

The Chemist as Anti-Hero: Walter White and Sherlock Holmes as Case Studies

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Abstract

Compared to chemists in film, chemists in modern television drama are underexamined by scholars, even though the genre is a powerful processor of images and ideas about culture and society. This critical essay draws on ideas from science communication, media studies and literary studies to examine the representation of chemists and chemistry in the acclaimed television dramas “Breaking Bad” and “Sherlock.” A textual analysis of these shows, chosen as critical case studies, demonstrates that they both portray their chemist protagonists as anti-heroes, who are morally ambivalent characters. The essay argues that both shows portray chemistry as uncommon knowledge, which is conducted largely in isolation or in secret. Although the shows represent chemistry as an empirical and experimental science, they demonstrate that the craft of chemistry is not ethically neutral. In “Breaking Bad,” Walter White chooses to stop using his chemistry skills to teach, and subsequently slides into an immoral world of death, destruction and destabilization. In “Sherlock,” Sherlock Holmes is an amoral, but benign, figure who uses his forensic knowledge to save lives and confront crime. These representations demonstrate that ethical choices are entwined with the practice of chemistry and these choices, in turn, have social consequences.

Chemistry and Contemporary Television Drama

The comprehensive study of chemistry on celluloid, *Reaction!* (2009), identified *Dr. Jekyll and Mr. Hyde* (1931) as the film that established the prototype for subsequent characterizations of chemists in movies. The chemist is at once good and evil, capable of care and harm, a dualistic portrayal that remains central to how chemistry is presented, and perceived, in Western culture. (1) This ambivalence is enhanced by the recurrent representation in film of chemists, and other scientists, as ambiguous figures. Even when they are benevolent figures, they are idealistic figures, who become gradually corrupted. They are ambitious, but overlook the social consequences of their science. They are driven to gain new knowledge, but become willing to violate ethical principles.” (2) Their uncertain social stature is reflected in their presentation in as unusual in dress and behavior -- and their scientific wisdom is portrayed as “uncommon knowledge.” (3)

Yet compared to their counterparts in movies, chemists in television drama have not received a similar amount of scholarly scrutiny. This is a significant shortfall because, as the scholar of television drama Helena Sheehan argues, the genre is a powerful “processor of the collective images and ideas through which we as a society represent ourselves to ourselves and to others.” (4) The genre reflects and refracts the values and experiences that exist in a particular culture at a specific time. This presentation of the world in dramatic television stories, Sheehan argues, is neither simple nor straightforward, but it does convey particular premises about how the world is organized, about how society is structured and about how culture is shaped by historical forces. The examination of the portrayal of chemistry and chemists in television drama, therefore, can reveal much about the image of chemistry in culture.

This critical essay aims to partially redress this overlooked portrayal of chemists, by investigating the patterns of representation of chemists and chemistry in contemporary television drama. Representation is used here as a concept from media studies to examine how the world is represented in television drama, a method of analysis that involves the close interrogation of media texts and their social contexts. (5) This approach informs the central questions of this essay: What images of chemists and chemists are presented in television drama? What does television drama reveal about the position of chemistry in society? What contribution does television drama make to the public understanding of chemistry?

The essay offers answers these questions by analyzing two specific television dramas, “Breaking Bad” and “Sherlock,” which have been purposefully chosen as critical case studies. (6) Both shows have protagonists -- Walter White and Sherlock Holmes -- who are chemists or have expertise in chemistry. Both shows have received popular and critical acclaim, highlighting their value as influential cultural products that warrant critical analysis. The selection of “Breaking Bad,” which was produced in the U.S. by cable network

AMC, and “Sherlock,” which was made by the U.K. public service broadcaster, the BBC, allows for the analysis of cross-cultural portrayals of chemists. Additionally, the shows presented complex characters and stories that run across multiple episodes, providing, therefore, a rich body of material to analyze, and so allow for multiple patterns of representation to be examined.

These complicated protagonists, appearing in several series of their shows, are difficult to categorize into distinct character types, which other studies of scientists in fiction and film have tended to do. Chemists are classed into categories, such as the evil alchemist, the noble scientist, the foolish scientist, the inhuman researcher, the scientist as adventurer, the mad, bad, dangerous scientist and the helpless scientist, (7) or as eccentrics or anti-social geeks. (8) But such categories, even in compound form, provide only a simplified shorthand for scientist types. Placing White and Holmes within these broad categories risks draining them of their psychological complexity. Instead, this essay explores these characters using the idea from literary studies of the anti-hero, an approach that allows for the examination of their complex representation, with their contradictions, tensions and individual quirks.

