



Epidemic Hysteria in Virginia: The Case of the Phantom Gasser of 1933-1934

ROBERT BARTHOLOMEW, PhD, Queensland, Australia; and SIMON WESSELY, PhD, London, United Kingdom

ABSTRACT

Objective. We studied an example of epidemic hysteria occurring outside a closed community and involving fear of being "gassed." The description presented is that of a previously unrecorded case of epidemic hysteria in the state of Virginia during 1933-1934.

Data Sources. Data were gathered from contemporary newspaper accounts.

Conclusion. The case of the Virginia "gasser" is one in a long series of epidemic hysteria incidents during the 20th century, coinciding with heightened awareness of environmental pollution and triggered by imaginary or exaggerated contamination threats. A recommendation is provided on how physicians should approach such episodes.

CONVERSION HYSTERIA refers to the presentation of physical complaints for which there is no identifiable organic basis. Mass hysteria or epidemic hysteria are the contemporary designations most commonly used to describe the collective occurrence of conversion symptoms and are frequently used interchangeably with such terms as hysterical contagion and mass psychogenic or sociogenic illness.^{1,3} According to a literature survey, most epidemic hysteria episodes occur within closed, cohesive social settings: schools, factories, convents, and hospitals.^{4,9}

While the rapid spread of conversion symptoms across communities has rarely been reported during the present century, they were common in the Middle Ages. Medieval episodes of dancing mania and tarantism affected communities across Europe and are widely regarded as history-specific forms of epidemic hysteria, though alternative explanations have been offered, such as ergot poisoning^{10,11} or cultural dimensions.^{12,13} Their appearance is typified as cathartic reactions to psychosocial stress precipitated by a series of crop failures, famines, social upheaval, and most conspicu-

ously, the unprecedented and devastating effects of the Black Death.^{6,14-16}

During the 20th century, there have been relatively few published examples of epidemic hysteria affecting the public at large, in contrast to the considerable literature detailing examples in specific social settings. There have been several reports of community-wide "mass hysterias" in the social science literature during this century, but most do not involve the spread of conversion reactions and there is a complete absence of illness symptoms. These episodes involve the rapid spread of false beliefs and/or the redefinition of ambiguous objects or events and are most accurately described as collective delusions.¹⁷⁻¹⁹ Sociologists and social psychologists commonly use the term collective (or mass) delusions to describe the rapid, spontaneous, temporary spread of false beliefs within a particular population. The word "delusion" should not be used to imply that those affected are experiencing psychologic disturbance. Delusion refers to the socially constructed nature of the episode. Examples of collective delusions recorded in the social science literature during the 20th century include reaction to the "War of the Worlds" broadcast,²⁰ mutilation scares,²¹⁻²³ mass appearances of the Virgin Mary,²⁴⁻²⁶ head-hunter rumor panics in Borneo,²⁷⁻²⁹ mundane windshield pits near Seattle, Washington erroneously attributed to atomic bomb fallout,³⁰

From the Department of Psychology and Sociology, James Cook University of North Queensland, Australia; and the Academic Department of Psychological Medicine, King's College School of Medicine and Institute of Psychiatry, London, United Kingdom.

Reprint requests to Robert Bartholomew, PhD, James Cook University of North Queensland, Department of Psychology and Sociology, Townsville 4811, Queensland, Australia.

and reports of an imaginary hatpin stabber in the vicinity of Paris, France, during the early part of this century.³¹

FROM DEMON POSSESSION TO CONTAMINATION THREATS

Under rare circumstances, conversion symptoms can affect diffuse populations. The appearance and presentation of symptoms in such cases are similar to those in school and factory episodes and appear to begin within cohesive, typically enclosed social units, but with the major difference that the imaginary harmful agent is at large within the communities in question, and anyone is viewed as a potential victim. Each of these reports occurred amid rumors and intense, credible media publicity involving the propagation of a false belief. Three episodes involved rumors of the use of poison gas against ethnic minorities who distrust distant, central governments, including the Palestinian fear of the Israelis,³² the Soviet Georgian suspicion of Moscow,³³ and ethnic Albanian mistrust of Serbs.³⁴ In Auckland, New Zealand, during 1973, 50 drums of the compound merphos were being unloaded at a wharf when it was noticed that several barrels were leaking, and a chemical-like smell permeated the air. After immediate requests for information on its toxicity, authorities were wrongly informed that merphos was extremely toxic, after which at least 400 dock workers and nearby residents received treatment for a variety of psychosomatic complaints: headache, breathing difficulty, and eye irritation.³⁵ During the 1980s, 400 people reported illness symptoms after intense media coverage about the contamination of a water supply in Camelford, England. A subsequent investigation concluded that contrary to popular media claims, the incident posed no long-term harmful effects, and the symptoms were precipitated by anxiety.³⁶

