why the usual clinical tests fail at an early stage, and may even fail completely, to show the presence of diseased kidneys. Once this equilibrating mechanism is upset, for whatever reason, renal function will rapidly deteriorate and uraemia develop. The morphological manifestation of this train of events constitutes what has been termed a "true scleroderma kidney."

Summary

In a small percentage of cases scleroderma produces characteristic morphological changes in the kidney. These consist of mucoid proliferation, accompanied by gross reduction in lumen, of the proximal parts of the interlobular arteries, while the distal parts of these arteries exhibit a fibrinoid necrosis extending to the arterioles. In the parenchyma of the renal cortex ischaemic necroses occur.

The case is reported of a woman aged 43 who developed acute renal failure shortly after the institution of steroid therapy for polymyositis. The renal histology followed the pattern seen in "true scleroderma kidney."

Out of 25 patients suffering from scleroderma of varying severity 80% showed a reduced $C_{P.A.H.}$ (for the estimation of R.P.F.), normal $C_{Cr.}$, and increased F.F. From this it is concluded that the finding of a reduced R.P.F. furnishes an earlier indication of scleroderma renal involvement than do the commonly used clinical tests.

Reduced $C_{P.A.H.}$, normal $C_{Cr.}$, and increased F.F. indicate that the anatomical changes in the preglomerular arteries are accompanied by spasm of the efferent vessels. The presence of a compensatory mechanism serving to maintain, so far as possible, maximum glomerular function in the presence of a diseased renal vascular system is suggested.

REFERENCES

- Allen, A. C. (1952). *The Kidney*. Churchill, London.
- Banks, B. M. (1941). *New Engl. J. Med.*, **225**, 533.
- Bartels, E. D., Christensen, L. K., and Ohlsen, A. S. (1955). *Acta path. microbiol. scand.*, Suppl. **105**, 174.
- Beigelman, P. M., Goldner, F., and Bayles, T. B. (1953). *New Engl. J. Med.*, **249**, 45.
- Bevans, M. (1945). *Amer. J. Path.*, **21**, 25.
- Calvert, R. J., and Owen, T. K. (1956). *Lancet*, **2**, 19.
- Conestabile, E., and Natale, P. (1953). *Progr. med. (Napoli)*, **9**, 41.
- Enticknap, J. B. (1952). *Lancet*, **1**, 316.
- Glaser, R. J., and Smith, D. E. (1953). *Amer. J. Med.*, **14**, 231.
- Goetz, R. H. (1951). *Angiology*, **2**, 555.
- Goldman, I. R., Young, J. M., and Knox, F. H. (1954). *Dis. Chest*, **25**, 94.
- Gömöri, P. (1949). *Kisérlet. Orvostud.*, **1**, 35.
- (1952). *Mag. Tud. Akad. Bol. orv. Tud. Osztal. Köz.*, **3**, 157.
- Földi, M., and Szabó, G. (1952). *Mag. belorv. Arch.*, **3**, 105.
- and Komáromy, I. (1950). *Ibid.*, **3**, 111.
- Gonzalez Salvatierra, A. (1955). *Rev. méd. Chile*, **83**, 162.
- Hannigan, C. A., Hannigan, M. H., and Scott, E. L. (1956). *Amer. J. Med.*, **20**, 793.
- Kampmeier, R. H. (1950). *Amer. Practit.*, **1**, 113.
- Leinwand, I., Duryee, A. W., and Richter, M. N. (1954). *Ann. intern. Med.*, **41**, 1003.
- Luneth, J. H., Baker, L. A., and Shifrin, A. (1951). *A.M.A. Arch. intern. Med.*, **88**, 783.
- Masuzi, M., and Yä-Shu (1938). *Virchows Arch. path. Anat.*, **302**, 39.
- Mathisen, A. K., and Palmer, J. D. (1947). *Amer. Heart J.*, **33**, 366.
- Menne, F., and Fritsch, M. (1956). *Z. klin. Med.*, **153**, 550.
- Hillenbrand, H. J., and Hoeltzenbein, J. (1956). *Klin. Wschr.*, **34**, 125.
- Moore, H. C., and Sheehan, H. D. (1952). *Lancet*, **1**, 68.
- O'Leary, P. A., and Erickson, J. G. (1953). *J. Amer. med. Ass.*, **152**, 1695.
- Pagel, W., and Treip, C. S. (1955). *J. clin. Path.*, **8**, 1.
- Platt, R., and Davson, J. (1950). *Quart. J. Med.*, **19**, 33.
- Pollack, A. D. (1940). *Arch. Path. (Chicago)*, **29**, 859.
- Rodnan, G. P., Schreiner, G. E., and Black, R. L. (1957). *Amer. J. Med.*, **23**, 445.
- Rossier, P. H., and Hegglin-Volkman, M. (1954). *Schweiz. med. Wschr.*, **84**, 1161.
- Sharnoff, J. G., Carideo, H. L., and Stein, I. D. (1951). *J. Amer. med. Ass.*, **142**, 1230.
- Spühler, O., and Morandi, L. (1949). *Helv. med. Acta*, **16**, 147.
- Talbot, J. H., Gall, E. A., Consolazio, W. V., and Coombs, F. S. (1939). *Arch. intern. Med.*, **63**, 476.

