



INDIGENERDITY AND STEM IN *FIREKEEPER'S DAUGHTER* BY ANGELINE BOULLEY

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INTRODUCTION

Popular media has a great impact on the way science, scientists, and their works are represented. Typically, STEM fields and geek culture are considered to be White and male-oriented domains. As Tan et. al note children, teenagers and adults from different ethnic groups stereotypically view scientists “as elderly or middle-aged White [males] who [work] individually in traditional indoor laboratory settings and [wear] a laboratory coat and glasses while conducting dangerous experiments” (Tan et. al 2015, 2). Another powerful stereotype which still persists in TV series, movies, Young Adult (YA) fiction, and real life, is that teenage girls are less able to excel in STEM careers such as engineers, scientists, computer workers, and architects.

Despite a recent increase in the representation of nerdy adolescent girls and women in movies, they remain both misrepresented and underrepresented (Steinke and Paniagua Tavarez 2017, 245). As Steinke and Paniagua Tavarez argue, teenage girls’ representation in popular films “[has] conveyed mixed messages about the status, role, and contributions of women in STEM fields by focusing on their attractiveness and romantic relationships, and by showing them in subordinate roles as research assistants” (245-246). For instance, in *The Big Bang Theory*, nerd characters Bernadette (Ph.D. in Microbiology) and Amy (Ph.D. in Neurobiology) are portrayed as unfeminine and socially-awkward women who are secondary to geek men. Such STEM-related movies generally do not portray well-rounded and dynamic female STEM characters, “giving the message that real women cannot be geeks” (Stanley 2015, 29). As Geena Davis explains, “[w]hen girls in their formative years don’t see female characters on screen as biochemists, software developers, engineers, or statisticians, they are less likely to imagine or pursue those career paths for themselves” (n.d.).



Furthermore, ethnic minorities remain underrepresented in STEM fields. According to a study conducted by the Geena Institute that analyzed STEM women characters in the entertainment media between 2007 to 2017, about 60 percent of STEM characters were White women, 23 percent were Black, around eight percent were Asian-American and six percent Latinx (n.d.). As this study shows, the female nerd identity is aligned with White women characters onscreen. Examples of YA novels that perpetuate this kind of stereotype are: *3:59* by Gretchen McNeil, *Catalyst* by Laurie Halse Anderson, *Alice Jones: The Impossible Clue* by Sarah Rubin and *Kiki Strike* by Kirsten Miller, all of which feature White female teen characters as their protagonists. In contrast with this dominant image of the female geek as White, *Firekeeper's Daughter* offers an ethnic Ojibwe nerd teenager, Daunis Lorenza Fontaine, as the main character.

Additionally, psychologists Douglas Medin and Megan Bang argue in their 2014 book *Who's Asking?* that there is also the common presumption that science is objective, rational, value-neutral, and acultural (2014, 3). STEM fields often favor the science-related practices of White middle-class males such as documentation, data-tracking, coding, and software developing, ignoring the fact that there is an ethnocultural aspect to science and science education. Medin and Bang further explain that there is a clash between the cultural values, orientations, and those privileged in science education (2014, 8-9). According to them, scientific practices embody “values and perspectives,” which “vary across factors like gender, social class, and culture” (2014, 10). In a similar vein, this essay argues that in *Firekeeper's Daughter*, Indigenous knowledge and traditions are regarded as invaluable resources for STEM fields.

INDIGENERDITY

Indigenerdity is a portmanteau of “Indigenous” and “nerd.” Johnnie Jae, the founder of A Tribe Called Geek, a multimedia company that features Indigenous contributions to geek and pop culture as well as STEM fields, defines indigenerdity as follows:

[Indige-nerds] are cosplayers, larpers, whovians, potterheads, twihards, Star Wars geeks, and trekkies or trekkers as some prefer to be called. We're also scientists, technologists, engineers, mathematicians, musicians, writers, etc. and there's no reason not to highlight and celebrate every aspect of who we are as Indigenous people and as human beings. (2016)

