

## SCIENTIFIC HUMANITIES

*The Scientific Origins of Wonder Woman**Matthew J. Brown***Introduction**

Science plays an important role in contemporary cultures around the world. That is, both the results and the methods of scientific inquiry, as well as its applications, are not only influenced by the culture in which it is produced, but they also have an outsized influence on that culture. Some scientists become important cultural figures—for example, Marie Curie, Charles Darwin, Sigmund Freud, Albert Einstein, Carl Sagan, Stephen Hawking, Richard Dawkins, Stephen Pinker, and Neil deGrasse Tyson, just to name a few. Scientific results and the ideas of scientists are accorded a special authority by most people, most of the time. Even those who doubt specific claims, for example, about the safety and efficacy of vaccines, or about the reality of climate change, typically have a lot of trust in the authority of science on other issues. Technology, today inextricably linked with scientific knowledge, in some ways plays an even more central role. Some of us with a more romantic bent may bemoan the situation, but it remains an undeniable fact of contemporary society.

Playing such an important role in culture, it is no surprise that science informs and makes important connections with other cultural products: art, literature, film, television, and, of course, comics. Scientists become key characters in narratives, and scientific research or its results become major plot points. In more subtle ways, scientific knowledge about a variety of subjects—biology, psychology, astronomy, engineering—becomes part of the context of background beliefs informing the creators of art, literature, and other media. And while science and technology have not always had the cultural authority or omnipresence that they have today, the interaction and interplay of science and culture are long-standing historical phenomena.

Many scholars in the humanities shy away from scientific topics; this is one side of the so-called “two cultures” split identified by C.P. Snow (1959). Whatever the general problems with the split of the sciences and the

humanities, lack of familiarity or comfort with the sciences limits the kinds of interpretation that humanities scholars can make of the relevant texts and artifacts. Insofar as the sciences inform the construction, content, or reception of the relevant texts, aspects of the text will be hidden from those who feel averse to and have little familiarity with science. An exception to this science-aversion are the areas of the humanities that themselves take science as their subject matter, including the history, philosophy, and literary and cultural studies of science, or broadly the humanistic side of the interdisciplinary field of Science and Technology Studies (STS). A related interdisciplinary field is referred to as “literature and science studies” and it includes literary scholars analyzing science, scientific humanities analyses of literature, and much more besides (Gossin 2002). Other exceptions are on the rise (for example, the area of digital humanities).

Serious research and writing in the humanities requires that we go beyond the surface-level meaning of texts, art objects, and cultural artifacts, beyond descriptions of, for instance, plot, style, and characterization; we require critical approaches to provide tools for research and interpretation that allow us to move beyond that superficial level. The aim of this book is to provide a survey of such critical approaches for the interdisciplinary field of Comics Studies. Scientific humanities is such a critical approach for interpretations that are only possible across the two cultures divide. It is a species of *contextual* approach whereby the text is situated in a critical context provided by science. This chapter explain the scientific humanities approach and apply it to golden-age *Wonder Woman* comics.

### Underlying Assumptions of the Approach

The first underlying assumption of scientific humanities, already canvassed above, is that science provides an important context for interpreting many narratives, not only didactic popular presentations of science, but a variety of fictional and nonfictional narratives. There are several ways that an understanding of science scaffolds such interpretive work. First, science is part of the background of the production of certain texts. In some cases, stories are written by scientists who themselves have a scientific agenda in mind; this is of course true of didactic works, but not only those—the sample analysis in this chapter focuses on a text produced by a scientist with a very specific scientific agenda. The goal of the text is not science education; rather, science forms the background of a comprehensive project of education and social reform that the comic attempts to enact.

Second, scientists, scientific techniques, or scientific research can be part of the narrative’s content. Obviously, it helps to know something about scientists or the scientific process to understand such narratives. What’s more, we can make comparisons in the other direction: reading and interpreting the text can help us think about the scientific context. Reading Mary Shelley’s description

in *Frankenstein* of Victor's obsessive attempt to complete the Creature helps us think about real-world examples where scientists focus only on the technical allure of their research, without sufficient attention to what the consequences of that research might be. Similar connections, with interesting twists, can be found in various other portrayals of "mad scientists," such as Batman's enemy Mr. Freeze, or Dr. Josephine Baker in Victor LaValle's *Destroyer*.