ONSET ENURESIS

BY

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No distinction is usually made between those enuretics who have always been wet at night and those who have once been dry and then have subsequently recommenced bed-wetting (onset enuresis). This report describes a study of children with onset enuresis in two practices on a post-war L.C.C. housing estate. The practices are similar in all respects and are contiguous geographically.

Case Finding

During the years 1950-5, 24 children with onset enuresis were brought for advice in the normal manner to one of us (J. D. P.), it being known among his patients that he was "interested" in the problem of enuresis.

On the N.H.S. list of the other of us (E. T.) there were on January 1, 1955, 317 families with a child or children under the age of 21, the family sizes being as shown in Table I. The total number of 677 children consisted of

TABLE I.—Family Size

No. of children in family	1	2	3	4	5	6	7	10
No. of families	101	137	50	13	8	2	4	-

331 girls and 346 boys. During the year 1955 the mother of each family was personally interviewed by E. T. and asked in respect of each child the age at which it had become dry at night, and the details of any relapses; and, in the case of those still wet, whether there had been any bouts of dryness, when these had occurred, and how long they had lasted. The incidence of enuresis (this being defined as one or more wet beds a week) revealed by this survey is shown in Table II, and is similar to that in previously published

TABLE II.—Incidence of Enuresis

Age in yrs.	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-21
No. of children	25	24	42	48	60	66	70	64	50	35	37	15	141
No. still wet	25	21	27	12	13	9	9	6	7	0	3	2	4
Percentage still wet	100	87	64	25	22	13	13	11	14		6		3

reports (Bransby, Blomfield, and Douglas, 1955; Blomfield and Douglas, 1956). Of the 478 children of 5 years of age or over, 438 were dry at the time of questioning. The ages at which they had become dry at night are shown in Table III

TABLE III.—Ages When Becoming Dry

	No. of Children	Percentages at Years:					
		1½	2	2½	3	4	5
First child	268	28	55	72	76	82	88
Second child	144	28	55	71	74	81	86
Third and subsequent children	66	57	77	87	88	91	93
All children		33	59	75	79	85	87

as a percentage of each age group according to birth order. Of the 31 children over the age of 6 who were still wet, 9 (29%) had previously been dry for at least three months, the average period of dryness being two years. In addition, 11 children, dry at the time of questioning, had had relapses

lasting between two months and four and a half years, after having been dry for at least three months.

There were thus 20 cases of onset enuresis revealed by the survey, and these with the 24 cases from the practice of J. D. P. gave a total of 44 cases available for study.

Aetiological Features

Eleven (25%) of the 44 children came from families which showed overt instability, and the onset was coincident with a family crisis—divorce, separation, or remarriage.

The other 33 cases occurred in apparently normal ordinary families, and in six of these there was at the time of the onset an obvious associated experience such as the child going into hospital or removal of the family to another area. In the remaining 27 cases, however, there had been no apparent disturbance in the family's or the child's routine, and the only discernible alteration in the child's circumstances at the time of the onset was that either the mother was pregnant or she had been confined during the previous nine months.

That this association between onset enuresis and a maternal pregnancy cannot be attributed to chance is shown by estimating the probability of such an association in children of the same age as the enuretics. In the same practices, at the average age (4 years) of the children with onset enuresis, the expected association of a maternal pregnancy was about 7%, while the actual association with all onset enuretics was 60%, and, excluding those cases explained by divorce, separation, or remarriage, the association with a maternal pregnancy rises to 80%.

