

ERGOTISM AND THE SALEM WITCH PANIC: A CRITICAL ANALYSIS AND AN ALTERNATIVE CONCEPTUALIZATION

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The controversial hypothesis that the Salem witchcraft panic of 1692 resulted from ergot poisoning was recently defended by Mary Matossian. She argued that (a) weather conditions in Salem were conducive to the growth of ergot, (b) new evidence concerning the age distribution of ergot sufferers is consistent with the ages of those who exhibited symptoms at Salem, and (c) the symptoms displayed and reported at Salem were those of convulsive ergotism. Each of these propositions is critically examined and rejected, and the events purportedly explained by the ergot hypothesis are accounted for within a social psychological framework. This perspective views the Salem crisis as a sociopolitical drama played out in terms of the worldview shared by seventeenth-century Puritans. The symptoms of demonic affliction are conceptualized as role enactments learned in and legitimated by the community, rather than as the results of disease.

In the winter of 1691-1692 a number of young people in the village of Salem, Massachusetts, began to behave strangely and eventually accused neighbors of having bewitched them. Other witnesses joined these "afflicted children" in making accusations, and the accused began to be tried for witchcraft. Within a few months the number of accusations and trials had escalated into the famous Salem witch crisis, the largest witch panic to occur in colonial America.¹ Several years ago Linda Caporael hypothesized that this panic resulted from the ingestion of ergotized rye by the afflicted children and other witnesses who testified against the accused.² The ingestion of ergotized grain can produce cardiovascular effects leading, among other things, to gangrene (gangrenous ergotism) or neurological effects leading, among other things, to convulsions (convulsive ergotism).³ Gangrenous symptoms did not occur at Salem, and Caporael hypothesized that the panic resulted from an outbreak of convulsive ergotism.

Jack Gottlieb and I took issue with the ergot hypothesis and with the evidence used to support it.⁴ We pointed out that the features of the Salem crisis did not correspond to those of a convulsive ergotism epidemic. For instance, the age and sex distributions of the "afflicted children" did not correspond to those expected in such an epidemic. Most important, we systematically examined the legal depositions of witnesses against the accused, available in the *Records of Salem Witchcraft*, for descriptions that might represent symptoms of ergot poisoning.⁵ None of the persons about whom symptom information was available suffered the constellation of symptoms that characterizes convulsive ergotism. In short, we found no evidence whatsoever to support the convulsive ergotism hypothesis.

In a recent *American Scientist* article, Mary Matossian attempted to revive the ergotism hypothesis.⁶ I will show that she does not present a single pertinent new fact in support of this hypothesis. The new information in her article is either irrelevant to the

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ergot hypothesis, incorrect, or presented in a highly misleading manner. There is, in other words, not a shred of evidence in support of the ergot hypothesis. The facts of the Salem crisis can be interpreted much more plausibly in terms of political and economic considerations that operated in Salem at that time.

Matossian's argument is threefold: (1) Temporal changes in the frequency of convulsive symptoms can be accounted for by a food shortage that led to the increased ingestion of ergotized rye. (2) New evidence indicates that the age distribution of ergot sufferers in modern epidemics corresponds to the ages of the sufferers at Salem. (3) The symptoms of the afflicted were symptoms of convulsive ergotism. I will consider each of these points individually.

CROP FAILURES AND FOOD SHORTAGES

According to Matossian, convulsive symptoms at Salem began in December of 1691 and peaked in the summer of 1692. To the best of my knowledge, a careful cataloging of changes in the frequency of convulsive symptoms (as opposed to changes in the frequency of accusations) at Salem has never been conducted, and Matossian cites no authority for this statement. Nevertheless, assuming that she is correct, how is this temporal course in symptomatology to be accounted for? Matossian suggests the following unsupported chain of inferences: (a) the winters of 1690-1692 were colder than usual; (b) in 1692 many crops that constituted the staple diet of New Englanders probably failed; (c) therefore, people probably became more dependent on rye, which flourishes in the cold, as a food source; (d) therefore, they probably began eating the poisoned rye earlier than usual; (e) therefore, symptom frequency peaked in the summer of 1692.