Perhaps the best known report of diffuse epidemic hysteria during the 20th century is the "mad gasser" of Mattoon, Illinois, during August 1944. It is easily the most widely cited case of mass conversion symptoms over the past 50 years. The outbreak began when local police received a telephone call from a middle-aged woman and her teenaged daughter who claimed that they had been attacked by a mysterious figure lurking in the shadows near their home. The intruder reportedly opened a bedroom window and sprayed the house with a sweet-smelling sickish gas that left them nau-

seated and dizzy. The mother also reported a slight, temporary paralysis in her legs. Police investigated the report but failed to find any evidence of the intruder. Two hours later they again rushed to the house after the woman's husband, upon returning home, saw a suspicious man running from near the window where the original incident had occurred. A police investigation was again unremarkable. The following evening of Saturday, September 2, the editors of the Mattoon *Daily Journal-Gazette* published the sensational headlines: "Anesthetic Prowler on Loose." After reading the story, two other local families contacted police with similar accounts of being recently gassed in their homes. Over the next several days, police were inundated with a flurry of gassing claims, which tailed off and ceased altogether after September 12. Johnson³⁷ concluded that victims were exhibiting conversion reactions that were limited to nausea, vomiting, dry mouth, palpitations, difficulty walking, and in one instance, a burning sensation in the mouth.

The spread of epidemic conversion symptoms mirror popular social and cultural preoccupations that define each era. Before the 20th century, the majority of epidemic hysteria reports involved psychomotor agitation and occasional dissociative states precipitated by long-standing religious, academic, or capitalist discipline. Between 1494 and 1662, strict Christian discipline in various European convents, coupled with popular beliefs about witches and demons, engendered a series of episodes involving what Wessely⁸ terms "mass motor hysteria."³⁸⁻⁴³ During the 18th and 19th centuries and the realization of the industrial revolution, rigid capitalist discipline and weak or nonexistent labor unionization led to a flurry of mass motor hysteria in oppressive Western occupational settings, most typically factories. These episodes occurred in England, France, Germany, and Russia and included convulsions,^{44,45} abnormal movements,⁴⁶ and neurologic complaints.⁴⁷ During this same period, strict academic discipline in many European schools, especially in Germany, Switzerland, and France, precipitated outbreaks of convulsions,⁴⁸⁻⁵² contractures,⁵³ shaking,^{54,55} and laughing.⁵⁶

During the 20th century, epidemic hysteria episodes are dominated by environmental concerns, especially exaggerated or imaginary fears involving mysterious odors. Unsubstantiated attributions of gassings are a com-

mon contemporary trigger of epidemic hysteria outbreaks in closed, cohesive social units such as school and occupational settings⁵⁷⁻⁶⁶ and in several of the more rarely recorded incidents in diffuse collectives.^{32-35,37,67} If, as Kleinman⁶⁸ suggests, hysteria is "the literal embodiment of conflicted meanings, somatic symbols that have psychological and social uses," then this present trend in hysterical symptomatology can be described as a sign of our times. Historian Edward Shorter⁶⁹ has likewise documented the change in the nature of hysterical symptoms, with a shift from classic conversion symptoms to more nonspecific, less verifiable complaints such as fatigue and dizziness. In the following account, we will describe for the first time in the scientific literature a remarkably similar case of epidemic hysteria occurring in Virginia.

THE VIRGINIA GASSER

Between December 1933 and January 1934, residents in rural, mountainous Botetourt* County, Virginia, were thrust into national media prominence after a series of alarming reports that a nefarious gasser was prowling the region and spraying citizens in their homes at night. Near the end of the episode, several more incidents were reported in adjacent Roanoke County. The episode began in the tiny hamlet of Fincastle, when a mysterious figure reportedly struck at the Cal Huffman farmhouse on three separate occasions between Friday evening, December 22, and early Saturday morning of the 23rd. The first incident began at about 10 PM when Mrs. Huffman detected a gassy odor and became nauseated. Despite the incident, she retired to bed while her husband stayed awake, hoping to catch the perpetrator in the event of a repeat attack. Thirty minutes later, a gas smell was again detected in the house, and Mr. Huffman telephoned police, who arrived about midnight, but the investigation was unrevealing. Immediately after deputy sheriff O. D. Lemon left at 1 AM, a third attack was reported when all of the 7 or 8 family members experienced choking fumes that made them temporarily ill. The Huffmans' 20 year-old daughter Alice was most seriously affected, having fainted, and when nearby Troutville physician S. F. Driver arrived, thinking her gravely ill, he dramatically administered "artificial respiration" to "resuscitate" her. In just a

few hours, she appeared to have completely recovered. She later relapsed and was described as "seriously ill," but physicians attributed her symptoms to anxiety.⁷⁰ After this third attack, Mr. Huffman and another person inside the house thought they may have seen a man fleeing.⁷¹ The only vague clue was a woman's high heel shoe imprint near the window where the gas was believed to have entered the house, and a second print under a porch where it was thought the gasser may have hidden.⁷²

The next press report appeared in the *Roanoke Times* of December 27, affirming the gasser's existence ("Gas Attacks on Homes Continue"), and adding a new case involving Mr. and Mrs. Clarence Hall of Cloverdale. The couple returned home at 9 PM after a church service and within 5 minutes detected sickening fumes that left a sweet taste in their mouths. Symptoms included nausea, smarting eyes, and weakness. The next evening someone thought they saw a figure shining a flashlight near a side window of the Hall residence.⁷³

