Books for Big Thinking: What Should Informatics Students Be Reading?

Brian E. Chapman, Ph.D.
University of Utah

This talk hopes to continue the blessings I've received my instructors and mentors sharing book suggestions with me. (Recommender shown in photograph adjacent to book).

I have the conflict that my entire livelihood is based on the belief that biomedical informatics is important. My spouse is also a consultant for IBM

Most images are taken from Amazon.com

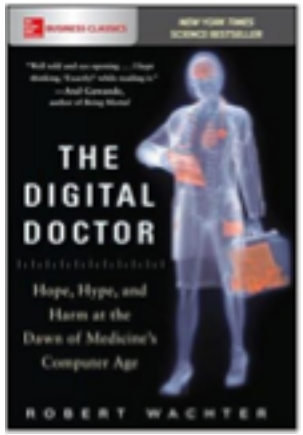
“Critical Thinking”….

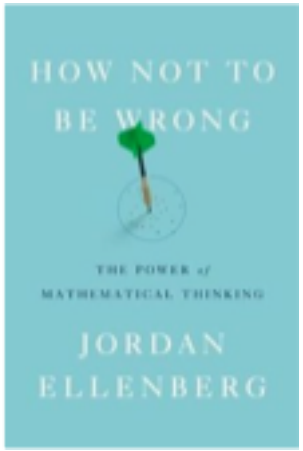
Pradeep K. Khosla UCSD

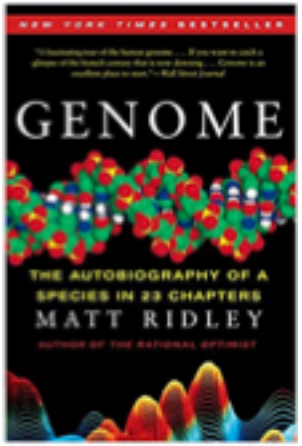
…we all want to believe we do it and that we are also teaching our students to think critically.

But, Khosla argues, it is in the arts, humanities, and social sciences--not mathematics and science--that we develop critical thinking. (**National Competitiveness Forum, Part 3, CSPAN**)

