

History of Singularitarian Thought:  
“Science Fiction is too Conservative” by G. Harry Stine

Stine, G. H. (1961) Science fiction is too conservative. *Analog Science Fact and Fiction* LXVII (3) (May), 83-99.

Excerpts and commentary by Eric Steinhart

Note on the text and author: Many of the ideas that are presented in recent literature on the singularity (especially Kurzweil) are presented in a prescient essay by George Harry Stine (born 1928 – died 1997). The essay “Science Fiction is too Conservative”, was published in May 1961 in *Analog*. *Analog* was a widely read science-fiction pulp magazine. Stine was a professional rocket engineer and part-time science fiction writer.

Science fiction is reflection on technology: “Science fiction is really speculative fiction based upon the new force in human affairs, technology.” (p. 85)

Trend curves are useful ways to extrapolate history into the future: “Old training as an s-f writer taught me the value of future trend curves. In order to write a story about the future, one had to have some notion of what the future held in store and in what approximate time period it was likely to take place. . . . Trend curves were probably first considered as a serious aid to research management by the Air Force Office of Scientific Research in 1953.” (86)

The example of the trend curve for speed: “A trend curve is a simple thing to plot. . . . For a better understanding of this matter of trend extrapolation, let us consider one of the simplest and most obvious of trend curves: speed.” (87-88)

Stine mentions walking, travel by horseback, travel by ships, then trains.

The sequence of S-curves forms an accelerating curve: “There is already something of interest that the trend curve can tell us at this point: each time a new concept of transportation showed up, the speed curve for that device rose sharply and finally leveled off as the practical limit for that device was reached. But, at the same time, each new quantum jump in speed was produced by a new device based on a new concept. This, then, gives the integrated curve a continually increasing slope.” (88-89)

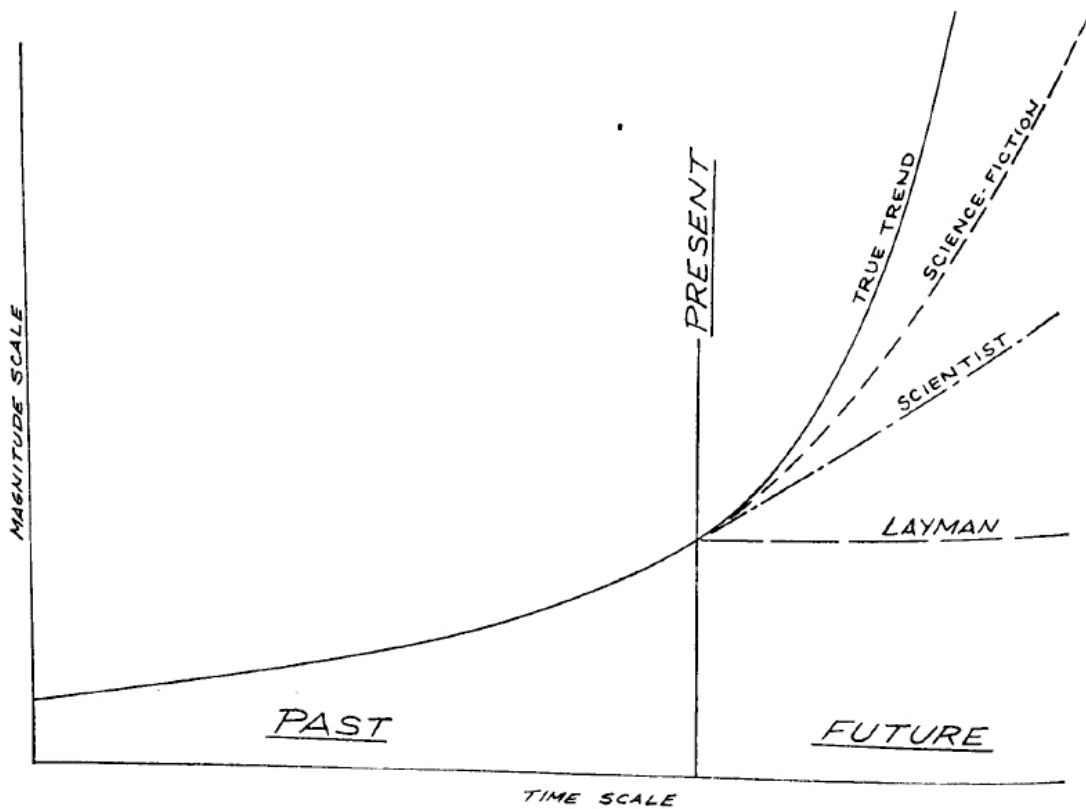
Stine continues the consideration of speed curves: he mentions the progress of airplane speeds; then rockets and missiles. He uses the trend curve for speed to argue that “Manned vehicles should achieve orbital velocity in 1961.”(89)

He mentions that the 1953 Air Force study used trend curves to predict that orbital velocity would be reached around 1957 and escape velocity soon after. Note that the USSR launched the first satellite, Sputnik, in October 1957.