The "gasser" struck again on Wednesday the 27th at Troutville as acetylene welder A. L. Kelly reported being attacked at 10 PM while in an upstairs room. Conspicuously, several other occupants in the house were unaffected.⁷⁴ This was followed by a temporary cessation of press coverage and reported incidents, with speculation that the gasser had ceased his sinister activities.⁷⁵

Reports of gas attacks resumed on Thursday night, January 11 at 10 PM when a Mrs. Moore of Howell's Mill, several miles west of Fincastle, reported hearing muffled voices in the yard followed by a rustling shade by a window that had been broken for some time. She immediately smelled gas, "grabbed her baby and ran out to give the alarm, but not until experiencing a marked feeling of numbness." The couple who owned the house lived upstairs and were unaffected by the "gas" and were unaware of the incident until hearing Mrs. Moore's cries.⁷⁶ Once again, the press had reported the gasser's existence as fact, beginning its account as follows: "Nocturnal dispensers of a nauseating and benumbing gas were abroad in Botetourt County again last night. . . ."⁷⁶ The house owner, Homer Hylton, stood sentry over the residence with a shotgun until daybreak, fearing another attack. Considerable alarm was raised when another "gassing" at about this same time in Troutville

*Pronounced "bot-ah-tot."

was suspected by one physician to have involved potentially lethal chlorine gas.⁷⁷

On Tuesday night, January 16, F. B. Duval told police that upon arriving at his home near Bonsack about 11:30, he learned that his family had been gassed. Driving to meet police, he caught a fleeting glimpse of a man running to a nearby car, and assumed that he was the perpetrator.⁷⁸ On Friday evening, January 19 at 7:30, a Mrs. Campbell was sitting near a window at her Carvin's Cove home when she noticed the curtains flutter, immediately followed by a sickening odor.⁷⁹ On Sunday night, January 21, Mr. and Mrs. Howard Crawford returned home in Colon at 9 PM, when Mrs. Crawford was staggered by fumes while trying to light a lamp.⁸⁰

By Tuesday, January 23, many families in remote sections of the county were sleeping with neighbors, while vigilante farmers were conducting their own road patrols or could be seen "sitting on their doorsteps with guns in their hands."⁸¹ One police officer expressed concern "that some innocent person passing a house or calling upon a neighbor may be wounded or killed through nervousness" by those fearing they were the gasser's next target.⁸² On the morning of the 24th, Mrs. R. H. Harteel of Pleasantdale returned home at about 4:30 AM after sleeping with a neighbor, only to find that the house had been gassed.⁸² On the 24th, police heightened tensions after an internal misunderstanding resulted in their erroneously reporting three separate attacks on homes 2 nights earlier.⁸² In actuality, there had been one report, at the residence of a man named Reedy. Upon detecting the odor, one of his sons grabbed a shotgun, ran outside and fired at what appeared to be a shadowy figure in a field.⁸³ On January 30, the Virginia legislature passed a bill imposing a prison term of up to 20 years for anyone convicted of releasing noxious gasses in public or private places.⁸⁴

On Sunday evening, January 28, five people sitting in a room at the Ed Stanley residence near Colon Siding were overcome by noxious fumes, experiencing a choking sensation and nausea. Although none lost consciousness, a Mrs. Weddle had to be carried from the house. When one of the victims, Frank Guy, reached fresh air, he saw what appeared to be four men running near the woods, grabbed a shotgun, and fired.⁸⁵ The next day, a \$500 reward was offered by the county Board of Supervisors for apprehension and conviction of the culprit or culprits.⁸⁶

Increasing Skepticism

With the lack of concrete evidence, a gradual increase in press skepticism began to appear, coinciding with the first obvious false alarm. This occurred in Fincastle on the night of the 24th, when Mamie Brown dashed from her residence near the jail, screaming that she had been gassed. A crowd quickly formed and rushed to her residence. However, it was soon determined that someone "had tossed a common fly killing fluid into the kitchen—apparently as a joke."⁸⁷ At 9 PM on the 25th, a watch dog at the Chester Snyder farm near Cloverdale began barking. Prepared for the gasser, Snyder leapt from his bed, grabbed a shotgun, and fired at the outline of a figure walking in a nearby field.⁸⁸ On January 28, a journalist jokingly interviewed Mr. Snyder's dog. "He [the dog] was friendly and apparently willing to 'make copy,' but when he was asked whether a man he detected prowling . . . was the 'gas' man, the pup merely pointed his ears . . . and barked a single bark."⁸⁹ By January 30, some citizens were suggesting that "the whole gassing case is a mere hoax, or figment of imagination of reported victims."⁹⁰ In another development, Dr. Driver told a meeting of the county Board of Supervisors that not all cases appeared to be genuine. It was also disclosed that in one "attack" the fumes were traced to a coal stove.⁸² Sheriff L. T. Mundy typified the mood at this time, declaring himself a "doubting Thomas." Meanwhile, his wife was stuffing keyholes on their farm in an effort to thwart the gasser.⁹¹