The anti-hero is a central character in a drama “who lacks the qualities of nobility and magnanimity expected of traditional heroes and heroines in romances and epics.” (9) The anti-hero exhibits amoral and selfish tendencies, in contrast to the hero who emerges victorious after a significant struggle with the ability to bestow benefits on humankind. (10) The anti-hero is essentially ambiguous and ambivalent in that they are neither heroic nor villainous. (11) Critics have labeled White (12) and Holmes (13) as anti-heroic, but have not developed this idea to explore what it means for the wider representation of chemistry.

Yet this idea of the anti-hero is useful for analyzing White and Holmes, because it resonates with chemistry’s broad social and cultural position. Examining the field’s status in society, the editors of *The Public Image of Chemistry* note that the popular associations of the field range from “poisons, hazards, chemical warfare and environmental pollution to alchemical pseudo-science, sorcery and mad scientists.” (14) The chemist Luciano Caglioti writes that chemical products, like penicillin, dynamite, insecticides and petrochemicals, are characterized by ambiguity in that they can, at once, improve life and make living more hazardous. (15) For chemist and popular science writer Pierre Laszlo, these associations contribute to the social impact of the field, as the public suffer from “chemophobia.” (16) The portrayal of chemists and chemistry in “Breaking Bad” and “Sherlock” are produced, and circulate, in this social and cultural environment.

“Breaking Bad” and Chemistry as Uncommon Knowledge

At the beginning of “Breaking Bad,” Walter “Walt” White, played by Bryan Cranston, is a self-described overqualified high school chemistry teacher. After contributing to the work of a Nobel Prize-winning research team early in his career, he has failed to live up to his academic promise. He earns \$43,700 in his job in Albuquerque, New Mexico, a salary he supplements working in a local car wash. Married to Skyler, with a son, Walter Junior -- joined in season three by daughter, Holly -- White has watched his former best friend at Cal Tech create a fortune as an industrial chemist and marry White’s ex-girlfriend. Diagnosed with inoperable lung cancer, he decides to provide for his family after his death by turning his prodigious talent as a chemist to something darker and more dangerous: the illicit production of crystal methamphetamine.

He teams up with a former student and small-time drug dealer Jesse Pinkman to manufacture a potent brand of meth identified by its distinctive blue color and its extraordinary purity. White progresses from “cooking” meth in the back of a dilapidated Winnebago using equipment stolen from his school, to industrial drug production in a secret laboratory with weekly quotas, run by meth kingpin Gustavo “Gus” Fring. Walt’s immersion into the gruesome and dehumanizing drug trade provides him with what one critic called “a sort of existential rejuvenation.” (17) The show dramatizes how Walt’s initial motivation -- to provide for his family -- is gradually surpassed by his desire to make his mark on the world through his chemistry.

The series features several recurring patterns about the nature of chemistry as a science. Chemistry is portrayed as a form of “uncommon knowledge.” This knowledge must be earned. For example, sitting on a desk in front of his class, with a poster of the periodic table hanging in front of the chalkboard behind him, Walt discusses the arcane wonders of chemistry that only extended study reveals:

Mono-alkenes. Di-olefins. Tri-enes. Poly-enes. I mean the nomenclature alone is enough to make your head spin. But when you start to feel overwhelmed -- and you will -- just keep in mind that one element: carbon. Carbon is at the center of it all. There is no life without carbon. Nowhere that we know of in the universe. Everything that lives . . . lived . . . will live . . . carbon. (18)

Walt uses his “uncommon knowledge” to produce meth. His brand of the drug is so pure because he synthesized it himself using his advanced knowledge. Walt trains Jesse -- whose first forays into the chemistry of drug production were characterized by his addition

of chili powder as a special ingredient -- in the advanced chemical skills needed to cook high-grade meth. But that knowledge is not easily acquired. For example, when Jesse first manufactures a batch of blue meth on his own and shows the results to Walt, their conversation shows how technically accomplished Jesse has become, but how much more he needs to learn.