Even when science or scientists are not explicitly part of the narrative's content, science may still provide a valuable interpretive framework by supplying important information about topics that might be central to that text, such as the environment, consciousness, economics, or society. Even when the author does not explicitly reference science, understanding the nature of such phenomena and the background scientific beliefs at the time about these phenomena can help unpack the meaning of the text.

It is important to recognize that either popular or expert understandings of science are relevant, and indeed, these understandings are always in dialogue where science forms part of the interpretive context for a cultural text. Creators might be scientists or have scientific training, or they may do copious research about science in the process of creating the work. In such cases, it is important to draw on expert scientific knowledge. When their own scientific work is not well known or is idiosyncratic, one may have to do significant interpretive work on their scientific works. On the other hand, creators might have no expert understanding of science, and may rely on general education, background cultural beliefs about science, and previous representations of science in popular culture. Likewise, whenever or insofar as we think about audience reception of such texts, we need to know about the popular understanding that is relevant. Work in public understanding of science or science communication becomes relevant here.

Another core assumption is that science itself is a sociocultural process and product. Science is not a set of timeless, apersonal truths. It is the product of socially, historically, and culturally situated human beings working individually and in groups. It relies not on pure rationality but on particular sociocultural practices of inquiry, on socially constructed concepts, on metaphors and analogies, on messy heuristics, and on human values. It involves competition and "political" struggles between individuals and groups. Typically, this is not "politics" as in liberals and conservatives, but as in "office politics." Sometimes, though, the larger political context informs scientific controversies, as with climate science or stem cell research. Science not only contributes to the larger society and culture, but it draws on and is influenced by them. This does not mean that we do not take science seriously. To say that science is a sociocultural process and product is not to deny that it produces knowledge or discovers truth, only to say that it does so from a human point of view.

The popular understanding of science and scientists, and their representation in art, literature, film, and pop culture, are thus doubly sociocultural

products. First, it is itself a reflection of the sociocultural products of science. Second, it is read through a variety of sociocultural lenses, interests, fashions, etc. This pushes us to interrogate social, historical, cultural, and evaluative factors at two levels—of the broader culture, and of the scientists themselves or scientific process itself.

### Appropriate Artifacts for Analysis

The type of artifacts to which a scientific humanities approach can be applied is potentially quite broad. For any work of literary, artistic, or cultural production, we can ask whether new details can be revealed by reading it in some scientific context. Because scientific knowledge touches every element of our natural and social worlds, that question is in principle open for any work. In practice, however, a scientific humanities approach is usually more revealing as a critical approach when the link between the work and the scientific context is much closer. Sometimes this can be difficult to determine without either significant background in the sciences (or the history or philosophy thereof), or without some background biographical information about the creator of the work. Scientific humanities scholars themselves often have background or interests that predispose them to see the scientific context.

Within the field of Comics Studies, appropriate artifacts for scientific humanities include comics texts that involve representations of scientists or the scientific process, have content that relates to areas of scientific knowledge, or are authored by scientists or those engaged in some way with science. This includes didactic/educational works about science, such as the work of Jay Hosler (*Clan Apis, Evolution: The Story of Life on Earth*) and Jim Ottaviani (*Two-Fisted Science, Feynman, Bone Sharps, Cowboys, and Thunder Lizards*), whether by scientists, educators, or others. It includes less didactic, fictional works by scientists (such as Wonder Woman's creator William Moulton Marston) or known science enthusiasts (like H.G. Wells), as well as critics of or commentators on science. It also includes texts where scientists are the protagonist, antagonist, or significant side characters (consider characters such as Dr. Manhattan, Hugo Strange, and Reed Richards), or where scientific research forms an important part of the story (as it does in *Frankenstein* or Jonathan Hickman's *The Manhattan Projects*).