Roanoke County

In early February, the attacks shifted for the first time outside of Botetourt County, to adjacent Roanoke County. Early on the evening of February 3, a trio were sickened by fumes at the Hamilton residence as the family was entering their home after an absence of several hours.⁹² Within 3 hours, the last case investigated as a possible attack in Botetourt County transpired on Saturday evening, February 3, at the Troutville home of A. P. Scaggs; seven persons and the dog were made ill.⁹³ As usual, the incident occurred between 8 and 9 PM, and a doctor was summoned to treat the victims, all of whom quickly recovered, including the pet.⁹⁴

There were subsequent gassing claims in Botetourt County, but none involved symptoms or the detection of gas by residents. The following evening John Shanks noticed a car near his home near Troutville, became suspi-

cious, and fired three shots into the air as the vehicle drove away. At about the same time, another Troutville man became fearful of a gas attack after hearing a noise on his porch. Police, however, noted that these incidents were ambiguous and probably unrelated to the gasser.⁹⁵

The gasser next struck in a residential section of Roanoke at about 8 PM on February 7, as Mrs. A. H. Milan of Rorer Avenue was in her living room with her 12-year-old daughter when a smell was detected coming from the door. Mrs. Milan, who had been ill for the previous 2 days, "was overcome by gas" and administered oxygen by the Roanoke Life Saving and First Aid Squad. Her daughter experienced only brief dizziness.⁹⁶ Mrs. Milan spent the night in the hospital as a precaution, though her daughter had no after-effects.⁹⁷ The following night, Roanoke police received five additional attack reports within 2 hours, only to be frustrated by a dearth of clues. The first call was received at 8:55 PM, when an employee of the city health department and three family members detected a strange smell in their home and briefly felt faint. Most calls consisted of residents smelling fumes but not becoming ill. One report was a clear false alarm when a maid overreacted after a car stopped near her residence.⁹⁸

On the following night of February 9, skepticism crystallized. Of the seven separate gasser calls investigated, "In no instance did the officers detect any nauseating fumes, and no occupants of any of the homes were affected."⁹⁹ In most cases, an obvious pedestrian source of the odors was readily detected. In one instance, fumes were believed to have emanated from a passing car. At another residence, three detectives rushed to a home, only to identify the source as coal fumes from a stove.

Residents at 316 Howbert avenue, Wasena, detected strange fumes near a furnace register about 8:25 but no one suffered any ill effects and police said they believed the fumes had come from the furnace. No one was seen or heard about the house before the odor was detected. . . .

Three reports were received between 10 and 11 o'clock . . . at 551 Washington avenue, S.W.—both occupants and police detected fumes, but they came from a thawing automobile radiator which contained alcohol. Several persons were playing bridge when the fumes were noticed. Police found that an automobile had been driven into a garage at the rear of the house and the smell of alcohol was decidedly noticeable.

A resident at 311 Broadway, South Roanoke, entered a bedroom and detected a peculiar odor. Police said they failed to find any trace of a noxious gas.

Residents at 811 and 813 Shenandoah avenue, N.W., noted a peculiar odor about 11 o'clock. Police said they believed that the occupants had smelled sulphur in coal smoke from passing train.⁹⁹

On the morning of February 10, when the seven pseudoattacks of the previous night were reported, a further revelation eroded public confidence in the gasser's reality. It was disclosed that Mrs. Langford, who became ill on the evening of February 8 after hearing a "gas canister" strike her door, was being released from the hospital after recovering. Meanwhile, police announced that the noise was believed to have been rice thrown at her door. The three other occupants of the house had been unaffected.¹⁰⁰

The following night of February 11, five more gassings were investigated as police disclosed a potential break in the case. A sweet-smelling oily liquid was found in the snow near the scene of a suspected attack.¹⁰¹ On February 12, police announced that the mysterious liquid was harmless to humans and most likely an insecticide "similar to that of fly exterminators used in practically every household."¹⁰² Reported gassings ceased entirely in both counties after February 11. In all, Roanoke police had received 19 calls, the last of which was traced to burning rubber, prompting the investigating officers to suggest that the "gas man" was "a product of overwrought imaginations."¹⁰³ This conclusion was supported by a *Roanoke Times* editorial proclaiming "Roanoke Has No Gasser."¹⁰⁴ The editor stated: "This newspaper has so believed from the first [in the gasser's nonexistence], but it seemed best to permit the police to go ahead and investigate without whatever handicap they might be under were cold water to be thrown on their search in advance." Despite this claim, an earlier editorial in the same newspaper, clearly implied that the gasser was real.¹⁰⁵

CONCLUSION

The episode of the phantom gasser of Virginia is a fascinating example of epidemic hysteria within a community setting. The remarkable parallels between this case and the famous phantom anesthetist of Mattoon may not be coincidental. During the 1930s and early 1940s, Americans were preoccupied with the issue of chemical weapons during wartime. In his study of the panic that followed the "War of the Worlds" radio play in October 1938, Princeton University psychologist

