

AN OUTBREAK OF DYSENTERY.

BY F. A. BAINBRIDGE, M.D., D.P.H.

(Lister Institute of Preventive Medicine.)

AND R. DUDFIELD, M.B., D.P.H.

*(Medical Officer of Health for Paddington.)*I. *History of the outbreak.*

ON February 10th, 1911, the attention of the Medical Officer of Health was called by the practitioner in charge to an outbreak of diarrhoea in a family named R. residing in Paddington. The note made at the interview was to the effect that cases had occurred on the 8th, 9th, and 10th (2 cases) of the month, the four patients having violent diarrhoea and passing much blood. The onset was quite sudden in every case. It was thought that "food poisoning" could be excluded, and the main object in directing attention to the outbreak was to ascertain if any defective drainage existed at the house. Incidentally it may be remarked that the house drainage, etc. had been completely overhauled in 1907 and that no defects existed in February last except one leaky joint on a waste pipe.

Inquiries were at once set on foot and it was found that the cases of diarrhoea were more numerous than stated.

The house is an old one, originally a good class dwelling, one of a group of houses known to one of us since the '60's when they were occupied by well-to-do families. The house at the time of the inquiries was let out in six tenements, the occupants numbering 30.

Cases of diarrhoea were found to have occurred in the R. and H. families who were much together (Mr R. keeps a coffee-stall and Mr H. assists him). No history of any attacks could be obtained among the other occupants of the house.

Half basement (2 rooms) and } 2nd floor (attic) front (1 } room);	{ R. family; man, wife and 10 children, ages 16 yrs.—3 mths., twins.
Ground floor (2 rooms) and } 2nd floor (1 room);	{ L. family, 3 adults and 4 chil- dren.
First floor back (1 room);	{ H. family, 2 adults and 3 chil- dren.
First floor front (1 room), and } 2nd floor (1 room);	X. family, 3 adults.
First floor (1 room);	One adult (away).
Second floor front (1 room);	Two adults (away).

A further case was found in a family named J. residing in the neighbourhood, the patient being a cousin of the R. children and much with them.

Unfortunately, as so frequently occurs, rather more than a fortnight had elapsed between the date of the first attack and the commencement of the inquiry (February 11th). Numerous visits of inquiry elicited the following history.

(1) R. R., f. aet. 5, taken ill January 26th with sickness, severe abdominal pain, much diarrhoea with blood. She was seen by a Dr C. on the next day and was well again on the 29th.

(2) E. R., f. aet. 5, taken ill with same symptoms on the 29th. She was seen by Dr C. and appears to have recovered by February 5th.

(3) C. R., f. aet. 7, was attacked about 3rd February. She had no sickness and was still ill on the 11th.

(4) W. J., f. aet. 3, attack of same kind commencing on February 4th; attended St Mary's Hospital as out-patient.

(5) A. R., m. aet. 2. Attack commenced February 5th. His attack, one of the severest of the series, was attended with collapse. He was still under treatment on the 11th.

(6) B. H., f. aet. 1, bad diarrhoea on February 5th (no medical attention).

(7) E. R., m. aet. 3 months,—one of twins—was taken ill on the 8th or 9th.

In addition to the seven well-defined attacks there were two others in which the history was less definite.

I. R., f. 11, slight diarrhoea ($\frac{1}{2}$ day) on February 5th.

T. R., m. 14, "ailing" from about February 10th. No history of diarrhoea could be obtained.

Of the R. children, three escaped attacks, viz.

J. R. (m. 16), J. R. (m. 10) and the other twin.

None of the parents in the R., H. or J. families were ill.

The fact that the cases occurred very nearly singly and in succession may be taken as conclusive evidence that "food poisoning" was not the causal factor. Further, the fact that all the children who were ill were closely associated—almost living together—while other children living in the house but not associating with the R., H., or J. families, escaped, points to personal infection, or transfer of infection through common use of closet, etc.

II. *Bacteriological examination.*

1. *Faeces and urine.* On February 14th, 1911, samples of faeces and urine from two patients (E. and R. R.), and faeces only from a third patient (L. H.) were received. The material was plated out on lactose-neutral-red-bile-salt-agar, and the white colonies were picked off, and examined as regards their morphological and cultural reactions. The faeces and urine of one patient (E. R.) yielded a negative result, as did also the urine of R. R. The faeces of R. R. and L. H., however, yielded numerous colonies of non-motile bacilli which had the following characters:

1. Production of acid on glucose, mannite, sorbite, arabinose, galactose and laevulose.

2. No visible fermentation of lactose, cane sugar, dulcitol, adonitol or inulin, salicin, raffinose, maltose, xylose or glycerin.

