

Impact
**How Rocks from Space Led to Life,
Culture, and Donkey Kong**
Greg Brennecka (Autor),

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*“The cosmos is within us. We are made of star-stuff.”
(Carl Sagan)*

This fascinating book by Greg Brennecka [1] gives an account of our planet and the human existence under the presumption that ‘humans owe their existence to meteorites’ and that our culture was significantly shaped by mysterious, observable events in the sky, like solar eclipses, gigantic supersonic fireballs, comets and supernovae.

To make his point the author plunges deep into the history of our universe and starts with the big bang 13.7 billion years ago. The formation process of galaxies, stars and planets is according to the standard model, however the author’s particular view starts with the creation of the Earth’s Moon by a collision of the than Earth with a huge comet 150 million years after the big bang which raised ‘a hell of energy’, and nothing was as before. The Moon caused eclipses and tidal forces on Earth, and according to Greg Brennecka, the further history of the Earth and its occupants would have definitely developed into an entirely different direction without this accidental occurrence.

In the following chapters the author walks you through almost all cultures and events which have occurred, been recorded or researched by ‘cosmic forensics’, and presents a plausible and convincing argument for his thesis: “Meteorites have influenced our planet” and deserve the same scientific attention as any other subject explaining where we come from and where we are going. The author describes historical, recorded and observed sightings and falls of meteorites in ancient Egypt, Mesopotamia, Middle East, Anatolia (Turkey) and China, and the stories going with them. In addition you learn the difference between asteroids, meteors, meteorites and comets.

The knowledgeable, yet popular language makes the book a fascinating reading. For example when he describes another decisive ‘big’ comet impact, the extinction of the dinosaurs at 66 million years ago: “Earth was simply not a pleasant place to be in the aftermath of being smacked by a giant rock moving incomprehensible fast. But, as Jeff Goldblum is famous for saying in the movie Jurassic Park “ Life, uh, find a way.”

Which means, the author makes a case, that the extinction of the dinosaurs by a devastating meteorite impact, was a decisive event for ‘how and why life developed’ in the way we see it today.

Brennecka ascertains his readers: “After having read the book I trust you will agree that meteorites are far more than just rocks from space that occasionally kill things—they are incredibly important objects that played a crucial role in building our planet and our culture”.

Many legends and myths were created about the mysterious rocks falling from the sky, Aristotle was the first earnest ‘scientist’ to explain the phenomena, however failed with his theory, so did Newton and Lavoisier. It was up to the German physicist and musician Ernst Chladni to create and document the first plausible scientific explanation in his book: *On the Origin of the Iron Masses Found by Pallas [2] and Others Similar to It, and on a Few Natural Phenomena Connected Therewith*, in early 1794. Significantly, Chladni mentions ‘iron’ in the title of his book, which played an important role in ancient communities which had it before the technique of melting and shaping of iron was known – thanks to meteorites.

But meteorites not only shaped or culture by providing iron, Brenneka quotes many historical examples, how documented or assumed meteorite impacts or comet sightings influenced almost every religion we know, starting with the Aborigines in Australia through the Bible and on to Mekka.

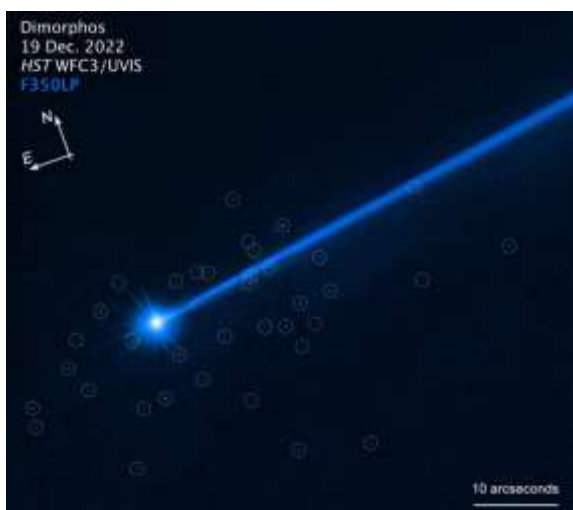
In the next chapters the author is moving on to the origins of life and the meteoritic connection.

