Epidemic Hysteria: School Outbreaks 1973–1993

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Key Words

Mass psychogenic illness · Epidemic hysteria

Abstract

Objective: Increased reporting of outbreaks has brought more familiarity with the syndrome but no more accurate knowledge about the nature and mechanisms of such episodes. As it has become an area for an expanding field of competitive explanations, the review is intended to find any additional epidemiological cues and any clarification about methods of investigating such outbreaks. **Methods:** The retrieval of data was organized upon a choice to have a homogeneous sample rather than a comprehensive one. Newspapers and sociological sources were left out. A Medline search with cross-referencing was conducted to select the outbreaks limited to the standard school type. Reports were examined from two points of view: the descriptive epidemiological parameters and the mode of reporting the outbreaks. **Results:** Forty-five episodes were

studied. A historic shift in the manifest presentation is apparent: larger groups are involved for a shorter time. A period at risk has been identified: the last 2 months of the school calendar. The peak age of affected children is 12. A downward age spread is present in 14/20 episodes where suitable information is provided. Methods of reporting were classified into four categories: descriptive (n = 24), public health reports (n = 7), case-control (n = 7), case study (n = 7). Diagnosis of exclusion for environmental contamination is still a prevalent mode of reporting but does not make the outbreak intelligible. **Conclusion:** (1) A two-step approach is suggested: a simple environmental check for short and uneventful outbreaks; an intensive case study for any episode with long duration or recurrence. (2) Two hypotheses for future testing are proposed: a hypothesis of arousal, probably of a benign, age-specific, and sexual nature, in short simple cases; a hypothesis of conflict in the long or recurrent ones.

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Introduction

This study reviews known published school outbreaks of mass or epidemic hysteria from 1973 to 1993, updating Sirois' [1] 1974 review of the scientific literature. That previous review outlined the historical framework and attempted a layout of the typical outbreak mainly from late 19th century sources. The typical epidemic hysteria episode was described as involving a small group of young females among whom occurred a rapid spread of a concurrent range of symptoms with bodily manifestations, of a short-lived nature and unknown source, most probably psychogenic. Schools were the most frequent setting.

Sirois' [1] review outlined a general overall picture of the typical school outbreak. However, more questions were raised than answered by that study. The more salient are the following ones. Some familiarity with the clinical syndrome did not entail accurate knowledge about the nature and mechanisms of such episodes which remained poorly understood. If benign in most cases, the outbreaks appeared rather complex and difficult to study. While dismantling the group – or closing the school – remained the frame of intervention, the lack of more precise understanding of the factors shaping the occurrence of such episodes prevented any approach to ascertain cues related to an incoming outbreak, as the phenomenon has shifted from being an object of popular curiosity to being a public health concern.

Moreover, while a typical outbreak had been delineated, more reports during the last 20 years have described all kind of variants of such occurrences, in industrial settings, in larger communities with various cultural and social aspects. At the same time the term hysteria disappeared from the official American psychiatric nomenclature. It is to be noted,

however, that 'epidemic hysteria' is still mentioned in the DSM-IV [2, p. 454] under the item 'Conversion Disorder'.

In the last 20 years the syndrome of epidemic hysteria has been locked into the following paradox. More 'clinical' reports have been published in that time span than for the entire previous century. Yet such outbreaks were labeled under an ever wider array of designations and subject to controversy from various sources. (Bartholomew [3] has found 75 names under which epidemic hysteria has been reported.) It became an ideal topic for the politics of knowledge [4]. More reports yielded an expanding field of competitive explanations rather than a clearer picture.

The context of the present study grew out of a twin set of preoccupations. It was felt that the larger number of reports dealt with much of the same problem, while yielding very few significant gains in knowledge. That raised the issue of an appropriate way of studying these outbreaks. The same issue was raised through a challenging and fruitful exchange of ideas with R.E. Bartholomew about the thorny aspects of the question [summarized in ref. 4, 5]. It provided the impetus for a new look at the evidence about epidemic hysteria. It will become obvious here how the author has adopted a sectorial approach as opposed to the all-encompassing one favored by Bartholomew.

Frame of the Review

The present review is certainly not free from the above-described ailments. It is surely bound to a specific angle of vision, built-in to understand this type of study, which is spelled out as follows. The aim of the review is to extract some reliable or probable cues from the wealth of reports accumulating in the literature. Designing a frame for the review raises

other difficulties. The two main ones are a proper delimitation of the field and of the sources of information.

The following procedures were followed. Epidemic Hysteria was restricted to its closest original meaning and its more frequent setting, the school. This means that epidemic is as important as hysteria. Hysteria is here taken in a slightly more general designation than its restricted conventional use, now named conversion disorder under DSM-IV. The term hysteria here covers any collective outbreak where either bodily symptoms of the conversion disorder type (including pain) or bodily symptoms of the anxiety disorder type, more specifically of the panic attack type [as detailed in ref. 2, p. 395], are reported. The lumping of both series of symptoms comes from the blended description in the clinical reports, published under various nonspecific titles such as Epidemic Transient Disturbances, Epidemic Mass Psychogenic Illness, etc.). The core designation refers to an epidemic of any of these two types of bodily symptoms of undetectable physical etiology, hence presumably psychogenic.