One obvious difficulty with this inferential chain is the lack of any evidence for a crop failure or food shortage. Matossian cites none: no diary entries, no letters, no sermons, no commercial records, no evidence at all that the inhabitants of Salem experienced unusual crop failure or food shortage. Instead, Matossian assumes there was a food shortage because she assumes the winters in question were colder than usual. How does she know this? She notes that several diarists wrote that the winters in question were "very cold."⁷ In the Boston area, however, winters are usually very cold, and diary entries to this effect tell us nothing at all about the relative temperature of the 1690-1692 winters. On the basis of data concerning tree rings reported by Emily DeWitt and Martha Ames, Matossian concludes that the growing period in New England during the relevant years was shorter than usual.⁸ However, Matossian fails to point out that the tree rings examined in the DeWitt and Ames volume were not in or even near Salem and therefore tell us very little about local growing conditions in the Salem area. In short, there is no evidence that the winters of 1690-1692 were colder than usual, that the growing seasons were shorter, that crops failed, or that there was a food shortage. This chain of inferences from beginning to end is little more than an unsupported fantasy. Moreover, it is a fantasy based on the unfounded assumption that the ergot hypothesis is valid. If there is no independent evidence of ergot poisoning at Salem, there is no reason to even raise questions about weather conditions, crop failures, and so on. As I will show, there is no evidence of ergot poisoning at Salem.

AGE DISTRIBUTION AND SYMPTOMS OF ERGOT POISONING

Gottlieb and I pointed out that the proportion of children under fifteen among the afflicted at Salem was less than in a typical epidemic of convulsive ergotism. Citing a paper by Teshome Demeke, Yemane Kidane, and Elizabeth Wuhib,⁹ Matossian states

that "in a recent epidemic of ergotism in Ethiopia, the ages of the victims were not much different from those in the Essex County epidemic of 1692: More than 80% of the Ethiopian victims were aged 5-34."¹⁰ Two important points should be made about Matossian's "new evidence." First, the Ethiopian epidemic described by Demeke et al. did not involve a single case of *convulsive* ergotism. It was an epidemic of gangrenous ergotism. The age and sex distributions for gangrenous and convulsive ergotism are not the same.¹¹ For this reason the Ethiopian evidence is largely irrelevant to the question of convulsive ergotism at Salem.

Second, even allowing for this, Matossian is simply incorrect in stating that the distribution of cases by age and sex in the Ethiopian epidemic corresponded to the distributions of those afflicted at Salem. Demeke et al. reported a more detailed breakdown of the percentage of ergot sufferers by age (and sex) in the Ethiopian epidemic than is indicated by Matossian's statement that 80 percent were between five and thirty-four years old. For example, the ratio of females to males in the Ethiopian epidemic was about 2.5 to 1 and, among females, 53.85 percent were between five and fourteen years of age. Of the eleven "afflicted children" who in the Salem crisis exhibited the most prolonged and extensive set of symptoms, 100 percent were female and only three percent were under fifteen. On the other hand, of the other people whose symptoms Gottlieb and I catalogued from the *Records of Salem Witchcraft*, 67 percent were male. Ages are reported for 70 percent of these people and none of these is under fifteen. Even if the eleven "afflicted girls" are added to the remaining people for whom symptoms were reported, the sex ratio for symptoms of females to males does not approach 2.5 to 1. In short, the age distribution of those with symptoms is clearly different from the Ethiopian epidemic. At Salem the large majority of those with symptoms were over fifteen.

SYMPTOMS OF THE AFFLICTED

In order to determine whether those afflicted at Salem suffered from convulsive ergotism, it is important to distinguish between *symptoms* and *syndromes*. For example, high fever is a symptom of appendicitis. However, it is also a symptom of a myriad of other disorders many of which, like the common cold, occur much more frequently than appendicitis. Thus, the occurrence of a high fever, in and of itself, is not sufficient evidence that someone is suffering from appendicitis. That diagnosis must rest on the person displaying a particular *constellation* of symptoms, a syndrome (for example, high fever, high white cell count, pain in the lower right quadrant). Matossian, like Caporael before her, attempts to support the ergot hypothesis by selectively citing a few examples of dramatic but isolated symptoms. She fails to realize that finding one person who was lame, another who was blind, and a third who had a swollen face tells us nothing of importance. Different isolated symptoms of this kind occurring in different individuals are not in and of themselves an indication of ergot poisoning.

As mentioned earlier, when Gottlieb and I catalogued the symptoms reported in the *Records of Salem Witchcraft*, we did not uncover a single person who displayed the constellation of symptoms that characterizes convulsive ergotism. For instance, by far the most common symptom reported by witnesses was apparitions (for example, reports of seeing a witch's specter, a ghost, or a "demonic" animal). In some cases this was the only symptom reported. Convulsive ergotism does not produce isolated symptoms of this type. Instead, hallucinations associated with ergot poisoning are accompanied by other perceptual disturbances, severe confusion and delirium, and vomiting and convulsions.¹²

The *Records of Salem Witchcraft* provide no evidence for the occurrence of such a syndrome. Instead, the reported apparitions were typically described as a relatively brief set of images. Oftentimes they occurred while the witness was in bed, and in these instances the apparitions were probably dreams or hypnogogic images, as in the case of John Hughes: "John Hughes being in bed in a closed room and the door being fast so that no cat nor dog could come in, the said John saw a great light appear in the chamber, and rising up in his bed he saw a large gray cat at his bed's foot."¹⁸ In other cases the apparitions occurred out-of-doors at night, when viewing conditions were likely to be far from ideal. For instance, on one March evening William Allen went to investigate an unusual noise and "there saw a strange and unusual beast lying on the ground [and] yet going up to it, the said beast vanished away and in [its] place start up 2 or 3 women and fled from me not after the manner of other women but swiftly vanished away out of sight."¹⁴ Frightened people, in the midst of a witch scare, testifying that they "saw" a ghost or a witch's specter while walking at night along an unlit path, or while lying in bed, hardly constitute evidence for ergot poisoning.