Our Incoming Student Reading List: Stories and Context

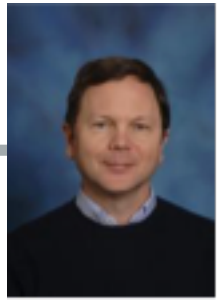




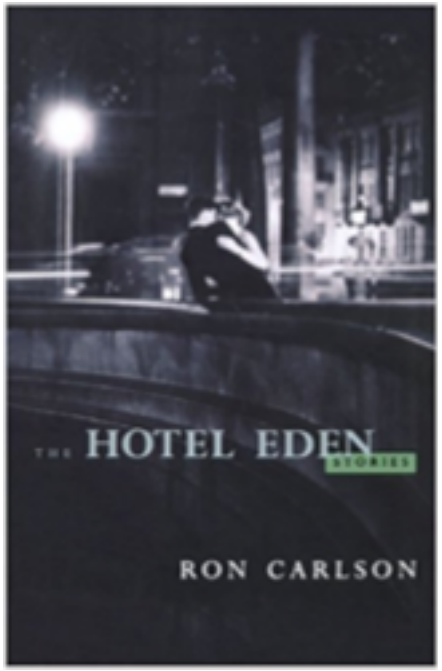


Hoping this provides more biomedical informatics context to incoming students

How to write a Progress report: We will all fail at sometime…



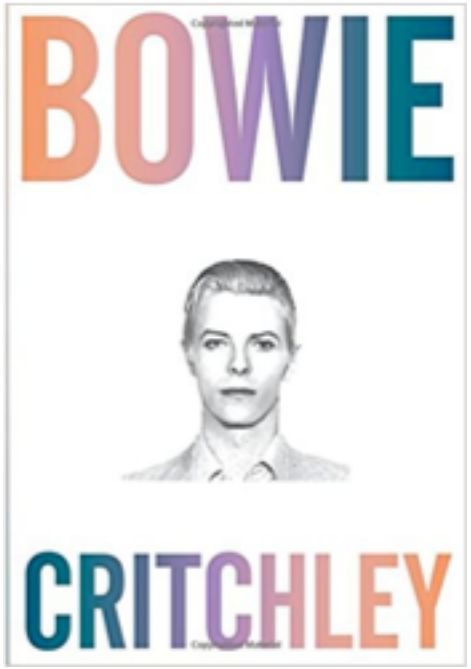
Greg Cooper



…and we'll need to explain and ask for another chance (and more money) anyway

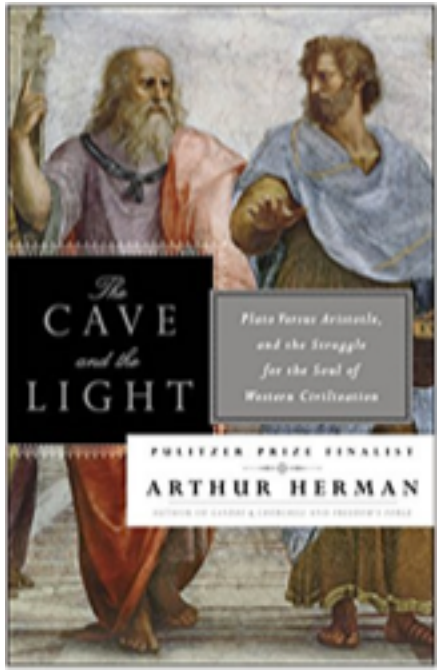
"WHAT WE WANTED to do was **[SPILL BOILING OIL ONTO THE HEADS OF OUR ENEMIES AS THEY ATTEMPTED TO BANG DOWN THE GATES OF OUR VILLAGE]** {REPLACE WITH YOUR OWN SCENARIO}, but, as everyone now knows, we had some problems, primarily technical problems, that prevented us from doing what we wanted to do the way we had hoped to do it. **What we're asking for today is another chance**." ("What We Wanted to Do")

Because we should all just know about Bowie…



…and Critchley is a philosopher, so how can you lose with this?!

Ideas come and go and come and go…



…as demonstrated by Plato and Aristotle playing leapfrog throughout ~2500 years of Western history…

…just like neural networks

And just Like John Prine taught us…

…Years Ago

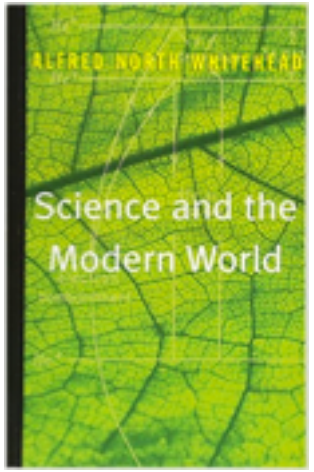
“That's the way that the world goes 'round.

You're up one day and the next you're down.”

Whitehead eloquently taught the evolution of ideas…

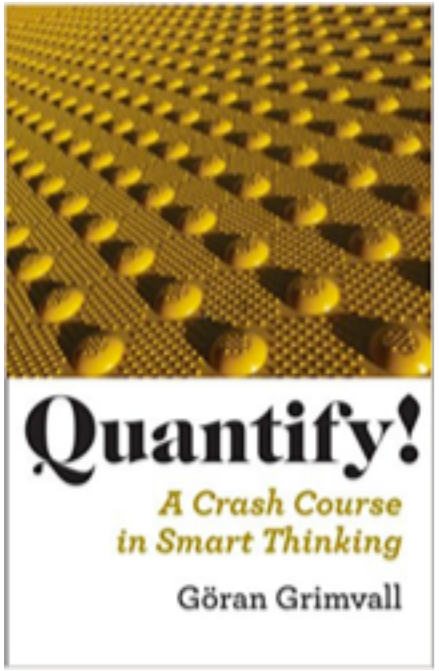
"Centuries, sometimes thousands of years, have to elapse before thought can capture action." (*Adventures of Ideas*, p. 55)

…and of the importance of patience and quantification…



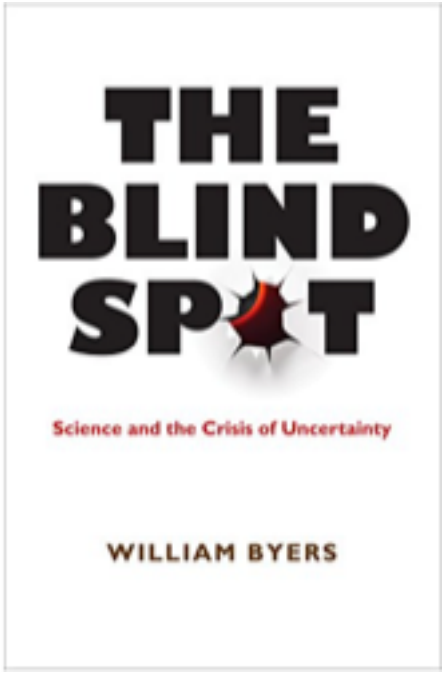
"measure, and thus…express quality in terms of numerically determined quantity." (*Science and the Modern World*)

