Geo-literature for the young mind
(because inquiring minds want to know)

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When youthful exuberance discovers the fascinations of nature and science, positive outcomes are assured. Career decisions are often triggered by inspiring events and engaging experiences early in life, long before the study of Maxwell’s equations and plate tectonics.

For a lucky few, the initial spark igniting interest in the geosciences may have occurred during a helicopter flight on a family vacation over a Hawaiian volcano or while hiking in a major mountain range. For the rest of us, the Discovery Channel motivates less expensively. However, another equally powerful although often underappreciated force is easily available: good literature.

Little exists that can inspire as-yet unchallenged, absorbent, and energetic minds more than the marriage of science, drama, and myth in well-written books. Many fascinating stories of dramatic, historical, and revolutionary discoveries do exist and are often accessible to high school and young adult learners. Here is my small subjective sampling of geoscience literature for the young mind.

Solving the great mysteries

Solving the great puzzles of nature requires patience and brilliance. More importantly, this pursuit often requires individuals to work together in intellectual struggle and who will share their fundamental knowledge, passionately debate their theories, and continually challenge each other to improve. This may occur over decades, between distant countries, and among diverse cultures. It involves rivalries, selfless cooperation, fun, and frustration—themes not commonly mentioned in the average textbook. My two examples that describe “the making” of breakthrough discoveries are enriched because the authors are the actual researchers.

T-Rex and the Crater of Doom is an epic geoscientific detective story about the fate of the dinosaurs. In this easy-to-read book, noted geophysicist Walter Alvarez’s quest begins by piecing together fragments of iridium scattered around the globe. For most, the ultimate demise of the dinosaurs does not come as a surprise (an apocalyptic meteor impact close to the Yucatan peninsula 65 million years ago is the current suspect). However, much more of interest can be learned from this book than the basic search for geologic evidence. There is an amazingly honest description of scientific jealousy, competition, and the multitude of human emotions behind this decades-long research. Eventually, a rarely acknowledged fact surfaces: solid science often emerges from the ashes of unsuccessful investigations and mind-numbing frustrations. Sometimes brilliant realizations break through. In other instances, theories must evolve slowly through sheer tough-minded endurance.

In Noah’s Flood, geoscientists William Ryan and Walter Pitman hypothesize that the Black Sea was flooded by an enormous cascade of sea water through the natural dam formed by the Bosporus. They propose that this deluge occurred about 5600 BCE, and that this event dramatically changed the way humanity and culture evolved. It became deeply embedded in local folklore (hence the biblical story of Noah’s ark). More significantly, it also caused a sudden shift in art, farming techniques, and population distribution with the intermingling of flood refugees with indigenous peoples in Europe, Russia, and the Middle East.

The authors explain how geoscientific tools and technologies, such as seismic sounding and core analysis, contribute solid scientific evidence. Ultimately, their book clearly defines the interplay of different disciplines in the sciences and humanities. They describe scientists of diverse backgrounds who, confined to a research vessel, share their disparate knowledge. This results in a snowball effect of new discoveries. Later, additional linguists, genealogists, archaeologists, and geophysicists produce more incremental advances toward an increasingly integrated scientific breakthrough.

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Table 1. Popular science books that can inspire young readers. The titles below the bold horizontal line are recommendations that are not mentioned in the text, but that are worth considering.
Nature's ferocities

Earthquakes, volcanoes, and tsunamis are closely linked to human tragedy and challenge researchers to seek their geologic origin, and also to assess their social and political consequences. I feel that two books masterfully expose the complex relationship between nature and humanity and reward readers with page-turning drama.

Simply observing a volcanic eruption shown on TV is awe inspiring. Standing on a trembling volcano’s slope induces an adrenaline rush almost beyond expression. Only rare masterful storytelling can convey the true feeling. Fortunately, Robert Harris does that in his novel *Pompeii*. Admittedly, this is a blockbuster-type book, a condition that generally precludes consideration in a scientific journal. However, one shouldn’t lightly dismiss this well researched account of a fictional engineer who is investigating broken water lines along Mount Vesuvius in 79 CE. The reader will, through the eyes of this Roman engineer, experience one of the most infamous natural disasters in recorded history. The descriptions of the overwhelming odor of sulfur, the suffocation due to falling ash, and the panicked rush through the flying pumice and debris bring Pompeii’s tragedy to life. The rich volcanological and historical details deserve a closer look even by those who generally choose fact over fiction.

*Krakatau—The Day the World Exploded* by the brilliant author-geologist Simon Winchester describes one of the most amazing days in human memory. On 27 August 1883, an entire Indonesian island simply exploded off the face of the Earth in a cataclysmic eruption that killed 40,000 people. The newly introduced telegraph quickly spread news of the disaster around the world. (Telegram service, kindly remembered by the older generation and probably unknown to the young generation, was discontinued just last year). Krakatoa became the first worldwide acoustic experiment as its shock wave was recorded—sometimes unintentionally—in numerous places on its seven trips around the globe. The author recounts countless bone-chilling eyewitness accounts of the tragedy, links the eruption with plate-tectonic movements, and highlights additional links to the resultant political and social change in the region. Of additional interest to young readers is that Anak Krakatoa, the son of the vaporized behemoth, is starting to rumble....

Resources and environment

Politics can taint even the most earnest study of the availability of natural resources on societies and cultures. So, it is refreshing to discover two books that provide well-researched, accessible, and common-sense interpretations of the ubiquitous interdependencies.

*Coal—a Human History* by Barbara Freese, former assistant attorney general of Minnesota, shares her fascination and insight into how deeply societies are defined by their energy choices. England and, specifically, London, are the first subjects of her impressive in-depth research. Her love for detail (such as describing how black umbrellas became popular by necessity in the 1700s) combined with an understanding of coal’s distinct properties highlight its role in the emergence of industrial powerhouses. She takes the reader on travels across continents and through time to delineate the disturbing patterns created by coal, environmental reactions, and national and international power brokers. With the current focus on the repercussions of global warming, her elegant book is a must-read for anyone who needs to appreciate the implications of our energy-policy decisions.

*The Control of Nature*, a little publicized piece by Pulitzer Prize winner John McPhee, should be on any geophysics reading list. Not a week passes without numerous new examples of McPhee’s description of human hubris and policy blunders. The devastation wrought by Hurricane Katrina and recent California fires are particularly apt reminders. McPhee documents man’s war against nature in three case studies. First, the U.S. Army Corps of Engineers struggles to keep the Mississippi River flowing toward New Orleans and Baton Rouge without returning to its natural (but economically devastating) course 100 miles away. Second, the reader can applaud Icelanders for successfully stopping a massive lava flow threatening to devour one of their cities. Third, the reader learns why boulders tumbling down the mountains, floods, and fires are Nature’s expressions that Los Angeles fights at enormous expense. Despite money spent and engineering marvels created and envisioned, McPhee (and I expect most readers) inevitably conclude that Nature will have her way in the long run.

Final thoughts

The books described in this article are highly engaging and surprisingly educational. They are written in a manner which inspires and illuminates the reader’s imagination, leading to a greater understanding of the information.

Obviously, this short list of titles does limited justice to the multitude of other worthy examples of geoscience literature. Table 1 lists the titles above and a few other geoscience-oriented books.

These books explain how science works and how scientific ideas are circulated. Each title can provide perfect topics for discussion between the young and the not-so-young. Who knows, it is also possible that one of these books may inspire a young intellect to focus on geoscience as a fulfilling career. TLE

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