It is worth noting that reports of apparitions similar to those described at Salem were a common feature in many other New England witchcraft trials. For instance, in 1673 Ann Smith claimed that an accused witch struck her with a stone and then "she [the accused] turned into a little dog and ran up the tree and flew away like an eagle."¹⁵ After quarreling with an accused witch, Thomas Bracey, in 1668, testified to seeing the specters of two witches by his bed. The specters began "afflicting and pinching [him] as if his flesh had been pulled from his bones."¹⁶ In 1687 Peter Pitford testified that "Goodwife James was a witch and that he saw her in a boat, at sea in the likeness of a cat."¹⁷ Testifying against the same defendant Richard Rowland stated that Goodwife James "came in at a hole in the window . . . and took him by the throat and almost choked him as he lay in his bed."¹⁸ Painstaking research conducted by John Demos on colonial witchcraft documents clearly indicates that testimony of this type was a standard feature in pre-Salem, New England witchcraft cases.¹⁹ Similar testimony was also common in sixteenth- and seventeenth-century English witchcraft cases.²⁰ Reports of this type indicate that seventeenth-century Puritans shared a worldview in which implicit criteria for differentiating reality from fantasy differed markedly from our own. They do not indicate that witnesses at Salem who gave such testimony were suffering from ergot poisoning.

Interestingly, Matossian appears to agree that the Salem records supply no evidence of the *syndrome* of convulsive ergotism. However, she explains away this strong negative evidence as follows: "If these symptoms [of ergot poisoning] were present, they may not have been reported because they were not commonly associated with bewitchment."²¹ This obviously strained attempt to deal with the embarrassing lack of evidence for ergotism will simply not do. Accusations of witchcraft were particularly easy to support precisely because symptoms of *any* kind could be taken to indicate bewitchment. For instance, vomiting and diarrhea, although common symptoms of convulsive ergotism, are never mentioned in the Salem records. In fact, such symptoms were reported in other witchcraft cases as indications of bewitchment.²² Therefore, there is no basis whatsoever for the argument that they occurred but went unreported at Salem because they were not associated with bewitchment.

The rather casual and often misleading manner in which Matossian describes the symptoms mentioned in the records is further illustrated by her statement that some individuals suffered from "a temporary, painful urine stoppage."²³ In fact, there is only one

case of urine stoppage reported in the *Records of Salem Witchcraft*. This was Bray Wilkins, an eighty-one-year-old man who believed that he had offended one of the accused witches and might, therefore, be in danger. Later, while sitting down to dinner, Wilkins saw the accused witch who "to my apprehension looked after such a sort upon me as I never before discerned in any way."²⁴ Only after being "looked upon" by the accused did Wilkins become upset, have trouble eating his dinner, and develop a temporary inability to urinate. There are two other important aspects of this case that Matossian fails to note which make ergotism a particularly unlikely explanation of Wilkins's symptoms: first, although Wilkins lived in Salem, he reported experiencing no symptoms before being "looked upon" by the accused, and second, the incident did not occur in Salem. It occurred while Wilkins was visiting relatives in Boston. In short, Matossian selected out the only case of urine stoppage in the records to illustrate the symptoms of ergot poisoning despite the fact that the symptoms occurred while the sufferer was outside of the area supposedly infested by ergot.

Matossian correctly points out that three people and several animals are reported to have died during the Salem crisis. Her implication, of course, is that such deaths cannot be explained by a psychological hypothesis and therefore are support for the ergot hypothesis. This implication is misleading, because there is no evidence whatsoever to indicate that these deaths were caused by ergot. Of course some people and some animals died in and around Salem in 1692. Without looking at a single record the same can be said with certainty about 1693, 1694, and 1983. People and animals regularly become sick and die. Since there are no baseline data concerning the typical rates of human and animal deaths in Salem, and since the records give no indication of a sudden marked increase in the frequency of such deaths during the crisis period, Matossian's statements about several people and animals dying says nothing whatsoever about ergotism.

