# Sense or Nonsense

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I want to talk with you today about the explosive growth of knowledge, and how we react to it. New knowledge can be very painful. It can make your worldview obsolete. It can make you retract things you once said were true. It can force you to discard the work of a lifetime. Because this process can be so painful, many people react in one of two classic ways: Either they say the new stuff is wrong, or they say we can't know anything at all. Neither contributes to human understanding. Both contribute to human misery.

Within this context, I would like to tell you a story about a recent discovery that poses an intriguing question. Just five years ago, a group of geologists from the United States and Turkey made a remarkable discovery during a survey of the Black Sea. They were taking core samples of the seafloor to determine whether any radioactive material from the Chernobyl disaster (in the Ukraine) was finding its way into the sediments of the Black Sea. What they discovered instead was that the seafloor was covered in its shallower part by a uniform layer of sediment about three feet thick.

The surprise was that this uniform layer covered sand dunes, old river channels, and other terrestrial features. This meant that a significant portion of today's Black Sea was once dry land. Moreover, it meant that the water must have risen very rapidly, or else the persistent wave action at the steadily encroaching shoreline would have destroyed surface features such as sand dunes.

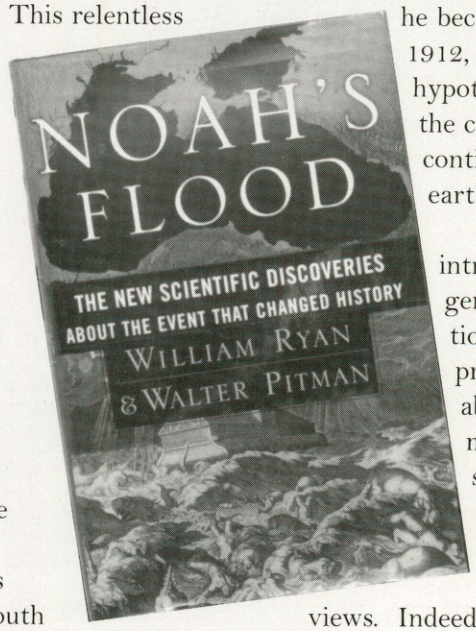
How did they explain their astonishing observations? To answer this question I have to say a word about the ice ages. During the last ice age, vast quantities of water were tied up in glaciers. All of Canada and much of Europe and Russia were covered by a sheet of ice thousands of feet thick. Consequently, the level of the oceans was much lower than it is today. But, as global temperatures rose, the ice began to melt; the oceans began to rise.

It is estimated that the world's oceans rose four to five hundred feet. However, prior to this epic meltdown, the Black Sea and the Mediterranean were not connected by the Bosporus Strait as they are today. Indeed, the level of the Black Sea was much lower than it is today, and the Danube River and the Dnieper, the Bug and the Dniester emptied into the Black Sea hundreds of kilometers from the present shoreline.

But as the Mediterranean continued its steady rise, the day came when water began to carve a channel through the land bridge between the Mediterranean and the Black Sea near the present-day city of Istanbul.

The trickle became a cataract, and water began to pour through with unimaginable power. It is estimated that the flux of water approached that of a thousand Niagaras.

The Black Sea began to rise. Each day it rose six to eight inches, advancing a mile or more every day at the northwestern shore of the Black Sea. This relentless torrent continued to pour into the Black Sea for over a year. When the water levels more or less equalized, the Black Sea had risen by well over three hundred feet.




Let me put this in perspective. The Black Sea is very large. It is larger than all of the Great Lakes combined. If you were to keep it at its present latitude but shift it to the Northwest United States, it would stretch from the Pacific Ocean to Montana, and from roughly Northern California to the Canadian border. The area that had once been dry land, but today is covered by water, corresponds roughly to an area stretching north-south from the Mexican border to San Francisco, and east-west from the Pacific to a line connecting Sacramento, Loma Linda, and the Salton Sea.

If a flood like that were to hit California next year, it would make an impression on us. Apparently it made an impression on the many people who lived around the Black Sea at that time. How do we know? Archaeological evidence suggests that the Black Sea population was dispersed in a mass migration that fanned out in all directions. It reached northward up through Hungary and Poland to Germany, and even as far as Paris; southward throughout the Aegean, and possibly into Egypt; eastward toward India and maybe even as far as China.

The geologists involved in the research, William Ryan and Walter Pitman, tell the story in their recent book entitled *Noah's Flood.*[1] Did the event they describe have anything to do with the story of Noah's Flood as described in the Bible? What about other ancient flood stories, such as the Gilgamesh Epic?

More importantly, how will we react to these discoveries? One classic response is simply to decide that Ryan and Pitman are wrong. But before we choose that course, let me outline one example that should give us pause.