Some, but by no means all, relevant texts will be in the science fiction genre, but not all texts in that genre will be appropriate for this approach. On the one hand, nonfiction, realistic fiction, memoir, and most any genre can fit in one or more of the categories above. On the other hand, there is much "science fiction" literature which portrays future worlds using different, futuristic technologies as tools, but where science or engineering, scientists, and technologists play no role in the narrative; where the futuristic elements serve purely ethical, political, or entertainment purposes; and where setting

those narratives or elements against a background of science or engineering would not reveal anything new.

### Procedure for Analysis

Scientific humanities as a critical approach draws on work in and the tools of the interdisciplinary field of Science and Technology Studies (including history, philosophy, and the social, literary, and cultural studies of science, as well as science communication) to read texts against a scientific background. The approach is inherently contextual: placing some aspect of the text against a relevant scientific background to see what new details and connections are thrown into relief. How the text itself is approached, and what counts as “relevant” information from science, science studies, or the public understanding of science will depend in large part on the particular text. One might focus on broad themes from the text or instead engage in close reading. Typically, this approach focuses on the thematic and narrative elements of a comics text. In tandem with reading the text, one must draw on the scientific context via history of science, rhetorical analyses of science, or contemporary science and its social or philosophical analysis, or, in cases where the creator is a scientist, biographical sources about the creator as a working scientist may be necessary. An analysis that focused more on the visual elements of certain comics might instead read them in the context of the history or practices of scientific diagrams, medical illustration, or cartography.

One way this might go involves drawing on the history of science from when the text was produced. For example, Jessica Murphy provides a reading of Spenser’s *The Faerie Queene* in the context of early modern medical thought at the time it was written. Her reading concerns a particular passage from Book III where the character of the princess Britomart is described as a “sicke virgin” and the nurse Glaucē attempts to cure her (Murphy 2010). Murphy argues against the interpretation of Britomart as “lovesick,” because lovesickness was considered a malady with symptoms quite different from Britomart’s. Murphy shows that a recognized disease of the time known as “greensickness” better fits Britomart’s case, comparing Spenser’s poem to both historical medical sources and contemporary histories of early modern medicine. Because Murphy approaches the medical discussion of greensickness (a “disease of virgins”) from a feminist or critical gender and sexuality studies lens, she is able to provide a more nuanced reading of issues of gender in the interpretation of *The Faerie Queene* than are contemporary readers who are unaware of the relevant scientific-medical context.

In another kind of case, one might draw on contemporary science and its philosophical analysis in critically analyzing texts. For example, Pamela Gossin, in discussing the ecological and environmentalist themes in the manga and animation of Hayao Miyazaki, brings in the mutual dialogue between ecology and environmental science, environmental history, and

environmental philosophy (Gossin 2015). This allows Gossin to understand not only the environmental influences on Miyazaki, such as Clive Ponting's *A Green History of the World*, but also to uncover a complex *ecophilosophy* being worked out in Miyazaki's comics and films.

In some cases, where the science itself is complicated or not well known, a scientific humanities approach may involve a relatively long digression through an analysis of the science itself before returning to the text it helps us analyze. In other cases, where the science is more simple or familiar or where existing scholarly analyses of the science are more easily available, such thorough explanations may not be necessary.

### Types of Questions for Analysis

What types of questions might this critical approach answer? One question that seems relevant, and indeed sometimes sparks an interest in taking a scientific humanities approach, is the question of how *accurate* the science in a text is. This could be understood historically, relative to the science at the time the text was written, or relative to the current state of scientific knowledge. One can of course ask whether the radioactive spider bite in Spider-Man's origin story is scientifically accurate, or whether it reflected the understanding of biology and radiation current in 1962. Perhaps, in a more sophisticated way, we could ask if the laboratory tinkering of a Doctor Will Magnus or a Victor Von Doom accurately represent how scientific research is done. But focusing on these questions turns out to be less significant than it might seem. At best, they can be stepping stones to drawing out other, more revealing questions about the text; in some cases, it leads to a dismissive attitude toward the "inaccurate" text. Questions about scientific accuracy are not the kind of questions that a scientific humanities approach should focus on exclusively or for their own sake.

