

## THE *MATERIA MEDICA* OF SHERLOCK HOLMES

by HAROLD BILLINGS

A number of cases that engaged the attention of Sherlock Holmes involved poisons, medications, and medicine that required knowledge and a resource regarding the use of drugs and *materia medica*. While a full background can never be established for the basis of Holmes's learning, a pharmacopoeia exists that he could have referred to if a case required it—albeit the book is signed not by Holmes, but by its owner: “Arthur Conan Doyle/Edinburgh University/1878–79–.” It is heavily annotated throughout in Conan Doyle's hand.

Holmes acknowledged attending college for only two years, although arguments have been advanced that he might have spent as many as three more at university. Spending hours in the laboratory while in school and afterwards, conducting various chemical experiments, would explain his singular strength in this field and paucity in others. Watson noted in *A Study in Scarlet* that Holmes's knowledge of chemistry was “Profound,” and he was also “Well up in belladonna, opium, and poisons generally.” So Holmes might well have consulted a *materia medica* for information useful in his detective work—probably the very one that I had an opportunity to purchase for the University of Texas when considerable Conan Doyle material began to come on the market around the turn of 1970, following family disputes over the ownership of both his physical and literary estates.

The flight home from a visit to the library of the University of California, Los Angeles, and book-scouting trip to that city in January 1971 was rendered especially exciting by this book that I carried with me: *The Essentials of Materia Medica and Therapeutics* by Alfred Baring Garrod, M.D., F.R.S.<sup>1</sup> There can be few things more fascinating to a reader than having in one's hands the raw stuffs that shaped a legend, in this case a fresh text from the early molding of Conan Doyle, Sherlock Holmes, and Dr. Watson.

On several occasions, I had the opportunity to visit the Red Barn bookstore of Zeitlin & Ver Brugge in Los Angeles. It appears the whole book world loved Jake Zeitlin, and for good cause. A colleague from the University of Texas (Michael Thompson, who now has his own bookshop in Los Angeles) had been employed by Zeitlin, and it was partly to see him that I was in the Red Barn in 1971. I had visited Zeitlin earlier, with Bill Homan—librarian, bookman, award-winning book designer and publisher—in 1968, when Homan spent a week introducing me to bookmen and their shops from Los Angeles to San Francisco.

Jake was one of the most astute of booksellers and nicest of men. For no reason except kindness to a young librarian, he drove me by his home and then to dine in the heights of a downtown Los Angeles club with another young bookman and his wife—David Laird, who later became library director at the University of Arizona and was then a bookseller in his own right. The final time that I visited Jake’s shop, I was especially interested in his engravings, early woodcuts, and other graphics, but much of his business interest at that time lay in the history of science and medicine.

That is probably why he had the Garrod–Conan Doyle book to show me. Sir Alfred Baring Garrod, M.D., F.R.S., the author of this textbook, holds a distinguished place in the history of medicine. He determined that high levels of uric acid were responsible for gout. But the fact that the book was signed by Conan Doyle and was filled with his holograph notes far outweighed any significance that Garrod held in the history of medicine. I simply knew that I had to bring the heavily annotated pharmacopoeia back to Austin because of all the bells it rang as I looked at it.

The Humanities Research Center of the University of Texas at Austin had at that time recently acquired several major collections in the history of science and medicine, and I had created catalog records or guides for much of the material. The combination of topic, the importance of Garrod, and the holograph notes and annotations by ACD in the textbook was beyond ignoring. As I recall, I purchased the book for the University from Zeitlin for \$300. As events developed, it was thirty years later before I had the opportunity to study the book in more detail.

It is especially significant that Drs. Garrod and Baxter, the author and reviser of this edition of the textbook, were both associated with the University of London, with King’s College, and King’s College Hospital. Conan Doyle would have routinely observed where these doctors practiced and lectured every time he consulted their book, and he could have had them on his mind when he named the University of London as the source for Watson’s medical degree in *A Study in Scarlet*.<sup>2</sup>

Conan Doyle annotated virtually every page of the Garrod book with extensive underlines and holograph notes. The marginalia obviously were meant to assist him—either for his medical studies or in his later practice—with quick, brief summaries of the contents of much more densely detailed topics in the textbook. In other instances, especially on the rear flyleaves, he wrote up specific directions for the preparation of medications or descriptions of the effects of various drugs on the human body.