The descriptions of symptoms Matossian provides are particularly misleading because she, like Caporael before her, describes them without reference to the social context in which they occurred. For example, it is quite true that the afflicted children very regularly convulsed, reported sensations of being pricked and pinched, and described seeing the "specters" (the shapes) of accused witches attacking them and others. However, Matossian fails to point out that the occurrence of these symptoms displays was governed by social factors and not by internal disease processes. For instance, the afflicted children regularly convulsed en masse in the courtroom whenever an accused witch was instructed by the judge to look in their direction. When an accused witch (but not anyone else) grasped the hand of an afflicted person the convulsions immediately stopped. When one afflicted girl reported that a specter was about to attack a second afflicted child, the second child would immediately enact a fit. When the first girl reported that the specter had left, the fits would cease. When an accused witch rolled up her eyes, the afflicted children followed suit and cried that their eyes were stuck. When an accused nervously bit her lip during an interrogation, the afflicted called out that they had been bitten. On some occasions, they even displayed bite marks on their arms ostensibly made by the witch's specter. When the accused moved her arm, the afflicted screamed that they were pinched with pins. On one occasion they even produced the pins purportedly used by the specter to pinch them. When rag puppets, supposedly used by an accused for witchcraft, were burned in the presence of the afflicted they screamed that they were being burned.

Socially cued symptom enactments of this type were not isolated incidents. Descriptions of them pervade both the court records and the various other eyewitness accounts of

the proceedings at Salem.²⁶ These descriptions indicate very clearly that the symptoms of the afflicted did not result from ergot, but rather were one aspect of a goal-directed enactment aimed at sustaining a self-presentation as "bewitched." To say that the symptoms were goal-directed actions does not, of course, imply that they were necessarily faked. Some of the afflicted may well have come to believe that they were bewitched. It would come as no surprise to social psychologists to find that the afflicted had adopted the same explanation for their enactments that was held and strongly legitimated by the most significant others in their community.²⁶ Along these lines, it is worth noting that once the afflicted role was adopted it could not be terminated by stating that one had not really been afflicted. The one girl who attempted to give up the afflicted role in this manner was herself accused of being a witch and would have been prosecuted had she not reverted to her bewitched status and begun again to display the appropriate symptoms of affliction.²⁷

Convulsive ergotism is a serious neurological disease, and prolonged exposure to the poison frequently leads to permanent sequelae (for example, permanent contractures of the extremities, dementia) and death. According to the ergot hypothesis the afflicted children convulsed and displayed other symptoms for months on end because they were being poisoned throughout this long period. Therefore, it is well worth noting Thomas Brattle's eyewitness description:

Many of these afflicted persons, who have scores of strange fits in a day, yet in the intervals of time are hale and hearty, robust and lusty, as tho' nothing had afflicted them. I remember that when the chief Judge gave the first Jury their charge, he told them, that they were not to mind whether the bodies of the said afflicted were really pined and consumed, as was expressed in the indictment; but whether the said afflicted did not suffer from the accused such afflictions as naturally *tended* to their being pined and consumed, wasted etc.²⁸

In other words, people supposedly suffering from months of poisoning severe enough to induce repeated convulsions throughout that period nonetheless appeared quite healthy, and displayed none of the chronic malaise associated with chronic poisoning of the central nervous system and none of the permanent sequelae associated with the disease in question—very unusual cases of chronic ergot poisoning, to say the least.

Paul Boyer and Stephen Nissenbaum pointed out that accusations at Salem followed a geographical pattern. Accusations were made by people living in one area of the village against people living in a different area. Caporael and Matossian argued that the accusers were suffering from ergot poisoning and, therefore, aimed their accusations at nonsufferers who lived elsewhere. However, there is no intrinsic reason why ergot sufferers should accuse nonsufferers living in a different part of the village as opposed to nonsufferers (of which there were many) living in the same part of the village. Thus, the pattern of witchcraft accusations at Salem cannot be adequately accounted for by the ergotism hypothesis.

SYMPTOMS AND ACCUSATIONS

Because the Salem crisis was the largest witch panic in the American colonies and because it occurred as witch prosecutions in England were in their final decline, both Caporael and Matossian argued that the Salem crisis requires an unusual explanation. Ergot has, therefore, been trotted forth to explain the inexplicable. This line of reasoning implies that witchcraft accusations (and presumably witchcraft beliefs) were steadily declining throughout the latter half of the seventeenth century in colonial New England, but were revived at Salem because of the extraordinary symptoms shown by the afflicted

children and other witnesses. In fact, trials for witchcraft were relatively common in New England (as compared to Old England) throughout the latter half of the seventeenth century. For instance, Demos's exhaustive New England survey yielded 141 individuals who were accused of witchcraft between 1638 and 1699, *excluding* those accused at Salem.²⁹ Moreover, Demos indicated that this figure is most certainly an underestimate. Although the number of people accused varied from year to year, Demos's data indicate no evidence of a decline in accusations as the century progressed. Thus, the Salem crisis did not rekindle the vestiges of a dying belief system. On the contrary, witch accusations and witch beliefs were a common feature of social life in seventeenth-century New England. The Salem crisis was unusual not because people were accused and tried for witchcraft, but because they were accused in large numbers within a relatively short period of time. To understand why requires that a sharp distinction be made between two features of the Salem crisis that are blurred in accounts based on ergotism: the demonic enactments of the afflicted children and some other witnesses, and the communities' interpretation of and reaction to those enactments.

