

History of Medicine

Sherlock Holmes and anaesthesia

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Sir Arthur Conan Doyle's first Sherlock Holmes adventure, A Study in Scarlet, was published 100 years ago. Between 1887 and 1927 he wrote 56 short stories and four novels about his fictional detective. Episodes in the adventures which relate to anaesthetic drugs are described. Use of the drugs was criminal in the case of chloroform, opium, and curare; therapeutic in the case of morphine; and recreational when Holmes himself used cocaine.

Sir Arthur Conan Doyle was born in Edinburgh in 1859. He was educated at Stonyhurst College, Lancashire, in northern England and entered Edinburgh Medical School in 1876. He graduated MB in 1881 and spent nearly ten years in general practice. After a brief attempt to become an eye specialist, he gave up his medical career in 1891 to become a full time writer. Nevertheless, Conan Doyle's interest in medicine continued throughout his life. He was awarded the higher degree of MD from Edinburgh University in 1885 for his thesis on tabes dorsalis. Between 1879 and 1927 he had four articles and 15 letters to the editor published in medical journals. He also wrote letters to the lay press on a variety of medical topics.

When Conan Doyle graduated from medical school, and during the forty years (1887–1927) that he wrote the Sherlock Holmes stories, the variety of drugs related to anaesthesia was limited. The general anaesthetics available were chloroform, ether, and nitrous oxide. Opium was commonly used as a sedative, although bromides and chloral were also available.¹ The first barbiturate was synthesized in 1903.² Morphine was the most potent analgesic. The systemic effects of cocaine were well known by the 1880's, and its local anaesthetic property recognized in 1884.³ The mode of action of curare was

known, although it was not used in clinical anaesthesia until 1942.⁴

Conan Doyle is best known for his creation of the fictional master detective, Sherlock Holmes. The first Sherlock Holmes adventure, *A Study in Scarlet*, was published in 1887 in Beeton's Christmas Annual. Sherlock Holmes' personal use of cocaine is well known, although it was only mentioned in four of the early stories which were published in 1890 and 1891. The criminal use of chloroform, opium, and curare, and the therapeutic use of morphine and artificial respiration in the adventures may be less generally known.

General anaesthetics

Chloroform was the only general anaesthetic used with criminal intent, and was mentioned in three of the later stories.

In *The Disappearance of Lady Frances Carfax* (1911), a middle-aged spinster was chloroformed and placed in an oversized coffin underneath the wizened body of an old lady. Holmes and Watson reached the house just as the coffin was being carried out for the old lady's funeral.

"With a united effort we tore off the coffin-lid. As we did so, there came from the inside a stupefying and overpowering smell of chloroform. A body lay within, its head all wreathed in cottonwool which had been soaked in the narcotic ... for half an hour it seemed that we were (too late) ... and then at last, with artificial respiration, with injected ether, with every device that science could suggest, some flutter of life, some quiver of the eyelids, some dimming of a mirror, spoke of the slowly returning life."

In *His Last Bow* (1917), Sherlock Holmes used chloroform to overpower a German agent shortly before the outbreak of the first world war. Holmes handed over false papers, actually a copy of *A Practical Handbook of Bee Culture*, which the German unwrapped:

"only for one instant did the master spy glare at this strangely irrelevant inscription. The next he was

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gripped at the back of the neck by a grasp of iron, and a chloroformed sponge was held in front of his writhing face."

In *The Adventure of the Three Gables* (1926) a frail widow, Mrs. Maberley, was anaesthetised with a chloroform-soaked rag by intruders who then stole a manuscript from her dead son's cabin trunk:

"They must have known the house to an inch. I was conscious for a moment of the chloroform rag which was thrust over my mouth, but I have no notion how long I may have been senseless. When I awoke, one man was at the bedside and another was rising with a bundle in his hand from among my son's baggage."