Hadley Cantril²⁰ concluded that a major contributing factor to the panic was the plausibility of the broadcast, since a substantial portion of listeners had assumed that the Martian "gas raids" were actually a German gas attack on the United States. One typical respondent told Cantril: "The announcer said a meteor had fallen from Mars and I was sure that he thought that, but in back of my head I had the idea that the meteor was just a camouflage . . . and the Germans were attacking us with gas bombs."²⁰

In this century, we are no longer oppressed by demons and spirits, at least not in the developed world, but our modern demons take new forms. It is perhaps part of the human condition to harbor fears about the environment and to believe in the existence of powerful yet invisible forces with the potential to control our destiny. To the medieval mind, demonic possession was a reality. To the inhabitants of interwar Virginia, such fears would have seemed quaint, but a threat from mysterious gases was viewed as realistic. A future use of poison gas against civilian populations was part of the mental landscape of the interwar periods.

At the end of the century, such fears are, if anything, even more prevalent. Fear of being gassed is no longer restricted to the context of either military service or a war against civilians such as waged by Saddam Hussein against the Kurds. The recent terrorist attack using sarin on the Tokyo subway produced a wave of further mass collapses almost certainly due to the resulting fear.¹⁰⁶ Instead, the specific fears of being gassed by an unseen enemy have now generalized into a more global perception of environmental hazard.¹⁰⁷⁻¹⁰⁹ Indeed, these fears gain increased resonance precisely because they are not always illusory—the examples of the Kurds, Bhopal, Seveso, and Chernobyl, and the legacy of Silent Spring, provide a fertile soil for current illness fears. Hence, as we approach the new millennium, concerns about the threats of domestic or foreign terrorists, coupled with more general "green" concerns, suggest there is fertile ground for future episodes of epidemic hysteria in closed settings. The ever-increasing reach of the media and Internet suggests that even more widespread manifestations of illness fears can be anticipated.^{110,111}

How should physicians approach epidemic hysteria episodes involving contamination fears? It must be realized that while epidemic

hysteria cannot be confirmed by any medical test, it is not an exclusionary diagnosis, since the presence of a constellation of distinct characteristic features almost certainly indicates the presence of psychogenic illness.⁸ These include ambiguous illness signs of a transient and benign nature; absence of an identifiable pathogenic agent; rapid onset and recovery; and extraordinary psychosocial stress. The most common symptoms are hyperventilation, nausea, dizziness, fainting, abdominal pain, tetanic spasms, headache, and weakness.^{8,9,112}

Once a diagnosis has been made, it is important to provide community reassurance that the agent believed to pose a threat was either imaginary or no longer exists. Physicians can seek to instill confidence and garner support from other influential leaders, and consider involvement in public forums or providing mass media interviews. Such forms of open dialogue with community members can counteract rumors and misinformation that typify episodes.

The lack of public support or understanding of the epidemic hysteria label often results in fierce community opposition to the diagnosing physician.^{59,113-115} Some researchers note that in dismissing claims it is important to refrain from remarks such as "it's all in their heads," which often exacerbate episodes and engender further hostility and defensiveness from those affected.^{116,117} It is important to realize that despite a psychosocial etiology, those affected actually have physical symptoms. Short-term symptoms are generally self-limiting and respond favorably to reassurance.⁸ In treating patients who are exhibiting long-term symptoms of chronic somatization (exceeding 6 months), the management strategy should heighten patient awareness of psychosocial cues and the inappropriate focus on physical symptoms.¹¹⁸

Acknowledgements. We thank Thomas Bullard, PhD, for providing us with the press accounts of the Botetourt "gasser."

References

1. Sirois F: Epidemic hysteria. *Acta Psychiatr Scand Suppl* 1974; 252:7-46
2. Bartholomew RE: Ethnocentricity and the social construction of 'mass hysteria.' *Cult Med Psychiatry* 1990; 14:455-494
3. Boss LP: Epidemic hysteria: a review of the published literature. *Epidemiol Rev* 1997; 19:233-243
4. Calmeil LF: *De la folie, consideree sous le point de vue pathologique, philosophique, historique et judiciaire.* Paris, Bailliere, 1845
5. Colligan MJ, Murphy LR: Mass psychogenic illness in organizations: an overview. *J Occup Psychol* 1979; 52:77-90