The frame for retrieving the data was set as follows. A choice was made in favor of homogeneity rather than extension. Newspaper reports were left out because of the difficulty of assessing basic epidemiological parameters [a compilation of such press accounts is reported in ref. 6]. Sociological sources were also excluded as the review does not address these issues, even if more outbreaks with features of endemicity or long duration would probably have been encountered there. It was felt easier to spare them for a separate review of larger community outbreaks. Data were selected through a Medline search. The procedure surely limits any claim to extensive coverage of the field. But it provides advantages. First, it covers the usual 'medical' external shape of most outbreaks, through the clinical, epidemi-

ological and public health parameters, hence its high retrieving potential. Second, it makes possible some comparison with Sirois' [1] review conducted through Index Medicus. The goal of data collection was to provide a reasonably large and rather homogeneous sample of outbreaks to enable detection of clinical or epidemiological indices in the usual benign type of outbreak.

We report here on 45 school outbreaks of epidemic hysteria covering the years 1973–1993. The geographical distribution is the following: North America 25 [7–30]; Europe 7 [31–37]; Asia 8 [38–46]; Africa 4 [47–50]; Caribbean 1 [51]. There is evidence that a score more have been detected in endemic environments [38, 45] but were left out unreported. Some of the outbreaks included here are at the border of larger community episodes [22, 35] or private occurrence [15, 16], that is nonepidemic. They have been included as they all dealt mainly with affected school-aged children.

The reports were examined from two main angles. The first deals with the factual parameters pertaining to the usual epidemiological configuration outlined in the reports. Only the gross ones could be sifted out like number of affected people, age, sex, duration and the symptomatic pattern. The second angle covers the mode of reporting to account for the outbreaks. It deals with how the outbreaks are approached, studied and managed. That aspect of the review is linked to a central hypothesis tying the first and the second angle. A finer epidemiological study of such outbreaks will yield cues that would lead to a decision process about a multiple-step approach.

Table 1. Number of affected people

Affected people:	Outbreaks					total
	small group <10	class size 10–30	large group 30–100	crowd >100	?	
Period						
1973–1993	4	11	18	12	0	45
1872–1972	8	15	4 ^a	4 ^a	1	32

^a All outbreaks reported from 1963 to 1972.

Table 2. Duration of outbreaks

Duration: Category:	Outbreaks					total
	1 day A	1 day–1 week B	1 week–1 month C	>1 month D	?	
Period						
1973–1993	23	9	6	6	2	45
1872–1972	4	3	12	12	1	32

Findings

Configuration of the Outbreaks (table 1)

The number of affected people has been distributed according to four categories: small group with 10 persons or less; class-size group with 10–30 persons; large group ranging from 30 to 100 persons, and crowd-size group with over 100 persons. As the review deals with school outbreaks, class-size group was thought to be a standard reference for such episodes. It was surprising to find that 18 outbreaks fit into the large-group category, 12 are in the crowd-size group, 11 are in the class-size group, and 4 in the small-group category. Compared with Sirois' [1] review of 1974, that finding shows a shift indicating that recent outbreaks involve a larger number of

affected persons than the earlier ones where the large majority of such episodes fit into the class-size group category. The trend suggests a change in the reference milieu. Moreover, all outbreaks falling into the two categories larger than class-size group which now make for two thirds of the episodes of the last 20 years accounted for only 25% of the outbreaks in the previous review, and were all reported only in the last decade of the time span of the first study (1963–1972). The trend of the last 30 years (1963–1993) would therefore strongly support that the whole school and not the class is the basic unit of reference for such epidemic outbreaks.

Duration (table 2)

Twenty-three of the 45 episodes are single-day events, 9 extend from 1 day to 1 week, 6

Table 3. Age of affected people

	Age, years														
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Reports, n	1	2	6	8	10	17	21	24	31	25	23	14	12	10	4
n = Number of tabulated outbreaks.															

last from 1 week to 1 month, and 6 more will persist more than a month; 1 is of unknown duration. Compared with Sirois' [1] review of 1974, the findings here show a trend towards a higher incidence of shorter episodes as 32 of the 45 current incidents (1973–1993) last less than a week (71%) while in earlier years before 1972, 24 out of the 32 outbreaks (75%) lasted more than a week.

Sex

Female students are overwhelmingly represented in the outbreaks. When lumped together all-female outbreaks and any other episode with a ratio equal to or above 2F/1M make for 34 of the 45 reported incidents. The 11 remaining episodes include 5 where sex is unspecified; the last 6 entail 4 where there is a majority of women, 1 in a school of boys and girls with equal proportion and 1 seemingly occurring in a male school in Africa.

