

# Science & Religion



## The Future Isn't What it Used to Be

By [Jeffrey M. Bradshaw](#) · June 6, 2016

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*Editor's Note: The following is Part 1 in a series based on a presentation given at the Second Interpreter Science and Mormonism Symposium: Body, Brain, Mind, and Spirit at Utah Valley University in Orem, Utah.*

### Understanding the Future of Science and Technology



The saying “The future isn’t what it used to be,” is often attributed to Yogi Berra,[\[i\]](#) although he admitted (as one might also conclude about Elder J. Golden Kimball[\[ii\]](#)), that he didn’t really say everything he said.[\[iii\]](#) The same aphorism was used by scientist and science fiction author Sir Arthur C. Clarke[\[iv\]](#) and later by Apple Computer co-founder Steve Jobs[\[v\]](#) as a preface to their optimistic extrapolations about the future of technology. Although I would agree with Clarke and Jobs that a bright future for technology lies ahead, that is not the drift of the talk I intend to give today.

More significant than the transformations that technology works upon us directly,[\[vi\]](#) more potent than the effects of any hallucinogenic drug on our thoughts and senses are the mind-altering impact of our changing conceptions about the future itself. Arthur C. Clarke observed: “Until a century ago nobody was very interested in the future for the simple reason that, apart from

natural catastrophes and wars, the future was going to be the same as the past. A man knew that the pattern of his life would be the same as his great-grandfather's, as far back as anyone could remember. Well, now we know differently.”[\[vii\]](#)

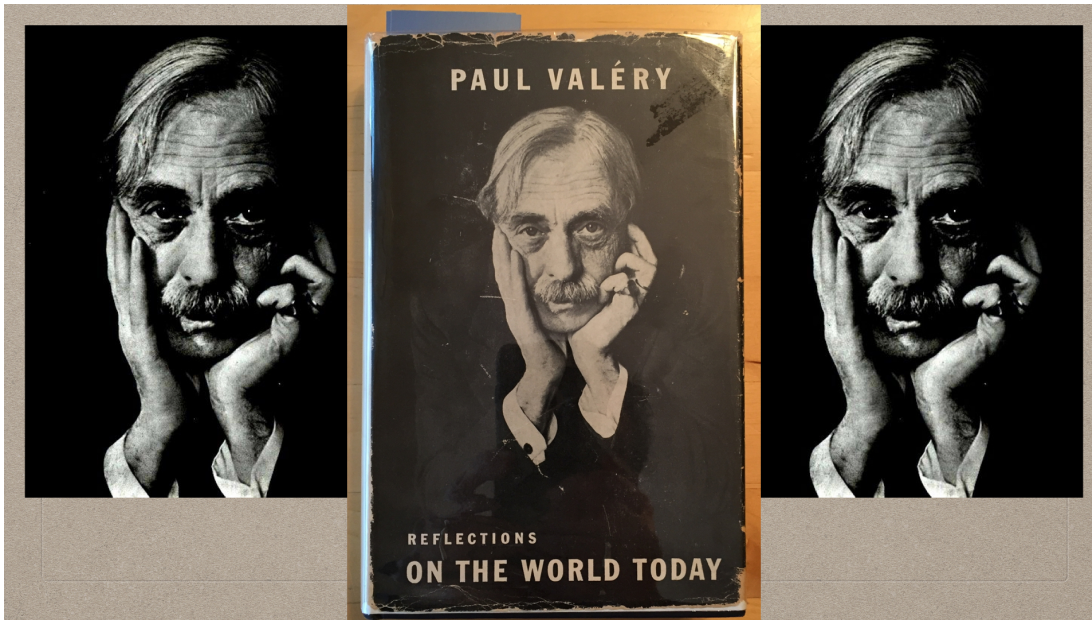


Figure 2 [\[viii\]](#)

The brilliant, problematic French poet and essayist Paul Valéry (1871-1945)[\[ix\]](#) explained why “the future isn't what it used to be” in 1937, long before any of the others I cited before.[\[x\]](#) Wrote Valéry:[\[xi\]](#)

The future, like everything else, is no longer quite what it used to be. ... We used to consider the unknown future as a simple combination of already known things, and the new was analyzed according to its unoriginal elements. But that is ended. ... [T]he rules of the game are changed at every throw. No calculation of probabilities is possible. ... Why? Because the ... modern world is assuming the shape of man's mind. Man has sought in nature all the means and powers that are necessary to make the things around him as unstable, volatile, and mobile as himself, as admirable, as absurd, as disconcerting and prodigious as his own mind. ... If ... we imprint the form of our mind on the human world, the world becomes all the more unforeseeable and assumes the mind's [own] disorder.