6. Sirois F: Perspectives on epidemic hysteria. *Mass Psychogenic Illness: A Social Psychological Analysis*. Colligan M, Pennebaker J, Murphy L (eds). Mahwah, NJ, Lawrence Erlbaum, 1982, pp 217-236
7. Olkinuora M: Psychogenic epidemics and work. *Scand J Work Environ Health* 1984; 10:501-515
8. Wessely S: Mass hysteria: two syndromes? *Psychol Med* 1987; 17:109-120
9. Bartholomew RE, Sirois F: Epidemic hysteria in schools: an international and historical overview. *Educational Studies* 1996; 22:285-311
10. Backman EL: *Religious Dances in the Christian Church and in Popular Medicine*. Classer E (trans). London, Allen and Unwin, 1952
11. Donaldson LJ, Cavanagh J, Rankin J: The dancing plague: a public health conundrum. *Public Health* 1997; 111:201-204
12. Bartholomew RE: Tarantism, dancing mania and demonopathy: the anthropological aspects of 'mass psychogenic illness.' *Psychol Med* 1994; 24:281-306
13. Bartholomew RE: Dancing with myths: the misogynist construction of dancing mania. *Feminism Psychol* 1998; 8:173-183
14. Hecker JFC: *Epidemics of the Middle Ages*. Babington B (trans). London, The Sydenham Society, 1844
15. Rosen G: Psychopathology in the social process: dance frenzies, demonic possession, revival movements and similar so-called psychic epidemics. an interpretation. *Bull Hist Med* 1962; 36:13-44
16. Rosen G: *Madness in Society*. London, Routledge and Kegan Paul, 1968
17. Bartholomew RE: Redefining epidemic hysteria: an example from Sweden. *Acta Psychiatr Scand* 1993; 88:178-182
18. Bartholomew RE: Collective delusions: a skeptic's guide. *Skep Inq* 1997; 21:29-33
19. Bartholomew RE: The medicalization of exotic deviance: a sociological perspective on epidemic koro. *Transcultural Psychiatry* 1998; 35:5-38
20. Cantril H: *The Invasion from Mars: A Study in the Psychology of Panic*. Princeton, NJ, Princeton University Press, 2nd Ed, 1947
21. Jacobs N: The phantom slasher of Taipei: mass hysteria in a non-western society. *Soc Problems* 1965; 12:318-328
22. Stewart JR: Cattle mutilations: an episode of collective delusion. *Skep Inq* 1977; 1:55-66
23. Bartholomew RE: Mutilation mania—the witch craze revisited: an essay review of An Alien Harvest. *Anthropol Consciousness* 1992; 3:23-25
24. Tumin M, Feldman A: The miracle at Sabana Grande. *Public Opin Q* 1955; 19:124-139
25. Yassa R: A sociopsychiatric study of an Egyptian phenomenon. *Am J Psychother* 1980; 34:246-251
26. Persinger M, Derr J: Geophysical variables and behavior: LIV. Zeitoun (Egypt) apparitions of the Virgin Mary as tectonic strain-induced luminosities. *Percept Mot Skills* 1989; 68:123-128
27. Bhar S: A headhunter scare in a Simunul Bajau village in Sandakan, 1979. *Borneo Research Bulletin* 1980; 12:26-29
28. Drake RA: Construction sacrifice and kidnapping: rumor panics in Borneo. *Oceania* 1989; 59:269-278
29. Erb M: Construction sacrifice, rumors and kidnapping scares in Manggarai: further comparative notes from Flores. *Oceania* 1991; 62:114-126
30. Medalia NZ, Larsen O: Diffusion and belief in a collective delusion. *Sociological Rev* 1958; 23:180-186
31. Burnham WH: *The Normal Mind*. New York, D. Appleton-Century, 1924
32. Modan B, Tirosh M, Weissenberg E, et al: The Arjenyattah epidemic. *Lancet* 1983; 2:1472-1476
33. Goldsmith MF: Physicians with Georgia on their minds. *JAMA* 1989; 262:603-604
34. Radovanovic Z: On the origin of mass casualty incidents in Kosovo, Yugoslavia, in 1990. *Eur J Epidemiol* 1995; 11:1-13
35. McLeod WR: Merphos poisoning or mass panic? *Aust N Z J Psychiatry* 1975; 9:225-229