An example of the first type of annotation is his treatment of the lengthy paragraph on “Hydrochlorate of Morphia.” He not only underlines the most

salient points about the drug in the text, he summarizes in the margin the steps to follow in its preparation:

- i  
Evaporate [opium] with Water
- ii  
Add Chloride of Calcium
- iii  
Evaporate excess Colour between Calico
- iv  
Dissolve again in warm water
- v  
Evaporate
- vi  
dissolve again and add H<sub>3</sub>N [ammonia]
- vii  
morphia precipitates and Codeia is left

The marginalia under each numbered heading above is divided into additional line breaks beyond those that I have indicated. In the second type of notation made in the book, Conan Doyle provides his own description of the effects of certain drugs, as in this example:

Slow Arsenic Poisoning  
Vomiting—plenty of stools  
Pain in the stomach & bowels  
Pulse Wiry. Forehead feels stuffy  
Eyes are red and are puffy,  
The Last of the symptoms may seem a,  
Slight one, and that is eczema.  
ACD.

A careful reading of this will show that Conan Doyle has written these symptoms in (strangely punctuated) lines to make his notes rhyme like verse. A lengthier piece on “Corrosive Sublimate as a Poison” is not only written in the same rhyming fashion, it is obviously meant to be recognized as verse, since the final words of the 14-line description are frequently indented to make the rhyme more obvious. For example, the final two lines end in the words “trooper” and “stupor,” while other lines end in such forced, untidy rhymes as “shanty” and “scanty,” “surging” and “purging.”

He applied the same technique to his descriptions of other drugs, their effects and usage—for example, “Actions of Liquor Potassae” (“a *violent poison* and famous Antacid”), “Quinine,” “Opium,” “Tartar Emetic,” “Ether,” “Turpentine,” and “Mercury.” Whether he did this simply for his own amusement, or as a mnemonic device to assist in his recollection of the actions of these drugs, is an interesting point. Perhaps a clue is the addition of his initials, ACD, to virtually every one of these exercises. In several instances, he added a more decorative graphic using his conjoined initials [AD]. It almost appears that he was consciously claiming auctorial ownership. Conan Doyle had earlier composed poems in school and twenty years later would have several books of verse published—though hardly as distinguished as his prose.

He probably had less use for Garrod’s pharmacopoeia in his private medical practice than as a student. But it was likely a well-traveled book. With him from his medical studies at the University of Edinburgh in 1879 through the completion of his degrees in 1881, it probably also accompanied him in February 1880 when, bored by school, he accepted the post of ship’s doctor on a whaling boat—the *Hope*—destined for the Arctic Circle. He was excited by this seven-month seal- and whale-hunting adventure, and returned more invigorated, if reluctantly, to his studies in the fall of 1880, completing his “Bachelor of Medicine and Master of Surgery” (M.B., C.M.) the following year.

There were no appointments to be found following the completion of his studies, despite his aggressive advertising for a position, and he was tired of serving medical apprenticeships. Given the success of his sojourn to the Arctic, it is understandable why he—probably accompanied again by Garrod’s book of therapeutics and *materia medica*—accepted appointment as ship’s surgeon aboard the cargo-passenger steamer, the *Mayuba*, which plied between Liverpool and the west coast of Africa. Unfortunately, this appointment lacked the excitement and pleasure he had found in the Arctic trip. He did not like it—the old greasy steamer, the poor pay, the “atrocious” climate, the “African fever” (malaria or yellow fever) that sickened him—as he wrote his mother—so he gave up his position after the steamer’s return to Liverpool in February 1882.