Age

Most reports give an age span of the affected persons. We have tabulated all of them by superposition, in order to fill the different specific age slots with an entry each time as indicated by the age span reported (for instance, a 10–14 age span would mean one entry for each of the five numbers 10–14). Such a simple compilation yields a simple curve indicating that youngsters aged 12 are

at greater risk, with the 11–14 age-group being the most affected (table 3).

This suggests that young girls near puberty and menarche are the most frequently affected persons. A second question addressed by the age distribution is the current view that outbreaks spread downwards on the age scale. First proposed by Moss and McEvedy [52], this age factor has been verified here with the following crude index: the index case, if identified, is older than the age category of most affected children. In 13 episodes involving same-age groups, it was not applicable; in the remaining 32, the downward spread along the age scale is present in 14 cases, absent in 6, and unknown in 12. This finding supports the hypothesis proposed by Moss and McEvedy [52].

Time of the Year

Thirty-two of the 45 outbreaks are from the US, Canada and Europe, countries where a typical Western school calendar is in use. The remaining outbreaks in Africa, Asia, Middle East and Caribbean Islands have a different calendar schedule for the school year (in Malaysia, the end of the school year is October–November). Little attention has been focused on the annual sequencing of such episodes. When plotted by month, table 4 emerges.

Table 4. Inception of outbreaks

	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	Apr	May	June
Outbreaks	4	1	3	1	3	0	0	3	2	3	10	5

This finding shows that 15 out of 35 outbreaks occur during the last 2 months of the school year, at a time of intense group involvement with year-end galas, concerts, graduation shows and rehearsals, and examinations. The number of outbreaks involving school bands, chorus, pep squads, dance gatherings or galas totals 13 episodes. No outbreaks have been reported during the Christmas and New Year period.

Symptoms (table 5)

It has become more or less a side issue in recent reports. It is not an easy task to report on symptoms as there are many, overall factors and often in the same person. A simple method of tabulation, hopefully not too skewed, was chosen here: only the most commonly reported symptom was kept for any given outbreak. The count yields the following frequency of symptom patterns: fainting 10; screaming and laughing 9; headache 8; abdominal pain 8; dizziness 5; nausea 3; pruritus 2. All the above symptoms are currently reported in most outbreaks with varying frequencies. Hyperventilation appears in about 10% of the affected children. Clinical attention should be focused on such cases, that need not only closer physical care but also of greater reassurance. If all the pain syndromes are included (16 episodes) with the 'hysterical-type' group of symptoms (fainting and screaming-laughing), it makes for 35 out of 45 outbreaks (77%); if abdominal pain is associated with dizziness and nausea for a subgroup

Table 5. Symptoms

Main symptom	Outbreaks
Fainting	10
Screaming and laughing	9
Headache	8
Abdominal pain	8
Dizziness	5
Nausea	3
Pruritus	2

of an anxious-type group, it makes for 16 of the 45 outbreaks (35%). A rough estimate would be that 2/3 of the outbreaks show a predominant hysterical symptomatic pattern and 1/3 a predominant anxious symptomatic pattern. Yet, the mixture of both types of symptoms appears to be a regular feature. The symptomatic configuration often takes a profile compatible with the main rumor about the alleged etiology. Abdominal pain is more frequent in perceived food poisoning, while dizziness and headache are more common in suspected gas leaks. Most epidemiological reports identify cardinal clinical features illustrating the incompatibility of the outbreak with an infectious, toxic or environmental etiology. They include the lack of an incubation period, the 'incompleteness' of the symptoms (abdominal pain without vomiting or loose stools in alleged food poisoning), the finding of very few signs in the presence of many symptoms, patterns of transmission by sight

Table 6. Attack rate

	Attack rate		
	<20%	20–35%	35–50%
Outbreaks	12	6	9

or sound, differential attack rates according to sex, age and household. This means that symptoms in such cases should be taken as physical presentations carrying mental representations.

Attack Rate (table 6)

It is estimated in about half the outbreaks. There is a difficulty choosing an appropriate denominator as the determination of the group at risk is unclear, whether it is the total school population or the limited group where the episode has begun. The findings of the current review about the number of affected people would favor selecting the total school population. Moreover, attack rates are constantly reported as different for boys and for girls. We give here a global attack rate. Different group settings are not taken into account, whether large as a whole school or limited as a school band. In all cases but 1, the attack rate never exceeds 50%. Twelve episodes had an attack rate below 20%, 6 between 20 and 35% and 9 between 35 and 50%. The tabulation suggests a combination of two curves: a first around 20% probably reflects the situation for the total population (large groups); a second closer to 40% might pertain to small groups with a tighter cohesiveness. All-female outbreaks report a wide range of attack rates.