The relationship between the events—pregnancy, confinement, and onset enuresis—is shown in Table IV. As can be seen, onset enuresis in the firstborn associated with

TABLE IV.—Association Between Onset Enuresis in Child and Occurrence of Pregnancy in Mother

	Months Pregnant									Months After Birth											
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	10	11	12
Second Pregnancy {				1						1	1			1	1						
Third Pregnancy {		2	1												2	2					
Fourth Pregnancy {			2	2										3	2						
Fifth Pregnancy {			1	2			4														

1=Onset in first child. 2=Onset in second child. 3=Onset in third child. 4=Onset in fourth child.

a second pregnancy occurs either immediately after the birth or when the infant is about 6 months old. With a third pregnancy, either the first or the second child is affected, the onset tending to occur in the first trimester of pregnancy rather than after confinement, and this was even more pronounced when the onset was associated with fourth and fifth pregnancies. With all birth orders, cases occurring after the birth of the baby tend to congregate in the fifth and sixth months, when the risk of further pregnancies is being realized by the mother and her anxiety is communicated to the child.

It is not necessarily the youngest, and therefore the child most dependent on the mother, who develops onset enuresis; with the fourth and fifth pregnancies it was still the first and second in the family who were most often affected. Thus it appears that first and second children are in some way different from children born later, and this is confirmed by the fact that third and subsequent children learned to master bladder control at a significantly earlier age than first and second children (see Table III).

The explanation may be that the first two children have an "individual" relationship with their parents and compete with each other for parental regard, while the parents discriminate openly between their behavioural performances. But if there are three or more children the tendency is to treat them as a group which must submit unreasonably to parental authority. Third and subsequent children coming into such a sibling group have from their earliest days a behavioural reference group which is childish and uncritical, and from which it is easy to learn the elements of domestic behaviour. This learning may be made even easier by the mother's increased skill with third and later children.

Treatment and Results

The mothers who came to J. D. P. for advice were given interviews at which they discussed with the doctor the problem of the onset enuresis in their children. The number of interviews varied from three to six and the total time spent at them averaged about two and a half hours. The content of these interviews is discussed below. The children were not seen.

Of the 27 cases associated with pregnancy, 13 occurred in the practice of J. D. P. and were treated as described above. As a result of this treatment, all the children became dry and had remained dry when followed up two years later. The average time taken to become dry is shown in Table V

TABLE V.—Results of Treatment

	No. of Cases	Age First Dry (Av.) Years	Age at Onset (Av.) Years	Age When Resolved (Av.) Years	Duration of Onset (Av.) Months	No. Unresolved
Untreated	14	2.0	4.0	6.5	29	6
Treated	13	1.10	3.9	4.6	9	0

and is compared with information obtained for the 14 children revealed by the survey of E.T. as having had onset enuresis in association with a maternal pregnancy.

The untreated group is not strictly a control group, but is nevertheless comparable, as the children came from similar backgrounds and the age at which they first became dry and the age at which the onsets began were similar. The only difference between the two groups was in sex distribution, the treated group having a preponderance of girls. A worse prognosis in girls would therefore have produced a bias. This, however, is unlikely, as onsets did not occur more often in girls, sex bore no relationship to the age at which children became dry, and the occurrence of precipitating factors showed no correlation with the sex of the existing children.

Discussion

The children studied here were in families which sprang from the socio-cultural stock of the older London boroughs. The parents had been nurtured in circumstances very similar to those described by Young and Willmott (1957) in Bethnal Green, and would be classed by Elizabeth Bott (1957) as families showing a "close-knit kinship network and segregated conjugal roles." The organization of this type of family presumes the acceptance of fixed social norms which are a reciprocal function of fixed occupation; men's work is outside the home, women's work within the home. In such a "status" family the wife submits to her husband's sexual needs, accepts his economic support, bears her children without complaint, and loves them uncritically and without discrimination.

The emotional values of status families contrast in all situations with those of the families described by Bott as showing a loose-knit kinship network and shared conjugal roles. Such "mobile" families accept the occupational emancipation of both men and women and its consequence on interpersonal relationships. They are critical of performance in their work, in their social relations, in their personal relations, and in conjugal partnership. They determine the number of their children by a critical assessment

of their own emotional, social, and economic potential to give their children all they "need." They strive to create one or two competitively successful children rather than a gregarious egalitarian sibling group.

