

The Anesthesiologist and the Arts

The Scarlet Letter: A is for Atropine

By Audrey Shafer, M.D.

Much recent interest regarding poison and atropine centers on atropine's use as an antidote to poisoning from nerve agent chemical warfare, i.e., organophosphate cholinesterase inhibitors such as tabun (GA), sarin (GB) and VX.

The article reprinted below, however, is a study of Nathaniel Hawthorne's novel, The Scarlet Letter, vis-à-vis the possible use of atropine as a poison by the cuckolded husband, Dr. Roger Chillingworth. As anesthesiologists, we routinely use anticholinergics such as atropine in the operating rooms, and therefore this literary forensic study is particularly apropos. This article reminds us that much of what we administer to our patients becomes poison in the wrong dose or setting—or when unaccompanied by concurrent life support.

The article generated a spate of controversy (NEJM published 8 letters to the editor and a reply [311(22):1438-41, 1984]), which is typical of the passions involved with analyzing works of art, or posthumously diagnosing illnesses or aberrations of historical figures. Hence the ultimate purpose of presenting this article is not to determine, yes or no, whether Reverend Dimmesdale died of atropine poisoning, but rather to provide an example of this type of critical thinking and analysis—how medical knowledge can be used as a tool to reveal different facets of literature.

But what does Dr. Khan, the author of this study, do when not sleuthing through the literary canon?

Jemshed A. Khan, M.D. completed his fellowship training in Eyelid Plastic Surgery at Harvard University's Massachusetts Eye and Ear Infirmary in 1987. He received his M.D. degree from the University of Missouri, where he also completed his ophthalmology residency training. Dr. Khan, a Board Certified Ophthalmologist, has practiced in Kansas City since 1987.

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Dr. Khan has authored over fifty medical publications. He is also a poet whose poetry can be found at: <http://www.geocities.com/al-hammer/poems.htm>.

Atropine Poisoning in Hawthorne's *The Scarlet Letter*

This article presents evidence that surreptitious atropine poisoning accounts for the bizarre behavior and ultimate demise of the Reverend Arthur Dimmesdale in Nathaniel Hawthorne's classic work, *The Scarlet Letter*.¹ This poisoning of a major character in a widely read novel, written by a celebrated author, has escaped forensic detection for more than a century. This should be of interest to the

The Anesthesiologist and the Arts—Cont'd

medical community, because the poisoning was accomplished through the agency of a physician.

As an aid to the reader, a summary of the plot of *The Scarlet Letter* is provided. The plot centers on three major characters: an adulteress, an adulterer, and a cuckolded husband. Hester Prynne, the adulteress, conceives and bears a child during the prolonged absence of her husband. As penance for her sin of adultery she is condemned to display a scarlet letter “A” on her clothing. The adulterer, the Reverend Arthur Dimmesdale, attempts to conceal his involvement with Hester Prynne and suffers from the torment of a guilty conscience and the vengeance of the cuckolded husband. The husband, Dr. Roger Chillingworth, discerns that Dimmesdale has fathered the illegitimate child, and is preoccupied with revenge. This article is concerned with the methods and effects of Chillingworth’s revenge.

Historically, critics have ascribed Dimmesdale’s bizarre behavior and ultimate demise to a powerful guilt neurosis, which was secretly and deliberately nurtured by his vengeful physician and companion, Dr. Roger Chillingworth. Critics have maintained and perpetuated the narrow view that Chillingworth’s methods of revenge were of a purely psychological nature, unwittingly ignoring²⁻⁵ or even denying⁶ the possibility of poisoning. Trollope wrote of Chillingworth, “He simply lives with his enemy ... attacking not the man’s body, to which indeed he acts as a wise physician—but his conscience.” A computer-generated literature search failed to produce any references to atropine in connection with *The Scarlet Letter*.⁷