- Jesse: In the end I just went with two reflux condensers. I didn't want to loose track of my pH levels. But I did everything else just like you taught me . . . super-careful in my amounts and watched the numbers every step of the way. So, what do ya think? It's good, right?
- Walt: What in the hell is this?
- What?
- What? This, this, this is my product, this is my formula, this is mine . . . I mean look at the diameters here. What did you use for reduction? Don't tell me. Platinum dioxide, right?
- No, mercury aluminum amalgam. The dioxide's too hard to keep wet.
- Alright, well you must have done it wrong, then. Your color is all cloudy so you were struggling with distillation, too. No, this is . . . this is very shoddy work, Pinkman. I'm actually embarrassed for you. (19)

The show dramatizes Jesse's progressive maturation as a scientist, as he learns hands-on in the lab, under Walter's tutelage. (20) His training is complete in season four, when he travels to Mexico to show a drug cartel's collection of chemists how to make blue meth. The head cartel chemist's initial dismissal of Jesse changes after young man demonstrates his newfound "uncommon knowledge" by making meth with a 96 percent purity. (21)

Yet Walt's talent surpasses that of every other chemist on the show. The chemist Gale Boetticher, originally picked to run the industrial meth production lab for Fring, admits that Walt's meth is the product of unique talent. Gale tells Gus:

I can guarantee you a purity of 96 percent. I'm proud of that figure. It's a hard-earned figure, 96. However, this other product is 99. Maybe even a touch beyond that . . . But that last three percent, it may not sound like a lot, but it is. It's tremendous. It's a tremendous gulf. (22)

Threatened with death by Gus, Walt argues that his specialist knowledge means that his brand of meth cannot be cooked by anyone who just follows a formula. The thug Victor claims to know Walt's meth cooking process after observing him over several weeks. Victor says: "It's called a cook because everything comes down to following a recipe." Walt responds:

You're not flipping hamburgers here, pal. What happens when you get a bad barrel of precursor, huh? How would you even know it? And what happens in summer, when . . . when . . . when the humidity rises and your product goes cloudy? (23)

When Gus hints that Walt is proprietorial about his meth formula, Walt emphasizes that his skills are based on his deference to the intellectual integrity of his specialist field. Walt says: "I simply respect the chemistry. The chemistry must be respected." (24)

The Craft of Methamphetamine Production

Yet while chemistry is portrayed as "uncommon knowledge," Walt embodies the idea of the chemist as craftsman. The show represents the particular scientific work undertaken by the chemist. Walt is talented, but he is also industrious and careful. He knows the importance of having the correct equipment. He is excited and astounded by the quality of the lab equipment that Gus procures for him: "My God . . . thorium oxide for a catalyst bed. Look at the size of this reaction vessel. There's gotta be . . . There's gotta be 1,200 liters." (25) The show features several sequences that show quality meth production as the result of hard work. Walt and Jesse turn up for work each morning and use glassware and specialized machinery to create compounds. They regularly take apart and laboriously clean their equipment. The show does not mystify chemistry. It depicts the work of the field as experimental and empirical. It shows chemistry as a science of synthesis. It shows chemists *making new materials*. Jesse says that their work is art, but Walt corrects him by saying it is just basic chemistry.

The craft of chemistry is, at times, presented as a pure process. Gale tells Walt that he holds a master's in organic chemistry, with a specialty in X-ray crystallography. Gale tells how he had been studying for a doctorate at the University of Colorado, following an established career path, but did not enjoy the politics of academic chemistry. The purity of the lab drives him. He tells Walt:

- I love the lab because it's all still magic, you know, chemistry.
- Walt: It is. It is magic. It still is. (26)

In one sequence, the two expert craftsmen make meth together and a whimsical song played as background music. The chemists cook. They play chess in their breaks. (27) They find found beauty and peace and joy in the craft. But neither chemist acknowledges, in the scene, the effect that their illicit work would have on society. Both essentially turn their backs on establishment science and science education. Through his actions, Walt has abandoned his belief in science as social good.

The portrayal of chemistry as socially or ethically problematic is signaled by the fact that the chemistry takes place in secret. Walt first produces his meth in a van in the middle of the New Mexico desert. Then he makes it in an underground lab, hidden in an industrial plant tied to Los Pollos Hermanos, the fried chicken business run by Gus as a front for his drug network. The secret locations are another manifestation of the ambiguity of chemistry. Walt is engaged in what science communication scholar Peter Weingart and colleagues call a “private science where the scientist has chosen to leave the community or was excommunicated by it because he or she transgressed the boundaries into forbidden research territory.” (28)

The Ambiguity of Walter White

The dramatic way Walt succumbs to circumstantial economic pressures means the show resonates with wider contemporary social uncertainties. For the *New York Times*, the show taps into the “sense of economic and social backsliding,” as the middle-class White family engages in an “undignified struggle for dignity.” (29) The same newspaper in another review -- with the headline “Better Living Through Chemistry” -- says that the dark mood of the series is so in tune with the post-bust economic times that its “extremist misery . . . feels virtually like reportage.” (30)

Walt is presented as a deeply ambiguous figure. He faces a complex moral choice when he opts to use his chemistry talents for ill. The same passion he once used to teach his students is used to manufacture meth. He remains loyal to Jesse, who was a sort of surrogate son to him. He breaks bad -- the expression from the American southwest that describes a good person doing bad things -- for his family, yet allows Skyler to become ever more involved in his illicit activities.