As Bott has observed, these family types probably represent extremes in a continuum along which most families are transitional or intermediate in their organization. The families with children exhibiting onset enuresis may have functioned well within the socio-cultural milieu of a status family network in their native London borough, but, at the same time, the parents' experiences at school, and subsequently at work, and the influence of radio, television, cinema, and magazines, denigrate status values and encourage mobile values. But until rehousing and the physical separation from the native borough have occurred such tendencies have been prevented from becoming manifest. The adjustment to mobile values after rehousing is difficult, and, because of this, 25% of the original families on the estate returned to their native boroughs in the first two years. Of the remainder, 70% manifest psychoneurotic ill-health (Paulett, 1956), and, as Martin, Brotherston, and Chave (1957) have shown in a similarly rehoused population, the actual rate of admission to hospital for psychoneurotic disorder shows a significant excess over the expected rate.

If our assessment is correct, the critical emotional conflict will be focused on the determination of family size. If the number of children can be limited to two, then the mother will be able to resume work when the children are at school, secure a degree of occupational and economic independence, and create a family which functions on mobile values.

There can be no doubt that the mothers of children developing onset enuresis in association with pregnancy wished at all costs to avoid repeated pregnancies. They were quite aware of the effect of overbreeding in their own parents' generation and were determined to do more for their children than had been done for themselves. They had mostly entered marriage knowing that "people did not have so many children nowadays," but were quite unaware of the practical or the emotional problems they would have to face in achieving this end.

In discussing with the mother her child's enuresis, this sociological approach to the problem was taken. It was explained that even such an acute personal problem can result from the change in the way of life of her family and of the stress of her new social situation. She need not feel guilty about doing things differently from the way her mother did them, and the best practical solution was to utilize those emotional values compatible with a mobile family organization.

We have shown that the prognosis of onset enuresis can be improved by the treatment outlined above, and it may well be that a more traditional mode of treatment would have achieved the same results. A search through the literature, however, fails to reveal any report of treating enuresis which compares results in treated and untreated groups.

There is also no information in the literature on the prevalence of the onset type of enuresis, and the present study shows an incidence which is perhaps higher than would be expected. This is probably due to specific emotional conflicts within family life, which, while characteristic of our culture, are most clearly seen in rehoused urban communities.

Summary

Forty-four cases of onset enuresis were studied.

The precipitating factor in most cases was a maternal pregnancy.

A sociological approach was taken in discussing the problem with the mothers.

Using untreated cases for comparison, such an approach is shown to be effective in treatment.

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REFERENCES

- Blomfield, J. M., and Douglas, J. W. B. (1956). *Lancet*, 1, 850.
 Bott, E. (1957). *Family and Social Network*. Tavistock Publications, London.
 Bransby, E. R., Blomfield, J. M., and Douglas, J. W. B. (1955). *Med. Offr.* 94, 5.
 Martin, F. M., Brotherston, J. H. F., and Chave, S. P. W. (1957). *Brit. J. prev. Soc. Med.*, 11, 196.
 Paulett, J. D. (1956). *Lancet*, 2, 37.
 Young, M., and Willmott, P. (1957). *Family and Kinship in East London*. Routledge and Paul, London.

TREATMENT OF NOCTURNAL ENURESIS BY THE ELECTRIC ALARM

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Eight years ago Davidson and Douglass (1950), using the method described by Mowrer and Mowrer (1938), reported on the treatment of 20 severe cases of enuresis by means of an electric alarm, but, though they obtained a high rate of cure, the method has not been widely adopted.

It has been employed locally for the past two years. During the first year four general practitioners treated 52 enuretics; then a clinic was established to which any doctor could refer his patients, and a further 48 were so treated. This paper records the results of treatment of 100 enuretics aged 3½ to 21 years (64 male and 36 female) and puts forward an explanation of the mechanism by which the electric alarm works.

Apparatus

The apparatus (Fig. 1) consists of a pad bearing spirally arranged metal electrodes which lies on the mattress under a drawsheet and is connected by a flex to a bedside bell activated by a 4½-volt dry battery. Contact of urine with

FIG. 1.—Apparatus in position.

the pad closes an electric circuit and rings the bell (the sensitivity is such that 5 ml. of urine will ring the bell); this awakens both mother and child. The child rises and empties his bladder, while the mother fixes a fresh dry section of drawsheet over the pad.

It might be thought that this technique merely prevents the bladder emptying completely, thus converting a soaking wet bed into one containing a small damp patch. Not only