36. David AS, Wessely SC: The legend of Camelford: medical consequences of a water pollution accident (Editorial). *J Psychosom Res* 1995; 39:1-9
37. Johnson DM: The "phantom anesthetist" of Mattoon: a field study of mass hysteria. *J Abnormal Soc Psychol* 1945; 40:175-186
38. Madden RR: *Phantasms or Illusions and Fanaticisms of Protean Forms Productive of Great Evils*. London, T. C. Newby, 1857
39. Garnier S: *Barbe Bruece, en religion, Soeur Sainte-Colombe et la pretendue possession des Ursulines d'Auxonne*. Paris, Felix Alcan, 1895
40. Huxley A: *The Devils of Loudun*. New York, Harper and Brothers, 1952
41. Loredan J: *Un grand proces de Sorcellerie au XVIIe siecle, L'Abbe Gaufridy et Madeleine de Demandolx (1600-1670)*. Paris, Perrin et Cie, 1912
42. de Certeau M: *La Possession de Loudun*. Julliard, Collection Archives, 1970
43. Thomas K: *Religion and the Decline of Magic*. London, Weidenfeld and Nicolson, 1971
44. St. Clare W: *Gentleman's Magazine* 1787; 57:268
45. Seeligmuller A: Uber epidemisches auftreten von hysterischen zustanden. *Allgemeine Zeitschrift fur Psychiatrie* (Berlin) 1876; 33:510-528
46. Bouzoul M: Relation d'une epidemie a phenomene hysterico-choreique observee a Algon (Ardeche) en 1882. *Lyon Medical* 1884; 47:142-148; 174-184; 211-217
47. Schatalow N: Zur frage von der epidemischen hysteric. *Neurologische Centralblatt* 1891; 10:405
48. Hirsch A: *Handbook of Geographical and Historical Pathology*. London, New Sydenham Society, 1883
49. Armaingaud M: Recherches cliniques sur l'hysteric; relation d'une petite epidemie d'hysteric observee a Bordeaux. *Memoire et Bulletin de la Societe de Medecine et Chirurgie de Bordeaux*, 1879, pp 551-579
50. Hagenbach E: Chorea-epidemie. *Kor-Blatt f Schweiz Arzte* (Basel) 1893; 23:631-632
51. Aemmer F: *Eine schulepidemie von tremor hystericus*. Inaugural dissertation, Basel, 1893
52. Hirt L: Eine epidemie von hysterischen krampfen in einer schleisischen dorfschule. *Zeitschrift fur Schulgesundheitspflege* 1893; 6:225-229
53. Regnard M, Simon J: Sur une epidemie de contracture des extremités observee a Gentilly. *Comptes Rendus des Seances de la Societe de Biologie* (Paris) 1877; 3:344-347, 350-353
54. Laquer L: Uber eine chorea-epidemie. *Dtsch Med Wochenschr* (Leipzig) 1888; 14:1045-1046
55. Wichman R: Eine sogenannte veitstanzepidemie in Wildbad. *Dtsch Med Wochenschr* (Leipzig) 1890; 16:632-636, 659-663
56. Rembolt S: Acute psychische contagion in einer Madchenschule. *Berliner Klinische Wochenschr* 1893; 30:662-663
57. Stahl S, Lebedun M: Mystery gas: an analysis of mass hysteria. *J Health Soc Behav* 1974; 15:44-50
58. Small G, Nicholi AM: Mass hysteria among student performers: early loss as a predisposing factor. *Arch Gen Psychiatry* 1982; 39:721-724
59. Wong SW, Kwang B, Tam YK, et al: Psychological epidemic in Hong Kong (Part 1). Epidemiological study. *Acta Psychiatr Scand* 1982; 65:421-436
60. Philen RM, Kilbourn EM, McKinley TW: Mass sociogenic illness by proxy: parentally reported in an elementary school. *Lancet* 1989; 2:1372-1376
61. Selden BS: Adolescent epidemic hysteria presenting as a mass casualty, toxic exposure incident. *Ann Emerg Med* 1989; 18:892-895
62. Cole TB: Pattern of transmission of epidemic hysteria in a school. *Epidemiology* 1990; 1:212-218
63. Krug S: Mass illness at an intermediate school: toxic fumes or epidemic hysteria? *Pediatr Emerg Care* 1992; 8:280-282
64. Rockney RM, Lemke T: Casualties from a junior high school during the Persian Gulf War: toxic poisoning or mass hysteria? *J Dev Behav Pediatr* 1992; 13:339-342
65. Taylor BW, Werbicki JE: A case of mass hysteria involving 19 schoolchildren. *Pediatr Emerg Care* 1993; 9:216-217

