

Literary Techniques in Scientific Literature Can Enhance Communication and Enthusiasm for Science

This essay analyzes two excerpts included in *Galileo's Commandment: 2,500 Years of Great Science Writing*. The excerpts are Bertrand Russell's "What Einstein Did" and Louise Young's "How Ice Changed the World." The essay shows how each author's use of literary techniques conveys their enthusiasm for science. It also shows that each author recognizes how literary techniques can help readers connect to the information being shared, which, in turn, fosters enthusiasm for science among their audiences. The excerpt from Russell will be analyzed first, followed by Young's excerpt.

BERTRAND RUSSELL, "WHAT EINSTEIN DID"

Russell's use of literary techniques shows his enthusiasm for science. In setting the imagery for his readers, Russell asks them to envision "fireworks which are being sent off from the ground, from trains, and from aeroplanes traveling in all directions, but you cannot see the ground or the trains or the aeroplanes because of the darkness" (Russell 285). He then subtly draws an equivalent between these imaginary fireworks and space bodies when he says, "... there are only brief flashes of light, which, during their short existence, travel through the void in the most various and bizarre curves." Taken together, these lines suggest that Russell has an enthusiasm for the physics of space objects, just as most people are enthusiastic about a fireworks show.

Russell's literary techniques help readers connect to the information being conveyed. He recognizes that the readers of his excerpt live in a world where the laws of Newtonian

gravitation are conventional. He accepts that some “imaginative reconstruction” (Russell 285) is needed to help readers fully understand why Einstein’s theory of relativity is so crucial to the advancement of science. To achieve this, he uses imagery that appeals to the reader’s senses, as well as to their sentiments, with allusions to fireworks and revolution:

Let us suppose further that while you were unconscious you were carried into a balloon, which, when you come to, is sailing with the wind in a dark night—the night of the fifth of November if you are in England, or of the fourth of July if you are in America. (Russell 285)

Russell fosters enthusiasm for science in his readers. He meets his audience’s need to understand that one does not have to be a genius or a physicist to comprehend the importance of Einstein’s theory of relativity. Having developed the imagery of a drugged balloonist floating in the darkness among brief flashes of light, he further encourages the reader’s imagination by setting them on the same creative plane as Einstein:

If an ordinary mortal is with you in the balloon, you will find his speech unintelligible. But if Einstein is with you, you will understand him more easily than the ordinary mortal would, because you will be free from a host of preconceptions which prevent most people from understanding him (Russell 285).

Russell uses an analogy to provide the reader with a lighthearted moment when describing how time and distance affect one’s perception of a hypothetical aviator traveling at a relative speed of 161,000 miles per second:

But here again reciprocity comes in, because in the aviator's opinion it is we who are traveling at 161,000 miles a second past him; and when he has made all allowances, he finds it is we who are sluggish. Our cigar lasts twice as long as his.

What a situation for envy! Each man thinks that the other's cigar lasts twice as long as our own. It may, however, be some consolation to reflect that the other man's visits to the dentist also last twice as long. (Russell 287)

Recognizing that many in his audience may be susceptible to mental distraction when reading a commentary on an abstruse subject, Russell's injection of humorous and tangible examples preserves the enthusiasm he has built in the reader. He soon uses the technique again near the end of a long paragraph, where he falsifies a wholesale acceptance of Newton's gravitational theory, which would "give different results according to which of many equally legitimate conceptions we adopt. This is as absurd as it would be if the question whether one man had murdered another were to depend upon whether they were described by their Christian names or their surnames" (Russell 287).

Analysis Summary. Russell's ingenious development of imagery that targets his audience's senses and emotions reveals his own enthusiasm for Einstein's theory of relativity and his desire to help readers understand the scientific theory so they can grasp its importance. His use of analogy helps to solidify the concepts in the minds of his audience.

LOUISE YOUNG, "HOW ICE CHANGED THE WORLD"

Young's use of literary techniques shows her enthusiasm for science. Young's enthusiasm for science is apparent as she maintains no aesthetic distance while blending her scientific

knowledge with her appreciation for the beauty of nature's harmony. Even the Richard Byrd epigraph she chooses foreshadows the appeal to the senses that she will weave throughout the excerpt.