Opium

In *The Adventure of Silver Blaze* (1892) powdered opium in a dish of curried mutton was used to sedate a stable lad. The dishonest trainer was then able to take the racehorse named Silver Blaze from its stable in order to injure one of its tendons. Holmes reviewed his reasoning that the trainer was the poisoner:

"Powdered opium is by no means tasteless. The flavour is not disagreeable, but it is perceptible ... A curry was exactly the medium which would disguise the taste ... The opium was added after the dish was set aside for the stable boy, for the others had the same for supper with no ill effects. Which of them, then, had access to that dish without the maid seeing them?"

In *The Adventure of Wisteria Lodge* (1908) a heavily drugged governess was abducted from a house where murder had been committed. She was rescued and brought by cab to Holmes' rooms at 221B Baker Street. Dr. Watson observed:

"Her head hung listlessly upon her breast, but as she raised it and turned her dull eyes upon us, I saw her pupils were dark dots in the centre of the broad grey iris. She was drugged with opium."

In *The Man With The Twisted Lip* (1891) Holmes and Watson unexpectedly met each other in an opium den near the River Thames. Watson had gone there to rescue an acquaintance who was an opium addict. Holmes was in disguise, hoping to discover the fate of a missing man:

"I suppose, Watson, that you imagine that I have added opium-smoking to cocaine injections and

all the other little weaknesses on which you have favoured me with your medical views."

In *The Sign of the Four* (1890) Jonathan Small, who had been a guard at the Agra Fort during the Indian mutiny, described how:

"the beating of drums, the rattle of tom toms, and the yells and howls of the rebels, drunk with opium and with bhong, were enough to remind us all night of our dangerous neighbours across the stream."

Morphine

Morphine was administered by hypodermic injection in three of the adventures, always for its therapeutic effect.

In *The Adventure of the Creeping Man* (1923) Professor Presbury, who had been taking the rejuvenating serum of anthropoid, developed the habit of creeping on all fours and was savagely attacked by a wolfhound. Dr. Watson attended him:

"In half an hour the danger was past. I had given the patient an injection of morphia, and he had sunk into deep sleep."

In *The Illustrious Client* (1925) Sherlock Holmes was severely beaten by two henchmen of Baron Gruner who resented Holmes' interference in his private affairs. On reading of the attack Dr. Watson hurried to Holmes' rooms where he found the surgeon, Sir Leslie Oakshott, in the hall who reported:

"No immediate danger. Two lacerated scalp wounds and considerable bruises ... morphine has been injected and quiet is essential."

Later in the same adventure Miss Kitty Winter, who had been ruined by Baron Gruner, threw sulphuric acid in his face. Dr. Watson did the best he could to relieve his agony:

"I bathed his face in oil, put cotton wadding on the raw surfaces and administered a hypodermic of morphia."

Curare

In *The Adventure of the Sussex Vampire* (1924) the South American arrow poison was used by a jealous teenage boy in an attempt to kill his baby step-brother. The Peruvian mother had been observed biting her baby's neck and sucking blood. On arriving at the house, Sherlock Holmes observed a variety of South American artifacts in one room. His suspicions were further aroused when he found

that the family dog had been lame. At the end of the case, Holmes described his reasoning:

"I watched him (the teenaged son) as you (the father) fondled the child just now. His face was clearly reflected in the glass of the window where a shutter formed a background. I saw such jealousy, such cruel hatred, as I have seldom seen in a human face ... Did it not occur to you that a bleeding wound may be sucked for some other purpose than to draw the blood from it? ... A South American household ... it might have been other poisons ... (but) when I saw that little empty quiver ... it was just what I expected to see. If the child were pricked with one of those arrows dipped in curare or some other devilish drug, it would mean death if the venom were not sucked out. And the dog! If one were to use such a poison, would one not try it first in order to see that it had not lost its power? I did not foresee the dog, but at least I understood him and he fitted into my reconstruction."