It is likely that both sea trips gave him the opportunity to practice his still modest medical skills and administer medications based on his notes in Garrod—treatment for “a bad gonorrhoea,” “hemorrhoids” (treated with Ointment of Galls and Opium), or “inflammatory diapedesis.” He also took advantage of the trips to take numerous photographs—a hobby of rapidly growing interest—the basis for several articles published the next few years.

After his trip to the Gold and Ivory Coasts early in 1882, Conan Doyle engaged in the brief, troubled “partnership” with his former medical school colleague, Dr. George Budd, in Plymouth. After breaking with the eccentric Budd,

he established in July a private practice in lovely Swansea, a suburb of Portsmouth. It may well be at this time that the Garrod *materia medica*, with ACD's school-day notes, and with instructions more applicable to actual medical treatment and the production of medications, could become of use not only to himself, but to his wife, Mary, or to his young brother, Innes, who had joined him as an assistant. The instructions to prepare prescriptions could have been used by them as needed. Physicians generally served as their own pharmacists.

Some of the notes in Garrod, examples such as "Obtain Aconitia" and "Test for Nitric Acid," are written in a somewhat different holographic style—larger, looser, perhaps more hurried in appearance than those that might have been Conan Doyle's school notes. These could have been written after he began his own practice "under the Red Lamp"—the outdoor lamp that marked the offices of a general physician. All of these points are interesting as they might help document Conan Doyle's medical practice and his knowledge and use of drugs, although it is his creative writing that is of chief interest.

He had begun writing fiction by his second year of medical studies and had already sold several stories while a student: "The Mystery of the Sasassa Valley," published in *Chambers' Journal* in October 1879, followed by "The American Tale," published in *London Society* in November.

He contributed a note to the *British Medical Journal*, 20 September 1879, "Gelseminum as a Poison," although this letter neither directly attributes the characteristics of gelseminum (or gelsemium) as a poison nor does it describe its medicinal efficacy. Rather, it is a record of Conan Doyle's attempt to find the limits to which the drug could be taken before one suffered serious side effects. He might well have been spurred on by a comment in Garrod: "Though much used in America, it has hitherto been little investigated in this country."<sup>3</sup>

"Several years ago," he wrote in his letter to the *British Medical Journal*, "a persistent neuralgia led me to use the tincture of gelseminum to a considerable extent. I several times overstepped the maximum of the text-books without suffering any ill effects. Having recently had an opportunity of experimenting with a quantity of fresh tincture, I determined to ascertain how far one might go in taking the drug, and what the primary symptoms of an overdose might be." He increased the amount of drug on a daily basis, well past the point usually suggested as a limit, until "diarrhoea . . . [became] so persistent and prostrating" that he gave up the experiment.

One of his conclusions was, "The system may learn to tolerate gelseminum, as it may opium, if it be gradually inured to it." This type of experimentation might just as well have been ascribed to Sherlock Holmes, so consistent was it with his practices. This letter is simply signed A.C.D. with his address—the work of a student freely accepted by the medical press.

This self-experimentation was not all that unusual at the time. Edinburgh was the home of several of the foremost leaders in *materia medica*, toxicology, and investigational self-medication. Sir Robert Christison, who retired just as Conan Doyle entered school, had written a highly regarded “Treatise on Poisons,” based in part on experiments on himself. His assistant, Sir Thomas Richard Fraser, professor of *materia medica* and clinical pharmacology during the years that Conan Doyle attended Edinburgh, succeeded Dr. Christison as the expert in the field. Dr. Fraser also experimented on himself—following Christison’s example—with extracts of the Calabar bean (which dilated the pupils of the eye, relieved by atropine) and the use of a drug from the African *stropanthus* plant (for the treatment of heart disorders).

*Stropanthus* was also the source for a poison applied to arrow shafts by the natives of tropical Africa for hunting and warfare. Conan Doyle would have become familiar with this poison during the time he was on Africa’s west coast. At one point the governor of Nigeria presented a quiver of the poisoned arrows to Fraser. Also a contributor to the *British Medical Journal*, Fraser may well have encouraged the gelsemium experiment by Conan Doyle and his submission of the results to the *BMJ*. Certainly there was the basis for self-experimentation and the study of esoteric poisons long established at Edinburgh.