3. Production of indol.

4. Milk showed initial acidity, but became alkaline in fourteen days.

On February 21st samples of faeces were received from L. H., E. R., R. R., T. R., L. A. R., and W. J.; all these children had suffered from clinical symptoms of dysentery. The faeces were soft and shiny in some cases, hard and green in others. On examination, bacilli identical with those first described were obtained from the faeces of T. R. and E. R.; the others gave a negative result.

Finally on February 25th and March 1st samples of faeces were obtained from the parents of the R. family and from Mr H. They had not been ill, and no dysentery bacilli were found in their stools.

The agglutination reactions of the organisms are shown in Table I. All the strains were tested with sera obtained from rabbits immunised

with *B. dysenteriae* (Flexner), *Bacillus "Y"* of Hiss and Russell, and *B. typhosus* respectively. It will be seen that the strains were not agglutinated by the Flexner serum in such high dilutions as *B. dysenteriae* (Flexner) or the "Y" bacillus, but they were agglutinated by the "Y" serum to the same extent as *B. dysenteriae* (Flexner) and *Bacillus "Y."* They were agglutinated in low dilutions only by the typhoid serum. These results correspond with those obtained by Morgan (1911) in the case of British strains of *B. dysenteriae*.

TABLE I.

Agglutination tests. Macroscopic method.

Organisms examined	<i>B. "Y"</i> serum	<i>B. Flexner</i> serum	<i>B. typhosus</i> serum titre 4,000
<i>B. dysenteriae</i> , Flexner	2,000	5,000	—
<i>Bacillus "Y"</i>	10,000	5,000	—
L. H.	1,000	1,000	800
E. R.	1,000	1,000	—
T. R.	1,000	1,000	—
R. R.	1,000	1,000	100

Absorption tests were not made as they seem to be of little value for the differentiation of this group of bacilli.

2. *Samples of blood.* Blood was obtained from three patients, namely R. R., T. R., and L. H., and tested as regards its agglutinating power for *B. typhosus* and *B. dysenteriae* (Flexner). The results are given in Table II.

TABLE II. *Agglutinating power of patients' serum.*

Microscopic method. Controls were used in each case.

Patient	Organism tested	
	<i>B. typhosus</i>	<i>B. dysenteriae</i> (Flexner)
R. R.	Positive reaction	Positive reaction (1-100)
T. R.	Negative "	" "
L. H.	" "	" "

In the case of R. R. the reaction was more complete with *B. dysenteriae* than with *B. typhosus*.

Sera, prepared by injecting *B. dysenteriae* into rabbits, usually contain secondary agglutinins for *B. typhosus*, so that the reaction of the serum of R. R. with both typhoid and dysentery is not surprising.

The presence of *B. dysenteriae* in the faeces of the patients, and the strong agglutination of this bacillus by the serum of three patients,

furnish evidence that this bacillus was the cause of their illness. Apart from Asylum dysentery, outbreaks of dysentery in this country appear to have been very rarely observed; the only instance previously recorded was a fatal case occurring in a child in London, in which Marshall (1909) obtained from the faeces a bacillus identical in cultural and agglutination reactions with *B. dysenteriae* (Flexner).

Morgan (1911), however, has recently examined a large number of strains of dysentery bacilli, which had been isolated by Ledingham from the faeces of typhoid convalescents and from other sources, and his observations seem to indicate not only that dysentery bacilli of the Flexner type are more often present in the faeces of healthy persons than has been hitherto supposed, but also that slight differences in the fermentation reactions of different strains are of minor importance.

On receiving information of the results of the bacteriological examination, inquiries were made to ascertain if any members of the affected families had been abroad or whether there had been any contact with persons recently arrived from foreign parts. Neither Mr nor Mrs R. had ever been out of the country, nor had any visitors from abroad. Mr H. had served in the Royal Army Medical Corps, being stationed at the Cambridge Hospital, Aldershot, where patients from all parts of the world are received. He had, however, left the Army some ten years ago. His faeces, moreover, were free from the *B. dysenteriae*.

It is worth noting that positive results were obtained twice from the first patient (E. R.), an interval of one week intervening between the taking of the specimens; also that T. R., in whose faeces the *B. dysenteriae* (Flexner) was found, and whose blood gave a positive reaction with the same bacillus, was not ill to the same severity as were other children from whose faeces the bacillus could not be isolated. T. R.'s trifling attack occurred ten days prior to the day on which his specimen was taken.

REFERENCES.

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