

we also wish to make it clear that the opinions expressed in this article are ours alone.

The cost of the psychiatric side of the programme was defrayed by a grant from the Research Committee of the Middlesex Hospital. We would like to thank Professor A. Kekwick and the members of the committee for making these funds available at very short notice, and for their interest and confidence.

The psychiatric investigation had the benefit of advice from Dr. A. W. Beard, Consultant Psychiatrist at the Middlesex Hospital.

His time and experience were freely given, greatly appreciated, and both administratively and intellectually essential.

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## Two School Epidemics

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*Brit. med. J.*, 1966, 2, 1300-1302

The epidemic at Blackburn described in the preceding paper was reported in the press with some prominence, and over the period of a week or so in which the item was considered newsworthy illnesses at schools in other parts of the country were coupled with it. Events at two of these schools—one at Portsmouth and one at Wrexham, Denbighshire—are of interest in relation to theoretical ideas about the epidemiology of hysterical outbursts.

### The Portsmouth School

The school at Portsmouth is a girls-only secondary school with 272 pupils distributed in five classes and 12 forms. As at Blackburn, the age of the girls is obtained by adding 10 to the class number (that is, the fourth class consists of 14-year-olds). On Thursday, 7 October (Day 1), half a form of 13-year-olds became ill in the late afternoon and five were taken to hospital complaining of vomiting and abdominal pain. None was detained. The next day (Day 2) there was an explosive epidemic which started at assembly and involved every class except the fifth during the course of the day; 72 girls had to be sent home from school. The girls seemed less convincingly ill than the Day 1 cases; their symptoms were mostly a matter of faintness and feeling peculiar. There was a similar outbreak on the Monday (Day 5: 47 girls sent home) and a trickle of new cases during school hours for the remainder of the week.

Five months after the event 70% of the girls filled in the Eysenck Personality Inventory and a questionnaire on the course of the epidemic. As Fig. 1 shows, the questionnaire results confirmed the clinical impression that there had been exceedingly few new cases during the week-end of Days 4 and 5. There is consequently good reason for believing that the epidemic was biphasic and linked to school hours.

Interestingly the epidemic was heavier in the A stream (65 out of 138 sent home: 46%) than in the B stream (39 out of 134: 29%). This effect was consistent in all classes, and is confirmed by the questionnaire results, though as for every two girls sent home another felt ill the actual incidences are higher (A 63%; B 43%).

Pathological and public health investigation of this epidemic yielded only negative results, and the medical officers concerned formed the opinion that, while the girls affected on Day 1 were probably organically ill in some mild gastrointestinal way, the Day 2 and subsequent cases were purely functional.

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*Time Course in Relation to Age.*—The headmistress had lists of the girls sent home on Days 1, 2, and 5 which she thought were chronologically accurate (that is, represented the actual order in which the girls were sent home). The Day 1 list does not concern us, as all but 2 of the 14 girls cited were in the same form; the Day 2 list was checked against the girls'

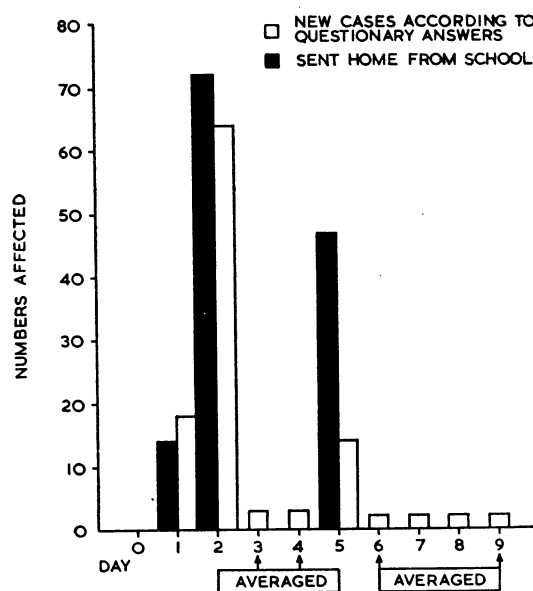


FIG. 1.—Time course of the Portsmouth epidemic.

questionnaire answers and found to be chronologically valid (Fig. 2); by the same test the Day 5 list was not. The Day 2 list shows a clear shift from the upper to the lower classes with time. The figures are given in Table I.

*Personality Factors.*—The questionnaire answers indicate that of 40 girls who were present on both Days 2 and 5 and were taken ill on Day 5, 27, or two-thirds, had been ill on Day 2. Half of these had been feeling quite well throughout the week-end. As for the morbid end of the behavioural spectrum, the headmistress supplied two lists compiled from objective data. The first was composed of 18 B-stream girls who had reached a specific level of conduct disorder during the term. Given a B-stream incidence of 29%, the number of these that might be expected to appear on the list of girls sent home is nearer 5 than 6; the actual figure is 10. The second list consisted of

four girls who were attending child-guidance clinics. Of these, one was sent home on both Days 2 and 5 ; one was affected on