Indigenous people, their mastery of scientific knowledge, their skills, and nerd-status, have been ignored for decades. In fact, there are numerous Indigenous physicians, engineers, anthropologists, archaeologists and astronauts. Susan La Flesche Picotte (Omaha) doctor; Ella Cara Deloria (Sioux) anthropologist; Fred Begay (Navajo) nuclear physicist; Bertha Parker Pallan Cody (Abenaki and Seneca) archeologist; Mary G. Ross (Cherokee) engineer; John Bennett Herrington (Chickasaw), astronaut; and



Aaron Yazzie (Diné) mechanical engineer at the NASA Jet Propulsion Laboratory, are some of the most influential Native American scientists in the U.S. They have all paved inspiring paths for Native Americans (Sloan, 2021). However, as Lee Francis IV states, “the romanticizing of Indigenous and Native existence is so highly hardwired into the American collective consciousness” that the mainstream society views Native people “as artifacts or relics” (2019). Jae also notes that “as Indigenous people, outside of the kitschy comic book characters, we have never been represented as geeks” (2017). She further argues, “So, it’s hard for people, even natives, to accept the reality that we can be and that we are geeks” (2017).

Notably, geekiness is strange to many Native Americans themselves. As Nayuka Gorrie, an Indigenous activist says, her geek friends “felt ostracised because they were into nerdy stuff that no one else was into, and people kind of questioned their Aboriginality” (quoted. in Francis, 2016). Kathy DeerInWater, the director of American Indian Science and Engineering Society, also notes that, “Due to chronic underrepresentation, Native students do not see themselves in STEM careers because they do not see relevant role models” (2019). *Firekeeper’s Daughter* challenges “the single story” by “counter-storytelling;” that is, it “[gives] voice to the lived experiences of groups that have traditionally been marginalized and oppressed in the United States” (Hughes-Hassell 2013, 219). Boulley herself talks about her experiences as a Native American consumer of popular culture as follows:

Growing up, none of the books I’d read featured a Native protagonist. With Daunis, I wanted to give Native teens a hero who looks like them, whose greatest strength is her Ojibwe culture and community. When making decisions for our tribe, we look seven generations ahead, considering the effect on our descendants. My hope is that, in sharing our Anishinaabeg experiences, *Firekeeper’s Daughter* will have that impact on future generations. (2021, 491)

Boulley aims to take Indigenous people out of the margins and place them at the center as protagonists and role models. In this regard, Rudine Sims Bishop’s argument that YA literature can be used both as “a mirror” for children belonging to minority groups and as “a window” for those belonging to the mainstream culture resonates here (1997, 3). According to Bishop, in fictional works, young adults can “see reflections of their culture, their values, beliefs, attitudes, institutions, social relations, language, customs; their ‘design for living’” (1997, 5), mirrored, paralleled and echoed. Moreover, YA books can also be used as windows for teens from the dominant culture so that they can “look through the window of books to come to know people whose cultures are different from their own” (1997, 7). The socially skilled, brainy, and Ojibwe teen geek protagonist in *Firekeeper’s Daughter*, can become both a mirror for Native American children and a window for those belonging to the mainstream culture. This essay, explores the ways in which Boulley changes how Indigenous



people can perceive themselves and how the non-native society perceives them by portraying the territory of the nerd and STEM culture from an Indigenous female teen perspective. In *Firekeeper's Daughter*, Ojibwe teen Daunis embraces her traditions and commits herself to interests like STEM, nerdy hobbies, popular culture, hockey playing, partying, and dating. She carries it with a badge of pride, and does not conform to hegemonic stereotypes of a female nerds, like unattractiveness and social awkwardness.

INDIGENERDITY AND STEM IN *FIREKEEPER'S DAUGHTER*

Firekeeper's Daughter is a Native American YA thriller which takes place on the Sault St. Marie Reservation in northern Michigan. The story features Daunis a biracial 18-year-old hockey player who after several family tragedies decides to delay her entrance into the University of Michigan and attends Lake Superior State University instead. Daunis is a smart, strong-willed, knowledgeable, skilled, and inquisitive character, who is interested in going to college.