Alfred Wegener, the son of an evangelical preacher, studied astronomy and geophysics in Germany. In 1910, at the age of 30, Wegener had a flash of insight. He noted the striking similarity between the shape of the African and South American coastlines, and wondered if they might once upon a time have been part of the same landmass. The more he reflected on the evidence—including the fossil record and geological formations on the two continents—the more convinced he became that he was onto something. In 1912, he outlined his groundbreaking hypothesis to the public: the position of the continents, he declared, is not fixed; continents drift on the surface of the earth.

Although some scientists were intrigued by Wegener's hypothesis, the general response was outright rejection. "Continents don't move. That's preposterous! After all, we're talking about 'terra firma.'" Ironically, as more evidence accumulated in support of Wegener's thesis, the voices of opposition grew louder. When Wegener died in 1930, the tide was clearly running against his views. Indeed, as late as 1950 a noted geologist argued that the idea of continental drift had fallen into disfavor.

Today we know that Wegener was right. The clincher came in the mid-1960s, when magnetic measurements of the ocean floor revealed that the plates are steadily being pushed apart by magma welling up from the interior of the earth. The record of magnetization frozen into the solidified magma is like a giant, slow-motion tape recording. The evidence was unequivocal.

Almost overnight, the attitudes of the geological community changed. Finally geologists could provide consistent explanations for a number of long-standing and fundamental questions. They could now explain how mountain ranges formed, how earthquakes are generated, how islands such as the Hawaiian chain are

formed, and so on. This transformation in the thinking of the geological community was revolutionary. But this revolution *could* have happened 50 years sooner. Why didn't it?

The answer is complicated, but it can certainly be argued that a significant factor was that the minds of many were simply not open to the evidence. Geologists just couldn't seem to bring themselves to believe that continents could move. Even though Wegener's hypothesis made good sense, they couldn't break free of their mental shackles. They just couldn't seem to see the obvious. Some would say that they refused to see the obvious. Their motto might have read: "I'll see it when I believe it."

"Human progress has never been advanced without changing someone's mind."

The other classic response to new evidence is somewhat more obscure. It is characterized by elaborate sophistry that takes us to the opposite pole of the epistemological compass. With this strategy, one simply takes the position that nothing can be known with certainty. This approach has an ancient pedigree and echoes across the centuries in Pontius Pilate's memorable words, "What is truth?" This response is alive and well even today as promulgated in the postmodernist school of thought. What the postmodernists, especially those of the French school, have been promoting since the 1960s is the notion that human understanding in general, and science in particular, are relative—that one's interpretation of reality depends entirely on one's cultural context. Stated differently, they would claim that there is no objective reality, only virtual reality, if you will.

Postmodernists started with a premise that one can appreciate and even applaud. Namely, that our approach to any given problem is always influenced by our background and context. But the elevation of that premise to a position of primacy, and the assertion that, therefore, there is no fixed point of reference, or objective reality, turns the very basis of their argument on its head and invalidates the very terms of their epistemology.

Alan Sokal, the physicist, recently exposed the intellectual nakedness of this group of literati with his celebrated and devastating spoof of postmodernism. I can't take time to elaborate on his hoax, or to give examples of some of the obscure, even absurd positions advanced by some postmodernists. Instead, I refer those interested to the recent book, *Fashionable Nonsense*, by Sokal and Jean Bricmont, in which a number of revealing case studies are presented and dissected.[2]

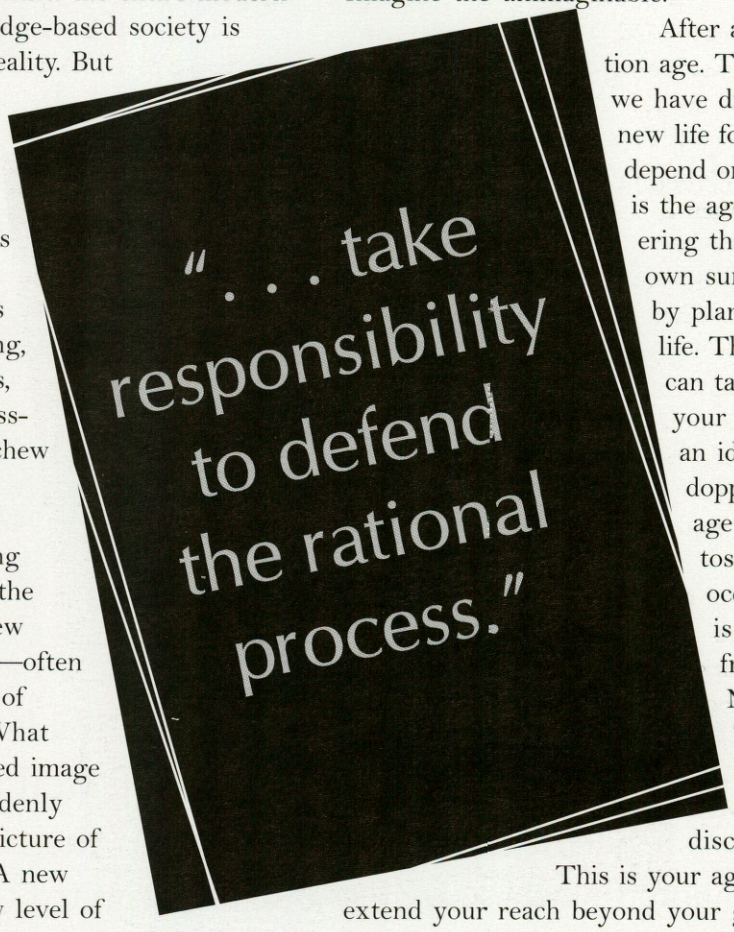
The two examples I have sketched illustrate the two classic reactions to new knowledge that I outlined at the beginning. I presented them for two reasons. First, I want to challenge you. For the first time in history, the time constant for knowledge turnover is much shorter than our life span. Indeed, it is even shorter than the years we spend in formal schooling.