What sort of questions should we ask when we're reading a comics text (or any other text) within a scientific context? Recall that cultural representations of science are a doubly sociocultural product; the science itself is the product of time, place, and culture, and the choice to represent it in a popular, artistic, or literary medium is likewise a sociocultural act with specific aims and values. There are thus many questions that are apropos of a scientific humanities reading, such as: Assuming a base level of scientific literacy of the time, what implicit details of the narrative can we uncover? What does the representation of science or scientists in the text tell us about what the author understands or believes about science, what they hope for or fear about science, or more generally, how they value science? What does it tell us about the audience's understanding of or beliefs about science? How does science inform the creator's goals? To answer some of these questions, along the way, we may have to make judgments of similarity or fit between information about science and the comics text itself. But

these are instrumental to answering more significant questions, not the goal of the critical approach.

### Artifact Selected for Sample Analysis

This chapter will look at the early *Wonder Woman* comics authored by the experimental psychologist William Moulton Marston, and influenced by his partners Elizabeth Holloway and Olive Byrne, themselves psychologists in their own right. It turns out this is a particularly appropriate choice for using a scientific humanities approach. Marston once described *Wonder Woman* as “psychological propaganda.” It follows that we should understand the content of Marston’s psychological ideas in order to understand the comics he produced to advocate for those ideas. I will thus read the *Wonder Woman* comics in light of an analysis of his psychological theories and experiments. Doing so leads to a quite significant reinterpretation of the dialogue, narratives, and imagery of the early *Wonder Woman* comics. This is an example of the interpretive possibilities revealed by the critical approach of scientific humanities. In particular, I will focus on three stories from *Wonder Woman* volume 1: “The Secret of Baroness Von Gunther” (*Wonder Woman* #3, February 1943), “The Rubber Barons” (#4, May 1943), and “Battle for Womanhood” (#5, July 1943), all written by William Moulton Marston and drawn by H.G. Peter. As published in the original issues, the separate stories, of which there were usually four of five per issue, were untitled. Titles were added in more recent collections. These stories can be found in the *Wonder Woman Archives* or *Wonder Woman Chronicles* collections (vols. 2 and 3) or *Wonder Woman: The Golden Age Omnibus*, vol. 1.

In order to provide the appropriate scientific context, one must also bring in sources to set that context. In general this could involve primary sources from the scientific literature or archives, works from the history, philosophy, sociology, or cultural studies of science, biographical sources, or science communication research about the public understanding of science. For my analysis, I have drawn on Marston’s psychological writings, particularly *The Emotions of Normal People* (1928), as well as secondary biographical sources on Marston himself, such as the work of Bunn (1997), Daniels (2000), and Lepore (2014).

### Sample Analysis

Marston, William Moulton and Harry G. Peter. 1943a. “The Secret of Baroness Von Gunther.” *Wonder Woman* vol. 1 #3 (February). New York: All-American Publications.

Marston, William Moulton and Harry G. Peter. 1943b. “The Rubber Barons.” *Wonder Woman* vol. 1 #4 (May). New York: All-American Publications.

Marston, William Moulton and Harry G. Peter. 1943c. "Battle for Womanhood." *Wonder Woman* vol. 1 #5 (July). New York: All-American Publications.

Marston, William Moulton. 1928. *Emotions of Normal People*. International Library of Psychology, Philosophy, and Scientific Method. New York: Harcourt Brace & Company.

In the panel from *Wonder Woman* #4 (Figure 19.1), we see two minor characters, Elva Dove and Ivar Torgson, engaged in a rather bizarre scene. Prior to this scene, Elva was caught by Diana Prince (Wonder Woman's alter ego, working as a secretary to Steve Trevor) stealing secret documents related to rubber production. Elva works for the crooked rubber producer, Torgson, with whom she is also in love, though he treats her badly. Wonder Woman saves Elva from Torgson's wrath and recruits her to help reform Torgson. She shows Elva "an X-ray photograph of Torgson's subconscious," where he appears as a wealthy king and Elva as his chained slave. Wonder Woman proposes to "cure" Ivar by making him think of Elva as his queen rather



Figure 19.1 "The Rubber Barons," *Wonder Woman* #4 (1943), p. 9, William Moulton Marston and Harry G. Peter. © DC Comics



than his slave, dresses Elva to fit the part, in a costume rendered by the artist H.G. Peter as a green fur-lined two-piece with a kind of crown. Elva controls Ivar with the help of Wonder Woman's Magic Lasso, which in its original form does not compel the person it binds merely to tell the truth, but compels them to submit to the wishes of the person that binds them. Wonder Woman promises that Ivar will love submission, that Elva will soon be able to control him without the lasso, and that after three days of this role-reversal, Ivar should be reformed of his evil ways.