Adding further descriptive holograph notes in the margin next to the text regarding the effects of *Tinctura Gelsemii* in his copy of Garrod, Conan Doyle wrote “Fraser” under them—apparently indicating their source as Professor Fraser’s class lectures that Conan Doyle attended. He also underlined the following text in Garrod regarding the effects of gelsemium: “It has been employed in various forms of neuralgia, rheumatism, and muscular spasm, as a sedative,” adding in the margin: “also for Chorea & inflammation.”

That Conan Doyle fully understood the danger of what he was doing is affirmed in yet other information that he underlined in Garrod’s text, indicating the results of an overdose of the drug: “Death results from apnoea, due to paralysis of the respiratory muscles.”

As a final comment regarding this type of self-based experimentation, it should be pointed out that this entire gelsemium episode could easily be incorporated into those lines regarding the attitude of Sherlock Holmes toward such investigations—as Stamford explained to Watson in *A Study in Scarlet*: “I could imagine his giving a friend a little pinch of the latest vegetable alkaloid, not out of malevolence, you understand, but simply out of a spirit of inquiry in order to have an accurate idea of the effects. To do him justice, I think he would take it himself with the same readiness.”

Conan Doyle began to write more copiously after he inaugurated his private medical practice in 1882. With the publication of “The Captain of the *Pole-Star*”

in the January 1883 issue of *Temple Bar*, there commenced a steady flow of publications, including short stories to such prominent magazines as *Cornhill Magazine*, *Cassell's Saturday Journal*, and *London Society*, articles about his photographic adventures to photography magazines, and a stream of letters to the press regarding a variety of issues, concerns and interests.

In spring 1886 he completed the novel that would be published in the 1887 *Beeton's Christmas Annual—A Study in Scarlet*—placing himself, his medical textbooks, and ultimately his future in the hands of Dr. Watson and Sherlock Holmes. Watson would have had his own *materia medica* texts to consult during his practice, although using an earlier edition of the Garrod textbook than Conan Doyle's 1877 edition, since Watson completed his medical degree at the University of London in 1878. Holmes would have had Conan Doyle's annotated pharmacopoeia available to him, including the brief marginal recipe for the concoction of Morphia and his descriptions of the actions of other drugs.

Holmes would also have the knowledge gained from his own experiments in “the chemistry laboratory up at the hospital”—apparently at St. Bart's, although Holmes might have spent time at King's College Hospital, another adjunct to the University of London. He would have gained much of his knowledge of anatomy in his observations in the hospital's dissecting rooms. Watson had been introduced to Holmes by Stamford in the hospital laboratory. The laboratory was said to be “familiar ground” to Watson, although it is likely the description might better fit the laboratory that Conan Doyle was most familiar with at Edinburgh: “This was a lofty chamber, lined and littered with countless bottles. Broad, low tables were scattered about, which bristled with retorts, test-tubes, and little Bunsen lamps, with their blue flickering flames.”

“The Resident Patient” has been called the most medical of the stories in the Canon. The story involves Dr. Percy Trevelyan, a specialist in “obscure nervous lesions.” Trevelyan had accepted the invitation of a (very frightened) patient to take up his practice in the patient's private home. This was very helpful given Trevelyan's troubled financial straits, circumstances that Conan Doyle knew well. Subsequently, a patient who claimed to have cataleptic attacks consulted Trevelyan for treatment. During such an attack (faked) by the patient, Dr. Trevelyan dashed away for a bottle of nitrite of amyl,<sup>4</sup> with which, he said, he had achieved good results in such cases. An understanding of medical practice by both Holmes and Watson is made apparent in this story, although it cannot be said that they were completely successful with the case.