Daunis' nerdiness and interest in STEM can be seen throughout the story. For instance, she names her cat Herri after the NASA astronaut John Herrington, the first Native American to walk in space (Boulley 2021, 196). She can easily talk about scientific concepts and ideas such as collision theory, medicine, human anatomy and astronomy. She has read "*Custer Died for Your Sins* by Vine Deloria Jr" (77), likes to watch *The Godfather* (125), *Hocus Pocus* (194), *Mulan* (214), and *The Powerpuff Girls* (Boulley 2021, 297), which all show that she is interested in a wide range of topics. Moreover, she knows both the Ojibwe and the Latin terminology of some words such as sweetgrass, which she says that "[in] Ojibwe it's called wiingashk, and in science it's *Hierochloe odorata*" (Boulley 2021, 53). Daunis is also adept at explaining relationships and everyday life through scientific analogies. An example of this can be found when she describes a girl who steals boyfriends as an anglerfish: "A bottom-dweller fish that bites its mate and fuses with it. A parasitic appendage unable to exist separately" (Boulley 2021, 41). Similarly, on a summer powwow day she expresses how the breeze helps to provide relief from the heat as follows: "A steady breeze and intermittent shade from puffy cumulus humilis clouds save us from frying in the August sun like ants under a magnifying glass" (Boulley 2021, 62). Her persistent references to STEM fields display her nerd power. She has a great knowledge about the universe, popular culture, science, and classics which help to construct her nerd identity.

Boulley gives a fresh insight to nerd discourse by representing Daunis as both cerebral and attractive, and well-versed in both modern technology and her culture's traditional teachings. Every morning she holds the semaa, tobacco, and releases it to the poplar tree and inventories the Seven Grandfathers-teachings about living a good life: love, respect, honesty, humility, bravery, wisdom, and truth (Boulley 2021, 97).



This is a traditional way of offering thanks to the Creator. Praying daily to become a strong Ojibwe woman “full of love, anger, humor, sorrow, and joy” (Boulley 2021, 328) is second nature to her. Additionally, Ojibwe Elders, the Earth, plants and herbs play a significant part in Daunis’ life. Thus, Boulley’s character dismantles the nerd girl stereotype. Instead, Daunis “chooses her own narrative over the narrative of a conformist society and demands to be accepted for who she is. And as punishment, pop culture robs her of her sex appeal” (Seltzer 2008, 25). Daunis belongs to Generation Z, which consists of people born between 1997 and 2012, but she is also someone who is attached to Ojibwe tradition and cultural teachings.

Daunis’s already unsettled life becomes more complex as her community is ravaged by meth addiction. The novel makes us wonder if the deaths of Daunis’ uncle and her friends Lily, Heather and Robin Bailey are connected to the meth-cookers. The FBI suspects that the drug is prepared with hallucinogenic mushrooms that might be connected to Ojibwe culture. Daunis gets caught up in an FBI investigation, after two FBI agents Jamie and Ron involve her in an undercover operation as they try to find the manufacturers of the drug. Jamie explains to Daunis that the FBI has chosen her as a confidential informant because of her love of STEM and her skill at combining science with her traditional beliefs: “You know science and you know your culture” (Boulley 2021, 110), the agents say.

Boulley highlights the significance of Indigenous cultural knowledge in the field of science. Indigenous people have always employed empirical methods for learning about human and non-human nature and focused on the medicinal uses of plants. Daunis admits, “I wanted to show people that our traditional healers are-and always have been-scientists who use plants as medicine” (Boulley 2021, 130). She, further, elaborates on the nature of Indigenous STEM; explaining that:

[O]ur Elders are our greatest resource, embodying our culture and community. Their stores connect us to our language, medicines, land, clans, songs, and traditions. They are a bridge between the Before and the Now, guiding those of us who will carry on in the Future. (Boulley 2021, 453)

Indigenous STEM, clearly, is centered around science, ancestral knowledge, land, folklore, plants and seasons. Thus, the FBI needs Daunis as a local Ojibwe person to reveal who makes the drug using traditional medicines (Boulley 2021, 130). Her task is to gather information about traditional medicines that cause hallucinations. In this way, Boulley demonstrates that a diversity of perspectives is essential in STEM fields. Daunis is the perfect CI as she can blend traditional knowledge and modern science perspectives.