Miscellaneous Factors

Rumor. In a large number of outbreaks a central rumor is reported as spreading during the episode in relation to an imaginary, plau-

sible harmful agent. The rumor has an organizing role in giving meaning to an otherwise unintelligible event. The two most common are 'gas leaks' and 'food poisoning' and these two were reported in a third of the outbreaks. The symptoms are often molded according to that rumored causal agent. Older reports scanned in Sirois' [1] review of 1974 frequently put forth fantasies of aggression and today fantasies of contamination are predominant. Smell is a very strong and major trigger, described in about 25% of the reports. This element is introduced in the descriptive background at the beginning of the episode: a room being painted, a chemical spilled, a nearby lawn sprayed, urine smell from the latrine, and at times only a claim of an offensive smell like rotten eggs.

Index Case. The first case to exhibit the reported illness is often identified, but rarely studied in depth; this should be considered in any prolonged or small-group outbreaks. Two types of situation occur. In some cases a real incident occurs: a sick child – a psychotic boy, a heat syncope, an occasionally sick adult, the unexpected incident which apparently transmits fear within the group. In other instances it might be only a peculiar state of mind, voiced by the index case and linked to some sensory stimulus like an odor. In large scale, explosive and short-lived episodes, while it seems unpractical to give special attention to the index case, it is different in outbreaks developing slowly within smaller groups. Benaim et al. [31] have convincingly demonstrated the importance of a detailed study of the index case.

Issues Related to Investigation, Management and Reporting

After reviewing the contents and configuration of the epidemic outbreaks, we will now

examine a different aspect of the topic, the way episodes were reported, investigated and managed. The obvious differences observed at that level raise the issue of the phenomenon being in the eye of the observer. Mass hysteria is difficult to study for several reasons: its unexpected and disruptive nature, rare occurrence, a mixture of ongoing and post facto appraisal, a combination of various levels of data and methodology, its short-lived course, and diagnosis as being one of exclusion. Therefore the methodology to be used varies from one case to the other and is often tentative. Four labels have been used to classify the reports about outbreaks as a key to rapid identification: descriptive, public health, case-control and case study.

Descriptive Reports

This general category is the usual type under which reports are made. We have put 24 of the 45 published cases under that rubric. A large group ($n = 17$) of these papers use an epidemiological frame of reference with basically descriptive organization of background knowledge, simple variables of time, place, persons involved and symptom identification. Some others ($n = 7$) are only anecdotal, as letters to journals, with scant or missing data. Most of them echo published cases as corroboration described in a fragmentary fashion. These reports are geared to the exclusion of a serious plausible threat and very often describe benign cases made of 1-day, explosive, large-scale and nonrecurring outbursts. However, many of those reports omit careful description and basic background information; even the symptomatic pattern and the time course are sometimes cursory presented.

Public Health Reports

Seven papers have been put in that category where the focus is on environmental assess-

ments. The investigation attempts to identify an ecological problem; sampling the environment with biomedical and chemical measurements is combined with reports of medical examinations of the affected persons. That type of approach is becoming prevalent in a majority of investigated outbreaks (that includes those filed under the descriptive type), as opposed to a medical oddity type or a psychosocial type of approach. Mass casualties are reported to public health authorities who dispatch disaster crews for emergency treatment. The first priority rests on the exclusion of a major environmental contamination (infectious, toxic, waterborne or airborne). Such reports assess what the outbreaks is not, and often the diagnosis is made by exclusion. The approach is well grounded in most benign cases in terms of appropriate money spending, but is often restricted to the identification of a single specific agent and does not make the outbreak any more intelligible with very scarce information about the core of the problem. For that reason, Gann [56] has argued to include in the epidemiological investigation the search for psychological indices of spread. He has made a plea for positive diagnosis of psychological parameters in such outbreaks. However, some investigators report how various members within the affected communities often react with hostility to the assessment of the outbreaks as being of a psychological nature [13, 19, 24, 35]. Parents are often reluctant to go along with that line of thought, received either as a blame or as negligence to find the 'real' cause.

A central dilemma of emergency management at the local level is the decision to shift from treating cases to activating a disaster plan; the latter invariably attracts mass media attention. Small and Borus [55], seasoned investigators of various outbreaks, suggest that media coverage might not contribute as much

Table 7. Personal characteristics of affected people

Author	IQ	MMPI	Absen- teeism	EPI ¹	Parental divorce	Death ²	Chronic illness	Academic performance
Goldberg [7]	–	PA+	+					
Teoh and Yeoh [38]				–				
Small and Nicholi [13]					+	+	–	
Wang et al. [42]				–				
Small and Borus [14]					–	–	–	
Goh [46]								–
Cole [24]			–					
Small et al. [25]						+	+	+

¹ EPI = Eysenck Personality Inventory.