“Happily,” concludes Valéry, “these prophecies are idle. I am busy doing exactly what I explained the vanity of a few moments ago. I am looking ahead, therefore I am wrong.”[\[xii\]](#)

Since the *far* future is impossible to predict with any confidence, my burden today will be to share some candid observations about the present and the *near* future as it has to do with technology, technologists, and society — between now and, say, 2025 — a little less than ten years from now. In brief, I want to explain why I am not convinced that a technological apocalypse is “nigh at hand.”[\[xiii\]](#) In addition, I cannot refrain from giving a little advice about the future. As the wise Duc de la Rochefoucauld said: “Old people like to give good advice, since they can no longer set bad examples.”[\[xiv\]](#)



First, a personal aside. I was the next-to-youngest in my family — my brother Scott and I were called “the little boys.” Scott and I were best buddies then, and have been close ever since. We were spoiled by our older brother and sisters.

My sisters defended my quirks, reassuring my parents that I would someday turn out to be quite normal. My mother engendered in me a love of learning and of the Gospel. Though she never had the chance to attend college, she became very well educated woman through her wide reading on many subjects, including the scriptures and the “best books”<sup>[xv]</sup> of doctrinal and apologetic literature.

My father was the first missionary and the first college graduate in his immediate family. He lovingly spurred me along in my scientific interests, providing me with a large cardboard box kept in the garage that was filled with motors, wind-up clocks, and vacuum-tube electronics that I could take apart and sometimes put back together.



Figure 4 [xvi]

One day at lunch, during the cold war years, after hearing me protest that I didn't want eat my orange because I didn't like the taste of the bitter white stuff that stuck on to the fruit after you peeled it, my Dad told me that the white stuff would protect me from radiation in the event of nuclear fallout. That creative fib not only solved the immediate problem in getting me to eat my orange but also convinced me that there was a real practical value to science.

One day my older brother, who I revered then and still revere now, convinced me that if I ran fast enough, I could be upstairs and downstairs at the same time. As I recall, my efforts to find out for myself whether that was true lasted long enough to provide amusement for all the family. Though I can't say I succeeded in proving my brother's hypothesis at the time, I was pleased when I later learned enough about quantum mechanics to vindicate the failures of my earlier experiments.

I mention all this to convince you that my reflections today come out of a lifetime of watching how scientists and technologists work — sharing from personal experience both their inspiring dreams and their hopeless fantasies.

My day job is at the Florida Institute for Human and Machine Cognition, or IHMC for short.<sup>[xviii]</sup> At IHMC, I feel very fortunate to work among researchers who are among the best in the world in their areas of specialty.

## IHMC Wins Big at DARPA Robotics Challenge



Atlas celebrates victory



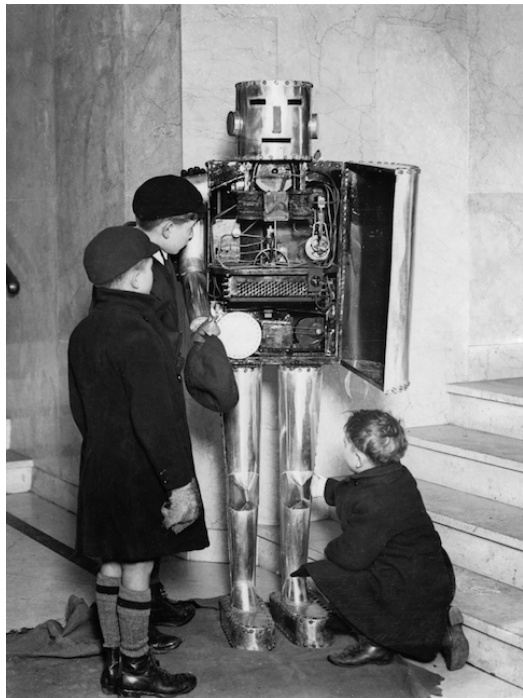
Meet the team behind Atlas



Read about us in TIME Magazine

One of our most exciting moments in 2015 was the final phase of the DARPA Robotics Challenge.<sup>[xix]</sup> There, the IHMC team walked away with a million-dollar check and top honors among all participating American universities and research institutions, and all but one international competitor. Researchers at IHMC are passionate about science and technology.