Accordingly, Daunis sticks her heart and soul into her work. She attends a meth tutorial at the federal crime lab and learns how to cook it. Working at the lab with, lab paraphernalia such as beakers, digital scales, and the Kjeldahl flask makes her happy.



In her words: “Science World has laws, standards, order, and methods. I’m fluent in its language. I immerse myself, grateful for the single-minded focus required of Science World inhabitants” (Boulley 2021, 156). Daunis also learns some drug lingo so she can understand it in conversations (Boulley 2021, 161). Besides portraying a lab-based STEM environment, Boulley emphasizes inquiry-based STEM studies. Daunis sets off on Duck Island to forage for hallucinatory mushrooms. She explores the island in cross-sections; thinking in figures, facts and lists. Besides taking pictures, collecting samples, and documenting each specimen of mushroom or fungi she comes across, Daunis looks up each sample in mushroom encyclopedias and a mushroom-foraging website that is searchable by location or species (Boulley 2021, 188-189). In these passages, Boulley draws attention to the significance of informal settings and after-school activities in the development of scientific practices and science identities. By making connections across formal and informal settings, Daunis has opportunities to bring the theories of formal education into the everyday sphere. Thus, she subverts the nerd stereotype who is generally associated with the lab, desk, or the computer.

Finally, through hard work, critical thinking and Indigenous knowledge, Daunis discovers that there is no connection between mushrooms and meth. The FBI suspected that there must have been hallucinogenic mushrooms in this drug because the Nish kids in Minnesota who consumed the drug had hallucinated little men following them in the woods. However, the FBI did not know that the little men were actually an Indigenous community known as Little People. What the Nish kids had was an encounter with the Little People warning them to leave the bad medicine alone (Boulley 2021, 331). The tribal elders of Daunis taught her that Little People are benign small creatures that check on children, get upset when some of them get involved with dangerous and unhealthy stuff, like drugs (Boulley 2021, 328). Boulley foregrounds Indigenous relationships with the Earth, mystery, the otherworldly realm as powerful alternatives to rational problem-solving. She also shows that scientific practices depend on cultural values, traditions and beliefs. As Takasaki states: “Although science is supposed to be universal, each scientist is a cultural being, affected by his or her cultural background...Intercultural and school differences, as well as individual idiosyncrasies are essential to the advancement of science” (164). In other words, values and multiple epistemological orientations affect scientific outcomes.

CONCLUSION

Representation matters and empowers. As Heflin and Barksdale-Ladd write, children and young adults of minority groups “construct messages about their cultures and roles in society” (2001, 810) through literature. When children and youth read stories that are relevant to them and about themselves, they may “find support for the process of defining themselves as individuals and understanding their developing roles within their families and communities” (Heflin and Barksdale-Ladd 2001, 810). *Firekeeper’s*



Daughter offers a STEM-loving and Native American Ojibwe geek character who is unusual in fictional works, TV series, films and comics. Boulley, through the character of Daunis, offers a pluralistic account of STEM-inclined teen nerd. Thus, she deconstructs an essential definition of a nerd, which is White male/female, either non-conformist or under-sexualized.

Further, this novel combines scientific practices such as abstract thinking, data collecting, objective analysis with Ojibwe cultural knowledge and spiritual beliefs. In the novel, science is a value-laden and community-oriented practice. Additionally, the story shows how Indigenous people are interested in and successful at STEM fields and encourages reflection on who one was, is and who one may become in the future. Accordingly, at the end of the novel, Daunis decides to apply to the ethnobotany program in Hawaii and become both a traditional medicine practitioner and scientist (Boulley 2021, 484). *Firekeeper's Daughter*, ultimately, diversifies the STEM field and culture by introducing Daunis as a role model who encourages readers and, particularly, female teenagers to develop positive dispositions towards science and one's ancestry, customs, and spiritual traditions.

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