy.	Reduced to 2-3 times per month Observed 4 months.
2. Male	9	9 months.	No lapse in 3 mths.
3. Male	7	Since infancy.	Once weekly. Observed 3 months.
4. Female	10	Since infancy.	Reduced to twice a month. Observed 4½ months.

Case No.	Age.	Duration.	Result.
5. Male	10	Since aged 4.	No improvement.
6. Male	12	Since infancy.	Reduced to once a week. Observed $3\frac{1}{2}$ months.
7. Female	11	Since infancy.	"Very occasionally" Observed $3\frac{1}{2}$ months.
8. Male	9	4 years	Reduced to twice a week. Observed 2 months.

While this number of cases is much too small to assess the value of the method used, the findings confirm those of Dunham and appear to justify a more extended trial than has so far been the case.

CONCLUSION.

Enuresis is a condition which not only causes much inhappiness to its victims but which does not by any means always undergo a natural cure. It is also more common than is generally realised.

In consideration of the aetiology of the condition, hereditary factors may play a small part but racial factors and size of family are of no significance, nor is there any greater incidence in either sex. The condition is more common among the poorer classes, but this may be due to the fact that most investigations have involved the hospital class of child. Most cases begin in infancy or develop in early childhood.

Of the many theories of causation none accounts for more than a proportion of the cases and that proportion is generally a small one. The majority of the diseases and defects which have been held to be causative are merely co-existing factors and not necessarily causative factors at all. This applies particularly to mental deficiency with which enuresis has no direct connection, the proportion of enuretics not increasing as the Intelligence Quotient diminishes.

The theory, which I think does cover most of the cases, with the exception of the small percentage having a specific lesion, cure of which will cure the enuresis, is that the condition is essentially one associated with defective training

and environment. This, in my view is by far the commonest cause.

The investigation of each individual case is of the utmost importance, including as it must, a careful history, a full physical examination and a careful investigation of the environment of the child.

With regard to the treatment of these children, I have enumerated various operative procedures which have been tried, most of which are as impracticable in the average case as they are undesireable. A survey is given of some of the numerous drugs that have been used in the treatment of enuresis and the effect of five of the most commonly used, Potassium Citrate, Belladonna, Thyroid, Atropine sulphate and Eserine sulphate, has been noted in a series of 91 cases.

The results are disappointing, the most effective being Belladonna and that failed in 60% of the cases in which it was tried.

I have made a strong plea for what may be termed prophylactic treatment. Every mother should, I think, receive instruction on the training of her child at the time of her confinement, particularly with regard to the inculcation of good habits in connection with bladder function. Thus, I feel, many cases might be prevented.

With regard to the established case of enuresis the most hopeful lines of treatment are I think to

improve the childs general health, to remedy all possible defects in environment and hygiene, and to attempt to obtain full co-operation of child and parent in order that the desire for cure, and the determination to be cured, may be fostered in the childs mind.

On the principle that any treatment is of value which suggests to the child that cure can and will take place, I have tried Dunhams method of getting the child to concentrate on suggestive sentences written on a card. The series of 8 cases so treated is too small for definite conclusions to be drawn but the results are encouraging.

With regard to the cases that fail to respond to treatment I think the main causes of lack of success are parental stupidity and indifference and lack of a full comprehensive investigation of the case.

The first factor is outwith control; the second is not, and, tedious as the necessary work may be, the result is surely worth while.

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