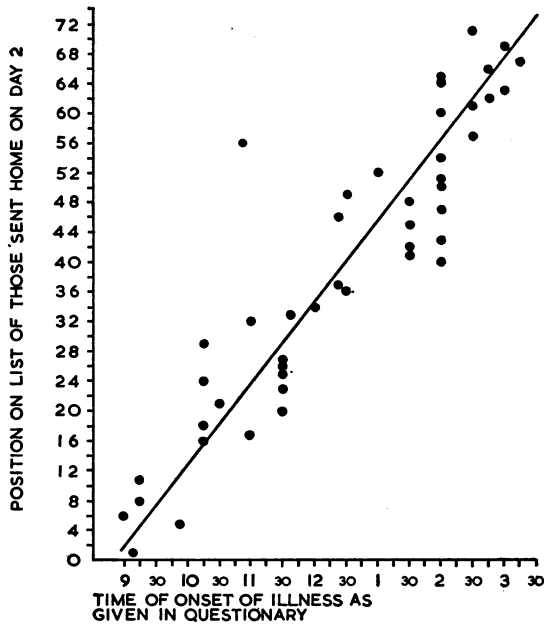


FIG. 2.—Chronological validation of the Day 2 list.

TABLE I

Class:	4	3	2	1
No. at risk	61	62	77	56
„ sent home first half of list	16	9	6	5
Midpoint equivalent to 12.30 p.m.				
No. sent home second half of list	0	7	16	13

Day 5 and one on a later day ; the fourth was absent for the whole week beginning with Day 5.

The Eysenck Personality Inventory scores are given in Fig. 3. Clearly the affected have a consistently higher mean score in neuroticism ; equally clearly there is no difference between the mean extraversion scores of the affected and unaffected.

**The Wrexham School**

The school at Wrexham is an infants' and junior school for both sexes with 230 infants and 320 junior pupils. On Thursday, 14 October, the headmistress reported a 30% absentee rate among the infants as against a normal 10% ; three children were taken ill at school during the day. As their symptoms—abdominal cramps and vomiting—suggested a diagnosis of food-poisoning, stool samples were sent for culture. On the Friday absenteeism was up to 45% among the infants and 20% among the junior pupils. By the week-end 27 out of 30 specimens cultured had grown *Shigella sonnei* with a consistent pattern of sensitivities ; the eight specimens typed were all Colicine VII.

The unusually rapid build-up in the number of cases suggested a food-borne epidemic. Because the food eaten at the school is prepared at a central kitchen 5 miles (8 km.) away and the two other schools that the kitchen serves remained trouble-free, suspicion fell on the canteen staff at the school. Of the 11 assistants two proved to have *Sh. sonnei* in their stools, and one of these remained symptom-free throughout the epidemic. The final epidemiological formulation was that this assistant was a carrier and that the lunch eaten on Tuesday, 12 October,

had been contaminated (the first cases had occurred that evening). The theoretical corollary to this formulation is that the dose of bacilli was evenly distributed across the school population.

*Time Course in Relation to Age.*—Table II shows that the peak incidence for each age group moves steadily up the age scale with time.

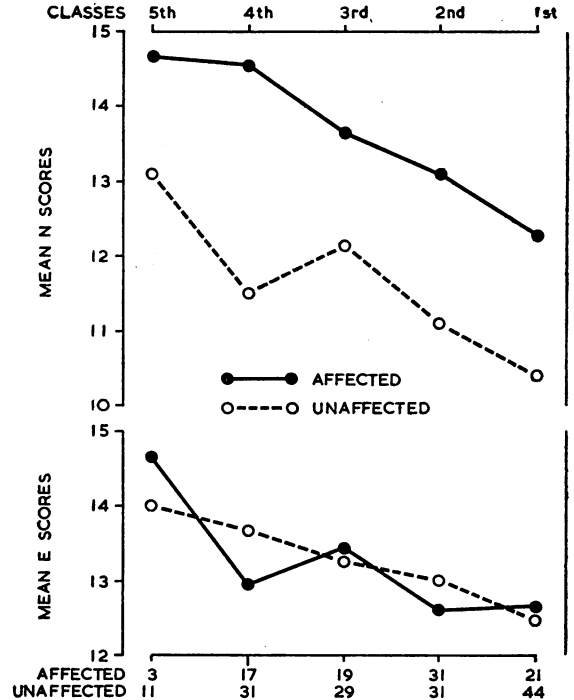


FIG 3.—Portsmouth school. Eysenck Personality Inventory scores.

TABLE II.—Cases of Proved *Sonne* Dysentery at the Wrexham School October 1965

Age (Years)	No. at Risk	Onset of First Symptoms. October					Total	Time of Peak Incidence Expressed as Mean Date
		12	13	14	15	Week Ending 22		
4-5	198	11	24	35	13	2	85	13.7
6-7	156	2	4	14	17	5	42	14.5
8-9	162	2	3	9	13	6	33	15.0
10	73	1	1	2	8	3	15	15.25

*Personality Factors.*—Personality assessment is not feasible at this age level, but it is perhaps worth noting that the only child attending a child-guidance clinic was not affected.