However, for the next few minutes, I'd like to share a few of the lessons I've learned, not about science and technology, but rather about *scientists* and *technologists*. If you understand scientists and technologists, you will be able to do a pretty good job in analyzing the news about science and technology, even if you do not understand the science and technology itself.



One thing I have learned about technologists is that they tend to be incurable optimists. For instance, consider the original caption on this photograph from the 1930s: “This steel man is near enough to accuracy to explain the physiology of the human frame.”<sup>[xxi]</sup> The two students at left are no doubt counting the number of ribs to make sure they are all there. This reminds me of a question I once heard posed about why young Primary children are often asked draw pictures of their fathers to show them on Fathers Day. The answer? Because the fathers want to know what they really look like.

When you look at the ups and downs in the lives of scientists and technologists, as shown here, it becomes understandable why they might suffer from incurable optimism, even when the face of reality glares at them fiercely between the eyes.<sup>[xxiii]</sup> As is often expressed, with unfeigned sympathy, “There goes another beautiful theory about to be murdered by a brutal gang of facts.”<sup>[xxiv]</sup> The professional lives of researchers are inherently unstable, and in many cases their stubborn, unreasonable optimism gives them courage to engage in tedious — and often discouraging — work every day.<sup>[xxv]</sup>

The stress of scientists and technologists is not merely a stress of the first order, like the kind that stems from high pressure and overwork, but also of the second order, which is something more existential in nature. Many researchers are passionate about the potential of their contributions, wanting to make a difference in important contemporary problems such as health, poverty, food production, and quality-of-life. Their stress is much like that of the struggling artist or of someone in the early, uncertain stages of a romantic relationship, “who really, really, really want[s] it to work, but lack[s] a clear model of *how*.”<sup>[xxvi]</sup> It is not just a matter of bulldozing one's way to success by working incredibly hard or of becoming more and more sure through experience about “about which path to take, but [rather] about [the uncertainty of] whether the paths (and the destination!) are even real.”<sup>[xxvii]</sup>

And then, if it weren't enough to be grappling with uncertainties relating to the *scientific* viability of the work, researchers usually have to be concerned just as deeply with the dizzyingly frequent changes in levels of public interest in the relevant ideas, which in turn drive the up and down trends of highly competitive funding in their particular lines of investigation.