How to quantify is a skill taught well…



…by a Norwegian mathematician

But…

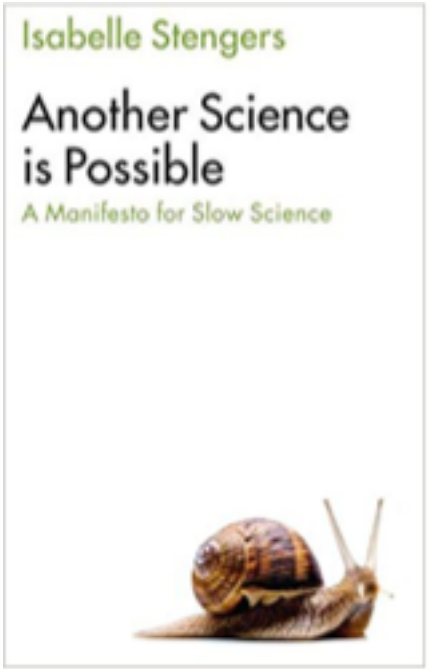


Quantifying what is not quantifiable

…quantification can induce its own errors and terrors

Believing only that which can be quantified exists, and if it can be quantified it is important

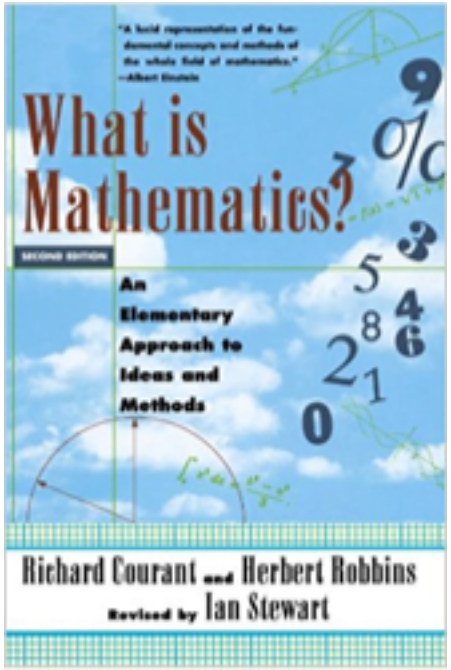
We should be reading to challenge our conceptions of science…



…recognizing that "Like fast food, fast science is quickly prepared, not particularly good, and it clogs up the system."

Slow down! Also a message to medicine from Larry Weed.

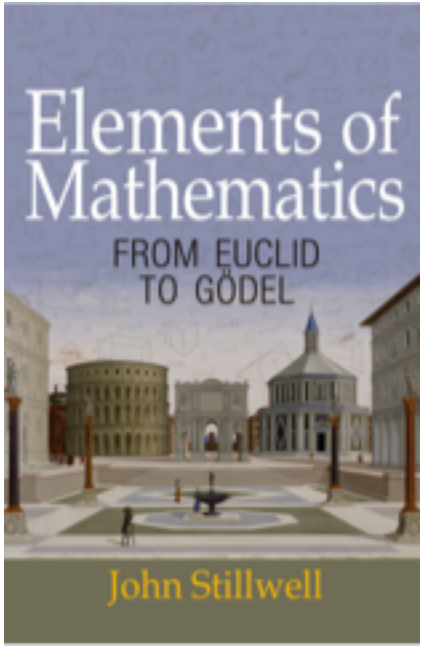
Informatics, like all modern science, is built on mathematics…