Observing, that first, complex organic molecules were required for life to develop on Earth, and second, complex molecules cannot exist at temperatures above a few hundred degrees Celsius. With these knowns, we find ourselves at an interesting place as we try to determine the source of the complex organics on our planet. There is little debate that the Earth, at some point during initial formation, and again after the moon-forming impact, was entirely molten with surface temperatures well above 1000°C. As such, chemistry and physics dictate that, had they already existed on the early Earth, no complex organic molecule would have survived the moon-forming impact.

So, Greg Brenneka concludes after presenting a lot of convincing and fascinating facts, that early meteorites likely represented an important injection of a much-needed, but scarce nutrients, or ‘organic building blocks’, when life was just getting started, and that included water which is speculated to be brought to Earth by comets as well.

Chapter 6 deals with meteorites from Mars, especially about the scientifically important consequences of the Mars meteorite ALH 84001 found in 1984, followed by a chapter how to “hunt” for meteorites on Earth, using their magnetism (“If your stick doesn’t stick, you must not a-quit”) and other earthly surface features.

Of course a book titled ‘Impact’, mentioning the dinosaur wipeout, the Tunguska meteorite and the Chelyabinsk event in 2013 must certainly talk about Near Earth Objects (NEO’s), the 2016 created Planetary Defense Coordination Office, and its activities since then. The last success in getting ready to defend Earth against the unlikely, yet statistically possible event of a disastrous impact was the Double Asteroid Redirection Test (DART) mission, demonstrating successfully that a satellite impact can influence the orbit of an asteroid.



This Hubble Space Telescope image of the asteroid Dimorphos was taken on 19 December 2022, nearly four months after the asteroid was impacted by NASA’s DART mission. Hubble’s sensitivity reveals a few dozen boulders knocked off the asteroid by the force of the collision. The bright white object at lower left is the asteroid Dimorphos. It has a blue dust tail extending diagonally to the upper right. A cluster of blue dots surrounds the asteroid. These are boulders that were knocked off the asteroid when, on 26 September 2022, NASA deliberately slammed the half-tonne DART impactor spacecraft into the asteroid as a test. NASA/ESA Hubble Space Telescope image [3]

The last chapter deals with the categorization and analysis of meteorite and the importance of determining the different stages of development of our solar system using them as time-capsules. Greg Brennecka is even speculating on the 'why' our solar system is kind of unique to others.

Based on Brennecka's book and applying my own logic to the big question: 'Creator or accidental evolution' it could be, that the notion of God came to Earth with the extraterrestrial 'organic building blocks', or God is a powerful eternal source residing outside our scientific reach. In my opinion, both options are not in contradiction of the bible.

In conclusion, Greg Brennecka's "Impact" is an exciting and accessible written book. It merges science, history, religion and culture by unveiling the profound influence of cosmic collisions on our past and on our everyday life. The book is leaving a lasting impression on the reader's mind, and is a highly recommended read for anyone trying to learn more about the many unanswered questions of our cosmic past and wants speculate about the future of our unique planet amidst the vastness of space.

As the author says: 'Stay in tune' - there is more to be expected from this relatively young science branch, the meteoritics, gaining rapid growing attention, attracting young and fresh minds globally.

References

[1] Greg Brennecka,

PhD is a staff scientist and cosmochemist at Lawrence Livermore National Laboratory. After his doctoral work at Arizona State University, Greg received the prestigious Sofja Kovalevskaja fellowship from the Alexander von Humboldt Foundation to study the early Solar System at the Institute for Planetology in Münster, Germany, where he led the "Solar System Forensics" group for five years. His research has appeared in Science, Nature, and Proceedings of the National Academy of Science. Greg lives in the Livermore Valley wine country and fully enjoys the local flavors. (https://www.goodreads.com/author/show/20651172.Greg_Brennecka)

[2] Peter Simon Pallas, the first scientist to investigate the "1,600-pound blob of iron found in the remote area of Siberia south of the village of Krasnojarsk in 1772.

[3]https://www.esa.int/Science_Exploration/Space_Science/Hubble_sees_boulders_escaping_from_asteroide_Dimorphos