The second reason is to remind ourselves that advances in understanding do not come cheaply. All too often those who propose new ideas are ridiculed, vilified, and even ostracized. Unfortunately, bad ideas can stick around for a distressingly long time—hundreds or even thousands of years. Consider slavery, or, the historical and continuing inequality of women in many parts of the world. The field of science is replete with examples. In 1996, the pope officially declared that the earth revolves around the sun. It took a mere three hundred years for one of the most intellectually sophisticated religious bodies in the world to acknowledge that Copernicus and Galileo had been right.

Those who are unable to cope with this explosion of knowledge will also tend to react with the only tools that they have. Either they will retreat into the familiar mental structures they learned as children, or they will give up any attempt to define a rational framework for human behavior. The former response is characteristic of fundamentalism, which is once again sweeping over societies around the world, and represents a retreat from (un)common sense; the latter can be characterized by postmodernism's less informed offspring and represents an embrace of nonsense.

Your task is to avoid both extremes. We should not fall into the same trap as those who systematically opposed the idea of continental drift. We should be willing to let the weight of the evidence influence our established belief system. It should not take three hundred years to accept the scientific fact of planetary motion.

On the other hand, you must defend the underlying scientific foundations on which the entire modern superstructure of our knowledge-based society is built. There IS an objective reality. But this approach has to be defended, lest the "fashionable nonsense" discussed by Sokal and Bricmont gain the ascendancy. And don't dismiss that possibility as unrealistic. Remember, astrology still has its devotees, as does channeling, crystal therapy, psychokinesis, and the like. The list is distressingly long, and those who eschew knowledge are the unwitting victims of such obfuscation.




By contrast, the inquiring mind that explores and tests the limits and ramifications of new knowledge—despite the pain—often discovers entirely new levels of understanding and insight. What heretofore had been a fractured image of disconnected elements suddenly snaps into focus to reveal a picture of clarity, elegance, and beauty. A new intellectual day dawns. A new level of abstraction (or in Ernst Mach's terms, "a new economy of thought") is achieved.

In summary, I urge each one of you to take responsibility to defend the rational process. Read books—serious books that tackle the issues of the day. Form discussion groups to grapple with the important questions. Communicate your views in understandable and understanding ways to the community in which you serve. Speak out against demagoguery, fashionable nonsense, and groupthink.

This will not always be easy. The task I recommend to you is not designed for personal gain; but it is part of a proud tradition that spans the millennia. It keeps faith with those who have gone before and have spoken prophetically so that we today are not worshipping idols of wood and stone, or ideologies set in concrete. And it keeps faith with generations yet unborn.

Be prepared to change your mind. Human progress has never been advanced without changing someone's mind. So, consider the notion that maybe South America is really floating westward. Toy with the possibility that maybe the Black Sea was the epicenter for the enduring story of the Great Flood. Imagine the unimaginable.

After all, this is the information age. This is the age in which we have discovered an entirely new life form that does not depend on sunlight for life. This is the age when we are discovering that other stars like our own sun are also surrounded by planets that may harbor life. This is the age when we can take a single cell from your body and reconstruct an identical genetic doppelgänger. This is the age in which we will be tossed to and fro on an ocean of knowledge that is rising inexorably from a thousand Niagaras of discovery. This is an age for bold exploration, for creativity, for exciting discovery.

This is your age. I invite you to extend your reach beyond your grasp for daily bread, and join forces with those who labor to dispel ignorance and superstition and who seek to cultivate unfettered understanding and civilizing civility.

## Notes and References

1. Ryan and Pitman, *Noah's Flood: The New Scientific Discoveries about the Event that Changed History* (New York: Simon and Schuster, 1998).

2. Sokal and Bricmont, *Fashionable Nonsense: Postmodern Intellectuals' Abuse of Science* (New York: Picador, 1998).

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