We see in this panel that Peter has rendered Ivar as a square-jawed, hyper-masculine brute. It is no surprise that he resists "feminine control." But Elva replies, as she has learned from Wonder Woman, that "Learning to submit is the final test of manhood." And shortly after this, Ivar finds indeed that he enjoys the feeling of submission and no longer has any desire to resist. Elva's lack of commitment ends up spoiling the experiment, and further hijinks ensue before Wonder Woman saves the day and reforms Torgson.

What is going on in this strange story? It brings together a number of common themes from the early *Wonder Woman* comics: women suffering or led to evil by the domination of a cruel husband or boyfriend, prevalence of bondage imagery, and a focus on reforming criminals rather than punishing them. But is the way these themes are tied together in this bizarre story merely a reflection of the kinky mind of its creators? I will argue that it is something more.

As mentioned above, Marston once described Wonder Woman as "psychological propaganda for the new type of woman who should, I believe, rule the world" (from a letter to early comics historian Colton Waugh, quoted in Walowit (1974, 42)). Marston was an experimental psychologist, as well as a lawyer, with his bachelor's, PhD, and law degree from Harvard. He was trained by the noted psychologist Hugo Münsterberg, the student of Wilhelm Wundt who William James had brought to Harvard to take over the psychology laboratory. His specialties were in the psychology of emotions, deception, relationships, personality types, and the nature of consciousness; he also dabbled in clinical psychology. He published a variety of journal articles on these topics, as well as two academic books—*The Emotions of Normal People* (1928), in some ways his culminating work of psychology, and *Integrative Psychology* (1931), a general textbook co-authored with his wife Elizabeth Holloway Marston<sup>1</sup> and C. Daly King. Many of the strange elements of Marston's *Wonder Woman* comics are reflected in some way in his psychological writings.

In the opening chapter of *The Emotions of Normal People*, Marston makes a striking claim: "I submit that the backbone of literature has been transplanted intact into psychology, where it has proved pitifully inadequate" (1928, 3–4). This quotation captures his central idea that psychology needed to radically break from our commonsense psychological concepts, such as the emotional language of romantic poetry and literature. It is not a critique of literature

per se, but a call for a scientific psychology not beholden to pre-scientific ideas. His approach not only clears the ground for setting a genuine scientific basis of psychology (based in neuroscience, evolutionary biology, and psychological experiments and observations), but it also serves an ethical-political purpose, eliminating potential status quo biases from a quite value-laden subject matter, human emotions and psycho-emotional health (Brown 2016).

According to Marston, emotions are constituted by the integration of signals in the motor pathways of the brain and nervous system. In particular, they are integrations of signals that derive from the self and from a stimulus. When self and stimulus are aligned, the emotion feels pleasant; when they are antagonistic, unpleasant. “Normal emotions” (as opposed to abnormal, i.e., unhealthy) tend toward promoting the pleasant and reducing or making transitory unpleasant emotions arising from antagonistic stimuli. The basic emotions, Marston argued on evolutionary grounds, must be normal emotions, as they promote the functioning of the organism. Emotions can also differ on whether the stimulus or the self signal is stronger. It is on the poles of these two distinctions (allied vs. antagonistic, stronger self or stimulus) that Marston defined his “basic emotions”:

- *Dominance* (antagonistic, stronger self)
- *Compliance* (antagonistic, stronger stimulus)
- *Submission* (allied, stronger stimulus)
- *Inducement* (allied, stronger self)