A key moment in White’s moral slide is the death of Jane, Jesse’s girlfriend, who is aware of Walt’s secret life in the drug trade. She dies after choking on her own vomit while passed out in a heroin haze alongside Jesse. Walt does not intervene to save her. He watches her die. His motivation is selfish as he knows this means Jesse will not break up his partnership with Walt and also that Jane will be never reveal his unlawful work. But Walt, while unknowingly drugged, alludes to his suppressed guilt. He tells Jesse: “If I had just lived right up until that moment and not one second more. That would have been perfect.” In the same scene, Walt reveals that he is aware of the immorality of his work and that his continuation beyond the point when he had earned enough money meant he crossed an ethical boundary. He says:

I missed it. It was some perfect moment and it passed me right by. I had to have enough to leave them. That was the whole point. None of this . . . None of this makes any sense if I didn't have enough. But it had to be before she found out, Skyler. It had to be before that. (31)

Walt’s ambiguity is linked implicitly to an ambivalent view of science through his choice of pseudonym in the drug trade: Heisenberg. The German Nobel-winning physicist is best-known for his Uncertainty Principle that says it is possible to know either the velocity or location of an electron, but not both. Heisenberg has remained controversial also for his atomic research in World War II. There are subtle references, too, to the development of atomic weapons, an historical association with Los Alamos in New Mexico that is made explicit when Walt meets Jesse’s street dealer friends in the atomic museum in Albuquerque. The ambivalence surrounding the Manhattan Project and its scientific work is bound up subtly with the figure of White.

White’s work dramatizes a fundamental philosophical tension about the social role of chemistry. Is the craft of the chemist morally neutral? Can purity of craft be separated from the social consequences that flow from laboratory work? At a time when they are crucial cogs in Gus’s meth empire, Walt tells Jesse: “You are not a murderer. I am not and you are not. It’s as simple as that.” (32) Yet at this time, there were several victims who died as Walt and Jesse became more embedded in their dark trade. Walt killed two rival dealers, Emilio and Krazy-8, choking one of them to death with a bicycle lock. Jesse’s friend Combo was killed while selling blue meth on a street corner in another gang’s territory. By the end of season four, Walt is responsible for at least nine deaths (33) -- fatalities that resulted from Walt’s complex moral choices.

The social consequences of illicit chemistry work are made clear. After Jane dies, her father is so distracted by grief in his work as an air-traffic controller that he fails to prevent a mid-air plane collision over Albuquerque. Debris and body parts rain down on the city and on Walt’s home, a metaphor for the social carnage wrought by his work. The cold-blooded murder of Gale is similarly symbolic. Walt believes that Gus is planning to kill him and Jesse, now that Gale had learned from Walt how to manufacture blue meth, so to

survive -- and to continue to be the one holding “uncommon knowledge” -- Walt tells Jesse to kill Gale. Jesse reluctantly does so. Gale -- the herbal tea-drinking, karaoke-performing, vegan libertarian -- loves the pristine isolation of laboratory life, but his execution shows that illicit chemistry has social costs. Walt comes to realize his progressive corruption that has resulted from his ambition. As his life is threatened by his associations with the drug trade, he is asked by his wife if he wants to go to the police to confess and get protection. But Walt tells her: “I am not *in* danger, Skyler. I *am* the danger.” (34)

Holmes’s Hidden Chemistry

Moving from Albuquerque to London, the portrayal of the eponymous detective in “Sherlock” is an illuminating point of comparison with White. Arthur Conan Doyle in his original novels and stories documents Holmes’s chemistry credentials. In *A Study in Scarlet*, Holmes first meets Dr. Watson in a “chemical laboratory.” Watson as narrator describes the scene:

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. (35)