A classic survey that is not simplistic

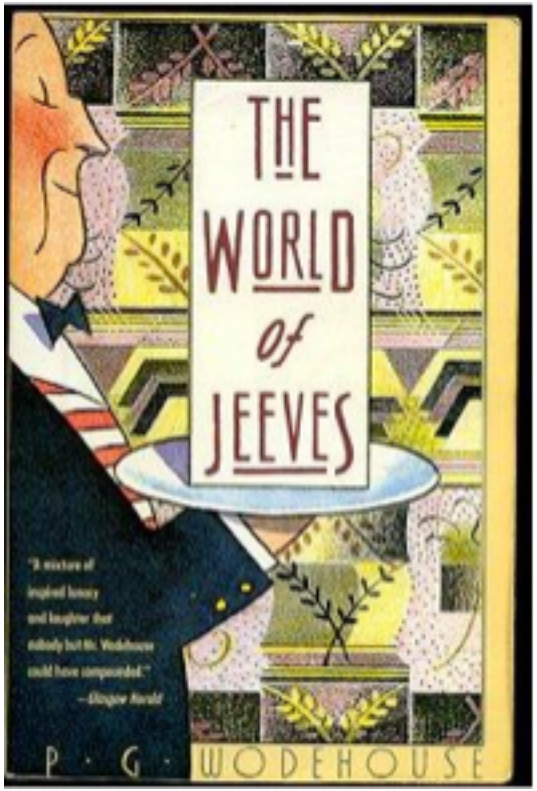
Peter Alfeld

…and you can never have enough math



A newer survey that includes more on computation

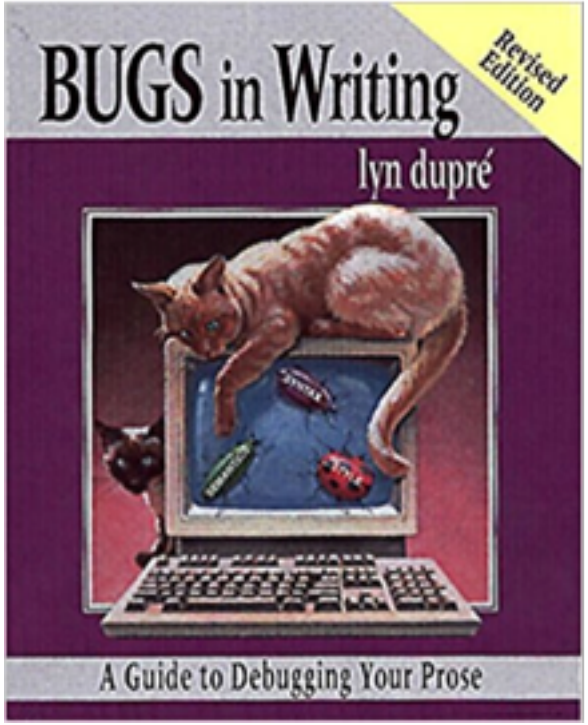
An unforgettable collection of short stories…



…because sometimes you just need to escape and laugh!

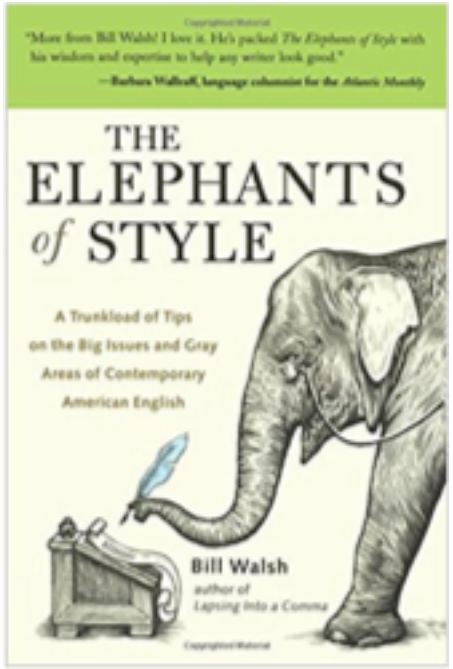
Everyone needs a style guide…

…Greg Cooper suggests



Developed for the informatics community.

But may I add…

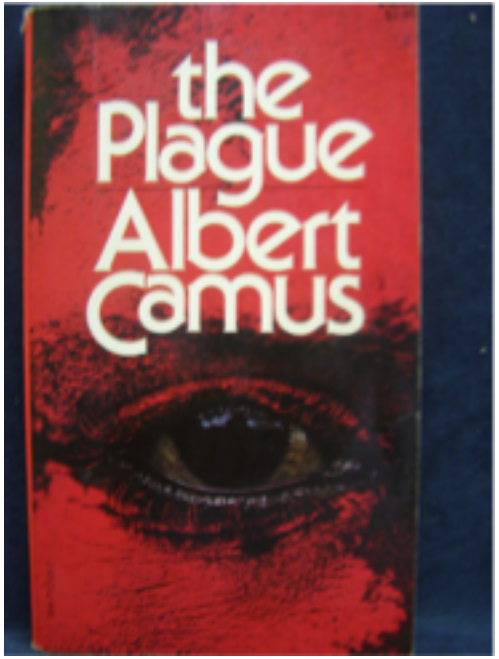


"To many, the use of [data and media] in their original plural form is a litmus test for literacy, so it takes some bravery to deviate from the norm. But I think **the words are now singular in most cases**.

Data was a plural word when its singular form was still alive. When was the last time you saw *datum* anywhere but in a discussion of this issue? The purists are trying to keep the singular form on life support, but I say it's time to pull the plug and acknowledge that *data* is a collective noun, like *information.*"

…and call on you to be brave.