² Previous death in the immediate family.

as expected in the buildup of an outbreak. According to those investigators, as long as mass media does not serve to transmit anxiety but inform about the *status quaestionis* and the investigation of possible causes, they are not a significant factor in perpetuating episodes.

Case-Control Reports (table 7)

Seven reports focus on the differentiation of affected individuals from the nonaffected. That type of report relies on self-administered psychological assessments. Most case-control approaches still yield unfruitful results. Many parameters have been checked. Some have investigated the personal psychopathological features of the affected. Goldberg [7] found a possible abnormal MMPI score on the paranoia scale; both Teoh and Yeoh [38] and Wang et al. [42] failed to find any differences with the Eysenck Personality Inventory. Others have tried to identify selected life events in the affected persons. Small and Nicholi [13], Small and Borus [14] and Small et al. [25] found contradicting evidence for parental divorce, previous death in the family and

chronic illness. Previous absenteeism at school was found to be present by Goldberg [7] but absent by Cole [24].

Case Study

Seven papers fit into this type of report where the focus is on group processes either at the psychological or the sociological level if not both. Such papers contain detailed and intensive descriptions linked with the analysis of personal ties, often sociograms of friendships or discussion of some paths of shared concerns. Investigators use key interviews of key informants in a participant-observer approach. That type of reporting appears best suited for studying a special subtype of epidemic hysteria where the outbreak spreads rather slowly and over a longer period of time in a small and often segregated community. However, the use of that method is still waiting for a full test with other usual types of outbreaks. Once environmental problems are excluded, it remains to be decided if the investigation should be closed or should proceed at a different level. What is to be investigated then? One could perhaps consider states of

mind. If case-control approaches are deceptive, some other level of investigation could be opened.

Discussion

The salient features of recent outbreaks as reviewed here can be summarized in the following points. The number of affected people seemed to have increased as compared with Sirois' [1] review of 1974. This change might result from the existence of larger school complexes constructed during the last 30 years, especially in rural areas with the implementation of using buses to transport large numbers of children. The unit of reference is no more the classroom, but the whole campus.

Episodes are also shorter in duration. Over 50% are now single-day events, 4 times as much as tallied in Sirois' [1] earlier review. When the reports are matched for duration against number of affected people, the 1-day episodes show a median of 40 affected people, while the 1-month-or-over episodes show a median of 60 affected people, the same as over-1-week episodes. While there is no obvious inverse relation between duration and the size of the affected group, closer inspection of the reports about long-lasting outbreaks suggests that something different is going on as the latter type of episode appears self-perpetuated by an ongoing process. If numbers are not the main issue, we would suggest to look for a different stand of the affected person toward the group. In single-day outbreaks, a multiplicative effect linked to imitation might play while the person is taking part, while in longer episodes an additive effect might play where the person is taking after some of the others' positions or attitudes in the outbreaks.

While females have always represented the majority of involved persons in such out-

breaks, little discussion has been advanced about that constant set of data. Some like Bartholomew [5] have advocated social factors. We would rather propose here a hypothesis of a psychological type already advanced years ago by Freud [57] in his discussion of identification. The sex distribution might rest on the plausible prevalence in females of a mode of relating to others termed the narcissistic type as opposed to the prevalence in the males of the anaclitic type [58]. It would account for the type of identification well described by Benaim et al. [31]. While that type of explanation remains speculative, it stresses the need for more intensive exploration of psychological parameters related to ties between people and opens an area for future research. The spread down the age scale would further support that same hypothesis, as the 'contagious' process, or part of it, could be seen as an imitative process rooted in narcissistic identification where the younger ones want to be like the older ones, the latter being taken as models. Such conclusions cannot be reached by the data reviewed here, but the data are compatible with such conclusions.

The review also finds that the peak age of the affected females is around age 12, with a distribution following a normal curve above and below that age. Should that age correspond to the onset of puberty and menarche, it would point to the importance of 'sexual' factors in the onset of such outbreaks; of what nature, it cannot be known here. However, if the data are matched with other findings like (a) those coming from the most frequent time of the year for the onset of such episodes, it is found that a majority occur at times of year-end shows of various natures where excitement is high, and (b) with the most frequent rumor reported during those outbreaks, that of an offensive smell with its high power of arousal and reaction, it could be suggested that issues of arousal and excitement, also

linked to the advent of puberty, might have to be investigated as playing some part as predisposing factors. All that indirect evidence points towards the importance of studying the nature and the circulation of fantasies and beliefs in such outbreaks [53]. The method to do it is however not evident.