The Salem witch panic did not occur because a number of young people began behaving strangely and accusing neighbors of bewitching them. It occurred because prominent members of the Salem community and surrounding communities chose to legitimate those accusations and the "special evidence" on which they were based (for example, the decisions by the court to admit as valid evidence unsupported testimony of having seen the specter of an accused behaving maliciously). The connection between accusations of bewitchment by afflicted persons and the acceptance of those accusations as a basis for legal prosecution by the community was by no means automatic and inevitable in either Old or New England.³⁰ It is important, therefore, to separate the factors that accounted for the occurrence of "demonic enactments" from the factors that led a community to legitimate (or not legitimate) the accusations that were sometimes associated with those enactments.

Demonic Enactments

Cases of "demonic affliction" were not particularly unusual in either Old or New England before the Salem crisis, and the symptoms of such affliction were well known and much discussed by prominent members of New England Puritan communities. In these pre-Salem cases (as at Salem) the most dramatic and prolonged demonic afflictions were almost always displayed by adolescents or near adolescents (usually females). For instance, several years before the Salem crisis, demoniacs (that is, those afflicted by the devil) in Boston, Groton, Newbury, Springfield, and Connecticut had displayed the symptoms seen later at Salem. English cases with similar symptoms were also common during the sixteenth and seventeenth centuries.³¹ In short, demonic affliction was a well-known entity in colonial New England and its most common and dramatic symptoms were those displayed at Salem—convulsions at the sight of the accused, reports of being pinched and bitten, displays of the offending pins, reports of witches and specters, reports of threats and temptations by the devil or his minions, and so forth. Thus, to become demonically afflicted was to adopt a social role that contained fairly clear-cut expectations concerning the subjective experiences and behaviors required. Furthermore, more detailed information about role requirements was inevitably provided by clerical "experts" and other community members who inadvertently conveyed their expectations about demonic enactments when they came to study, diagnose, pray for, or simply visit the afflicted.³² Along these lines, it is worth noting that the initial behaviors of the

afflicted children at Salem appear to have been rather diverse and ambiguous, but became increasingly consistent with the stereotype for demonic affliction as the children gained increasing exposure to clerical and judicial "experts."³³ One does not have to posit unusual poisoning to account for the constellation of symptoms exhibited by the afflicted children at Salem. They were the symptoms of demonic affliction; a well-established syndrome with symptoms that were generally known or could be easily learned by those who adopted the demoniac role.

Group outbreaks of demonic possession, some involving symptom enactments similar to those reported at Salem, continue to occur in cultures that legitimate demonic explanations of deviant behavior.³⁴ Similar instances of psychological contagion also occur, not infrequently, in our own culture.³⁵ However, given our technological worldview, these manifestations are initially defined as contagious disease and later, when an offending biological agent cannot be found, are rediagnosed as "group hysteria." Modern studies of these phenomena have provided a good deal of information about the social conditions in which these outbreaks occur (for example, people living or working in close quarters during times of incrementing uncontrollable social stress), the types of individuals most likely to show symptoms (for example, those with marginal social status; those experiencing unusually high levels of stress), the friendship and other social network lines of communication along which the contagion spreads to new individuals, and the reinforcements involved in adopting the sick (or possessed) role (for example, reductions in job stress; sympathetic attention from others).³⁶

The role of social factors such as these in initiating and facilitating the spread of the demonic enactments at Salem is difficult to pinpoint with accuracy because information about the initial phases of the "afflictions" is extremely scant. Nevertheless, it is clearly no accident that the afflicted children tended to be adolescent, unmarried (and thereby socially impotent) females. In short, they were individuals in a subservient and transitional status whose future social standing in the community would be determined by factors over which they had little control. Neither is it surprising that the first two children to enact symptoms lived in the household of the local minister, a stern, embittered man preoccupied (as his written sermons attest) with demonic interventions in the affairs of men, and at the time embroiled in a political controversy that threatened his position as minister.³⁷

At Salem (as in other New England possession cases) the social advantages accrued by the afflicted children for maintaining their demonic enactments are fairly obvious. On the one hand, they received solace and sympathetic attention as the victims of satanic influence. On the other, they were catapulted from a social position of little influence to one of power. They became the center of the community's attention, awesome seers whose performances commanded fearful respect.³⁸ But why were these social advantages afforded the children? What was gained and by whom, if not for actively encouraging, then at least for allowing and legitimating the demonic enactments and their attendant accusations of witchcraft?