More complex emotions (both normal and abnormal) were formed from either combinations or sequences of these basic emotions. The basic emotions also formed the basis of personality types and relationship styles. (The personality types scheme survives today as the DISC personality or behavior assessment tool used by business leadership types, where three of the four terms have been slightly renamed: Dominance, Influence, Steadiness, and Conscientiousness. It is used as a competitor or complement to the Myers-Briggs test.) While there is far too much going on here to discuss in detail in this analysis, there are several aspects of Marston’s theory of the emotions, his picture of psycho-emotional health, and the consequences he draws for society that are directly relevant to understanding the story of “The Rubber Barons” and other common themes from the *Wonder Woman* comics.

First, the nature of *submission* on Marston’s account has several surprising features. Recall the account of pleasant and unpleasant emotions in Marston’s theory: alliance-based emotions like submission are *pleasant*, and indeed, says Marston, “Under no possible conditions can true submission be unpleasant” (Marston 1928, 243). Many have looked at the terminology of “domination” and “submission” in Marston’s *Wonder Woman* and assumed commonsensical definitions of those terms which make them complementary (one person dominates, the other person submits) and in which

submission can be understood as a kind of self-denial or even masochistic role. But on Marston's account, the complement of dominance is *compliance* (one complies with a stronger dominator), while the complement of submission is *inducement* (one person induces another to submit). One can only truly submit to a "loving authority" who has one's own interests at heart, such as a wise teacher.

Inducement and submission form the basis of the group of "love" emotions. By contrast, dominance and compliance form the basis of the "appetite" emotions. For Marston, a healthy psyche is one where the love emotions predominate, and the appetite emotions serve or are "adapted" to the love emotions: "The normal relationship consists of complete adaptation of appetite to love. Any life which is both successful and happy must adapt its successes to its happiness" (Marston 1928, 381). This idea follows from what we have already said about normal emotions. Because appetite emotions contain conflict and unpleasantness, it follows that the well-adjusted person will use such emotions only when an antagonistic stimulus (whether an external threat or an internal stimulus, such as hunger) is present, and will tend to remove the antagonism. Someone who is persistently engaged in appetite emotions like dominance, competition, anger, or fear is thus in an abnormal or unhealthy mental state.

The primary complex love emotions are passion (or passive love) and captivation (or active love). In the former, submission is primary, while in the latter, inducement is primary. In terms of loving interpersonal relations, one partner will be more of a captivator, while the other will be more passionate (passive, submissive). In a relationship, the partner who is stronger with captivation emotion is also called a "love leader." Love is key to emotional health, and loving relationships are key to experiencing love, so every healthy person will be or will have a love leader. What's more, a society, just like a person, must adapt appetite to love in order for the individuals within it to lead healthy lives. As such, our social and political leaders should also be love leaders rather than dominators.

Finally, Marston held a peculiar view that there are significant sex differences in one's capacity for captivation emotion, and specifically that women were much more capable of inducement and captivation than men, and thus that only women were suitable candidates for love leaders. He based his argument on behavioral observations and surveys of women, as well as background physiological and hormonal information, such as it was. His view that only women could be love leaders, along with the view that healthy society required love leadership, led him to propose a social program of "Emotional Re-Education" in the concluding chapter of *Emotions of Normal People*. This program included both recognizable feminist goals (educational equity and self-sufficiency for women) and more radical claims (the inherent superiority of women, a call for a future matriarchal utopia).

Fifteen years later, the psychologist was now a comic book writer, crafting the narrative of "The Rubber Barons" and various other stories. Against the

background of Marston's scientific views, many details of the story become clearer; in a sense, *Wonder Woman* has become a means of "emotional re-education" (showing, after all, that Marston was not opposed to making use of the true "backbone of literature"). Ivar Torgson represents the abnormal state of being driven by appetite, by competition, hunger for wealth, etc. Torgson rejects and mocks Elva's professions of love early in the story. He leads a life of crime that ends up hurting him, those who love him, and his country. Wonder Woman wants Elva to help her reform Ivar by realigning his emotional life to be well-adjusted, that is, governed by love rather than appetite. She sets up Elva as a love leader for Torgson, and it seems that she would have succeeded if she were more committed and better trained.