However, there is sufficiently explicit evidence in *The Scarlet Letter* to warrant the view that Dr. Chillingworth may have concocted an atropine-based poison and administered it to Dimmesdale. I have researched and developed four major arguments in support of the atropine-poisoning theory. First of all, Chillingworth certainly had the motive, circumstances, and knowledge necessary for the preparation and administration of a poison intended for Dimmesdale. Secondly, certain plants mentioned in the novel are commonly known to be poisonous. Such plants, if administered, would result in characteristic atropine poisoning. Thirdly, at the time *The Scarlet Letter* was written, atropine and its effects were probably well known to Hawthorne. Finally, a review of Dimmesdale’s symptoms and behavior suggests a pattern that is remarkably consistent with atropine poisoning.

Motive—A Dark Purpose

There is little doubt that Chillingworth’s motive was revenge against Dimmesdale, the man who had impregnated Chillingworth’s wife. Hawthorne describes this desire for revenge as “a new purpose ... dark enough to engage the full strength of his [Chillingworth’s] faculties” (p. 87). Later in the story Chillingworth “had

The Anesthesiologist and the Arts—Cont'd

grown to exist only by perpetual poison of the direst revenge!” (p. 124), but Hawthorne leaves it to the reader to discern “the hidden practices of his revenge” (p. 141).

Circumstance—Physician of the Young Minister Whose Health Had Suffered of Late

Dimmesdale’s symptoms developed over a prolonged period, indicating that they were probably the result of chronic poisoning. This would suggest that the victim was repeatedly subjected to small doses of poison. In order to avoid suspicion, Chillingworth would have had to administer the poison surreptitiously either with meals or in the guise of a medicine. The more plausible possibility is that Dimmesdale was poisoned by his physician’s concoctions.

Chillingworth, being “extensively acquainted with the medical science of the day ... ” (p. 87), presented himself as a physician. Indeed, “it was understood that this learned man was the physician as well as friend of the young minister ... ” (p. 80). As physician to Dimmesdale, Chillingworth had ample opportunity to poison his patient. It was “at a hint from Roger Chillingworth [that] ... the two were lodged in the same house” (p. 91). Dimmesdale certainly did not improve under the watchful eye of Chillingworth. In fact, the pastor’s “health had suffered as of late ... ” (p. 80), and Chillingworth was “anxious to attempt the cure ... ” (p. 89). It was observed that Chillingworth often gathered herbs and plants, “even in the graveyard” (p. 95), and “arranged his study and laboratory with distilling apparatus, and the means of compounding drugs and chemicals, which the practised alchemist knew well how to turn to purpose ... ” (p. 92).

Chillingworth did not accomplish these actions without arousing suspicion. Hester Prynne, adulteress and estranged wife of Chillingworth, suspected “the continual presence of Roger Chillingworth, ~~the~~ secret malignity, infecting all the air about him ... ” (p. 139), and she questioned “his authorized interference, as a physician, with the minister’s physical and spiritual infirmities ... ” (p. 139). Even Dimmesdale questioned the benefit derived from Chillingworth’s “kindly care of this weak frame of mine” (p. 97).

Knowledge—The Practiced Alchemist

Not only was Chillingworth “extensively acquainted with the medical science of the day ... ,” but in his travels among the Indians “he had gained much knowledge of the properties of native herbs and roots ... ” (p. 87). He even boasted about his knowledge of “recipes that were as old as Paracelsus” (p. 55). Chillingworth’s sophistication in alchemy was manifested in his distilling apparatus, and Dimmesdale would sometimes stand idly by, “watching the processes by which weeds

The Anesthesiologist and the Arts—Cont'd

were converted into drugs of potency ... ” (p. 95). Hawthorne even implies that the doctor had previously been associated with the then-infamous Dr. Forman, who was involved in the murder-by-poison plot against Sir Thomas Overbury (p. 93).