Holmes' drug use

Holmes' personal use of drugs is mentioned in several of the stories. In *The Adventure of the Five Orange Pips* (1891) Watson described Holmes as a self-poisoner by cocaine and tobacco. In *A Scandal in Bohemia* (1891) Holmes:

"alternated between cocaine and ambition, the drowsiness of the drug, and the fierce energy of his own keen nature ... he had risen out of his drug-created dreams, and was hot upon the scent of some new problem."

In *The Man With the Twisted Lip* (1891) Holmes said to Watson,

"I suppose that you imagine that I have added opium smoking to cocaine injections."

In a much later story, *The Adventure of the Missing Three-Quarter* (1904) Watson cautioned:

"It was dangerous to leave him without material upon which to work. For years I had gradually weaned him from that drug mania ... under ordinary conditions he no longer craved for this artificial stimulus; but I was well aware that the fiend was not dead but was sleeping".

There is no mention of Sherlock Holmes being a user of either morphine or opium. In *A Study in Scarlet* (1887)

Holmes knowledge of the opium alkaloids is said to be profound, but Watson denied any likelihood of abuse when he commented:

"I have noticed such a dreamy, vacant expression in his eyes, that I might have suspected him of being addicted to the use of some narcotic, had not the temperance and cleanliness of his whole life forbidden such a notion."

It is in *The Sign of the Four* (1890) that the exhilarating effect of cocaine is described:

"Sherlock Holmes took his bottle from the corner of the mantle-piece, and his hypodermic syringe from its neat morocco case. With the long, white, nervous fingers he adjusted the delicate needle, and rolled back his left shirt-cuff. For some little time his eyes rested thoughtfully upon the sinewy forearm and wrist, all dotted and scarred with innumerable puncture-marks. Finally, he thrust the sharp point home, pressed down the tiny piston, and sank back into the velvet-lined arm-chair with a long sigh of satisfaction. 'Which is it today,' I asked, 'morphine or cocaine?' 'It is cocaine,' he said, 'a seven-per-cent solution. Would you care to try it? ... Perhaps you are right, Watson, I suppose that its influence is physically a bad one. I find it, however, so transcendently stimulating and clarifying to the mind that its secondary action is a matter of small moment.' Watson responded 'But consider! Count the cost! You know what a black reaction comes upon you. Surely the game is hardly worth the candle. Why should you, for a mere passing pleasure, risk the loss of those great powers with which you have been endowed?'"

The appearance of a client at that moment was followed by vigorous mental and physical activity, with no mention of cocaine, for the next three days until the case was brought to a conclusion. The story ends with Watson remarking:

"You have done all the work in this business. I get a wife out of it, Jones (The Scotland Yard detective) gets the credit; pray what remains for you?" 'For me,' said Sherlock Holmes, 'There still remains the cocaine-bottle.' And he stretched his long, white hand up for it."

Discussion

The criminal use of anaesthetic drugs has been reviewed by Masson,^{5,6} and chloroform features prominently. The use

of chloroform to overcome a victim's resistance was reported soon after its introduction into clinical anaesthesia. In the Sherlock Holmes stories in which chloroform was used, none of the victims died. Methods of administering the drug described in *The Three Gables* and *His Last Bow* were similar to those in actual cases.

Dr. Watson's use of injected ether to resuscitate Lady Frances Carfax is puzzling. She was already deeply anaesthetised with chloroform, so adding ether would make the situation worse. No explanation is offered in *The Annotated Sherlock Holmes*.⁷ However, medical journals of the period when the story was published show that injection of ether by either the subcutaneous or intravenous route was a recognised method of resuscitation when a patient collapsed under anaesthesia.^{8,9}

Dr. Watson's use of artificial respiration for Lady Frances Carfax was successful, though the method was not described. In *The Stockbroker's Clerk* (1893), when a criminal attempted suicide by hanging, Dr. Watson used Sylvester's method¹⁰ of raising and lowering the arms.