**Discussion**

Most clinical signs are capable of more than one interpretation, and final diagnosis usually rests on a grouping of signs no one of which is incontrovertible. The overall contrast between these two epidemics is clear enough.

At Portsmouth the main features of the illness were as follows. It occurred in a girls' school ; it spread explosively during school hours but failed to manifest significantly when the school was closed (less than 10% of cases arose outside school hours) ; it spread from older to younger girls during the day of maximum incidence ; it correlated positively with conduct disorders ; and it failed to yield positive laboratory findings.

At Wrexham the following were the main features of the illness. It occurred in a school for both sexes ; it was manifested

as increasing absenteeism (less than 10% of cases reported sick during school hours); it showed, over a week, a progression from younger to older pupils; and it was quickly and decisively diagnosed.

How far these "symptom clusters" may be taken as of general application to the functional/organic distinction in school epidemiology only time and more evidence can decide. A simple deciding test is probably not yet within our reach. The N factor of the Eysenck Personality Inventory seems to discriminate between affected and non-affected populations in functional epidemics, but the E effect appears to be either unreliable or obtainable only under ideal conditions. And in the absence of control studies the usefulness of the N effect is debatable, for high N personalities may well have a low threshold for reporting organic illness.

A diagnostic category that is reached only by exclusion will collect all the errors made at earlier stages in the diagnostic process—and fall into disrepute. If diagnoses of epidemic hysteria are to inspire any confidence they must be made on positive grounds. Nevertheless, it does seem possible to collect positive data not only in the specially favourable case of mass admission to hospital but in the ordinary clinically undocumented instance.

### Summary

Two school epidemics are contrasted: one at Portsmouth, probably functional, and one at Wrexham, due to *Shigella sonnei*. The Portsmouth epidemic satisfied criteria suggested previously for functional outbreaks. It occurred in a girls' school, and manifested almost exclusively in school hours. Its incidence showed a swing from older to younger classes with time on the day of maximum involvement; it correlated with conduct disorders. The Wrexham epidemic, studied as a certainly organic control, did not satisfy these criteria.

The N scores, but not the E scores, of the Eysenck Personality Inventory, differentiated between affected, and unaffected populations in the Portsmouth epidemic.

We would like to thank the headmistresses of the schools involved for their co-operation, particularly Miss P. King, who uncomplainingly went to great trouble to meet a long list of requests.

The psychological side of these investigations was financed by a grant from the Clinical Research Committee of the Middlesex Hospital. We would like to thank Professor A. Kekwick and the Committee for their support and also Dr. A. W. Beard, consultant in psychological medicine at the Middlesex Hospital, for his interest and advice.

## Return to Work after Myocardial Infarction

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*Brit. med. J.*, 1966, 2, 1302-1304

Four out of every five survivors of myocardial infarction at present return to work (Biörck and Wedelin, 1964; Biörck, 1964; Sharland, 1964). Little attention has been paid to the problems faced by these patients during their convalescence and return to work, except by Biörck (1959) and by Goble, Adey, and Bullen (1963), who emphasize the fact that disability is as often psychological as physical. The present investigation was designed to define these problems by means of a study of a group of men of working age who had had a myocardial infarct some months previously.

### Patients Studied

A review was made of the case notes of all men under the age of 70 who were discharged in 1964 from the Radcliffe Infirmary with a diagnosis of myocardial infarction. There were 98 such cases, and 25 of them were excluded at the outset—9 because there was no definite evidence of a recent myocardial infarct, 11 because they had died since discharge, 3 because they lived too far from Oxford, and 2 on account of other major disease. The general practitioners of the remainder

TABLE I.—*Age Distribution*

Age ..	30-39	40-49	50-59	60-69	Total
Number ..	5	13	33	14	65

were written to and were asked for permission for a medical social worker to visit their patients. Only two refused. The patients were then written to; only one would not agree to be visited, though five more did not reply to two letters. Table I shows the distribution by age of the remaining 65 men.

Six of the men were single, two were widowers, and one was separated. Sixteen had been admitted after their second myocardial infarct and one after his third.

The patients were visited at home by a medical social worker, who conducted a semi-structured interview lasting on average one and a half to two hours. Some specific questions were asked, but most of the interview consisted of open-ended questions, which allowed development in individual cases along particular lines. Table II shows the time after admission at which the patients were seen.

TABLE II.—*Interval Between Admission and Interview*

Months ..	<6	6-8	9-11	12-14	15-17	18+	Total
Number ..	0	8	15	20	13	9	65

TABLE III.—*Principal Problems Encountered*

	During Convalescence	At Time of Interview
None .. .. .	6	20
Anxiety over job .. .. .	30	13
Physical limitations .. .. .	19	14
Fear of recurrence, etc. .. .. .	15	19
Financial worries .. .. .	13	6
Fear of dependence .. .. .	5	17
Depression or anxiety .. .. .	5	7
Miscellaneous .. .. .	11	11

### Results

Table III shows the principal problems encountered by the 65 men in the period immediately after the infarct and during convalescence, and those present at the time of interview. As might be expected, anxieties over employment and money, often related to the maintenance of a high standard of living and to

\* The Radcliffe Infirmary, Oxford.