

# **A Geologist Speculates**

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ON GEMSTONES,  
ORIGINS OF GAS AND OIL,  
MOONLIKE IMPACT SCARS ON THE EARTH,  
THE EMERGENCE OF ANIMALS AND CANCER

John M. Saul

## Preface

During a varied career in geology, I have observed two matters that seem to stand out as fundamental truths. First of all, there is a great deal that we do not understand about the workings of the Earth. But even so, it is clear that everything is connected, not just the many aspects of geology itself — mineralogy, earthquake studies, exploration for oil and gas, and much else — but also astronomy, biology, and even cancer studies and the emergence of complex societies. The connections are not immediately evident in our usual interactions with the world around us, however, or even by plunging into specialized studies, because so many key events took place in the exceedingly distant past, and so much has changed since.

Geology, along with astronomy, turns out to be a good base from which to explore the great nexus of “things connected” because its subject matter includes events that set the stage for much of what was to come.

Chapter 1 of *A Geologist Speculates* deals with the formation of certain transparent gemstones, garnet, ruby, tourmaline, and tanzanite, among them. The elusive conditions that allowed humdrum materials to crystallize in a transparent “gemmy” manner have puzzled scientists at least as far back as the times of Robert Boyle (1627–1691). Hints how such exceptional crystals were able to form include the presence of gases with an “organic” odor associated with many gemstone deposits, their common association with graphite, and the rough alignment of many gemstone occurrences more or less parallel to modern and ancient coastlines.

There is a logical sequence and progression to the chapters, although they can be read separately. Chapters 1 and 4 require somewhat more background than others.

Chapter 2 treats the origin of gas and oil. Oil companies and their exploration teams certainly appear to have done a good job in keeping the world supplied with energy. Is it possible that they have got the science wrong? Some have thought so, including Sir Robert Robinson, Nobel Laureate in chemistry in 1947, who argued that petroleum was a material of inorganic, “mineral” origin to which molecules of biological origin had been added. Robinson wrote of the “duplex origin of petroleum,” and it is likely that he was correct, unless the origin was actually “triplex” or “multiplex.” For, as suggested by their widespread occurrence throughout the Solar System and beyond, hydrocarbons are easy to make. Earthquakes, volcanism, and the world’s reserves of petroleum, and also of water, are all addressed in this chapter.

In Chapter 3, I commence with the scientific argument that the Earth and Moon are neighbors in space and that our planet could not have escaped the great bombardment that

scarred the Moon early in the history of the Solar System, leaving the lunar surface saturated with impact scars. These days it is almost universally believed that traces of this bombardment have been eliminated from the surface of our own planet by rain, wind, cycles of erosion and, most of all, by the workings of plate tectonics with the subduction and deep burial of much of the Earth’s crust. I argue differently, claiming that the impact scars remain but that scientists have not established the correct criteria for recognizing them. Parts of my argument, which continues into Chapter 4, hinge on the geological occurrences of various transparent gemstones and the locations of certain regions rich in oil and gas.

Much of Chapter 4 deals with the first appearance of large complex animals, what is commonly referred to as the “Cambrian Explosion.” This event, or, rather, this episode in the Earth’s history, was also marked by the first formation of particular types of gemstone deposits. Excluding special cases treated in Chapter 1, no deposits of garnet, ruby, tourmaline, tanzanite, and numerous other types of transparent gemstones were formed before the approximate time of the Cambrian Explosion. In short, I argue that exceptional mountains — including a “supermountain” — were formed around this time, that deposits of gemstones were formed in their root-zones, and that the existence of complex animals is due to the erosion of these mountains and the materials that were then washed into the seas. For many, however, the main interest of Chapter 4 is the examination of the nature of cancer, a pathology that did not, and could not, exist before the “Explosion.” In brief, I argue that the supermountain, the gemstone deposits, the complex animals who are our ancestors, and cancer all came into existence during the same broad interval of geological time, that all were consequences of the workings of plate tectonics, and that the workings of plate tectonics were conditioned and guided by 3-D scars left by the same bombardment that marked the Moon.

In Chapter 4, I evoked Darwinism and the workings of evolution, and in my short final Chapter 5, I consider three life-forms that might arguably have escaped the workings of Darwinism. One case is that of human beings. I show that Darwinism is indeed universal, but I also accept that humans are somehow different from all other creatures, as is almost universally accepted. Darwin did not have the last word. A surprising “post-Darwinian” factor came into play during the first generation of the Paleolithic when religion, purposeful observations of earth and heavens, and myth-making were all inserted into the ways of humans, inserted virtually instantaneously.