Stine discusses how speed curves are not linear; they accelerate and thus need to be plotted on logarithmic graph paper; but the acceleration is accelerating. (90)

Non-experts make flat extrapolations: “Most laymen are content to predict the future in terms of a trend curve that levels off from the present ever onward.” (91)

Scientists make linearly increasing extrapolations. They make linear trend curves: “Scientists, on the other hand, are a bit more radical; they tend to predict the future trend with a curve of constant slope from now on.” (91) See Figure 1.



HOW PEOPLE PREDICT THE FUTURE

**Figure 1.** How people predict the future.

Scientists are not radical enough: “Using a linear trend curve, scientists in 1930 were predicting a controlled nuclear reaction not before 2000 A.D. Obviously too conservative, because a controlled nuclear reaction was achieved ten years later.” (91)

Even science fiction writers have been too conservative: “Science fiction writers, myself included, were using a straight exponential trend curve, also a conservative one, and

predicted generally that space flight might be achieved around 1975, and that we might land on the Moon or travel to Mars around the turn of the century [around 2000].” (91)

Extrapolation yields radical predictions about speed: “If you really understand trend curves, you can extrapolate them into the future and discover some baffling things. The speed trend curve alone predicts that manned vehicles will be able to achieve near-infinite speeds by 1982. . . . the curve becomes asymptotic by 1982.” (92) See Figure 2.

Trend curves are declarative but not procedural: “The trouble with a trend curve is that it may tell you quite accurately what to expect, but it doesn’t tell you how it is going to happen. I have no idea how we are going to achieve near-infinite speeds – or near-infinite acceleration. The curve simply goes asymptotic.” (92)

The coming singularity for speed: “If this is really the case, a true scientific breakthrough of major importance must be in the offing in the next twenty years. The breakthrough itself will probably be within the next few years. . . . This is downright serious stuff, not fantasy, because the trend curve says that something is going to happen. . . . Get busy, something’s going to happen soon to keep the speed curve rising.” (92-93)

The proper task of science fiction is to consider the effects of accelerating trend curves: “Consideration of all the varied aspects of this is a proper, legitimate, and professed job for science fiction. It is the only medium of communication by which this can truly be considered in advance.” (92)