A major unanswered question lies with the apparent difference between a frequent type of outbreak, lasting 1 day and obviously benign, often linked to a festive occasion, and a second type¹, lasting longer with periods of relapsing symptoms, rather cumulative than explosive in terms of affected people, often building up slowly. Benaïm et al. [31] from a psychological viewpoint and Mohr and Bond [36] from an epidemiological perspective present evidence that there is a conflict worked out in such groups, possibly over some grieving process or loss. The analysis by Mohr and Bond [36] illustrates how the outbreak takes the form of an anniversary reaction in September. Benaïm et al. [31] show how the trauma of the death of a fellow student following a pregnancy is worked out in a small group of girls. Small and Nicholi [13] suggest that affected children should probably have experienced some form of loss; but they take it as an external event to be measured rather than studying the psychological fate of that loss in affected persons. But in one of his papers, Small and Nicholi [13] think that the forthcoming expected loss of the school principal might have been abreacted in the outbreak. In some outbreaks, it looks like children's duplication of a larger social problem

[21, 41]; in others, the issue of conflict is again present or plausible [22, 39, 40]. In this type of outbreak, the ruling out of environmental threats is insufficient as opposed to the benign outbreaks; the psychological issue must be addressed in some way. Often it has to be done *ex post facto*.

What is striking about these two types of outbreaks is the common factor of misunderstanding. What is the use of having oneself and others being led to think that one is prey to some sort of environmental aggression? There are many possible levels of misunderstanding in such events. The first is at the level of investigation. Even if public health approaches try to clarify the negative side of it, the presumed environmental threat, the misunderstanding might persist in the face of a *bona fide* explanation. We do not think it stems from a faulty public relation endeavor. It might just be that the explanation raises more anxiety than it dissipates. Should this specific feature be present, it points to the repressed nature of the psychological representation carried by the outbreak [54], whether *hypothetically* an unacknowledged loss or some sort of diffuse and shared sexual excitation. So far that last factor has been either ignored or dismissed. It still has to be demonstrated, provided an adequate methodology for investigating socially shared fantasies or beliefs is laid out. In some case studies [31, 39, 40] there is evidence for the presence of such fantasies. Some usual explosive school outbreaks might just be benign cases of collective sexual excitement, whereas others might develop as a displaced and covered working through of a highly conflict-ridden and anxiety-laden fantasy like in the report by Benaïm et al. [31]: sex is lethal; there is no sex in our school. Epidemiologists still have to find ways of studying the mental life of groups, unless they choose to collaborate with investigators from other disciplines after having worked

¹ We are not referring here to Wessely's [59] distinction between two syndromes of epidemic hysteria differentiated on the basis of symptomatic patterns, the mass motor type and the anxiety hysteria type. We have seen in the analysis of the symptom profile of the outbreaks that this distinction is borne out as two poles of the symptomatic configuration. It seems that the mass motor type is relatively less frequent now, as only 25% of the 45 outbreaks reviewed here were classified as such [6].

out their own evaluation. After all, as 'natural laboratories', these small little incidents might have more to yield from 'double coverage'. But it is uneasy to do as the current review shows.

Conclusions

The review of school outbreaks of epidemic hysteria for 1973–1993 highlights the following epidemiological parameters: (1) episodes are shorter and involve larger groups, reflecting a shift from earlier reports. (2) The peak of the age span of affected children, mostly female, is around 12. (3) Fifteen of the 45 outbreaks occur during the months of May and June. Ten reports did not specify the time of the year. The end of the school year is the period of highest risk. (4) Many outbreaks ($n = 13$) are associated with school galas, choruses and gathering. (5) A very small proportion (3/45) of the outbreaks seem to be associated with larger social unrest. (6) A perceived odor, real or imaginary, noxious or nonoffensive, is reported at the onset of about 30% of cases. (7) A downward age spread occurs in 2 out of 3 cases. (8) Although there is no inverse variation of the duration of the outbreak with the number of persons involved, durationwise outbreaks are readily divisible into two types: a large majority (23/45) of brief, single-day episodes called here *explosive* and a minority (12/45) lasting longer than a week, often more than a month, called here *cumulative* (9 episodes fall in between; 1 is of unknown duration).

A review of the issues of investigating, reporting and handling of outbreaks shows: (1) Case-control approaches which seek to highlight individual personality characteristics of the affected, do not yield convincing evidence that major personality disturbances are a major factor in the outbreaks. (2) Inves-

tigations exclusively oriented toward an environmental origin are insufficient to make the outbreak intelligible. (3) There is no single optimal mode of reporting about outbreaks. (4) A central rumor related to the etiology of the outbreak is often present but rarely studied in detail. (5) Small-group investigation is rare (sociometrics). (6) In-depth case studies seem useful in long-lasting episodes. One cannot expect from a database oriented towards a medical search to obtain data outside its domain. In the vast majority of such reports, one is satisfied with excluding a serious epidemiological problem; the last three features pertain more to some other field of study. Should there be a need to understand more fully the underlying significance of the outbreak, once the basic epidemiological evaluation has been done, a second type of investigation would have to be conducted. The decision to proceed accordingly would need the identification of indices. Among those the most obvious seem to be of a duration over 1 week.