Her enthusiasm swells near the end of the excerpt as she declares that "spring is the supreme gift of the Ice King A few weeks—just a little fraction—out of any lifetime can be well spent observing this extraordinary unfolding of life in all its exquisite detail" (Young 455). Perhaps her most lyrical use of alliteration comes in "where the southern sun shone strong through the still-barren branches of beech"

Young's literary techniques help readers connect to the information being conveyed.

She is conscious of the need to explain terminology to her readers, which she accomplishes concisely: "Loess is a fine-grained sediment, easily cultivated, and has a varied mineral composition, providing the important nutrients for plant growth" (Young 452). Young also makes frequent use of simile to ensure that the audience can envision ice's activity. She describes ice sheets and disks that become pressed together and take on a shape "like shallow saucers" (Young 448), and marks left by ice sheets upon the bedrock are compared to "clawmarks on a tree trunk" (Young 451).

Young's imagery significantly benefits the reader's understanding of geologic features. She describes "bowl-shaped depressions near the mountain peaks where the weight and movement of the growing ice mass carve steep-walled basins called cirques" (Young 449) and "beautiful fjord landscapes where the sea runs in shining threads far inland between towering rock walls" (Young 450).

Young fosters enthusiasm for science in her readers. She inspires enthusiasm in an audience who may have little to no education in geological processes. She invokes their senses to

develop a clear image of how the ice ages have shaped the world as we now experience it. The reader is pulled into her explanation of how ice shaped the land surfaces with her skillful use of consonance:

Along the [snow-]drifted country roads, beside the shining seashores,
through the softened spaces of forests and cities dressed in white, for a brief
period of time frozen water has redesigned our world. (Young 448)

Anthropomorphism helps to describe cloud droplets as being “so light that they remain airborne, suspended by the rapidly dancing molecules of the gases in the atmosphere” (Young 448-449).

Her lack of aesthetic distance from the subject is infectious. At times the reader may feel wonder, excitement, awe, peacefulness, appreciation, or gratitude. Young craftily draws her readers into a downy web of imagination and knowledge, alternating between concise geological descriptions and a lyrical, sometimes magical tone. This is exemplified in her portrayal of the slow skirmish of ice sheets and disks upon the shoreline:

Along the shore they pile up and slowly hour by hour build fantastic castles
with high walls and moats and turrets and battlements and deep wells down
through the ice. Into these holes waves send sudden jets of water that spout
fountains high into the air. The drops freeze as they fall in a sparkling shower
of crystals, diamond-bright. (Young 448)

Young analogizes these ice formations to castles with the aid of a diacope. The repeated use of “and” while listing common features of a castle compels the reader to envision her crazy

castle of ice. When visualizing castles and “crystals, diamond-bright,” what reader will not apply a sense of enchantment to Young’s ice-encrusted shoreline?

Young’s enthusiasm for ice’s impact on the natural world is unrestrained. Her highly descriptive prose and various literary techniques propel her audience into her vision, undoubtedly surprising readers with the endowment of an enhanced appreciation for nature’s magnificent dynamics.

CONCLUSION

In “What Einstein Did,” Russell’s imagery presses readers’ scientific consensus through a cognitive sieve, straining out their limiting beliefs and leaving only imagination. His desire to meet the reader on their level and pull them into the brilliant mind of Einstein is evidence of his enthusiasm for Einstein’s discovery. Russell uses tangible examples, such as cigars and visits to the dentist, to cement concepts in the reader’s mind. The reader experiences a sense of satisfaction in having gained an understanding of such an abstract scientific theory.

Similarly, Young’s “How Ice Changed the World” illustrates ice’s effects on our landscape in a way that immerses readers in the ever-changing, often magical realm of nature’s cycles. Young aptly interweaves this imagery with concise definitions that advance her reader’s knowledge. Her extensive appeal to emotion captures the reader in a world of sight and sound where ice is extraordinarily captivating.

This essay has shown how each author uses literary techniques to convey their enthusiasm for science and their dedication to meeting the needs of their audiences. These skilled authors have ushered readers through friendly doorways to the world of scientific knowledge.

Works Cited

Russell, Bertrand. "What Einstein Did." *Galileo's Commandment: 2,500 Years of Great Science Writing*. Ed. Edmund Blair Bolles. New York: Henry Holt and Company, 1999. 284-289.

Young, Louise B. "How Ice Changed the World." *Galileo's Commandment: 2,500 Years of Great Science Writing*. Ed. Edmund Blair Bolles. New York: Henry Holt and Company, 1999. 447-457.