66. Spitlers C, Darcy J, Hardin T, et al: Outbreak of unexplained illness in a middle school—Washington, April 1994. *MMWR Morb Mortal Wkly Rep* 1996; 45:6-9
67. Christophers AJ: Civil emergency butyl mercaptan poisoning in the Parnell civil defence emergency: fact or fiction. *N Z Med J* 1982; 95:277-278
68. Kleinman A: *Rethinking Psychiatry: From Cultural Category to Personal Experience*. New York, The Free Press, 1988, p 41
69. Shorter E: *From Paralysis to Fatigue: A History of Psychosomatic Illness in the Modern Era*. New York, The Free Press, 1992
70. One gas victim seriously ill. officers seek clues here with little success. *Roanoke Times* [Roanoke, Virginia], December 30, 1933, p 2. Girl still ill. *Roanoke Times*, January 2, 1933, p 10
71. Gas 'attack' on family is probed. fumes at night fell girl and make others ill at Haymakertown home. *Roanoke Times*, December 24, 1933, p 13
72. . . Finds woman's track. *Roanoke Times*, December 29, 1933, p 2
73. Gas attacks . . . second reported from Cloverdale. *Roanoke Times*, December 27, 1933, p 2
74. Stealthy gasser is active again. Troutville man is latest victim. *Roanoke Times*, December 29, 1933, p 2
75. Gas attacks appear to have ceased in Botetourt County. *Roanoke Times*, January 2, 1934, p 10
76. Gasser busy in West Botetourt. fourth attack is reported. *Roanoke Times*, January 12, 1934, p 2
77. . . Reports chlorine used. *Roanoke Times*, January 21, 1934, p 15
78. Ghostly gasser operates again. perpetrator vanishes again without trace after Carvin's Cove attack. woman is made ill. *Roanoke Times*, January 21, 1934, p 15. . . Sees man run. *Roanoke Times*, January 22, 1934, p 2
79. . . No motive known. *Roanoke Times*, January 22, 1934, p 2
80. . . Botetourt visited by gasser. shots fired at fleeing suspect. *Roanoke Times*, January 23, 1934, p 2
81. Gasser reported in action. family, fearing to stay in house at night, finds fumes on return. *Roanoke Times*, January 25, 1934, p 2
82. . . Fears injury to innocent. *Roanoke Times*, January 31, 1934, p 2
83. . . Occurs at customary hour. *Roanoke Times*, January 24, 1934, p 2
84. Gas throwing prompts bill for rigorous penalties. sponsors propose prison sentence. *Roanoke Times*, January 24, 1934, p 2
85. Continue search for 'gas' clues. officers' test eliminates chlorine—inhabitants are highly keyed. *Roanoke Times*, January 31, 1934, p 2
86. Gas throwers make new foray . . . reward of \$500 authorized. *Roanoke Times*, January 30, 1934, p 2
87. This gas attack less diabolical than real thing. *Roanoke Times*, January 25, 1934, p 2. . . Noticed car passing. *Roanoke Times*, February 12, 1934, p 1
88. Gasser suspect greeted with buckshot barrage. *Roanoke Times*, January 27, 1934, p 2
89. Spirited pup is gas thrower foe. *Roanoke Times*, January 28, 1934, p 2
90. . . Hoax angle taken up. *Roanoke Times*, January 30, 1934, p 3
91. . . Sheriff 'from Missouri.' *Roanoke Times*, February 6, 1934, p 2
92. Mysterious gas thrower visits home at Vinton. *Roanoke Times*, February 6, 1934, p 3. 2 New 'gassings' puzzle to police. *Lynchburg News* [Lynchburg, Virginia], February 7, 1934, p 3
93. . . Dog acts queerly. *Roanoke Times*, February 6, 1934, p 7
94. Troutville home gas attack . . . officers again find no clues. *Roanoke Times*, February 5, 1934, p 2
95. . . Latest call investigated. *Roanoke Times*, February 6, 1934, p 2
96. Rorer Avenue home target of mysterious gas attack. *Roanoke Times*, February 8, 1934, pp 1,4
97. . . Gas not identified. *Roanoke Times*, February 8, 1934, p 4
98. 5 attacks by mystery gasser keep police busy. reports of nocturnal visits come from widely separated spots. *Roanoke Times*, February 9, 1934, pp 1,4
99. Seven suspected visits of 'gasser' reported to police. *Roanoke Times*, February 10, 1934, p 3
100. . . Victim recovering. *Roanoke Times*, February 10, 1934, p 3
101. Bottle of old liquid seen as clue to mysterious 'gassings.' authorities investigating reported attacks. *Roanoke Times*, February 11, 1934, pp 1-2
102. Sample of 'gas' is found to be harmless to humans. *Roanoke Times*, February 12, 1934, p 1
103. 'Gas man' takes full night off. skeptical police get but one call and find burning rubber to blame. *Roanoke Times*, February 12, 1934, p 1
104. Roanoke has no gasser. *Roanoke Times*, February 14, 1934, p 6
105. Botetourt's mysterious 'gassers.' *Roanoke Times*, February 24, 1934, p 6
106. Wessely S: Hysteria after gas attacks. *The Times* (London), July 4, 1995, p 14a
107. The dump that wasn't there. *Science* 1982; 215:645
108. Schechter MT, Spitzer WO, Hutcheon ME, et al: Cancer downwind from sour gas refineries: the perception and the reality of an epidemic. *Environ Health Perspect* 1989; 79:283-290
109. Cole D, Tarasuk V, Frank J, et al: Research responses to outbreaks of concern about local environments. *Arch Environ Health* 1996; 51:352-358
110. Showalter E: *Hystories: Hysterical Epidemics and Modern Culture*. London, Picador, 1997
111. Frost K, Frank E, Maibach E: Relative risk in the news media: a quantification of misrepresentation. *Am J Public Health* 1997; 87:842-845
112. Colligan MJ, Murphy LR: A review of mass psychogenic illness in work settings. *Mass Psychogenic Illness: A Social Psychological Analysis*. Mahwah, NJ, Lawrence Erlbaum, 1982, pp 33-52
113. Nitzkin JL: Epidemic transient situational disturbance in an elementary school. *J Fla Med Assoc* 1976; 63:357-359
114. Roueche B: Annals of medicine. *The New Yorker* 1978; 21:63-70
115. Cartter ML, MsHar P, Burdo H: The epidemic hysteria dilemma. *Am J Dis Child* 1989; 143:89
116. Singer JE: Yes Virginia, there really is a mass psychogenic illness. *Mass Psychogenic Illness: A Social Psychological Analysis*. Colligan M, Pennebaker J, Murphy L (eds). Mahwah, NJ, Lawrence Erlbaum, 1982, pp 127-135
117. Singer JE, Baum CS, Baum A, et al: Mass psychogenic illness: the case for social comparison. *Mass Psychogenic Illness: A Social Psychological Analysis*. Colligan M, Pennebaker J, Murphy L (eds). Mahwah, NJ Lawrence Erlbaum, 1982, pp 155-169
118. Bass C, Benjamin S: The management of chronic somatisation. *Br J Psychiatry* 1993; 162:472-480