Hypotheses advanced in this review are the following: (1) Arousal (some hypervigilance akin to an anxiety state) might be a triggering intermediate step. (2) Sexual excitement of a benign and age-specific nature might be an overlooked factor in explosive types. (3) Conflicts over unrecognized excitement, loss or aggression should be studied, especially in episodes of longer duration.

References

- 1 Sirois F: Epidemic hysteria. *Acta Psychiatr Scand* 1974(suppl 252).
- 2 Diagnostic and Statistical Manual of Mental Disorders, ed 4. Washington, American Psychiatric Association, 1994.
- 3 Bartholomew RE: Ethnocentricity and the social construction of mass hysteria. *Cult Med Psychiatry* 1990; 14:455–494.
- 4 Sirois F: Epidemic hysteria: A dialogue with R.E. Bartholomew. *Med Principles Pract* 1997;6:45–50.
- 5 Bartholomew RE: Epidemic hysteria: A dialogue with François Sirois. *Med Principles Pract* 1997;6:38–44.
- 6 Bartholomew RE, Sirois F: Epidemic hysteria in schools: An international and historical overview. *Educ Stud* 1996;22:285–311.
- 7 Goldberg EL: Crowd hysteria in a junior high school. *J Sch Health* 1973;43:362–366.
- 8 Levine RJ, Sexton DJ, Romm FJ, Wood BT, Kaiser J: An outbreak of psychosomatic illness at a rural elementary school. *Lancet* 1974;ii: 1500–1503.
- 9 Sirois F: A propos de la fréquence des épidémies d'hystérie. *Union Med Can* 1975;104:121–123.
- 10 Nitzkin JL: Epidemic transient disturbance in an elementary school. *J Fla Med Assoc* 1976;63:357–359.
- 11 Levine RJ: Epidemic faintness and syncope in a school marching band. *JAMA* 1977;238:2373–2376.
- 12 Moffatt MEK: Epidemic hysteria in a Montreal train station. *Pediatrics* 1982;70:308–310.
- 13 Small GW, Nicholi AM: Mass hysteria among schoolchildren: Early loss as a predisposing factor. *Arch Gen Psychiatry* 1982;39:721–724.
- 14 Small GW, Borus JF: Outbreak of illness in a school chorus: Toxic poisoning or mass hysteria? *N Engl J Med* 1983;308:632–635.
- 15 Wason S, Bausher J: Epidemic mass hysteria. *Lancet* 1983;ii:731–732.
- 16 Roback HB, Roback E, LaBarbera JD: Epidemic grieving at a birthday party: A case of mass hysteria. *J Dev Behav Pediatr* 1984;5:86–89.
- 17 Robinson P, Szewczyk M, Haddy L, Jones P, Harvey W: Outbreak of itching and rash: Epidemic hysteria in an elementary school. *Arch Intern Med* 1984;144:1959–1962.
- 18 Elkins GR, Gamino LA, Rynearson RR: Mass psychogenic illness, trance states, and suggestion. *Am J Clin Hypn* 1988;30:267–275.
- 19 Cartter ML, MsHar P, Burdo H: The epidemic hysteria dilemma. *Am J Dis Child* 1989;143:89.
- 20 Gamino LA, Elkins GR, Hackney KU: Emergency management of mass psychogenic illness. *Psychosomatics* 1989;30:446–449.
- 21 Goldsmith M: Physicians with Georgia on their minds. *JAMA* 1989;262:603–604.
- 22 Philen RM, Kilbourne EM, McKinley TW, Parrish RG: Mass sociogenic illness by proxy: Parentally reported epidemic in an elementary school. *Lancet* 1989;ii:1372–1376.
- 23 Selden BS: Adolescent epidemic hysteria presenting as a mass casualty, toxic exposure incident. *Ann Emerg Med* 1989;18:892–895.
- 24 Cole TB: Pattern of transmission of epidemic hysteria in a school. *Epidemiology* 1990;1:212–218.
- 25 Small GW, Propper MW, Randolph ET, Eth S: Mass hysteria among student perfumers: Social relationships as a symptom predictor. *Am J Psychiatry* 1991;148:1200–1205.
- 26 Baker P, Selvey D: Malathion-induced epidemic hysteria in an elementary school. *Vet Hum Toxicol* 1992;34:156–160.
- 27 Desenclos JC, Gardner H, Horan M: Mass sociogenic illness in a youth center. *Rev Epidemiol Santé Publique* 1992;40:201–208.
- 28 Krug S: Mass illness at an intermediate school: Toxic fumes or epidemic hysteria? *Pediatr Emerg Care* 1992;8:280–282.
- 29 Rockney R, Lemke T: Casualties from a junior-senior high school during the Persian Gulf War: Toxic poisoning or mass hysteria. *J Dev Behav Pediatr* 1992;13:339–342.
- 30 Taylor BW, Werbicki IE: A case of mass hysteria involving 19 schoolchildren. *Pediatr Emerg Care* 1993; 9:216–217.
- 31 Benaim SM, Horder J, Anderson J: Hysterical epidemic in a classroom. *Psychol Med* 1973;3:66–73.
- 32 Smith HCT, Eastham EJ: Outbreak of abdominal pain. *Lancet* 1973;ii: 956–959.
- 33 Forrester RM: Epidemic hysteria: Divide and conquer. *BMJ* 1979;ii: 669.
- 34 Bebbington E, Hopton C, Lockett HI, Madeley RJ: Epidemic syncope in jazz bands: Logistics aspects of investigation. *Community Med* 1980;2:302–306.
- 35 O'Donnell B, Elliot TJ, Huibonhoa C: An outbreak of illness in a rural school. *J Ir Med Assoc* 1980;73: 300–302.
- 36 Mohr P, Bond MJ: A chronic epidemic of hysterical blackouts in a comprehensive school. *BMJ* 1982; 284:961–962.
- 37 Ruiz MT, Lopez JM: Mass hysteria in a secondary school. *Int J Epidemiol* 1988;17:475–476.
- 38 Teoh JI, Yeoh K: Proceedings cultural conflict and transition: Epidemic hysteria and social sanction. *Aust N Z J Psychiatry* 1973;7:283–295.
- 39 Teoh JI, Soewondo S, Sidharta M: Epidemic hysteria in Malaysian schools: An illustrative episode. *Psychiatry* 1975;38:258–268.
- 40 Ackerman SE, Lee RL: Mass hysteria and spirit possession in urban Malaysia: A case study. *J Sociol Psychol* 1978;1:24–34.
- 41 Lee RL, Ackerman SE: The socio-cultural dynamics of mass hysteria: A case study of social conflict in West Malaysia. *Psychiatry* 1980;43: 78–88.
- 42 Wang SW, Kwang B, Tam YK, Tsoi MM: Psychological epidemic in Hong Kong. 1. Epidemiological study. *Acta Psychiatr Scand* 1982; 65:421–436.
- 43 Tam YK, Tsoi MM, Kwang B, Wang SW: 2. Psychological and physiological characteristics of children who were affected. *Acta Psychiatr Scand* 1982;65:437–446.
- 44 Modan B, Tirosh M, Weissenberg E, Acker C, Swartz TA, Costin C, Donagi A, Revach M: The Arjenyattah epidemic – a mass phenomenon: Spread and triggering factors. *Lancet* 1983;ii:1472–1476.