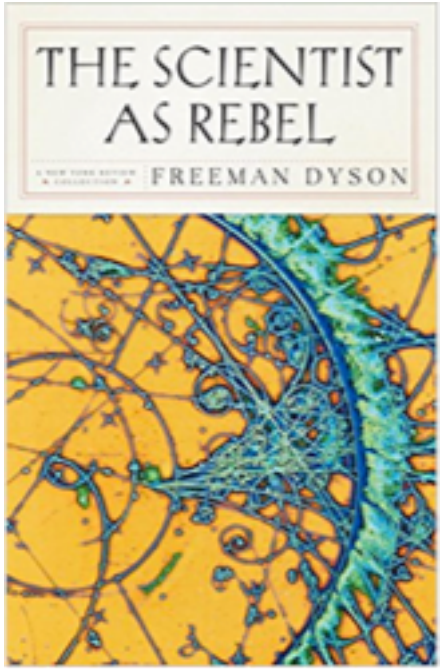
The story of a physician struggling against enormous odds…



…that restates the fundamental assumption of informatics.

"On the whole, men [clinicians] are more good than bad; that, however, isn't the real point. **But they are more or less ignorant**, and it is this that we call vice or virtue."

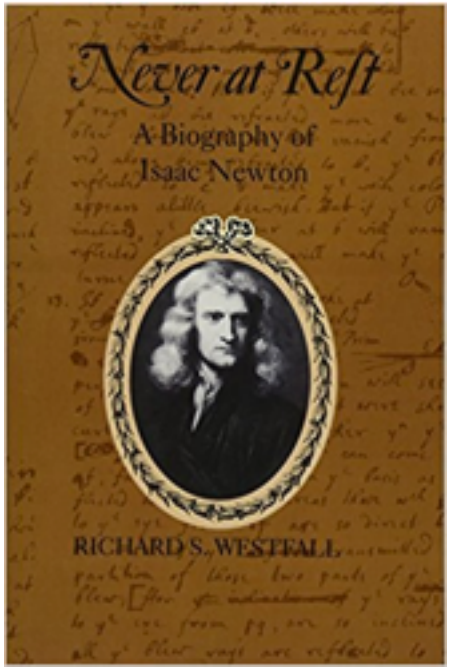
Freeman Dyson never earned a doctorate…



…but was one of the greatest physicists of the 20th Century

"Science is an alliance of free spirits in all cultures **rebelling against the local tyranny that each culture** imposes on its children.…If science ceases to be a rebellion against authority, then it does not deserve the talents of our brightest children."

When egos get a little big, think of giving this…



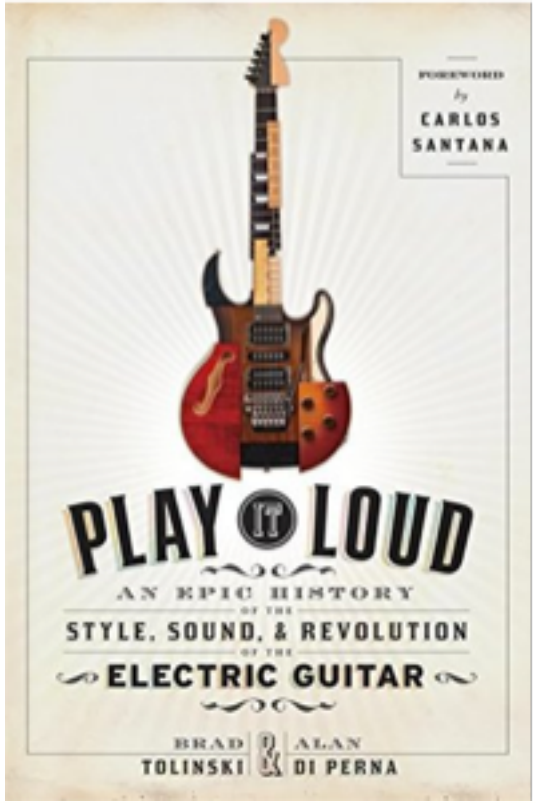
…either to your student or your advisor; this book might bring them down to earth

"The more I have studied him, the more Newton has receded from me. It has been my privilege at various times to know a number of brilliant men, men whom I acknowledge without hesitation to be my intellectual superiors. I have never, however, met one against whom I was unwilling to measure myself…[M]y study of Newton has served to convince me that **with him there is no measure**."

At 691pages perhaps this should be a graduation present…

…but it is a great exploration of perception, bias, and the psychological effect of the order of information presentation

I haven't read this…



…but I'd like to.

Book group anyone?

And my list goes on and on…

As I'm sure yours do also