Legitimizing Accusations

In 1671 Elizabeth Knapp of Groton, Massachusetts, convulsed and exhibited many of the other dramatic symptoms later enacted by the afflicted children of Salem. Within the first weeks of her affliction Elizabeth accused a neighbor of bewitching her. However, her minister refused to legitimate the accusation and instead described the accused as a person "of sincere uprightness before God."³⁹ Elizabeth was encouraged to reconstrue

her reasons for making the accusation and concluded that "she believed Satan had deluded her, and [she] hath never since complained of any such apparition or disturbance from the [accused]."40 Later in her affliction Elizabeth accused a second neighbor. Once again, however, the community refused to legitimate the accusation and it was dropped from consideration. Similar incidents occurred in Boston. Legal proceedings against accused witches were not undertaken because the parish minister refused to legitimate the accusations of afflicted children, and refused to divulge the names of those accused.⁴¹ The role played by social status in legitimating (or not legitimating) witchcraft accusations in colonial New England was summarized by Demos as follows:

. . . ideas about particular suspects developed first among people of little or no distinction. In some (many?) instances suspicion did not spread much further, and hence did not yield action of a formal sort (i.e., in court). In other cases, however, persons of higher rank and larger influence joined the fray. And when that happened legal measures became far more likely. Full blown jury-trials invariably displayed alliances spanning a broad social range; *some* representation at high status-levels was requisite to move witchcraft charges into the courts. At the same time the weight of social distinction might go the opposite way. Magistrates and ministers were more cautious about believing (and acting on) specific charges than average folk. At least occasionally they used positions of official responsibility to discourage, or even to countermand, the prosecution of witchcraft.⁴²

Thus, accusations of witchcraft did not necessarily (or even usually) lead to formal legal proceedings. Such proceedings required legitimation of the accusations by members of the community who held social power.

An adequate account of who was and was not accused of witchcraft at Salem, and of why those accusations were legitimated rather than defused (for example, as delusions of Satan) cannot be obtained by focusing on the psychology (even less the physiology) of the afflicted children. Such an account requires careful analysis of Salem Village as a community, and of the social, political, and economic factors that produced dissension and distrust between competing groups within the community. A highly competent analysis along these lines has been provided in Boyer and Nissenbaum's *Salem Possessed*. Briefly, these investigators pointed out that, in 1692, Salem Village was not an independent political entity. Instead, it was a part of Salem Town. The village had no independent local government, it paid its taxes to the town, and its constables were chosen by the town. Some in the village and many in the town had vested economic interests in maintaining the status quo. However, many other villagers saw their economic and political futures best served by establishing Salem Village as an independent political entity; a full-fledged town with its own church and local government. The lack of a local government or a court system responsive to local needs made the settling of legal disputes in Salem Village a bitter and protracted process. As Boyer and Nissenbaum pointed out:

What made Salem Village disputes so notorious, and ultimately so destructive, was the fact that structural defects in its organization rendered the Village almost helpless in coping with whatever disputes might arise. . . . Given the ineffectiveness of the Village's institutional structures, private grievances and disputes escalated with a rapidity which must have startled even those embroiled in them, until the entire community, willy nilly, was drawn in.⁴³

The hub of Puritan communities was the church, and the church was as much a political as a religious institution. In such communities the establishment of a church was the first step toward political autonomy.⁴⁴ After a protracted struggle Salem Village established its own church. However, conflicts about separating completely or remaining

tied politically to Salem Town remained heated and were expressed in disputes about the village minister (for example, how he should be selected, who should pay his salary, who should be allowed to join the church). Those who lived relatively far from Salem Town and who had a vested interest in political autonomy for Salem Village supported the minister. Those who lived close to Salem Town and who had economic interests in maintaining strong connections with the town opposed the minister. Early in 1692, as conflicts about the minister grew more intense and threats to depose him escalated, two children living in his household began displaying the first signs of "affliction." Accusations of witchcraft followed shortly thereafter, and the pattern of those accusations mirrored the economic/geographical factionalism that characterized village politics. Members of the faction supporting the minister and favoring political autonomy for the village accused members of the opposing faction of witchcraft. As Boyer and Nissenbaum stated:

The witchcraft episode did not generate the divisions within the Village, nor did it shift them in any fundamental way, but it laid bare the intensity with which they were experienced and heightened the vindictiveness with which they were expressed. . . . Unable to relieve their frustrations politically, the members of the [prominister] faction unconsciously fell back on a different and more archaic strategy: they treated those who threatened them not as a political opposition but as an aggregate of morally defective individuals [i.e., witches].⁴⁵

Understanding the demonic enactments, the pattern of accusations, and the legitimation of those accusations that occurred at Salem requires that these events be viewed as part of a sociopolitical drama that was played out in terms of the implicit worldview and explicit religious assumptions that held sway among seventeenth-century Puritans. The ergot hypothesis neither fits the facts of the case nor, in any way, helps to elucidate those facts.