Holmes is presented in this initial encounter holding a test tube as he explains excitedly that he has developed a novel chemical test to identify human blood. Holmes says: “I’ve found it! I’ve found it . . . I have found a re-agent which is precipitated by hoemoglobin [sic], and by nothing else.” Later in the same story, Watson evaluates Holmes’s areas of specialized knowledge. Watson lists as “nil” Holmes’s understanding of literature, philosophy and astronomy, while his anatomical knowledge is “[a]ccurate, but unsystematic.” He had good knowledge of poisons and could tell different types of soil. Crucially, Watson notes that Holmes’s knowledge of chemistry is “profound.” (36) Coming at Holmes from the perspective of chemistry in movies, Griep and Mikasen note that he is an archetype of a particular onscreen scientist-- the forensic detective. (37) Indeed Conan Doyle has done more than any other writer to present the social value of forensic science. (38)

“Sherlock” updates Conan Doyle’s Victorian setting to contemporary England. As played by Benedict Cumberbatch, the consulting detective is now a tool-ed-up and hyper-connected twenty-first century digital citizen. He continues to be fascinated by forensics. He is first shown in St. Bartholomew’s Hospital beating a corpse with a riding whip, to evaluate the post-mortem formation of bruises. Critic Elizabeth Renzetti in her discussion of the series for *The Globe and Mail* writes: “Fascinated by forensics and chemistry, Holmes could have been a character on CSI Baker Street.” (39)

But there is a telling omission in this representation of Holmes and his abilities as a forensic chemist. Nowhere is Holmes identified as a chemistry expert. Nor is his advanced knowledge of the science explicitly identified. His knowledge and love for chemistry is instead portrayed as implicit and allusive. Throughout the series, he is featured in repeated shots using a microscope in the laboratory. He is known for his ability to distinguish between more than 100 varieties of cigarette ash. His kitchen table is usually covered with laboratory glassware. (His science takes places in secret.) His love of chemistry is symbolized most clearly by the only decoration that appears on his bedroom wall: a colorful poster of the periodic table.

Holmes as Sociopath

“Sherlock” presented Holmes as an ambiguous figure: impatient, anti-social, friendless, arrogant and cruel with a pronounced lack of empathy. Cumberbatch calls him “this character of the night, this sociopathic, slightly autistic, slightly anarchic, maverick, odd antihero.” (40) Holmes is portrayed as amoral. For example, when asked by the police to help investigate a bizarre set of apparent suicides that have been linked by a mysterious note left by one of the victims, Holmes says: “Brilliant! Yes! Four serial suicides and now a note. Oh, it’s Christmas.” Holmes views the multiple killings as an exciting competition, a challenge for his mental capacities. A clearly delighted Sherlock leaves his apartment to investigate the suicides and his landlady tells him his enthusiasm is not decent. He responds: “Who cares about decent? The game, Mrs. Hudson, is on!” (41)

This lack of empathy is noted by the police. When Dr. Watson, recast in the series as a British army doctor who has returned traumatized from the war in Afghanistan, first accompanies Holmes to a crime scene, Sergeant Sally Donovan warns Watson to stay away from the detective. She says:

You know why he's here? He's not paid or anything. He likes it. He gets off on it. The weirder the crime, the more he gets off. And you know what? One day just showing up won't be enough. One day we'll be standing around a body and Sherlock Holmes will be the one that put it there . . . he's a psychopath. Psychopaths get bored. (42)

When he is once again called a psychopath by another police forensic expert, Holmes says: "I'm not a psychopath . . . I'm a high-functioning sociopath. Do your research." (43)

As Holmes tries to outwit his nemesis Jim Moriarty, who threatened to leave corpses around London, Watson confronts his friend's amorality. He asks:

- There are lives at stake, Sherlock. Actual human lives. Just, just so I know: do you care about that at all?
- Will caring about them help save them?
- Nope.
- Then I'll continue not to make that mistake.
- Don't make people into heroes, John. Heroes don't exist and if they did I wouldn't be one of them. (44)

But despite his ambivalence, Holmes is liked and respected by Watson. At the end of season two, after his climactic confrontation with Moriarty, Holmes is forced to jump from a rooftop to his apparent death. The closing scene of the series highlights Holmes's humanity. Watson stands over what he believes to be Holmes's grave. He is watched, unknowingly, by Holmes, who has somehow manufactured his own death. The detective hears his only friend say: "There's just one more thing, one more thing, one more miracle, Sherlock, for me. Don't . . . be . . . dead." (45)

Holmes's Uncommon Knowledge

Holmes's method of reasoning is obscured in Conan Doyle's stories. As the literary critic Steven Knight notes:

The contexts of medical science, the chemistry and the exhaustive knowledge of crime are only gestured at, and we are actually shown no more than a special rational process. (46)

This methodology continues to be largely hidden in "Sherlock." Examining physical evidence, Holmes rapidly forms conclusions that dazzle Watson (himself, a trained physician) with their insight. Elaborating on this point, Cumberbatch tells *The Times*: "You can have scientists on the ground who analyze forensics, but they won't be able to take that leap which takes them to a conclusion . . . It takes [Holmes'] leap of imagination as well as his knowledge to connect the dots." (47) For Holmes, the physical evidence is just the starting point. His uncommon knowledge lies in his powers of interpretation.

With this portrayal, "Sherlock" presents scientific insight as the result of a process that is closer to artistic creation than experimental science. This is a recurring means of representing the work of the scientist, especially to audiences who may be unfamiliar with the process of scientific creativity. (48) But advances in production technology have allowed the creators of "Sherlock" to bring to the surface more elements of Holmes's uncommon reasoning process. In "A Study in Pink," as Holmes examines physical evidence, words flash up on screen that correspond to pieces of data that Holmes identifies as significant. For example, when Holmes examines the corpse of a woman who apparently took her own life, labels are projected onto her clothing to reveal her history and circumstances of her death. Holmes identifies from her body, clothing and jewelry that she was left-handed and married unhappily for more than 10 years. When Holmes meets a man in Buckingham Place, he reads the man's life history in an instant from his clothing and appearance. The viewer sees the evidence, sees what Holmes sees -- but the conclusion can only be provided by Holmes. The conclusions remain the result of flashes of individual genius.

Holmes's "uncommon knowledge" is symbolized also by what reviewers interpret as the character's uncommon appearance. *The Times* says this Holmes looks "as odd as you'd expect The Cleverest man in the World to look. Eyes white, skin like china clay and a voice like someone smoking a cigar inside a grand piano." (49) For *The Daily Telegraph*, Cumberbatch, with his "shock of blackened hair, his parchment-pale skin and liquid eyes [takes] on a translucent quality that made him appear both sickly and mesmerizingly other-worldly." (50)

The philosopher John Gray says this version of Holmes represents a conflicted modern attitude to science. Gray argues that the detective embodies reason in an age when systems of rationality -- from security software to the mathematical formulae used by hedge funds -- "have proved to be dangerously unreliable." For Gray, Holmes symbolizes the power of the mind, at a time when "idea that intellect alone can be guide in life is weaker than it has been for many years." (51)

Conclusion: The Social Consequences of a Chemist's Ethical Choices

Although the patterns of representation in both shows are complex and sometimes contradictory, common themes about the public image of chemists and chemistry can be discerned. Chemistry is represented as an empirical and experimental field. Chemistry is portrayed as a type of “uncommon knowledge” held by particular experts. But the precise nature of this knowledge is depicted differently. The knowledge in “Breaking Bad” is gained through a process of experimentation and instruction, based on knowledge of the fundamentals of the field, although each chemist has particular talents and skills that distinguish their work. The special understanding in “Sherlock,” by contrast, is gained through a process of imaginative interpretations of physical evidence, a largely hidden process that is portrayed as unique to Holmes.

Chemists are represented in both shows as ambiguous figures. Neither White nor Holmes possesses the traditional heroic virtues. Instead, they are depicted as anti-heroes, who each exhibit various degrees of amorality, immorality and selfishness. White and Holmes see the practice of their work as ethically neutral, a value-free demonstration of their intellectual prowess. Their chemistry is largely conducted in secret, in private and in isolation. These common patterns mean the television characters of White and Holmes conform and reinforce the wider cultural portrayal of chemists as socially and ethically problematic figures.

The moral ambivalence of White and Holmes also allows for the dramatic portrayal of ethical issues in chemistry. White and Holmes face moral choices of varied complexity about how to apply their scientific skills. Holmes’s amoral view of his work nevertheless improves society by causing the capture of criminals. White chooses to stop using his knowledge to teach. He then becomes progressively corrupted, as he slides into an immoral world of duplicity, deceit and death. By dramatizing the dilemmas of White and Holmes, the shows demonstrate that ethical choices are entwined with the craft of chemistry and these choices, in turn, have social consequences. The practice of chemistry, in both shows, is inseparable from its social consequences. Circulating these ideas through culture can contribute to a deep public understanding of chemistry.

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