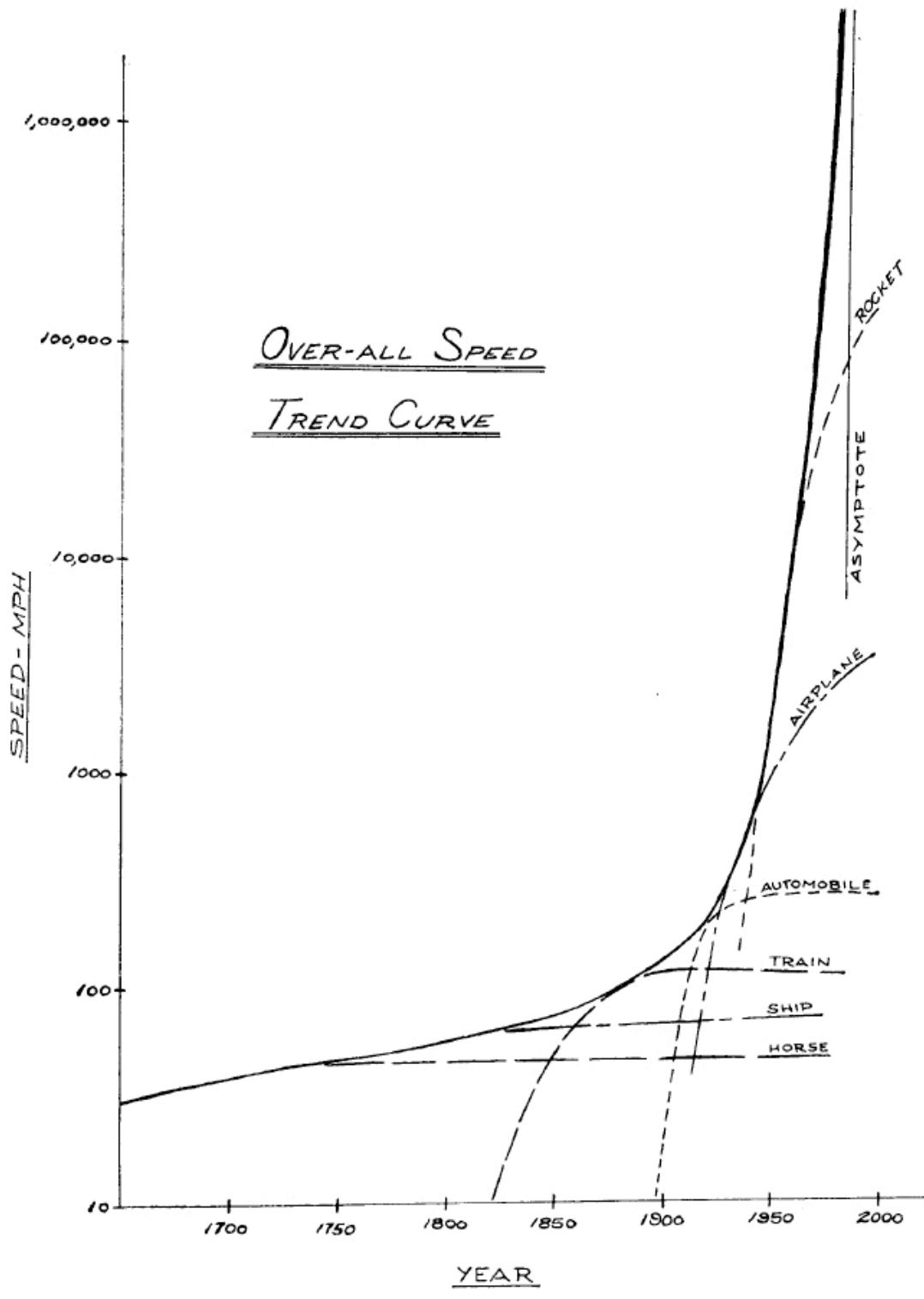


Figure 2. Over-all speed trend curve.

The singularity is coming around the year 2000: “The speed curve isn’t the only one that is going up fast. All trend curves are now rising rapidly, and all of them go asymptotic before 2000 A.D.” (93)

The life-span curve is accelerating: “1. Life expectancy is increasing, and this trend curve indicates that anyone born after the year 2000 A.D. lives forever, barring accidents.” (93)

The population curve is accelerating: “Population is rising rapidly, and early in the Twenty-first Century there isn’t enough room on the planet Earth for everybody.” (94)

The rate of cultural change is accelerating: “3. Historical cycles are getting shorter. . . . A cultural cycle today is about twenty years long. Soon, we can expect to see several major cultural changes in one life span.” (95)

The amount of controllable energy per capita is accelerating: “4. The trend curve for controllable energy is rising rapidly. . . . It is highly probable that controlled fusion has been achieved in the laboratory and will become commercial within a matter of years. . . . By 1981, this trend curve shows that a single man will have available under his control *the amount of energy equivalent to that generated by the entire sun.*” (95; italics Stine’s)

The power of computation is accelerating: “5. The number of circuits in cybernetic devices is increasing on the familiar trend curve. The human brain has an estimated four billion neural circuits. By 1970, computer engineers may have achieved the same number of circuits in a digital computer.” (95)

The amount of knowledge is accelerating: “6. The amount of knowledge that must be assimilated by our young people before they are equipped to earn a livelihood is also increasing on the super-exponential trend curve along with the curve representing the total accumulated knowledge of the human race.” (96)

Total coordinated acceleration: “*All* the trends are upward, not just one of them.” (97)

Civilization is accelerating to the singularity: “Things are going to happen much faster than we think, and they are going to have much wider implications that we have considered. We need only look at the last twenty-five years. And we need to realize that we will see must as much change in the next ten years.” (99)

It is necessary to think about this acceleration: “If the trend curves can tell us that all this – and more – is going to happen, we should try to do a little engineering and planning in advance so that they don’t happen willy-nilly, so that we can have some control over making them happen the way we want them to.” (99)

Science fiction is futurism based on extrapolation of trend curves: “Science fiction is the logical medium in which to do this.” (99)

Optimism about the future: “The future isn’t all death and destruction. We live in a better world than our fathers did. Our children will live in an even better world if we apply our minds to the problem right now.” (99)

Some general predictions in the article:

- 1960s – controlled commercial fusion
- 1970 – digital computers with the complexity of the brain
- 1975 – manned space flight
- 1981 – energy per capita equals total energy of the sun
- 1982 – human vehicles achieve near –infinite speed
- 2000s – humans land on the Moon or travel to Mars
- 2000 – anyone born thereafter is immortal