The first chloroform murder trial was in London, England in 1886 when Adelaide Bartlet was accused of murdering her husband.¹¹ Death was certainly due to chloroform, and strong suspicion attached to the accused, but the jury returned a verdict of not guilty. Other murders have been committed with this agent. The most recent case occurred in Edmonton, Alberta, in 1986.¹² A husband was convicted of first degree murder of his pregnant wife. He had killed her two days after taking out a \$150,000 double indemnity insurance on her life.

One hundred years ago the variety of sedative drugs was limited. A contemporary textbook of pharmacology¹ stated that opium or morphia was used to relieve sleeplessness, but for worry it was better to use potassium bromide or chloral because opium-taking could become a habit. In cases of coma of unknown aetiology opium poisoning was to be suspected from the odour of the breath and pinpoint pupils. If a victim survived for twelve hours recovery was almost certain. The descriptions of opium poisoning in *The Adventure of Silver Blaze* and *The Adventure of Wisteria Lodge* are appropriate, and neither case was fatal.

Use of opiates for sedation, especially in elderly patients, continued until after the second world war. In the late 1940's their use, or misuse, in elderly women whose wills benefited their doctor, led to Dr. Bodkin Adams of Eastbourne, England, being charged with murder. He was found not guilty.¹³

Curare was not used clinically until after Conan Doyle's death. Its neuromuscular blocking effect had been described by Claude Bernard in 1857,¹⁴ and was described in the pharmacology text mentioned above. However, there is another, more likely, source for Conan Doyle's

background knowledge of curare for *The Adventure of the Sussex Vampire*. Charles Waterton (1782–1865) a predecessor of Conan Doyle's at Stonyhurst College, was one of its most famous old boys, and died only three years before Conan Doyle entered the school. Much of Waterton's natural history collection from South America remained in the school for many years. The earliest museum gift book, compiled in 1818, records: "Specimens of the blow-pipe, of the bows with different darts and arrows used by the South American Indians ...".¹⁵ Conan Doyle is therefore very likely to have seen them when he was a boy at the school. In *Wanderings in South America*,¹⁶ published in 1825, Waterton described the paralysing effect of curare on various animals. The first experiment was performed on a dog. The safety of ingesting curare, by eating an ox killed by a large dose of the poison, was also mentioned.

At the time Conan Doyle wrote of Sherlock Holmes using cocaine the attitude to this drug was very different from what it is today. Its properties of mood elevation and fatigue reduction received enthusiastic recommendations from Hammond,¹⁷ retired surgeon-general of the American army, and from Aschenbrandt¹⁸ in the German army. Sigmund Freud¹⁹ extolled its virtues as an antidepressant, and for the treatment of morphine addiction. It was already widely used for these purposes before its local anaesthetic properties were recognised by Koller³ in Vienna in 1884.

Conan Doyle appears to have confused the properties of morphine and cocaine in *A Scandal in Bohemia*. This is surprising because Sir Robert Christison,²⁰ one of cocaine's greatest protagonists, was Professor of Materia Medica in Edinburgh while Conan Doyle was a student.²¹ Cocaine was not an illegal drug, having been admitted to the American pharmacopoeia in 1880.²² It was an ingredient of such tonic drinks as Mariani's wine,²³ and was in Coca-cola until 1903.²⁴ However, cocaine's addicting properties were gradually recognised. Conan Doyle emphasised this aspect of the drug when he described how "the fiend was not dead, but sleeping." He wrote this in 1904, more than ten years after his description of Holmes' last use of the drug. The local anaesthetic property of cocaine was not mentioned by Conan Doyle, although he studied ophthalmology in Vienna where the discovery was made.

The Sherlock Holmes adventures may be read purely for enjoyment, but they also reflect the contemporary medical scene. Conan Doyle was familiar with the anaesthetic and sedative drugs of his era and described their criminal, therapeutic, and recreational uses. Other drugs, diseases, treatment, and medical terminology which are little known today may also be found in the stories.

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