In “The Engineer's Thumb,” Watson is called upon to attend to a mutilated hand from which the thumb had been hacked. But this required no consulting a book on therapeutics or *materia medica*—unless some brandy and water can be

included in such a category. This was a restorative used frequently throughout the Holmes stories.

Holmes makes use of his background in chemistry to solve a crime—one of those adventures hinted at but never recounted by Dr. Watson—that is only briefly referred to in “The Naval Treaty,” before that story begins on its own feet.

Holmes was seated at his side-table clad in his dressing-gown and working hard over a chemical investigation. A large curved retort was boiling furiously in the bluish flame of a Bunsen burner, and the distilled drops were condensing into a two-litre measure. My friend hardly glanced up as I entered, and I, seeing that his investigation must be of importance, seated myself in an arm-chair and waited. He dipped into this bottle or that, drawing out a few drops of each with his glass pipette, and finally brought a test-tube containing a solution over to the table. In his right hand he held a slip of litmus-paper.

“You come at a crisis, Watson,” said he. “If this paper remains blue, all is well. If it turns red, it means a man’s life.” He dipped it into the test-tube, and it flushed at once into a dull, dirty crimson. “Hum! I thought as much!” he cried. . . . “A very commonplace little murder,” said he.

If “The Resident Patient” is the most medical of the Holmes adventures, then surely “The Devil’s Foot” represents the most esoteric, fanciful use of poisons in the Canon. There has been debate among Holmes scholars regarding the accuracy of the toxicological basis for references to poisons in various stories. Two examples illustrate what I believe to be a conscious effort by Conan Doyle to divert prospective users of poisons by switching the type of one lethal alkaloid for another—or simply letting his imagination conjure up what might be needed for a story from his own knowledge of poisons and personal experience with them. The use of *radix pedis diaboli*, or “devil’s-foot root,” prepared from a West African plant in “The Devil’s Foot” is one example. The use of “curare or some other devilish drug” in “The Sussex Vampire” is another.

The “devil’s-foot root” could have been inspired by what Conan Doyle knew of gelseminum, prepared from the twisted, “tortuous” root of the Yellow Jasmine, while the South American poison could have been based on the “West African” arrow poison prepared from the *stropanthus* tree-climbing vine in the African tropics. Both of these could have helped shape the concept of the brownish “devil’s-foot” powder that the lion hunter, Dr. Leon Sterndale (in the story), brought back with him from Africa. In fact, an additional poisonous alka-



loid was derived from the Calabar bean, named after a town on Africa's west coast. It, too, had been used as an ordeal poison by African witch doctors.

The deliberate exposure of Watson and Holmes to the fumes of the poison may be the most foolish thing that Holmes ever did, but it closely matches the comments that Stamford made about Holmes in *A Study in Scarlet*. When one recalls that Edinburgh's Dr. Fraser—following in the steps of his mentor, Dr. Christison—had experimented on himself with Calabar and *stropanthus*, it is easy to see how these drugs could be on Conan Doyle's mind. The hallucinatory and lethal result from the vaporous combustion of "devil's-foot root" does not fit any of the attributes of known poisons, but as the lion hunter, Sterndale, comments in the adventure, "It has not yet found its way into the pharmacopeia or into the literature of toxicology." Dr. Garrod's book suggests nothing that produces the effects ascribed to "devil's-foot root."

Conan Doyle was an avid admirer of Edgar Allan Poe, and it has been suggested that the murder in Poe's "The Imp of the Perverse," accomplished by means of a poisoned taper, could have generated the idea for the story. There are similar echoes of Conan Doyle's study of poisons in Dr. Garrod's textbook and in his personal experience with West African ordeal poisons and poisoned arrows used in "The Sussex Vampire"—although recast to a South American point of view.

"Poison!"

"A South American household. My instinct felt the presence of those weapons upon the wall before my eyes ever saw them [says Holmes]. It might have been other poison, but that was what occurred to me. When I saw that little empty quiver beside the small bird-bow, 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."