- 45 Araki S, Honma T: Mass psychogenic systemic illness in schoolchildren in relation to Tokyo photochemical smog. *Arch Environ Health* 1986;4: 159–162.
- 46 Goh KT: Epidemiological inquiries into a school outbreak of an unusual illness. *Int J Epidemiol* 1987;16: 265–270.
- 47 Adomakoh CC: The pattern of epidemic hysteria in a girls' school in Ghana. *Ghana Med J* 1973;12:407–411.
- 48 Muhangi JR: Mass hysteria in an Ankole school. *East Afr Med J* 1973; 50:304–309.
- 49 Dhadphale M, Shaikh P: Epidemic hysteria in a Zambian school: 'The mysterious madness of Mwinilunga'. *Br J Psychiatry* 1983;142:85–88.
- 50 Wittstock B, Rozental L, Henn C: Mass phenomena at a Black South African primary school. *Hosp Community Psychiatry* 1991;42:851–853.
- 51 Figueroa M: (Related) in epidemic hysteria (editorial). *BMJ* 1979;iii: 409.
- 52 Moss PD, McEvedy CP: An epidemic of overbreathing among schoolgirls. *BMJ* 1966;ii:1295–1300.
- 53 Sirois F: Remarques sur l'hystérie collective. *Evol Psychiatr (Toulouse)* 1977;42:11–24.
- 54 Sirois F: Perspectives on epidemic hysteria; in Colligan MKJ, Pennebaker JW, Murphy LR (eds): *Mass Psychogenic Illness*. Hillsdale, Erlbaum, 1982, chapter 13, pp 217–236.
- 55 Small GW, Borus JF: The influence of newspaper reports on outbreaks of mass hysteria. *Psychiatr Q* 1987; 58:269–278.
- 56 Gann PH: Truth or consequence: When the study reintroduces the disease agent. *Epidemiology* 1990;1: 192–194.
- 57 Freud S: *Group Psychology and the Analysis of the Ego* (1921). Standard Edition. London, Hogarth Press, 1955, vol 18, p 107.
- 58 Freud S: *On Narcissism: An Introduction* (1914). Standard Edition. London, Hogarth Press, 1957, vol 14, p 90.
- 59 Wesseley S: Mass hysteria: Two syndromes? *Psychol Med* 1987;17:9–120.