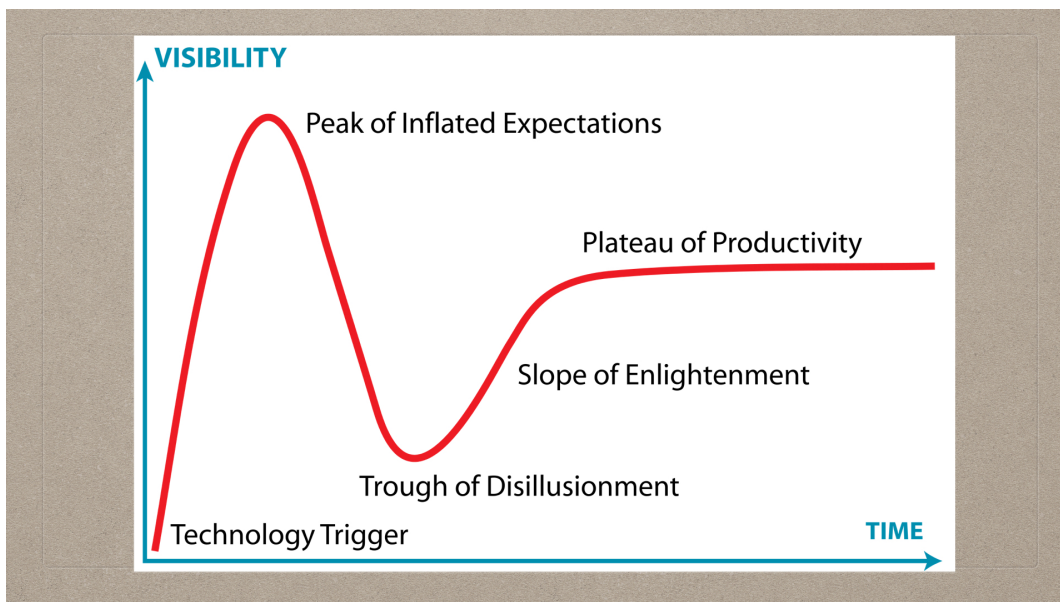
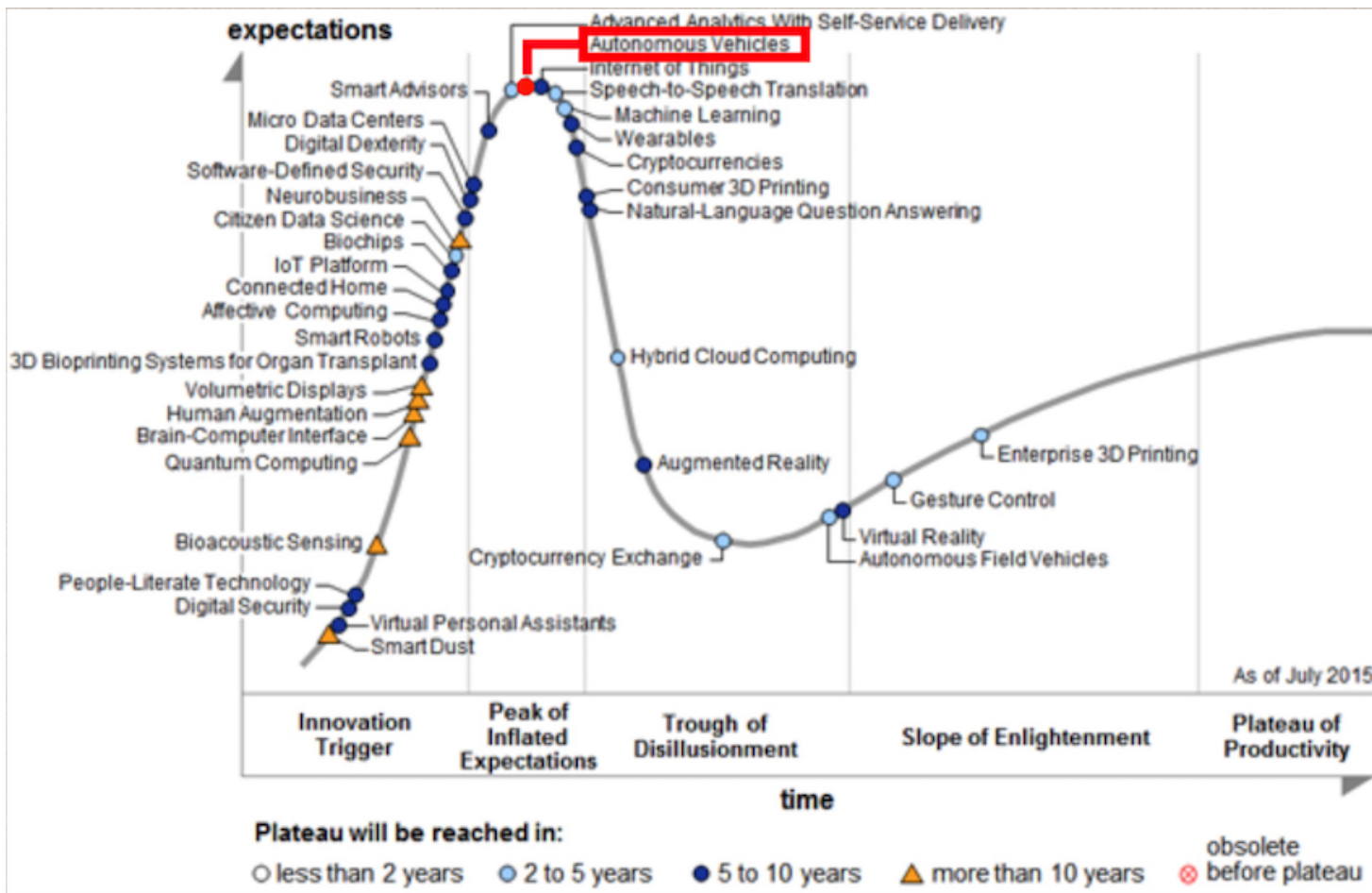


Figure 10 [xxviii]

Each year the Gartner Group publishes an annual update to their hype cycle.[xxix] The curve illustrates how the most successful emerging technologies rapidly trend upward toward a peak of “inflated expectations” before suddenly dropping down into a “trough of disillusionment.” Only a relative few such technologies sustain their popularity long enough to progress through a gradual “slope of enlightenment” and on to a “plateau of productivity.”

Bad timing with respect to the hype cycle can be more destructive to the odds of success in executing a line of research than having a bad idea to begin with. The truth of this claim is evident in the sheer volume of bad ideas that are funded as soon as a given topic approaches the peak of the hype cycle.