Toxic Plants—All Manner of Vegetable Wickedness

Traditionally, references to various plant species in *The Scarlet Letter* have been interpreted either in purely symbolic terms or as an extension of New England folklore.^{8,9} However, the mention of identifiably poisonous plants raises the possibility of their use as poisonous agents. There are two passages with specific references to poisonous plants. Hawthorne plants the first poisonous seedling of suspicion early in the novel, with a reference on the first page to apple of Peru (*Nicandra physalodes*), which may contain cardioactive solanine glycoalkaloids.^{10,11}

Although the suspicion is carefully nurtured through vague and frequent references to poisons, plots, clysters, and the like, it is not until late in the novel that the second specific reference to poisonous plants appears. The seedling reaches full and venomous bloom in the mind of Hester Prynne, who imagines Chillingworth sinking into a barren blasted spot of earth “where, in due course of time, would be seen deadly nightshade, dogwood, henbane ... ” (pp. 126-127). It is telling that Hawthorne should select these particular plants. Deadly nightshade (*Atropa belladonna*) contained atropine, as well as the related poisons scopolamine and hyoscyamine.¹⁰ Henbane (*Hyoscyamus niger*) contains hyoscyamine, scopolamine, and atropine.¹⁰ The so-called dogwood (*Rhus vernix*), known in Massachusetts as poison dogwood, causes a cutaneous reaction similar to that of the closely related poison ivy (*Rhus toxicodendron*).^{12,13}

Hawthorne’s Sources

The alkaloids derived from the solanaceous plants have been known as poisons since the Egyptian and Hindu civilizations; mention is made of them as anti-spasmodics in the Ebers Papyrus (1550 B.C.). They were a favorite agent of the professional poisoners of the Middle Ages, and their mydriatic effects were known to Galen. Linnaeus (1707 to 1778) recognized the deadly effects of the plant nightshade and gave it the name *Atropos*, after the oldest of the three Fates, who cut the delicate thread of life.¹⁴

Records compiled from the Salem Athenaeum during Hawthorne’s “solitary years,” 1825 to 1837, indicate that the writer was “deeply engaged in reading everything he could lay his hands on. It was said in those days that he read every book in the Athenaeum. ... ”¹⁵ A perusal of Hawthorne’s reading list reveals

The Anesthesiologist and the Arts—Cont'd

several books of a botanical nature, one of which sheds light on the references to atropine-containing plants in *The Scarlet Letter*.¹⁶ Deadly nightshade and henbane appear close to each other in Sowerby's *English Botany*.¹⁷ It seems unlikely that references to the same toxic plants in *The Scarlet Letter* are merely coincidental. This connection between a description of toxic plants in a book that Hawthorne was known to have borrowed from the Athenaeum and the subsequent mention of the plants in his novel, along with characteristic symptoms of poisoning from these plants, indicates the probable source of Hawthorne's information about poisonous plant forms.

The Symptoms—A Nervous Despondency in His Air

Intoxication with atropine, a tertiary amine, results in both central and peripheral nervous-system manifestations.¹⁸ The early symptoms are visual disturbances, xerostomia, mydriasis, and photophobia. Dysphagia and speech disturbances may also be present. The skin becomes dry and hot, and a diffuse nonpunctate erythematous rash may appear, especially over the face, neck, and chest. Confusion, incoordination, auditory and visual hallucinations, psychotic behavior, and convulsions may also occur. The pulse is weak and rapid, and in severe cases, the patient may progress to stupor, then coma, and finally stertorous respiration and cyanosis.¹⁰ Sedation, fatigue, dizziness, and postural hypotension have also been described as symptoms of atropine poisoning.¹⁸ To a remarkable degree, many of these symptoms are described in *The Scarlet Letter*.