NOTES

1. For accounts of the Salem witchcraft episode see Marion Starkey's *The Devil in Massachusetts* (New York: Knopf, 1949); and Chadwick Hansen's *Witchcraft at Salem* (New York: Braziller, 1969). More recent and more scholarly is Paul Boyer and Stephen Nissenbaum's *Salem Possessed: The Social Origins of Witchcraft* (Cambridge: Harvard University Press, 1974). For recent historical accounts of western European witchcraft see Norman Cohn, *Europe's Inner Demons* (New York: Basic Books, 1975); Jeffrey B. Russell, *A History of Witchcraft: Sorcerers, Heretics, and Pagans* (London: Thames and Hudson, 1980); Nicholas P. Spanos, "Witchcraft in Histories of Psychiatry: A Critical Analysis and an Alternative Conceptualization," *Psychological Bulletin* 85 (1978): 417-439.
2. Linda R. Caporael, "Ergotism: The Satan Loosed in Salem?" *Science* 192 (1976): 21-26.
3. Frank J. Bove, *The Story of Ergot* (New York: Barger, 1970); George Barger, *Ergot and Ergotism* (London: Gurney & Jackson, 1931).
4. Nicholas P. Spanos and Jack Gottlieb, "Ergotism and the Salem Village Witch Trials," *Science* 194 (1976): 1390-1394.
5. W. Eliot Woodward, ed., *Records of Salem Witchcraft Copied from the Original Documents*, 2 vols. (Roxbury, Mass.: Privately printed, 1864; reissued, New York: DaCapo Press, 1969).
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7. *Ibid.*, p. 257.
8. Emily DeWitt and Martha Ames, eds., *Tree-Ring Chronology of Eastern North America* (Tucson: Laboratory of Tree-Ring Research, University of Arizona, 1978).
9. Teshome Demeke, Yemane Kidane, and Elizabeth Wuhib, "Ergotism—A Report on an Epidemic, 1977-78," *Ethiopian Medical Journal* 17 (1979): 107-114.
10. Matossian, "Ergot," p. 356.
11. Barger, *Ergot and Ergotism*.
12. A. Cerletti, "Discussion Third Symposium," in *Proceedings of the First International Congress of Neuropharmacology*, ed. P. B. Bradley, P. Deniker, and C. Radauco-Thomas (Amsterdam: Elsevier, 1959), pp. 117-123.