\*\*Figure 11 [xxx]

This brings us to our first example, which sits at the very top of the 2015 Gartner hype cycle update: self-driving cars.

(To Be Continued in Part 2)

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[i] A version of the saying that uses the word "ain't" is often credited to Yogi Berra: "The future ain't what it used to be." According to Future Is Not, Quote Investigator, Future Is Not, Quote Investigator: "The baseball great Yogi Berra writing in his 1998 volume *The Yogi Book* did claim that he used this expression. A precise timeframe was not given, but the saying was accompanied with a picture from 1974. Yogi also offered an interpretation: 'I just meant that times are different. Not necessarily better or worse. Just different.'"

[ii] As is the case with many prominent figures, some of the stories told about Elder Kimball never happened. "Once a nephew came to J. Golden and said: 'Well, Uncle Golden, I heard another J. Golden yarn today.' 'I'll bet the damn thing isn't genuine,' wheezed the old man. 'Seems like all the stories told these days are either about me or Mae West' (A. Fife *et al.*, *Saints*, p. 314). Cf. E. A. Eliason, *J. Golden Kimball Stories*, p. 67.

[iii] See the full title of Y. Berra, *Yogi Book*.

[iv] See *Future Isn't* (video); A. C. Clarke, *Future Isn't* (article). Clarke was prescient in anticipating many future developments.

[v] S. Jobs, *Future Isn't*. See Y. Heisler, In 1983 Speech for many examples of what Jobs foretold accurately.

[vi] For a popular summary of initial evidence of some of the complex physiological, social, and cultural changes that technology is working upon us, see, e.g., S. Greenfield, *Mind Change*.

[vii] A. C. Clarke, *Future Isn't* (article), p. 4.

[viii] Paul Valéry: [http://www.katakarak.net/sites/default/files/events/paul\\_valery.jpg](http://www.katakarak.net/sites/default/files/events/paul_valery.jpg) (see also <https://quoadsubjectum.files.wordpress.com/2012/08/paulvalery3.jpg>, <http://www.aphorism4all.com/images/1355814906.jpg>)

[ix] The biography of Valéry on the website of "The Poetry Foundation" summarizes (Paul Valéry (1871-1945), Paul Valéry (1871-1945)):

Paul Valéry occupies a position in the history of French letters that is at once strategic and highly problematic. Critics have affixed to him various labels, all of them partially correct. He has been called the last French symbolist, the first post-symbolist, a masterful classical prosodist, an advocate of logical positivism, and a cerebral narcissist. ... [H]e is understood as having broken away from symbolism, as having rejected the cult of poetry for its own sake in favor of a cult of the mind. These views need not be contradictory. ...

Some facts about Valéry might predict a less than faultless comportment on Valéry's part during World War II and France's occupation by Germany: first, he had been

quietly but strongly “anti-Dreyfusard” during the famous Dreyfus affair ... Furthermore, Valéry was also friendly with Marshal Philippe Petain, one of the leaders of France’s pro-German Vichy government.

However, the poet did prove sympathetic to the Free French Movement led by General Charles de Gaulle, and of the Nazis he wrote in “War Economy for the Mind”: “As for our enemies, we, and the whole world, know that their politics with regard to the mind has been reduced or limited for ten years to repressing the developments of intelligence, to depreciating the value of pure research, to taking often atrocious measures against those who consecrated themselves to these things, to favoring, even as far as endowed chairs and laboratories, worshippers of the idol to the detriment of independent creators of spiritual richness, and they have imposed on the arts as on the sciences the utilitarian ends which a power founded on declamations and terror pursues.”

[x] Future Is Not, Quote Investigator, Future Is Not, Quote Investigator found one earlier occurrence of this saying than Valéry’s:

The earliest evidence of this saying located by [Quote Investigator] was published in 1937 in a journal called “Epilogue” within an article titled “From a Private Correspondence on Reality” by Laura Riding and Robert Graves. The authors who were both prominent literary figures asserted that the perception of the future had changed:

The human mind has reached the end of temporal progress: the future is not what it used to be, and people talk with less and less progenitive self-precipitation into the future, and behave with more and more fatally decisive immediacy. The future, that is, contains nothing but scientific development. It is an involuntary spending and manipulation of physical forces, empty of consciousness: it no longer matters.