Conan Doyle always acknowledged that Joseph Bell was a model for Sherlock Holmes. And Bell's statement to Conan Doyle is frequently quoted: "You yourself are Sherlock Holmes and well you know it." The real point is that Sherlock Holmes and Dr. John H. Watson both *were* Conan Doyle, and neither could be more or less than Conan Doyle's own training, experience, and imagination that he brought to their characters. It is significant that this textbook used in medical school by Conan Doyle represents a cradle of the contemporaneous drug and medical background of all three. Further study of it may assist in understanding and enjoying more fully the adventures that Holmes and Watson and Conan Doyle all shared.

## NOTES ON SOURCES

The primary basis for this essay, of course, is the copy of *The Essentials of Materia Medica and Therapeutics*, by Alfred Baring Garrod, located in the collections of the Harry Ransom Humanities Research Center, The University of Texas at Austin. Gratitude is expressed to the Center for the use of material from that book.

Additional use has been made of the following sources for this essay.

- Baring-Gould, William S. *The Annotated Sherlock Holmes*. 2 vols. New York: Clarkson N. Potter, 1967.
- Clarkson, Stephen. *The Canonical Compendium*. Ashcroft, BC: Calabash Press, 1999.
- Conan Doyle, Arthur. *Letters to the Press*. Edited and introduced by John Michael Gibson and Richard Lancelyn Green. Iowa City: University of Iowa Press, 1986.
- Haskett, Louise. "The Chemistry of Sherlock Holmes." <<http://surrey-shore-freeservers.com/HolmesChem.htm>>.
- Jones, Kelvin I. *The Sherlock Holmes Pharmacopoeia: Being an Examination into the Uses and Effects of Drugs and Poisons in the Sherlock Holmes Stories*. Weston-super-Mare, England: Oakmagic Books, 2002.
- Pearson, Hesketh. *Conan Doyle: His Life and Art*. London: Methuen, 1943.

## NOTES

1. Alfred Baring Garrod, *The Essentials of Materia Medica and Therapeutics* 6th ed. Revised and edited, under the supervision of the author, by E. Buchanan Baxter, London: Longmans, Green, and Co., 1877. xxxi, 517 pp., 20 cm.
2. It is interesting also to note that these affiliated institutions played a role in the life of the British novelist M. P. Shiel, who set out to study medicine at King's about 1885, but gave it up—he said—after observing a surgery on the eye. This, then, recalls the sickened student's reaction to his first surgery in Conan Doyle's short story "His First Operation," collected in *Round the Red Lamp*, 1894.
3. *Tinctura Gelsemii*, as described in Garrod, was prepared from the roots of the Yellow Jasmine.
4. Garrod, "A powerful inhalant," p. 168.

The detective Sherlock Holmes is one of the most recognised characters in the world; he never actually existed, but began life 130 years ago in 1887. Sherlock Holmes is 130. He was over 1 m 80 cm tall, and so thin that he looked even taller. He had sharp eyes and a thin nose, and looked like a very determined man. A righter of wrongs, Holmes helps people to find justice, especially if the problems are difficult to almost impossible to solve. The stories boosted the sales of the magazine so high, that Doyle asked for more money on subsequent stories. The first of the twelve stories is "A Scandal in Bohemia". The King of Bohemia has an affair with the beautiful Irene Adler. There is a photograph of the two of them together that he asks Sherlock to get for him from Irene. Although the character has been used in many adaptations of Sherlock Holmes stories, Irene Adler only shows up in this tale. She is often portrayed as Sherlock's love interest, though he did have a bit of a crush, it was more a respect for her wit. The story begins with a visit from the King of Bohemia in disguise. To Sherlock Holmes she is always THE woman. I have seldom heard him mention her under any other name. In his eyes she eclipses and predominates the whole of her sex. "Well, I followed you to your door, and so made sure that I was really an object of interest to the celebrated Mr. Sherlock Holmes. Then I, rather imprudently, wished you good-night, and started for the Temple to see my husband. We both thought the best resource was flight, when pursued by so formidable an antagonist; so you will find the nest empty when you call to-morrow.