Cardiovascular Symptoms—Gripping Hard at his Breast

A rapid weak pulse and flushing are the most prominent cardiovascular symptoms of atropine poisoning. There are two descriptions of Dimmesdale with a flushed appearance. One is in conjunction with chest pain: "he was often observed, on any slight alarm, to put his hand over his heart, with first a flush and then a paleness, indicative of pain" (p. 88). It is tempting to postulate that Dimmesdale suffered from angina exacerbated by atropine-induced tachycardia. Hawthorne certainly emphasizes the presence of disease in Dimmesdale's heart, with descriptions of him gripping his chest "as if inflicted with an importunate throb of pain" (p. 113) and the appearance of what "had now become a constant habit, rather than a casual gesture, to press his hand over his heart" (p. 88). Even Dimmesdale became aware "that the poison of one morbid spot was infecting his entire heart's substance ... " (p. 102).

The Anesthesiologist and the Arts—Cont'd

Gait Disturbances, Tremors, and Convulsions—Tremulously Put Forth

Muscular incoordination and convulsions occur under the influence of atropine. Hawthorne is particularly keen in his description of these afflictions. Initially, there was only a nervous “despondency in his [Dimmesdale’s] air ... ” (p. 135). However, Dimmesdale’s condition deteriorated, and there was the appearance of a “listlessness of gait” (p. 137). Close to death, the minister had a “Deathlike hue” and “tottered on his path so nervously” that his “passage resembled the wavering effort of an infant ... ” (p. 177). He tore off his shirt with a “convulsive motion” (p. 180) and died soon thereafter.

Visual Disturbances and Hallucinations—He Indistinctly Beheld

The classic symptom of atropine ingestion is mydriasis. “Belladonna,” the name of the atropine-containing plant deadly nightshade, is derived from an Italian root word meaning “fair lady.” This derivation stems from the atropine-induced pupillary dilatation that gave an appearance of large and supposedly desirable eyes in women who used the plant. *Atropa belladonna* is a member of the genus solanum, a word derived from the root “solar,” reflecting the plant’s stupefying power, similar to that of the sun. In one reference to mydriasis, and possibly also to photophobia, it is noted that Dimmesdale’s “large dark eyes had a world of pain in their troubled and melancholy depth” (p. 83).

Even defenders of Hawthorne’s elegantly symbolic prose have conceded that the writer transcended the boundaries of credibility in one particular sense.³ The scene in question involves Dimmesdale’s viewing of a scarlet letter in the heavens above the Puritan town (p. 113). In view of the fact that atropine may induce visual disturbances and hallucinations, it is reasonable to postulate that the scene is a realistic portrayal of a visual hallucination. Indeed, on reviewing this scene, it seems that such an interpretation is implicit in the text: “We impute it, therefore, solely to the disease in his own eye and heart that the minister, looking upward toward the zenith, beheld there the appearance of an immense letter—the letter A—marked out in lines of dull red light” (p. 113).

Dysphagia and Speech Disorders—His Voice Had a Prophecy of Decay in It

Speech difficulties and dysphagia in atropine poisoning result from suppression of salivation.¹⁰ Hawthorne notes changes in the character of Dimmesdale’s voice: it “had a certain melancholy prophecy of decay in it ... ” (p. 88) and was “more tremulous than before ... ” (p. 89).

The Anesthesiologist and the Arts—Cont'd

Although there are no direct references to dysphagia, Hawthorne notes several times that Dimmesdale's "form grew emaciated ..." (p. 88); "his cheek was paler and thinner ..." (p. 89). Close to death, "he looked haggard and feeble ..." (p. 135).

The Scarlet Letter—A Rash Conclusion?

On his deathbed, Dimmesdale tore the garments from his chest, as if to reveal and expiate his guilt. Thus, before "the gaze of the horror-stricken multitude ..." (p. 180), he revealed the red stigmata of guilt that festered on his chest. It is my conclusion that "this burning torture ..." (p. 181) on Dimmesdale's chest was a diffuse nonpunctate erythematous rash.

The rash, that is, of atropine poisoning.

University of Missouri Columbia
Columbia, MO 65212

Jemshed A. Khan, M.D.

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