In 1950, Mordecai M. Kaplan wrote: “Men say the future isn’t what it used to be. Neither is the past. Both are in need of reconstruction, if we are to have a livable present” (M. M. Kaplan, *Random Thoughts*, cited in C. C. Doyle *et al.*, *The Dictionary of Modern Proverbs*, p. 90).

[xi] P. Valéry, *Our Destiny*, pp. 135, 143-144.

[xii] *Ibid.*, p. 142.

[xiii] Luke 20:30-31.

[xiv] L. D. d. L. Rochefoucauld, *Maxims*, 93, p. 29. L. D. d. L. Rochefoucauld, *Maxims*, 93, p. 21: « Les vieillards aiment à donner de bons préceptes, pour se consoler de n’être plus en état de donner de mauvais exemples. »

[xv] D&C 88:118; 109:7, 14.

[xvi] <http://i.huffpost.com/gen/3052140/images/o-PEELING-ORANGE-facebook.jpg>

[xvii] Image licensed from [www.shutterstock.com](http://www.shutterstock.com). Image reference 67038073

[xviii] See [www.ihmc.us/groups/jbradshaw/](http://www.ihmc.us/groups/jbradshaw/).

[xix] For a summary of some of the unique aspects of IHMC’s approach to the DARPA Robotic Challenge, written for the general reader, see M. Johnson *et al.*, *Seven Cardinal Virtues*. For a video presentation that includes a description of the application of the principles of coactive design to the DARPA Robotic Challenge, see J. M. Bradshaw *et al.*, *Lessons Learned*. For a detailed description of coactive design, see M. Johnson *et al.*, *Coactive Design*.

[xx] H. Neubauer, *Curious Moments*, p. 634. Image licensed from Black Star / Alamy Stock Photo, Image Reference A2Y241.

[xxi] *Ibid.*, p. 634.

[xxii] From A. Salamon, *Why Startup Founders*.

[xxiii] Many of the thoughts in this section are drawn from and paraphrased from *ibid.*.

[xxiv] I don’t know who first came up with this version of the saying, but it was not the Duc de La Rochefoucauld, to whom so many places on the Web attribute it falsely. I like this particular wording of the sentiment, which came from a talk I heard Elder Maxwell give in 1978 (N. A. Maxwell, *The stern but sweet seventh commandment* (Devotional, Salt Lake Institute of Religion, 8 December 1978), p. 8).

The original source from which the basic thought is derived is probably Thomas Huxley, in his Presidential Address to the British Association for the Advancement of Science, Liverpool Meeting, 14 September 1870 (T. H. Huxley *et al.*, *Scientific Memoirs* 3, p. 580; T. H. Huxley, *Biogenesis and Abiogenesis*, p. 244): “But the great tragedy of Science — the slaying of a beautiful hypothesis by an ugly fact — which is so constantly being enacted under the eyes of philosophers, was played, almost immediately, for the benefit of Buffon and Needham.”



See also the famous statement by John Adams in his 1770 legal defense of British soldiers involved in the Boston Massacre ({O'Toole, 2010 #5300}, emphasis added):

I will enlarge no more on the evidence, but submit it to you, gentlemen — *Facts are stubborn things*; and whatever may be our wishes, our inclinations, or the dictates of our passions, they cannot alter the state of facts and evidence: nor is the law less stable than the fact. If an assault was made to endanger their lives, the law is clear, they had right kill in their own defence.

Several earlier versions of the phrase “Facts are stubborn things” are known, going back to 1713 ({O'Toole, 2010 #5300}). Joseph Smith uses “Facts are stubborn things” in the title of a *Times and Seasons* article (see {Smith, 1969 #46, 15 September 1842, p. 266}).

[\[xxv\]](#) As Anna Solomon described it A. Salamon, Why Startup Founders:

It's easy to point to the value in euphoria and optimism. You get lots of code written, recruit lots of funding and talent, write a perfect draft — it's the part of the cycle where you're drawn to working seventy hour weeks, checking off each and every item from your to-do list. But the “down” parts often feel like they're pointless at best, and dangerous or counterproductive at worst. ... In our own pasts, we found ourselves wondering why our brains couldn't just hang on to the momentum — why they insisted on taking us through stupid detours of despair or shame before returning us back to apparent “forward motion.”

[\[xxvi\]](#) Ibid.

[\[xxvii\]](#) Ibid.

[\[xxviii\]](#) Gartner Hype Cycle, Gartner Hype Cycle.

[\[xxix\]](#) Ibid.

[\[xxx\]](#) Gartner's 2015 Hype Cycle, Gartner's 2015 Hype Cycle.