13. Woodward, *Records*, p. 39.
14. *Ibid.*, p. 38.
15. Deposition by Briget Clifford, in *Massachusetts Archives*, 135, no. 8 (Boston: Statehouse).
16. Deposition by Thomas Bracey, 13 August 1668, *Willys Papers: Records of Trials of Witchcraft in Connecticut*, W-10 (Ann Mary Brown Memorial, Providence, R.I.: Brown University Library).
17. *County Court, Salem Records, 1648-1655*, leaves 28, 33 (Salem, Mass.: Essex County Courthouse).
18. *Essex County Court Papers: Original Depositions and Other Materials from the Proceedings of the Quarterly Courts of Essex County, Mass.* 12, leaves 86-87 (Salem, Mass.: Essex County Courthouse).
19. John P. Demos, *Entertaining Satan: Witchcraft and the Culture of Early New England* (New York: Oxford University Press, 1982).
20. For testimony in English witchcraft cases see Keith Thomas, *Religion and the Decline of Magic* (New York: Scribner's, 1971); and Alan Macfarlane, *Witchcraft in Tudor and Stuart England* (New York: Harper, 1970).
21. Matossian, "Ergot," p. 356.
22. For instance, Margaret Jones of Charlestown, Massachusetts, was convicted of witchcraft in 1648 in part because "she was found to have such a malignant touch, as many persons . . . were taken with deafness, or vomiting, or other violent pains or sickness" (from *John Winthrop's Journal*, 2 vols., ed. James K. Hosmer [New York, 1908], 2: 344). For the wide range of symptoms taken to indicate bewitchment in pre-Salem colonial witchcraft cases, see Demos, *Entertaining Satan*; and Charles Upham, *Salem Witchcraft*, 2 vols. (New York: Unger, 1959); for the range of symptoms indicating bewitchment in England and on the Continent see Rossell H. Robbins, *The Encyclopedia of Witchcraft and Demonology* (New York: Crown, 1959); as well as Thomas, *Religion*; and Macfarlane, *Witchcraft*.
23. Matossian, "Ergot," p. 356.
24. Woodward, *Records*, vol. 2, p. 9.
25. For descriptions of the symptoms exhibited by the afflicted children in the courtroom, see Woodward, *Records*. Other contemporary eyewitness accounts of the children's behavior outside as well as within the courtroom are given in the "Letter of Thomas Brattle, F. R. S.," reprinted in *Narratives of the Witchcraft Cases 1648-1706*, ed. George L. Burr (New York: Scribner's, 1914); Cotton Mather, "The Wonders of the Invisible World," in Burr, *Narratives*; John Hale, "A Modest Inquiry into the Nature of Witchcraft," in Burr, *Narratives*; Deodat Lawson, "A Brief and True Narrative of Some Remarkable Passages Relative to Sundry Persons Afflicted by Witchcraft, at Salem Village Which Happened from the Nineteenth of March, to the Fifth of April, 1692," in Burr, *Narratives*.
26. Social psychological accounts of how people came to define themselves as demonically afflicted or "possessed" are provided by Thomas, *Religion*; Nicholas P. Spanos, "Demonic Possession: A Social Psychological Analysis," in *Compliance Behavior*, ed. Max Rosenbaum (New York: Free Press, forthcoming); Nicholas P. Spanos and Jack Gottlieb, "Demonic Possession, Mesmerism and Hysteria: A Social Psychological Perspective on Their Historical Interrelations," *Journal of Abnormal Psychology* 88 (1979): 527-546; D. P. Walker, *Unclean Spirits: Possession and Exorcism in France and England in the Late Sixteenth and Early Seventeenth Centuries* (Philadelphia: University of Pennsylvania Press, 1981).
27. Woodward, *Records*, pp. 117-135.
28. Letter, in Burr, *Narratives*, p. 187.
29. Demos, *Entertaining Satan*.
30. Thomas, *Religion*; Demos, *Entertaining Satan*; Spanos, "Demonic Possession."
31. For the Boston cases see Cotton Mather, "Memorable Providences Relating to Witchcrafts and Possessions," in Burr, *Narratives*; for the case of Elizabeth Knapp at Groton see Samuel Willard, "A Brief Account of a Strange and Unusual Providence of God Befallen to Elizabeth Knapp of Groton," reprinted in *Exorcism through the Ages*, ed. Elmo Nauman (Secaucus, N.J.: Citadel Press, 1974); for Newbury see Increase Mather, "An Essay for Recording Illustrious Providences," in Burr, *Narratives*; for Springfield see Samuel G. Drake, *Annals of Witchcraft in New England* (New York: Franklin, 1869); for the Connecticut cases see John M. Taylor, *The Witchcraft Delusion in Colonial Connecticut, 1647-1697* (Stratford, Conn.: J. E. Edwards, 1908); for symptoms in the English cases see Thomas, *Religion*; Walker, *Unclean Spirits*; and Wallace Notestein, *A History of Witchcraft in England* (New York: Crowell, 1911).
32. Spanos, "Demonic Possession"; Walker, *Unclean Spirits*.
33. Boyer and Nissenbaum, *Salem Possessed*; Spanos and Gottlieb, "Ergotism."
34. Raymond L. M. Lee and S. E. Ackerman, "The Sociocultural Dynamics of Mass Hysteria: A Case Study of Social Conflict in West Malaysia," *Psychiatry* 43 (1980): 78-88; Ian M. Lewis, *Ecstatic Religion* (Middlesex, England: Penguin, 1971).
35. Alan C. Kerckhoff and Kurt W. Back, *The June Bug: A Study of Hysterical Contagion* (New York: Appleton, Century, Crofts, 1968); Gary W. Small and Armand M. Nicholi, Jr., "Mass Hysteria among

Schoolchildren," *Archives of General Psychiatry* 39 (1982): 721-724; Edgar A. Schuler and Vernon J. Parenton, "A Recent Epidemic of Hysteria in a Louisiana High School," *Journal of School Psychology* 17 (1943): 221-235.

36. Kerckhoff and Back, *June Bug*; Frieda L. Gehlen, "Toward a Revised Theory of Hysterical Contagion," *Journal of Health and Social Behavior* 18 (1977): 27-35.

37. Boyer and Nissenbaum, *Salem Possessed*.

38. Demos, *Entertaining Satan*; Spanos, "Demonic Possession."

39. Willard, *A Brief Account*, p. 177.

40. *Ibid.*, pp. 177-178.

41. Cotton Mather, "A Brand Pluck't Out of the Burning," in Burr, *Narratives*.

42. Demos, *Entertaining Satan*, p. 291.

43. Boyer and Nissenbaum, *Salem Possessed*, p. 51-52.

44. *Ibid.*

45. *Ibid.*, p. 109.