The evils of male domination are a common theme in *Wonder Woman* comics. In "Battle for Womanhood," Wonder Woman rescues Marva from her husband Doctor Psycho, who has put her in a trance and used her as a source for his supernatural powers. In the final panel of the story, Marva sits despondently in what appears to be a darkened room. She complains to Wonder Woman, "Submitting to a cruel husband's domination has ruined my life" (Marston and Peter 1943c, 16A). Here the terminology is a little sloppy, for Marva never truly submitted, as one cannot submit to domination; instead she was hypnotized, forced to marry Psycho against her will, and then entranced and exploited. Male domination always leads to bad ends in *Wonder Woman*, whether the dominator be a villain like Doctor Psycho or even the well-meaning Steve Trevor. When Marva asks Wonder Woman, "But what can a weak girl do?" Wonder Woman answers with elements of her program of emotional re-education, "Get strong! Earn your own living ..." That is, don't depend on dominant men for your safety or sustenance.

Bondage imagery is extremely prevalent in early *Wonder Woman* comics. Tim Hanley discovered that fully 27 percent of panels from the first ten issues of *Wonder Woman* involved some form of bondage (Hanley 2014, 46). This prevalence has led to some significant criticism of Marston's work. Bryan Dietrich describes Marston's *Wonder Woman* as "the strangest set of Freudian images comics had ever endured" (2006).<sup>2</sup> Bradford Wright, in *Comic Book Nation*, his comprehensive history of the American comic book industry, says about Marston's *Wonder Woman*:

On the other hand, there was a lot in these stories to suggest that Wonder Woman was not so much a pitch to ambitious girls as an object for male sexual fantasies and fetishes. The stories were rife with suggestive sadomasochistic images like bondage, masters and slaves, and men groveling at the feet of women.

(2001, 21)

These criticisms seem to me based in a unfortunately superficial engagement with Marston's body of work, in part because the scientific context of the

work is left out. I see the bondage imagery as largely involved in demonstrating a crucial distinction in Marston's theory between (often unhealthy) compliance to a stronger dominator and the pleasure of submission to a love leader. We often see Wonder Woman and the other Amazons or the Holliday Girls tying each other up for fun, but we also see the unfortunate results of women allowing themselves to be bound by men or by evil women. In "The Secret of Baroness Von Gunther," Wonder Woman thinks to herself, "The bad thing for them is submitting to a *master* or an *evil mistress*" (Marston and Peter 1943a, 7C). There are no good masters for Marston, though there are good mistresses (love leaders). Teaching the distinction between true submission and problematic compliance is a preoccupation of the comics that becomes quite clear when read in the appropriate context.

A final caveat: Marston's scientific work does not reflect our current scientific understanding of the emotions, mental health, sex and gender differences, or human relationships. It is in many ways a highly idiosyncratic episode in the history of science, though it does have some contemporary resonances. But scientific humanities is not looking for scientific accuracy in the texts that analyzes. Rather, it is looking for interesting and revealing connections, which may simply help us understand puzzling features of popular or significant texts, or which may provide important insights into the influence of science over culture, society, and human values. Between Marston's scientific and comics work, there are many such interesting connections.

### Notes

- 1 Marston lived together with his wife, Elizabeth Holloway Marston, as well as his one-time student and research assistant, Olive Byrne, also known as Olive Richards. Elizabeth and Olive were trained psychologists in their own right, and they made significant contributions to the scientific work published under Marston's name. It might be better, in fact, to refer to the authors of most of the scientific work as "Holloway, Byrne, and Marston," but I will follow conventional attribution in the main text. Holloway and Byrne also inspired, but probably contributed less directly to, aspects of *Wonder Woman*. Different but quite controversial interpretations of their relationship are provided by the historian Jill Lepore (2014) and the independent comics scholar Noah Berlatsky (2015).
- 2 The prevalence of Freudian interpretations of *Wonder Woman*, including Fredric Wertham's attack, should be read in the context of the many anti-Freudian arguments in Marston's own psychological writings. See Brown (2016, 11–15).

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